



**magnitude
surveys**

**Geophysical Survey Report
of
Lullington
South Derbyshire**

**For
Lanpro Services**

Magnitude Surveys Ref: MSSK804A

December 2020



magnitude surveys

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Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c.67.12ha area of land at Lullington, South Derbyshire. A fluxgate gradiometer survey was successfully completed across the survey area. Agricultural features including ridge and furrow cultivation, a former mapped field boundary, modern ploughing and drains have been identified. Two mapped former ponds have also been identified within the survey area. Some anomalies classified as 'Undetermined' were identified within the survey area and while archaeological interpretations for these cannot be excluded, no anomalies suggestive of significant archaeological activity have been identified. The impact of modern activity on the site is limited to magnetic interference around field perimeters and that caused by pylons.

Contents

Abstract.....	2
List of Figures	4
1. Introduction	5
2. Quality Assurance	5
3. Objectives.....	5
4. Geographic Background.....	6
5. Archaeological Background.....	7
6. Methodology.....	8
6.1. Data Collection.....	8
6.2. Data Processing.....	8
6.3. Data Visualisation and Interpretation.....	9
7. Results.....	9
7.1. Qualification.....	9
7.2. Discussion.....	10
7.3. Interpretation.....	10
7.3.1. General Statements	10
7.3.2. Magnetic Results - Specific Anomalies.....	11
8. Conclusions	12
9. Archiving	13
10. Copyright.....	13
11. References	13
12. Project Metadata	14
13. Document History	14

List of Figures

Figure 1:	Site Location	1:25,000 @ A4
Figure 2:	Location of Survey Areas	1:5,000 @ A3
Figure 3:	Magnetic Total Field - Lower Sensor (Overview) (West)	1:3,000 @ A3
Figure 4:	Magnetic Interpretation Over Historic Maps (Overview) (West)	1: 3,000 @ A3
Figure 5:	Magnetic Total Field - Lower Sensor (Overview) (East)	1:3,000 @ A3
Figure 6:	Magnetic Interpretation Over Historical Maps (Overview) (East)	1:3,000 @ A3
Figures 7-9:	Magnetic Gradient, Magnetic Interpretation, XY Trace Plot (Northwest)	1:1,500 @ A3
Figure 10-12:	Magnetic Gradient, Magnetic Interpretation, XY Trace Plot (Southwest)	1:1,500 @ A3
Figure 13-15:	Magnetic Gradient, Magnetic Interpretation, XY Trace Plot (Centre-North)	1:1,500 @ A3
Figure 16-18:	Magnetic Gradient, Magnetic Interpretation, XY Trace Plot (Centre-South)	1:1,500 @ A3
Figure 19-21:	Magnetic Gradient, Magnetic Interpretation, XY Trace Plot (Southeast)	1:1,500 @ A3
Figure 22-24:	Magnetic Gradient, Magnetic Interpretation, XY Trace Plot (East)	1:1,500 @ A3
Figure 25-27:	Magnetic Gradient, Magnetic Interpretation, XY Trace Plot (Northeast)	1:1,500 @ A3

1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by Lanpro Services to undertake a geophysical survey on a c.67.12ha area of land at Lullington, South Derbyshire (SK 24367 13985).
- 1.2. The geophysical survey comprised hand-pulled, cart-mounted and hand-carried GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK for its ability to detect a range of different features. The technique is particularly suited for detecting fired or magnetically enhanced features, such as ditches, pits, kilns, sunken earth houses, and industrial activity (David *et al.*, 2008).
- 1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David *et al.*, 2008), the Chartered Institute for Archaeologists (CIfA, 2014) and the European Archaeological Council (Schmidt *et al.*, 2015).
- 1.4. It was conducted in line with a WSI produced by MS (Beck, 2020)
- 1.5. The survey commenced on 16.11.2020 and took ten days to complete.

2. Quality Assurance

- 2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society of Archaeological Prospection).
- 2.2. The directors of MS are involved in the cutting edge of research and the development of guidance/policy. Specifically, Dr. Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CIfA and is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr. Kayt Armstrong has a PhD in archaeological geophysics from Bournemouth University, is a Member of CIfA, the Editor of ISAP News, and is the UK Management Committee representative for the COST Action SAGA; Dr. Paul Johnson has a PhD in archaeology from the University of Southampton, has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.
- 2.3. All MS managers have relevant degree qualifications to archaeology or geophysics. All MS field and office staff have relevant archaeology or geophysics degrees and/or field experience.

