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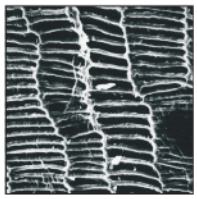


A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

INTERIM GEOPHYSICAL SURVEY REPORT

commissioned by Arcadis (UK)
on behalf of Highways England

August 2018

HEADLAND ARCHAEOLOGY

REGISTERED ORGANISATION CIfA

A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

INTERIM GEOPHYSICAL SURVEY REPORT

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This report adheres to the quality standard of ISO 9001:2015

PROJECT INFO:

HA Project Code **WHSI18** / NGR **SD 3939 39660 to SD 3532 4052** / Parish **Little Singleton, Lancashire** / Local Authority **Lancashire County Council** / OASIS Ref. **headland5-325605**

PROJECT TEAM:

Project Manager **Sam Harrison** / Author **Olivier Vansassenbrouck** / Fieldwork **Krasimir Dyulgerski, Richard McGregor Edwards, Ross Bishop, Olivier Vansassenbrouck** / Graphics **Caroline Norrman, Julia Bastek-Michalska, Ross Bishop, Olivier Vansassenbrouck**

Approved by **Sam Harrison**

Headland Archaeology North
Unit 16 | Hillside | Beeston Rd | Leeds LS11 8ND
t 0113 387 6430
e north@headlandarchaeology.com
w www.headlandarchaeology.com

HEADLAND ARCHAEOLOGY

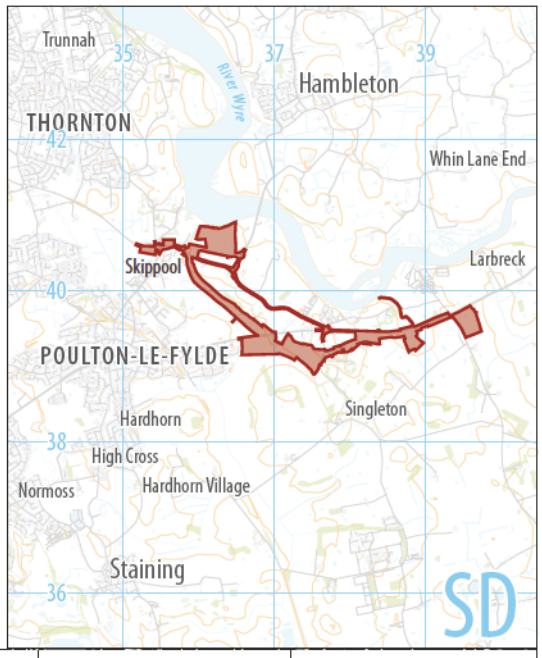
PROJECT SUMMARY

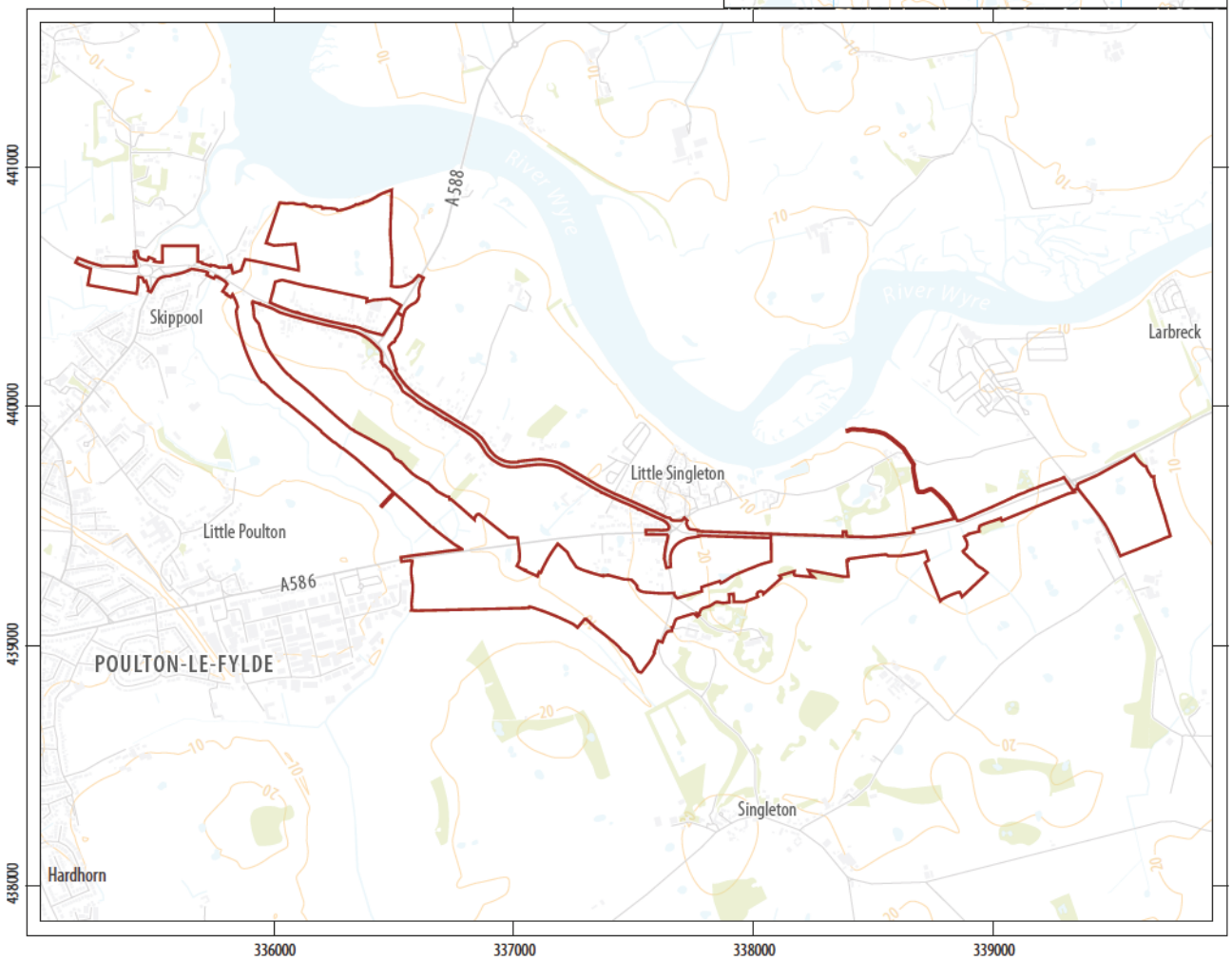
Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey of a 90 hectare site in Little Singleton, Lancashire to provide further information on the archaeological potential along the proposed route of the A585 Improvement Scheme. This interim report presents the results of the A585 survey undertaken to date, an area of 49 hectares. No anomalies of definite or possible archaeological potential have been identified by the survey. The survey has mainly identified anomalies consistent with the agricultural landscape such as former boundaries, field drains and ploughing, as well as areas of magnetic disturbance that correspond with the locations of former ponds identified on historical maps. On the basis of the geophysical survey undertaken to date, the archaeological potential along the route is assessed as low although the spreading of 'green waste' in some areas has the potential to 'mask' archaeological anomalies, if present. Survey of the remaining fields may provide additional information on the overall archaeological potential along the route. All of the data will be re-evaluated upon completion of the survey.

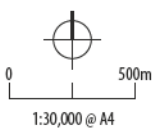
CONTENTS

LIST OF ILLUSTRATIONS

A585 Windy Harbour to Skippool
Improvement Scheme
Poulton-le-Fylde
Lancashire







development consent order boundary

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Headland Archaeology North
Unit 16 | Hillside | Beeston Rd | Leeds LS11 8ND
t 0113 387 6430
e north@headlandarchaeology.com
w www.headlandarchaeology.com

ILLUS 1 Site location

A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

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1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by Arcadis (UK) (the Client), to undertake a geophysical (magnetometer) survey at Little Singleton, Lancashire, along the proposed route of the A585 Improvement Scheme. The survey has been requested by Highways England to inform on the archaeological potential along the route and to assist in determining appropriate levels of further archaeological work (eg trial trenching) and mitigation. This interim report presents the results of the survey undertaken to date. It is expected that a full report will be produced once access has been agreed to the remaining (currently unsurveyed) areas.

The work was undertaken in accordance with a Specification for Geophysical Survey (TWAS 2018) and in line with current best practice (Chartered Institute for Archaeologists 2014, Europae Archaeologia Consilium 2015).

The survey was carried out between the 11th June and the 20th June 2018.

1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The geophysical survey area (GSA) encompasses the development consent order (DCO) boundary for the improvement scheme (see Illus 1). This comprises compound areas as well as the land that will be taken for the road improvements both for new carriageway and improvements to existing road. The new section of road extends from immediately east of Poulton-le-Fylde at Skippool skirting around the southern periphery of Little Singleton to rejoin the existing carriageway east of the village at Windy Harbour.

The GSA covers 90 hectares across 51 (some partial) fields (F1–F51) which were a mixture of permanent pasture and arable cultivation. Some fields had been recently harvested or mown prior to survey (see Illus 2–5). Of the fields where access was approved for this phase of work only Field 31 was unsuitable for survey due to high grass.

The improvement scheme crosses a predominantly flat landscape between 10m Above Ordnance Datum (AOD) and 20m AOD. At the western end of the scheme at Skippool Junction the land is at 12 metres AOD rising to 16m AOD at the crossing of Garstang Road East and 18m AOD at Lodge Lane, north of Little Singleton before gradually falling to 9 metres AOD at Windy Harbour at the eastern end of the scheme (Illus 6).

1.2 GEOLOGY AND SOILS

The bedrock geology comprises Singleton Mudstone Member (mudstone), which is overlain by diamicton over most of the route. In the south and east of the survey corridor Tidal Flat Deposits comprising clay and silt are present. Further south along the route peat and small pockets of Glaciofluvial Deposits (sand and gravel) are recorded (NERC2018 – see Illus 7).

Over the majority of the DCO, the soils are classified in the Soilscape 8 association, characterised as slightly acid loams and clay soils with impeded drainage. To the south of the DCO the soils are classified in the Soilscape 21 association, characterised as loams and clays of coastal flats with naturally high groundwater. The west of the DCO contains soils of Soilscape 18 which are classified as slowly permeable seasonally wet slightly acid but base-rich loams and clays (Cranfield University 2018).

