

ARCHAEOLOGICAL GEOPHYSICAL SURVEY

PHASE 1, BICESTER GATEWAY OXFORDSHIRE

SITE CENTRED AT NGR 457320 221140

PCG REPORT CA/BG1 2016

REPORT PREPARED FOR

COTSWOLD ARCHAEOLOGY

ON BEHALF OF BLOOMBRIDGE LLP

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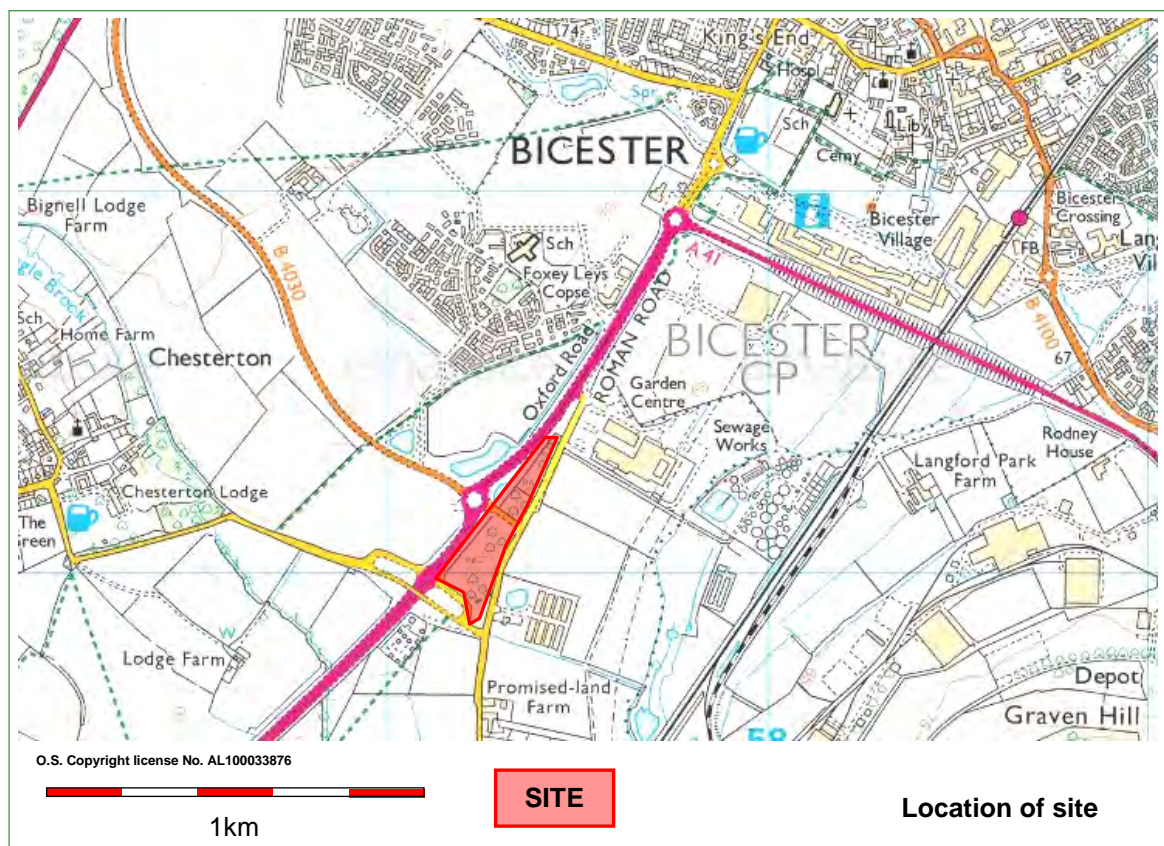
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Non technical summary

A fluxgate gradiometer survey of Phase 1, Bicester Gateway, Oxfordshire has identified traces of archaeological remains in the south-eastern part of the site in the form of short ditches and pits also including a possible site of industrial activity. Elsewhere, the majority of the site appears to be relatively clear of geophysical indicators of further remains, with a possible isolated curvilinear ditch recorded in the northern region

The survey recorded limited traces of likely ridge and furrow in the mid and southern region.