3. Objectives

- 3.1. 3.1 The objective of this geophysical survey was to assess the subsurface archaeological potential of the survey area.

4. Geographic Background

4.1. The survey area was located c.600m north of Lullington (Figure 1). Gradiometer survey was undertaken across 11 fields, under both arable use and pasture. The survey area was bounded by Burton Road to the west, Main Street to the east, with Lullington Road crossing the survey area north-south, and further fields located to the north and south of the survey area (Figure 2). An area of c.2.27ha was not surveyed due to waterlogged ground conditions and standing water.

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	The area consisted of an arable, flat field with a young crop present.	The area was bounded by Main Street and hedges to the east, and by hedges to the south, west and north.
2	The area consisted of an arable field with a young crop present. The area was predominantly flat, slightly sloping down towards the west. In the southern part boggy ground made some patches unsurveyable.	The area was bounded by Main Street and hedges to the east, and by hedges to the south, west and north.
3	The area consisted of an arable field, with a young crop present. The area was predominantly flat, with a gentle slope down towards the field edges. In the north-eastern part, there were unsurveyable areas, due to waterlogging.	The area was bounded by hedges in all directions, and additionally by a ditch to the south (boundary with Area 4), and a line of trees to the north.
4	The area consisted of an arable, flat field with a young crop present. In the south-eastern part some areas were unsurveyable due to waterlogging.	The survey area was bounded by hedges in all directions, additionally by a ditch to the north (boundary with Area 3).
5	The area consisted of an arable field with a young crop present. The area was predominantly flat, slightly sloping down towards the east. In the north-eastern part as well as south-eastern part, there were unsurveyable areas, due to waterlogging.	The survey area was bounded by hedges in all directions.
6	The area consisted of a pasture field. The area was predominantly flat, slightly sloping down towards the east.	The survey area was bounded by hedges and metal fencing in all directions. The survey area was cut in the southern part, by a powerline cable with three poles.

7	The area consisted of an arable field with a young crop present. The area was predominantly flat, slightly sloping down towards the west.	The survey area was bounded by hedges in all directions and additionally by Lullington Road to the east. On the axis east-west, in the southern part, powerline with 4 poles occurred.
8	The area consisted of an arable, flat field with a young crop present. Heavily boggy zone occurred in the eastern and southern part of surveyed area and remained unsurveyable.	The survey area was bounded by hedges in all directions, and additionally by Lullington Road to the west. On the axis north-south, in the central part, powerline with one pole occurred.
9	The area consisted of an arable, flat field with a young crop present.	The survey area was bounded by hedges in all directions, and additionally by Lullington Road to the east and a ditch to the south.
10	The area was predominantly flat, slightly sloping down towards the east. In the south-eastern part, a pond occurred. A small patch of the area was unsurveyable, due to a manure pile which is situated right next to the pond.	The survey area was bounded by hedges in all directions, and additionally by Lullington Road to the east, and Burton Road to the west.
11	The area consisted of an arable, flat field with a young crop present. Within the survey area, two big trees (western side) as well as a pond (southeast corner) occurred.	The survey area was bounded by hedges in all directions, and additionally by Burton Road to the west. The survey area was bisected by an overhead service with two pylons located within the survey area. A telephone line follows the southern field boundary.

4.3. The underlying geology comprises Gunthorpe mudstone and siltstone. Superficial deposits consist of glaciofluvial sand and gravel as well as clay and silt (British Geological Survey, 2020).

4.4. The soils consist of slightly acid, loamy and clayey soils with impeded drainage and slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils (Soilscapes, 2020).

5. Archaeological Background

5.1. *Awaiting Background Information (DBA or other) from Client.*

6. Methodology

6.1. Magnetometer surveys are generally the most cost effective and suitable geophysical technique for the detection of archaeology in England. Therefore, a magnetometer survey should be the preferred geophysical technique unless its use is precluded by any specific survey objectives or the site environment. For this site, no factors precluded the recommendation of a standard magnetometer survey. Geophysical survey therefore comprised the magnetic method as described in the following section.