2 ARCHAEOLOGICAL BACKGROUND

A Cultural Heritage Desk-Based Assessment (Arcadis 2018) of a 1 kilometre study area around the DCO has identified that there are no designated heritage assets within the DCO but 51 non-designated assets. Based on these figures the assessment concluded that there was a medium to low potential for prehistoric remains to be found within the GSA, as well as a medium potential for Roman remains. However, none of the focus points of these potential remains are located within the DCO. For both medieval and post-medieval remains, the potential was assessed as medium, with an extensive agricultural resource from both periods and some post-medieval industrial evidence within the DCO.

Overall, the archaeological potential of the improvement scheme was deemed to be medium, for currently unknown archaeological remains to be present.

3 AIMS, METHODOLOGY AND PRESENTATION

The general aim of the geophysical survey was to provide sufficient information to establish the presence/absence, character and extent of any archaeological remains within the DCO. This will therefore enable an assessment to be made of the impact of the proposed improvement scheme on any sub-surface archaeological remains, if present.

The specific archaeological objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to therefore model the presence/absence and extent of any buried archaeological features; and
- to prepare a report summarising the results of the survey.

3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney & Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses (swaths) 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. Terrasurveyor V3.0.32.4 (DWConsulting) software was used to process and present the data.

3.2 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:15,000. Illus 2–5 are site condition photographs. Illus 6 is a 1:15,000 survey location plan showing the direction of survey as GPS swaths as well as sector boundaries. Illus 7 shows the superficial geological deposits (NERC 2018) and photograph locations, also at a scale of 1:15,000. The processed greyscale data and an overall interpretation plot are also presented at 1:15,000 in Illus 8 and 9. Large-scale, fully processed (greyscale) data, minimally processed data (XY traceplot) and accompanying interpretative plots are presented at a scale of 1:2,500 in Illus 10–27 inclusive.

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. Data processing details are presented in Appendix 4. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 5.

The survey methodology, report and any recommendations comply with the Specification for Geophysical Survey (TWAS 2018), guidelines outlined by Europae Archaeologia Consilium (EAC 2015) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations from Ordnance Survey mapping are reproduced with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.

4 RESULTS AND DISCUSSION

The ground conditions were generally good (Illus 2–5) and contributed to a high standard of data quality throughout.

Generally, there are changes in the magnetic background, due to the variation of the superficial deposits and the soils from which they are mostly derived. Against this background, numerous linear and discrete anomalies have been identified and these are discussed below and cross-referenced to specific examples on the interpretive illustrations, where appropriate.

ILLUS 2 F14 looking east **ILLUS 3** F30 looking north **ILLUS 4** F1 looking north-west

Ferrous anomalies

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris is common on most sites, often being present as a consequence of manuring or tipping/infilling. There is no obvious clustering to these ferrous anomalies which might indicate an archaeological origin. Far more probable is that the 'spike' responses are likely caused by the random distribution of ferrous debris in the upper soil horizons.

Several high magnitude dipolar linear anomalies were identified and interpreted as buried service pipes. SP1 and SP2 in F14 and SP3 in F12 (Sector 1, Illus 10–12), SP4 and SP5 in F30 and F48 respectively (Sector 2, Illus 13–15), SP6 running through F1, F7 and F29 (Sectors 3–4, Illus 16–21) and SP7 and SP8 in F38 (Sector 4, Illus 19–21).

Two areas of magnetic disturbance (P1 in the east of F1 and P2 in the north-west of F7 (Sector 3, Illus 16–18), locate former ponds recorded on early edition OS maps, one of which (P1) is still partially extant.

The data throughout most of F30 (Sector 2, Illus 13–15) and the north-east of F29 (Sector 4, Illus 19–21) is dominated by high magnitude magnetic disturbance throughout. Disturbance of this magnitude and distribution is characteristic of the recent spreading of organic waste (or 'green waste') as soil conditioner. The exact cause of the response is not fully understood but is thought to be caused by the presence of magnetic compounds in the soil created during decomposition processes, and also by frequent ferrous contaminants within the waste material. Against this background,

ILLUS 5 F33 looking east

only extremely high magnitude anomalies can be identified. Any low magnitude anomalies of archaeological potential, if present, within these affected areas would probably be 'masked' by the much stronger readings due to the green waste.

Other areas of magnetic disturbance around the perimeter of fields is due to ferrous material present within the field boundaries or the proximity of the roads, houses and other modern infrastructure.

Agricultural anomalies

Linear trend anomalies have been identified throughout the DCO, the best example being the linear anomalies running north-west to south-east in F4 (Sector 5, Illus 22–24). These anomalies are all either parallel or at right angles to current field boundaries and are caused by recent ploughing.

Linear trend anomalies identified in F3 and F4 (Sector 5, Illus 22–24) and F51 (Sector 6, Illus 25–27) are characteristic of field drains. They are running south-west to north-east in F3, F4 and F51. In the latter, north-west to south-east orientated drains were found as well.

Former field boundaries, recorded on historic mapping, are identified in F14 (FB1, Sector 1, Illus 10–12), FB2 in F7/29 (Sectors 3–4, Illus 16–21) and FB3, FB4 and FB5 in F38 (Sector 4, Illus 19–21) as linear anomalies.

Geological anomalies

Numerous small isolated anomalies (discrete areas of magnetic enhancement) are identified throughout the DCO. These are interpreted as geological in origin and are due to variation in the composition of the superficial deposits and the soils from which they derive.

Several low magnitude trends in the data, such as the ones found in F4 (Sector 5, Illus 22–24) are also interpreted as being geological in origin also being due to localised variations in the soils.

Anomalies of uncertain origin

Several linear trends in the data, are identified at several locations along the corridor, such as UA1 and UA2 in F38 (Sector 4, Illus 19–21) and UA3 in F51 (Sector 6, Illus 25–27). Their linearity precludes a geological interpretation, they are aligned oblique to the extant field boundaries and do not correspond to any recorded features on historical maps. The lack of an archaeological context suggests that a modern or agricultural origin is most likely.

5 CONCLUSION

The geophysical survey has successfully evaluated part of the proposed route of the A585 Improvement Scheme and has identified no anomalies of likely archaeological origin. All the anomalies are caused by recent agricultural practice (ploughing, drainage, hedge boundary removal and the spreading of green

waste) or recent activity (small scale mineral extraction, modern service pipes or drains). On the basis of the survey carried out to date the archaeological potential of the areas covered is considered to be low. However, the potential masking effect of the green waste means that the presence of archaeological features in these areas cannot be discounted.

6 REFERENCES

Arcadis 2018 ***A585 Windy Harbour to Skippool Improvement Scheme Appendix 7.1: Cultural Heritage Desk-Based Assessment***

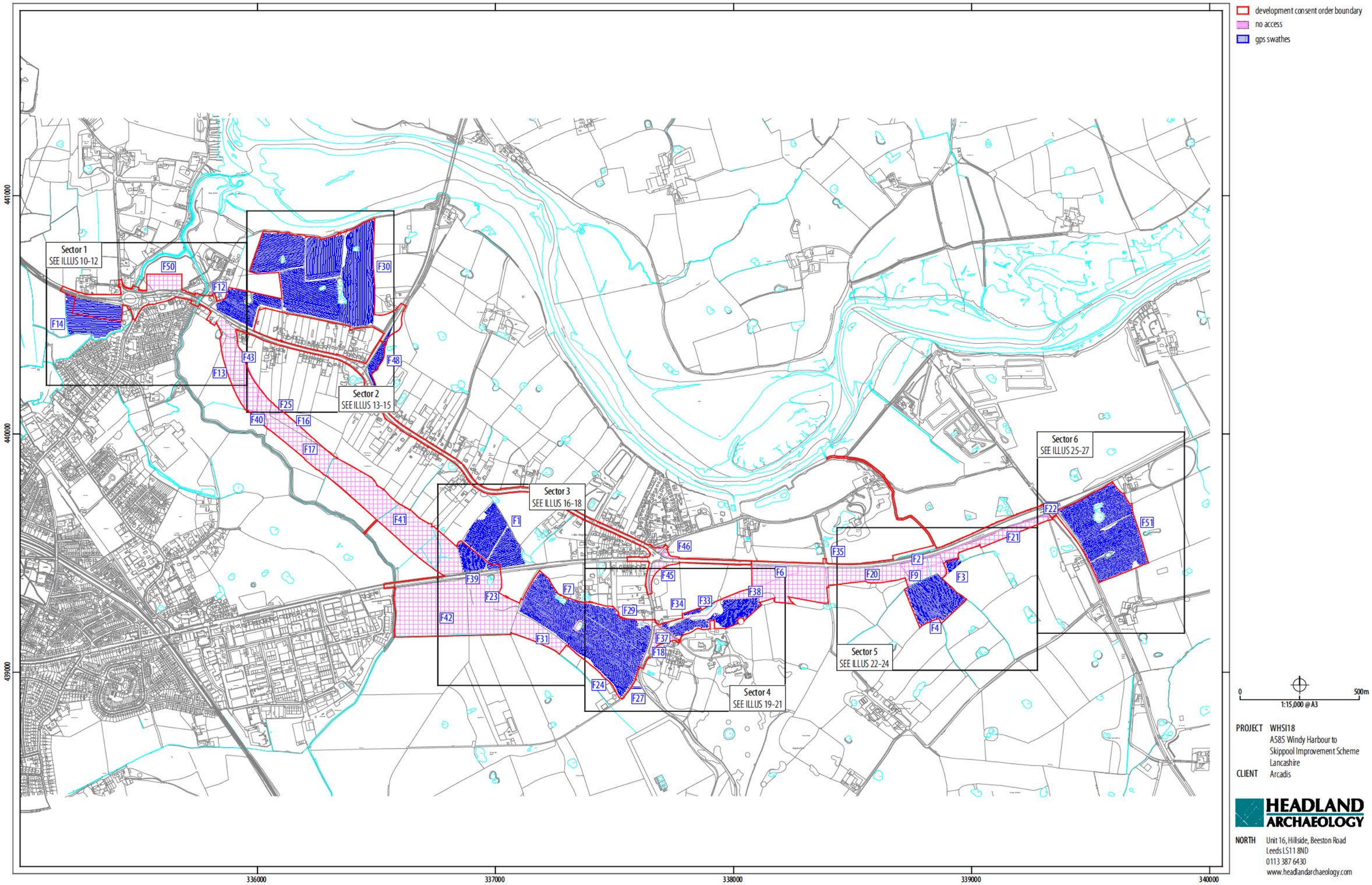
Chartered Institute for Archaeologists (CIfA) 2014 ***Standard and guidance for archaeological geophysical survey*** (Reading) http://www.archaeologists.net/sites/default/files/CIfAS%26GGeophysics_2.pdf accessed 9 August 2018

