pre-construct geophysics

archaeological surveys

GEOPHYSICAL (GRADIOMETER) SURVEY

LAND OFF REBECCA ROAD, PERSHORE, WORCESTERSHIRE

CENTRED AT SO 93650 46350

REPORT PREPARED BY DAVID BUNN

ON BEHALF OF MARRONS LTD AND ITSCLIENTS LIONCOURT HOMES LTD & TOUCH DEVELOPMENTS LTD

SEPTEMBER 2024

Contents

Illustrations

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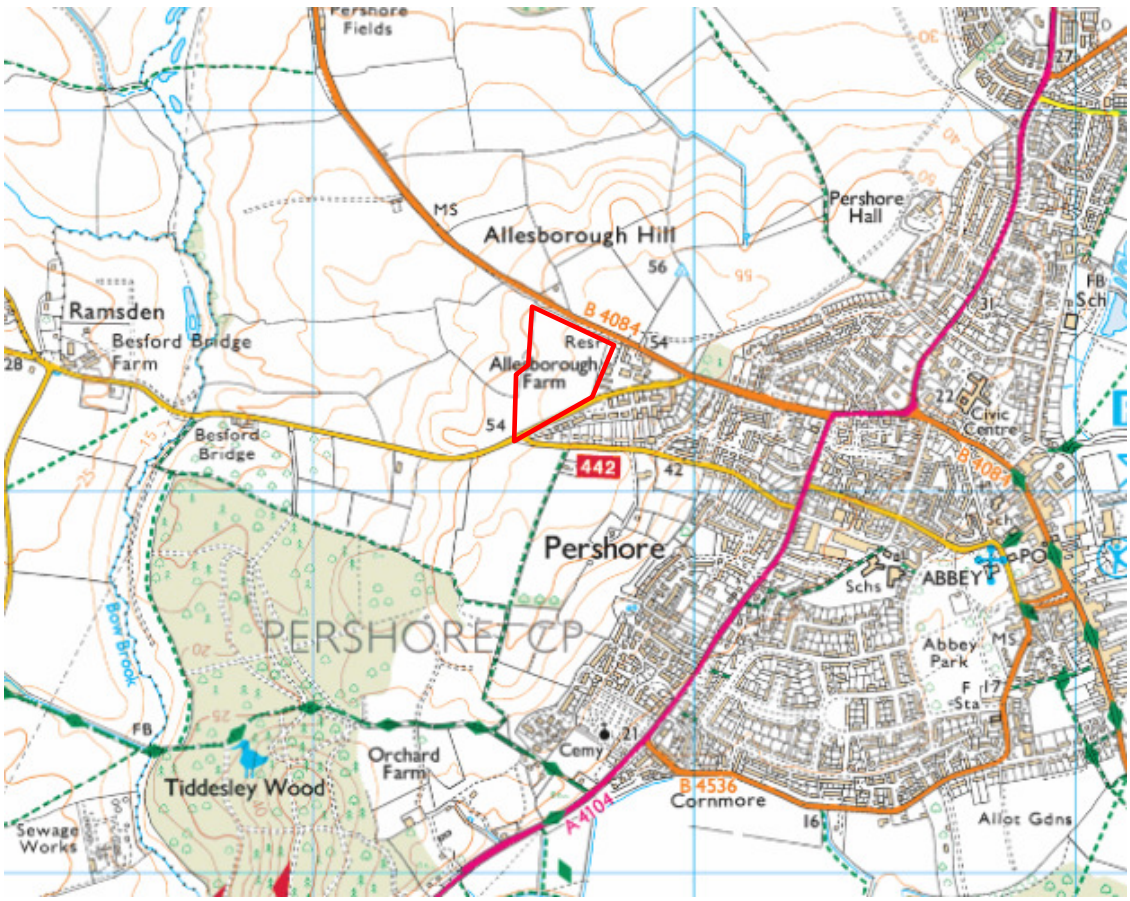
Non technical summary

- *A fluxgate gradiometer survey undertaken on land off Rebecca Road, Pershore, Worcestershire has not identified magnetic variation that can be confidently attributed to buried archaeological remains. With that in mind, an archaeological origin for a limited number of discrete anomalies as buried pits/burnt material ditches cannot be discounted.*

