

**ARCHAEOLOGICAL GEOPHYSICAL SURVEY**

**PROPOSED SOLAR FARM  
SHEPHERD'S FARM  
CLYST ST. MARY  
DEVON**

**CENTRED ON NGR: 299460 89980**

**REPORT PREPARED FOR  
COTSWOLD ARCHAEOLOGY  
ON BEHALF OF  
SUSTAINABLE POWER PARTNERS LTD  
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## Contents

Non technical summary	1
1.0 Introduction	2
2.0 Location and description	2
3.0 Geology and soils	2
4.0 Archaeological context	2
5.0 Methodology	3
6.0 Results	4
7.0 Conclusions	5
8.0 Acknowledgements	5
9.0 References	5

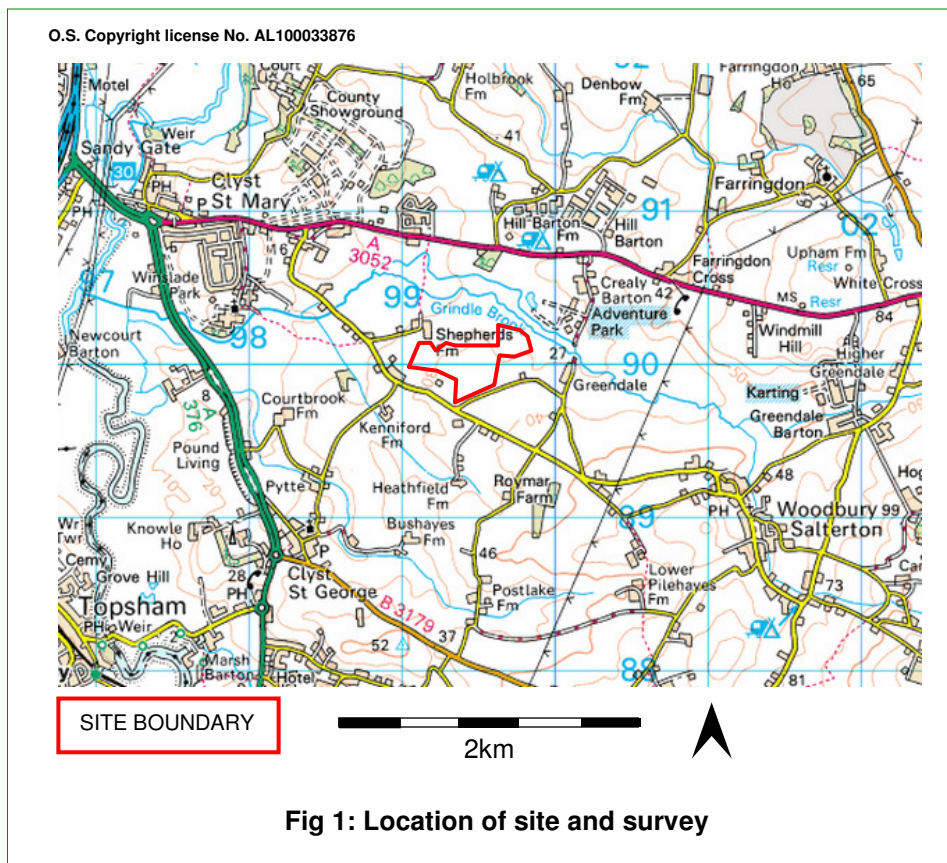
## Illustrations

Fig. 1: Location of site and survey	1:50000
Fig. 2: Location of site and survey	1:2500
Fig. 3: Interpretation	1:2500
Figs. 4 – 7: Field 1 - Trace, greyscale and interpretive images	1:1500
Figs. 8 – 11: Field 2 - Trace, greyscale and interpretive images	1:1250

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### Non technical summary

- A fluxgate gradiometer survey was undertaken on land at Shepherd's Farm, Clyst St. Mary, Devon .The site is proposed for a solar installation.
- The survey identified a curvilinear array of variation that has been tentatively interpreted as possible traces of a ring ditch in the eastern part of the site (Field 2). A number of other possible ditches and pits were also detected in this general vicinity, with slight suggestions of potential ditches in the mid-northern part of the site (in Field 1). However, the preponderance of likely natural variation has served to compromise a definitive appraisal of most weak anomalies.
- Elsewhere, the survey registered residual traces of recently removed boundaries and a track (including an associated rubble spread) in Field 1, and relatively strong readings induced by modern features and objects, including a modern track to the south of Shepherd's farm, cultivation, a buried service, ferrous litter and (possibly) land drains at the eastern edge of Field 2.
- Notwithstanding that some geophysical evidence is suggestive of ditches and pits, it is concluded that the archaeological potential of the surveyed areas is limited.



## 1.0 Introduction

Acting for Sustainable Power Partners Ltd, Cotswold Archaeology commissioned Pre-Construct Geophysics Ltd to undertake a fluxgate gradiometer survey on land at Shepherd's Farm, near Clyst St. Mary, Devon (centred on 299460 89980). The site is proposed for a solar installation.

The objective of the survey was to detect and precisely locate any potential buried archaeological features using non-intrusive techniques.

This report incorporates information that has been selectively extracted from a Heritage Desk-Based Assessment (DBA) prepared by Cotswold Archaeology (Davis, 2013).

## 2.0 Location and description (Figs. 1 & 2)

The c.16.5ha site lies c.2km to the south-east of the village of Clyst St. Mary, Devon. It comprises two agricultural arable fields (PCG designation: Fields 1 & 2). The southwestern part of Field 1 lies outside the proposed development area, with Field 2 entirely within the site.

Unsafe ground conditions predisposed survey across much of the southern part of Field 1. Following a partial survey within this area, the preponderance of ploughed in, rotting, pumpkins was considered to pose an (unseen) serious risk of ankle injury.

Field 1 is bounded to the west by a track, with hedges forming the northern, eastern and south-eastern boundaries. The south-east corner of the field lies immediately adjacent to a narrow lane that extends between Higher Road and Greendale Lane. Shepherd's Farm is situated to the immediate north-west of the site.

Field 2 is bounded on all sides by hedges (and ditches along the northern and western edges).

## 3.0 Geology and topography

The underlying geology comprises Triassic mudstone of the Exmouth Mudstone and Sandstone Formation<sup>1</sup>.

Superficial deposits are not recorded.

