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ARCHAEOLOGICAL GEOPHYSICAL SURVEY

CLIFTON WEST, NOTTINGHAM

CENTRED AT NGR SK 53976 34399

PCG PROJECT CW/2017

OASIS PROJECT ID: preconst2-276176

REPORT PREPARED FOR
LOCUS CONSULTING
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FEBRUARY 2017

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Non-technical summary

- *A fluxgate gradiometer survey undertaken on land at Clifton, Nottingham has recorded limited geophysical evidence of potential archaeological remains in the form of two ditch-type linear responses in the northern part of the site.*

- *Modern responses include those induced by buried services, land drains, tennis court hardstanding and a recently removed track that extends towards a backfilled pond or quarry.*

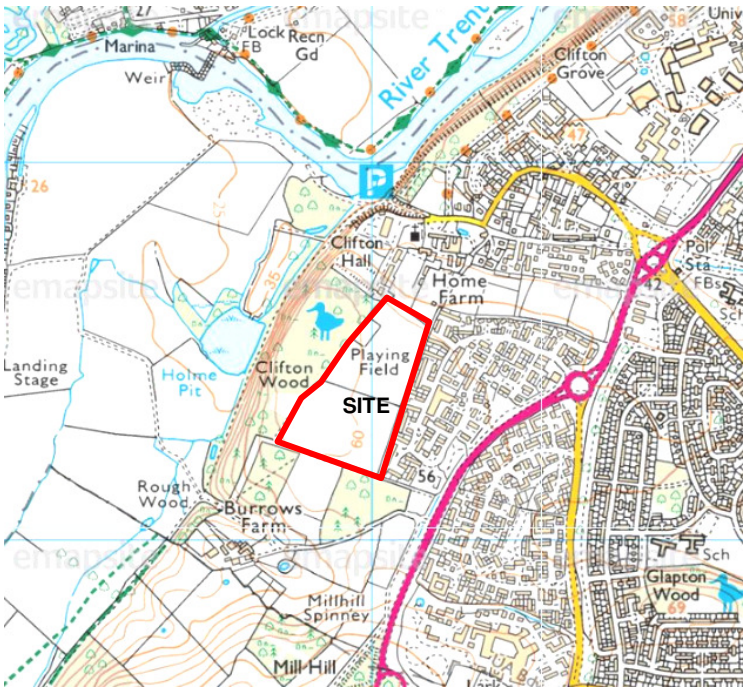

Fig. 1 Location of site

1.0 Introduction

Locus Consulting commissioned a fluxgate gradiometer survey of land at Clifton, Nottingham. The site, *Clifton West*, is proposed for residential development.

This survey was undertaken to establish the presence/absence of magnetically anomalous archaeological features and, if recorded, define their extent and, where possible, the nature of such anomalies.

2.0 Location and description (Figs. 1 – 2)

The site, which lies to the immediate west of Clifton, encompasses two sub rectangular pasture fields (PCG designated F1 & F2). It is bordered to the east by residential developments, to the west by Clifton Wood and to the north and south by a mix of open land and woodland. The northern part of the site (F1) has recently been utilised as a sports field, with a derelict unfenced tennis courts adjacent to the western boundary. A small number of trees lie close to the northern boundary.

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3.0 Geology and topography

The solid geology of the site comprises mudstone (Edwalton Member) - sedimentary Bedrock formed approximately 217 to 229 million years ago during the Triassic Period in a local environment previously dominated by hot deserts (BGS, 2017). Superficial deposits are not recorded.

The site is generally level and situated at a height of c.60m AOD.

The magnetic response of archaeological remains within mudstone is variable.

4.0 Archaeological context (*Pers comm*, T Linington, Locus Consulting)

Potentially relevant known archaeological assets in proximity to the site include:

- Iron Age/Romano-British field systems at Grove Farm (MNU885), finds of prehistoric date recovered during field walking in Clifton in advance of the A453 widening (MNU665), a multi-phase site, dating from the Late Iron Age to 3rd century AD during excavation for the A453 widening scheme (MNU717) and evidence of Later Prehistoric/Romano-British enclosures revealed during a gradiometer survey for the NET2 Clifton Terminus Park & Ride (MNU718). The findings of the gradiometer survey have since been confirmed by excavation (MNU729);

- Evidence of Roman activity, including a Roman-British field system recorded at Grove Farm (MNU884, MNU885, ENU599, ENU713), rural Romano-British farmstead remains recorded during the widening of the A453 (ENU665, ENU717) and the possible infilling of early features during Romano-British period recorded during the Clifton Terminus works (ENU718, ENU729);

