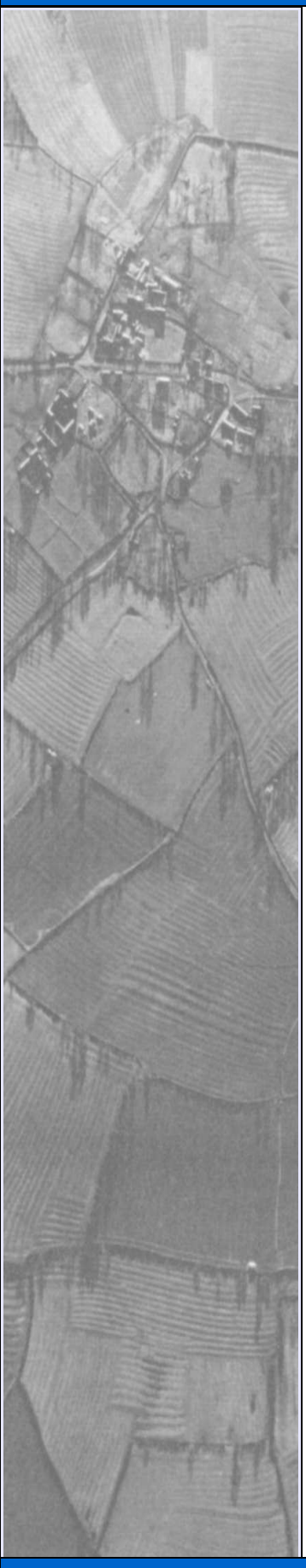

Water Main Replacement Access adjacent to the Fosse Way Norton Wiltshire

MAGNETOMETER SURVEY REPORT

for

Wiltshire Council Archaeology Service

David Sabin and Kerry Donaldson

August 2014

Ref. no. 564

ARCHAEOLOGICAL SURVEYS LTD

Water Main Replacement Access adjacent to the Fosse Way Norton Wiltshire

Magnetometer Survey Report

for

Wiltshire Council Archaeology Service

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

Survey date – 12th August 2014
Ordnance Survey Grid Reference – **ST 88630 86542**

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd, on behalf of the Wiltshire Council Archaeology Service, along a narrow corridor of land adjacent to the Fosse Way Roman road in Norton, Wiltshire. The corridor had been stripped of topsoil as part of an access route and easement for a replacement water main. The stripping of the topsoil revealed a number of wall foundations, hard surfaces, pits, ditches and possible industrial activity indicative of a continuation of the Roman town located to the north of the River Avon at White Walls, Easton Grey, 500m to the north. The results of the survey show that despite the narrow width of the corridor and some magnetic disturbance from the existing ferrous water pipe, the site contains a large number of linear ditches, pits and areas of burning, primarily at the northern end of the survey corridor. The response to the features is very strong, partly due to the removal of topsoil and partly due to strong magnetic enhancement caused by burnt material. A positive linear anomaly also extends along the western edge of the survey and this may relate to an eastern flanking ditch of the Fosse Way Roman road. A number of irregularly shaped positive responses have also been located, many of which are immediately adjacent to the flanking road ditch and they are likely to relate to quarry pits.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Melanie Pomeroy-Kellinger, from the Wiltshire Council Archaeology Service, to undertake a magnetometer survey of an area of land adjacent to the Fosse Way at Norton in north Wiltshire. The site is along an access route associated with the replacement of a water main by Bristol Water. The survey forms part of an archaeological assessment of a linear zone stripped of topsoil.

1.1.2 The site lies adjacent to the Fosse Way Roman road and a watching brief had been undertaken by Border Archaeology prior to the survey. At the northern end of the site Roman structural remains, pits, ditches and evidence of industrial activity were revealed below the ploughsoil. A plastic water main pipe has been inserted inside the existing iron/steel pipe. The access route is to the west of the pipeline, except near the northern end where the two converge.

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 recorded prior to backfilling of the access route. 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 east of the Fosse Way at Norton in the north western part of Wiltshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) ST 88630 86542, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 1ha within two narrow survey corridors immediately adjacent to the Fosse Way. Area 1 in the northern part of the site is approximately 600m long and 15m wide, Area 2 in the southern part of the site is approximately 155m long and 7m wide.