Cranfield University 2018 ***Cranfield Soil and Agrifood Institute Soilscapes*** http://www.landis.org.uk/soilscapes/ accessed 9 August 2018

Europae Archaeologia Consilium 2015 ***EAC Guidelines for the use of Geophysics in Archaeology*** Archaeolingua 2015

Gaffney, C & Gater, J (2003) ***Revealing the Buried Past: Geophysics for Archaeologists*** Stroud

Natural Environment Research Council (NERC) 2018 ***British Geological Survey*** http://www.bgs.ac.uk/ accessed 9 August 2018



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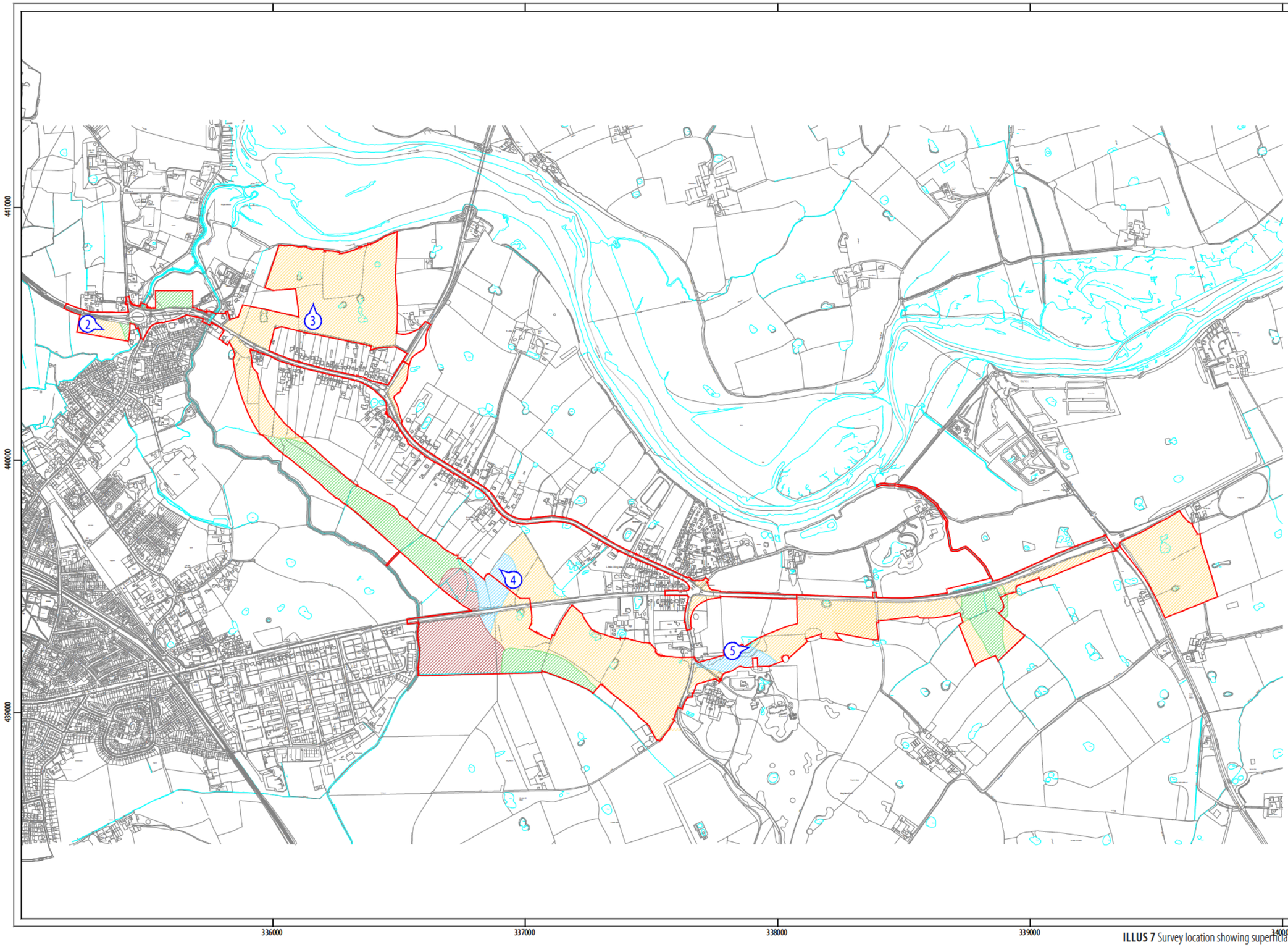
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 6 Survey location showing GPS swaths and sector boundaries (1:15,000)



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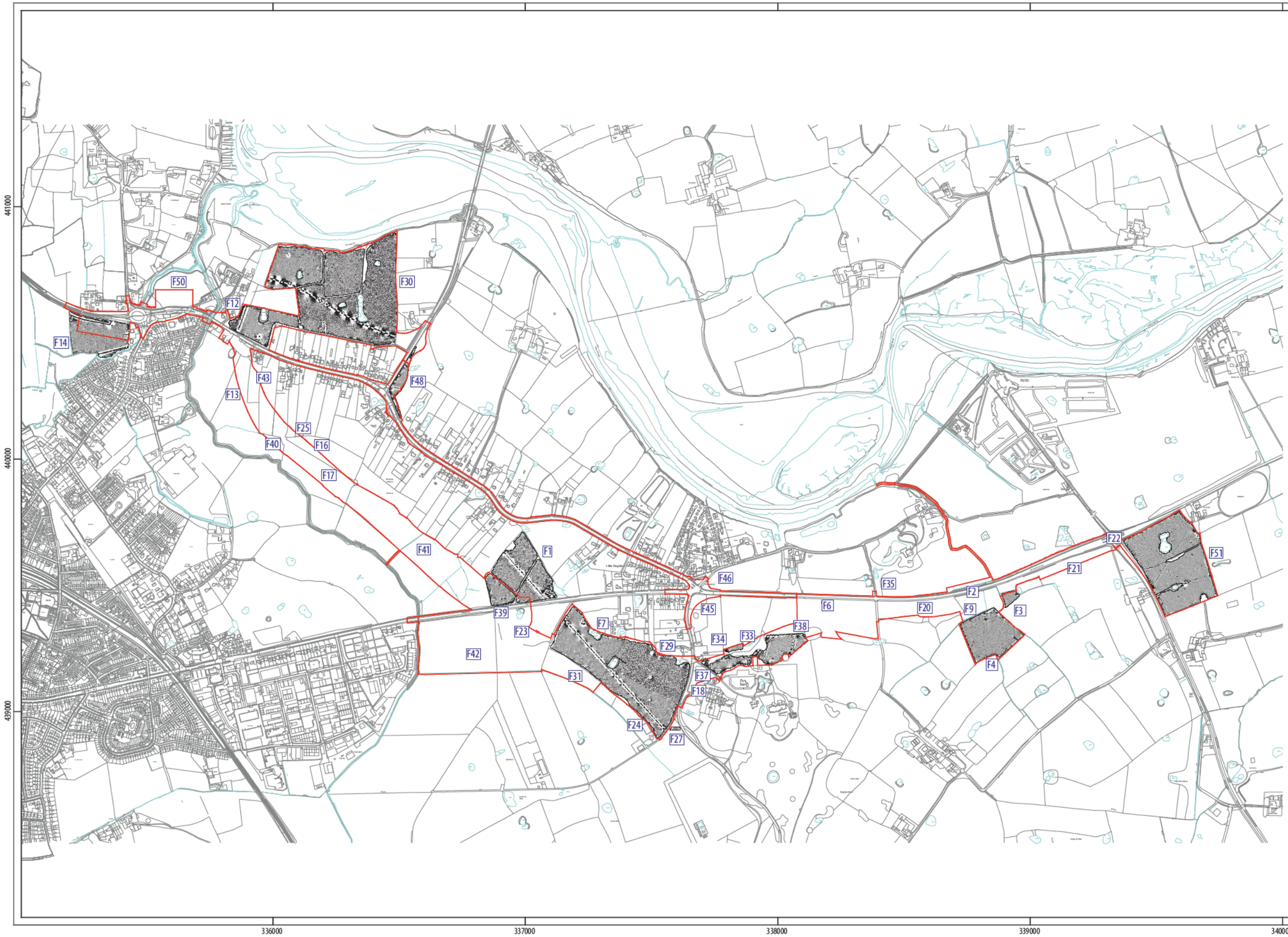
ILLUS 7 Survey location showing superficial geological deposits and photo locations (1:15,000)