- *For the most part, strongest variation relates to modern or recent occupation, including ferrous-rich debris contained within a former pond in the mid north-eastern region and along a relict field boundary in the south-west corner. Probable spreads of imported modern debris were also recorded, with strong readings also registered in close proximity to sections of current boundaries.*

- *With reference to the survey results, it is concluded that there is a limited potential for archaeological remains to lie within the site.*



Location of site
(1:25000)

1.0 Introduction

Acting for Lioncourt Homes Ltd & Touch Developments Ltd, Marrons Ltd commissioned a geophysical survey of land to the north of Rebecca Road, Pershore, Worcestershire (centred at NGR SO 93650 46350).

The objective of the geophysical survey is to provide information relating to potential archaeological resources within the site.

This document references information contained within a Heritage Assessment (including Archaeological Desk-Based Assessment) that has been prepared by Marrons Ltd (Linington, 2024).

2.0 Site Description (Fig. 1)

The site lies immediately adjacent to the western edge of the town of Pershore, which is situated located approximately 10km west of Evesham and 12km east of Worcester.

It encompasses a single arable agricultural field that is bounded to the south by Rebecca Road, to the north by the B4084; to the east by two small reservoirs and a recently constructed residential development; to the west by further arable land.

3.0 Geology and topography

The solid geology across the site comprises Charmouth Mudstone - sedimentary bedrock formed between 199.3 and 182.7 million years ago during the Jurassic period (BGS, 2024).

Superficial deposits are largely unrecorded, other than a small area of Pershore Sand and Gravel in the south-eastern region This sedimentary deposit was formed between 2.588 million and 11.8 thousand years ago during the Quaternary period.

The effectiveness of magnetic prospection over mudstone is average (English Heritage, 2008).

The site is generally level, situated at a height of approximately 54m AOD.

4.0 Archaeological Context

Extract of the summary of the Heritage/Desk-Based Assessment (Linington, 2024).

Overall, there is a moderate potential to impact upon remains of up to a regional level of archaeological interest.

If encountered, remains of local level to regional archaeological interest are most likely to be associated with stray finds Early Prehistoric date, settlement and/or farming activity of Iron Age and Roman date, and with Medieval and later agricultural land management and farming practices.

5.0 Methodology

The survey methodology is based on heritage industry guidance and best practice advice, including the *EAC Guidelines for the use of Geophysics in Archaeology* (Schmidt et al. 2016), and the '*Standard and Guidance for Archaeological Geophysical Survey'* (Chartered Institute for Archaeologists, 2014).

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.

It should be noted that 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.

The fieldwork was undertaken on the 28th August 2024.

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 CS15 RTK (with Leica SmartWorx Viva software) to an accuracy of +/- 0.1m.

The data were processed using *Terrasurveyor V3*.

The raw data sets are reproduced as greyscale image on Fig. 2 (data clipped to +/-20nT).
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 +/-4nT on the greyscale images of the processed data (Fig. 4).

Anomalies in excess of +/-10nT are highlighted pink and blue on the interpretive figure (Fig. 5). 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.

The report will be submitted as a PDF.

A digital archive of the geophysical data and report will be retained by PCG.

6.0 Results and discussion (Figs. 2 – 5)

The survey recorded a small number of discrete anomalies that exhibit potential as possible pits, conceivably containing burnet materials (Fig. 5: red dots).

All strong, dipolar responses are considered to be associated with recent or modern occupation (pink and blue). This includes a recently backfilled pond in the mid north-western region (circled yellow) and a former boundary in the south-western corner (yellow line) - both of which are depicted on historic O.S Maps (Linington, 2024).

Likely spreads of imported near surface ferrous-rich materials (e.g. fragments of brick/tile) were registered to the east and north-east of the former pond, with strong responses also recorded along sections of current boundaries.

A seemingly random spread of more discrete examples (typically) signify miscellaneous objects contained within the plough soil, such as ploughshares, horseshoes and brick/tile rubble (imported within manure).

Discussed anomalies were recorded against a relatively neutral backdrop of natural variation.

