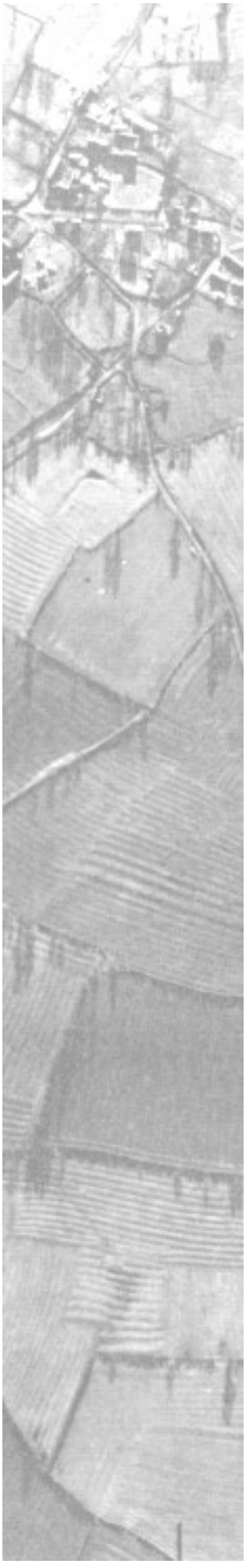

# ARCHAEOLOGICAL SURVEYS

GEOPHYSICAL SURVEY REPORT

## Bristol Water Pipeline
## Banwell to Winscombe

Magnetometer Survey

for

## Wessex Archaeology

David Sabin and Kerry Donaldson

September 2006

Ref no. 155

ARCHAEOLOGICAL SURVEYS

# Bristol Water Pipeline
# Banwell to Winscombe

Magnetometer Survey

for

Wessex Archaeology

Fieldwork by David Sabin (MIFA) and Francis Sabin
Report by David Sabin and Kerry Donaldson

Survey date – **11th and 12th September 2006**
Ordnance Survey Grid Reference – **ST 407 586 to ST 416 585**

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SUMMARY

A magnetometry survey was carried out along approximately 900m of water pipeline corridor between Banwell and Winscombe in North Somerset. The survey located linear and discrete anomalies that are of uncertain origin and few anomalies could be confidently interpreted.

# 1 INTRODUCTION

## *1.1 Survey background*

1.1.1 Archaeological Surveys was commissioned by Wessex Archaeology on behalf of Bristol Water to undertake a geophysical survey of a water pipeline corridor. This survey formed part of an assessment of any potential archaeology that may be affected by intrusive pipe laying operations.

## *1.2 Survey objectives*

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 intrusive operations.

## *1.3 Site location*

1.3.1 The survey is located to the southeast of Banwell in North Somerset and covers a pipeline corridor 20m wide starting from the A371 southeast of Banwell Castle (ST 407 586) and finishing southwest of Sandford Batch in Winscombe and Sandford parish (ST 416 585). The survey crosses six fields listed as Areas 1 to 6 from west to east for the purposes of this survey.

## *1.4 Site description*

1.4.1 The geophysical survey covers approximately 900m of pipeline corridor split between six different fields. Land generally undulates gently along the route and groundcover consists of grass for Areas 1 and 6, stubble for Areas 2, 3 and 5 with a maize crop in Area 4 preventing survey.

Plate 1 Survey Area 1

### *1.5 Site history and archaeological potential*

1.5.1 Within the survey areas there is an increased potential for remains of later prehistoric/ Romano-British date with the possible coincidence of the route with a Roman road and with evidence for settlement activity of the same date in fields immediately to the south of the proposed pipeline (Wessex Archaeology, 2006).

### *1.6 Geology and soils*

1.6.1 The underlying geology is Triassic mudstone (BGS 2001) with overlying soil from the Whimple 1 association which is stagnogleyic argillic brown earth. This consists of fine loamy and clayey soil with slight seasonal waterlogging (Soil Survey of England and Wales 1983).

## 2 METHODOLOGY

### *2.1 Technical synopsis*

2.1.1 Detailed magnetometry records localised magnetic fields that can relate to former human activity. Alteration of iron minerals present within topsoil is related to activities such as burning and the break down of biological material. These minerals become weakly magnetic within the Earth's magnetic field and can accumulate in features such as ditches and pits that are cut into the underlying subsoil. Mapping this magnetic variation can provide evidence of former settlement and land use. Additional technical details can be found in Appendix A.

2.1.2 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 nanoteslas (nT) which are equivalent to $10^{-9}$ tesla (T).

### *2.2 Equipment details and configuration*

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 0.1 nanoTesla (nT). All readings are saved to an integral data logger for analysis and presentation.

2.2.2 Data was collected at 0.25m centres along traverses 1m apart. The survey area was separated into 20m by 20m grids giving 1600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 1995).

2.2.3 The proposed pipeline route was located in the field using a CSI Wireless dGPS (differential Global Positioning System) and the survey grids were set out using a Topcon GTS212 total station. The dGPS uses an error correction signal transmitted from ground-based beacons and is considered as having sub-metre accuracy. A number of parameters are constantly monitored in order to achieve best accuracy.

### *2.3 Data processing and presentation*

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger is 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 B contains specific information concerning the survey and data attributes and is derived directly from ArcheoSurveyor.

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

**Processing schedule:**

- clipping of the raw data at ±10nT to improve greyscale resolution,
- clipping of processed data at ±3nT to enhance low magnitude anomalies,
- destagger may also be used to enhance linear anomalies,
- zero median traverse is applied in order to balance readings along each traverse.

**Processing notes:**

*Clipping*

Clipping replaces the values outside the specified minimum and maximum with those values. The process is useful for displaying detail as extreme values are removed allowing greyscale shades to be allocated to a narrower range of values which improves the definition of anomalies.

*Zero Median Traverse*

The median of each traverse is calculated ignoring data outside a threshold value, the 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 is used to remove striping.

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 each survey area. Where further interpretation is possible or where a number of possible origins should be considered, further more detailed discussion is set out in Section 4.

2.3.4 The main form of data display used in this report is the processed greyscale plot followed by an abstraction and interpretation plot. Graphic raster images in windows bitmap format are initially prepared in ArcheoSurveyor. These images are combined with base mapping using MapInfo Professional version 6 creating TAB file formats. A digital archive including raster images is produced with this report allowing separate analysis if necessary, see 2.4 below.

## *2.4 Archive*

2.4.1 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 is supplied on CD. Further information on the production of the report and the digital formats involved in its creation are set out below.

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

- ArcheoSurveyor version 2.1.1.4 (geophysical data analysis),
- MapInfo Professional version 6 (plots),
- JASC Paint Shop Pro 8 (image rotation),
- Microsoft Word 2000 (document text),
- PDF Creator version 0.9 (PDF archive).

2.4.3 Digital data is supplied on CD ROM and includes the following files:

- ArcheoSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- Composite graphics as windows bitmaps,
- MapInfo TAB files,
- Microsoft Word 2000 doc file,
- PDFs of all figures,
- Photographic record in JPEG format.

2.4.4 The CD ROM structure is formed from a tree of directories under the title J155 Banwell – CD. Directory titles include Data, Documentation, MapInfo, PDFs and Photos. Multiple directories exist under Data for each survey area – each data directory holds grid, composite and graphic files with CSV composite data held in export.

