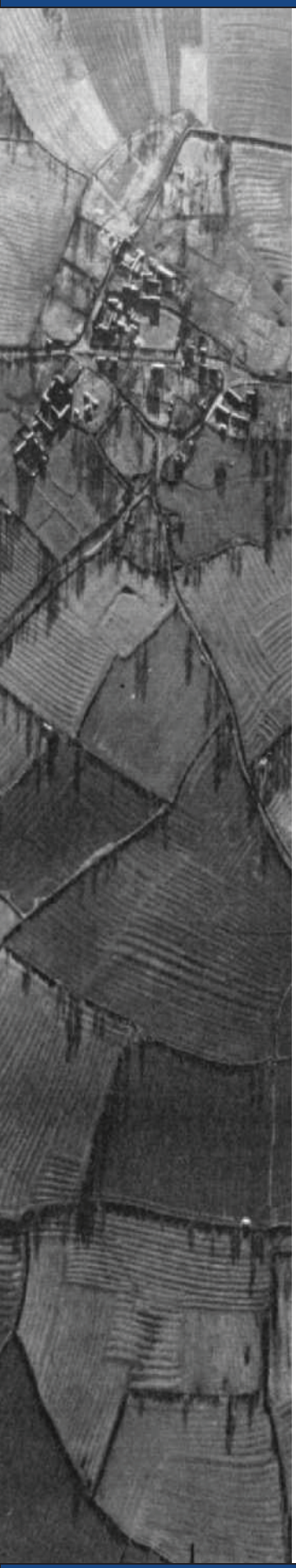

Odd Down
Bath

MAGNETOMETER SURVEY REPORT

for

Cotswold Archaeology

on behalf of

WYG Environment

David Sabin and Kerry Donaldson

November 2009

Ref. no. 292

ARCHAEOLOGICAL SURVEYS LTD

Odd Down, Bath

Magnetometer Survey

for

Cotswold Archaeology

on behalf of

WYG Environment

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

Survey date - **6th November 2009**
Ordnance Survey Grid Reference – **ST 7415 6200**

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SUMMARY

A magnetometer survey was carried out over 2.5ha within a former school playing field at Odd Down, Bath. The northern part of the site contained widespread magnetic debris which may relate to strongly magnetic material that has been used to infill a former quarry and/or ground make-up associated with levelling the school playing field. Magnetic debris and services are also associated with demolished buildings within the northern and eastern part of the site. The site contains several short positive and negative linear anomalies and weak discrete anomalies of uncertain origin.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Cotswold Archaeology, on behalf of WYG Environment, to undertake a magnetometer survey of an area of land at Odd Down, Bath. The site has been outlined for the proposed development of a supermarket, retirement flats and a carehome. The survey forms part of an archaeological assessment of the site.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by WYG Environment (2009) and approved by Richard Sermon, Archaeological Officer for Bath and North East Somerset 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 objective will also be to "obtain information that will contribute to an evaluation of the significance of impact of the scheme upon cultural heritage, and which will enable further evaluation and/or mitigation measures to be designed" (WYG Environment, 2009).

1.2.2 The methodology is considered an efficient and effective approach to archaeological prospection. The survey and report generally follow the recommendations set out by: English Heritage, 2008, *Geophysical survey in archaeological field evaluation;* Institute for Archaeologists, 2002, *The use of Geophysical Techniques in Archaeological Evaluations*.

1.3 Site location, description and survey conditions

1.3.1 The site is located at on the southern side of Bath and is bounded to the north by the Frome Road (A3062), to the east by Three Ways and The Link School, to the south by residential dwellings facing Cranmore Place and to the west by

St Martins Garden Primary School. It is centred on Ordnance Survey grid reference ST 7415 6200.

1.3.2 The geophysical survey covers an area of approximately 2.5ha of a former school playing field. The site is bounded by steel fencing, with a disused tennis court in the south western corner. Ground cover consisted of grass.

