ARCHAEOLOGICAL PROJECT SERVICES

GEOPHYSICAL SURVEY

BATTS BRIDGE ROAD
MARESFIELD
EAST SUSSEX
(MFBB22)

Prepared for
MJB Architecture
by
Archaeological Project Services

Date: March 2022

APS Report No: 10/22

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Document Control

Project Name	**Batts Bridge Road, Maresfield**
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Version	**1.0**

Site name	**Batts Bridge Road, Maresfield** **-Geophysical Survey Report**
National Grid Reference	**TQ 4560 2331**
OASIS Record No.	**archaeol1-505267**

CONTENTS

List of Plates

1. SUMMARY

A detailed magnetic gradiometer survey was undertaken for MJB Architecture in connection with a proposed business park on land south of Batts Bridge Road, near Maresfield, Sussex. The survey area totalled c. 30.4h.

The survey revealed a number of anomalies, indicating the position of a known roman road and several features known from historical maps. It also suggests the existence of further field boundaries unknown from historical maps, the potential presence of charcoal clamps associated with Forgepit Woods and possibly a small structure in the northern area of the Site.

2. INTRODUCTION

2.1 Definition of an Evaluation

Geophysical survey is a non-intrusive method of archaeological evaluation. Evaluation is defined as *'a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site. If such archaeological remains are present Field Evaluation defines their character and extent, quality and preservation, and it enables an assessment of their worth in a local, regional, national or international context as appropriate'* (CIfA 2014a).

2.2 Project Background

Archaeological Project Services (APS) was commissioned by MJB Architecture to undertake a detailed magnetometer survey totalling some 30.4ha on land to the South of Batts Bridge Road, Maresfield, Sussex. This was in advance of a proposed business park. The work was undertaken in accordance with a method statement prepared by APS. The survey was carried out between the 31st January 2022 and 9th February 2022.

2.3 Topography and Geology

Maresfield is situated 3.2km north of Uckfield, in the administrative district of Wealden, East Sussex (Fig. 1). The Site is located at National Grid Reference TQ 4560 2331 and lies 1.2km southwest of the centre of Maresfield as defined by St Bartholomew's church (Fig. 2). The total area of the site is 30.4ha, encompassing two fields. The site is bounded by Batts Bridge Road to the north and the stream of the same name to the west with an industrial park to the east and sewage works between the two fields.

Local soils are slightly acidic loamy and clayey soils with impeded drainage (CSAI 2022). These soils seal alluvial deposits in the west of the site near the stream with no other recorded drift deposits over the rest of the site. The underlying solid geology is Ardingly sandstone (BGS 2022).The site lies at a height of between *c.*20 and 30m OD on slightly sloping ground.

2.4 Archaeological Setting

The site is situated in a known area of archaeological interest with a Roman road (HER MES5138) running through the survey area. This is aligned north to south and sits on the western half of the site. It is referenced on the notification areas for East Sussex as DES9296. There is also a Grade II Listed building to the north of the area, known as Batts Farmhouse. A desk based assessment highlighted slight potential of previously unrecorded

remains of late prehistoric date occurring within the site, and a strong potential for evidence related to the post-medieval Iron industry (Hunt 2021).

Old maps of the site (plate 1) indicate that the site was largely in the same from the mid 19th century until the mid 20th century, with some areas of woodland removed and a lake and stream filled in on the western edge of the site. The woodland and water features that existed at this time are thought to relate to a forge which operated to the south of the site (Maresfield Forge).

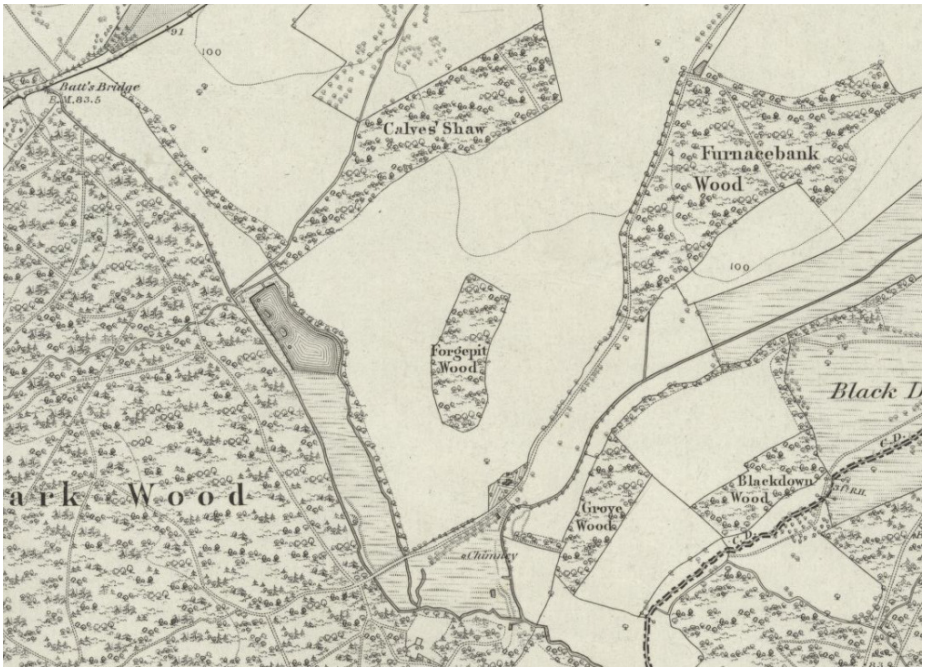


Plate 1: 1878 Ordnance Survey, Sussex Sheet XXVII, 6" map.

3. GEOPHYSICAL SURVEY

3.1 Methods

A magnetic gradiometry survey was carried out with a Bartington Grad 601-2 fluxgate magnetometer. The fields were divided into 40m^2 grids using a survey grade GPS and each grid was walked systematically in a zigzag pattern, taking readings every 0.25m in traverses 1m apart.

The layout of the survey area is shown in Figure 3. At the time of the survey, the northern field was covered in a young crop, while the southern field was left for countryside stewardship and was mostly natural grasses. The western edge near the stream had standing water and marsh vegetation, preventing surveying in this area.

The survey was undertaken in accordance with Historic England (2008) and CIfA (2014b) guidelines and codes of conduct. A detailed methodology can be found in Appendix 1.

3.2 Results

The presentation of the data for the site comprises a greyscale print-out of the raw data (Fig. 4; clipped for display but otherwise unprocessed) and the processed data (Fig. 5). Magnetic anomalies have been identified and plotted on to an interpretative drawing (Fig. 6). In the

following text, the letters in brackets refer to annotations on Figures 6.

North Field (Figs 4-6)
Positive linear anomalies
There are two large linear positive anomalies clearly visible in the data (depicted with solid red lines). The first to the northeast (A) is aligned along the projected route of the Roman road (albeit 7m east of the mapped position) and is likely to track this feature. Whether the highlighted anomaly represents the road itself or an associated ditch is dealt with in the discussion.

The second positive linear can be seen in the west of this field (B). As it connects to a stream channel at the western end, it is likely to represent a cut water feature, either a former natural channel or human made drain, predating the 1874 map.

Weak positive linear anomalies
Weak positive linear anomalies have been highlighted with a broken red line. To the southeast of the area, these coincide with former boundaries known from early maps (C). It is worth noting that the readings east of these linear features are more chaotic and typical of formerly marshy areas. The shorter weak anomalies (D) have no obvious source and could represent human made features or natural.

Bipolar linear anomaly
To the northeast of the field (E) is a small bipolar linear anomaly depicted with a blue line. This has no obvious cause, but could be related to a manmade feature.