- Undated earthworks are situated to the south of the Site (ENU879). These earthworks consist of several round and sub rounded crop marks visible on an aerial photograph from 1948 which are typically measures ca. 20m by ca. 15m, the largest measuring ca. 50m by 38m;

- A further undated cropmark is recorded ca. 340m southeast of the Site (MNU880), evidence of a possible rectangular enclosure, which was investigated by geophysical survey and excavation, though no dating evidence was recovered;

- Two programs of geophysical investigation have been conducted within the search area, the first on the Clifton Village Green (ENU667), which identified potential buried

structural remains and the second at Grove Farm (ENU682) which identified possible ditches and pits.

5.0 Methodology

The survey methodology used follows guidelines set out in *'Geophysical Survey in Archaeological Field Evaluation'* (English Heritage. 2008) and '*Standard and Guidance for Archaeological Geophysical Survey'* (Chartered Institute for Archaeologists, 2014).

A site specific Method Statement was produced by PCG and approved by Mr Scott Lomax, Acting City Archaeologist for Nottingham City Council (Bunn, 2017).

5.1 Fluxgate Gradiometry is a non-intrusive scientific prospecting tool, used to determine the presence/absence of some classes of sub-surface archaeological remains (e.g. pits, ditches, kilns, and occasionally stone walls).

Gradiometry is used to establish the presence/absence of buried magnetic anomalies, which can indicate sub-surface archaeological features, and may therefore form a basis for subsequent archaeological trenching, where required.

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 using a data logger.

This technique only records magnetic variation in relation to natural background levels, established by careful selection of magnetically 'quiet' zones where instrument sensors are calibrated to 0nT. As such, the magnetic response of archaeological remains will vary according to geology/pedology, with a possibility that buried features could remain undetected should their magnetic susceptibility closely match that of the surrounding soils. Additionally, some remains may be buried beyond the effective 1m - 2m range of the instrumentation; for example beneath alluvium. Back-filled shallow pits or ditches might also exhibit minimal variation.

5.2 The survey was undertaken on the 8th & 9th February 2017. The zigzag traverse method of survey was used, with readings taken at 0.25m intervals along 1.0m wide traverses.

The survey grid was established by Global Positioning Satellite using a Leica GS08 RTK, with an accuracy of +/- 0.1m. Data were processed using *Terrasurveyor V3*, and raw data are presented 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 image (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 interpretive images). Collectively, concentrations of such anomalies 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.

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6.0 Results and discussion (Figs. 2 - 5)

Two linear anomalies in the northern part of F1 exhibit some potential as buried ditches, of possible archaeological origin (red lines). However, a more recent agricultural origin should not be discounted, such as unmapped former boundaries, with the E-W aligned example appearing to extend from the north-east corner of the former tennis courts.

The survey recorded geophysical evidence of traces of current or recent features/activity. These include *in situ* remains of a track and quarry pit in the northern part of F1, as depicted on historic O.S. Maps (Fig. 3: highlighted yellow, see also inset: O.S. dated 1966). Other (linear) responses that were recorded in F1 are considered to be of likely modern origin, comprising possible land drains (albeit magnetically ill-defined: dotted purple lines), with clearly-defined land drains in the south-western part of the field and an isolated potential cultivation mark in the mid-southern region (purple & orange lines, respectively).

Stronger dipolar variation (pink and blue) was induced by buried services (blue lines), *in situ* remains of goal posts (**EP** - visible on Google Earth timeline), tennis court hardstanding, with scatters of such responses across both fields probably indicative of modern near surface ferrous-rich debris.

The discussed anomalies were recorded against a backdrop of predominately uniform natural geology (greenscale). More distinct zones of likely natural magnetic enhancement are broadly defined by dotted green lines).

7.0 Conclusions

The survey has recorded limited geophysical evidence of potential archaeological remains in the form of two ditch-type linear responses in the northern part of the site.

Modern responses include those induced by buried services, land drains, tennis court hardstanding and a recently removed track that extends towards a backfilled pond or quarry. With the exception of some of the buried services all were recorded in the northern half of the site.

8.0 Acknowledgements

Pre-construct Geophysics would like to thank Locus Consulting for this commission.