1.3.3 Survey conditions were generally good with manageable ground cover and overcast but dry weather. A zone of raw sewage had discharged from an inspection chamber pipe in the north western part of the site and a section approximately 4m wide was left unsurveyed. High levels of magnetic disturbance were encountered adjacent to steel fencing surrounding the site.

Plate 1: Survey area looking north

1.4 Site history and archaeological potential

1.4.1 The archaeological background has been derived from the WSI (WYG Environment, 2009). No archaeological sites or findspots are known to exist within the survey area. Within the vicinity, prehistoric activity has been recorded through chance finds of flint artefacts dating from the Upper Palaeolithic/Mesolithic to the Neolithic and Bronze Age. A 1300m section of the West Wansdyke runs approximately east-west some 75m to the south of the site. Although believed to date to the Early Medieval period (410AD – 1066AD) there is some thought that this earthwork may have a prehistoric origin.

1.4.2 Romano-British activity within the area relates to settlement and funerary remains. Several stone coffins were found some 400m to the north east and

600m to the south west of the site, and the Fosse Way is located approximately 250m to the west of the site. Buildings from two phases of Roman occupation have also been recorded to the south of the site.

1.4.3 During the medievel period the site was likely to be under agriculture. In more recent times, within the vicinity of the site, a glasshouse was in the process of bottle making in 1696 and the Bath Union Workhouse was constructed in 1936-8, (becoming St Martins Hospital in 1948). Ordnance Survey mapping also shows the area immediately to the west of the site to contain "sewage hydrants".

1.4.4 Within the site there have been several changes of land use and layout. From the 19th century, the northern part of the site had been divided into small parcels of land containing dwellings (since removed). A cottage was located within the north western part of the site at least until 1994. The northern part of the site was quarried at least since 1932 and partially reinstated by 1950. At this time the southern part of the site was subdivided by a north-south field boundary and the Wansdyke Infant School had been built in the eastern part of the site. By 1989 the school had been demolished and more recently the cottage in the north western part of the site has also been removed.

1.4.5 The site lies within an area containing archaeological evidence particularly from the Romano-British and Post-Medieval periods, showing settlement and industry has played an important role in the area. The modern disturbance, including building and quarrying, is likely to have truncated any archaeological remains within the northern part of the site.

1.5 Geology and soils

1.5.1 The underlying geology is Greater Oolite (BGS, 2001). The overlying soils across the site are unmapped as they lie within the urban area of Bath; however, the adjacent soils are from the Elmton 1 association which are brown rendzinas. These consist of shallow, well drained, brashy, calcareous fine loamy soils over limestone (Soil Survey of England and Wales, 1983).

1.5.2 Previous surveys by Archaeological Surveys over similar geology and soils have produced good magnetic contrast between cut features and the material into which they are cut.

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 Grad601-2 gradiometer. This 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. The instrument is extremely sensitive and is able to measure magnetic variation to 0.01nanoTesla (nT) with an effective resolution of 0.03nT. All readings are saved to an integral data logger for analysis and presentation

2.2.2 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. It may be very difficult to obtain optimum balance for the sensors due to localised magnetic vectors that can 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.

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

Date of calibration/service	16th May 2009
Sensor type	Bartington Grad - 01 – 1000 Nos. 084 and 085
Bandwidth	12Hz (100nT range) both sensors
Noise	<100pT peak to peak
Adjustable errors	<2nT

Table 1: Bartington fluxgate gradiometer sensor calibration results

The instrument was considered to be in good working order prior to the survey with no known faults or defects.

2.2.4 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).

2.2.5 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS and oriented parallel to the field boundaries. The GPS is used in conjunction with Topcon's TopNet 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 ±10nT 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 for the survey area.

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 assessment of features within the survey area.

2.3.4 The main form of data display used in this report is the greyscale plot. Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot.

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. Prior to displaying against base mapping, raster graphics require a rotation anticlockwise to restore north to the top of the image. Greyscale images are rotated by AutoCAD.