A weak bipolar anomaly (F), depicted with a broken blue line, sits towards the south of the area and has a rough rectangular shape. There is the possibility this may represent a building, but it is not so well defined as to make this interpretation solid; potentially the anomaly may be due to an interaction of an area of naturally enhanced magnetic material and the plough scheme.

Area of Bipolar disturbance
Within the eastern side of this field are several areas of magnetic disturbance (highlighted with blue hatching). The strength of some of the variance (up to 100nT) suggests this is not natural variations. Therefore these could be associated with magnetically enhanced material such as metal, burnt deposits, tile or brick.

Agricultural features
There are a series of positive linear anomalies to the southwest of the field these appear to form a pattern with approximately 18m separations. These are likely to be field drains and are believed modern in origin.

Agricultural trend
Across most of this field, there is a very weak pattern of parallel linear anomalies. This is the current agricultural regime.

Central Area (Fig 7-9)
Weak positive linear anomalies
There are eight weak positive anomalies in this area (highlighted with broken red lines) (G-M). These are most likely caused by unrecorded former field boundaries, although some may instead be particularly strongly surviving plough marks.

Bipolar linear anomalies
One particularly strong bipolar anomaly (marked with a blue line) is sinuous (O) and follows the line of a known former stream. Two straight bipolar anomalies are within the area of the

former lake and may represent part of the infrastructure used to either fill the lake (prior to the late 19th century) or drain the lake (after the 19th century).

Areas of Bipolar disturbance
There are many areas of bipolar disturbance within this field (blue hatching). The most important is in the northwest corner of this field this is located where the Roman road is believed to be (Q). This is not as clear as to the north, but may be obscured by later works in this area, such as the channels relating to the former streams and lake.

The larger patch of disturbance found to the north (R) is likely related to the construction of the sewage facility possibly a spread of excavated topsoil. In the center of this field is another patch of disturbance (S) this has many small isolated positive anomalies and on historic mapping, there was a former wood in this area (Forgepit wood), which believed to be the cause for this response.

Discrete bipolar anomalies
There are a number of discrete bipolar anomalies (highlighted with a blue dot) which represent particularly strong magnetic readings (up to 15nT). Most of these fall within the area disturbed by the former woodland. One has even stronger readings of up to 100nT (T). The anomalies are up to 5m in diameter, although it should be noted that magnetic anomalies tend to be larger than the features that cause them, particularly when strong readings are produced. These may represent accumulations of detritus in hollows left by tree clearance, or industrial features.

Agricultural Feature
Similar to in the first field there is a series of parallel positive linear anomalies with approximately 20m separation between each these are thought to be land drains, these may also connect to the weak positive anomaly identified earlier and run out to the stream to the south.

Agricultural Trend
Within the field are several agricultural trends that show this area has been used for farming recently. There are several different areas with different orientations, indicating the recent sub-divisions of the field.

South Field
Positive Linear Anomaly
In the far south of this field there is a strong positive linear anomaly (U), this is likely to be a former ditch, although it does not correspond to a known former boundary.

Weak Positive linear anomaly
There are two curving weak linear anomalies (V and W) which probably represent ditches, but are not recorded on historical maps. A third is straight and orientated northwest to southeast (X) and may be a drain, or field boundary as it appears to separate two different orientations of land drain.

Area of Bipolar disturbance
In the center of the area is a small relatively weak patch of bipolar disturbance, most likely the result of natural variation in subsurface deposits (Y). In the very south of the field there is larger patch of disturbance (Z), which is near a house and there is a strong possibility it has been caused by modern disturbance associated with this building.

Agricultural Feature
Similar to in the first field there is a series of parallel positive linear anomalies with approximately 20m separation between each these are thought to be land drains, these may

also connect to the weak positive anomaly (X) identified above and run out to the stream to the south.

Agricultural Trend
Within the field are several agricultural trends these show this area has been used for farming recently and show possible field separations with changing patterns of agricultural trends.

4. DISCUSSION

The survey has identified the Roman road as a subsurface feature. The identified position is slightly different to that drawn on existing maps (up to 7m east). Typically a Roman road would expected to be defined by a central mass of stone with ditches on either side, which would ordinarily produce a negative signal flanked by two positive signals. Sometimes the road itself does not show up at all, but the two flanking ditches should still be visible. This is not the case in the survey, where a single broad (3-4m wide) and positive anomaly is visible. It is possible that this is one of the associated ditches, with the road and other ditch having been ploughed out, but it seems more likely that along this stretch the road was a hollow way (or potentially was replaced by a hollow way). This may account for the fact little evidence of the road was found during excavations at the nearby sewage works.

The area to the west of the north field has a strong change in the magnetic properties and this is likely to be related to the change in natural geology seen towards the stream. The variation seen is typical of that produced in marshland environments.

Also in the north field is a weak rectangular bipolar anomaly that might suggests a structure approximately measuring 10m by 6m. However, incidental concentrations of magnetic material in the soil could have been arranged into a rough rectangular arrangement through plough action.

In the south field there is a large area of disturbance associated with the historically known feature of Forgepit Wood. It is likely that these anomalies are pits left by tree clearance or Ironstone prospecting. However, some of the strongest magnetic anomalies might be related to industrial features. Post-medieval charcoal clamps, producing fuel for a nearby forge would be expected.

The field boundaries known from historical maps have been identified. Added to this, several potential ditches have been identified which do not correspond to historically known field boundaries. There are no obvious suggestions of dates associated with these features.

The soils magnetic properties across the majority of the site are uniform. However, there are broad scatters of magnetic disturbance. Potentially this is from green waste or ironstone geology. This has not majorly affected the overall interpretation of the data with many weaker anomalies still visible, but small discrete responses have not been picked in many locations due to this magnetic spread.

5. ACKNOWLEDGEMENTS

Archaeological Project Services wish to acknowledge MJB Architecture for commissioning this project. Paul Cope-Faulkner coordinated the work and edited this report along with Jonathon Smith.

6. PERSONNEL

Project coordinator: Paul Cope-Faulkner
Geophysical Survey: Sean Parker and Ryan Godbold
Survey processing and reporting: Sean Parker and Jonathon Smith
Archiving: Denise Buckley

7. BIBLIOGRAPHY

BGS 2019, *Geology of Britain Viewer*. Available at http://mapapps.bgs.ac.uk/geologyofbritain/home.html (accessed 23.02.2022)

CIfA, 2014a *Standard and Guidance for Field Evaluation.*

CIfA, 2014b *Standard and Guidance for Geophysical Survey.*

East Sussex HER, Archaeological Notification Areas for East Sussex, Brighton and Hove (arcgis.com) (accessed 23.02.2022)

Historic England, 2008 *Geophysical Survey in Archaeological Field Evaluation.*

NLS, 2022, National Library of Scotland maps repository. Available at Ordnance Survey Maps - National Library of Scotland (nls.uk) (accessed 23.02.2022)

Soilscape, 2022, Landis , Available at Soilscapes soil types viewer - National Soil Resources Institute. Cranfield University (landis.org.uk) (accessed 23.02.2022)