1.0 Introduction

Acting Bloombridge LLP, Cotswold Archaeology commissioned a fluxgate gradiometer survey of land at Bicester Gateway, Oxfordshire. The site is the westernmost component (Phase 1) of a proposed business park allocated by Policy Bicester 10 of the Cherwell Local Plan.

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 the Heritage Desk-Based Assessment of the proposed development and surrounding area under preparation by Cotswold Archaeology (2016). It also adheres to a Method Statement for geophysical survey prepared by Pre Construct Geophysics (PCG) (Bunn, 2016).

2.0 Location and description (Figs. 1 & 2)

The c.5ha site lies approximately 1km south of Bicester, to the east of Oxford Road and its junction with the B4030 (Vendee Drive). It encompasses a triangular parcel of uncultivated land, separated into two areas by a road linking the junction of Oxford Road and the B4030 to Wendlebury Road, which extends along the eastern edge of the site.

Areas of dense vegetation prevented safe and effective survey in the southern, north-eastern regions of Area 1 and the northern tip of Area 2.

CNCR 457320 221140.

3.0 Geology and topography

Solid geology is Kellaways Sand Member, comprising sandstone and siltstone in the southern region and mudstone to the north – sedimentary bedrock 161 to 165 million years ago during the Jurassic Period in a local environment previously dominated by shallow seas (British Geological Survey, 2016).

Superficial geology predominately comprises River Terrace sand and gravel, with a narrow c.north-west to south-east aligned band of alluvium extending cross the northern area. These were formed up to 2 million years ago during the Quaternary Period in a local environment dominated by rivers.

The site is generally level and situated at a height of c.65m AOD.

4.0 Archaeological Context

Extract from a Heritage Desk-Based Assessment under preparation by Cotswold Archaeology (Taylor, 2016)

The majority of recorded heritage assets within the surroundings of the Site comprise late Iron Age and Roman remains, and the assessment of available data has therefore indicated that there is high potential for the survival of remains of late Iron Age and Roman date within both Phase 1 and Phase 2 of the Site, due to its location adjacent to the Roman Town of Alchester and major Roman roads. As the Site lies outside existing and former settlements it is probable that it formed part of a wider agricultural hinterland during the Roman and medieval periods.

The closest of these to the current site include:

- Northern extents of the Roman town Alchester (Scheduled Monument 1006365) approximately 150m to the south-east of the site;

- Iron Age and Romano-British settlement remains to the immediate south and west of the site (Oxfordshire Heritage and Environment Records OHER) 5438 & 5564;
- Prehistoric/Romano-British settlement remains to the immediate west of the northern part of the site (Archives Monuments Information England (AMIE) Ref. 1381175);
- A section of Alchester - Towcester Roman Road that lies to the immediate east (HER Ref. 23967), with a cropmark conceivably indicative of an original part of the road to the east of the modern road.

LiDAR imagery indicates the remains c.north-west to south-east aligned ridge and furrow extending across all of Area 1 (Taylor, 2016).

5.0 Methodology

The survey methodology is based on guidelines set out in the documents '*Geophysical Survey in Archaeological Field Evaluation*' (English Heritage. 2008) and '*Standard and Guidance for Archaeological Geophysical Survey*' (Chartered Institute for Archaeologists, 2014). A method statement

5.1 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).

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 via a data logger.

5.2 The survey was undertaken on 8th September 2016. The zigzag traverse methodology was employed, with readings taken at 0.25m intervals along 1.0m wide traverses.

The survey grid was established by Global Positioning Satellite using a Leica GS015 RTX, to an accuracy of +/- 0.1m.

The data were processed by the author using *Terrasurveyor V3*.

The raw data are presented as greyscale images on Fig. 4 (clipped to +/-10nT to enhance resolution).

A '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 were clipped to +/- 20nT on the trace plots (Fig. 5) and +/-3nT on the greyscale images of the processed data (Fig. 2).