nT
-1.0 2.0

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1:15,000 @ A3

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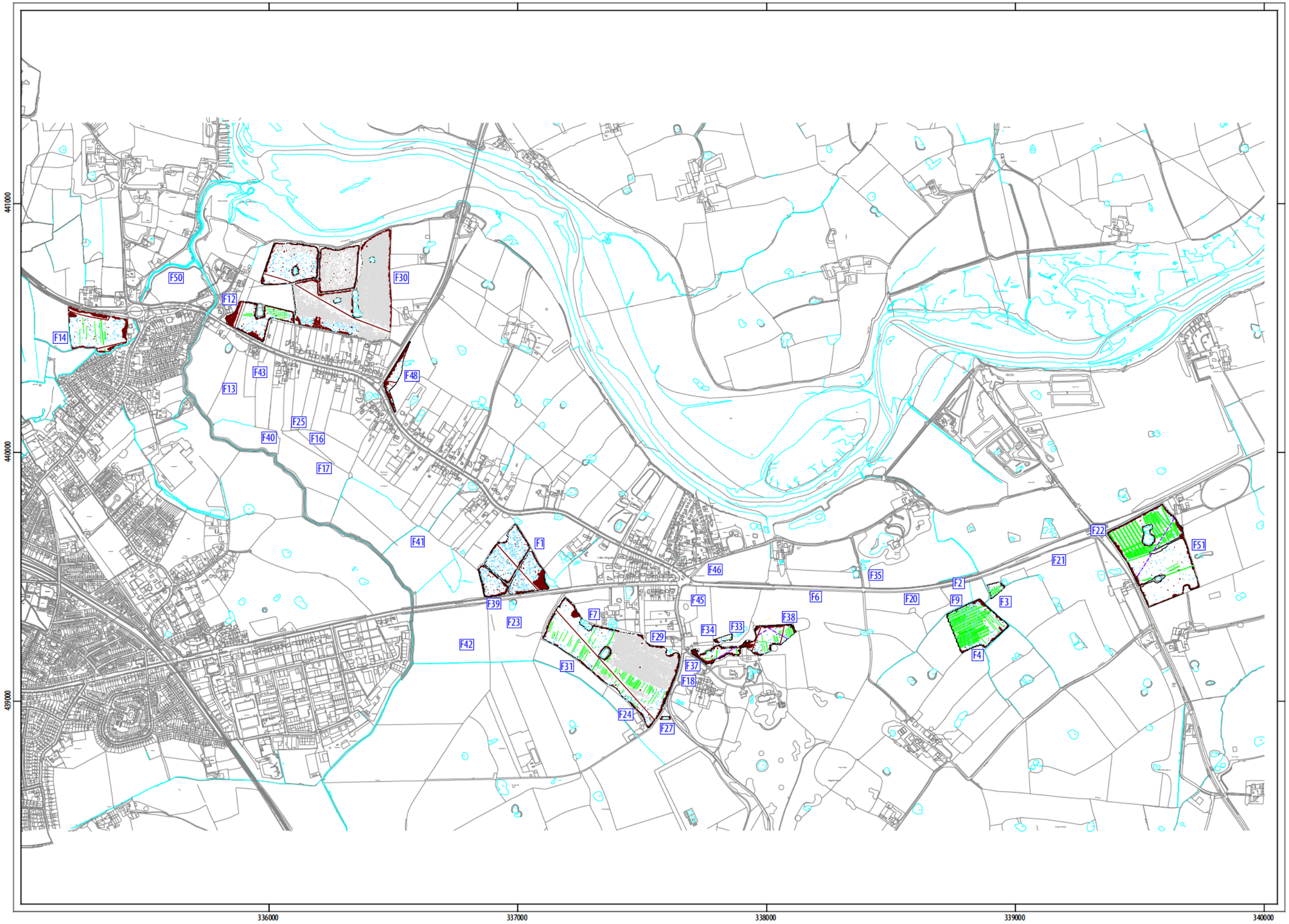
ILLUS 8 Processed greyscale magnetometer data (1:15,000)



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
linear	service pipe
magnetic disturbance	green waste
linear trend	agricultural
linear trend	field drain
linear	former field boundary
linear trend	geological variation
magnetic enhancement	geology
linear	unknown

0 500m
1:15,000 @ A3

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Illus 9 Interpretation of magnetometer data

ILLUS 9 Interpretation of magnetometer data (1:15,000)

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ILLUS 10 Processed greyscale magnetometer data; Sector 1 (1:2,500)

0 50m
1:2,500 @ A3

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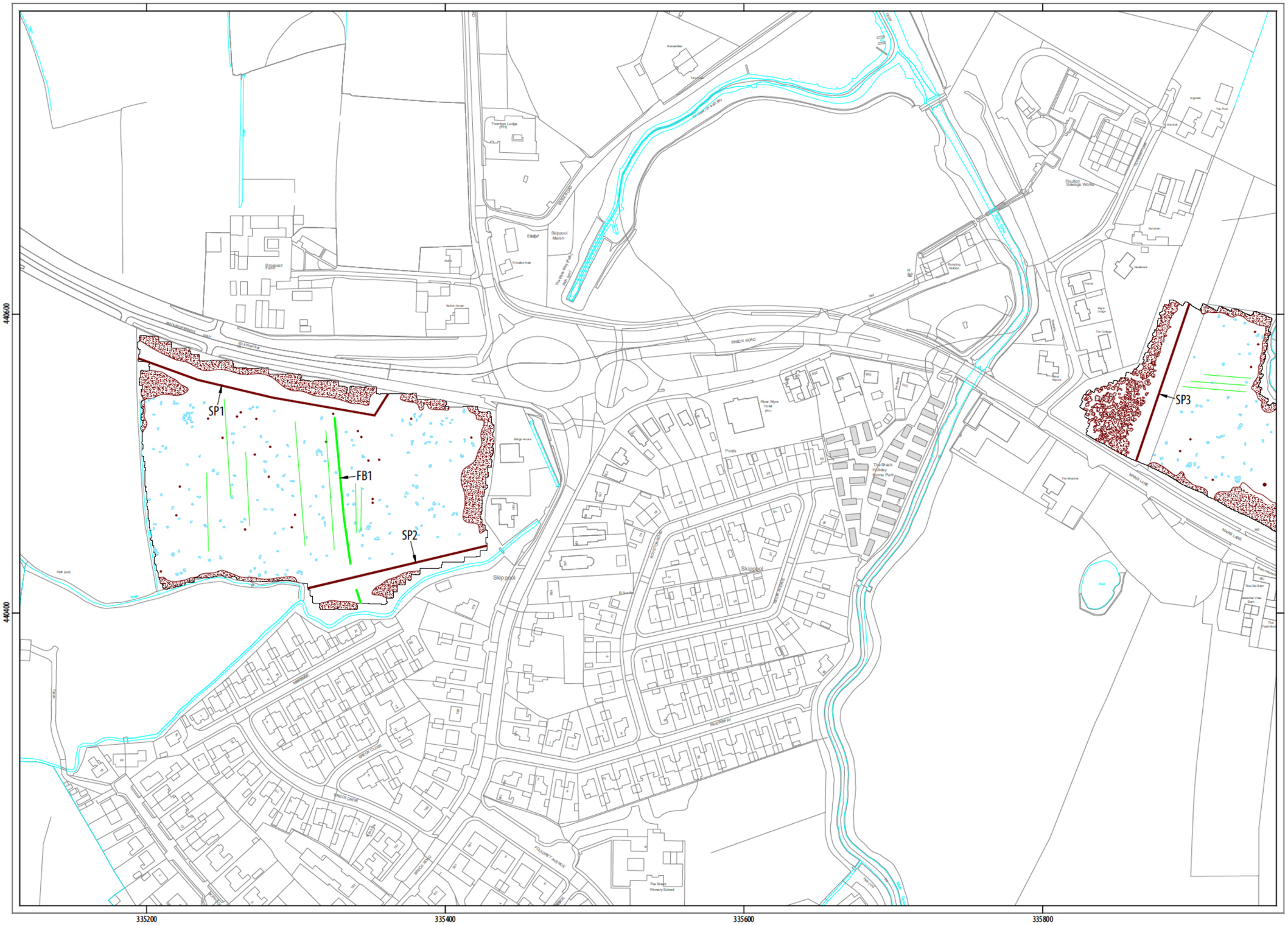
ILLUS 11 XY trace plot of minimally processed magnetometer data; Sector 1 (1:2,500)



ILLUS 12 Interpretation of magnetometer data; Sector 1 (1:2,500)

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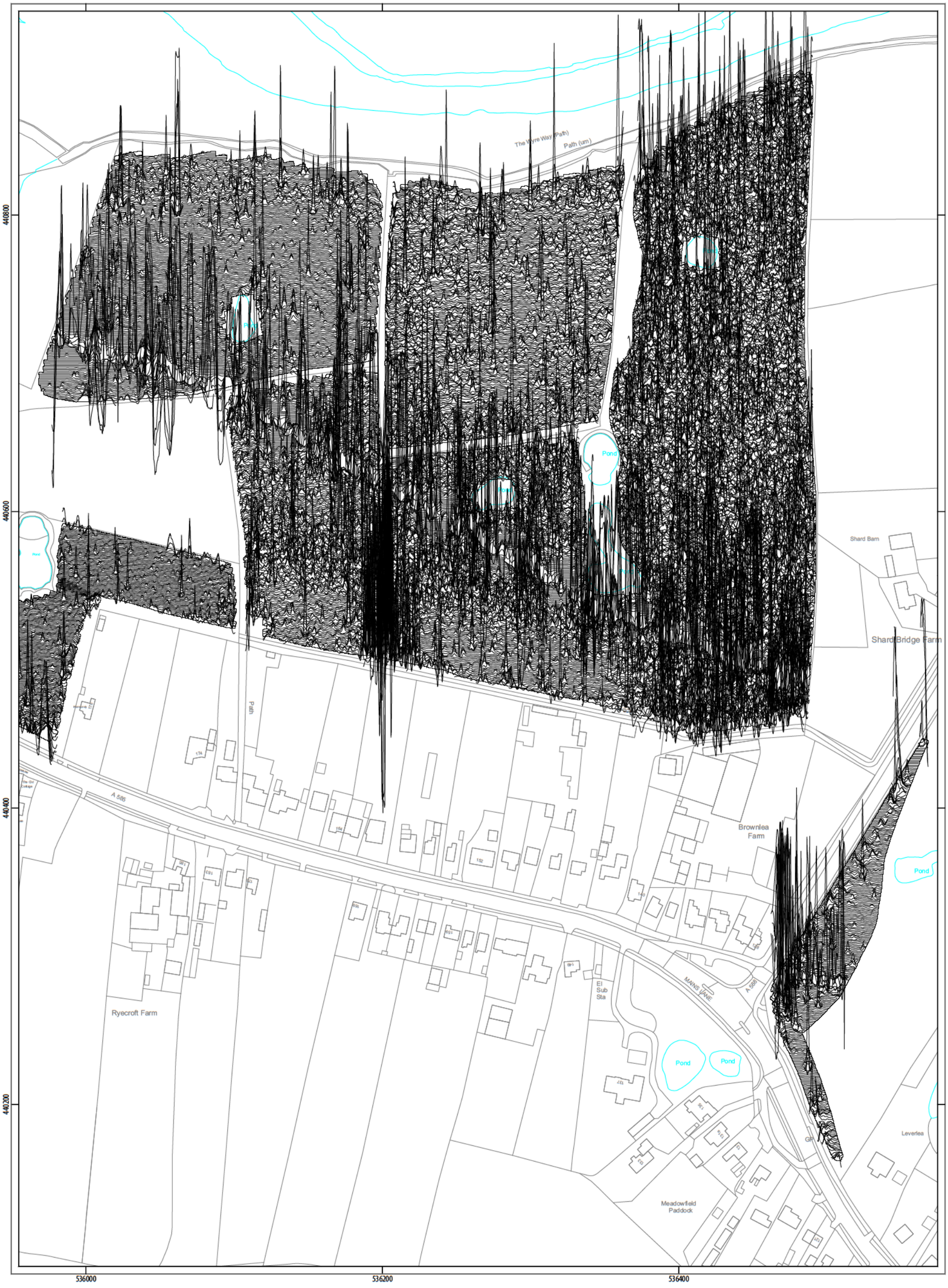
ILLUS 13 Processed greyscale magnetometer data; Sector 2 (1:2,500)