8. ABBREVIATIONS

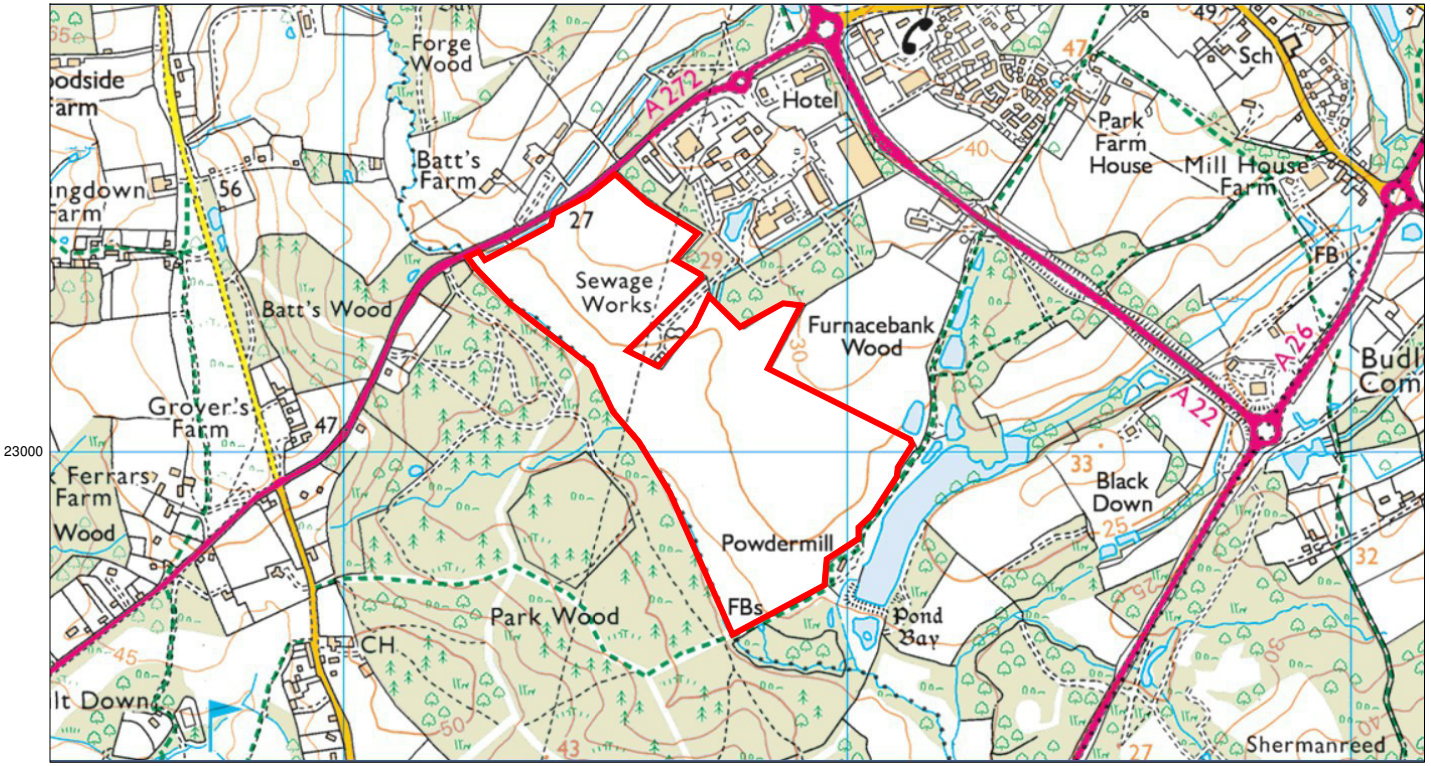
AOD Above Ordnance Datum

APS Archaeological Project Services

BGS British Geological Survey

CIfA Chartered Institute for Archaeologists

Figure 1 - General location plan



Survey Area

0 500m

N

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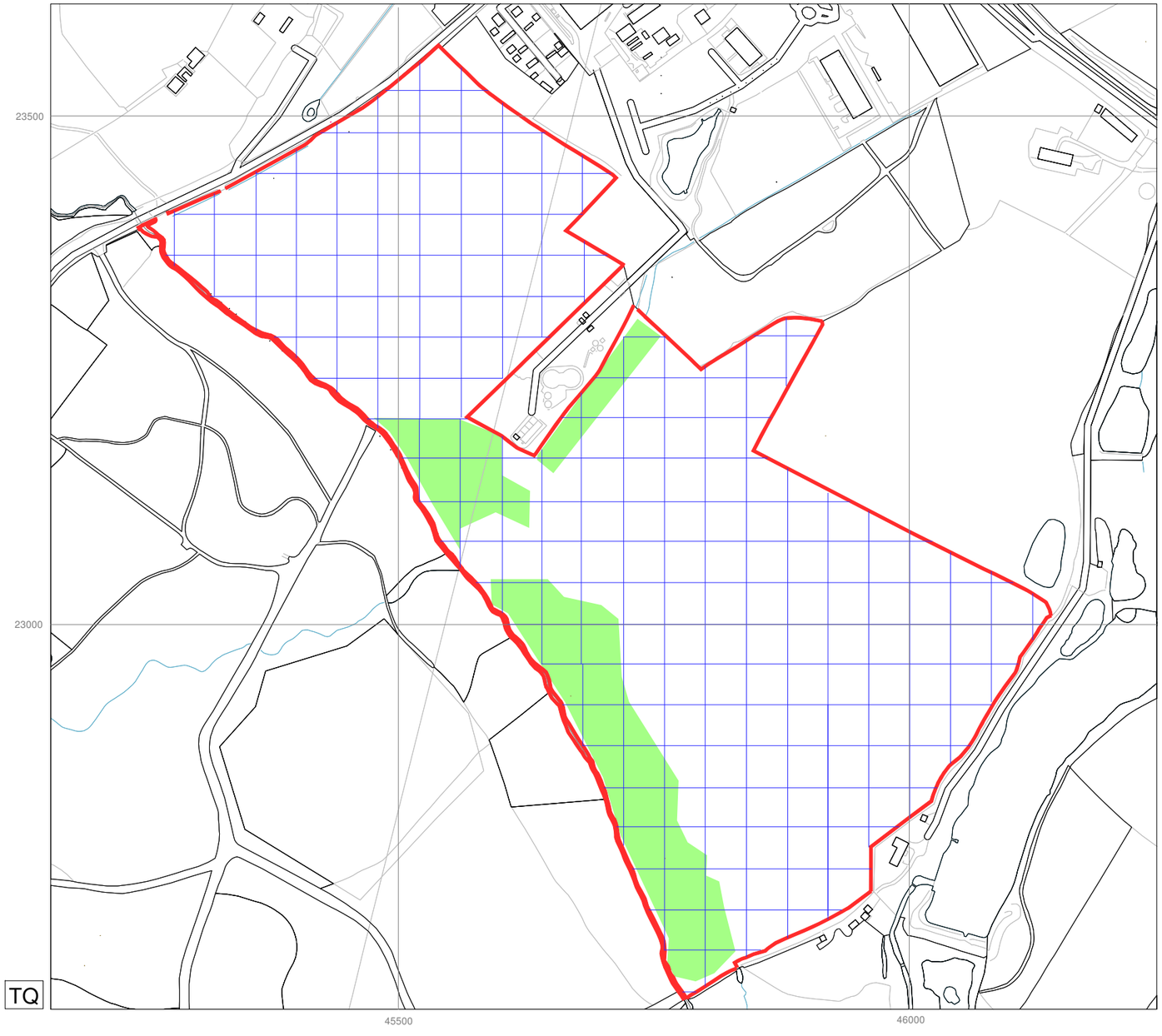
Project Name: Batts Bridge Road, Maresfield		
Scale 1:1500	Drawn by: SP	Report No: 10/22

Figure 2 - Survey location plan



N

Site boundary

Survey Grid

Unsurveyable

0 200m

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Project Name: Batts Bridge road, Maresfield		
Scale: 1:5000 A3	Drawn by: SP	Report No: 10/22