Plate 1: Area 1 - looking to the north and showing a former roadside ditch in the left of the shot

1.3.3 Topsoil had been stripped from the survey areas revealing a stony subsurface with pockets of clayey soil. Area 1 slopes down gently to the south and Area 2 slopes down towards the north. Between the two areas a narrow valley contained a stream that had flooded due to recent heavy rain. The valley was unsuitable for survey due to the flooding, rutted ground and the presence of a temporary bridge.

1.3.4 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Weather conditions during the survey were variable with periods of heavy rain.

1.4 Site history and archaeological potential

1.4.1 The site lies immediately east of the Fosse Way Roman road and to the south of the River Avon and Easton Grey Roman Town (White Walls). The main part of the town and scheduled area (*Medieval moated site and Romano-British settlement at White Walls Wood, SM 12046*), is bounded to the east by the Fosse Way and south by the River Avon, but The Cotswold Hills National Mapping Programme (NMP) has recorded associated features within an area 1.5km long and over 700m wide. Several other cropmarks, including linear ditches and enclosures, have also been recorded in the surrounding vicinity during the NMP.

1.4.2 Within the stripped access route the remains of several Roman buildings, pits, ditches and industrial activity were visible at the northern end of the site. The fill of a linear ditch running parallel to the Fosse Way Roman road was also visible within the easement, see Plate 1. There is therefore a very high potential for the magnetometer survey to locate archaeological features.

1.4.3 The surface conditions within the site were suitable for the observation of cultural material during the course of the survey. Two Roman coins were picked up from spoil at the northern end of the site but both were very badly corroded and could not be identified further. Numerous Roman pottery fragments were visible also but these tended to peter out away from the northern end of Area 1, with no material noted in Area 2.

1.5 Geology and soils

1.5.1 The underlying geology is generally Cornbrash but with some Kellaways Clay extending into the northern part of the site. (BGS, 2013).

1.5.2 The overlying soil across the site is from the Sherborne association and is a Brown Rendzina. It consists of a shallow, well drained, brashy, calcareous, clayey soil over limestone. There may be Evesham 1 soil associated with the Kellaways Clay and this is a typical calcareous pelosol. It consists of slowly permeable, calcarerous, clayey soil associated with shallow, well drained brashy, calcareous soil over limestone (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 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 20 Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. They are linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged PDA computer system.

2.2.2 Data are collected along a series of parallel survey transects wherever possible. The length of each transect is variable and relates to the size of the survey area and other factors including ground conditions. A visual display allows accurate placing of transects and helps maintain the correct separation between adjacent traverses.

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. Georeferenced data are then exported in ASCII format for compensation (destriping), interpolation and clipping using TerraSurveyor. Greyscale images are also produced using TerraSurveyor.

2.3.2 Appendix C contains specific information concerning the survey and data attributes and is derived directly from TerraSurveyor; this should be used in conjunction with information provided by Figure 02.

2.3.3 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 for the SENSYS MAGNETO data:

- clipping of processed data at ±20 nT to enhance low magnitude anomalies,
- zero median traverse is applied in order to balance readings along each traverse.

2.3.4 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 each survey area.

2.3.5 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 each survey area.

2.3.6 The main form of data display prepared for this report is the 'processed' greyscale plot 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.

2.3.7 Data captured with the SENSYS MAGNETO cart-based system are resampled to a resolution of effectively 0.5m between tracks and 0.18m along each survey track. A TIFF file (OSGB36) is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing when using GIS or CAD software.

2.3.8 The raster images are combined with base mapping using ProgeCAD Professional 2014 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.

2.3.9 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 two survey areas within a narrow corridor along the water pipe access route, covering 1ha in total.

3.1.2 Magnetic anomalies located can be generally classified as positive responses of archaeological potential, positive anomalies of an uncertain origin, areas of magnetic 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 are described below.

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. Severe magnetic disturbance has occurred close to the steel/iron pipe near the northern and southern ends of Area 1. The disturbance almost certainly obscures anomalies of archaeological potential near the northern end of Area 1 as this is where several buildings had been located during the watching brief. Some magnetic disturbance in Area 2 was caused by engineering equipment and this also has the potential to obscure weaker anomalies.

3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A 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 AS-ABST MAG POS 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.
Anomalies associated with magnetic debris AS-ABST MAG STRONG DIPOLAR	Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a modern origin AS-ABST MAG DISTURBANCE AS-ABST MAG 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. 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.