# 3 RESULTS

## *3.1 General overview*

3.1.1 The detailed magnetic survey was carried out over a total of 5 survey areas covering a length of approximately 900m. Geophysical anomalies located can be generally classified as:

- positive and negative linear anomalies of uncertain origin,
- positive areas of uncertain origin,
- discrete positive anomalies formed by possible pit-like features,
- areas of magnetic disturbance,
- multiple dipolar linear anomalies associated with services, pipelines, drains etc.,
- dipolar anomalies caused by near surface ferrous objects.

3.1.2 Anomalies located within each survey area have been numbered and will be outlined below with subsequent discussion in Section 4.

3.1.3 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. Sub-headings are then used to group anomalies with similar characteristics for each survey area.

*Anomalies with an uncertain origin*

(Positive anomalies abstracted are plotted in orange, negative anomalies in blue)

The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Within corridor surveys often the full extent and shape of an anomaly remains unknown due to the constraints of the survey area. Anomalies in this category may well be related to archaeologically significant features but equally relatively modern features, geological/ pedological anomalies and agricultural features should be considered.

*Anomalies with a modern origin*

(Abstracted anomalies are plotted in magenta)

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 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.

*Dipolar anomalies caused by ferrous objects*

Although strong discrete dipolar anomalies have been abstracted, the significance of these objects cannot be determined and the majority are likely to be associated with modern objects within the topsoil. No further interpretation is offered.

## *3.2 Area 1*

Area centred on 340828 158616, see Figures 3 & 4.

*Anomalies of uncertain origin*

(1) – Positive linear anomaly of uncertain origin possibly related to a cut feature.

(2) – Similar to anomaly (1) and may be associated.

(3) – Positive linear anomaly possibly associated with anomalies (4) and (6).

(4) – Positive linear anomaly similar to (3) and may be associated with anomaly (6).

(5) – Negative linear anomaly possibly caused by material of low magnetic susceptibility such as stone, subsoil etc.

(6) – Negative linear anomaly of uncertain origin that may be associated with parallel anomalies (3) and (4). The negative response may suggest a pipeline.

(7) – Negative linear anomaly of uncertain origin. The anomaly maybe associated with (8).

(8) – Similar to anomaly (7) and may be associated.

(9) – Discrete positive anomaly possibly indicating a pit-like feature.

(10) – Similar to (9).

(11) – Positive area possibly associated with linear anomaly (2).

(12) – Positive area of uncertain origin.

### *3.3 Area 2*

Area centred on 341003 158597, see Figures 5 & 6.

*Anomalies of uncertain origin*

(13 - 16) – Positive and negative linear anomalies that may be a response to a pipeline.

(17 - 20) – Discrete positive anomalies possibly related to pit like features or depressions. The origin of the anomalies may be natural or anthropogenic.

### *3.4 Area 3*

Area centred on 341152 158581, see Figures 7 & 8.

*Anomalies of uncertain origin*

(21) – Positive linear anomaly of uncertain origin possibly associated with anomaly (22).

(22) – Similar to (21).

(23) – Positive linear anomaly possibly related to agriculture.

(24) – Similar to (23).

(25 - 28) – Discrete positive anomalies possibly related to pit like features or depressions. The origin of the anomalies may be natural or anthropogenic.

### *3.5 Area 4*

Area centred on 341235 158572.

No survey possible due to maize cover.

### *3.6 Area 5*

Area centred on 341152 158581, see Figures 9 & 10.

*Anomalies with a modern origin*

(29) – An area of magnetic disturbance has been caused by a steel pipeline.

(30) – A multiple dipolar linear anomaly indicative of a steel/iron pipeline.

(31) – A multiple dipolar linear anomaly possibly indicating a terracotta pipeline or cable.

### *3.7 Area 6*

Area centred on 341497 158534, see Figures 11 & 12.

*Anomalies with a modern origin*

(32) – An area of magnetic disturbance surrounds a steel pipeline and extends along the northern field boundary. Disturbance close to the north eastern corner of the survey area has been caused by a steel gateway.

(33) – A multiple dipolar linear anomaly indicative of a steel/iron pipeline.

## 4 DISCUSSION

### *4.1 Overview*

4.1.1 The geophysical survey located a number of linear, area and discrete anomalies of uncertain origin. There is little evidence to suggest the presence of significant archaeological deposits within the survey area. However, the origin of anomalies of uncertain origin should be considered carefully.

### *4.2 Linear anomalies of uncertain origin*

4.2.1 Positive linear anomalies of uncertain origin may relate to former cut features although it is not possible to determine the significance of such features. Agricultural marks and buried services may also produce positive anomalies.

4.2.2 Negative linear anomalies indicate the presence of material having lower magnetic susceptibility than surrounding soils. Such material may originate

from subsoil or underlying solid geology or other manmade material such as plastic and concrete. Occasionally a strong positive anomaly may have a negative 'return flux'. Negative linear anomalies within Areas 1 and 2 may represent the course of existing pipelines.

### *4.3 Discrete positive anomalies and positive areas*

4.3.1 Discrete positive anomalies and positive areas may be caused by the accumulation of soil within former cut features or natural subsurface variations such as may occur from tree-throw pits. Pits can only confidently be interpreted as anthropogenic in origin when associated with other features such as enclosures etc. or occurring in obvious groups.

## 5 CONCLUSION

5.1.1 The magnetometry survey has provided some evidence for linear anomalies, particularly within Areas 1 and 2, and for discrete positive anomalies that may represent pit-like features, however these anomalies have no characteristics that allow informed, confident interpretation.

## 6 REFERENCES

British Geological Survey, 2001, *Solid Geology Map, UK South Sheet, 1:625 000 scale, 4th edition.*

English Heritage, 1995, *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No 1*.

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

Wessex Archaeology, 2006, Bristol Water Pipeline Between Banwell, Rowberrow and Winscombe in Somerset and North Somerset. Archaeological Desk-based Assessment.

## 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 on 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 the 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 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 of 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 – survey and data information

SITE **Area 1a raw data**

COMPOSITE
Filename: Area1a-raw.xcp
Instrument Type: Grad 601 (Magnetometer )
Units: nT
Surveyed by: DJS on 12/09/2006
Assembled by: DJS on 12/09/2006
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 80 x 20
Survey Size (meters): 20 m x 20 m
Grid Size: 20 m x 20 m
X Interval: 0.25m
Y Interval: 1m

Stats
Max: 6.80
Min: -10.00
Std Dev: 2.06
Mean: -0.52

Processes: 2
1 Base Layer
2 Clip from -10 to 10

Source Grids: 1
1 Col:0 Row:0 grids\Area 1a-01.asg

SITE **Area 1a processed data**

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.08
Mean: -0.08

Processes: 6
1 Base Layer
2 Clip from -10 to 10
3 DeStripe Median Traverse: Grids: All
4 DeStripe Median Traverse: Grids: All
5 De Stagger: Grids: All Mode: Both By: -1 intervals
6 Clip from -3 to 3

Source Grids: 1
1 Col:0 Row:0 grids\Area 1a-01.asg

SITE **Area 1b raw data**

COMPOSITE
Filename: Area1b-raw.xcp
Instrument Type: Grad 601 (Magnetometer )
Units: nT
Surveyed by: DJS on 12/09/2006
Assembled by: DJS on 12/09/2006
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 80 x 160
Survey Size (meters): 20 m x 160 m
Grid Size: 20 m x 20 m
X Interval: 0.25m
Y Interval: 1m