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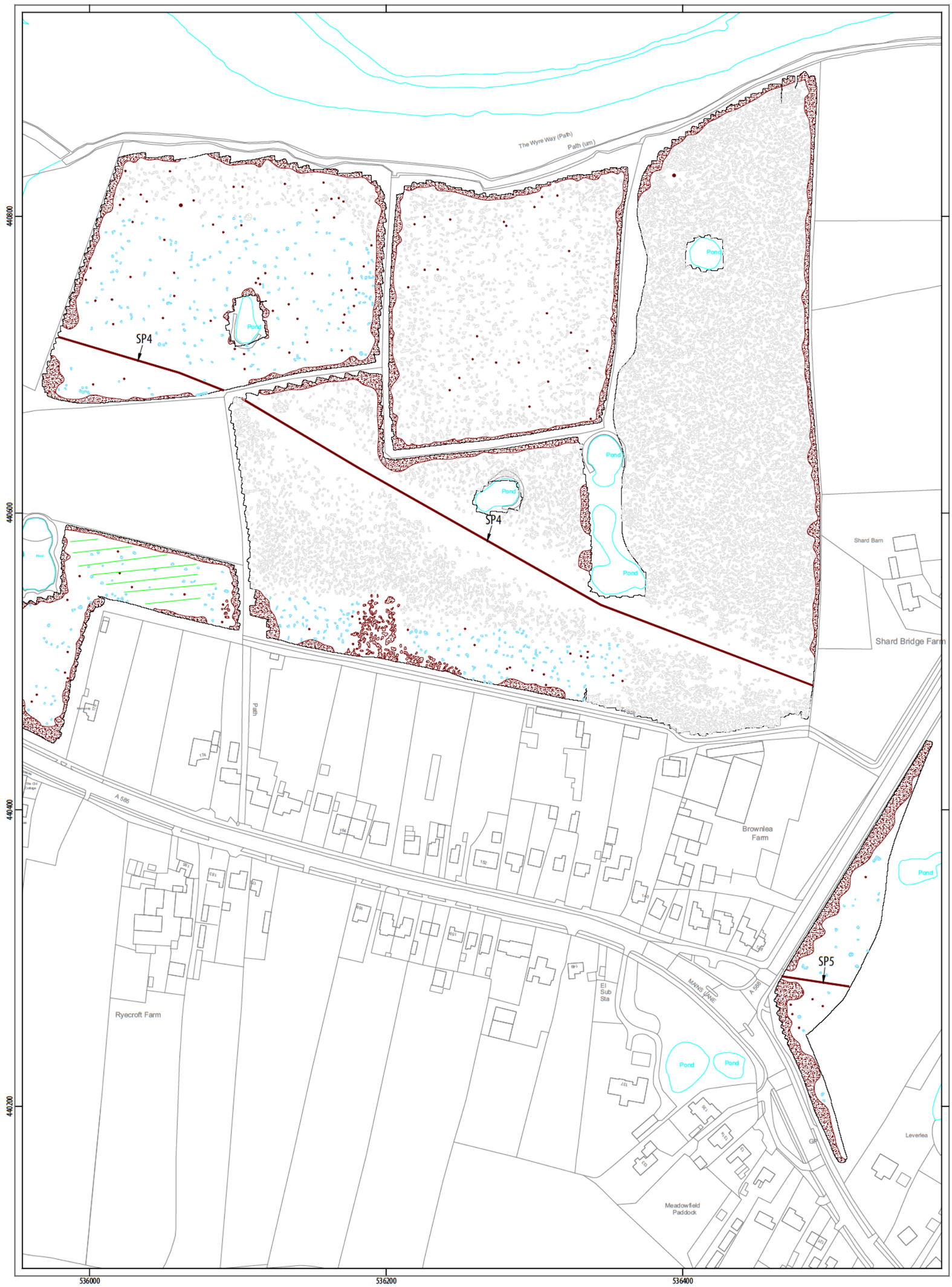
ILLUS 14 XY trace plot of minimally processed magnetometer data; Sector 2 (1:2,500)



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
magnetic disturbance	green waste
linear trend	agricultural
magnetic enhancement	geology

ABBREVIATIONS

SP service pipe

0 50m

1:2,500 @ A3

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ILLUS 15 Interpretation of magnetometer data; Sector 2 (1:2,500)

nT -1.0 2.0

0 50m 1:2,500 @ A3

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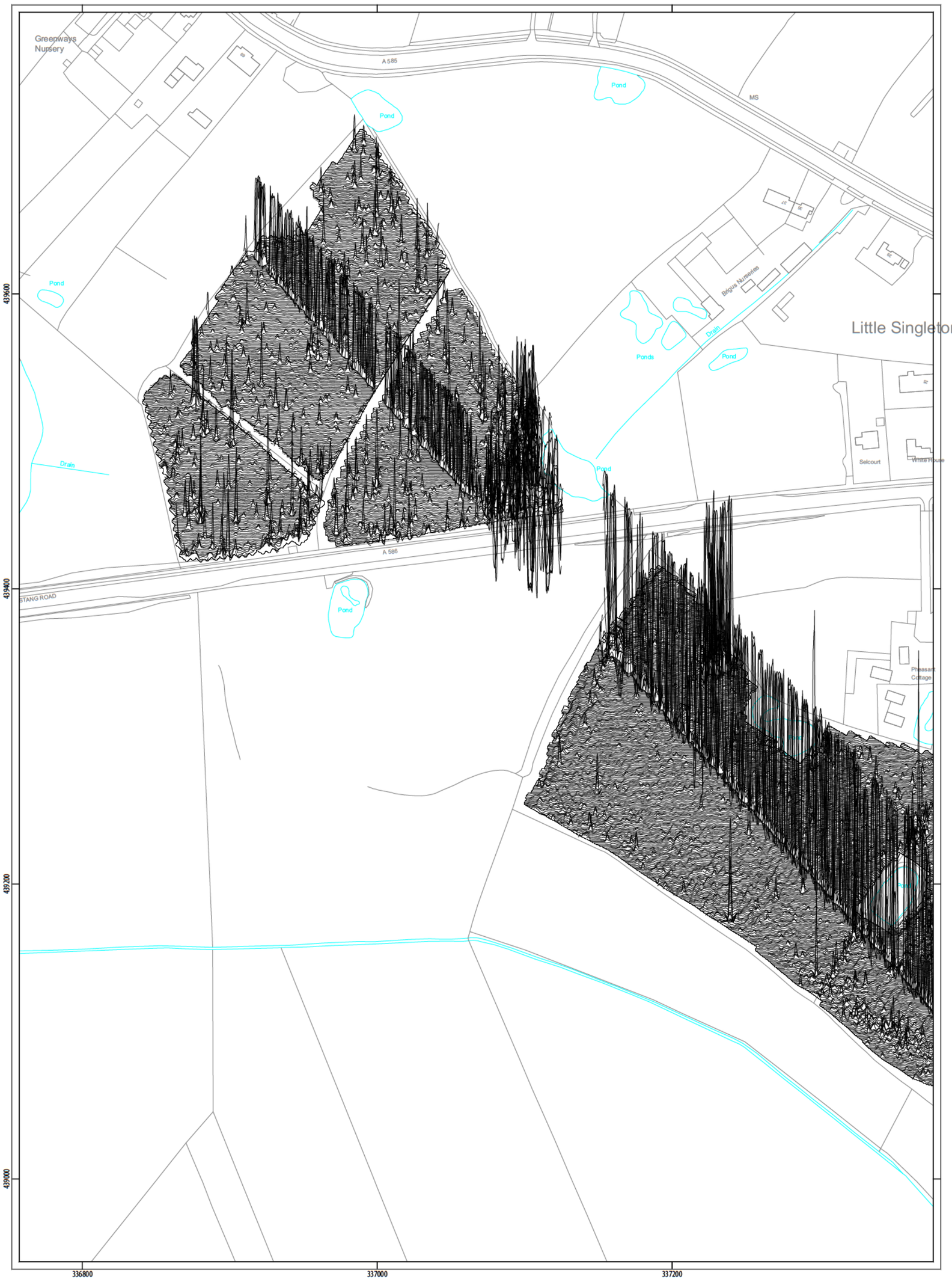
ILLUS 16 Processed greyscale magnetometer data; Sector 3 (1:2,500)