2.3.6 The raster images are combined with base mapping using 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.. A digital archive, including raster images is produced with this report, allowing separate analysis if necessary, see Appendix D below.

3 RESULTS

3.1 General overview

3.1.1 The detailed magnetic survey was carried out over a total area of 2.5ha. Geophysical anomalies located can be generally classified as, positive and negative linear anomalies of an uncertain origin, 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. Anomalies located within each survey area have been numbered and will be outlined below.

3.1.2 The listing 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 reference to the abstraction and interpretation plot. Sub-headings are then used to group anomalies with similar characteristics for each survey area.

Anomalies with an uncertain origin

Positive anomalies
Negative anomalies

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.

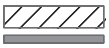
Anomalies with an agricultural origin

Agricultural anomalies

Where confidence is high that anomalies have been caused by agricultural features this category is applied. 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 with a modern origin

Magnetic disturbance
Strong multiple dipolar linear anomaly - pipeline/service



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.

Anomalies associated with magnetic debris

Magnetic debris
Strong discrete dipolar anomaly

The response often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. Magnetic debris 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 may therefore be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to

ferrous objects within the topsoil.

3.2 List of anomalies

Anomalies with an uncertain origin

(1) – A series of four short positive linear anomalies situated close to the north western corner of the site. It is not possible to determine the origin of these anomalies but they have the potential to relate to cut features.

(2) – A weakly positive curvilinear anomaly extends south eastwards from the area of magnetic debris in the northern part of the site.

(3) – Two very short positive linear anomalies. It is possible that they relate to agricultural activity although this is not certain.

(4) – Weak discrete positive responses may indicate pit-like features although it is possible that they may relate to geological or pedological features.

(5) – A short positive linear anomaly, oriented almost east-west, may be associated with anomalies (6).

(6) – Positive and negative responses with a broadly linear form. They only appear within the eastern half of the survey area and are perpendicular to the main plough trend across the site; however, Ordnance Survey mapping from the 1930's indicates that there was a north-south field boundary halving the site. It is therefore possible that these anomalies relate to plough marks within this former eastern field.

(7) – A positive linear anomaly within the footprint of and parallel with the former Wansdyke Infant School. Although it is likely that this anomaly relates to the former building, it has to be considered that it may relate to a cut feature that is not directly associated.

(8) – A negative linear anomaly lies parallel to, and approximately 4m inside, the western field boundary. This type of anomaly indicates a response to material with low magnetic susceptibility and may correlate with a low embankment within this part of the site. It is, however, a possibility that it relates to a buried service.

Anomalies with an agricultural origin

(9) – A series of parallel linear anomalies, oriented north-north-west to south-south-east relate to agricultural activity.

Anomalies associated with magnetic debris

(10 & 11) – U shaped area of magnetic debris (10), close to the eastern edge of the field, relates to the site of the former Wansdyke Infants School building. A narrow L

shaped linear zone of magnetic debris surrounds the former building on the western and southern sides and relates to a former boundary or pathway associated with the school.

(12) – An area of magnetic debris located in the western part of the site relates to a former building that was situated here until recently.

(13) – A widespread zone of magnetic debris dominates the northern part of the site and has a very strongly defined southern boundary. The central part of this area relates to the site of a former quarry, and former buildings were also known to have existed on the site in the north eastern and north western corners. The magnetic debris may therefore relate to material directly associated with the demolition of the buildings and the infill of the quarry, or to general ground make-up, perhaps associated with levelling the site for the playing field. Much of the material has a very strong response, suggesting that ferrous and other magnetically thermoremnant material from industrial sources is incorporated within it.

(14) – The site contains many strong discrete dipolar anomalies relating to ferrous objects within the topsoil.

Anomalies with a modern origin

(15) – The site contains a number of strong multiple dipolar linear anomalies in the eastern and north western parts of the site which relate to services associated with the former buildings (10 & 12).

(16) – A negative linear anomaly extends across the northern part of the survey area and is oriented approximately north west to south east. It appears to "cut" across the area of the infilled quarry, indicating that it is a modern feature, likely to relate to a plastic or concrete pipe or service.