Figure 3: Survey Grids

Figure 4: North, Raw greyscale data

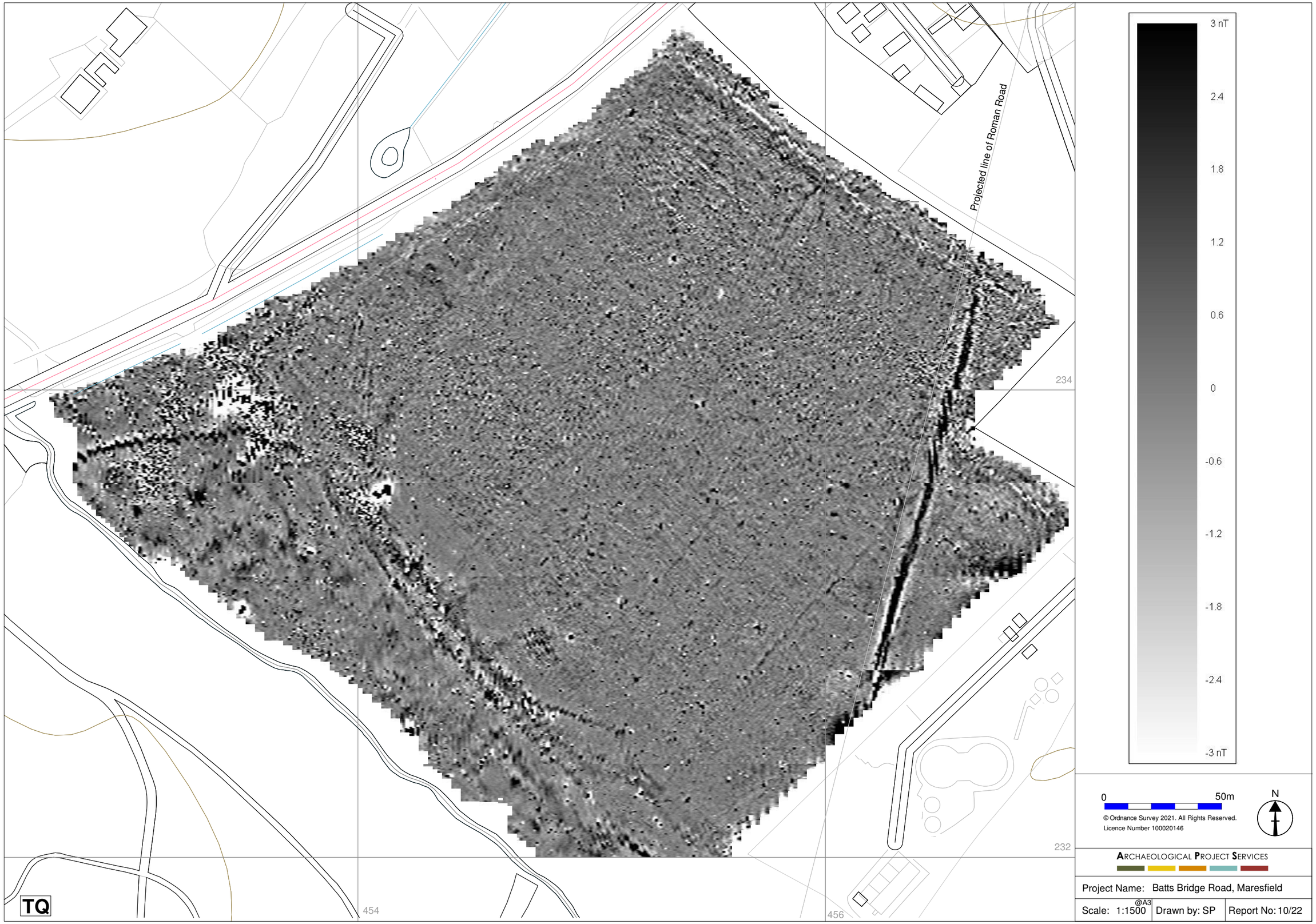


Figure 5: North, processed greyscale data

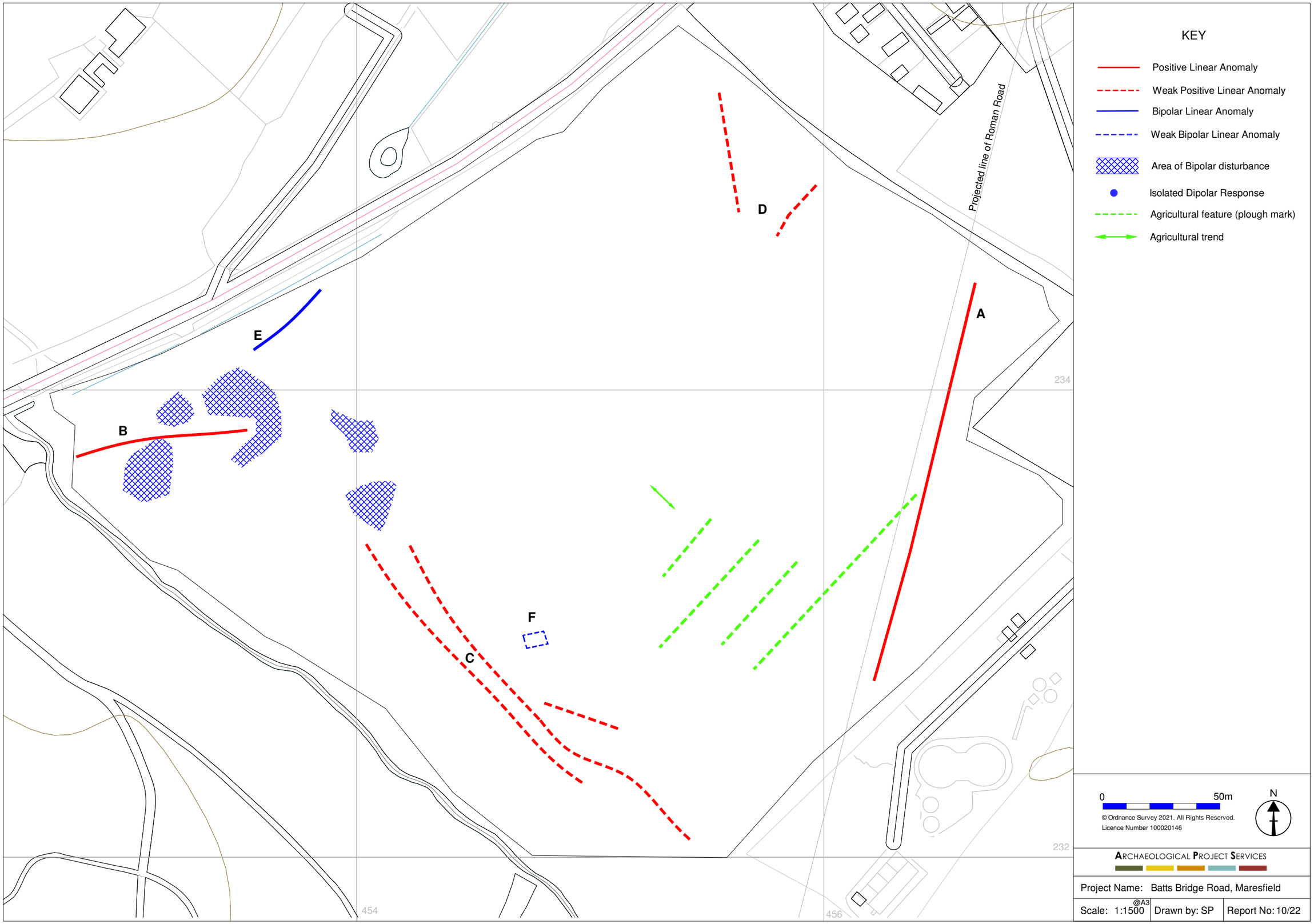


Figure 6: North, Interpreted data

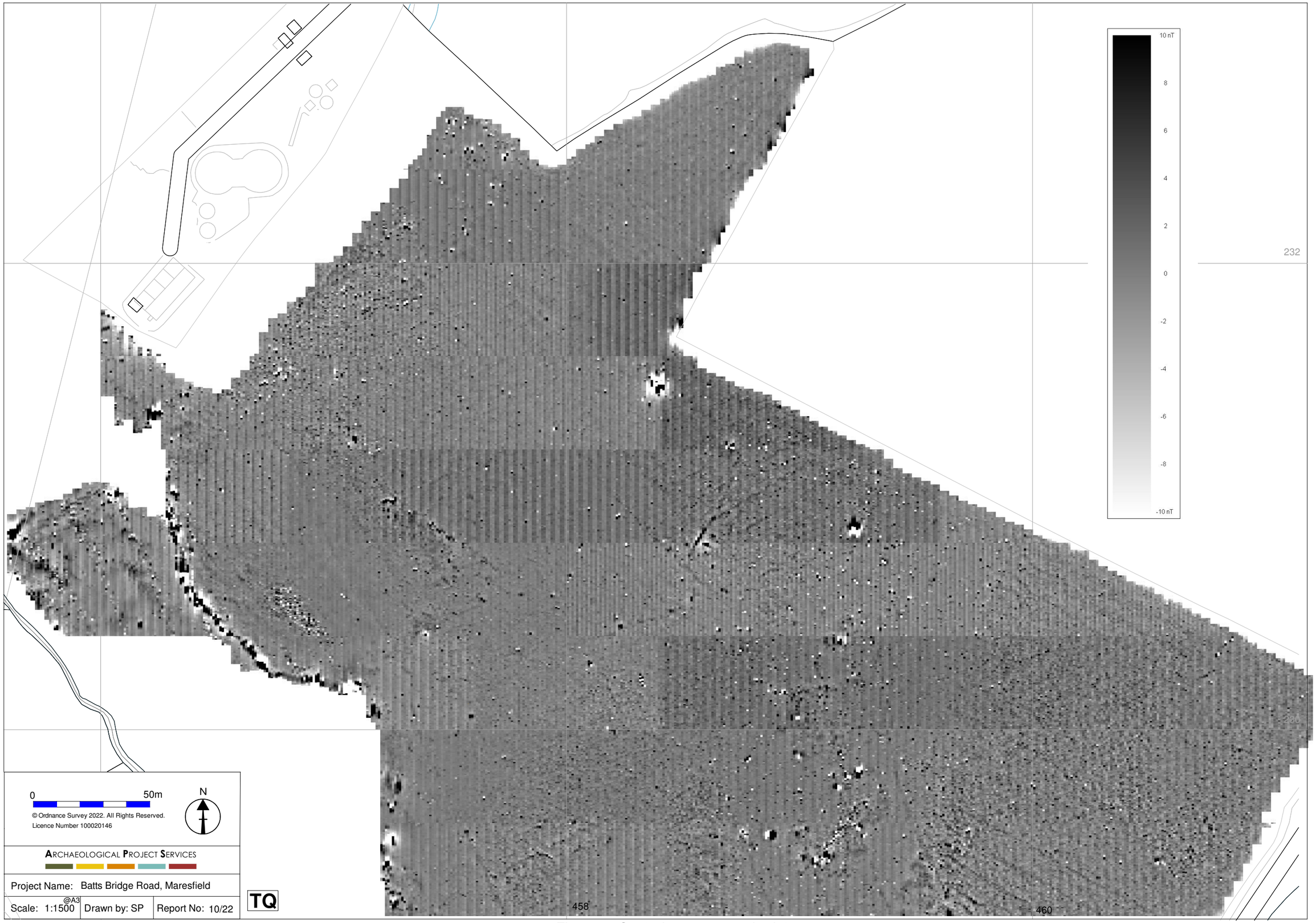


Figure 7, Central, raw greyscale data

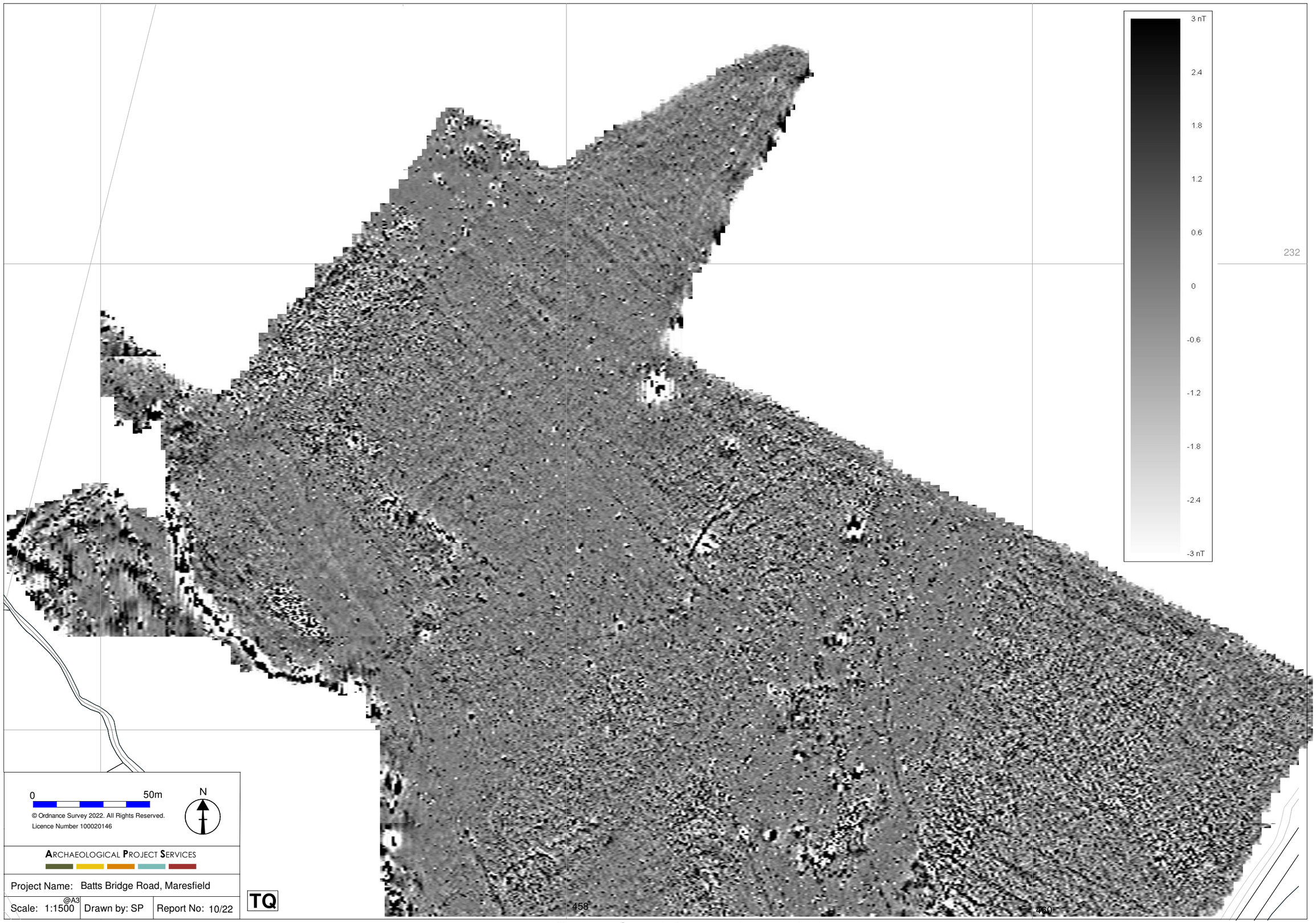


