ARCHAEOLOGICAL EVALUATION REPORT:

GEOPHYSICAL SURVEY BY MAGNETOMETRY ON LAND OFF PEARTREE HILL ROAD, WHAPLODE ST CATHERINE, LINCOLNSHIRE

Planning Reference: H23-0313-25
NGR: TF 3241 1727
AAL Site Code: WSCA 25
Museum Accession Code: LCNCC:2025.147
OASIS Reference Number: allenarc1-536571

Report prepared for Clarke Group Construction

By
Allen Archaeology Limited
Report Number AAL2025125

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Allenarchaeology

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Document Control

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Cover image: View from the southwest corner of the site looking east-northeast

Executive Summary

- Clarke Group Construction commissioned Allen Archaeology Ltd to undertake a geophysical survey using magnetometry on land off Peartree Hill Road, Whaplode St Catherine, Lincolnshire, prior to determination of a planning application for a new poultry unit and associated works.
- The site lies within an area of archaeological interest with potential Roman and medieval activity within the site. The Roman activity may represent both industrial and settlement activity, whilst the medieval activity is likely limited to field systems and agricultural practices.
- The survey has identified features likely relating to Roman salt making within the central part of the site and possible associated activity to the east and northeast of these features. There are also likely medieval dylings or drainage features.
- The survey has also identified a number of former intercutting streams and channels, typical of the local fenland environment.
- The evidence suggests a high archaeological potential for the proposed development area.

1.0 Introduction

1.1 Clarke Group Construction commissioned Allen Archaeology Ltd (AAL) to undertake a geophysical survey using magnetometry on land off Peartree Hill Road, Whaplode St Catherine, Lincolnshire, prior to determination of a planning application for a new poultry unit and associated works.

1.2 The site works and reporting conform to current national guidelines as set out in '*EAC Guidelines for the Use of Geophysics in Archaeology*' (EAC 2016), '*The Use of Geophysical Techniques in Archaeological Evaluations*' (Gaffney et al. 2002), the Chartered Institute for Archaeologists '*Standard and guidance for archaeological geophysical survey*' (CIfA 2020a), local guidelines set out in the *'Lincolnshire Archaeology Handbook'* (LCC 2024), and a WSI by this company (AAL 2025).

1.3 The documentation and records generated by the survey will be assembled in accordance with the national guidelines in *'Archaeological Archives: A guide to best practice in creation, compilation, transfer and* curation' (AAF 2011), the Chartered Institute for Archaeologists '*Standard and guidance for the creation, compilation,transfer and deposition of archaeological archives'* (CIfA 2020b), and the local guidelines set out in the *'Lincolnshire Archaeology Handbook'* (LCC 2024). The digital archive will be deposited with Archaeological Data Service (ADS) in York.

2.0 Site Location and Description

2.1 The proposed development site lies between Flag Lane and Peartree Hill Road approximately 3.2km south-southwest of Whaplode St Catherine, in the administrative district of South Holland, Lincolnshire. Whaplode St Catherine is situated c.9.4km east-southeast of Spalding and c.15.8km northwest of Wisbech. The site measures approximately 9.2 hectares and is centred at National Grid Reference (NGR) TF 3241 1727 and is c.2m above Ordnance Datum (Figure 1).

2.2 The bedrock geology comprises West Walton Formation mudstone and siltstone, with superficial geology of Tidal Flat deposits of clay and silt recorded (https://www.bgs.ac.uk/mapviewers/geoindex-onshore/). The response of geophysical survey to mudstone is poor but can be very variable and average to poor on alluvial clays and silts.

3.0 Planning Background

3.1 A planning application has been submitted for the *'Provision of a new poultry unit and associated works'* (H23-0313-25). The Historic Environment Officer advising South Holland District Council has recommended a programme of geophysical survey, followed by geoarchaeological assessment and trial trenching.

3.2 The approach adopted is consistent with the recommendations of the National Planning Policy Framework (NPPF), with the chapter of relevance being '*Section 16. Conserving and enhancing the historic environment'* (Ministry for Housing, Communities and Local Government 2025).

4.0 Archaeological and Historical Background

4.1 The site lies within a wider landscape of Romano-British to medieval activity.

4.2 The site lies within an area designated in Philips '*The Fenland in Roman Times'* as Settlement 3217 (Philips 1970) and is described as a compacted settlement with industrial site. Domestic debris of Romano-British date, including pottery sherds, bone and shell, have been recovered from within the site (Lincolnshire Historic Environment Record Monument Number (LHER) MLI20401). Within the southwest corner of the site pulverised baked clay, ash, baked clay trench lining and vessel fragments have all been recovered (LHER MLI20402), likely relating to salt-working. Material recovered from the site suggests occupation from at the least the early 2nd century AD through to the late 3rd and 4th centuries.

4.3 Approximately 200m to the east of the site an excavation in 1961 revealed evidence of two hut sites with postholes, querns, bone, shell and pottery sherds, dating to the Romano-British period (LHER MLI20392).

4.4 Aerial photography in December 1950 and March 1952 revealed cropmarks of ditched enclosures and droveways likely representing Romano-British settlement and salt-working (LHER MLI22147) within and around the site. These were partly obscured by later parallel drainage ditches of medieval date (LHER MLI22148).

4.5 A watching brief alongside Jekil's Bank and Fox Headings Lane (Rayner 2000) approximately 650m to the northeast of the site, revealed a poorly defined ditch with briquetage recovered from the subsoil, indicating salt-making was taking place during the Late Iron Age or Early Roman period within the area.

4.6 Approximately 350m north of the site is the location of a former Royal Observer Corps underground observation post (LHER MLI125198), opened in 1960 and closed in 1968.

5.0 Geophysical Survey Methodology

5.1 The geophysical survey consisted of a detailed gradiometer survey of as much of the development area as was suitable, extending to approximately 9ha. The survey was undertaken in a series of 30m grids across the site.