4 CONCLUSION

4.1.1 The geophysical survey located strong magnetic anomalies that relate to land make-up and demolition material associated with a former quarry and buildings in the northern part of the site. Magnetic debris and disturbance was also associated with the former Wansdyke Infant School within the central eastern part of the site.

4.1.2 Several positive and negative anomalies were abstracted from the data but interpretation is limited. Agricultural anomalies located in the southern part of the site tend to indicate relatively little disturbance when compared to the northern part of the site. The results corroborate the 19th and 20th century map evidence of a former land boundary with an east-west orientation that separated agricultural land from industrial/residential land.

5 REFERENCES

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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.

Appendix C – survey and data information

Raw magnetometer data

Filename: mag-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: DJS on 06/11/2009
Assembled by: DJS on 06/11/2009
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: Zero

Dimensions
Composite Size (readings): 640 x 200
Survey Size (meters): 160 m x 200 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: 16.21
Mean: -1.31
Median: 0.59
Composite Area: 3.2 ha
Surveyed Area: 2.3809 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 20
1 Col:0 Row:0 grids\19.xgd
2 Col:0 Row:1 grids\20.xgd
3 Col:0 Row:2 grids\01.xgd
4 Col:0 Row:3 grids\02.xgd
5 Col:0 Row:4 grids\03.xgd
6 Col:1 Row:0 grids\17.xgd
7 Col:1 Row:1 grids\18.xgd
8 Col:1 Row:2 grids\04.xgd
9 Col:1 Row:3 grids\05.xgd
10 Col:1 Row:4 grids\06.xgd
11 Col:2 Row:0 grids\15.xgd
12 Col:2 Row:1 grids\16.xgd
13 Col:2 Row:2 grids\07.xgd
14 Col:2 Row:3 grids\08.xgd
15 Col:2 Row:4 grids\09.xgd
16 Col:3 Row:0 grids\13.xgd
17 Col:3 Row:1 grids\14.xgd
18 Col:3 Row:2 grids\10.xgd
19 Col:3 Row:3 grids\11.xgd
20 Col:3 Row:4 grids\12.xgd

Processed magnetometer data

Filename: mag-proc.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: DJS on 06/11/2009
Assembled by: DJS on 06/11/2009
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: Zero

Dimensions
Composite Size (readings): 640 x 200
Survey Size (meters): 160 m x 200 m
Grid Size: 40 m x 40 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 10.00
Min: -10.00
Std Dev: 6.77
Mean: -0.69
Median: -0.34
Composite Area: 3.2 ha
Surveyed Area: 2.3796 ha

Processes: 8
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Mean Traverse: Grids: All Threshold: 0.5 SDs
4 DeStripe Mean Traverse: Grids: All Threshold: 0.25 SDs
5 DeStripe Mean Traverse: Grids: All Threshold: 0.25 SDs
6 Clip from -10.00 to 10.00 nT
7 De Stagger: Grids: All Mode: Outbound By: 1 intervals
8 Clip from -10.00 to 10.00 nT

Source Grids: 20
1 Col:0 Row:0 grids\19.xgd
2 Col:0 Row:1 grids\20.xgd
3 Col:0 Row:2 grids\01.xgd
4 Col:0 Row:3 grids\02.xgd
5 Col:0 Row:4 grids\03.xgd
6 Col:1 Row:0 grids\17.xgd
7 Col:1 Row:1 grids\18.xgd
8 Col:1 Row:2 grids\04.xgd
9 Col:1 Row:3 grids\05.xgd
10 Col:1 Row:4 grids\06.xgd
11 Col:2 Row:0 grids\15.xgd
12 Col:2 Row:1 grids\16.xgd
13 Col:2 Row:2 grids\07.xgd
14 Col:2 Row:3 grids\08.xgd
15 Col:2 Row:4 grids\09.xgd
16 Col:3 Row:0 grids\13.xgd
17 Col:3 Row:1 grids\14.xgd
18 Col:3 Row:2 grids\10.xgd
19 Col:3 Row:3 grids\11.xgd
20 Col:3 Row:4 grids\12.xgd

Appendix D – digital archive

Survey results are produced in hardcopy using A4 for text and A3 for plots (all plots are scaled for A3). In addition digital data created during the survey are supplied on CD. Further information on the production of the report and the digital formats involved in its creation are set out below.