Figure 8: Central, Processed greyscale data

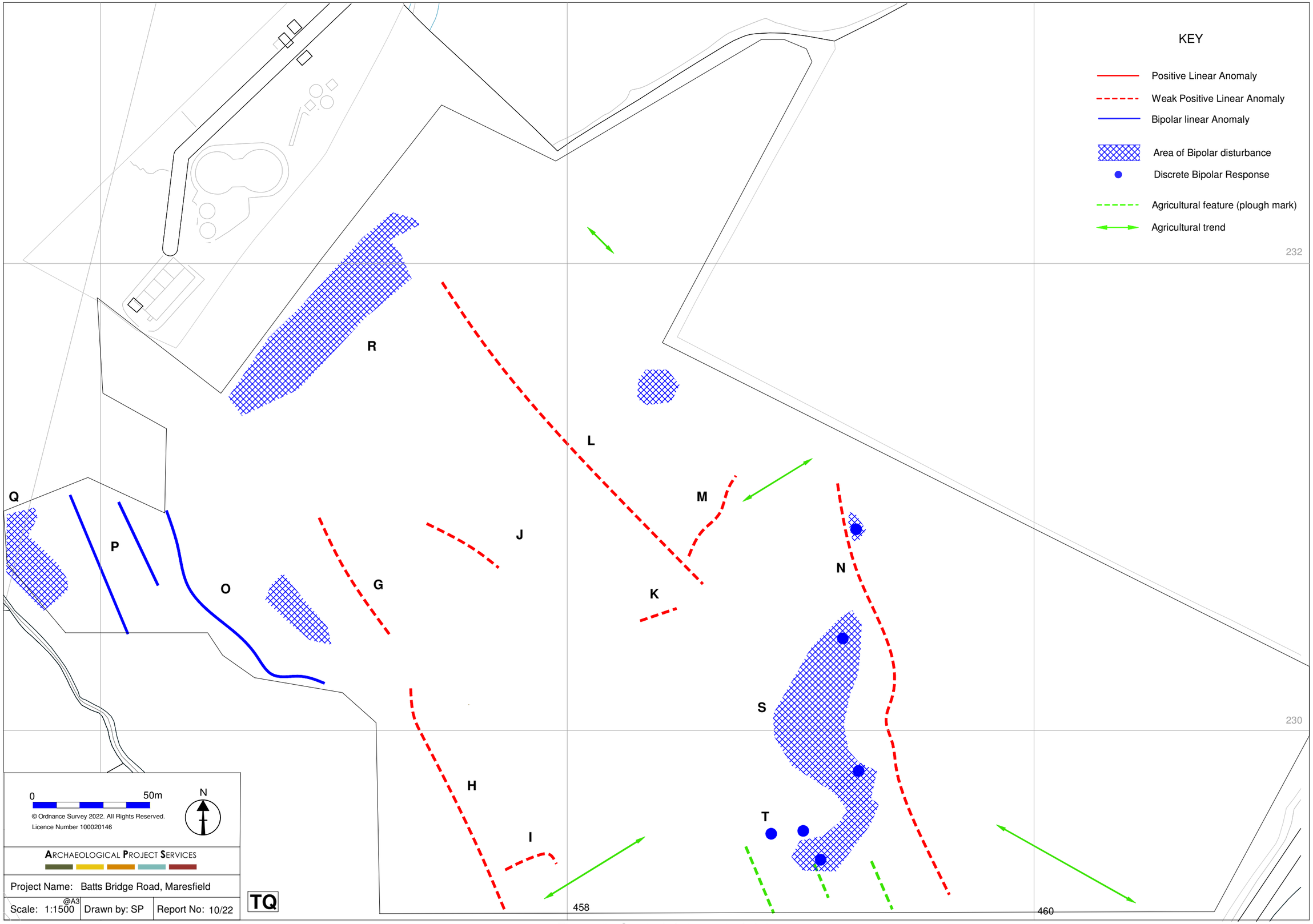


Figure 9: Central, Interpreted data

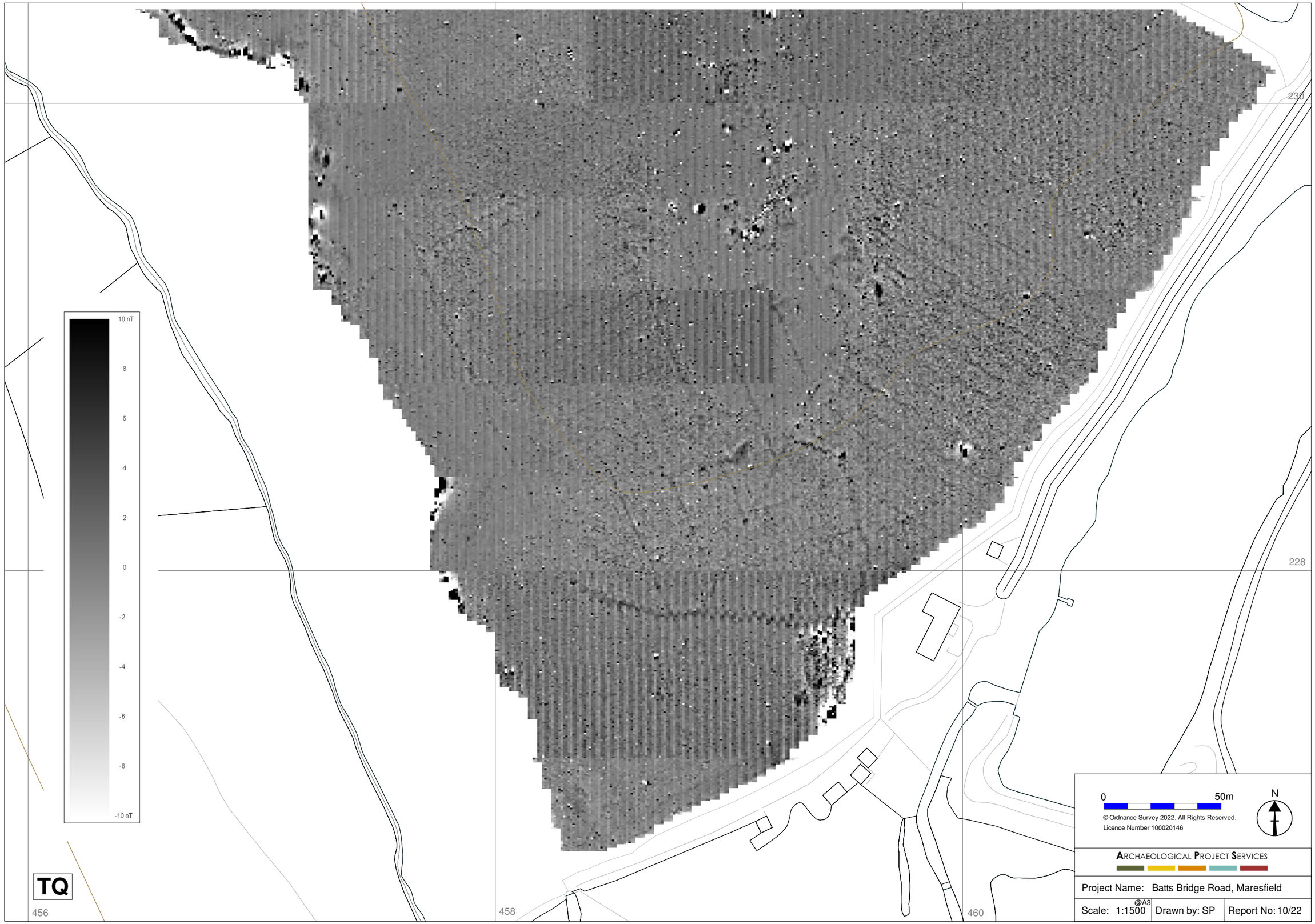


Figure 10: South, Raw greyscale data

Figure 11: South, Processed greyscale data

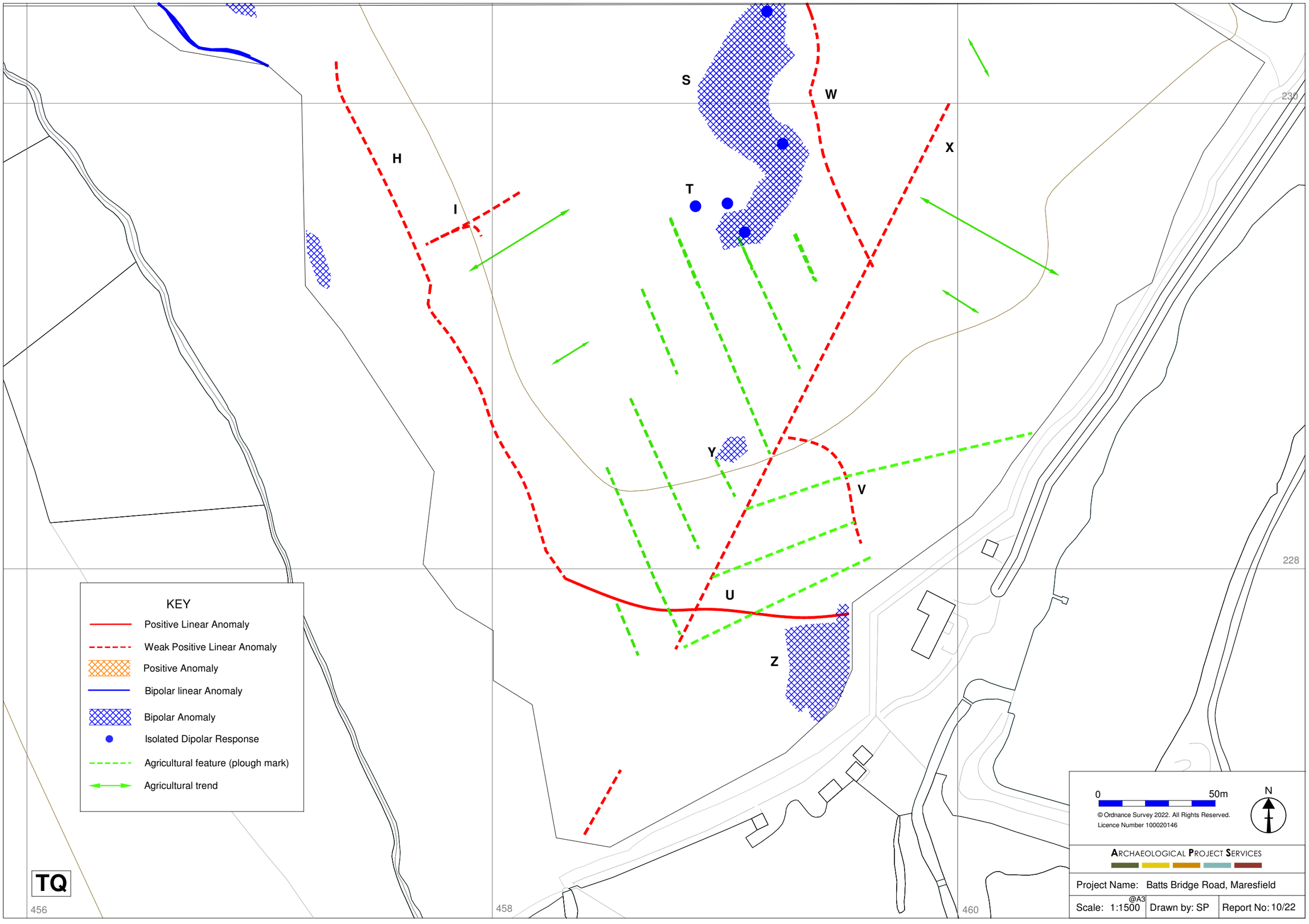
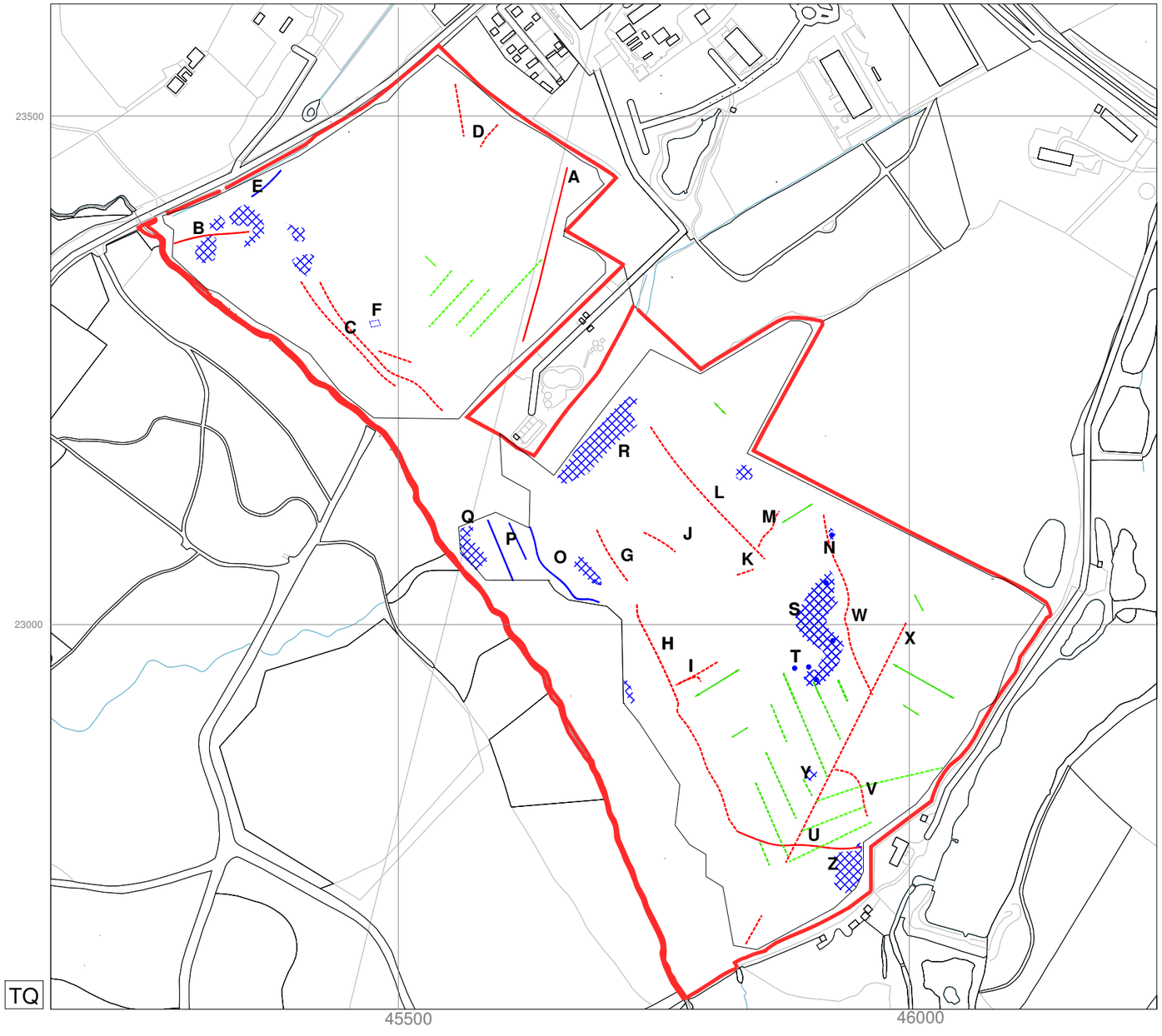


Figure 12: South, Interpretation



N

Site boundary

Positive Linear Anomaly

Weak Positive Linear Anomaly

Bipolar Linear Anomaly

Weak Bipolar Linear Anomaly

Area of Bipolar disturbance

Isolated Dipolar Response

Agricultural feature (plough mark)

Agricultural trend

0 200m

ARCHAEOLOGICAL PROJECT SERVICES

Project Name: Batts Bridge road, Maresfield

Scale: 1:5000 A3 | Drawn by: SP | Report No: 10/22

Figure 13: Summary of interpretation

Appendix 1

TECHNICAL INFORMATION

Principles of magnetometry
Magnetic prospecting is designed to identify concentrations of magnetised iron oxides in the soil. Iron oxides can exist in states of weak or a strong magnetisation (Gaffney and Gater 2003).