9.0 References

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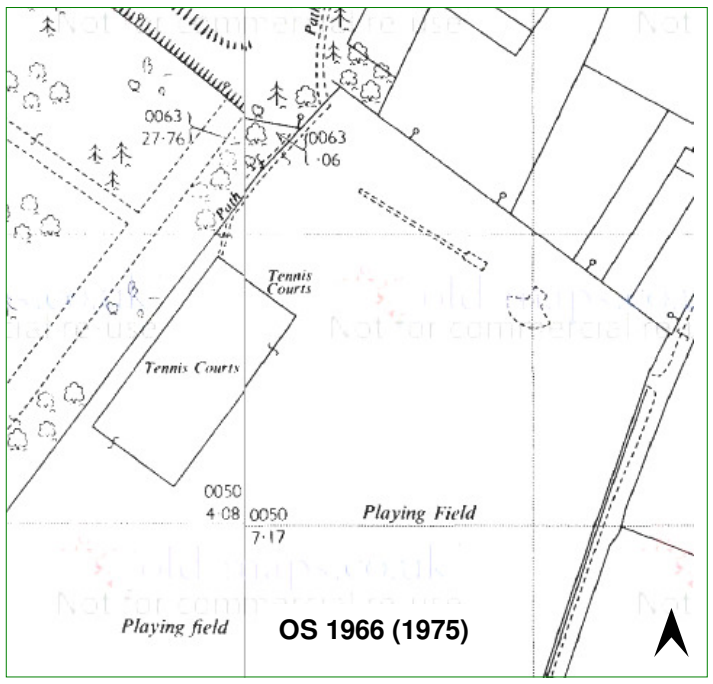
English Heritage. 2008 *Geophysical Survey in Archaeological Field Evaluation*. London, English Heritage.