Summary of Survey Parameters

5.2 Fluxgate Magnetometer

Standard Survey Instrument:	Bartington Grad601-2 Dual Fluxgate Gradiometer
Sample Interval:	0.25m
Traverse Interval:	1.00m
Traverse Separation:	1.00m
Traverse Method:	Zigzag
Resolution:	0.01nT
Processing Software:	Terrasurveyor 4.1.14.7
Surface Conditions:	Pasture
Area Surveyed:	9.01 hectares
Date Surveyed:	Monday 18th to Wednesday 20th August 2025

Surveyors:	Robert Evershed BSc (Hons)
Data Interpretation:	Robert Evershed BSc (Hons)

Data Collection and Processing

5.3 The grids were marked out using pre-programmed grids on a GNSS rover. Magnetic data was collected on a north to south orientation due to the orientation of the site. A traverse pattern close to north – south is preferable as the fluxgate gradiometer is set up and balanced with respect to the cardinal points. Since the data is plotted as north – south traverses there is considerable merit sampling the north – south response of a magnetic anomaly with as many data points as is possible, this is accomplished as the density collected along the traverse line is greater than that between traverses (Aspinall et al. 2008).

5.4 The data collected from the survey has been analysed using Terrasurveyor 4.1.14.7. The resulting data set plots are presented with positive nT/m values and high resistance as black and negative nT/m values and low resistance as white.

The data sets have been subjected to processing using the following filters:

- De-striping
- Clipping
- De-staggering

5.5 The de-stripe process is used to equalise underlying differences between grids or traverses. Differences are most often caused by directional effects inherent to magnetic surveying instruments, instrument drift, instrument orientation (for example off-axis surveying or heading errors) and delays between surveying adjacent grids. The de-stripe process is used with care as it can sometimes have an adverse effect on linear features that run parallel to the orientation of the process.

5.6 The Bartington Grad 601-2 is set to record data within the range between -100 and 100 nT/m. The clipping process is used to remove extreme data point values which can mask fine detail in the data set. Excluding these values allows the details to show through.

5.7 The de-staggering process compensates for data correction errors caused by the operator commencing the recording of each traverse too soon or too late. It shifts each traverse either forward or backwards by a specified number of intervals.

5.8 Plots of the data are presented in processed linear greyscale (smoothed) with any corrections to the measured values or filtering processes noted, and as separate simplified graphical interpretations of the main anomalies detected.

6.0 Geophysical Survey Results

6.1 For the purposes of interpreting the anomalies, the survey data has been clipped to the values of -3 to 3 nT/m (Figure 5). This enhances faint anomalies that may otherwise not be noted in the data, with a few anomalies identified across the data set. These are discussed in turn and noted as single- or double-digit numbers in square brackets. Positive anomalies represent material that is more magnetically susceptible than the surrounding material, with negative anomalies representing material that is less magnetically susceptible.

6.2 The sub-rectangular positive feature [1], producing magnetic readings of 10 to 25 nT/m, is situated on one of the higher parts of the site (Figure 8) and corresponds with the location of previous finds of 'industrial material' (Figure 9), and as likely represents a saltern, most probably of Roman date.

6.3 To the northeast of [1], also situated within a slightly higher part of the site (Figure 8), are the positive linear/rectilinear features [2]. These have produced similar readings to [1], 10 to 25 nT/m, and likely also relate to former salt making activity within the site. This area also corresponds with previous finds of 'domestic debris' (Figure 9). It is likely the current drainage channel running roughly north to south across most of the site has cut through these features.

6.4 Continuing to the east on the slightly higher ground (Figure 8) and corresponding with more areas of domestic debris finds (Figure 9) are a few positive linear features [3], 3 to 9 nT/m. These may well represent industrial, or settlement activity associated with [1] and [2]. Further to the northeast is an amorphous positive feature [4], 7 to 8 nT/m, which could represent further archaeological activity. These areas are shown on the Lidar data as being slightly higher than the areas immediately to the east and southeast (Figure 8).

6.5 Close to and extending from the southern edge of the site is a positive linear feature [5], aligned roughly northeast to southwest, 10 to 15 nT/m. This feature likely represents a former field boundary as seen on Figure 9.

6.6 Across the site are many negative linear and curvilinear features [6], [7] and [8], -0.5 to -1 nT/m. These features likely relate to later activity than the Roman salt making and could represent medieval dylings (field systems). These features can be seen very clearly on Google Earth Pro historic images dated 01/01/2007.

6.7 The potential positive linear features in the eastern half of the site close to the southern edge, aligned east-northeast to west-southwest and roughly north to south [9], 1 to 3 nT/m, most likely represent modern land drainage, as does the east to west aligned potential positive linear feature [10], 1 to 2 nT/m.

6.8 The large area of positive amorphous and curvilinear features [11] towards the eastern end of the site, 6 to 10 nT/m, most likely represents geological variation associated with meandering palaeochannels and alluviation typical of a fenland environment. The Lidar demonstrates that these features lie within the lowest part of the site (Figure 8).

6.9 The linear/amorphous positive features aligned roughly northwest to southeast [12], 4 to 6 nT/m, likely represent a palaeochannel, likely related to the former saltmaking evidence which flanks the feature. There are other positive and negative curvilinear and linear features [13] and [14], 2 nT/m and -0.5 nT/m respectively, which likely also represent smaller palaeochannels.

6.10 The potential positive linear feature [15], 0.5 to 1 nT/m, running adjacent and parallel to the southern edge of the site likely represents modern cultivation activity.

6.11 Scattered throughout the entire site are many weak and strong dipolar responses, examples of which are highlighted as [16]. The characteristic dipolar response of pairs of positive and negative 'spikes' suggest near-surface ferrous metal or other highly fired material in the topsoil, which could represent small pieces of metal such as nails or horseshoes or parts of a tractor.

6.12 The area of magnetic noise [17], -30 to 70 nT/m, corresponds with a small hollow within the field and with an oval cropmark seen on the Google Earth Pro historic images dated 01/01/2007. The large magnetic readings could indicate more modern material has been used to fill in a former feature. Similarly, the area of magnetic noise at the southwest corner of the site [18], -5 to 15 nT/m could represent buried modern material.

6.13 The large rectangular unsurveyed area [19] corresponds with an area of overgrown vegetation. The small unsurveyed areas across the site [20] correspond with the location of hay bales.

7.0 Discussion and Conclusions

7.1 The survey has identified likely Roman salt making within the centre part of the site, with part of this truncated by the drainage ditch running roughly north to south across most of the middle of the site. There is a second possible saltern site to the southwest, and both sites lie on slightly higher ground to either side of a possible former channel [12]. Further activity is recorded a short distance to the east, again, on slightly higher ground. These areas also correspond with scatters of Roman material previously recovered from the site.

7.2 There are also a number of negative linear and curvilinear features running across the site which likely represent later medieval field systems, known in this fenland landscape as dylings. Potentially there are at least two phases of these features as they appear on slightly different alignments.