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

- ArcheoSurveyor version 2.5.2.1 (geophysical data analysis),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.1.0 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

Digital data are supplied on CD ROM which includes the following files:

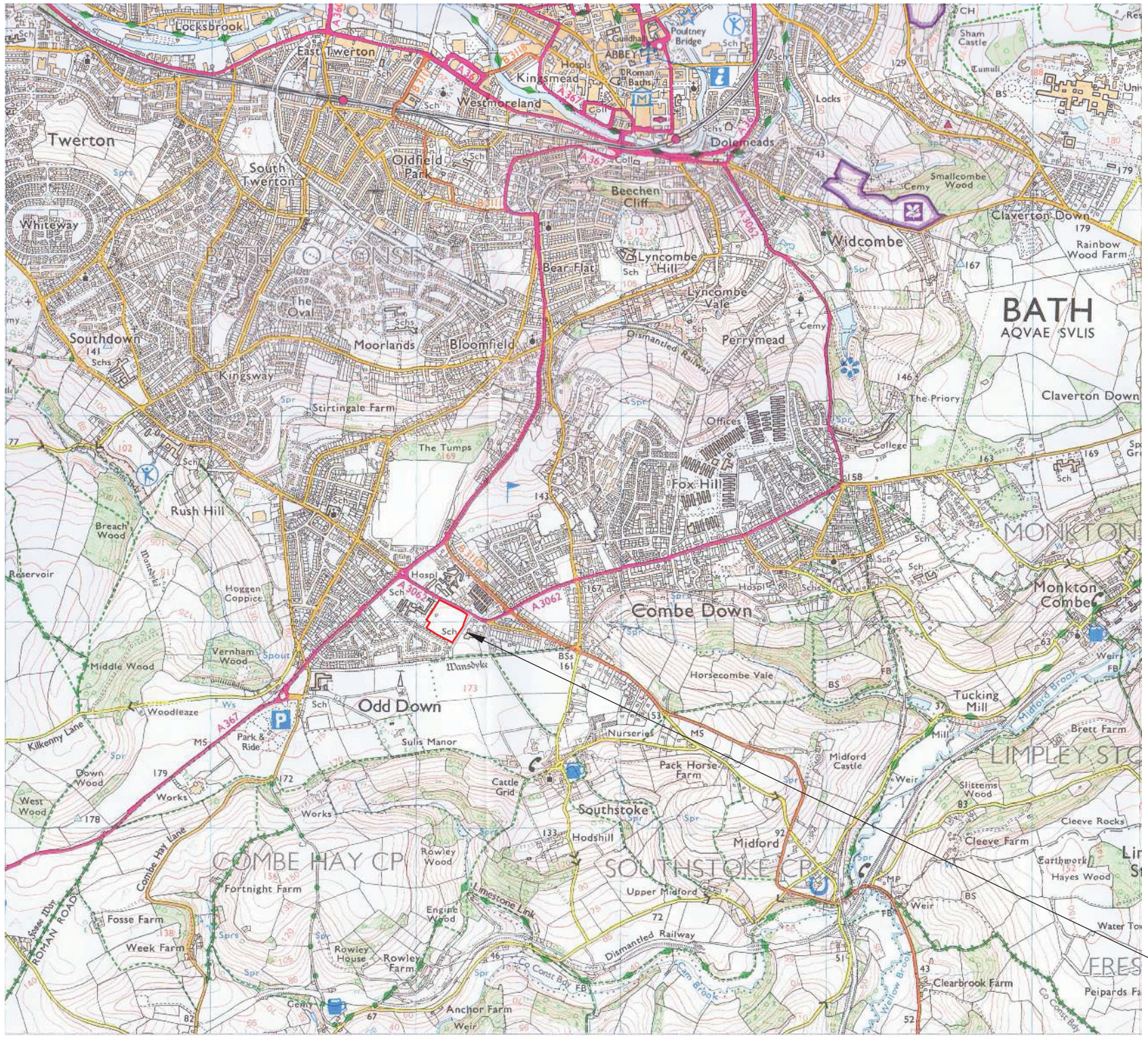
- ArcheoSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as OpenOffice.org ODT file,
- report text as Word 2000 doc file,
- report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