The site occupies a gentle north-facing slope of the shallow valley of the east-west aligned Grindle Brook that passes to the north of the site. The ground level of the western field falls from approximately 35m AOD in the south to approximately 25m AOD in the north-west corner, whilst the eastern field falls from approximately 30m AOD to approximately 22m AOD in the north.

## 4.0 Archaeological Context

Extract from summary of the DBA:

*There is some limited potential for currently unrecorded Roman archaeology being present at the site, derived from the proximity of the site to a Roman road and a possible Roman settlement site. Such remains could be of some local archaeological significance, although the small-scale of ground disturbance associated with solar development is unlikely to result in significant harm to buried archaeological remains.*

*Extant earthworks related to a post-medieval or modern field boundary present within the proposed development site is of very limited archaeological value. The cartographic, historic and archaeological evidence suggests that the site has been agricultural land since the medieval period. Thus, if any additional archaeological remains of the medieval, post-medieval or modern periods were to be discovered at the site, it is likely that they too would be agricultural in nature, and therefore of limited archaeological interest.*

## 5.0 Methodology

The survey methodology is based upon English Heritage guidelines: *'Geophysical Survey in Archaeological Field Evaluation'* (English Heritage, 2008).

**Fluxgate Gradiometry** is a non-intrusive scientific prospecting tool that is used to determine the presence/absence of some classes of sub-surface archaeological features (e.g. pits, ditches, kilns, and occasionally stone walls). By scanning the soil surface, geophysicists identify areas of varying magnetic susceptibility and can interpret such variation by presenting data in various graphical formats and identifying images that share morphological affinities with diagnostic archaeological remains.

The use of gradiometry should help to establish the presence/absence of buried magnetic anomalies, which may reflect sub-surface archaeological features, and may therefore form a basis for a subsequent scheme of archaeological trenching.

The use of magnetic surveys to locate sub-surface ceramic materials and areas of burning, as well as magnetically weaker features, is well established, particularly on large green field sites. The detection of anomalies requires the use of highly sensitive instruments; in this instance the Bartington 601 Dual Fluxgate Gradiometer. This is accurately calibrated to the mean magnetic value of each survey area. Two sensors, mounted vertically and separated by 1m, measure slight, localised distortions of the earth's magnetic field, which are recorded by a data logger.

The survey was undertaken on 17<sup>th</sup> – 19<sup>th</sup> February 2014. The zigzag traverse method of survey was used, with readings taken at 0.25m intervals along 1.0m wide traverses.

Each survey area was established by Global Positioning Satellite using a Topcon GRS-1, with an accuracy of +/- 0.1m and subsequently geo-referenced on an Auto drawing of the site.

The data sets were processed using *Terrasurveyor V 3.0.22.1*.

Raw data sets are presented on Figs. 4 & 8 (clipped to +/-10nT to enhance resolution).

The 'Despike' function was applied to reduce the effect of extreme readings induced by metal objects, and 'Destripe' to eliminate striping introduced by zigzag traversing. The data sets were clipped to +/- 20nT on trace plots (Figs. 5 & 9) and +/-2nT on greyscale images (Figs. 2, 6 & 10).

### 5.2 Character, interpretation and presentation of magnetic anomalies (Figs. 3, 7 & 11)

Anomalies considered to represent modern ferrous-rich features and objects are highlighted in blue on the interpretive images. These are characterised magnetically as dipolar 'iron spikes', often displaying strong positive and/or negative responses, typically inducing a response in excess of +/-10nT. Examples include those deposited along existing or former boundaries (e.g. wire fencing), services and scatters of horseshoes, ploughshares etc across open areas. Ferro-enhanced (fired) materials such as brick and tile (sometimes introduced during manuring or land drain construction) usually induce a similar, though predominately weaker response. Concentrations of such anomalies will often indicate rubble spreads, such as would be used to backfill ponds or redundant ditches, or indicate the blurred footprints of demolished structures.

On a cautionary note, fired clay associated with early activity (e.g. kilns, furnaces, tile spreads) has the same magnetic characteristics as modern brick/tile rubble. Therefore, the interpretation of such variation must consider the context in which it occurs.

Potential archaeological remains are highlighted as red on interpretive images; former boundaries as yellow lines, services as blue land drains as purple, cultivation as orange and suggested natural features as green.

## 6.0 Results and discussion (Figs. 2 - 11)

### 6.1 Field 1 (Figs. 2 – 7)

The survey recorded:

- a) Residual traces of recently removed field boundaries and a trackway (**1**), as depicted on historic maps (Fig. 7: dashed/solid yellow lines, see also inset on Fig. 2). A number of other linear trends have been tentatively flagged as related boundaries, albeit not shown on historic maps (dotted yellow lines). Stronger anomalies (highlighted blue) signify miscellaneous ferrous-rich materials deposited along/adjacent to their alignments (e.g. rubble, iron objects), with a substantial spread of such responses registered at the junction of **1** and other boundaries; this is almost certainly of modern origin, possibly a former area of hard standing.
- b) Slight traces of probable cultivation (dotted orange lines).
- c) Strong variation (highlighted blue), some recorded in relative isolation (e.g. ploughshares, brick fragments etc) and also along former (as discussed above) and current boundaries. The latter includes a boundary track that lies to the south of Shepherds Farm. A buried service extends along the south-eastern boundary of the field (blue line).
- d) Widespread weak variation ('greenscale' backdrop). Notwithstanding that most probably relate to natural features (such as tree throws and geological/pedological inconsistencies), linear trends are apparent within a relatively large concentration of slightly stronger readings in the north-eastern part of the field (e.g. dotted rd lines). As such, the presence of archaeological remains in this area cannot be completely discounted.

### 6.2 Field 2 (Figs. 2, 3, 8 – 11)

The survey detected:

- a) A magnetically weak curvilinear anomaly, speculatively a partially resolved ring ditch, in the eastern part of the field (Fig. 11: **2** - red lines). A potential linear ditch was detected to its north-west (red line), with other possible (though less distinct) examples elsewhere (dotted red lines).
- b) A dense array of anomalies, of various strengths, adjacent to the eastern boundary. The majority resolve as potentially modern (e.g. fragments of brick/tile), although others might conceivably signify pits (e.g. red dots - **3**). It is also possible that linear trends in this area might represent land drains, with other possible drain in the north-eastern region (dotted purple lines).
- c) A back drop of predominately natural responses, as discussed above (green scale).
- d) Likely modern responses (highlighted blue). It is possible that strong readings along the southern edge of the survey relate to a buried service that lies to the immediate south (dotted blue line).