7.3 There are a number of palaeochannels running across the site as well as a large area of geological variation corresponding with the lowest part of the site which likely represents a fenland environment of intercutting streams and channels.

7.4 The evidence suggests a high potential for archaeological activity, most likely settlement and industrial activity of a Roman date

8.0 Effectiveness of Methodology

8.1 The non-intrusive methodology employed was appropriate to the scale and nature of the site. Magnetometry was the prospection technique best suited to the identification of archaeological remains on the site. Other techniques would have required further justification and may have proved too time consuming or cost prohibitive.

9.0 Acknowledgements

9.1 Allen Archaeology Limited would like to thank Clarke Group Construction for this commission.

10.0 References

AAF, 2011*, Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation,* Archaeological Archives Forum

AAL, 2025, *Specification for a geophysical survey by magnetometry: Peartree Hill Road, Whaplode St Catherine, Lincolnshire,* Allen Archaeology Ltd, unpublished planning document

Aspinall, A, Gaffney, C, and Schmidt, A, 2008, *Magnetometry for Archaeologists*, Plymouth: Altamira Press

CIfA, 2020a, S*tandard and guidance for archaeological geophysical survey*, Chartered Institute for Archaeologists, Reading

CIfA, 2020b, *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*

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

Europae Archaeologiae Consilium (EAC), 2016, *EAC Guidelines for the use of geophysics in Archaeology, Questions to Ask and Points to Consider. EAC Guidelines 2.* European Archaeological Council

Gaffney, C., Gater J., and Ovenden, S., 2002, *The Use of Geophysical Techniques in Archaeological Evaluations. IFA Paper No. 6.* The Institute for Archaeologists

LCC, 2024, *Lincolnshire Archaeology Handbook*, Lincolnshire County Council

Ministry of Housing, Communities and Local Government, 2025, *National Planning Policy Framework*. London: HMSO

Phillips, C., W., (ed.), 1970, *The Fenland in Roman times: studies of a major area of peasant colonization with a gazetteer covering all known sites and finds*, London: The Royal Geographical Society, Research Series: No. 5

Rayner, T., 2000, *Archaeological Watching Brief of land at Jekil's Bank and Fox Headings Lane, Holbeach St John, Spalding, Lincolnshire,* APS Report No. 82/00

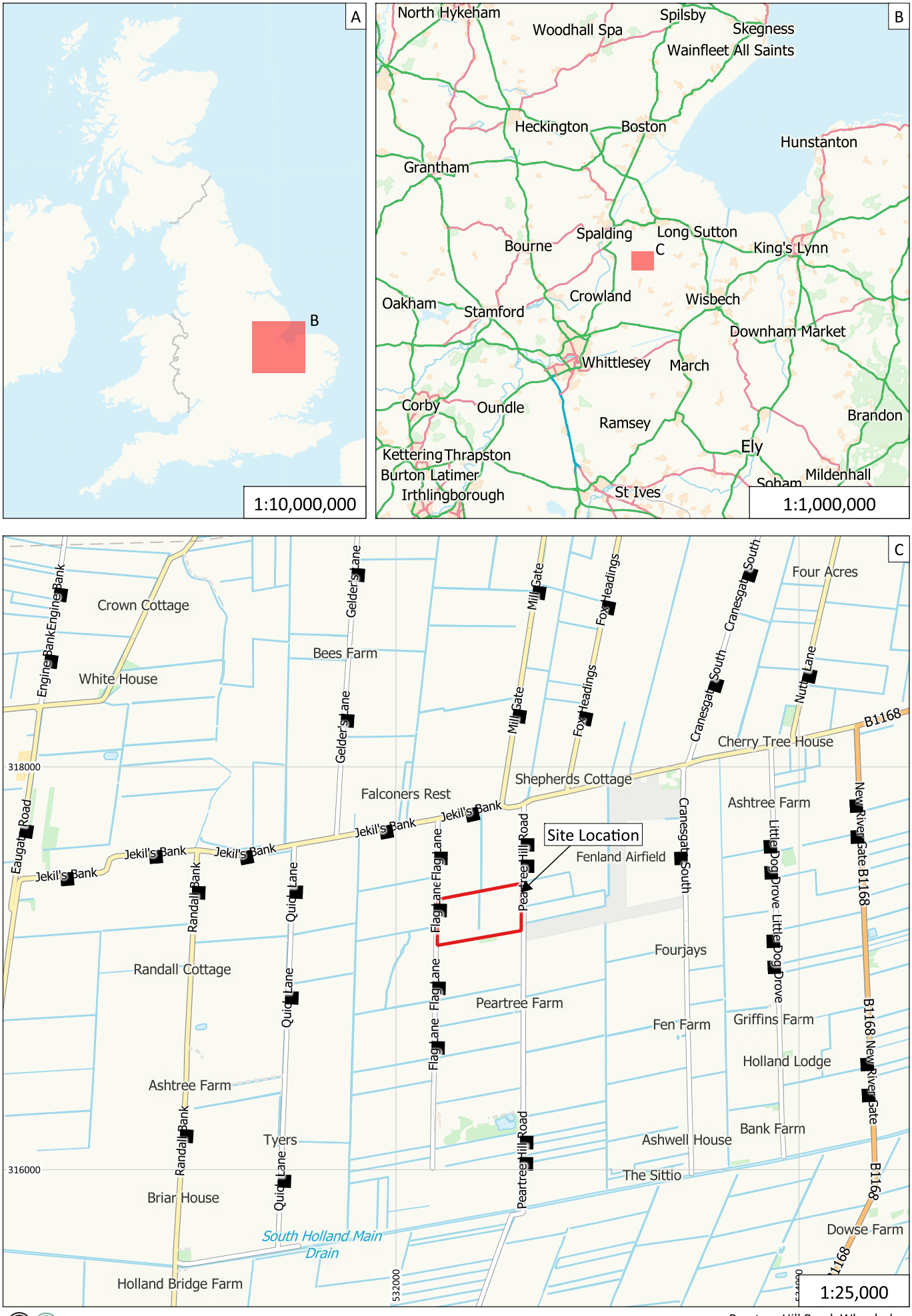
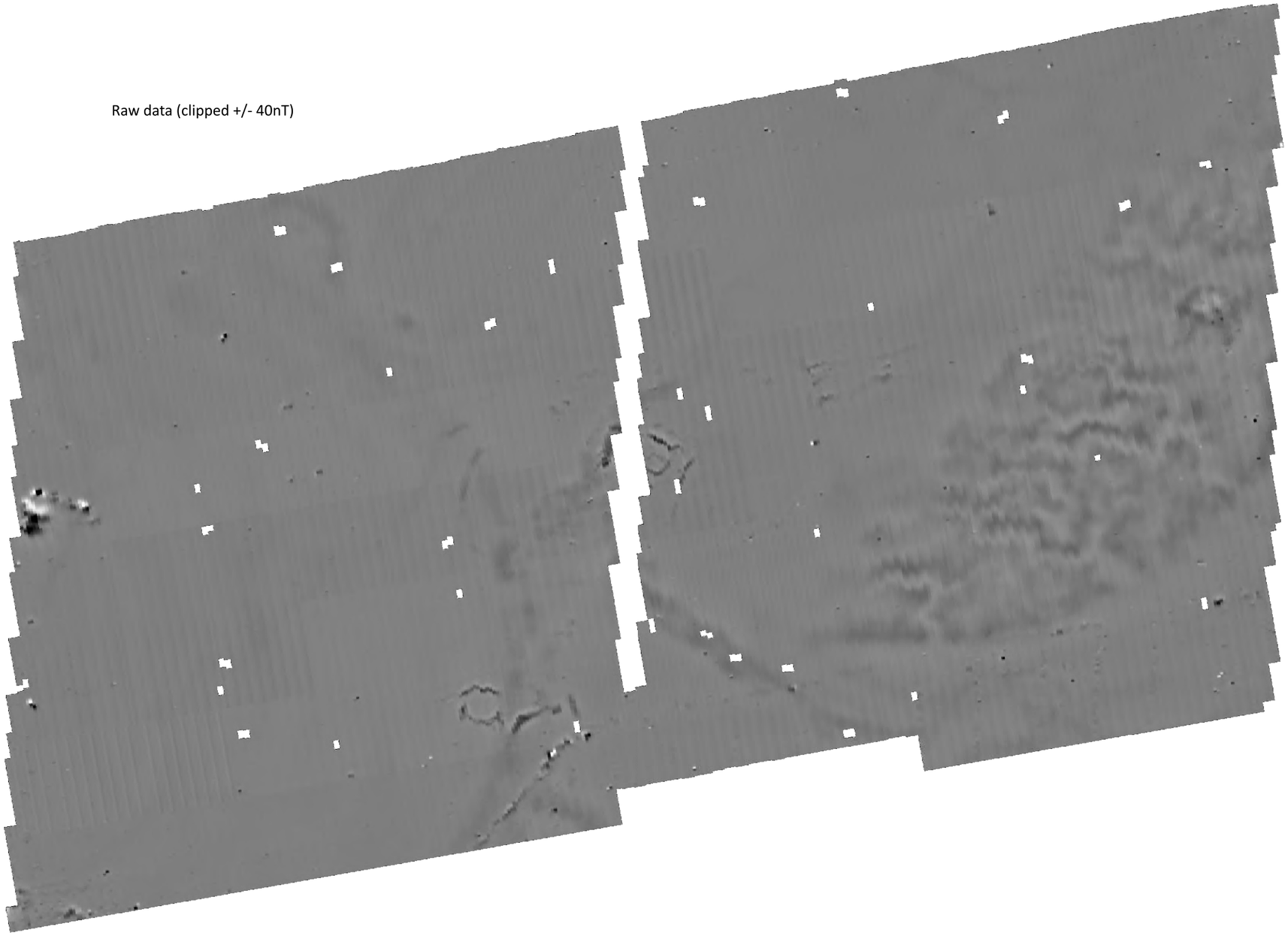