[1]http://www.old-maps.co.uk/maps.html



>-3 nT < 3

100m

SITE BOUNDARY

Clifton Wood

F1

F2

Track

Fig. 2: Greyscale images of processed data

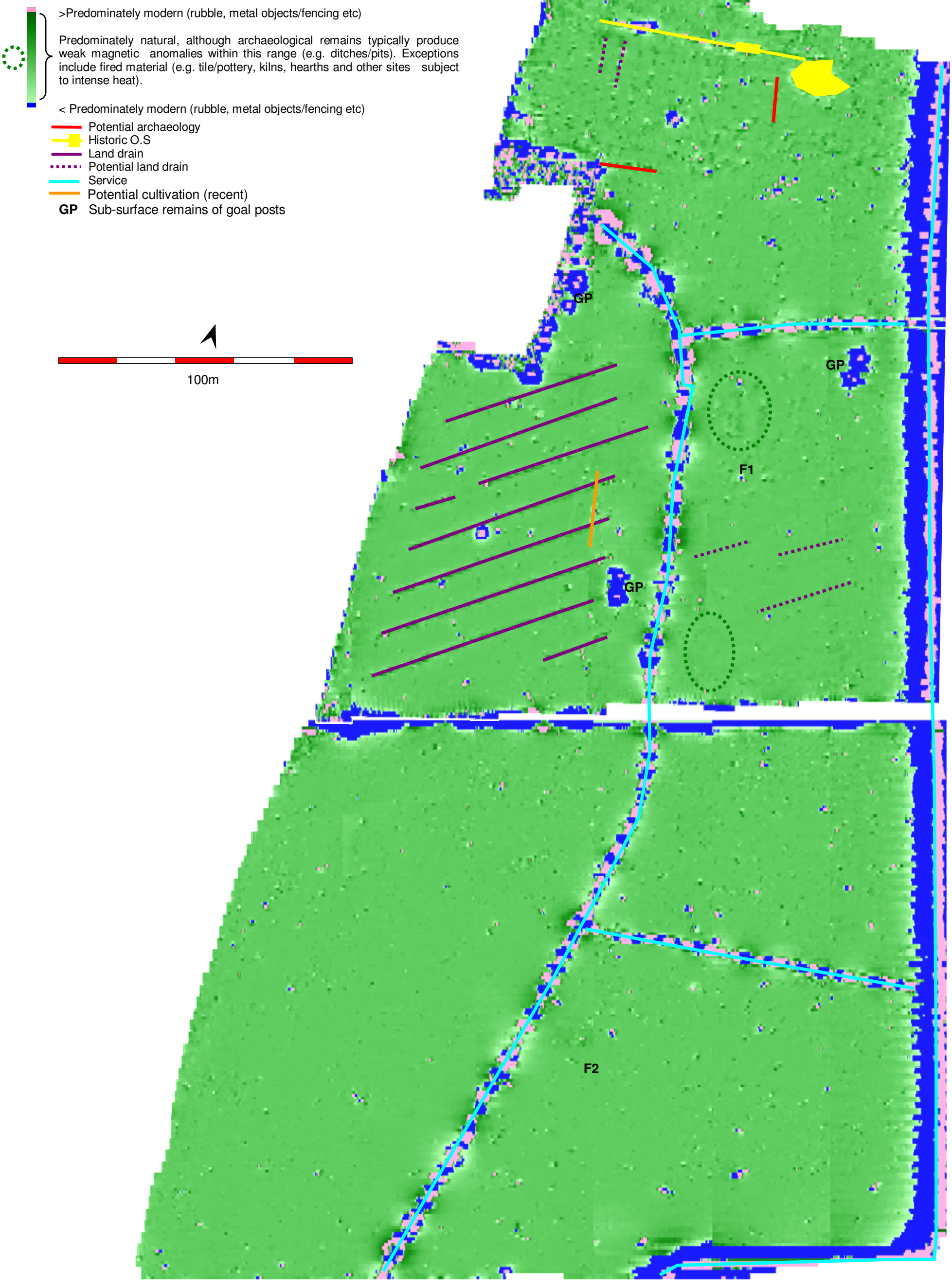