## 7.0 Conclusions

The survey identified a curvilinear array of variation that has been tentatively interpreted as possible traces of a ring ditch in the eastern part of the site (Field 2). A number of other possible ditches and pits were also detected in this general vicinity, with slight suggestions of potential ditches in the mid-northern part of the site (in Field 1). However, the preponderance of likely natural variation has served to compromise a definitive appraisal of most weak anomalies.

Elsewhere, the survey registered residual traces of recently removed boundaries and a track (including an associated rubble spread) in Field 1, and relatively strong readings induced by modern features and objects, including a modern track to the south of Shepherd's farm, cultivation, a buried service, ferrous litter and (possibly) land drains at the eastern edge of Field 2.

Notwithstanding that some geophysical evidence is suggestive of ditches and pits, it is concluded that the archaeological potential of the surveyed areas is limited.

## 8.0 Acknowledgements

Pre-Construct Geophysics would like to thank Cotswold Archaeology for this commission.

## 9.0 References

Davis, R. 2014 *Shepherd's Farm, Clyst St. Mary, Devon*. Heritage Desk Based Assessment. Cotswold Archaeology, Project 4744, Draft Report 14057.

English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation*. London, English Heritage.

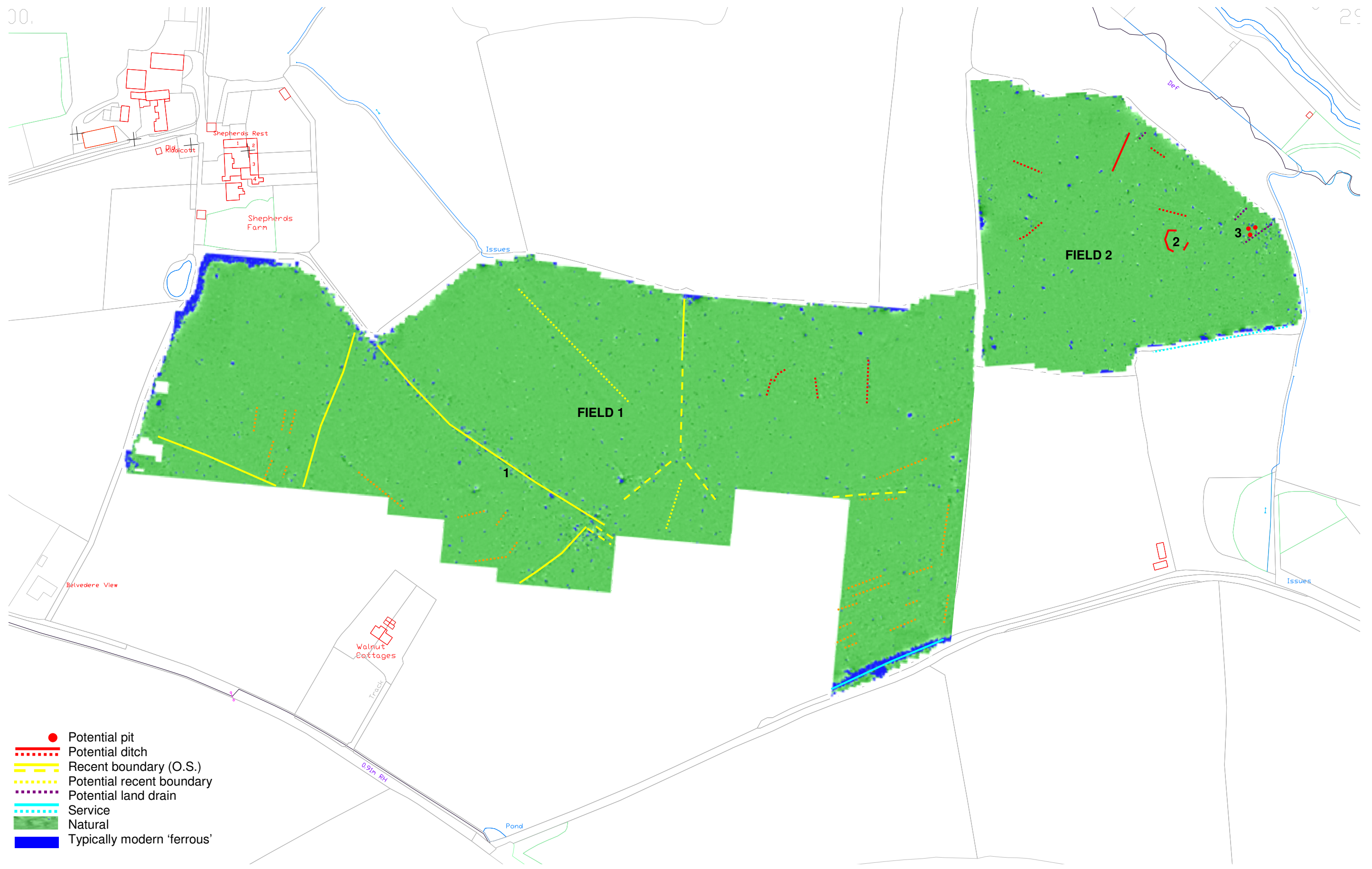
<sup>1</sup>[http://maps.bgs.ac.uk/geologyviewer\\_google/googleviewer.html](http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html), 1:50,000. British Geological Survey, Keyworth.