Stats
Max: 10.00
Min: -10.00
Std Dev: 1.22
Mean: -1.04

Processes: 3
1 Base Layer
2 Clip from -10 to 10
3 De Stagger: Grids: All Mode: Both By: -1 intervals

Source Grids: 8
1 Col:0 Row:0 grids\Area1b-01.asg
2 Col:0 Row:1 grids\Area1b-02.asg
3 Col:0 Row:2 grids\Area1b-03.asg
4 Col:0 Row:3 grids\Area1b-04.asg
5 Col:0 Row:4 grids\Area1b-05.asg
6 Col:0 Row:5 grids\Area1b-06.asg
7 Col:0 Row:6 grids\Area1b-07.asg
8 Col:0 Row:7 grids\Area1b-08.asg

SITE **Area 1b processed data**

Stats
Max: 3.00
Min: -3.00
Std Dev: 0.73
Mean: 0.01

Processes: 6
1 Base Layer
2 Clip from -10 to 10
3 De Stagger: Grids: All Mode: Both By: -1 intervals
4 DeStripe Median Traverse: Grids: All
5 Clip from -3 to 3
6 De Stagger: Grids: All Mode: Both By: -1 intervals

SITE **Area 2 raw data**

COMPOSITE
Filename: Area2-raw.xcp
Instrument Type: Grad 601 (Magnetometer )
Units: nT
Surveyed by: DJS on 12/09/2006
Assembled by: DJS on 12/09/2006
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 80 x 160
Survey Size (meters): 20 m x 160 m
Grid Size: 20 m x 20 m
X Interval: 0.25m
Y Interval: 1m

Stats
Max: 10.00
Min: -10.00
Std Dev: 0.89
Mean: -0.06

Processes: 3
1 Base Layer
2 Clip from -10 to 10
3 De Stagger: Grids: All Mode: Both By: -1 intervals

Source Grids: 8
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2 Col:0 Row:1 grids\Area2-02.asg
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4 Col:0 Row:3 grids\Area2-04.asg
5 Col:0 Row:4 grids\Area2-05.asg
6 Col:0 Row:5 grids\Area2-06.asg
7 Col:0 Row:6 grids\Area2-07.asg
8 Col:0 Row:7 grids\Area2-08.asg

SITE **Area 2 processed data**

Stats
Max: 3.00
Min: -3.00
Std Dev: 0.53
Mean: 0.02

Processes: 5
1 Base Layer
2 Clip from -10 to 10
3 De Stagger: Grids: All Mode: Both By: -1 intervals
4 DeStripe Median Traverse: Grids: All
5 Clip from -3 to 3

SITE **Area 3 raw data**

COMPOSITE

Filename: Area3-raw.xcp
Instrument Type: Grad 601 (Magnetometer )
Units: nT
Surveyed by: DJS on 12/09/2006
Assembled by: DJS on 12/09/2006
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 80 x 120
Survey Size (meters): 20 m x 120 m
Grid Size: 20 m x 20 m
X Interval: 0.25m
Y Interval: 1m

Stats
Max: 10.00
Min: -10.00
Std Dev: 1.61
Mean: -0.65

Processes: 2
1 Base Layer
2 Clip from -10 to 10

Source Grids: 6
1 Col:0 Row:0 grids\Area3-01.asg
2 Col:0 Row:1 grids\Area3-02.asg
3 Col:0 Row:2 grids\Area3-03.asg
4 Col:0 Row:3 grids\Area3-04.asg
5 Col:0 Row:4 grids\Area3-05.asg
6 Col:0 Row:5 grids\Area3-06.asg

SITE **Area 3 processed data**

Stats
Max: 3.00
Min: -3.00
Std Dev: 0.60
Mean: 0.02

Processes: 5
1 Base Layer
2 Clip from -10 to 10
3 DeStripe Median Traverse: Grids: All
4 De Stagger: Grids: All Mode: Both By: -1 intervals
5 Clip from -3 to 3

SITE **Area 5 raw data**

COMPOSITE

Path: C:\Business\Jobs\J155 Banwell\Data\Area 5\comps\
Filename: Area5-raw.xcp
Description:
Instrument Type: Grad 601 (Magnetometer )
Units: nT
Surveyed by: on 12/09/2006
Assembled by: on 12/09/2006
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 80 x 140
Survey Size (meters): 20 m x 140 m
Grid Size: 20 m x 20 m
X Interval: 0.25m
Y Interval: 1m

Stats
Max: 10.00
Min: -10.00
Std Dev: 3.64
Mean: -1.57

Processes: 2
1 Base Layer
2 Clip from -10 to 10

Source Grids: 7
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2 Col:0 Row:1 grids\Area5-02.asg
3 Col:0 Row:2 grids\Area5-03.asg
4 Col:0 Row:3 grids\Area5-04.asg
5 Col:0 Row:4 grids\Area5-05.asg
6 Col:0 Row:5 grids\Area5-06.asg
7 Col:0 Row:6 grids\Area5-07.asg

SITE **Area 5 processed data**

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.45
Mean: -0.53

Processes: 4
1 Base Layer
2 Clip from -10 to 10
3 DeStripe Median Traverse: Grids: Area5-01.asg Area5-04.asg Area5-05.asg Area5-06.asg Area5-07.asg
4 Clip from -3 to 3

SITE **Area 6 raw data**

COMPOSITE

Filename: Area6-raw.xcp
Instrument Type: Grad 601 (Magnetometer )
Units: nT
Surveyed by: on 12/09/2006
Assembled by: on 12/09/2006
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 80 x 200
Survey Size (meters): 20 m x 200 m
Grid Size: 20 m x 20 m
X Interval: 0.25m
Y Interval: 1m

Stats
Max: 10.00
Min: -10.00
Std Dev: 2.81
Mean: -0.78

Processes: 2
1 Base Layer
2 Clip from -10 to 10

Source Grids: 10
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2 Col:0 Row:1 grids\Area6-02.asg
3 Col:0 Row:2 grids\Area6-03.asg
4 Col:0 Row:3 grids\Area6-04.asg
5 Col:0 Row:4 grids\Area6-05.asg
6 Col:0 Row:5 grids\Area6-06.asg
7 Col:0 Row:6 grids\Area6-07.asg
8 Col:0 Row:7 grids\Area6-08.asg
9 Col:0 Row:8 grids\Area6-09.asg
10 Col:0 Row:9 grids\Area6-10.asg

SITE **Area 6 processed data**

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.15
Mean: -0.18

Processes: 6
1 Base Layer
2 Clip from -10 to 10
3 DeStripe Mean Traverse: Grids: All Threshold: 1 SDs
4 Clip from -3 to 3
5 De Stagger: Grids: All Mode: Both By: -1 intervals
6 Clip from -3 to 3