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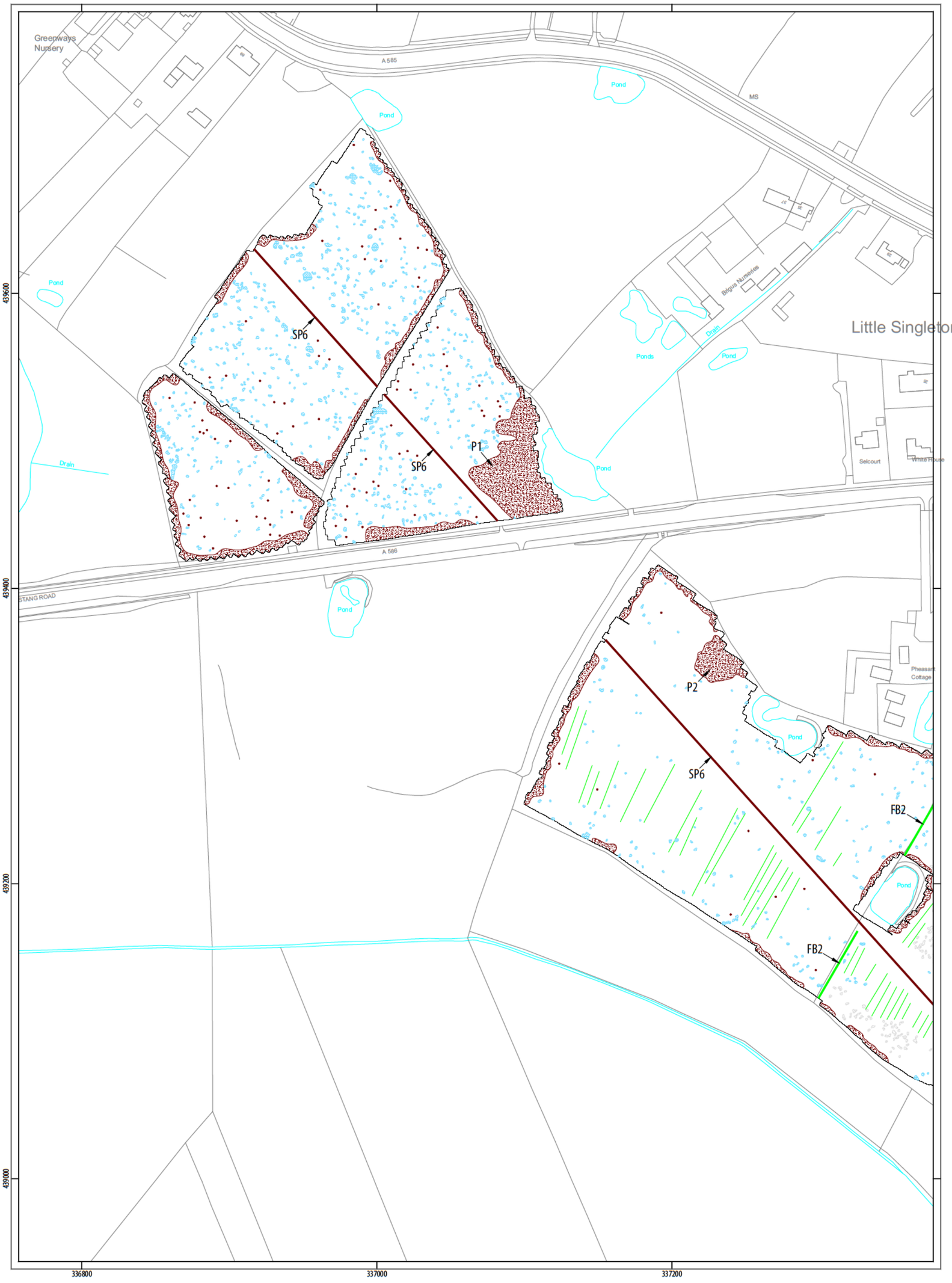
ILLUS 17 XY trace plot of minimally processed magnetometer data; Sector 3 (1:2,500)



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
magnetic disturbance	green waste
linear trend	agricultural
linear	former field boundary

TYPE OF ANOMALY	INTERPRETATION
magnetic enhancement	geology

ABBREVIATIONS	
FB	former boundary
P	pond
SP	service pipe

nT: -1.0 to 2.0

0 50m

1:2,500 @ A3

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ILLUS 18 Interpretation of magnetometer data; Sector 3 (1:2,500)

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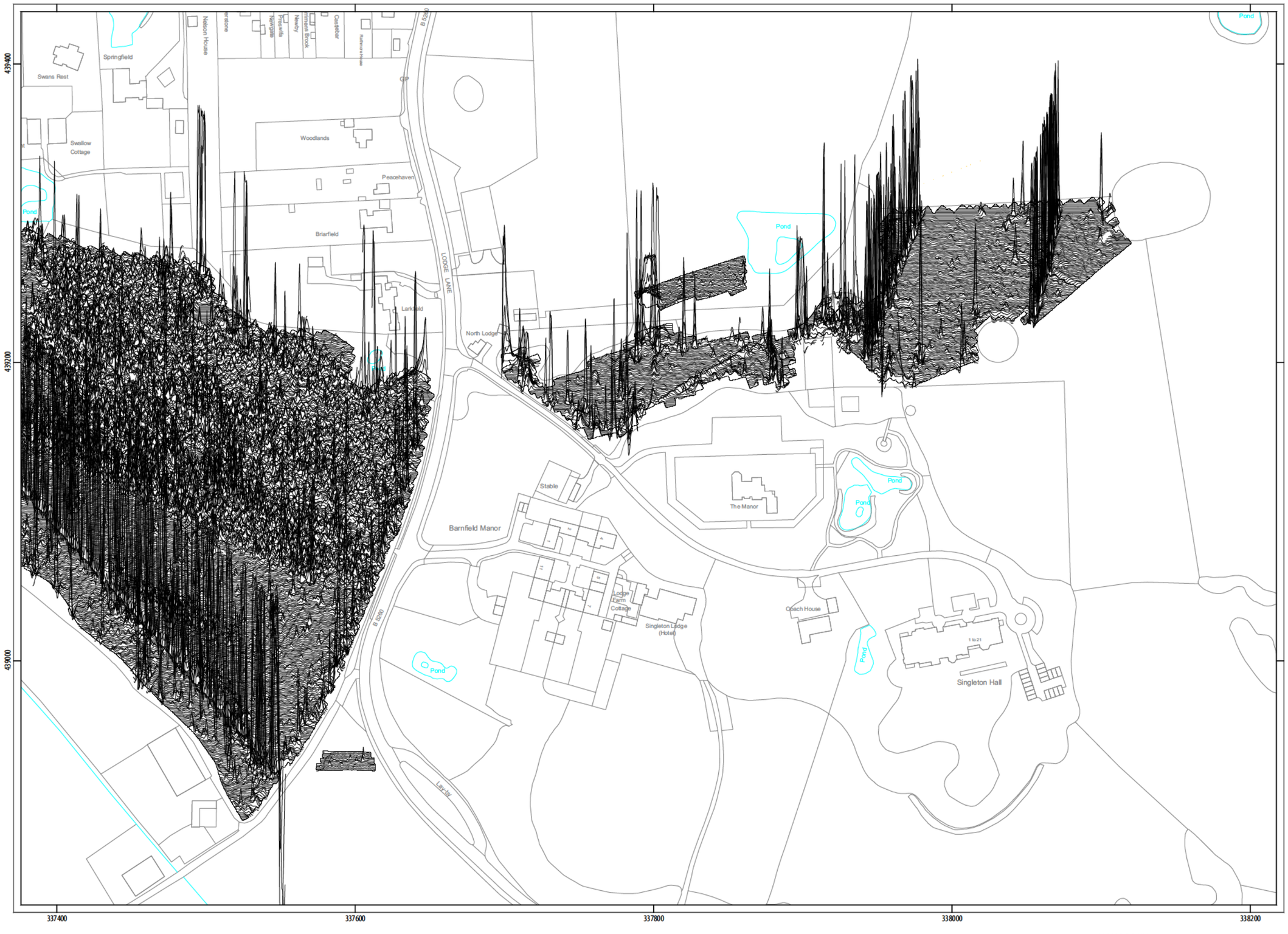
ILLUS 19 Processed greyscale magnetometer data; Sector 4 (1:2,500)



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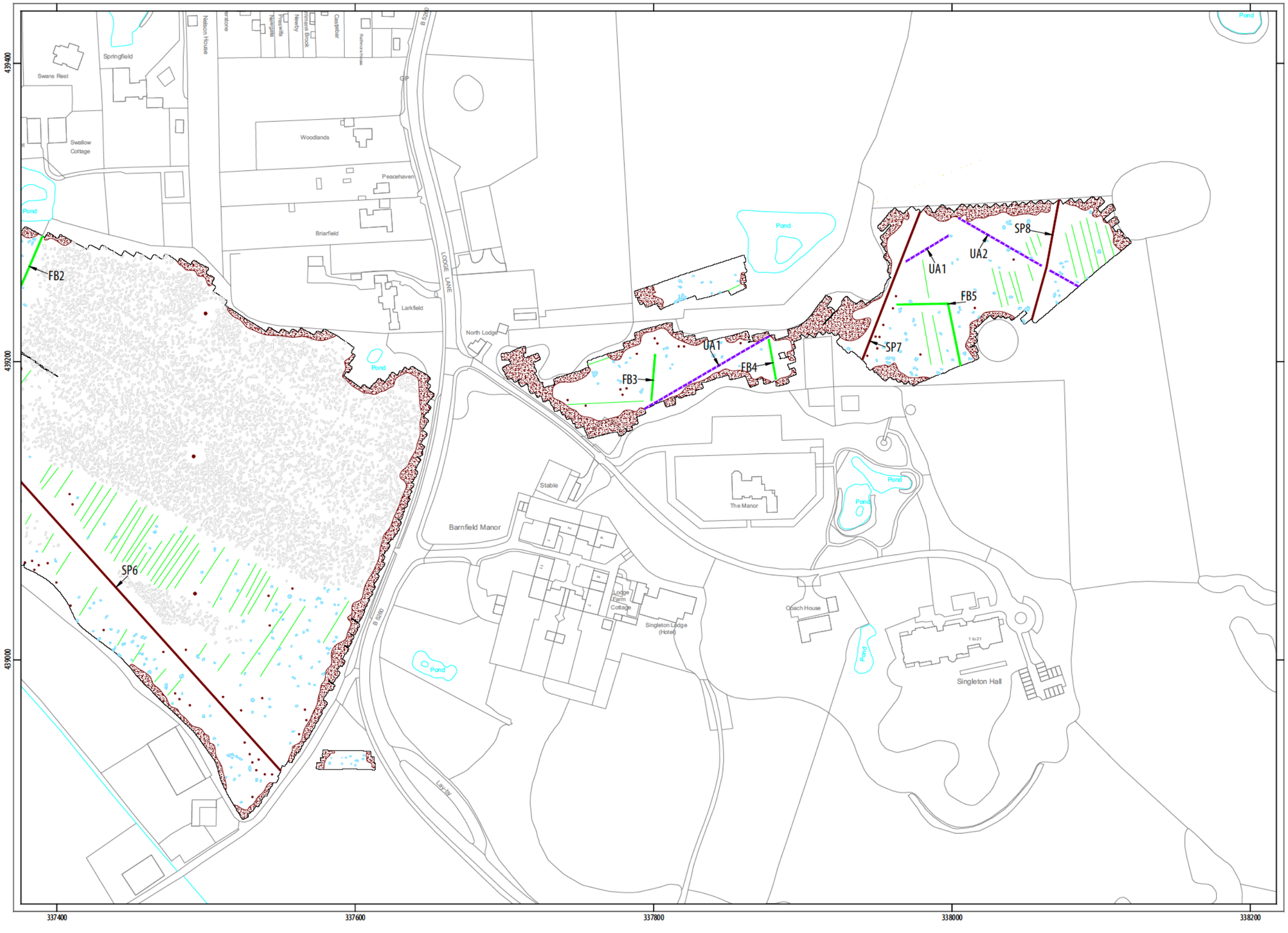
ILLUS 20 XY trace plot of minimally processed magnetometer data; Sector 4 (1:2,500)