<sup>2</sup><http://www.old-maps.co.uk/maps.html>



**Fig. 2: Location of site and survey**  
 (Inset: extract of O.S. Map dated 1889)





- Potential pit
- Potential ditch
- Recent boundary (O.S.)
- ... Potential recent boundary
- ... Potential land drain
- ... Service
- Natural
- Typically modern 'ferrous'

200m



Fig. 3: Interpretation

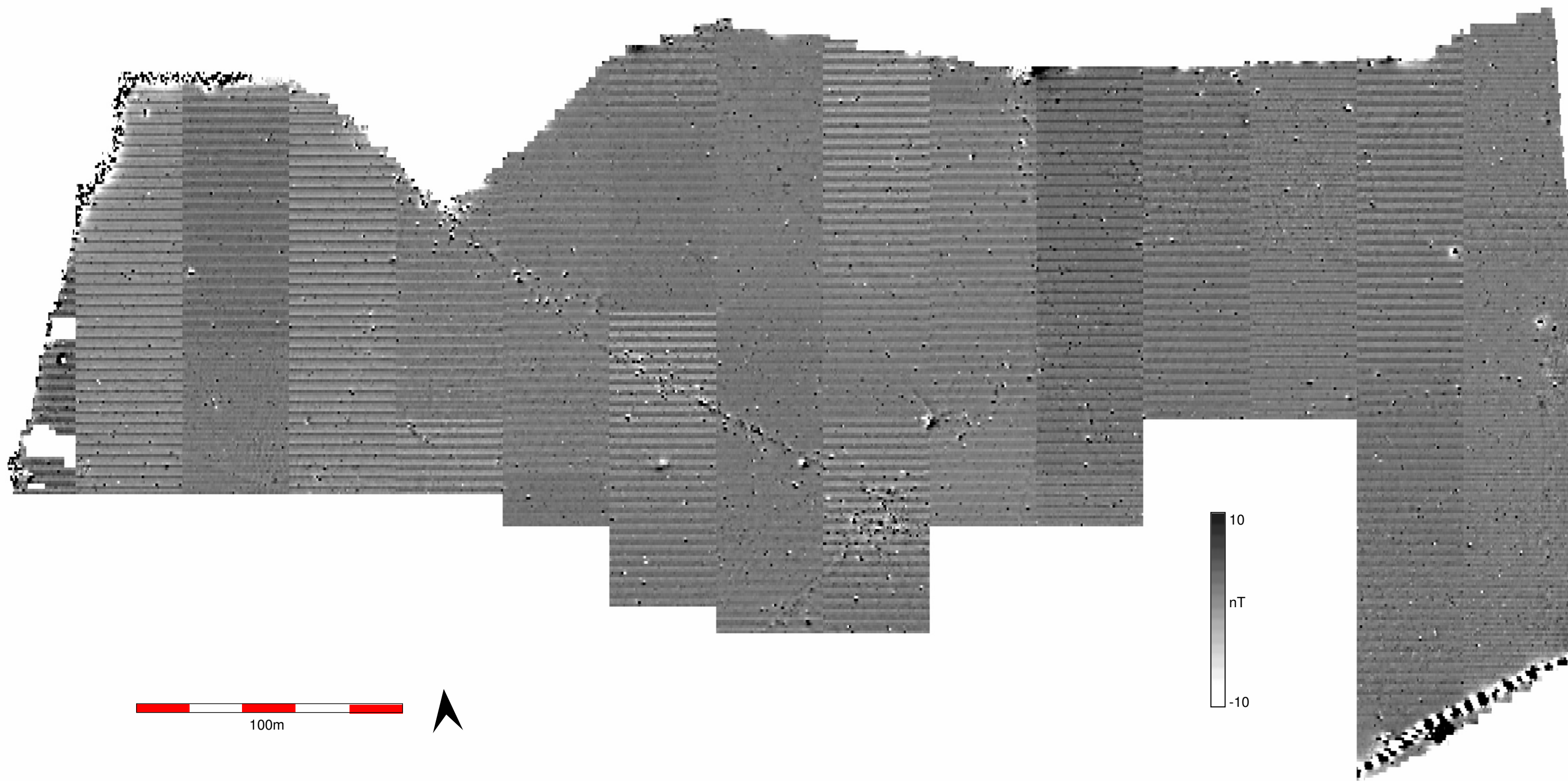


Fig. 4: Field 1 - Greyscale image - unprocessed data

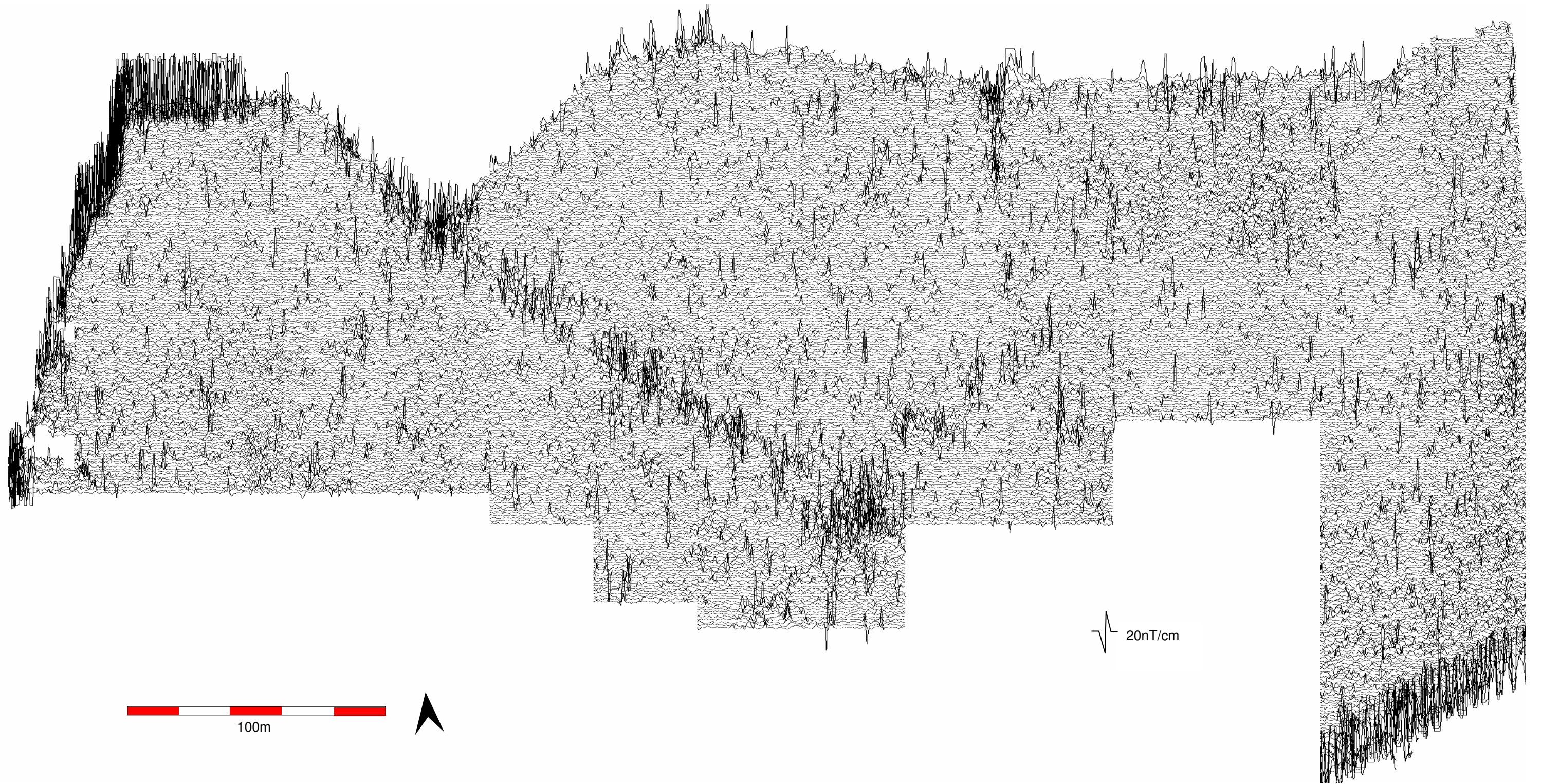


Fig. 5: Field 1 – Trace plot