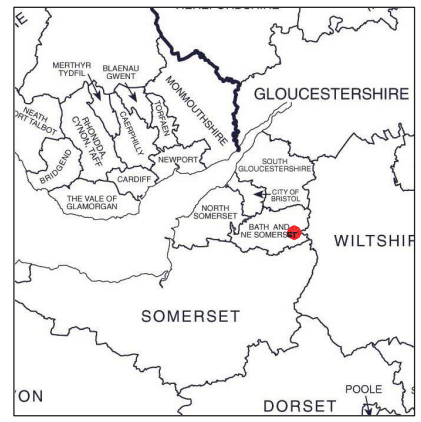
The CD ROM structure is formed from a tree of directories under the title J292 Odd Down – CD. Directory titles include Data, Documentation, CAD, PDFs and Photos. Multiple directories exist under Data and hold Grid, Composite and Graphic files with CSV composite data held in Export.

The CAD file contains externally referenced graphics that may be rotated with separate A3 size layouts for each figure. Layouts are fixed using frozen layers and named views allowing straightforward plotting or analysis on screen. (Note – CAD files are prepared using AutoCAD's e Transmit function to produce a directory containing the digital drawing along with any externally referenced graphics which may need reloading).

Archaeological Surveys Ltd

Geophysical Survey
Odd Down
Bath





Survey location

Site centred on OS NGR
ST 144 620

Map of survey area

Reproduced from OS Explorer map no.155 1:25 000 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100043739.