7.0 Conclusions

The survey has not identified magnetic variation that can be confidently attributed to buried archaeological remains. With that in mind, an archaeological origin for a limited number of discrete anomalies as buried pits/burnt material ditches cannot be discounted.

For the most part, strongest variation relates to modern or recent occupation, including ferrous-rich debris contained within a former pond in the mid north-eastern region and along a relict field boundary in the south-west corner. Probable spreads of imported modern debris were also recorded, with strong readings also registered in close proximity to sections of current boundaries.

With reference to the survey results, it is concluded that there is a limited potential for archaeological remains to lie within the site.

8.0 Acknowledgements

Pre-Construct Geophysics Ltd. thanks Marrons Ltd for this commission.

9.0 References

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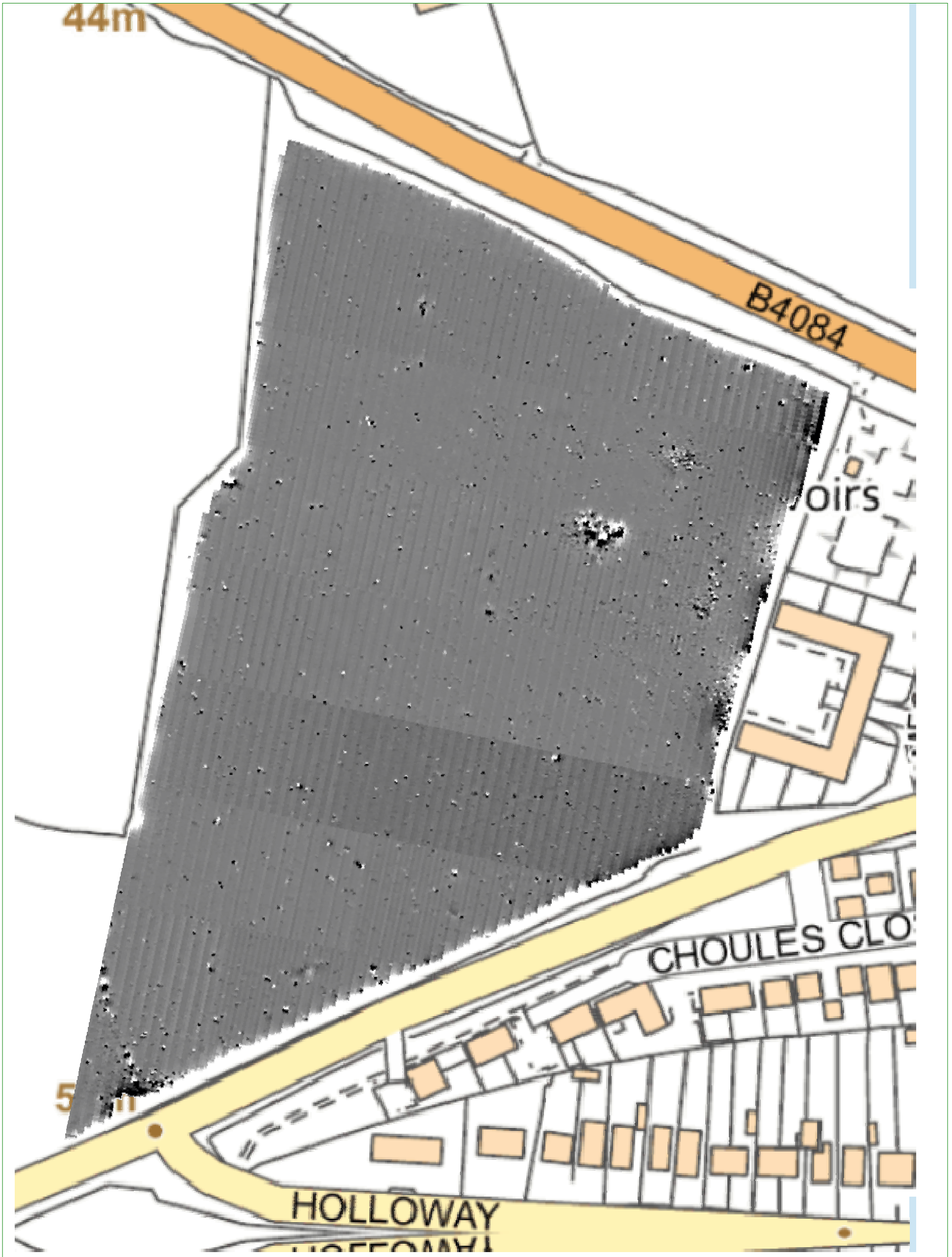