Archaeological Surveys

# Bristol Water Pipeline - Banwell to Winscombe

**General location map**

**Scale 1:50 000**

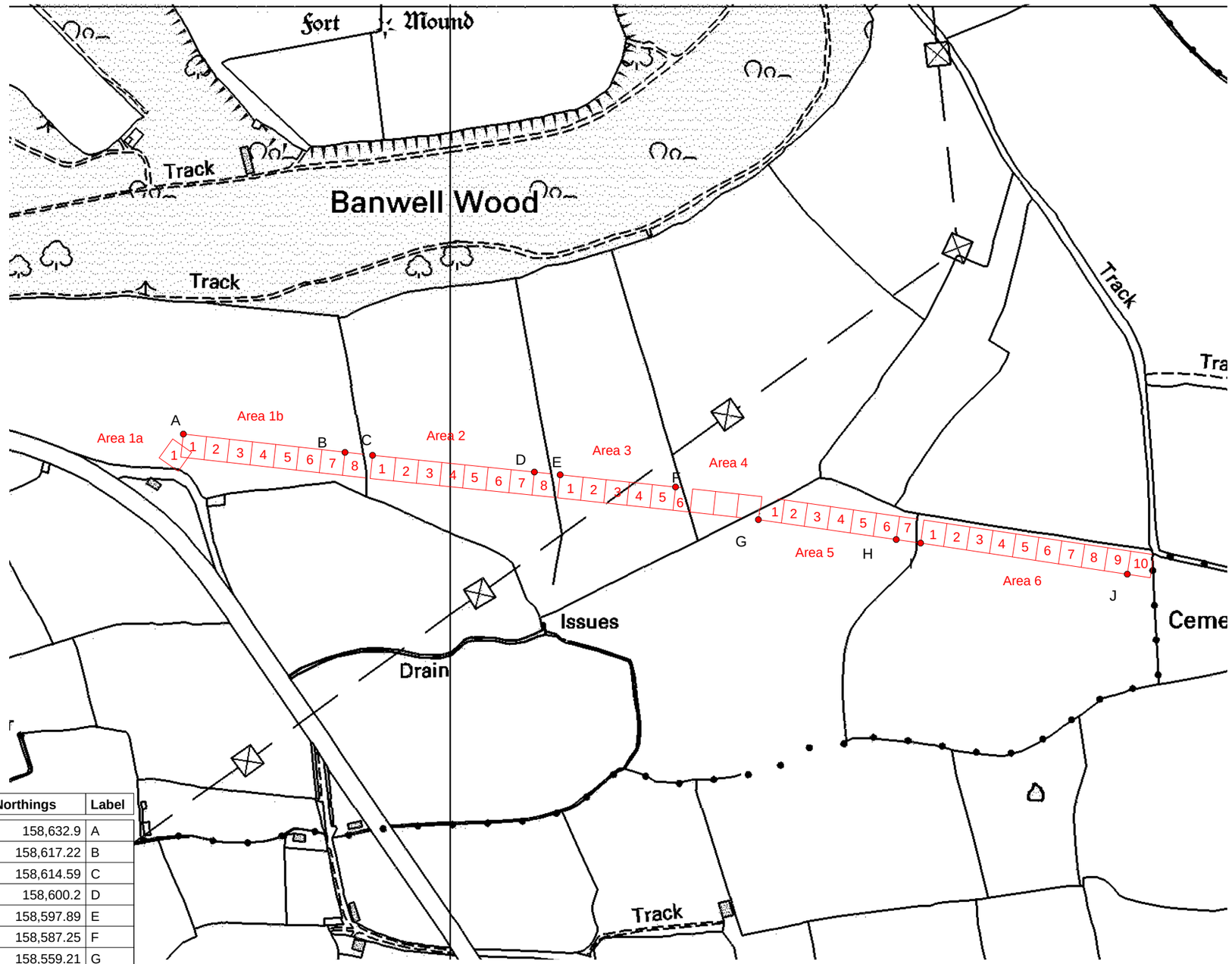



Fig 01

# Bristol Water Pipeline - Banwell to Winscombe

**Survey referencing - OSGB36**

**Scale 1:4000**




| ID | Eastings | Northings | Label |
|---|---|---|---|
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| Point | 340,908.69 | 158,617.22 | B |
| Point | 340,932.46 | 158,614.59 | C |
| Point | 341,071.72 | 158,600.2 | D |
| Point | 341,093.83 | 158,597.89 | E |
| Point | 341,193.26 | 158,587.25 | F |
| Point | 341,264.52 | 158,559.21 | G |
| Point | 341,383.29 | 158,542.09 | H |
| Point | 341,404.23 | 158,539.05 | I |
| Point | 341,582.21 | 158,512.17 | J |