Table 1: List and description of interpretation categories

3.4 List of anomalies - Area 1

Area centred on OS NGR 388702 186655, see Figures 03 - 06.

Anomalies of archaeological potential

(1) – A positive linear anomaly is located in the northern part of the survey area and relates to a cut linear ditch that is oriented north-north-west to south-south-east. It has a response of over 40nT and is almost 2m wide. It appears to cut, or have been cut by a narrower linear anomaly (2).

(2) – A positive linear anomaly oriented west-north-west to east-south-east appears to cut, or be cut by anomaly (1). It is much weaker (<20nT) and narrower (c0.6m) than anomaly (1).

(3) – A positive linear anomaly that appears to relate to a cut linear ditch and oriented almost east-west. It is strongest at its eastern end (45nT) and weakest towards the west (10nT) and appears to have been cut by or cut through an irregularly shaped pit.

(4) – The northern part of the survey contains a number of positive linear anomalies but the majority of these do not form a coherent pattern or morphology. However, it is likely that they are associated with cut features.

(5) – Extending along the western edge of the survey area, and therefore parallel with the adjacent Fosse Way, is a positive linear anomaly. It is possible that this relates to the eastern flanking ditch of the Roman road. Within the southern half of Area 1 it could be distinguished as a soil ditch fill within the natural cornbrash, see Plate 1.

(6) – Predominantly within the northern part of the survey area are numerous

discrete positive responses which relate to pits and possible areas of burning. The majority of the anomalies are between 30nT and 40nT, but some peak at over 200nT and 400nT, and it is likely that these relate to intense burning.

(7) – A number of amorphous positive anomalies have been located along the length of the survey area. The majority of these are immediately adjacent to anomaly (5). They generally have a response of less than 10nT, but peak in places at 30nT. They appear to relate to quarry pits and may be associated with the construction or maintenance of the Roman road and/or other possible structures within the site.

Anomalies associated with magnetic debris

(8) – There are very few strong, discrete, dipolar anomalies as the topsoil has been removed. However, there is a cluster at the southern edge, but these are likely to be modern ferrous objects.

Anomalies with a modern origin

(9) – Magnetic disturbance has been caused by the existing ferrous water pipe which enters the northern and southern ends of the survey area and extends along the eastern edge.

3.5 List of anomalies - Area 2

Area centred on OS NGR 388450 186226, see Figures 07 & 08.

Anomalies with an uncertain origin

(10) – In the northern part of the survey area are three weakly positive linear anomalies oriented almost east-west. Other weak linears are also located further south in the survey area. Their weak response (2-4nT) and the narrow width of the survey area prevents confident interpretation.

(11) – A number of discrete positive anomalies are located in the central part of the survey area. They have a response of over 10nT, which may indicate that they are the response to the fill of cut features; however, a natural origin cannot be ruled out.

Anomalies with a modern origin

(12) – Magnetic disturbance is a response to engineering equipment and dumped material just to the west of the survey area.

4 CONCLUSION

4.1.1 The detailed magnetometer survey located a number of positive linear and discrete responses, primarily in the northern part of the survey corridor. They relate to ditches and pits and possible areas of burning and/or industrial activity. These have a very strong response, in part caused by the removal of topsoil which allows closer survey by the magnetometer, and partly due to the presence of magnetically enhanced material within their fill.

4.1.2 Along the western edge of the survey corridor within Area 1, is a positive linear anomaly which appears to relate to a flanking ditch of the adjacent Fosse Way Roman road. Several amorphous positive responses have also been located and these are likely to relate to quarry pits.

4.1.3 The results demonstrate the presence of a dense area of archaeological features within the northern half of Area 1 that correlates with the remains recorded by Border Archaeology. There is some potential for other features of archaeological potential extending further to the south but these are mainly in the form of small quarry pits.

4.1.4 Several ditch-like anomalies appear to cross the survey corridor at angles and are neither parallel nor perpendicular to the Fosse Way. It is possible that these may indicate a pre-Roman focus of activity but this cannot be stated with confidence due to the limited area surveyed.

5 REFERENCES

British Geological Survey, 2014. *Geology of Britain viewer, 1:50 000 scale [online]* available from http://mapapps.bgs.ac.uk/geologyofbritain/home.html [accessed 18/8/2014].

English Heritage, 2008. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1.* 2nd ed. Swindon: English Heritage.

Institute for Archaeologists, 2002. *The use of Geophysical Techniques in Archaeological Evaluations*. IfA Paper No. 6. IfA, University of Reading.