Fig. 2: Greyscale image of raw data

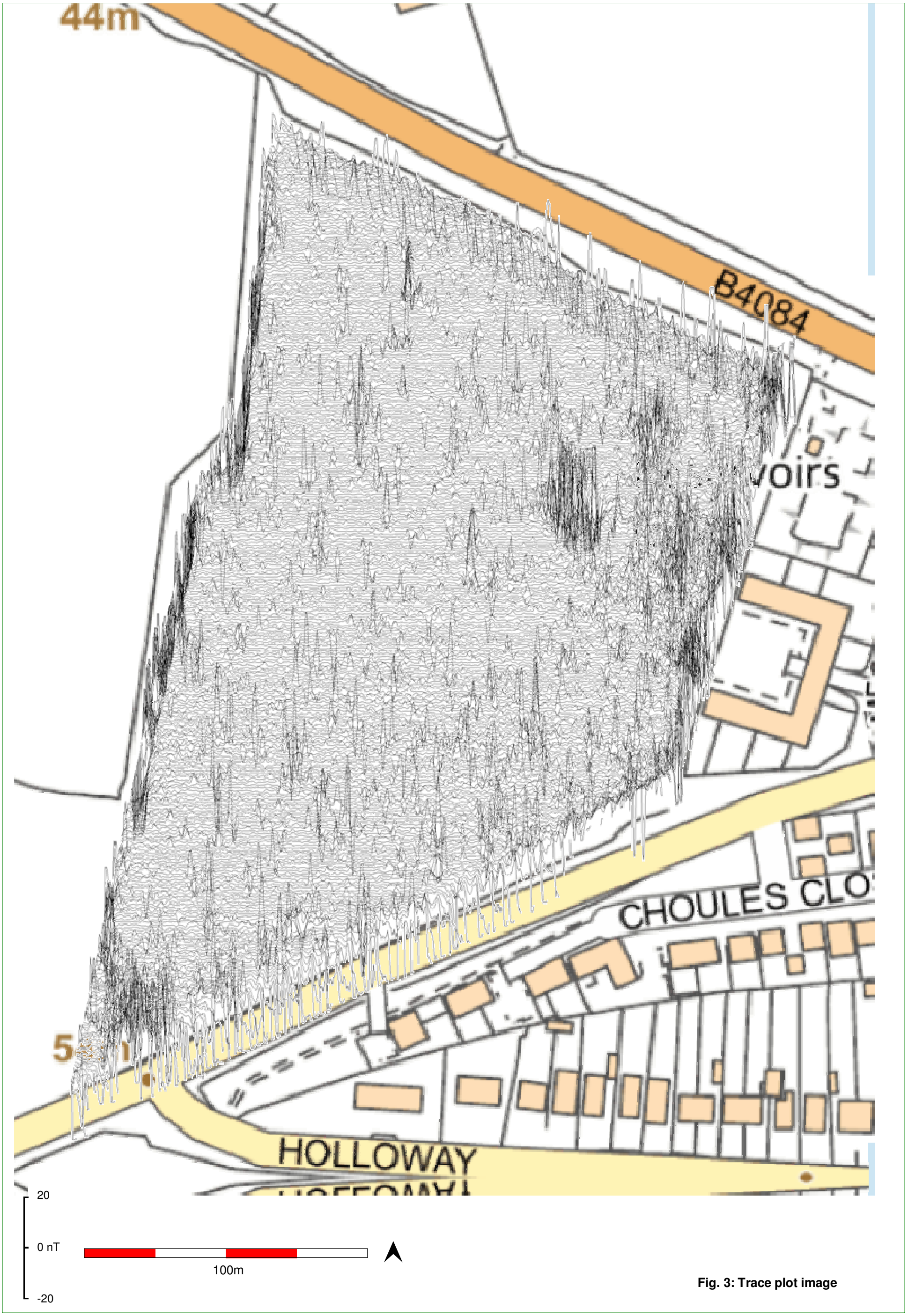

Fig. 3: Trace plot image