Figure 1: Site location outlined in red

Peartree Hill Road, Whaplode
St Catherine
Site Code: WSCA 25

WSCA 25 Figure 1: @ A4 Drawn by: XX Revision 1 Contains OS data

Raw data (clipped +/- 40nT)



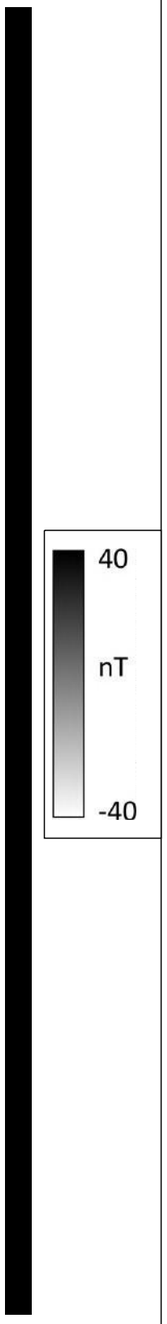


Figure 2: Greyscale raw data

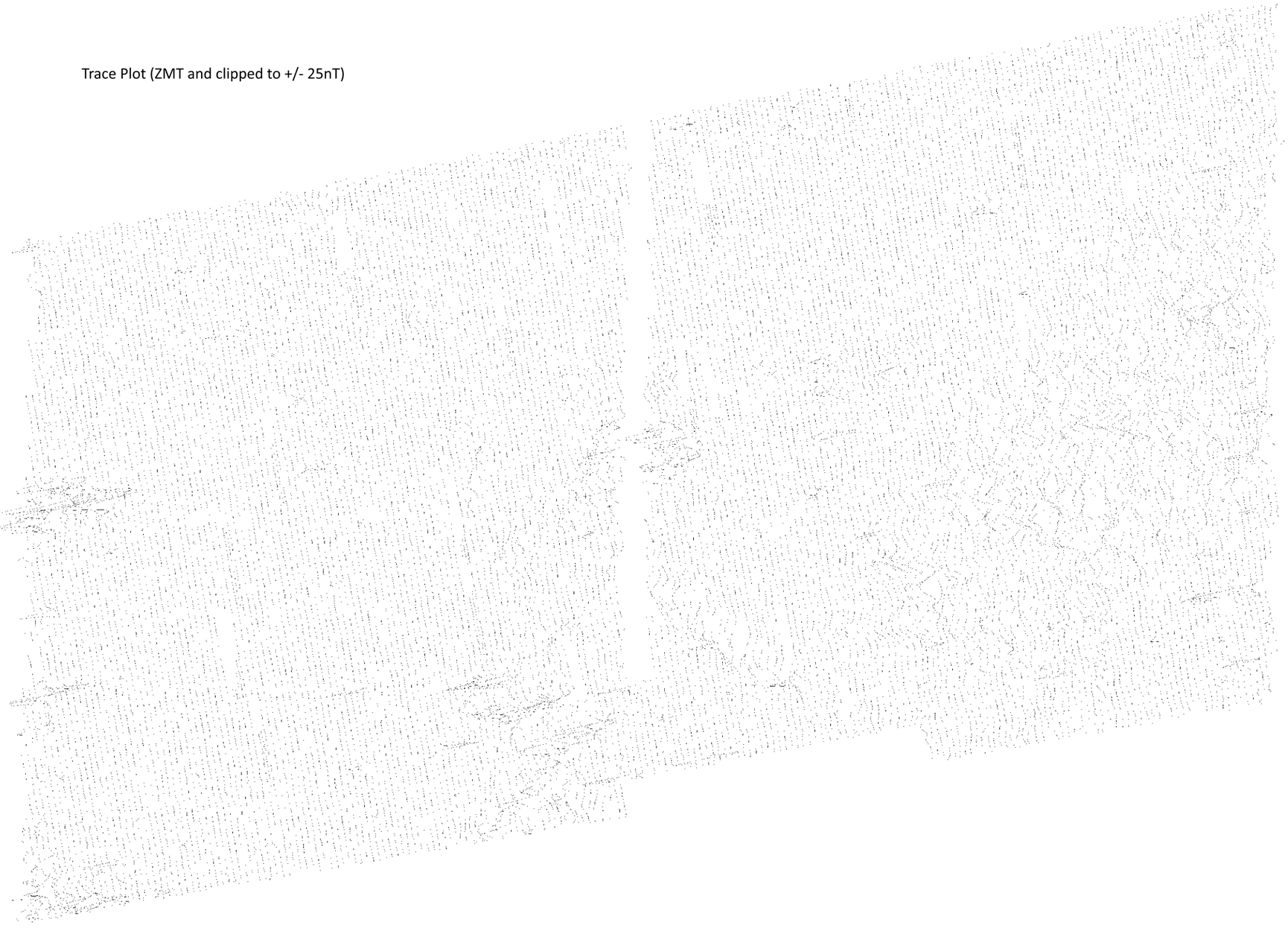
0 50 100 150 200 m

1:1,500

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 2 1:1500 @ A3 Drawn by: RE Revision 1

Trace Plot (ZMT and clipped to +/- 25nT)



25nT

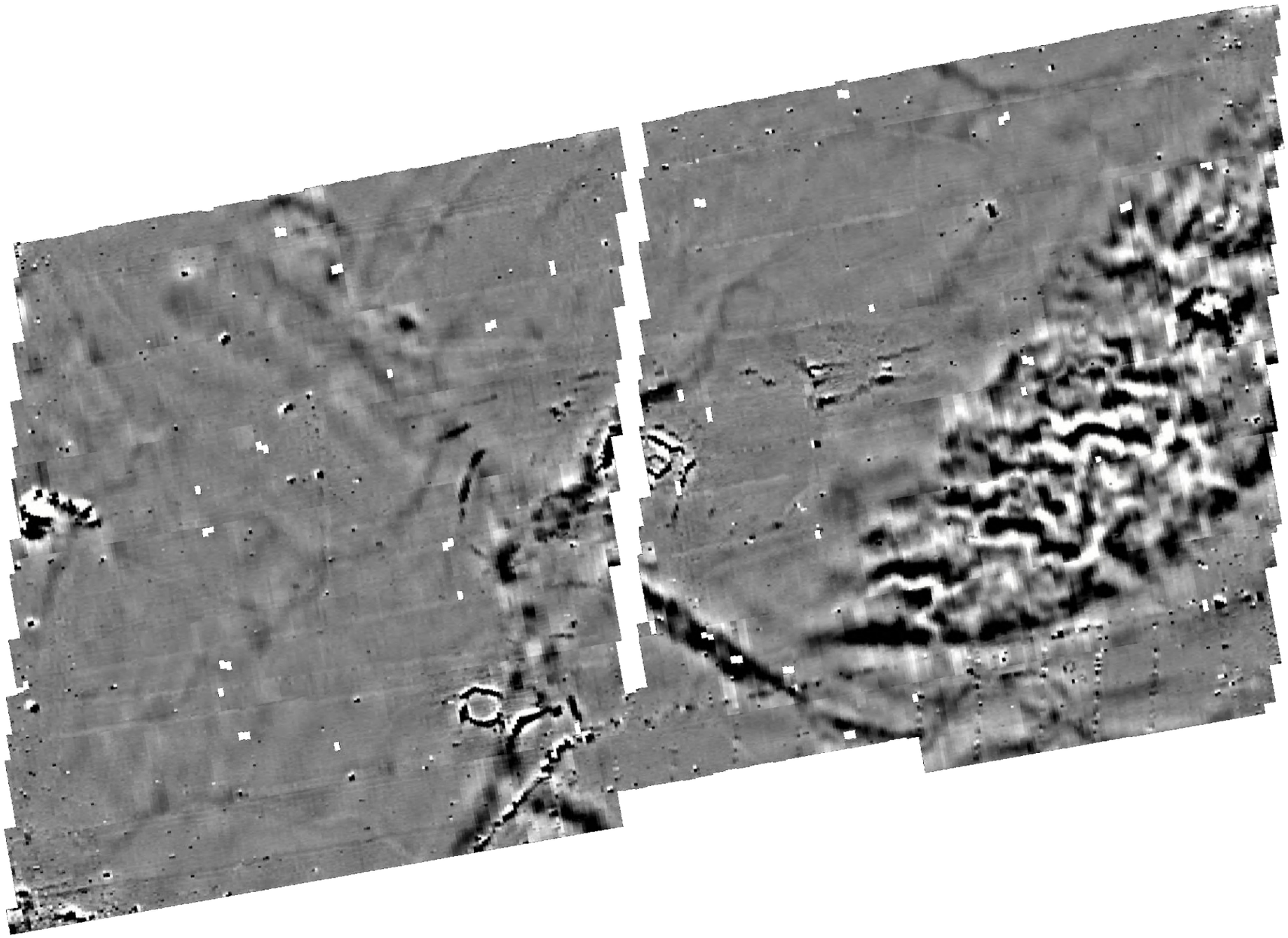
Figure 3: Processed trace plot

0 50 100 150 200 m

1:1,500

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 3 1:1500 @ A3 Drawn by: RE Revision 1