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ILLUS 21 Interpretation of magnetometer data; Sector 4 (1:2,500)

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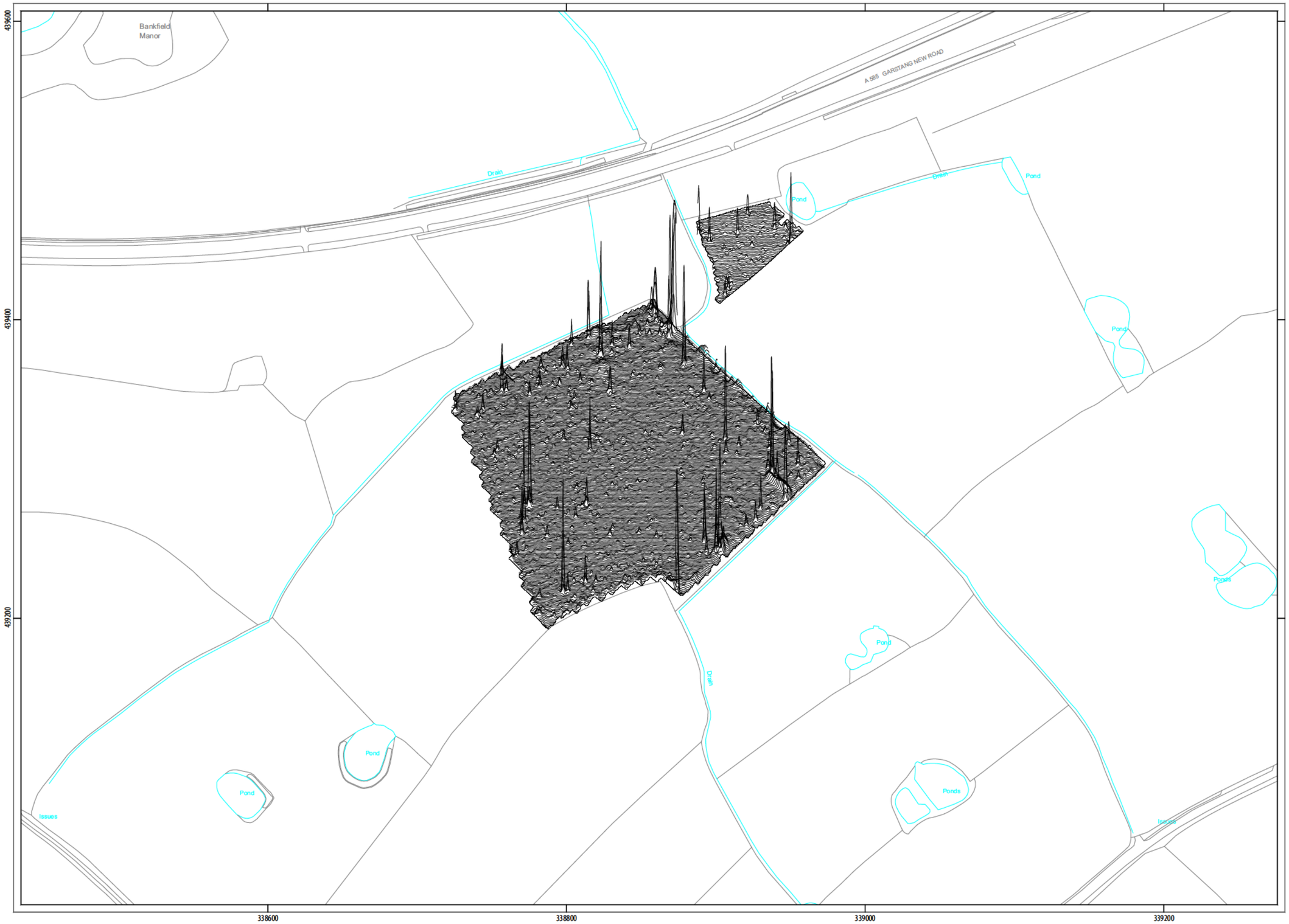
ILLUS 22 Processed greyscale magnetometer data; Sector 5 (1:2,500)



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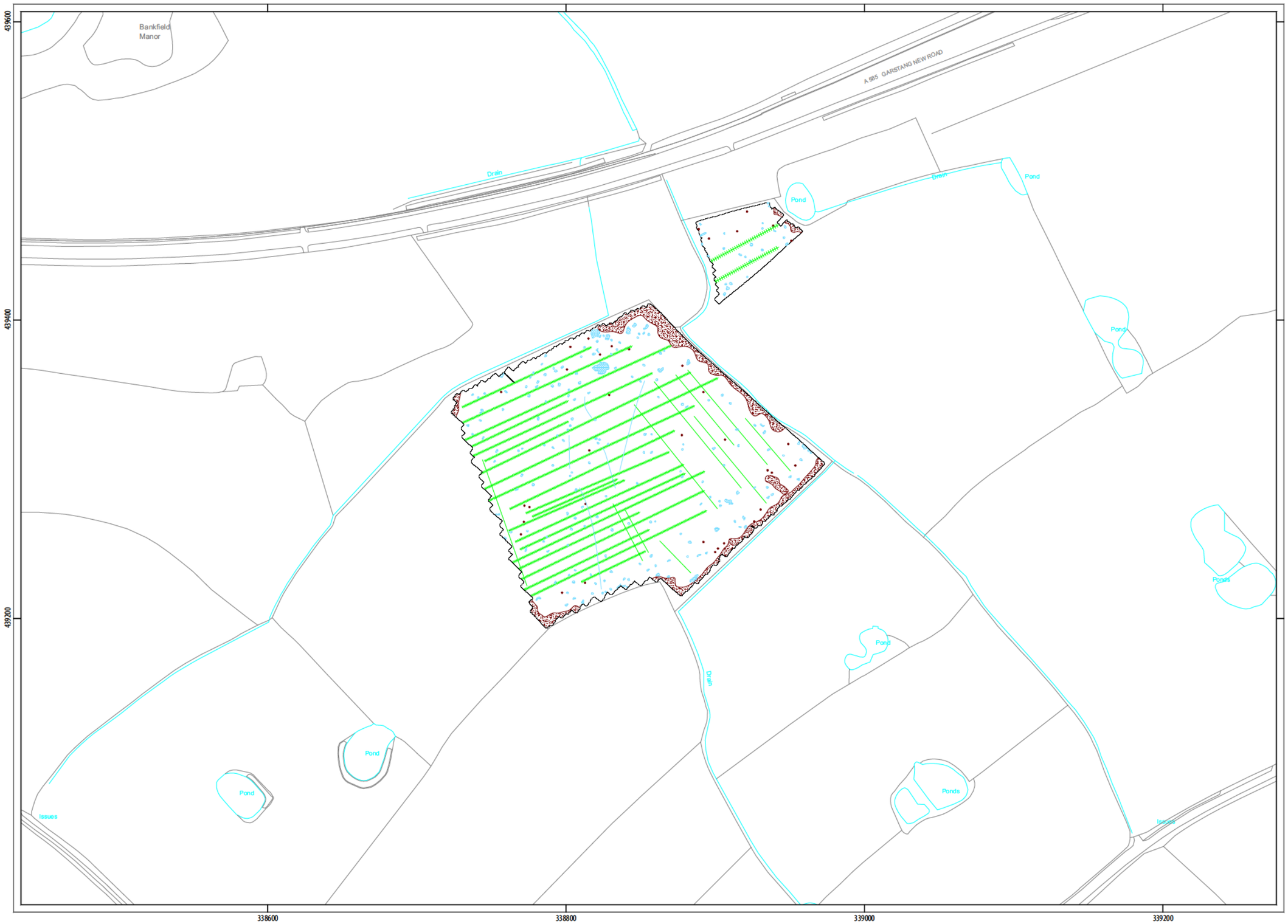
A585 Windy Harbour to Skippool Improvement Scheme
Lancashire

CLIENT Arcadis

HEADLAND ARCHAEOLOGY
NORTH Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 23 XY trace plot of minimally processed magnetometer data; Sector 5 (1:2,500)



0 50m
1:2,500 @ A3

PROJECT WHSI18
A585 Windy Harbour to Skippool Improvement Scheme
Lancashire

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HEADLAND ARCHAEOLOGY
NORTH Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
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ILLUS 24 Interpretation of magnetometer data; Sector 5 (1:2,500)

PROJECT WHSI18
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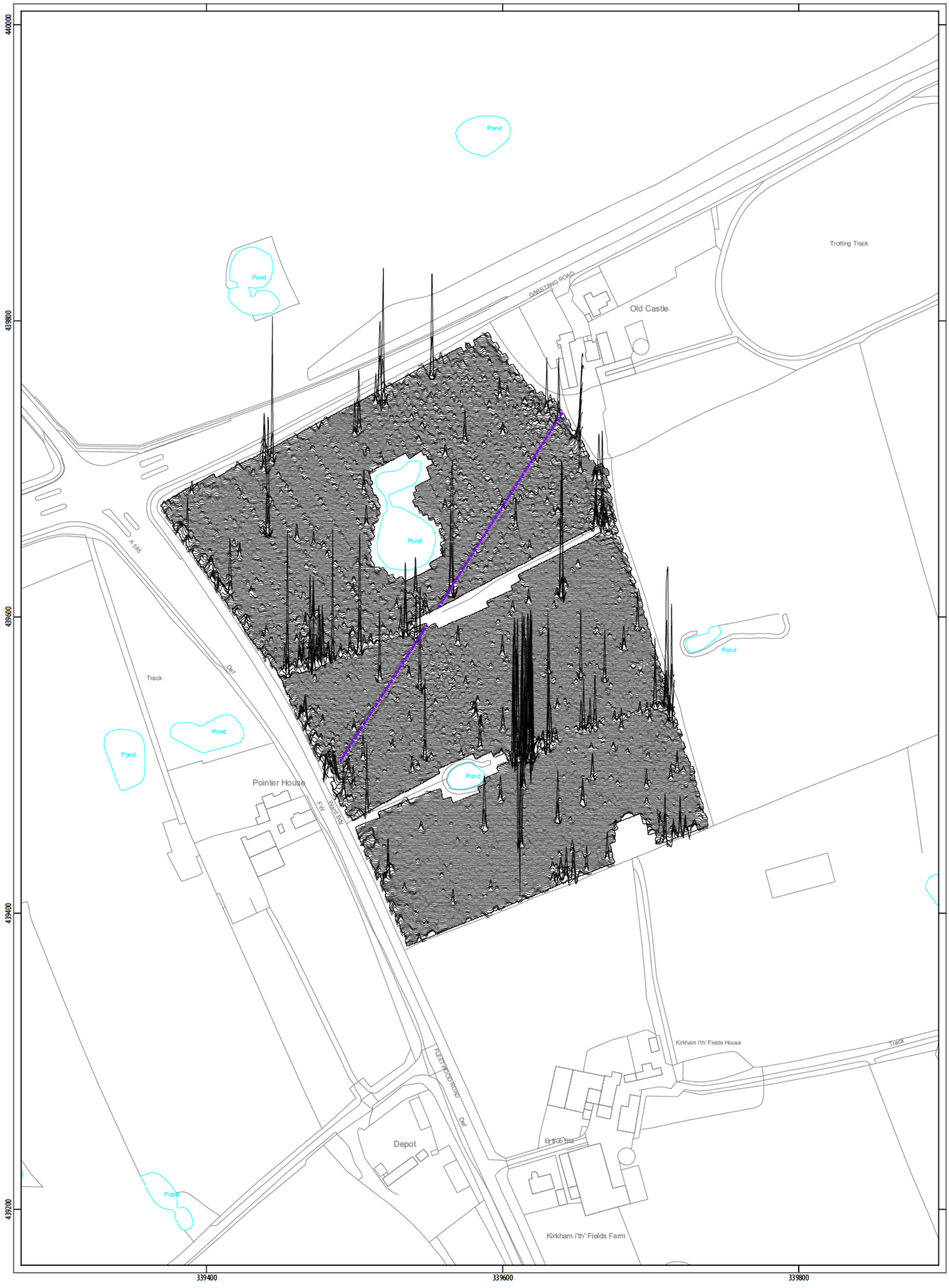
NORTH Unit 16, Hillside, Beeston Road
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 25 Processed greyscale magnetometer data; Sector 6 (1:2,500)