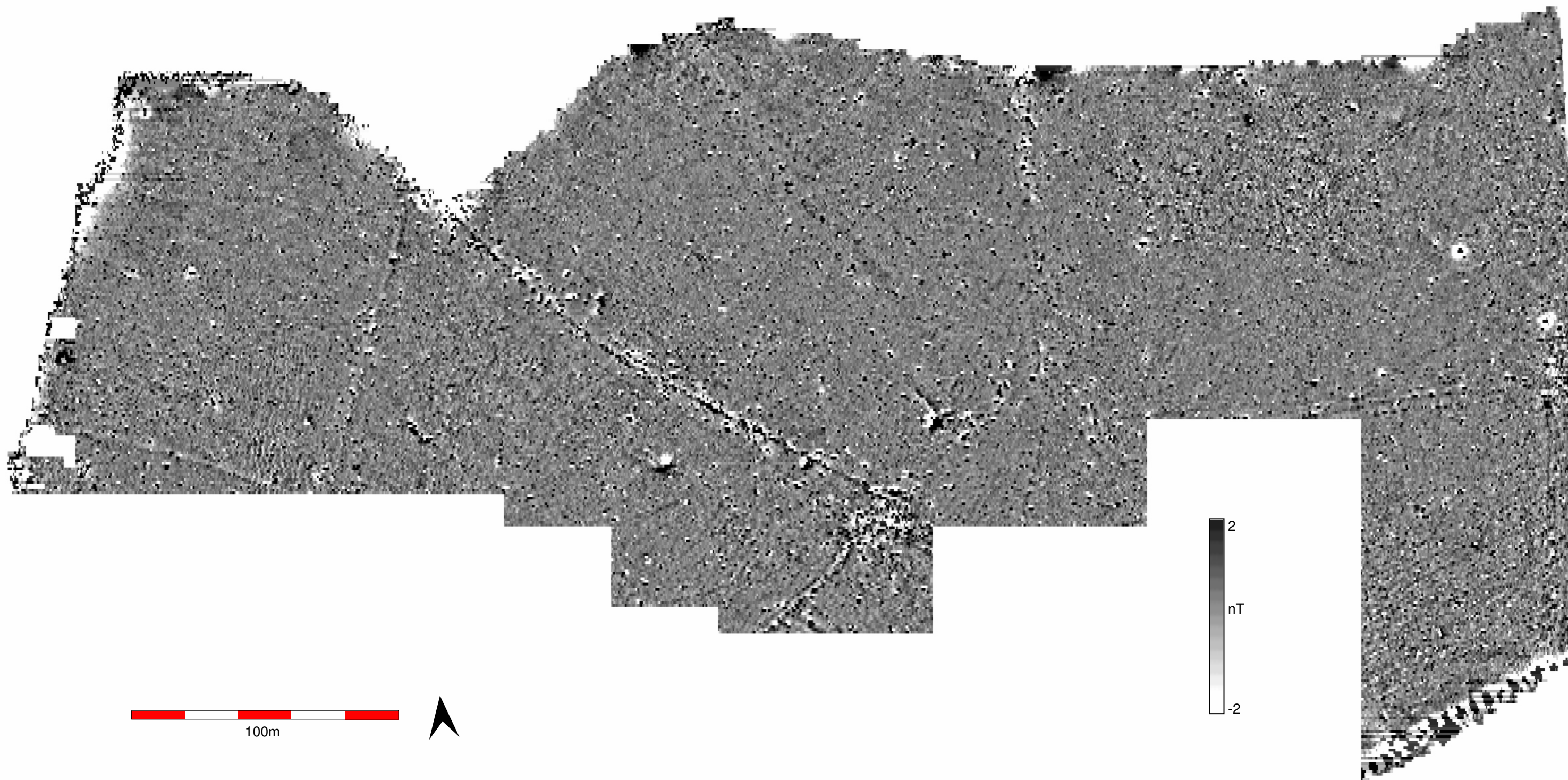


Fig. 6: Field 1 - Greyscale image - processed data

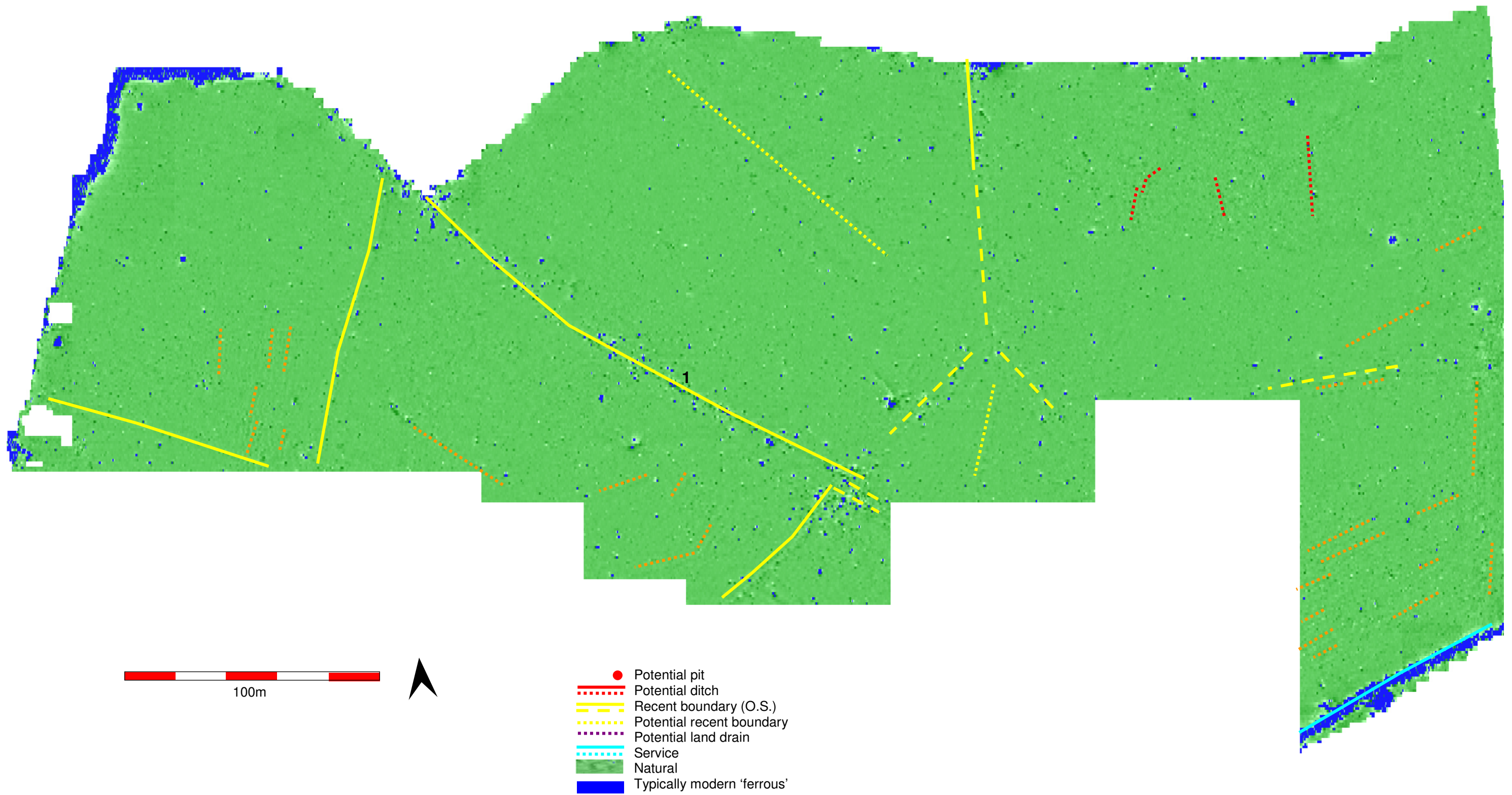


Fig. 6: Field 1 - Interpretation

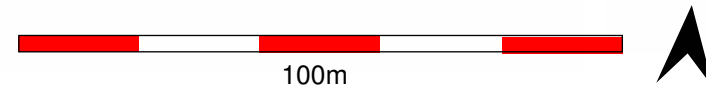
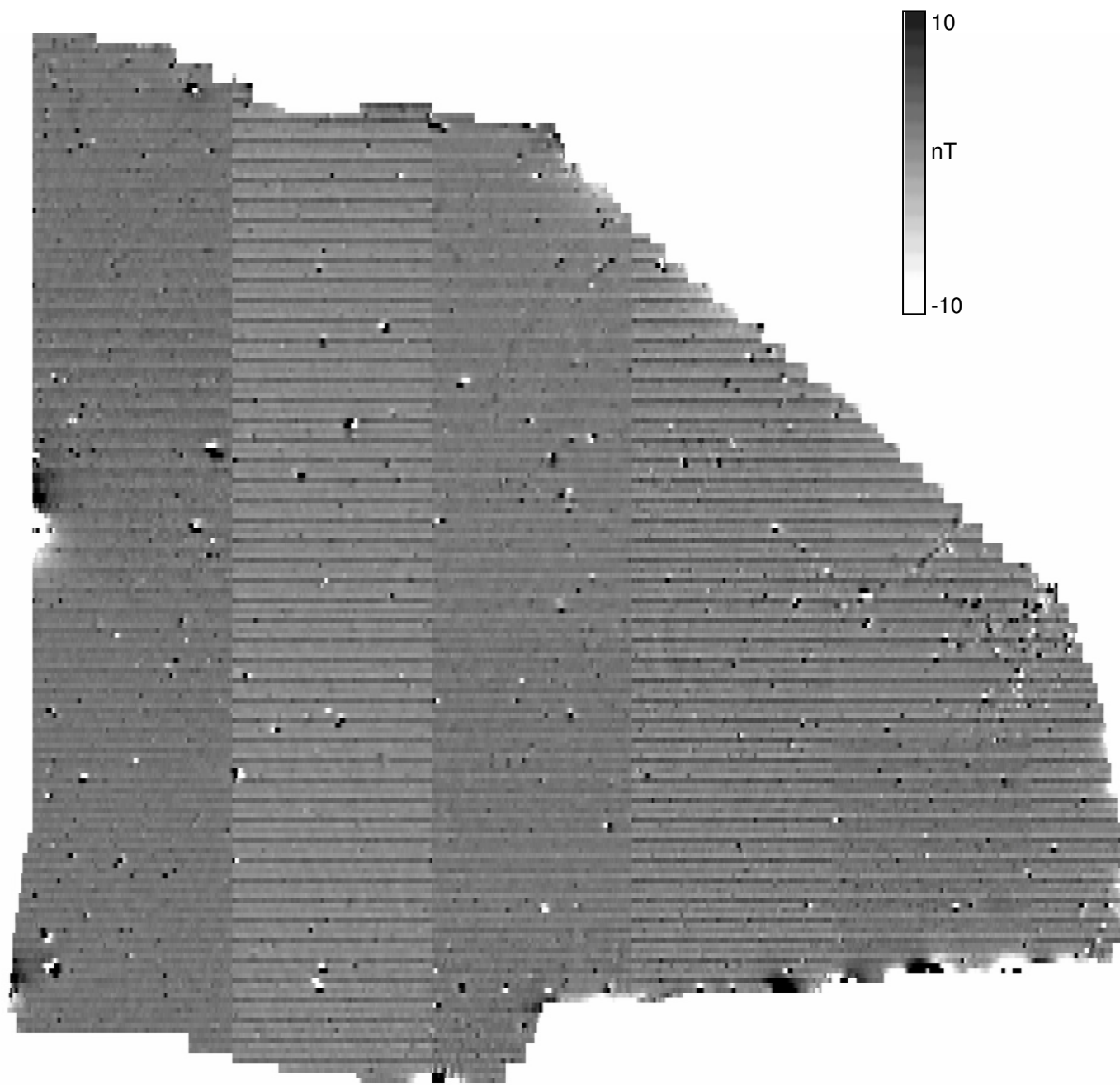