3
nT
-3

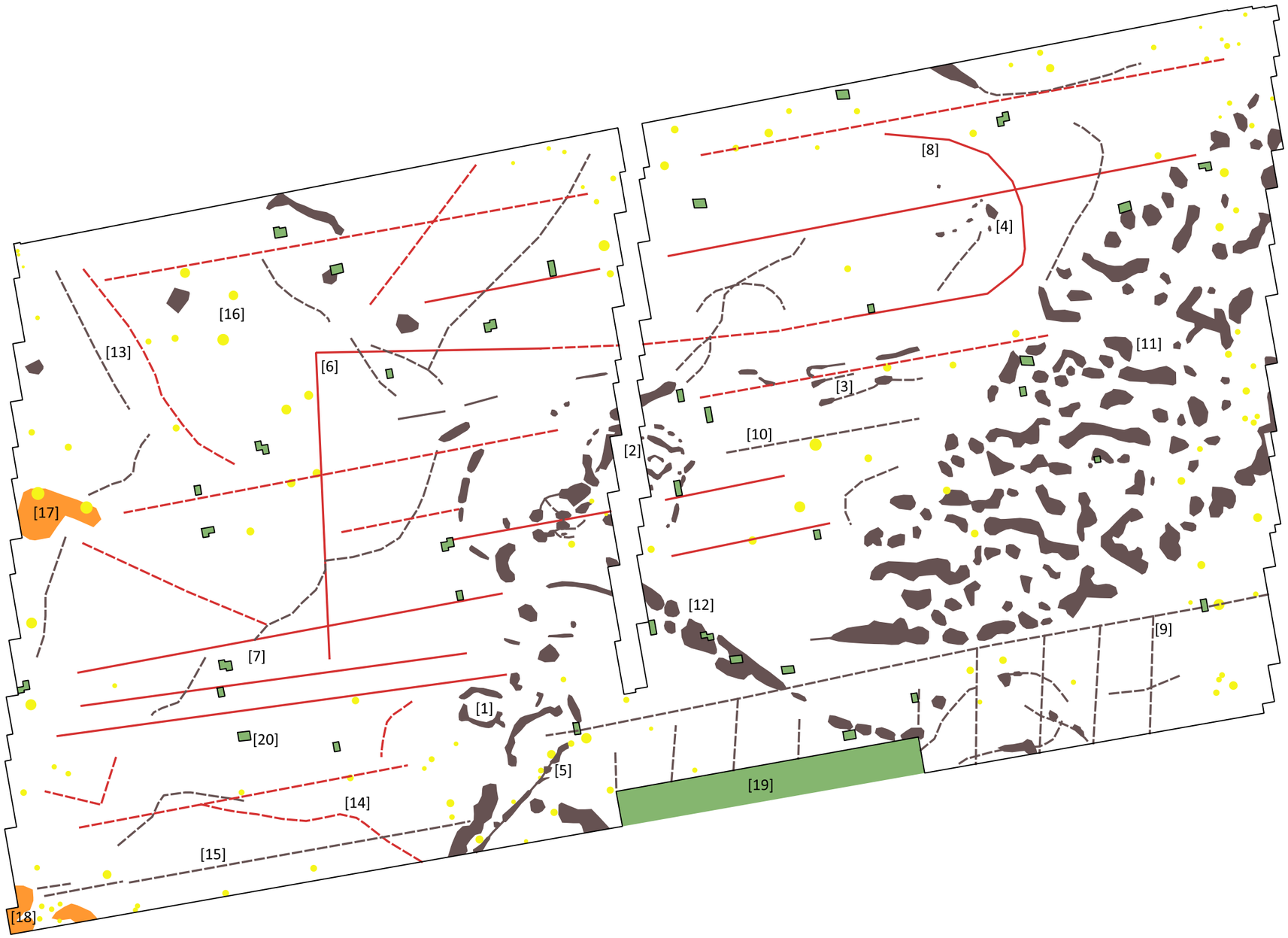
Figure 4: Processed greyscale plot

0 50 100 150 200 m

1:1,500

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 4 1:1500 @ A3 Drawn by: RE Revision 1



Key

- Positive anomaly
- Negative anomaly
- Dipolar anomaly
- Magnetic noise
- Survey boundary
- Unsurveyed

Figure 5: Geophysical interpretation

0 50 100 150 200 m

1:1,500

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 5 1: @ A3 Drawn by: RE Revision 1