Fig 02

Archaeological Surveys

# Bristol Water Pipeline - Banwell to Winscombe

**Processed magnetometer data - Area 1**

**Scale 1:1000**

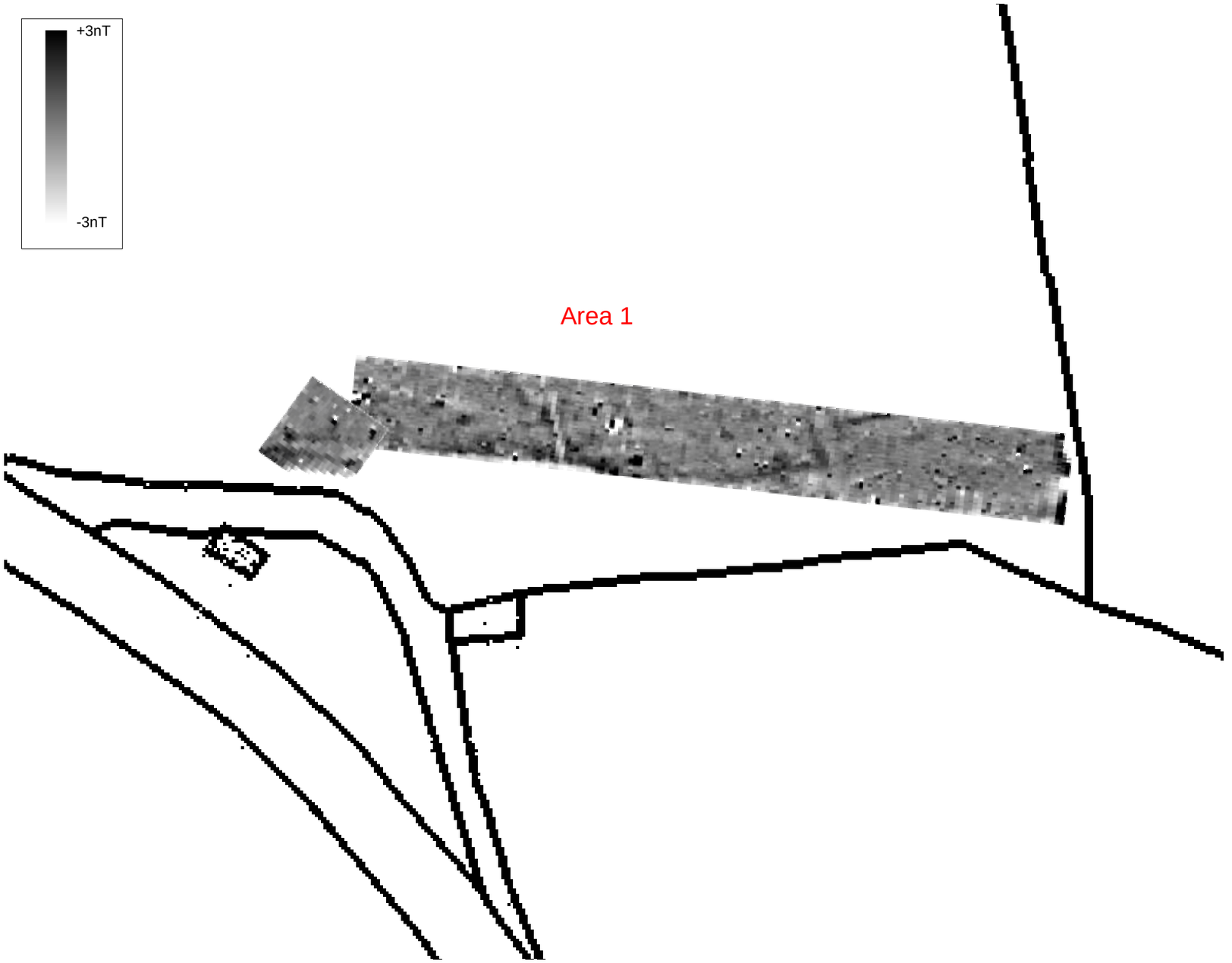



Fig 03

Archaeological Surveys

# Bristol Water Pipeline - Banwell to Winscombe

**Abstraction and interpretation - Area 1**

**Scale 1:1000**


Fig 04

Archaeological Surveys

# Bristol Water Pipeline - Banwell to Winscombe

**Processed magnetometer data - Area 2**

**Scale 1:1000**

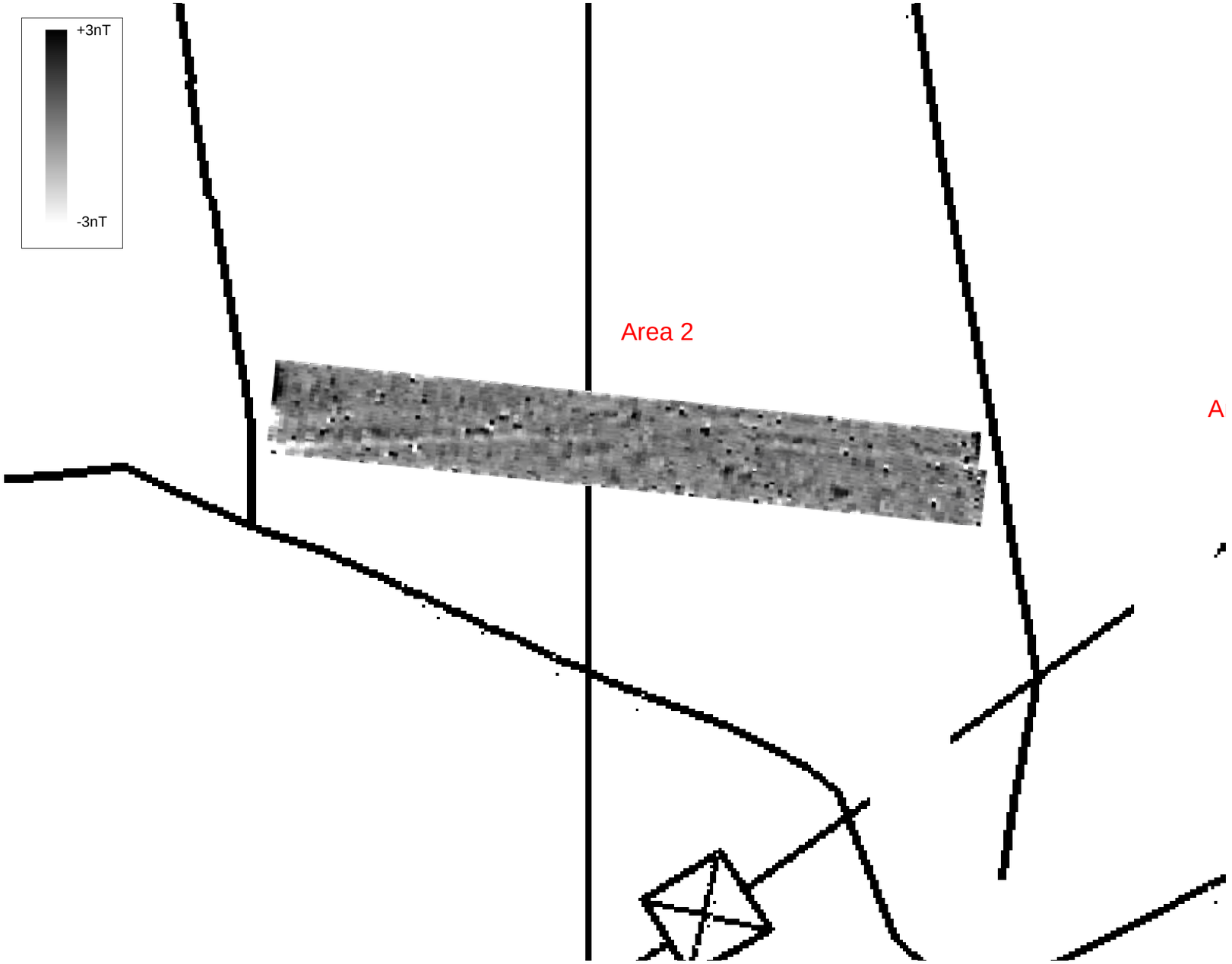



Fig 05

Archaeological Surveys