6.2. Data Collection

6.2.1. Geophysical prospection comprised the magnetic method as described in the following table.

6.2.2. Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Magnetic	Bartington Instruments Grad-13 Digital Three-Axis Gradiometer	1m	200Hz reprojected to 0.125m

6.2.3. The magnetic data were collected using MS' bespoke hand-pulled cart system and hand-carried, GNSS-positioned system.

6.2.3.1. MS' cart and hand-carried system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.2.3.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

6.2.3.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

6.3. Data Processing

6.3.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to Historic England's standards for "raw or minimally processed data" (see sect 4.2 in David et al., 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen et al. (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

6.4.Data Visualisation and Interpretation

- 6.4.1.This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the upper and/or lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images of the gradient and total field at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figures 9, 12, 15, 18, 21, 24 and 27). XY trace plots visualise the magnitude and form of the geophysical response, aiding in anomaly interpretation.
- 6.4.2.Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historic maps, LiDAR data, and soil and geology maps. Google Earth (2020) was consulted as well, to compare the results with recent land usages.
- 6.4.3.Geodetic position of results - All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

7. Results

7.1.Qualification

- 7.1.1.Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek

feedback on their reports as well as reports of further work in order to constantly improve our knowledge and service.

7.2. Discussion

7.2.1. A fluxgate gradiometer survey was successfully completed across all but c.2.27ha of the survey area, which could not be surveyed due to waterlogged ground conditions. The geophysical results are presented in consideration with historical maps (Figures 4 and 6).

7.2.2. The fluxgate gradiometer survey has responded well to the environment of the survey area. The geophysical survey has primarily detected historical and modern agricultural activity, with drainage systems evident across the landscape. The impact of modern activity on the results is generally limited to magnetic interference from two pylons, as well as fencing and metal objects at the edges of survey areas. No anomalies suggestive of significant archaeological features were identified, though archaeological origins cannot be ruled out for several anomalies classified as 'Undetermined' within the survey area.

7.2.3. Evidence of agricultural activity has been detected throughout the survey area in the form of ridge and furrow cultivation in several fields and a mapped former field boundary in the western part of the survey area (Figure 4). The presence of ridge and furrow ploughing regimes indicate that the area has been under cultivation since at least the medieval/post-medieval period. Modern ploughing trends and drainage features have also been detected across the majority of the survey area. Broad sinuous bands across parts of the survey area have been interpreted as natural variations, which are best seen in the Total Field data (Figures 3 and 5). The banding likely relates to the glaciofluvial conditions under which the superficial deposits were laid down, and reflects differences in the composition and texture of said deposits.

7.3. Interpretation

7.3.1. General Statements

7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.

7.3.1.2. **Ferrous (Spike)** – Discrete ferrous-like, dipolar anomalies are likely to be the result of isolated modern metallic debris on or near the ground surface.

7.3.1.3. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentrated deposition of discrete, dipolar ferrous anomalies and other highly magnetic material.

7.3.1.4. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures along the edges of the field have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure the response of any weaker underlying features, should they be present, often over a greater footprint than the structure they are being caused by.

7.3.1.5. **Undetermined** – Anomalies are classified as Undetermined when the anomaly origin is ambiguous through the geophysical results and there is no supporting or correlative evidence to warrant a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally not ferrous in nature.

7.3.2. Magnetic Results - Specific Anomalies

7.3.2.1. **Ridge and Furrow (Trend)** – Arrangements of regularly-spaced weak linear and curvilinear anomalies have been identified, located in Areas 3, 4, 6 and 8 (Figures 4 & 6). These anomalies are indicative of ridge-and-furrow regimes and have been identified as following five different alignments. It appears that some of the furrows may have been re-used as a land drains, an example being in Area 4 where it is difficult to distinguish between drainage and ploughing trends (Figure 19).

7.3.2.2. **Agricultural (Weak & Strong)** – A weak linear anomaly has been identified crossing the centre of Area 11. The anomaly correlates with a field boundary recorded on 2nd Edition OS mapping (Figure 4). Several strong subcircular anomalies were also detected along the weak linear anomaly. It is possible that these anomalies relate to tree removal from the former boundary.

7.3.2.3. **Agricultural (Trend)** – Weak linear anomalies have been identified across the majority of the survey area. These anomalies are aligned with modern ploughing directions identified on satellite imagery and are characteristic of such activity.