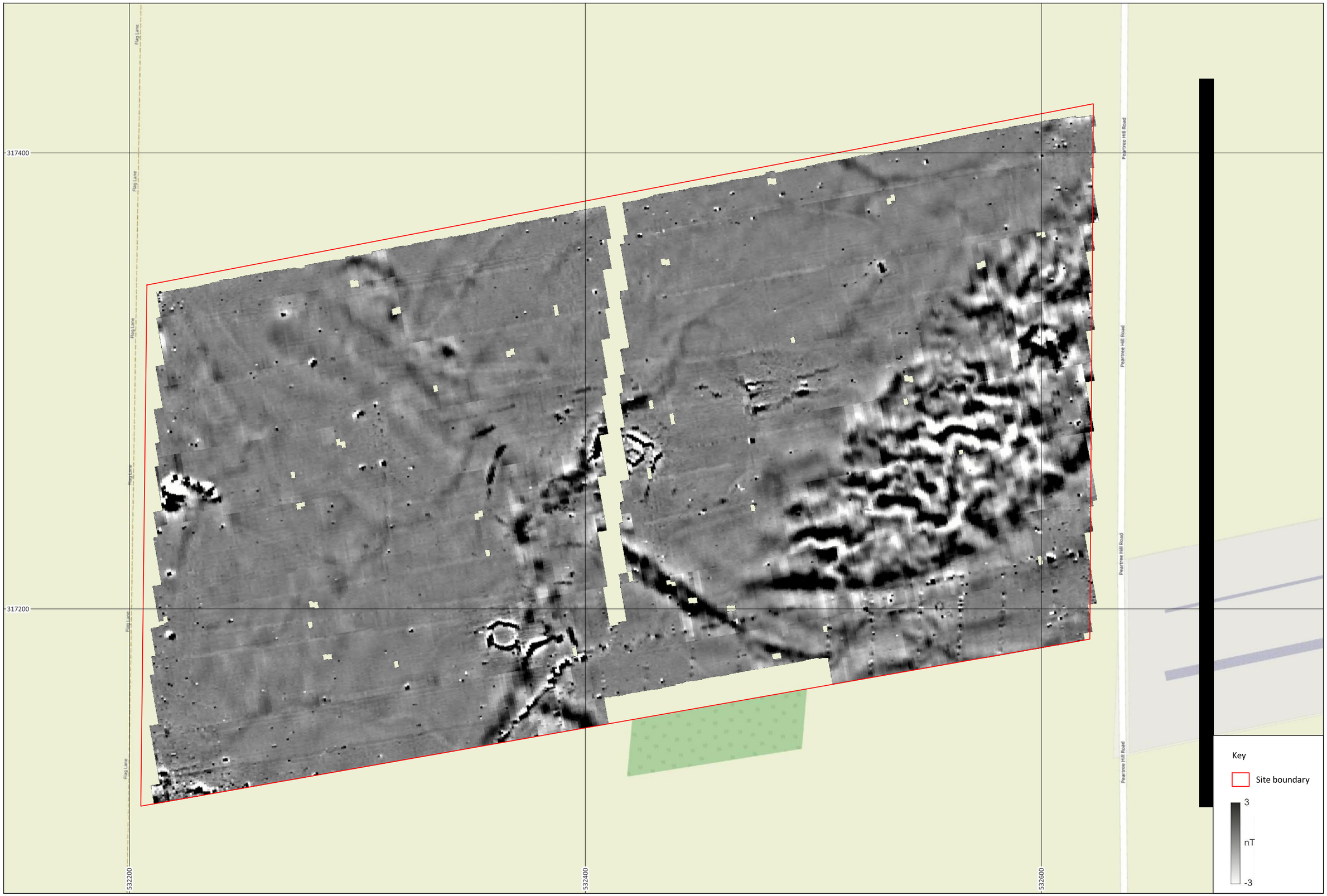


Figure 6: Processed greyscale location

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 6 1:1500 @ A3 Drawn by: RE Revision 1

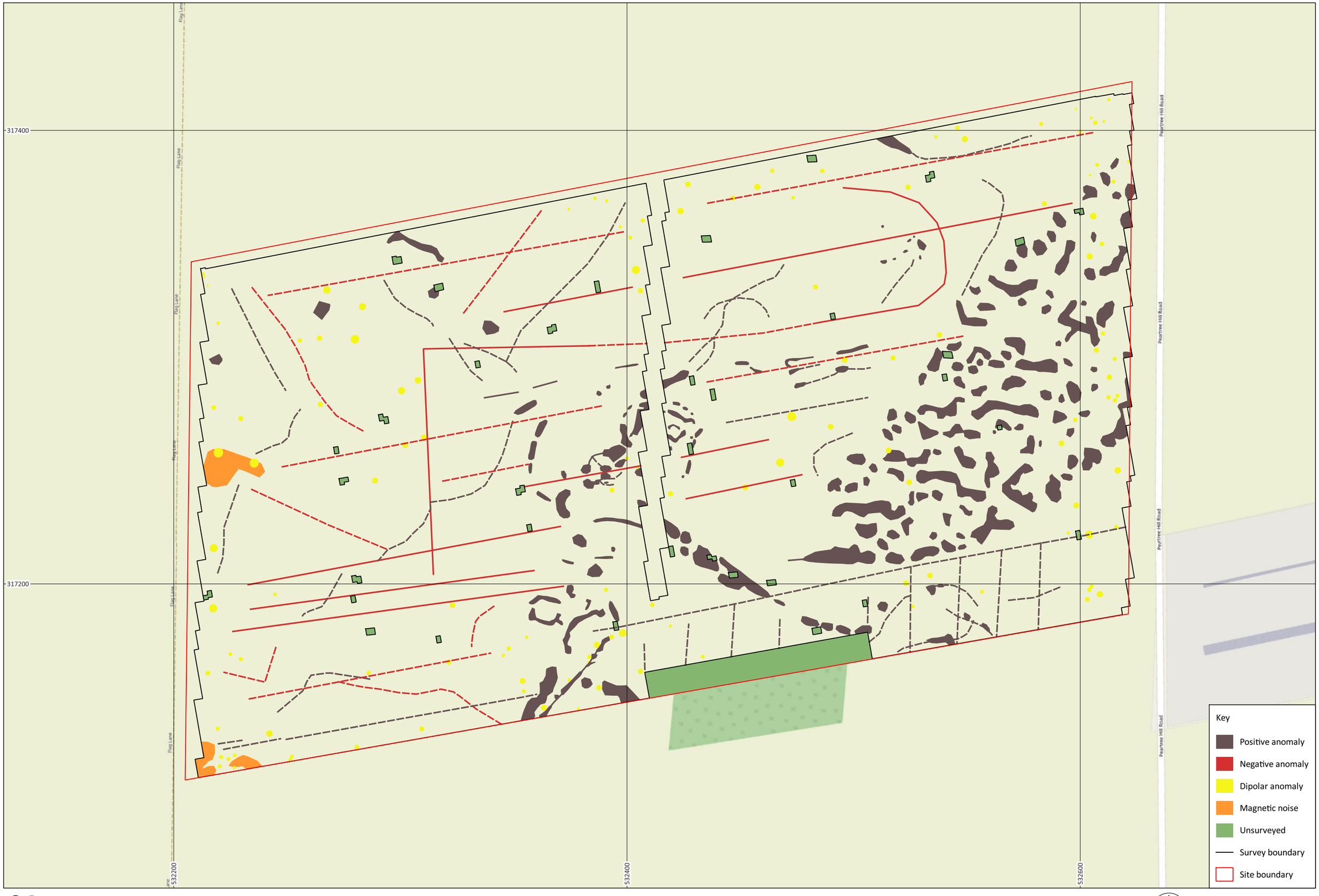


Figure 7: Geophysical interpretation location

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 7 1:1500 @ A3 Drawn by: RE Revision 1