Fig. 2: Greyscale image of raw data

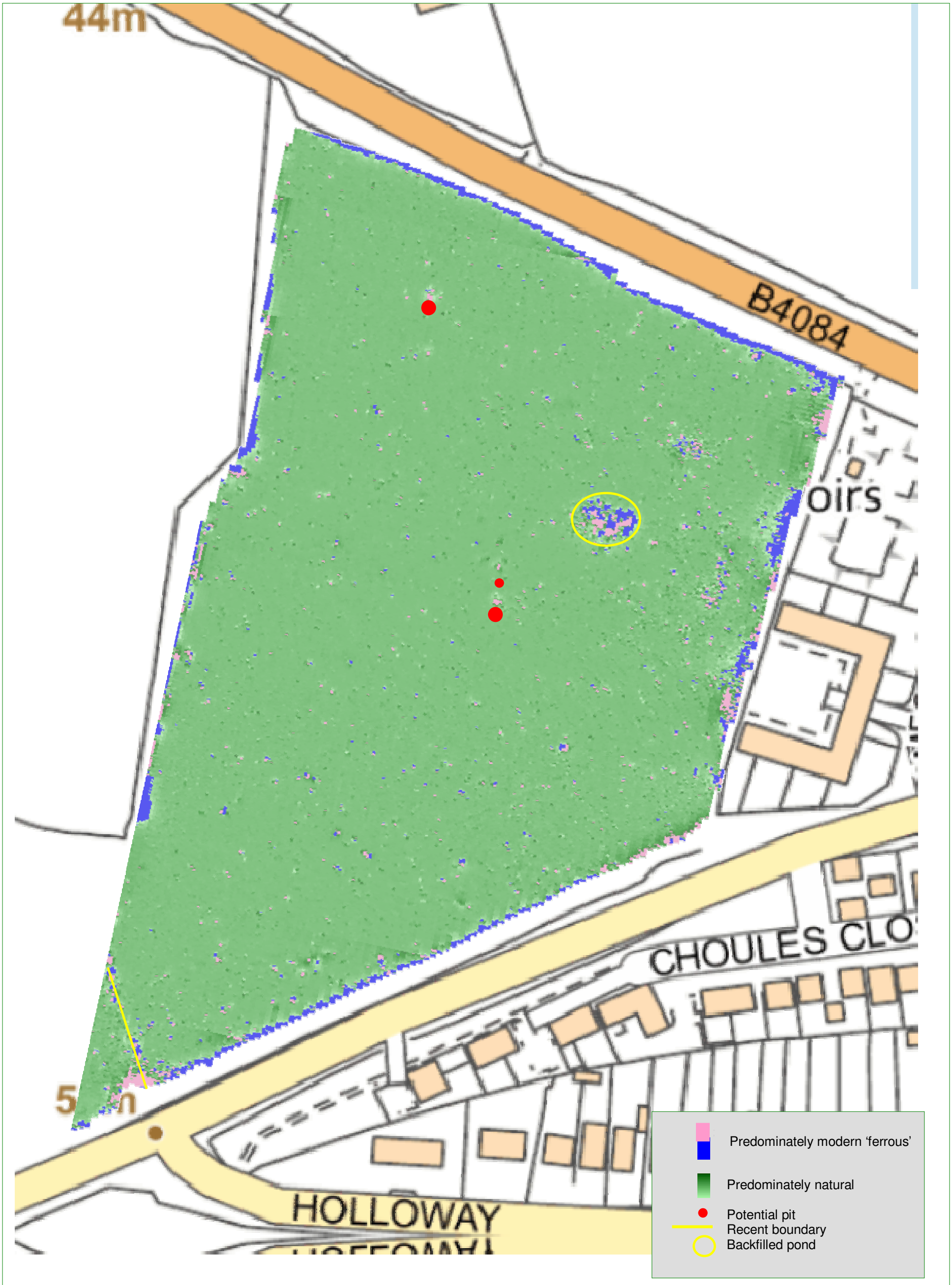

Fig. 5: Interpretation