7.3.2.4. **Drainage Features** – Systems of parallel linear anomalies, characterised as alignments of dipolar anomalies, have been identified across the survey area (Figures 3 and 5). These anomalies are indicative of land drains, potentially fired clay drains, which would lead to this type of magnetic signal. In the south-eastern part of Area 10 and in the northern part of Area 11, the drainage system appears to be connected to the nearby pond (Figure 8). Similarly, in Area 2 there appears to be a network of drains associated with a former pond depicted on historic mapping (Figure 6).

7.3.2.5. **Pond (Former) & Ferrous/Debris (Spread)** - In the central part of Area 2, a weak sub-circular anomaly has been detected. A former pond has been identified on historic mapping in this location. It is likely that the anomaly relates to a weakly enhanced magnetic material concentrated within the depression of the former pond (Figures 22 and 23). In the north-eastern part of Area 10, a concentration of strongly dipolar anomalies was detected in the location of another former pond depicted on historic mapping (Figure 4). This spread of ferrous material was likely used as material to infill the former pond.

7.3.2.6. **Undetermined (Strong)** – Across the survey area several anomalies have been classified as ‘Undetermined’, including strong, discrete anomalies and weak, short, linear anomalies. These have limited context and no distinctive signal

or shape. The anomalies likely relate to natural, agricultural or modern features or objects, but an archaeological origin cannot be completely ruled out.

8. Conclusions

- 8.1. A fluxgate gradiometer survey was successfully completed across all but c. 2.27ha of the c. 67.12ha survey area. Magnetic disturbance was limited to haloes caused by fencing and pylons, and the survey environment presented a relatively homogenous magnetic background, against which even very weak, small anomalies could be confidently identified. Natural variations have been identified as sinuous bands across parts of the survey area.
- 8.2. The geophysical results primarily reflect the agricultural usage of the survey area in the form of drainage systems, and ridge and furrow regimes. Modern ploughing was also identified across the survey area, along with a former mapped field boundary.
- 8.3. No anomalies suggestive of significant archaeological activity were identified within the survey area, though archaeological origins cannot be ruled out for the anomalies which have been classified as 'Undetermined'.

9. Archiving

- 9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.
- 9.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to the any dictated time embargoes.

10. Copyright

- 10.1. Copyright and the intellectual property pertaining to all reports, figures, and datasets produced by Magnitude Services Ltd. is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.