# Bristol Water Pipeline - Banwell to Winscombe

**Processed magnetometer data - Area 2**

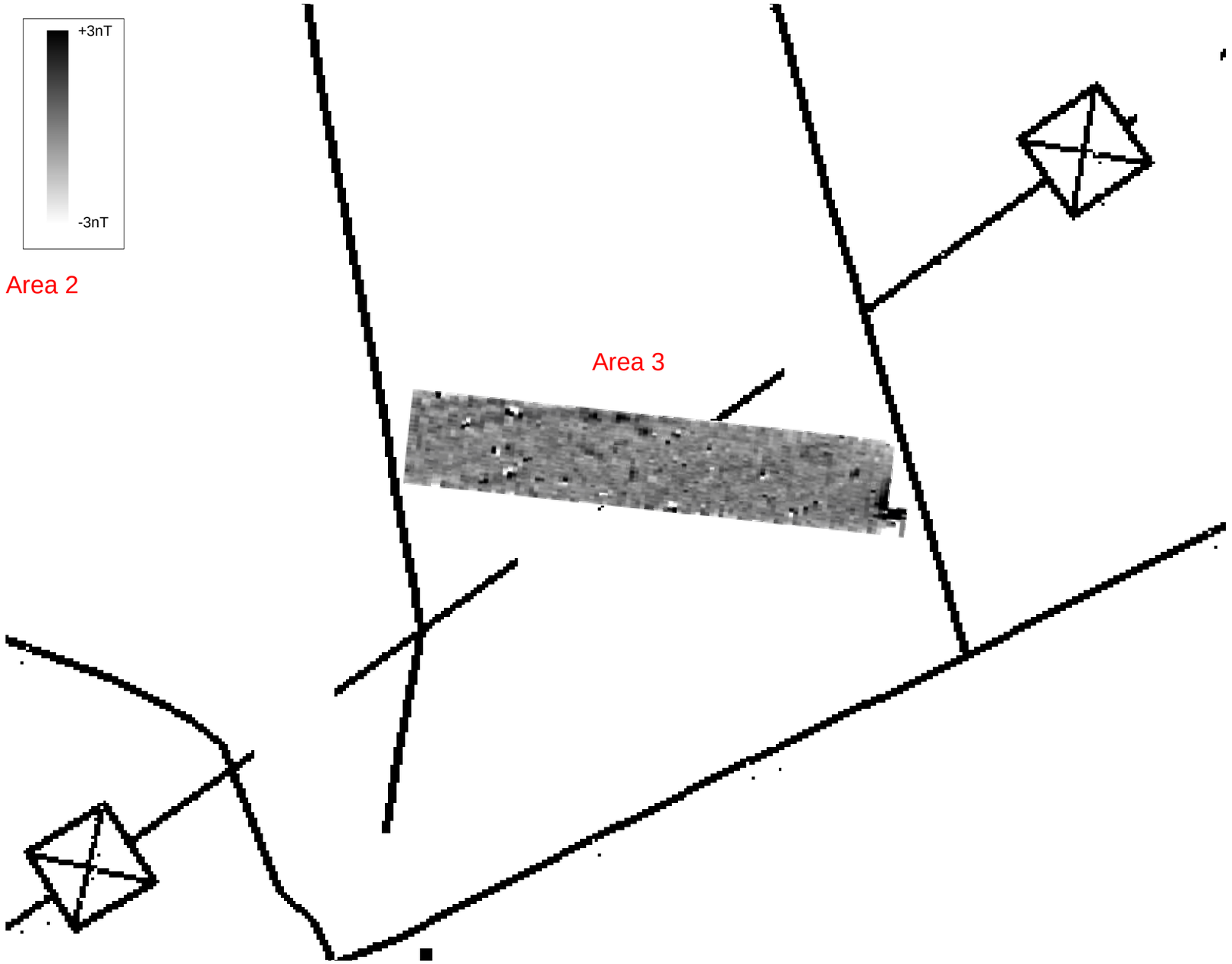
**Scale 1:1000**


Fig 06

# Bristol Water Pipeline - Banwell to Winscombe

**Processed magnetometer data - Area 3**

**Scale 1:1000**



Archaeological Surveys

# Bristol Water Pipeline - Banwell to Winscombe

## Abstraction and interpretation - Area 3

**Scale 1:1000**

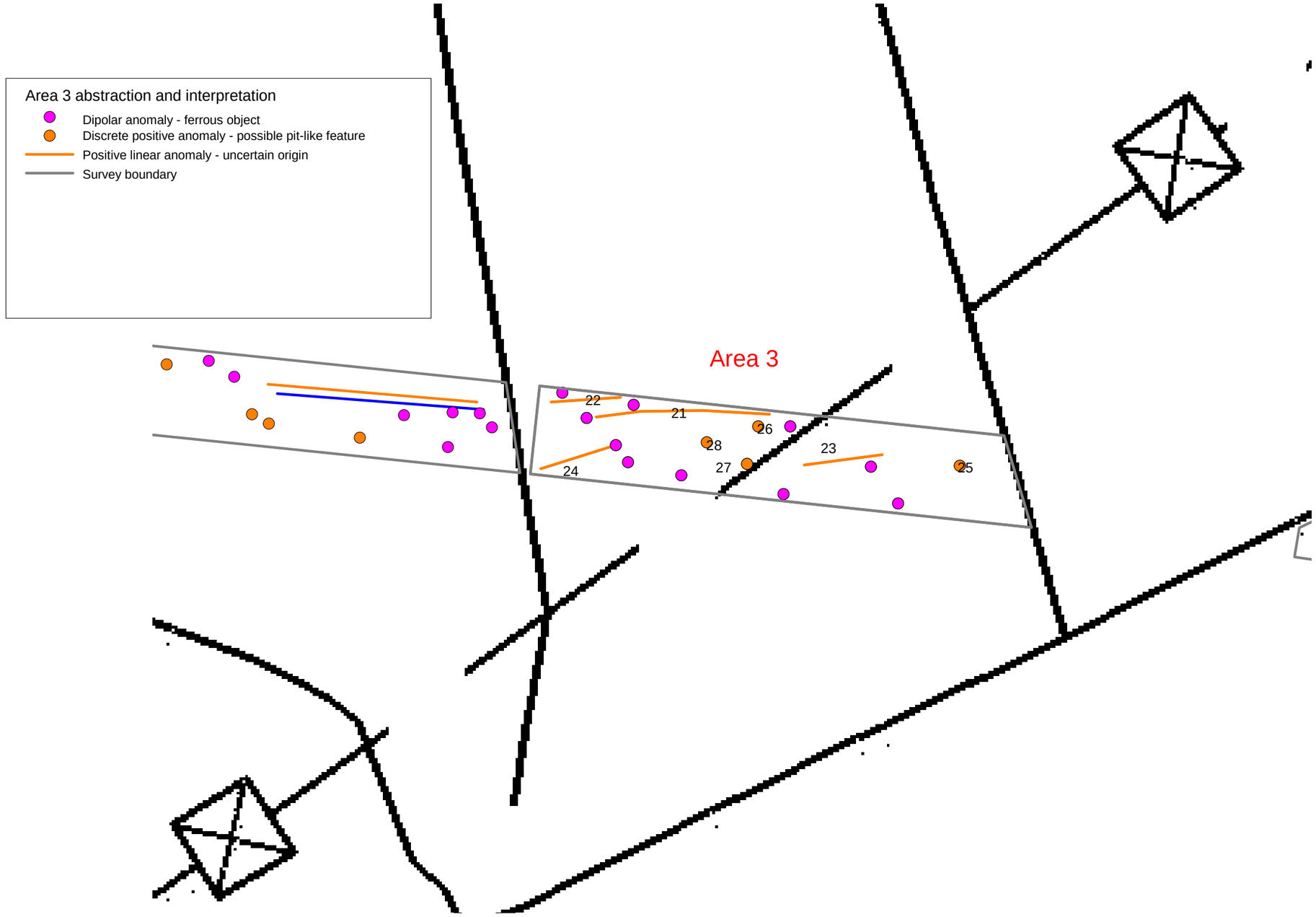



Fig 08

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# Bristol Water Pipeline - Banwell to Winscombe