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

Survey grid size = 40m

Survey start and traverse direction

01 Grid reference number and filename

N

13 14 15 16 17 18 19 20 10 11 07 12 08 04 09 05 01 06 02 03

374061.97

162005.00

374164.32

161942.36

SCALE 1:1000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 02

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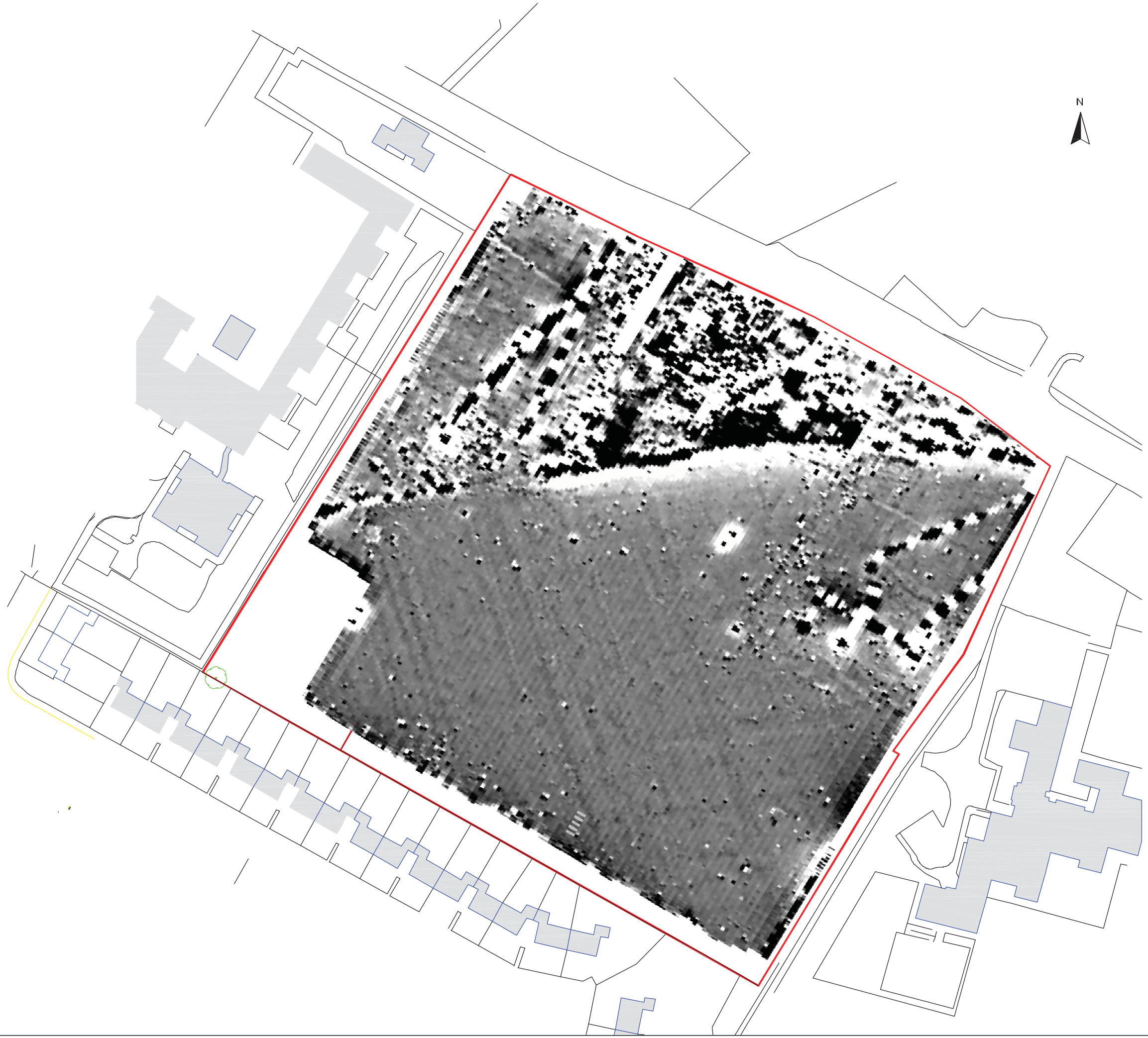
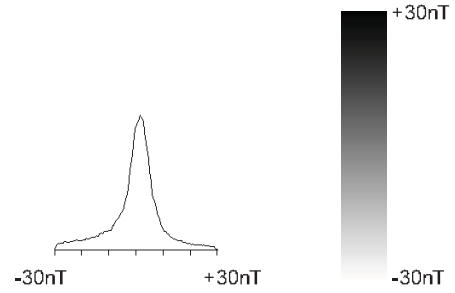
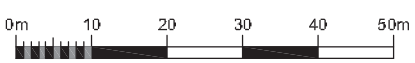