11. References

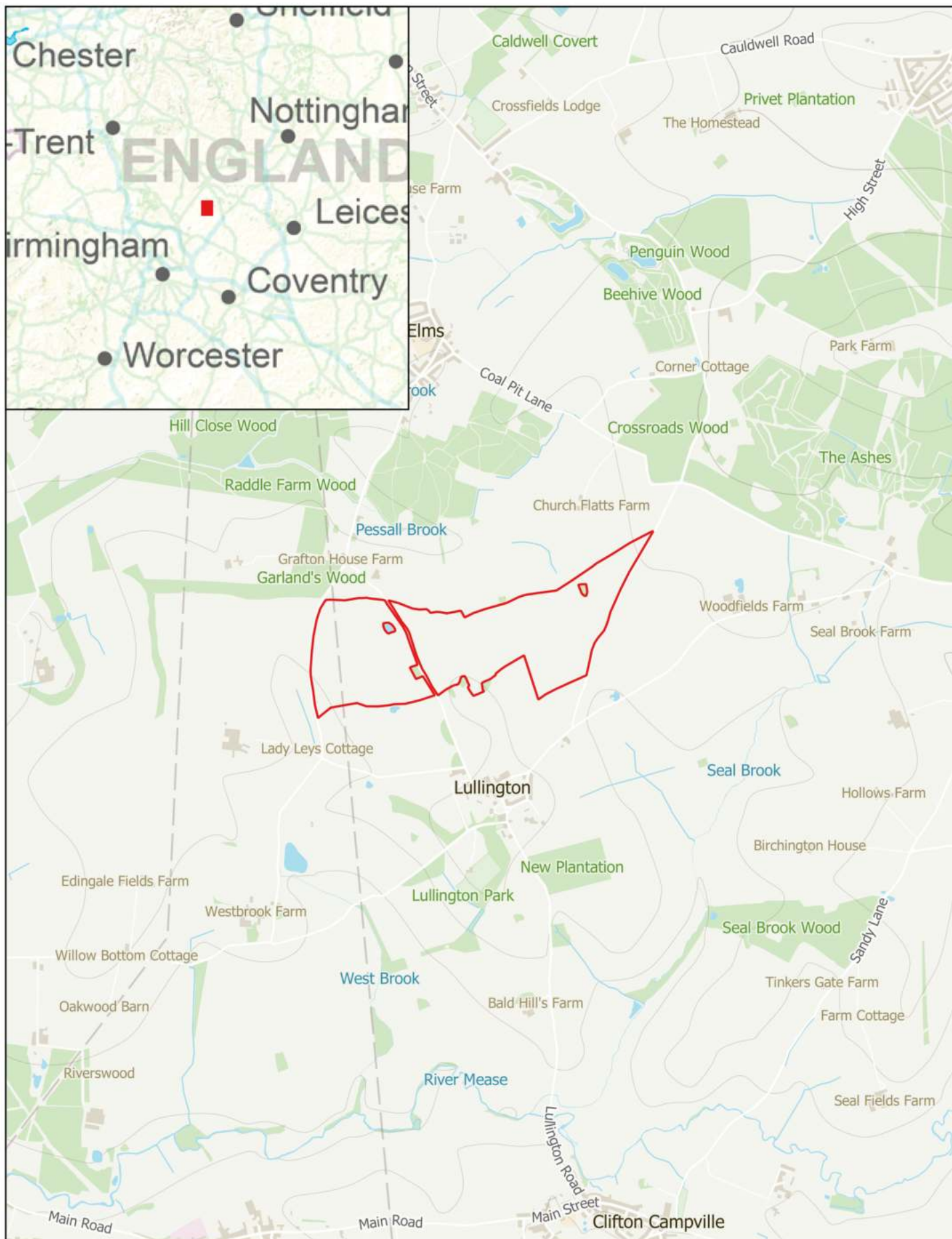
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12. Project Metadata

MS Job Code	MSSK804
Project Name	Lullington, South Derbyshire
Client	Lanpro Services
Grid Reference	SK 24367 13985
Survey Techniques	Magnetometry
Survey Size (ha)	67.12ha (Magnetometry)
Survey Dates	2020-11-16 to 2020-11-27
Project Lead	Lauren Beck BA
Project Officer	Lauren Beck BA
HER Event No	TBC
OASIS No	TBC
S42 Licence No	N/A
Report Version	0.3

13. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	AC	LB	04 December 2020
0.2	Corrections from Project Lead, draft for Director Approval	AC	KA	04 December 2020
0.3	Director corrections, draft issued to Client	AC	KA	04 December 2020



MSSK804 - Lullington, south Derbyshire

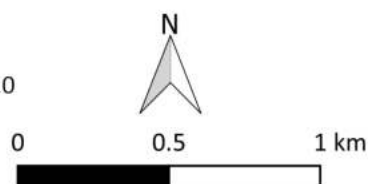
Figure 1 - Site Location

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 Site Boundary

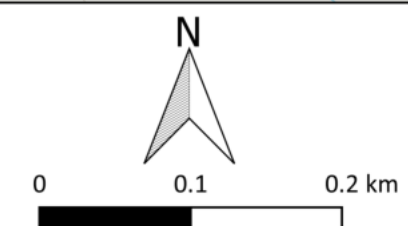


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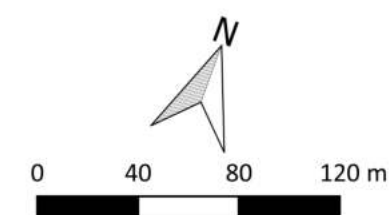
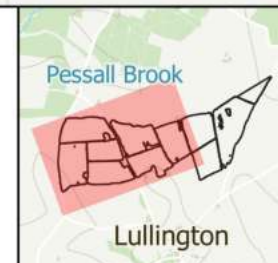
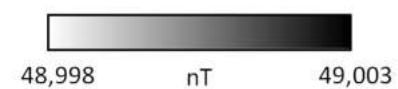
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Figure 2 - Location of Survey Areas
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-  Survey Extent
-  Not Surveyable