Anomalies in excess of +/-10nT are highlighted pink and blue on the interpretive figure (Fig. 3). These are characterised magnetically as dipolar 'iron spikes', often displaying strong positive and/or negative responses, which reflect ferrous-rich objects (particularly apparent on stacked trace plots). Examples include those forming/deposited along current or former boundaries (e.g. wire fencing), services and random scatters of horseshoes, ploughshares etc across open areas. Fired (ferro-enhanced) material, such as brick/tile fragments (often where the latter are introduced during manuring or land drain construction) usually induce a similar though predominately weaker response, closer to c+/-5nT (highlighted in pink/blue on the interpretive image). Collectively, concentrations of such anomalies typically indicate probable rubble spreads, such as backfilled ponds/ditches and demolished buildings. On a cautionary note, fired clay associated with early activity has the same magnetic characteristics as

modern brick/tile rubble. As such, the interpretation of such variation must consider the context in which it occurs.

It should be noted that this technique only records magnetic variation (relative to natural background levels). As such, the magnetic response of archaeological remains will vary according to geology/pedology. Additionally, remains may be buried beyond the effective 1 - 2m range of the instrumentation.

6.0 Results and discussion (Figs. 2 – 5)

The survey recorded an array of probable ditches and pits adjacent to the mid-eastern boundary of Area 1, to the immediate west of Wendlebury Road (Fig. 3: red lines). A small group of relatively strong magnetic responses at the northern edge of this group conceivably reflect some form of industrial activity (hatched red/annotated). Conceivably, these date from at the least the Iron Age/Romano-British Periods, given the close proximity to similarly-dated settlement remains that were exposed during excavations of land to the immediate south/south-west (Cotswold Archaeology 2016). Unfortunately, dense vegetation prevented survey of the southernmost part of the field. It also seems likely that the construction of the modern Wendlebury Road and (possibly) earlier road will have partially/wholly eradicated traces of any continuation of occupation remains to the immediate east of the site boundary.

Elsewhere, (for the most part over the same geology) there is minimal geophysical evidence of further potential pits and ditches, although an isolated curvilinear anomaly recorded in the mid-southern part of Area 2 exhibits some potential as buried ditch.

The survey registered slight traces of former ridge and furrow cultivation in Area 1 (dotted orange lines). Its minimal resolution in the final 'destriped' processed data (Fig. 2) is largely the result of its shared alignment with the survey traverse direction. It should be noted that the cultivation does not appear to significantly mask/truncate underlying features, thus reinforcing the relative absence of archaeological remains across the surveyed area.

For the most part, a west-north-west to east-south-east linear array of anomalies in the central part of Area 2 almost certainly relate to a recently removed field boundary (*ibid*, yellow line).

Elsewhere, stronger responses (pink and blue) include those induced by a relatively widespread zone of likely modern debris in the south-east corner of Area 2 (partially buried heavy duty polythene was visible on the surface) and the site of a recent bonfire in the mid northern part of the field (both annotated on Fig. 3).

More isolated examples probably signify iron objects (ploughshares, horseshoes, etc) or fragments of brick and tile, all contained within the ploughsoil.

The described anomalies were recorded against a backdrop of predominately uniform natural geology (greenscale).

7.0 Conclusions

The survey has successfully identified linear and discrete anomalies in the south-eastern part of the site that exhibit potential as archaeological remains in the form of short ditches and pits also including a possible site of industrial activity. These probably date from at least the prehistoric period, situated in close proximity to known Iron Age and Romano-British settlement remains. Elsewhere, the majority of the site appears to be relatively clear of geophysical indicators of further remains, with a possible isolated curvilinear ditch recorded in the northern region. However, it seems likely that traces of archaeological features might survive at the southern edge of the site that was not surveyed due to the presence of dense vegetation.

The survey recorded limited traces of likely ridge and furrow in the mid and southern region.

8.0 Dissemination and archiving

A .PDF copy of the report will be submitted to Oxfordshire HER and to the OASIS database (within 6 months of completion of the project).