Institute for Archaeologists, 2011. *Standard and Guidance for archaeological geophysical survey*. IfA, University of Reading.

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 5 South West England.*

Appendix A – basic principles of magnetic survey

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

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

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

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

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

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

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The SENSYS gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 65cm apart. The instrument is carried about 10-20cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried 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 ±15nT and ±10nT 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.

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
Filename: J564-Area1.xcp
Description: Imported as Composite from: J564-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 388536.305704647, 186906.864303764 m
Southeast corner: 388884.785704647, 186391.164303764 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 313900

Dimensions
Composite Size (readings): 1936 x 2865
Survey Size (meters): 348 m x 516 m
Grid Size: 348 m x 516 m
X Interval: 0.18 m
Y Interval: 0.18 m

Stats
Max: 22.10
Min: -22.00
Std Dev: 15.20
Mean: 0.06
Median: 0.07
Composite Area: 17.971 ha
Surveyed Area: 0.8226 ha

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse: Threshold: 1.5 SDs
4 Clip from -20.00 to 20.00 nT

Area 2

COMPOSITE
Filename: J564-Area2.xcp
Description: Imported as Composite from: J564-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 388406.432946831, 186294.411890574 m
Southeast corner: 388491.572946831, 186160.131890574 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 39100

Dimensions
Composite Size (readings): 473 x 746
Survey Size (meters): 85.1 m x 134 m
Grid Size: 85.1 m x 134 m
X Interval: 0.18 m
Y Interval: 0.18 m

Stats
Max: 22.10
Min: -22.00
Std Dev: 15.24
Mean: -0.07
Median: -0.23
Composite Area: 1.1433 ha
Surveyed Area: 0.10473 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse: Threshold: 1.5 SDs
4 Clip from -20.00 to 20.00 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). A hard copy report will be sent to the Wiltshire Historic Environment Record.

Archaeological Surveys Ltd shall retain intellectual property rights for the materials and records created as part of this project. A non-exclusive, transferable, sub-licensable, perpetual, irrevocable and royalty-free licence shall be granted to the client in order for them to use, reproduce and enhance the reports, documentation, graphics and illustrations produced as part of this project for the purpose for which they were commissioned. Copyright licence will also be granted to the local authority for planning use and within in the Historic Environment Record for public dissemination upon instruction by the client. Archaeological Surveys Ltd shall retain the right to be identified as the author and originator of the material.

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

- TerraSurveyor version 3.0.23.0 (geophysical data analysis),
- SENSYS MAGNETO®ARCH version 1.00-04(geophysical data analysis),
- ProgeCAD Professional 2014 (report graphics),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