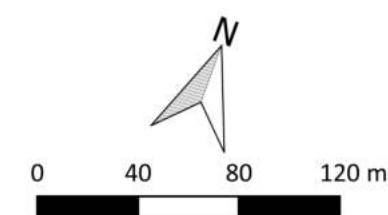
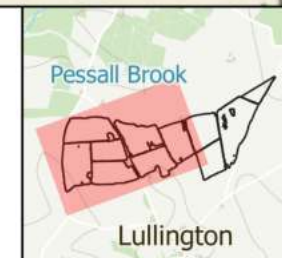
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 Figure 3 - Magnetic Total Field (Lower Sensor) (Overview) (West)
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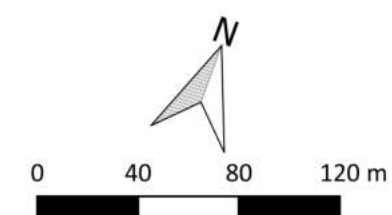
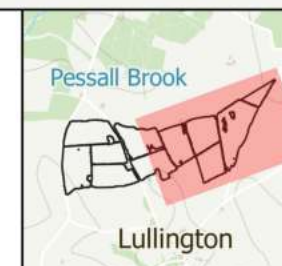
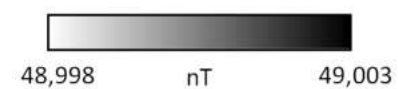
MSSK804 - Lullington, south Derbyshire
 Figure 4 - Magnetic Interpretation Over Historical Maps (Overview) (West)
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 Contains historic maps: Ordnance Survey, 6" 2nd edition c. 1882-1913 ©
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- | | | |
|-----------------------|-------------------------|--------------------------|
| Agricultural (Strong) | Ferrous/Debris (Spread) | Ridge and Furrow (Trend) |
| Agricultural (Weak) | Undetermined (Strong) | Drainage Feature |
| Natural (Weak) | Undetermined (Weak) | Ferrous (Spike) |
| Magnetic Disturbance | Agricultural (Trend) | |