**Processed magnetometer data - Area 5**

**Scale 1:1000**

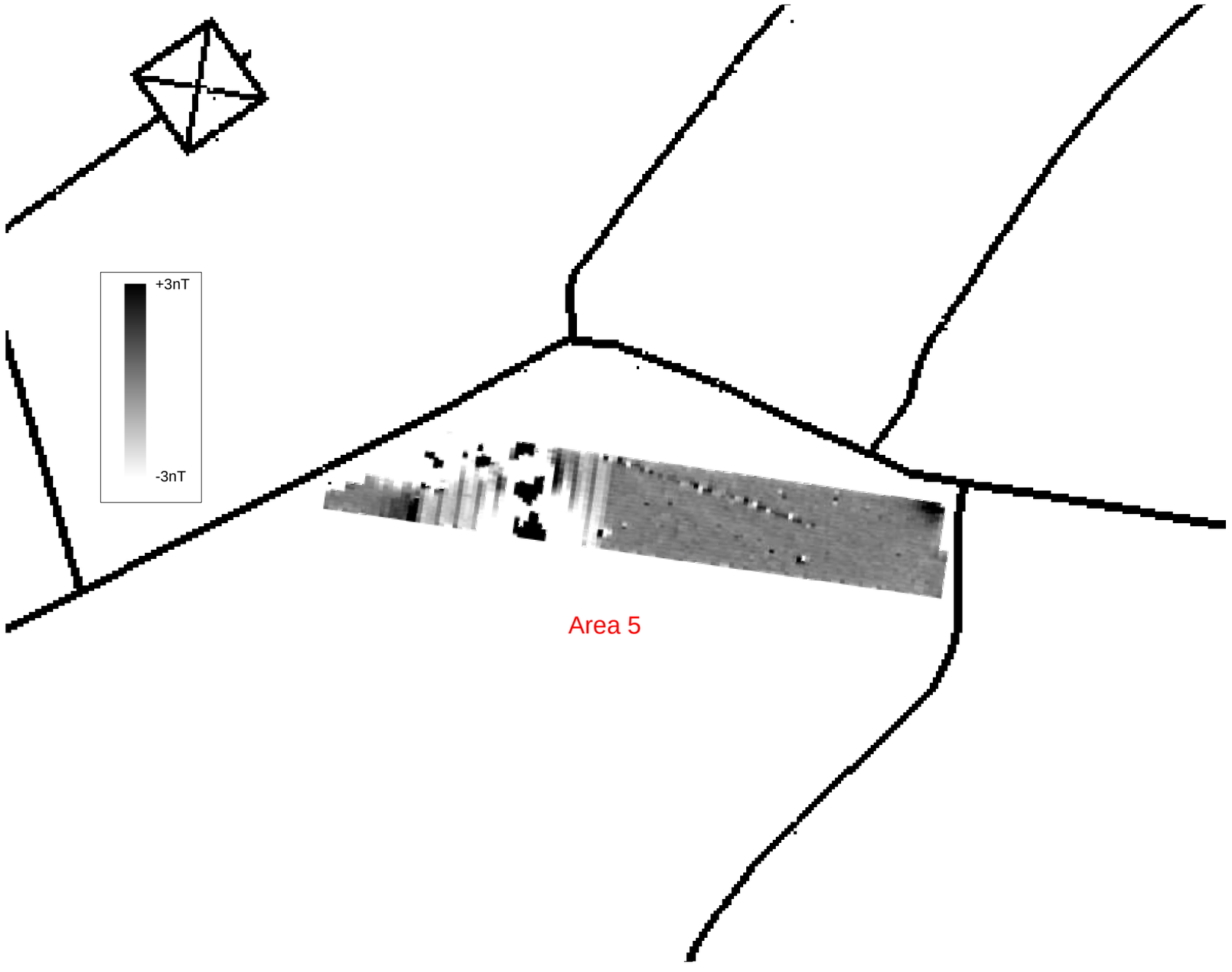


Fig 09

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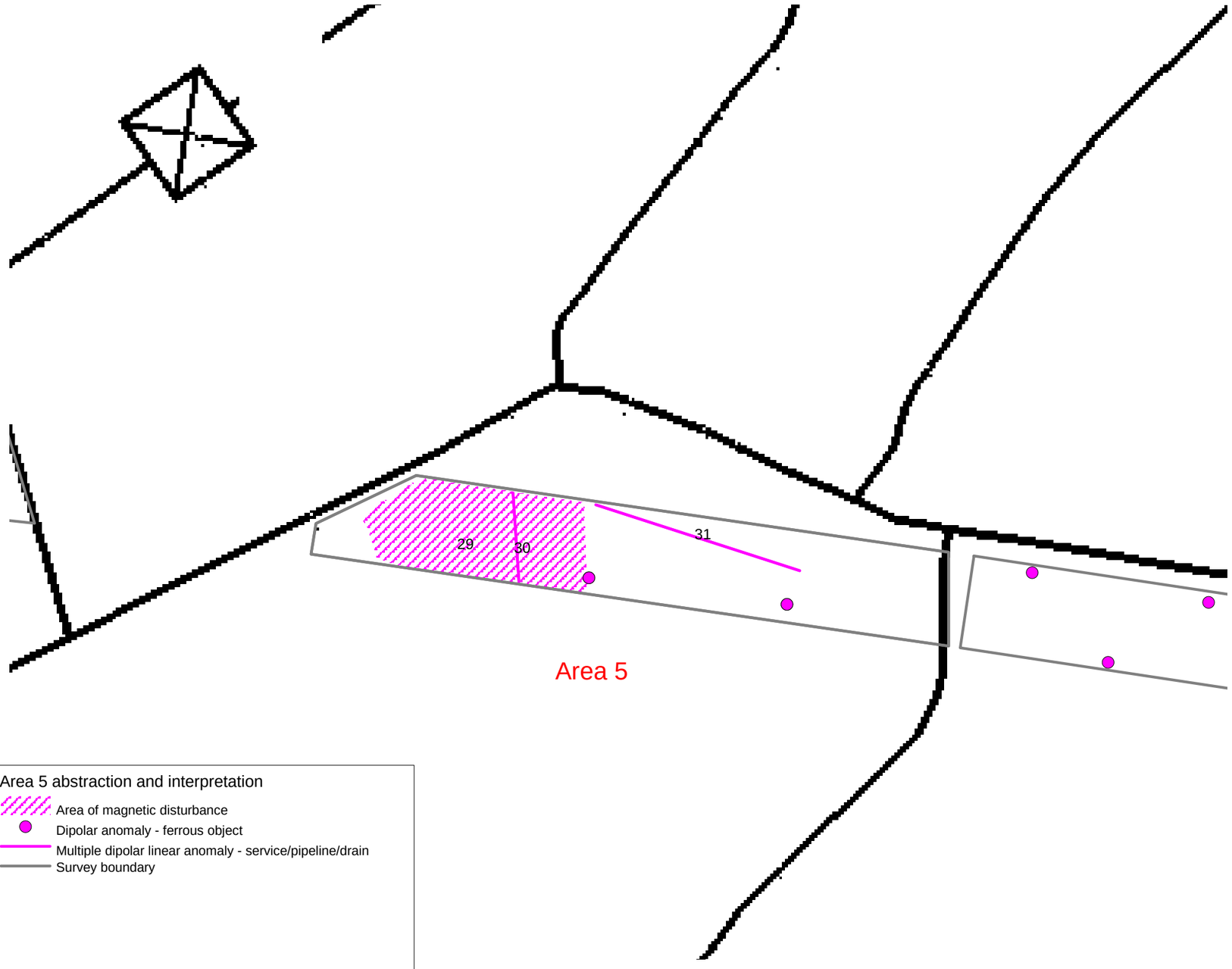
# Bristol Water Pipeline - Banwell to Winscombe

**Abstraction and interpretation - Area 5**

**Scale 1:1000**




Area 5 abstraction and interpretation

- Area of magnetic disturbance
- Dipolar anomaly - ferrous object
- Multiple dipolar linear anomaly - service/pipeline/drain
- Survey boundary