PCG will retain an archive of all data generated by the project.

9.0 Acknowledgements

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

10.0 References

British Geological Survey. 2016. Geology of Britain viewer, 1:50,000 geological mapping, bedrock and superficial - <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> (accessed June 2016)

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Fig. 2: Greyscale images of processed data

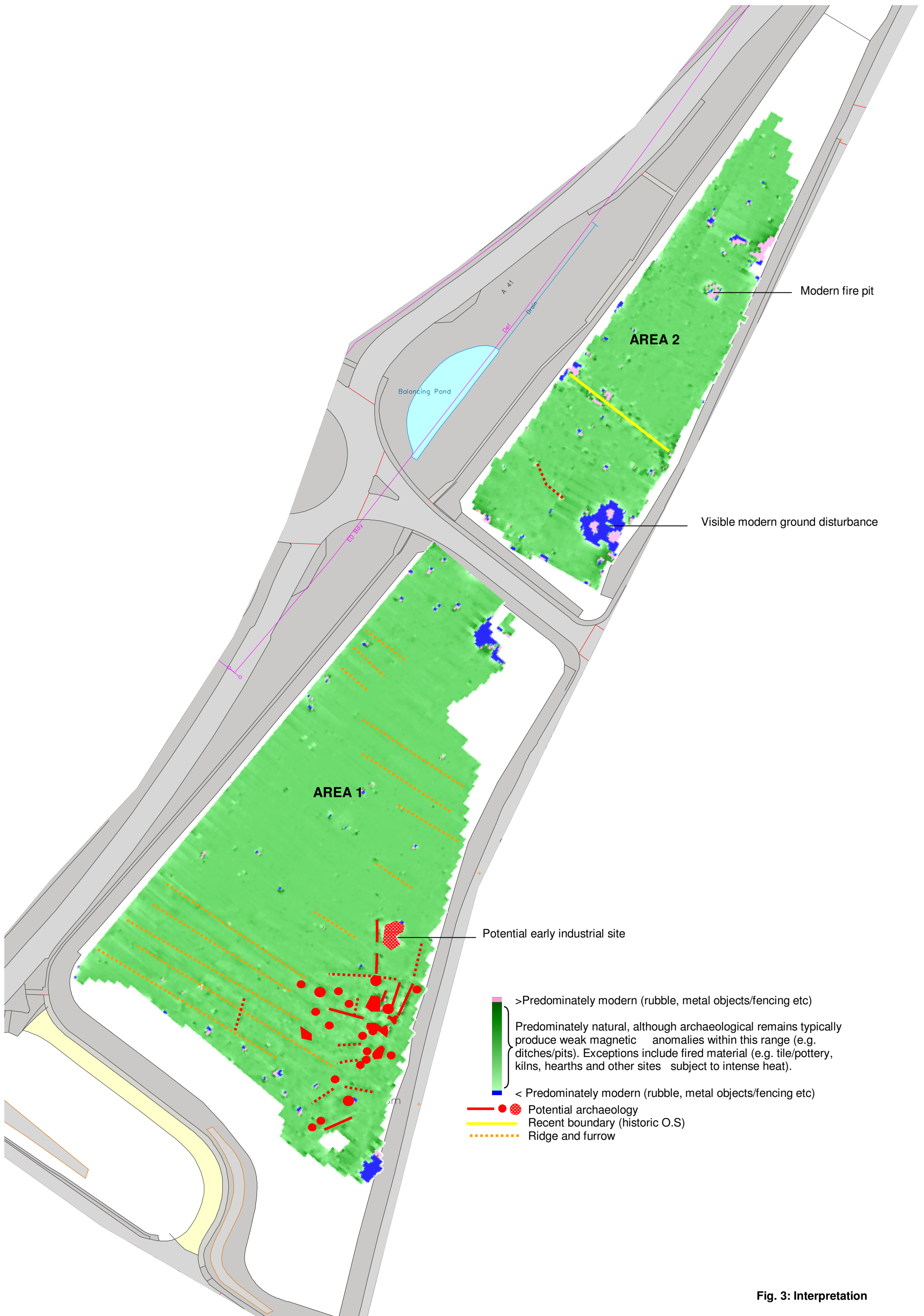


Fig. 3: Interpretation

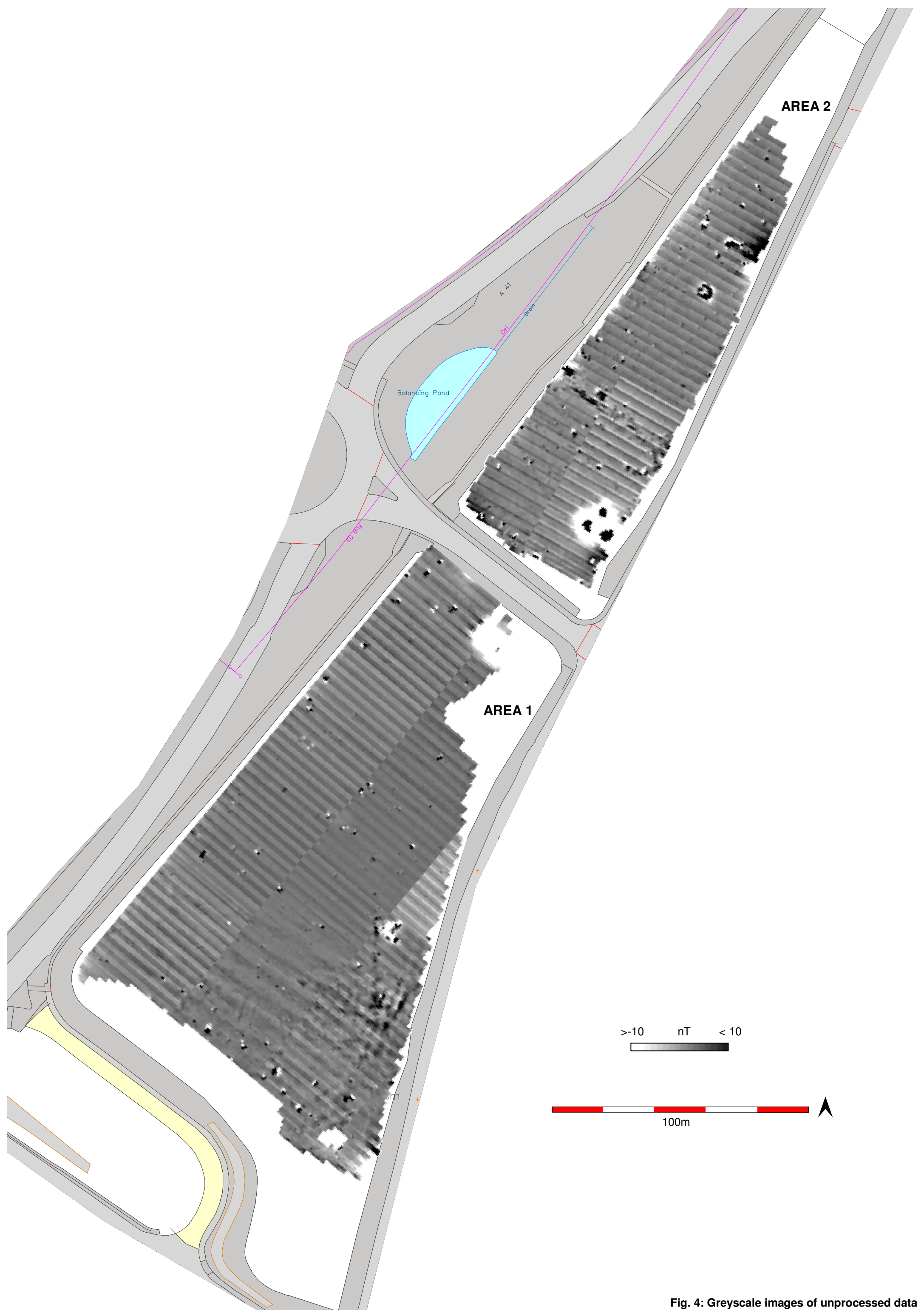


Fig. 4: Greyscale images of unprocessed data

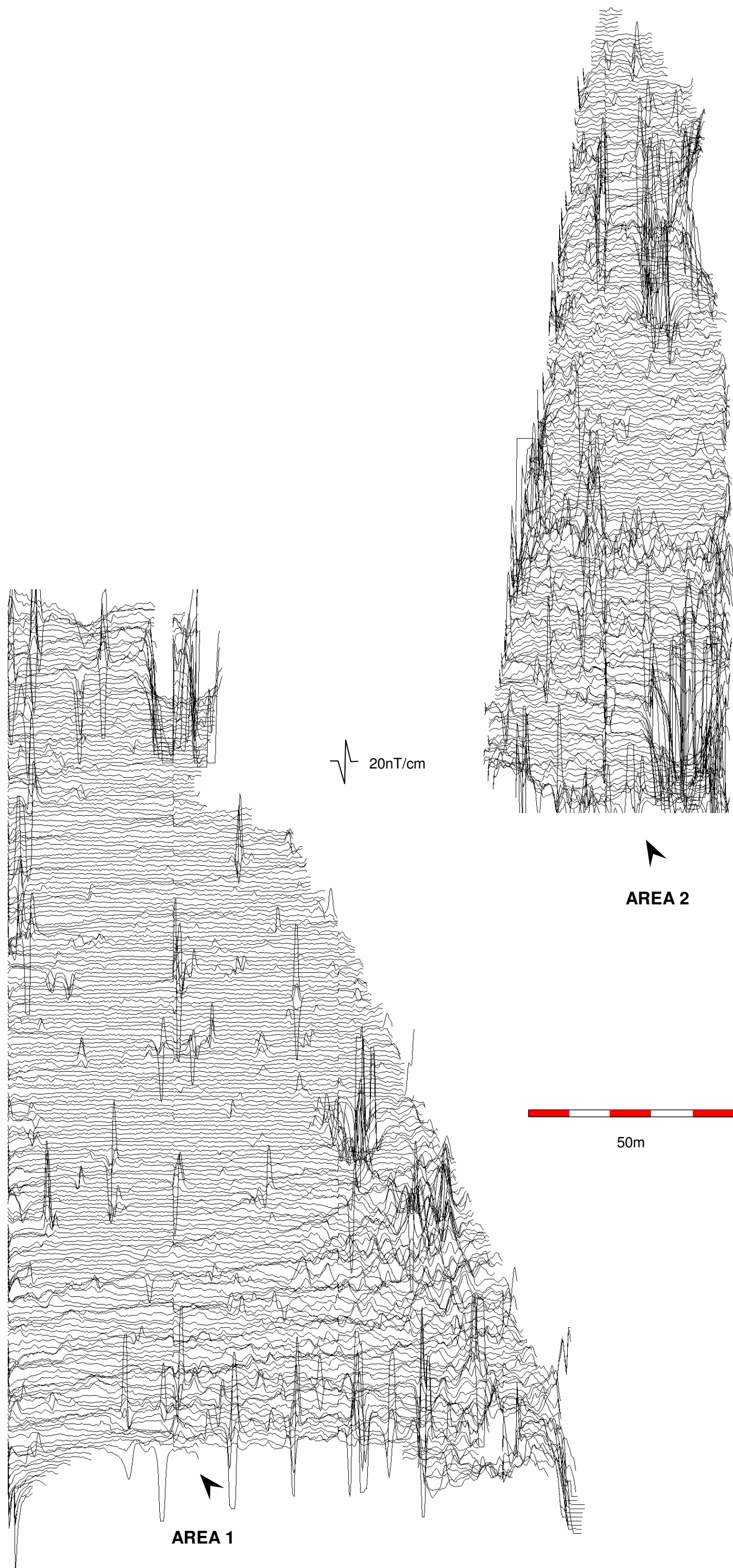


Fig. 5: Trace plot images