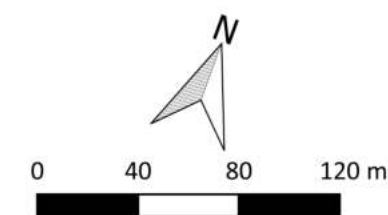
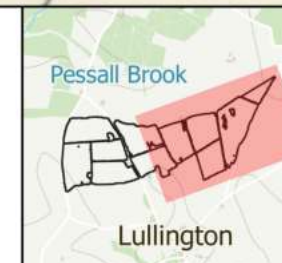
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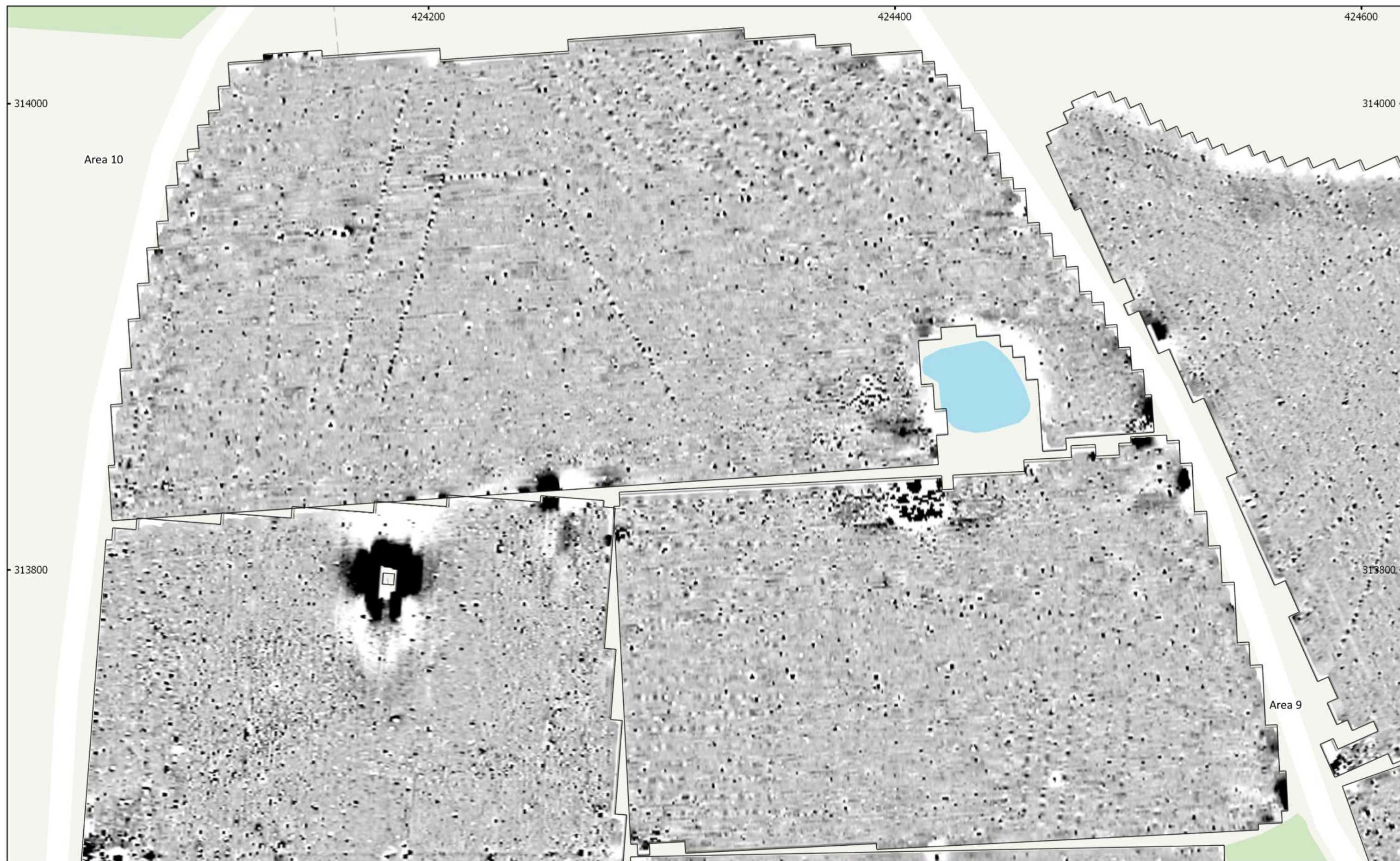