Fig 10

Archaeological Surveys

# Bristol Water Pipeline - Banwell to Winscombe

**Processed magnetometer data - Area 6**

**Scale 1:1000**

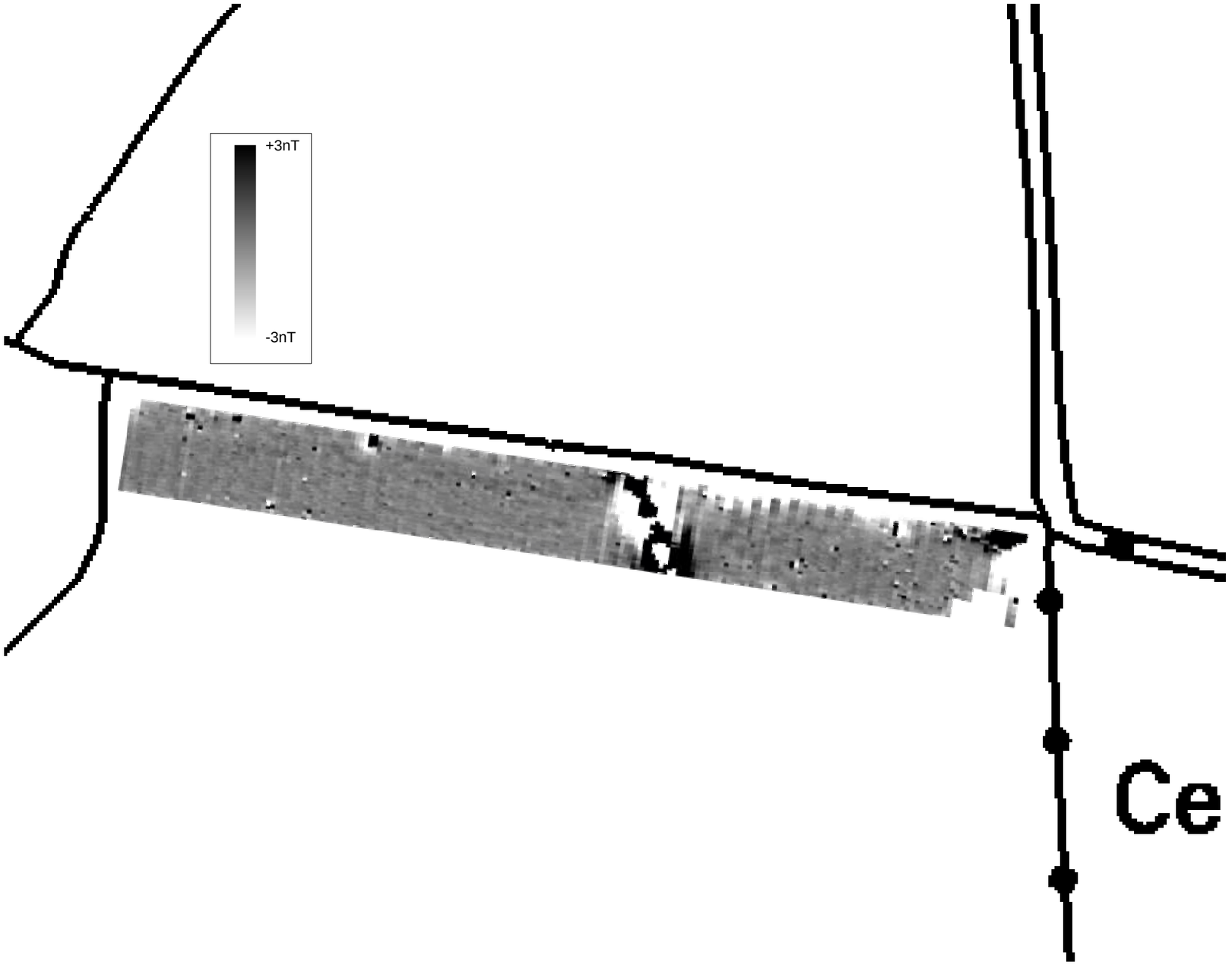



Fig 11

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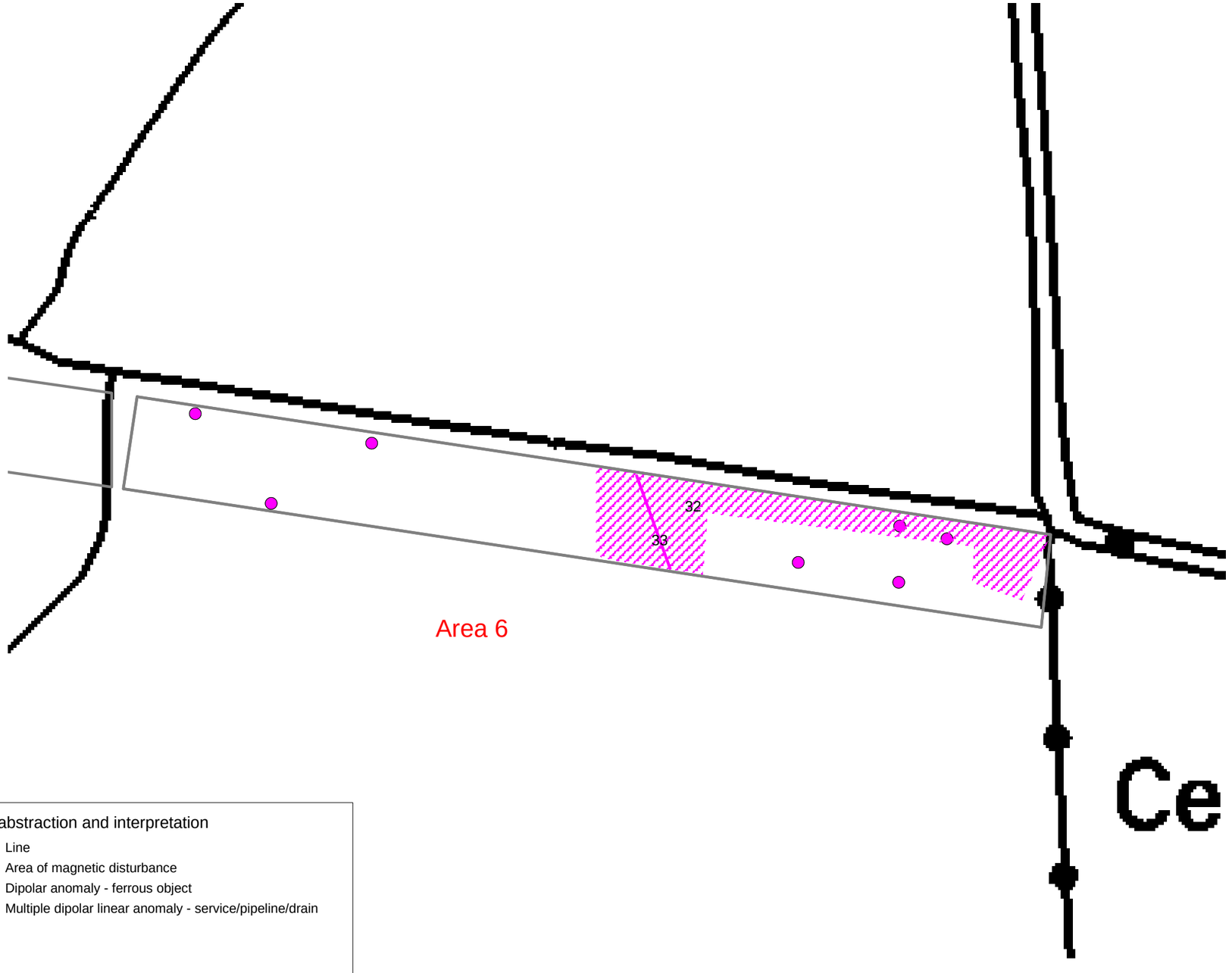
# Banwell Water Pipeline

**Abstraction and interpretation - Area 6**

**Scale 1:1000**




Area 6 abstraction and interpretation

- Line
- Area of magnetic disturbance
- Dipolar anomaly - ferrous object
- Multiple dipolar linear anomaly - service/pipeline/drain

Fig 12