Fig. 8: Field 2 - Greyscale image - unprocessed data

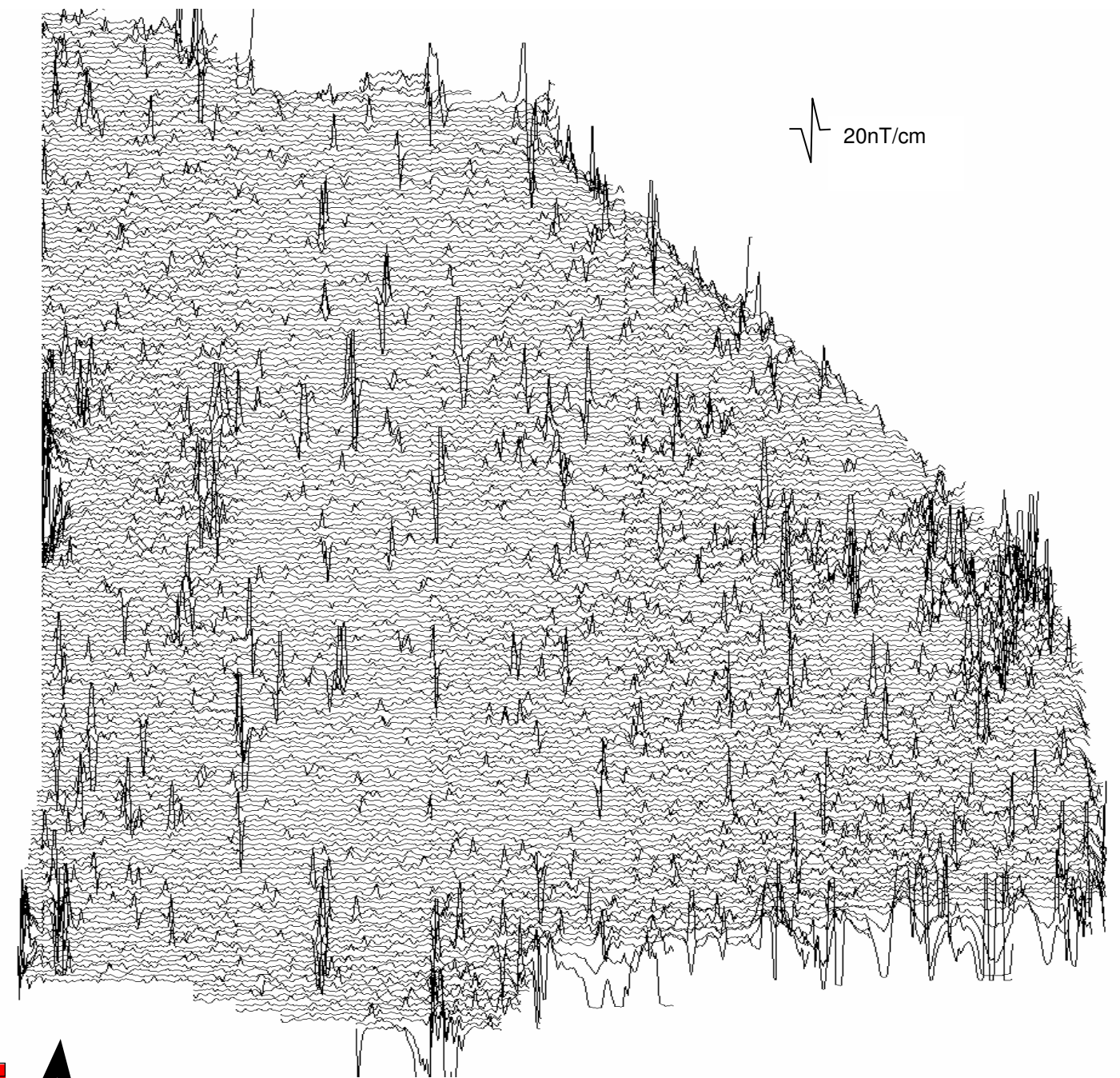


Fig. 9: Field 2 - Trace plot

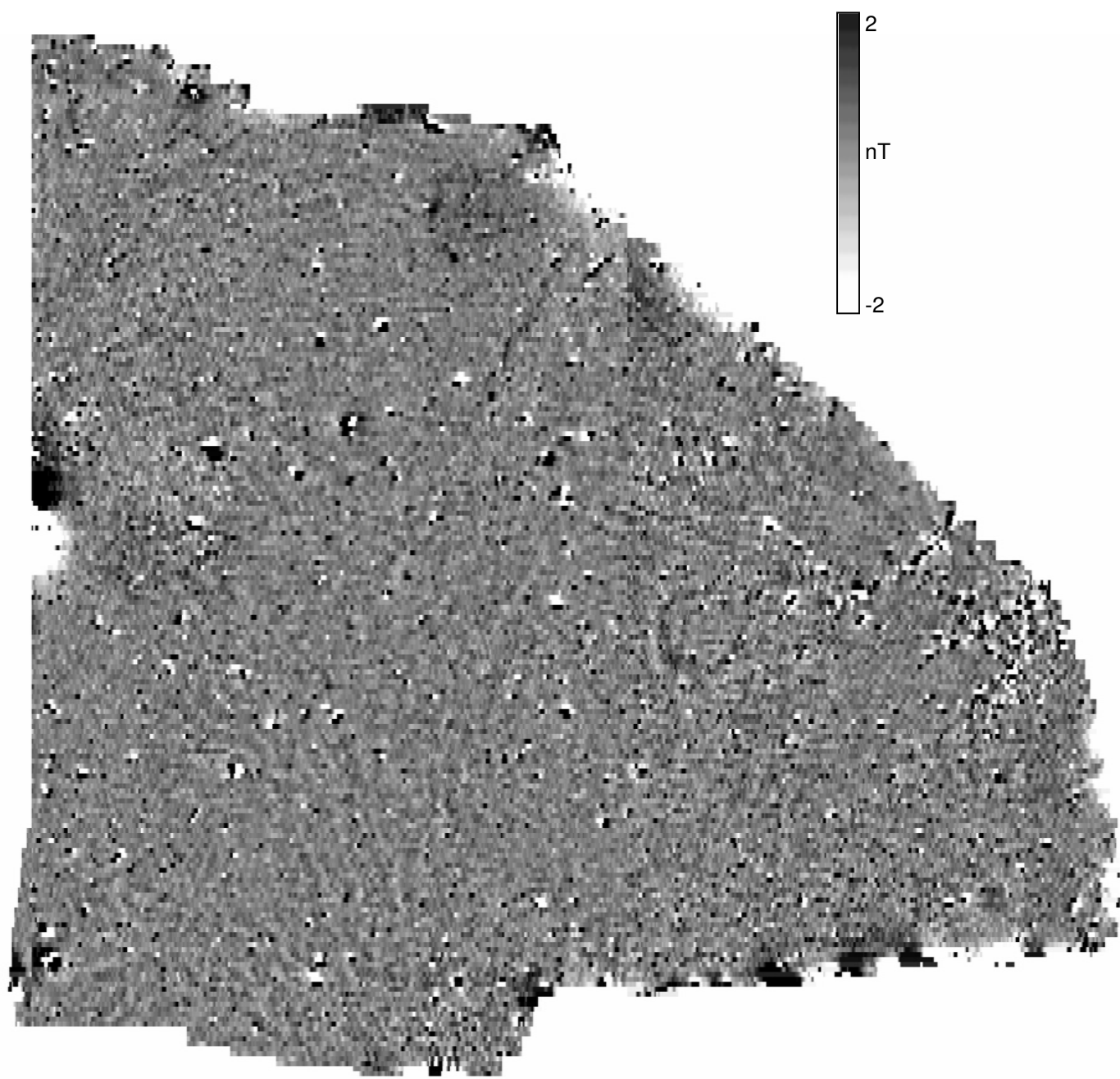