Greyscale plot of raw magnetometer data



SCALE 1:1000



SCALE TRUE AT A3

FIG 03

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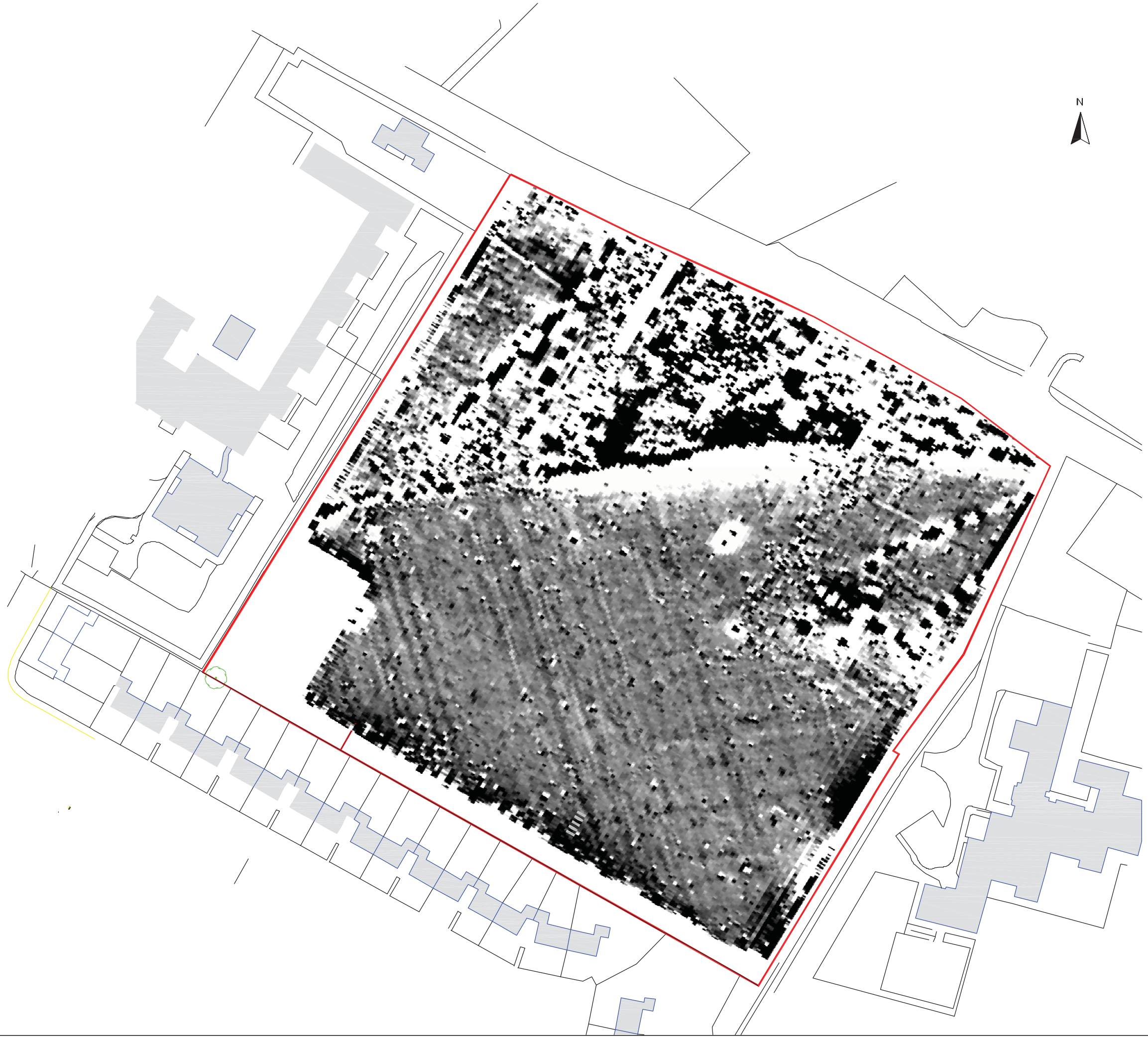
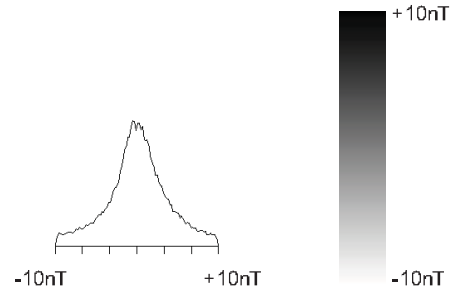
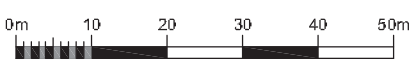


Greyscale plot of processed magnetometer data



SCALE 1:1000



SCALE TRUE AT A3

FIG 04

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Bath

Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin (trend only shown)
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Positive anomaly -weakly magnetically enhanced material
- Negative anomaly - material with low magnetic susceptibility
- Magnetic debris - spread of magnetically thermoremnant material associated with former buildings
- 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 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 05