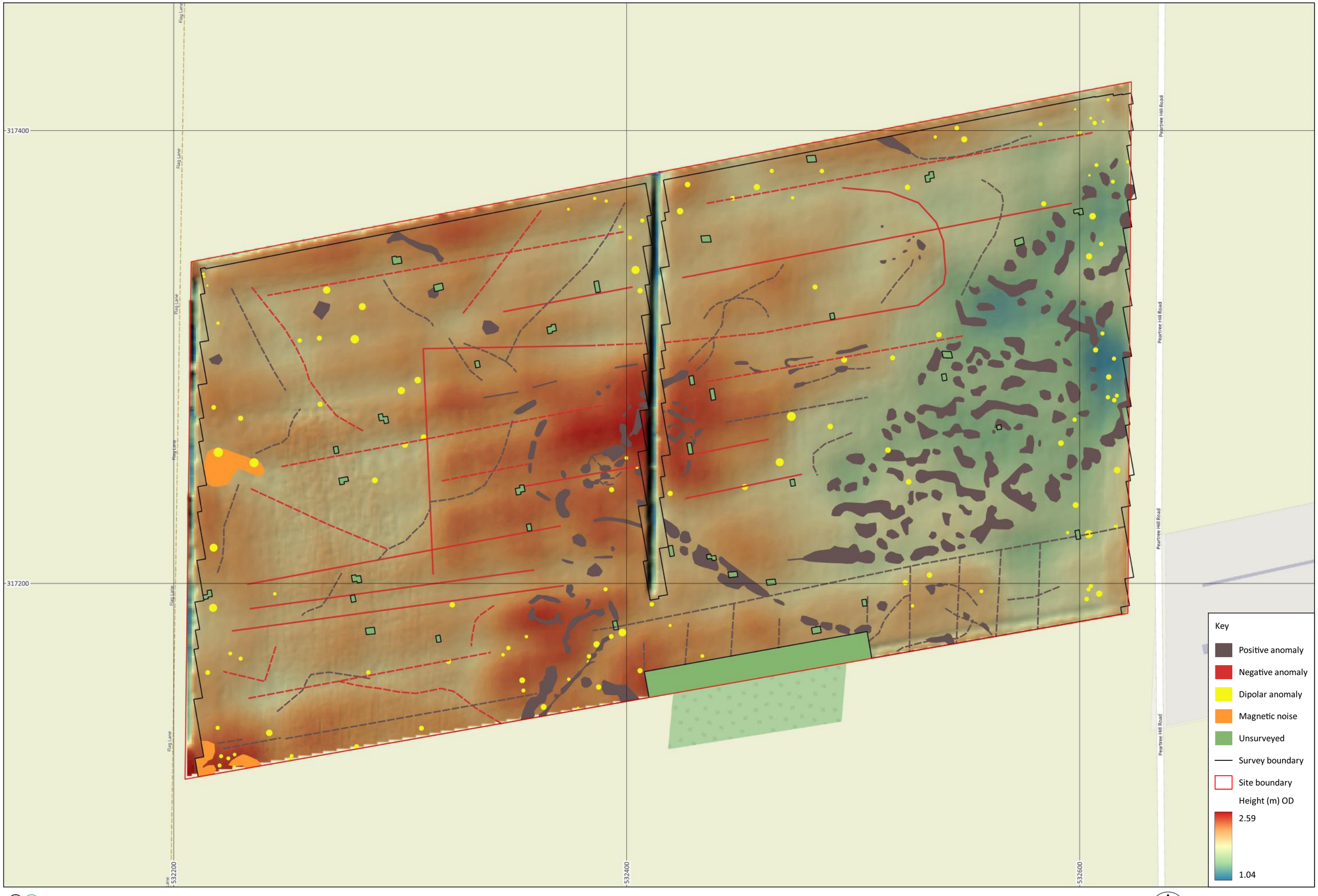


Figure 8: Geophysical interpretation superimposed over Lidar data

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 8 1:1500 @ A3 Drawn by: RE Revision 1

Figure 9: Geophysical interpretation superimposed over 'The Fenland in Roman Times' Map 7 Sheet G

Peartree Hill Road,
Whaplode St Catherine
Site Code: WSCA 25

WSCA 25 Figure 9 1:1500 @ A3 Drawn by: RE Revision 1

Appendix 2: Oasis Summary

OASIS ID (UID)	allenarc1-536571
Project Name	Geophysical Survey by Magnetometry Survey: LAND OFF PEARTREE HILL ROAD, WHAPLODE ST CATHERINE, LINCOLNSHIRE
Sitename	LAND OFF PEARTREE HILL ROAD, WHAPLODE ST CATHERINE, LINCOLNSHIRE
Sitecode	WSCA 25
Project Identifier(s)	
Activity type	Geophysical Survey, Magnetometry Survey, MAGNETOMETRY SURVEY
Planning Id	H23-0313-25
Reason For Investigation	Planning: Between application and determination
Organisation Responsible for work	Allen Archaeology Limited
Project Dates	18-Aug-2025 - 20-Aug-2025
Location	**LAND OFF PEARTREE HILL ROAD, WHAPLODE ST CATHERINE, LINCOLNSHIRE** NGR: TF 32410 17270 LL: 52.73685654976131, -0.04027886000704 12 Fig: 532410,317270
Administrative Areas	Country: England County/Local Authority: Lincolnshire Local Authority District: South Holland Parish: Whaplode
Project Methodology	Clarke Group Construction commissioned Allen Archaeology Ltd to undertake a geophysical survey using magnetometry on land off Peartree Hill Road, Whaplode St Catherine, Lincolnshire, prior to determination of a planning application for a new poultry unit and associated works. The geophysical survey consisted of a detailed

	gradiometer survey of as much of the development area as was suitable, extending to approximately 9.0ha. The survey was undertaken in a series of 30m grids across the site
Project Results	The survey has identified likely Roman salt making within the centre part of the site, with part of this truncated by the drainage ditch running roughly north to south across most of the middle of the site. There are likely at least two main concentrations of salterns, with potential further archaeological activity continuing to the east and northeast. These features are situated on the higher parts of the site. There are also a number of negative linear and curvilinear features running across the site which likely represent later medieval field systems, know as dylings. Potentially there are at least two phases of these features as they appear on slightly different alignments. There are a number of palaeochannels running across the site as well as a large area corresponding with the lowest part of the site which likely represents a fenland environment of intercutting streams and channels.
Keywords	Saltern - ROMAN - FISH Thesaurus of Monument Types Darland Field System - MEDIEVAL - FISH Thesaurus of Monument Types
Funder	Private or public corporation Clarke Group Construction
HER	
Person Responsible for work	Robert Evershed
HER Identifiers	
Archives	

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