Fig. 10: Field 2 - Greyscale image - processed data

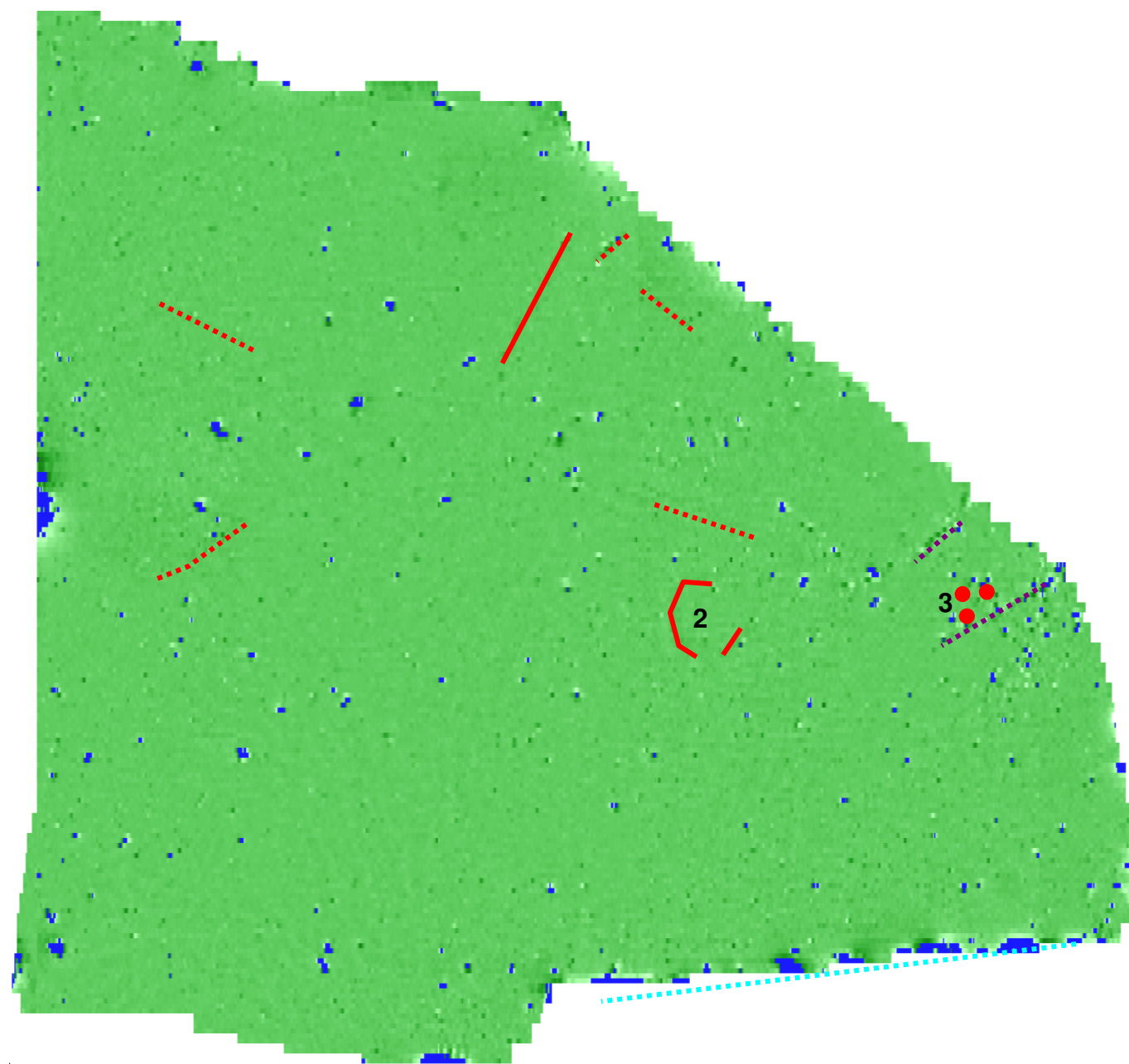


Fig. 11: Field 2 – Interpretation