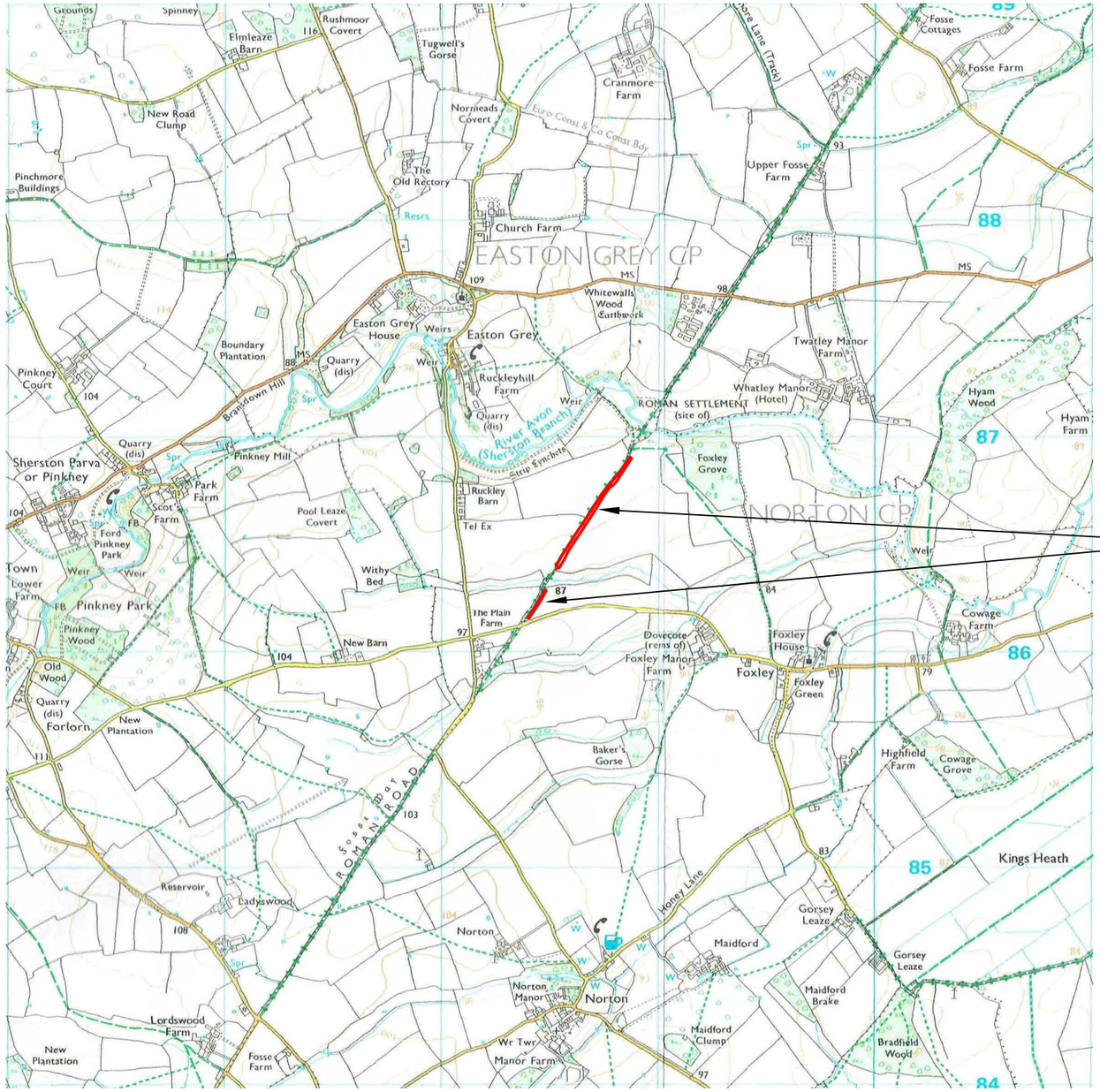
Digital data produced by the survey and report include the following files:

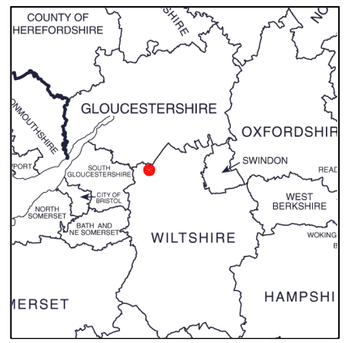
- TerraSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as OpenOffice.org ODT file,
- report text as Word 2000 doc file,
- report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

Archaeological Surveys Ltd

Geophysical Survey
Water Main Replacement Access adjacent to the Fosse Way
Norton
Wiltshire

Map of survey area





Survey location

Reproduced from OS Explorer map no.168 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.