Fig. 3: Interpretation

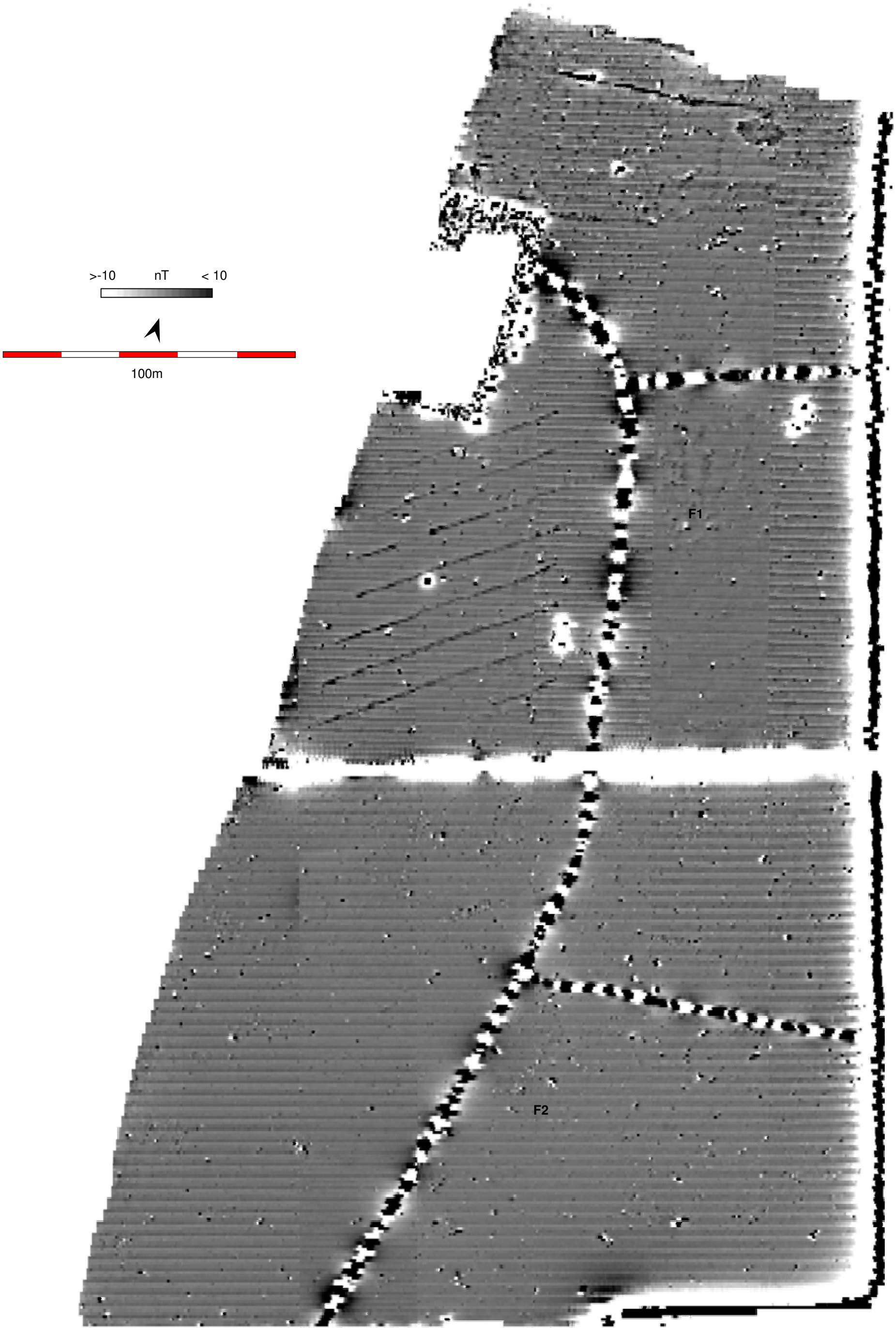


Fig. 4: Greyscale images of processed data

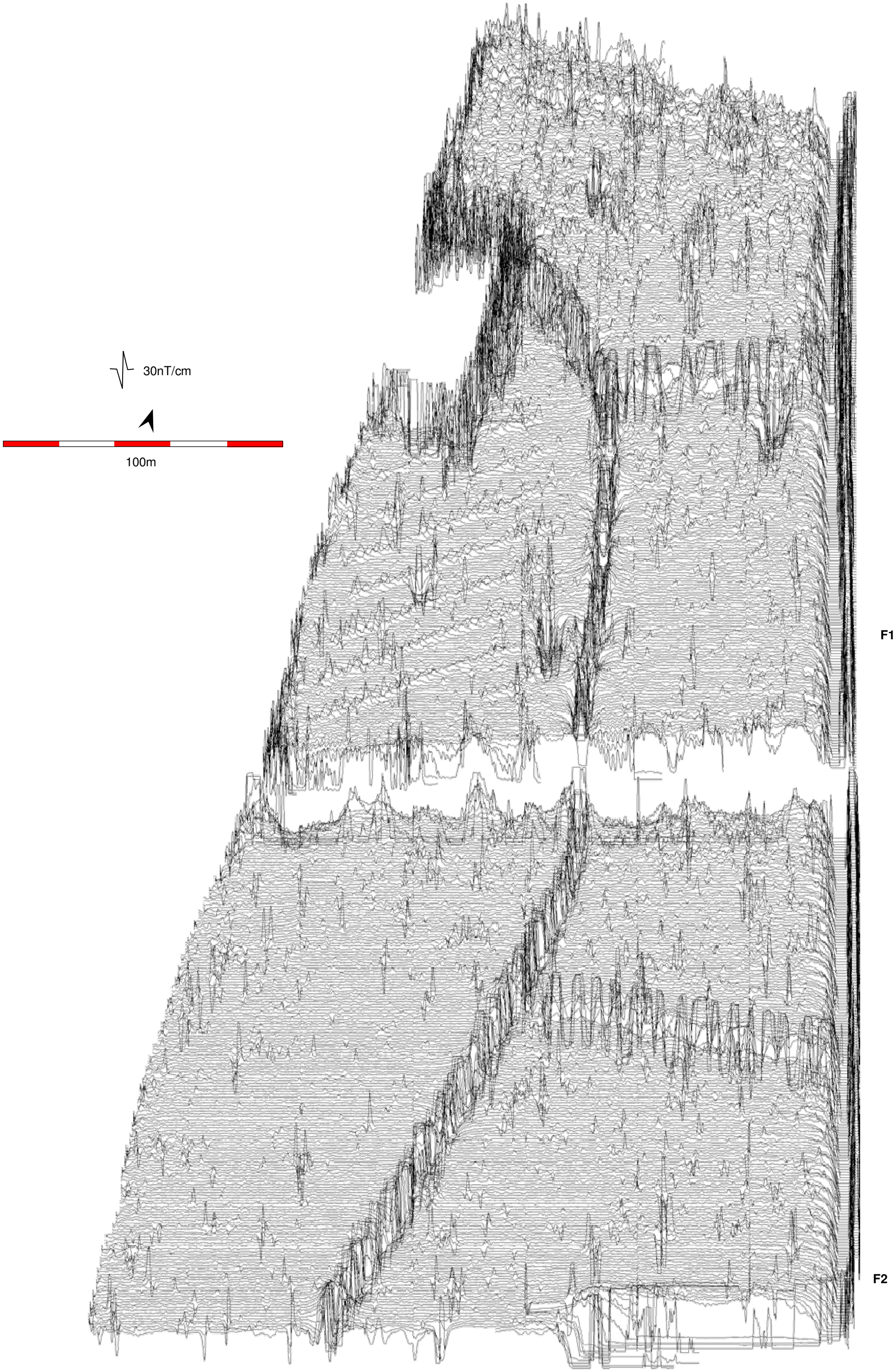


Fig. 5: Trace plot images