PROJECT	WHSI18 A585 Windy Harbour to Skippool Improvement Scheme Lancashire	
CLIENT	Arcadis	

0 50m
1:2,500 @ A3

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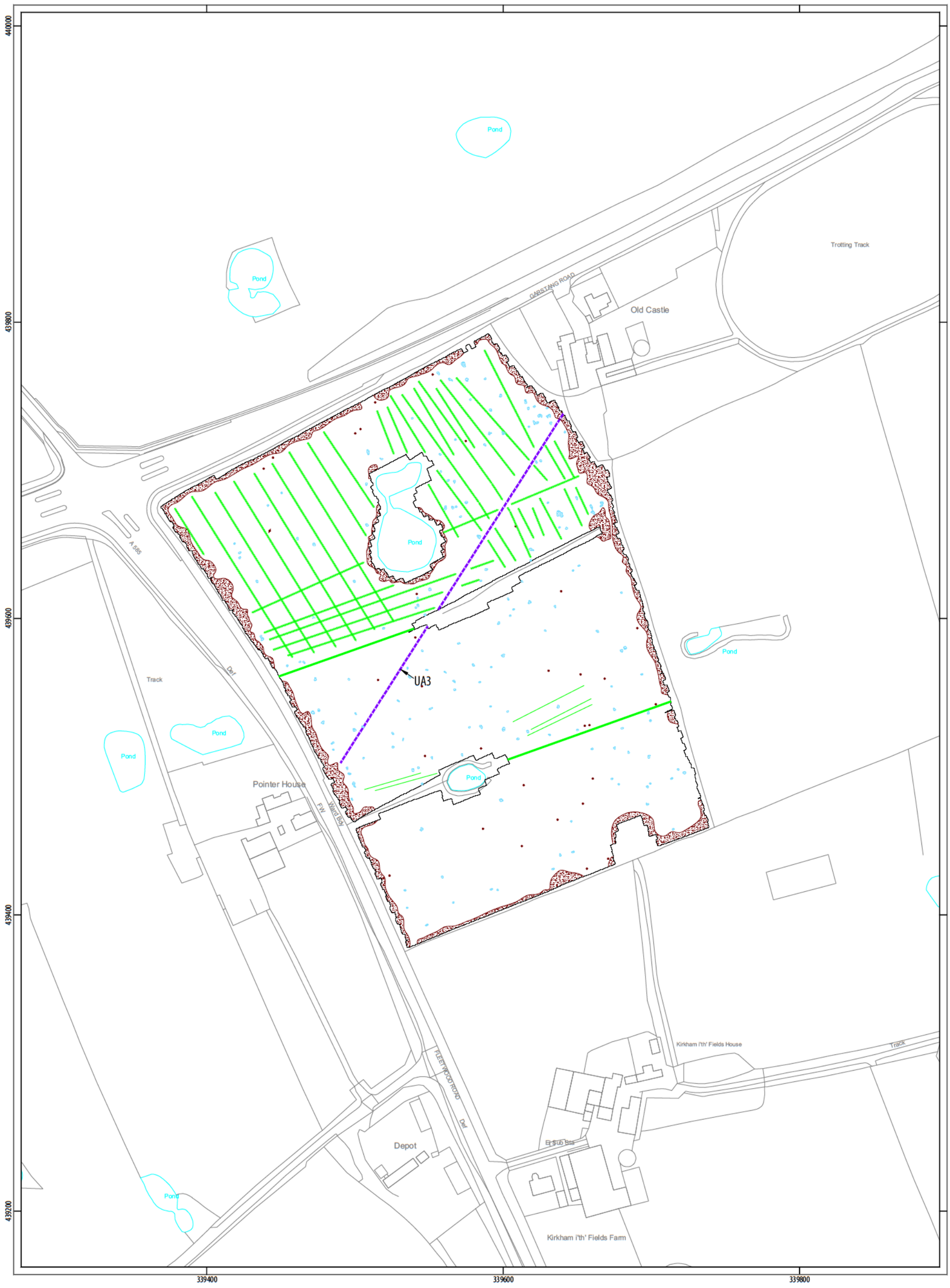
Leeds LS11 8ND
0113 387 6430
www.headlandarchaeology.com

ILLUS 26 XY trace plot of minimally processed magnetometer data; Sector 6 (1:2,500)



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
linear	service pipe
linear trend	agricultural
linear trend	field drain
linear	former field boundary

TYPE OF ANOMALY	INTERPRETATION
magnetic enhancement	geology

ABBREVIATIONS

UA unknown anomaly

0 50m

1:2,500 @ A3

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NORTH Unit 16, Hillside, Beeston Road Leeds LS11 8ND 0113 387 6430 www.headlandarchaeology.com

ILLUS 27 Interpretation of magnetometer data; Sector 6 (1:2,500)

7 APPENDICES

APPENDIX 1 MAGNETOMETER SURVEY

Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

Types of magnetic anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes) These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report.

The project will be archived in-house in accordance with recent good practice guidelines (http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3). The data will be stored in an indexed archive and migrated to new formats when necessary.

APPENDIX 4 DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) in order to maximise the clarity and interpretability of the archaeological anomalies.

The data has also been clipped to remove extreme values and to improve data contrast.

APPENDIX 5 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-325605

Project details	
Project name	A585 Windy Harbour to Skippool Improvement Scheme
Short description of the project	Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey of a 90 hectare site in Little Singleton, Lancashire to provide further information on the archaeological potential along the proposed route of the A585 Improvement Scheme. This interim report presents the results of the A585 survey undertaken to date, an area of 49 hectares. No anomalies of definite or possible archaeological potential have been identified by the survey. The survey has mainly identified anomalies consistent with the agricultural landscape such as former boundaries, field drains and ploughing, as well as areas of magnetic disturbance that correspond with the locations of former ponds identified on historical maps. On the basis of the geophysical survey undertaken to date, the archaeological potential along the route is assessed as low although the spreading of 'green waste' in some areas has the potential to 'mask' archaeological anomalies, if present. Survey of the remaining fields may provide additional information on the overall archaeological potential along the route. All of the data will be re-evaluated upon completion of the survey.
Project dates	Start: 11-06-2018 End: 20-06-2018
Previous/future work	Not known / Not known
Any associated project reference codes	WHSI18 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 4 - Character Undetermined
Monument type	N/A None
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Methods & techniques	"Geophysical Survey"
Development type	Road scheme (new and widening)
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application
Solid geology (other)	Singleton Mudstone Member (mudstone)
Drift geology (other)	diamicton, Tidal Flat Deposits, peat and Glaciofluvial Deposits
Techniques	Magnetometry
Project location	
Country	England
Site location	LANCASHIRE FYLDE SINGLETON A585 Windy Harbour to Skippool Improvement Scheme
Study area	90 Hectares
Site coordinates	SD 3939 3966 53.849425156108 -2.9214235126 42 53 50 57 N 002 55 17 W Line
Site coordinates	SD 3532 4052 53.856663227882 -2.983469174458 53 51 23 N 002 59 00 W Line
Project creators	
Name of Organisation	Headland Archaeology
Project brief originator	Arcadis
Project design originator	Headland Archaeology
Project director/manager	Harrison, S
Project supervisor	Vansassenbrouck, O.
Type of sponsor/funding body	Developer

Project archives	
Physical Archive Exists?	No
Digital Archive recipient	In house
Digital Contents	"other"
Digital Media available	"Geophysics"
Paper Archive Exists?	No
Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	A585 Windy Harbour to Skippool Improvement Scheme: Geophysical Survey
Author(s)/Editor(s)	Vansassenbrouck, O.
Other bibliographic details	WHSI18
Date	2018
Issuer or publisher	Headland Archaeology
Place of issue or publication	Edinburgh
Description	A4 Glue bound report and PDF/A
Entered by	Sam Harrison (sam.harrison@headlandarchaeology.com)
Entered on	13 August 2018

Headland Archaeology South & East
Building 68C | Wrest Park | Silsoe | Bedfordshire MK45 4HS
t 01525 861 578
e southandeast@headlandarchaeology.com

Headland Archaeology Midlands & West
Unit 1 | Clearview Court | Twyford Rd | Hereford HR2 6JR
t 01432 364 901
e midlandsandwest@headlandarchaeology.com

Headland Archaeology North
Unit 16 | Hillside | Beeston Rd | Leeds LS11 8ND
t 0113 387 6430
e north@headlandarchaeology.com

Headland Archaeology Scotland
13 Jane Street | Edinburgh EH6 5HE
t 0131 467 7705
e scotland@headlandarchaeology.com

www.headlandarchaeology.com