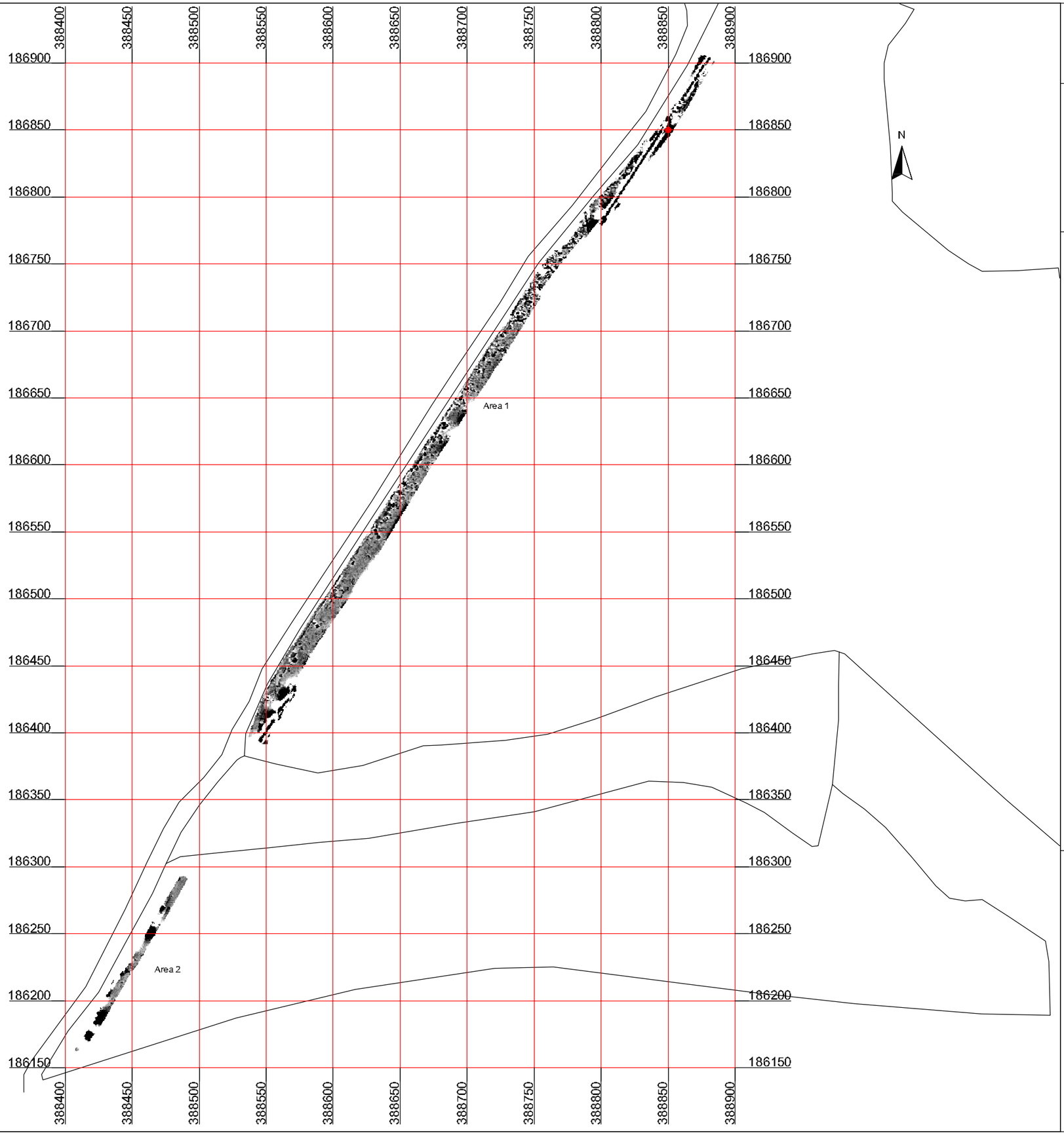
Site centred on OS NGR ST 88630 86542

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01



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Geophysical Survey
Water Main Replacement Access adjacent to the Fosse Way
Norton
Wiltshire