Human activities tend to enhance the magnetic properties of iron oxide particles. Where these particles accumulate, such as in cut features like ditches and pits, a weak positive magnetic anomaly is apparent. In cases where very strong heat has been applied, such as furnace and kiln bases, a bipolar magnetic anomaly will be apparent, with one area having a strong positive signature and one area having a strongly negative signature. Where banks have been built up from natural geological material which excludes magnetically enriched sediments, or walls have been made of stone, this may result in a negative anomaly. Modern metallic items and fired bricks cause sharp bipolar spikes. Modern services have a tendency to alternate between positive and negative readings along their length.

It should be noted that not all features will be detectable magnetically and an absence of anomalies does not necessarily indicate absence of archaeological features (Clark 1996).

Bartington Grad 601-2
A gradiometer uses two sensors separated by a fixed distance in order to measure the difference in strength between the earth's magnetic field and the soil. The Bartington Grad 601 uses two fluxgate sensors separated vertically by 1m to take these readings. This reduces natural variations associated with the Earth's magnetic field and deep geology. Changes as small as 0.2 nanoTesla (nT) in an overall field strength of c. 49,000nT can be accurately detected using this instrumentation, although in practice instrument interference and soil noise can limit sensitivity. The instrument has typical penetration of 0.5m-1m, although stronger anomalies can be detected at greater depths. The 601-2 model uses two sets of sensor pairs to take parallel readings 1m apart horizontally.

Methodology
The survey area is divided into grid squares of 40x40m. The grids are set out using a survey grade GPS, accurate to 0.03m. The grids are systematically walked in a zigzag pattern with the gradiometer taking readings every 0.25m along a traverse, and each traverse being separated by 1m. This equates to 6400 sampling points in a full 40m x 40m grid. Readings are automatically recorded on a datalogger which is downloaded at the end of each day. The gradiometer is 'zeroed' at the start of each day and at intervals throughout to ensure consistent results are achieved throughout the survey.

Data Processing
The data is downloaded and processed using TerraSurveyor software (version 3.0.37.25). The raw data is then adjusted to emphasise possible features. At each stage the data is examined as a greyscale image and as a trace plot.

Minimally Processed data
The data is clipped so that the mid-range of readings is most visible. This involves excluding all readings outside of the -10nT to 10nT range.

Processed Data
The following processes are applied to produce the processed greyscale image:

- Destripe: Each traverse is flattened with regard to surrounding traverses by setting the median value of the traverse to 0nT. This produces cleaner images, but may cause bleeding where particularly strong signals are present at one end of a traverse.
- Data Clip: The data is clipped to provide the most suitable contrast for seeing archaeological features. This excludes readings outside of the -3nT to 3nT range.
- Grad shade: This is to remove pixelation and smooth anomalies in data for interpretation.

Data is exported as a JPG image and georeferenced for use in scale plans of the site. Anomalies are then checked against historical maps, and where available, lidar contour data.

References

Clark, A., 1996 *Seeing Beneath the Soil*, London, 2nd edn.

Gaffney C. and Gater, J., 2006 *Revealing the Buried Past: Geophysics for Archaeologists,* The History Press

Appendix 2

GLOSSARY

Alluvium	Deposits laid down by water. Marine alluvium is deposited by the sea, and fresh water alluvium is laid down by rivers and in lakes.
Charcoal clamp	A furnace for converting wood into charcoal.
Drift	Material that has been eroded, transported or deposited by glaciers (or their melt water). The term 'drift' is commonly used to describe any deposits of Quaternary age.
Geophysical Survey	Essentially non-invasive methods of examining below the ground surface by measuring deviations in the physical properties and characteristics of the earth. Techniques include magnetometry and resistivity survey.
Lidar	An aircraft-based method of survey using analysis of pulses of laser light reflected from the surfaces of the ground and buildings. It is cable of identifying subtle differences in topography.
Medieval	The Middle Ages, dating from approximately AD 1066-1500.
Modern	The current period, dating from around AD 1900 to the present time.
Natural	Undisturbed deposit(s) of soil or rock which have accumulated without the influence of human activity
Post-medieval	The period following the Middle Ages, dating from approximately AD 1500-1900.
Roman	Pertaining to the period dating from AD 43-410 when the Romans occupied Britain.

Appendix 3

THE ARCHIVE

The archive consists of:

7 Daily record sheets
1 Report text and illustrations
1 Digital data

File names	MFBB22.csv, MFBB22-2.csv
Explanation of codes used in file names	.csv files allow whole composite to be generated and stored easily.
Description of file formats	All files are in csv format where Z= nT reading
List of codes used in files	
Hardware, software and operating systems	TerraSurveyor 3.0.37.29 running under Windows 10
Date of last modification	23/02/2020
Indications of known areas of weakness in data	
Survey Technique	Zigzag
Origin	Starts at A1. X axis progresses east. Y axis progresses south
Grid size	40mx40m
Interval	X=1, Y=0.25m
Dummy Value	2047.5
XYZ Separation	Comma

All primary records are currently kept at:

Heritage Lincolnshire/Archaeological Project Services
The Old School
Cameron Street
Heckington
Sleaford
Lincolnshire
NG34 9RW

Final destination of the archive is:

Archaeological Data Service

OASIS code: archaeol1-505267

Summary for archaeol1-505267

OASIS ID (UID)	archaeol1-505267
Project Name	GEOPHYSICAL SURVEY: BATTS BRIDGE ROAD, MARESFIELD, EAST SUSSEX (MFBB22)
Sitename	
Activity type	Magnetometry Survey
Project Identifier(s)	GEOPHYSICAL SURVEY: BATTS BRIDGE ROAD, MARESFIELD, EAST SUSSEX (MFBB22)
Planning Id	
Reason For Investigation	Planning requirement
Organisation Responsible for work	Archaeological Project Services
Project Dates	31-Jan-2022 - 09-Feb-2022
Location	Batts Bridge Road, Maresfield NGR : TQ 45600 23310 LL : 50.9907802134342, 0.073220453345162 12 Fig : 545600,123310
Administrative Areas	Country : England County : East Sussex District : Wealden Parish : Maresfield
Project Methodology	A magnetic gradiometer survey using a Bartington Grad 601-2, covering the area with traverses 1m apart and taking a reading every 25cm.
Project Results	Identified the location of a previously known Roman road. Identified possible industrial structures in old woodland, most likely charcoal clamps. Highlighted several possible field boundaries and one possible structure.
Keywords	Road - ROMAN - FISH Thesaurus of Monument Types Charcoal Burners Site - POST MEDIEVAL - FISH Thesaurus of Monument Types
Funder	
HER	East Sussex HER - noRev - LITE
Person Responsible for work	J, Smith, Sean, Parker
HER Identifiers	
Archives	