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

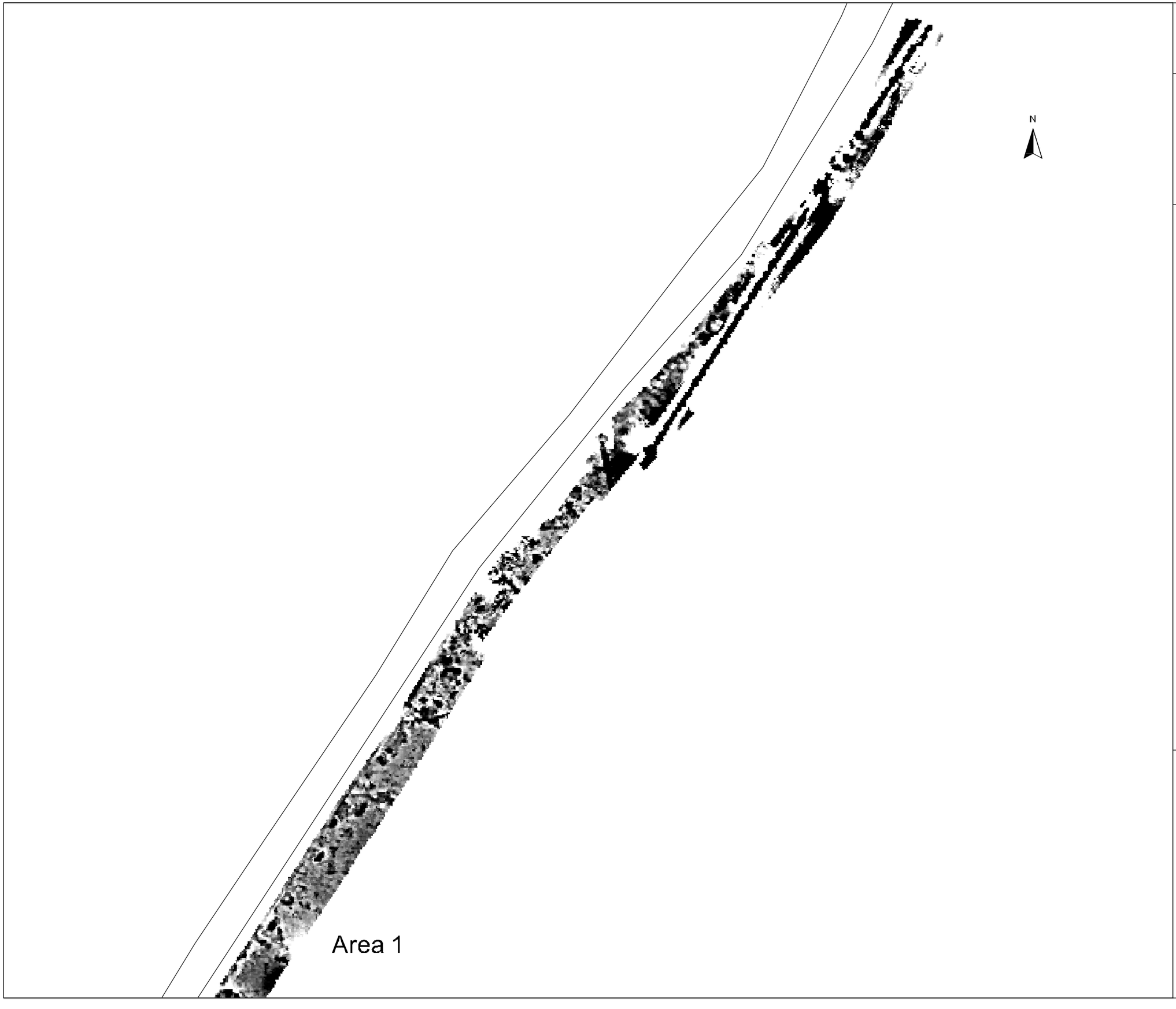
● 388850 186850

SCALE 1:3000

0m 30 60 90 120 150m

SCALE TRUE AT A0

FIG 02



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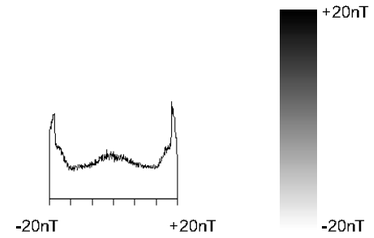
Geophysical Survey
Water Main Replacement Access adjacent to the Fosse Way
Norton
Wiltshire

Greyscale plot of processed magnetometer data - Area 1 north



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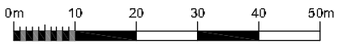


SCALE TRUE AT A0

FIG 03

Archaeological Surveys Ltd

Geophysical Survey
Water Main Replacement Access adjacent to the Fosse Way
Norton
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Area 1 north

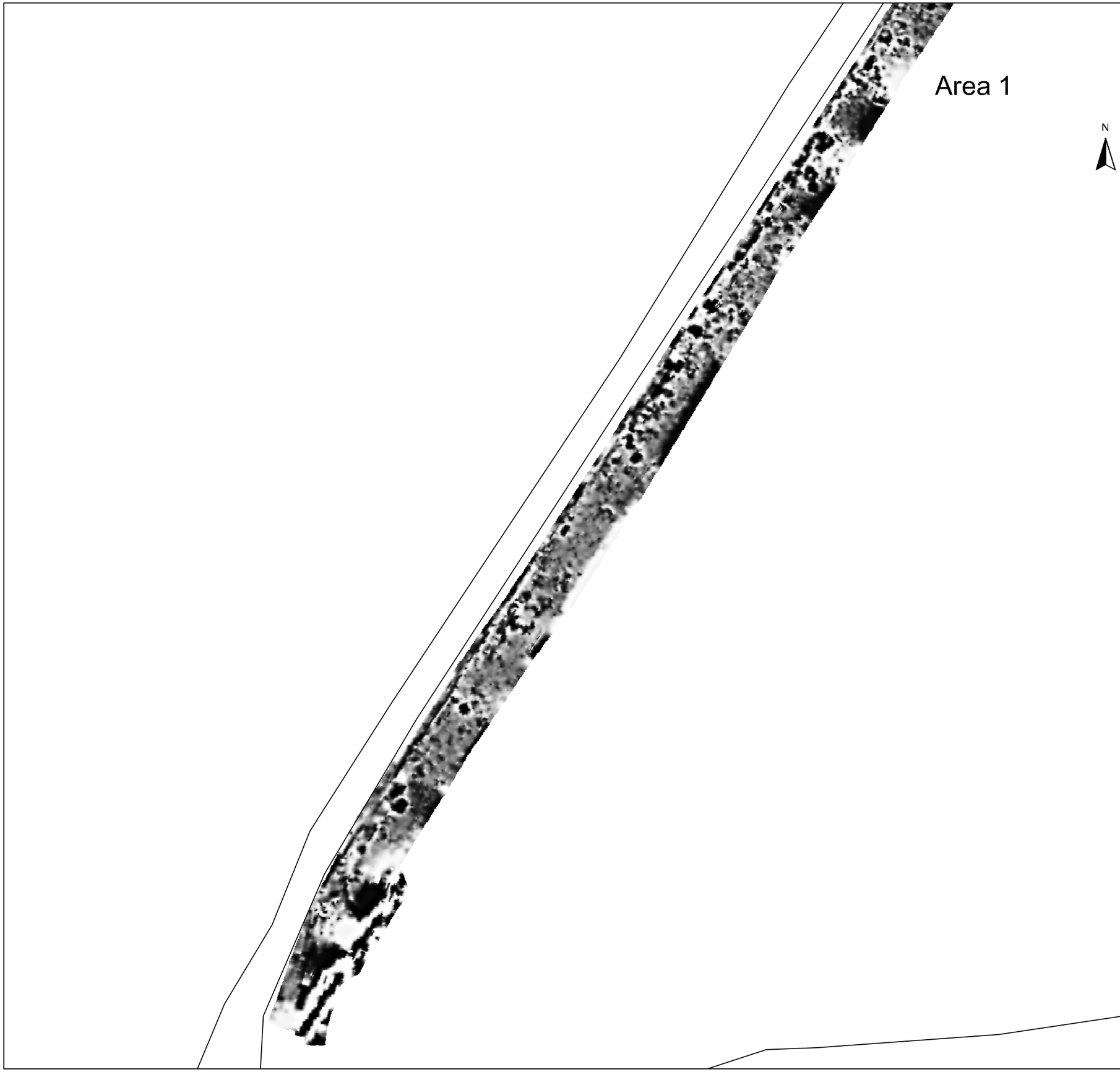
- Positive linear anomaly - cut feature of archaeological potential
- Discrete positive response - cut feature of archaeological potential
- Positive anomaly - magnetically enhanced material (possible quarrying)
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04



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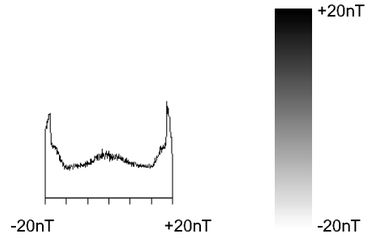
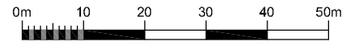
Greyscale plot of processed magnetometer data - Area 1 south



SCALE 1:1000



SCALE TRUE AT A3

FIG 05

Area 1

N

7

7

7

7

4

8

9

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Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - cut feature of archaeological potential
- Discrete positive response - cut feature of archaeological potential
- Positive anomaly - magnetically enhanced 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 06

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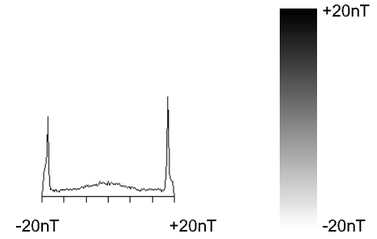
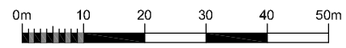
Greyscale plot of processed magnetometer data - Area 2



N

Area 2

SCALE 1:1000



SCALE TRUE AT A3

FIG 07

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Abstraction and interpretation of magnetometer anomalies - Area 2

- Positive linear anomaly - possible ditch-like feature
- Discrete positive response - possible pit-like feature
- 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 08