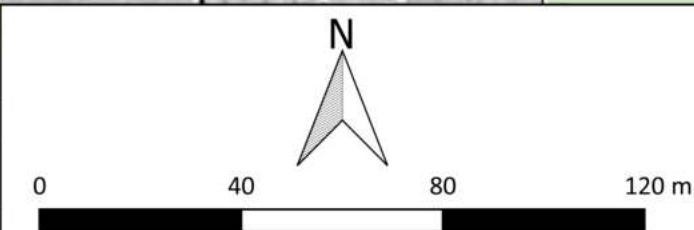
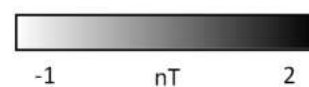
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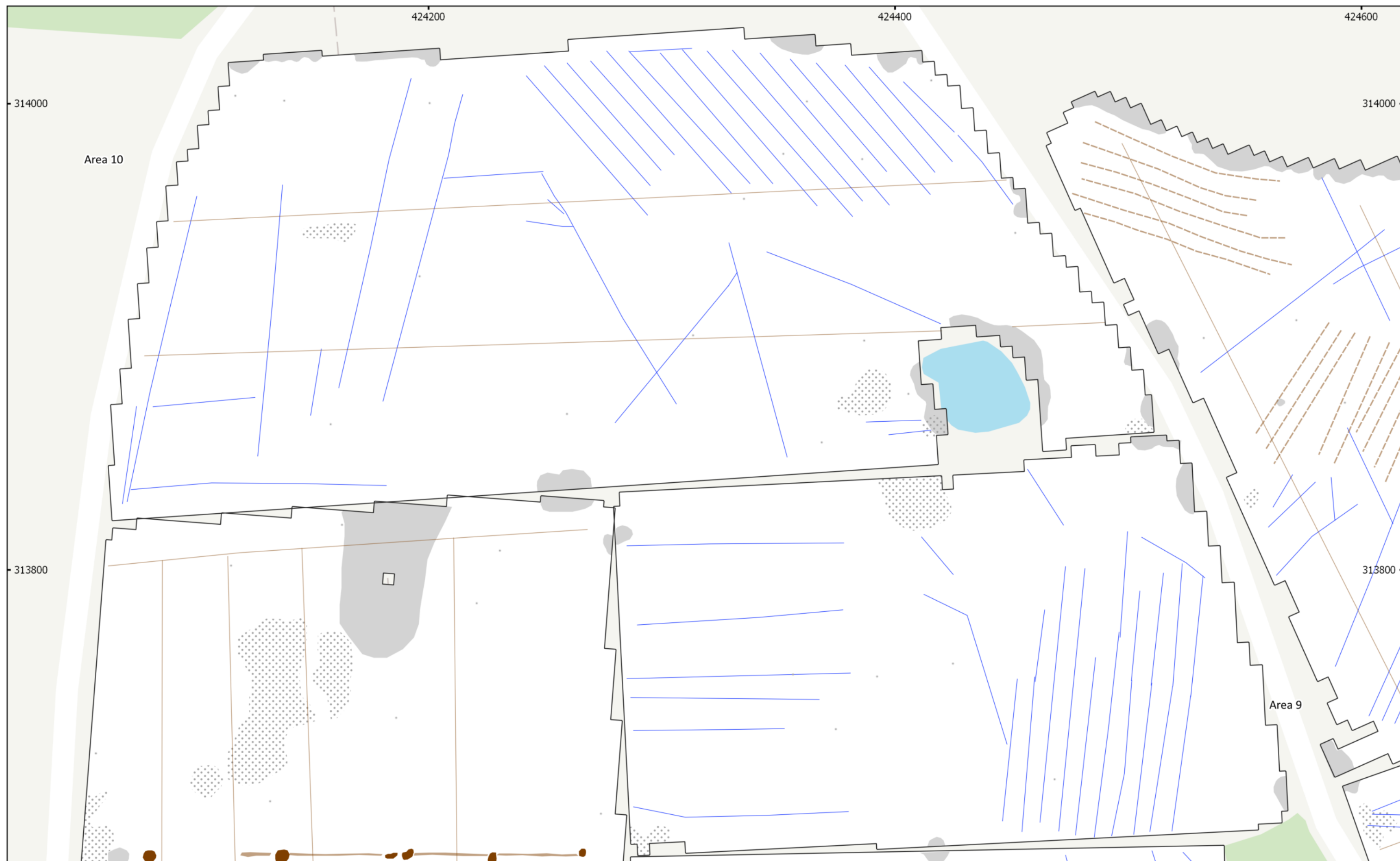
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|----------------------|-------------------------|--------------------------|
| Pond (Former) | Ferrous/Debris (Spread) | Ridge and Furrow (Trend) |
| Natural (Weak) | Undetermined (Strong) | Drainage Feature |
| Magnetic Disturbance | Undetermined (Weak) | Ferrous (Spike) |
| | Agricultural (Trend) | |





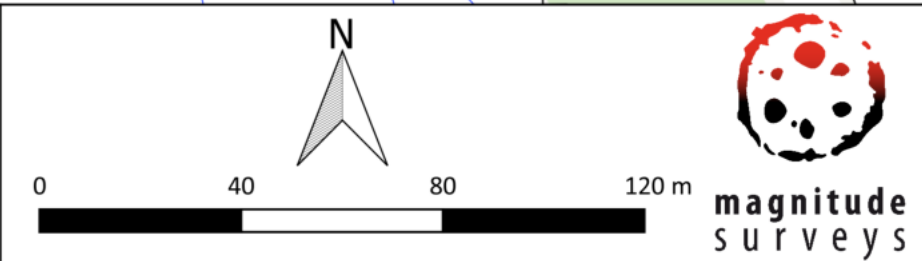
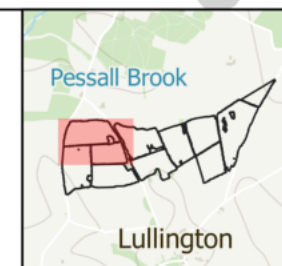
MSSK804 - Lullington, south Derbyshire
 Figure 7 - Magnetic Gradient (Northwest)
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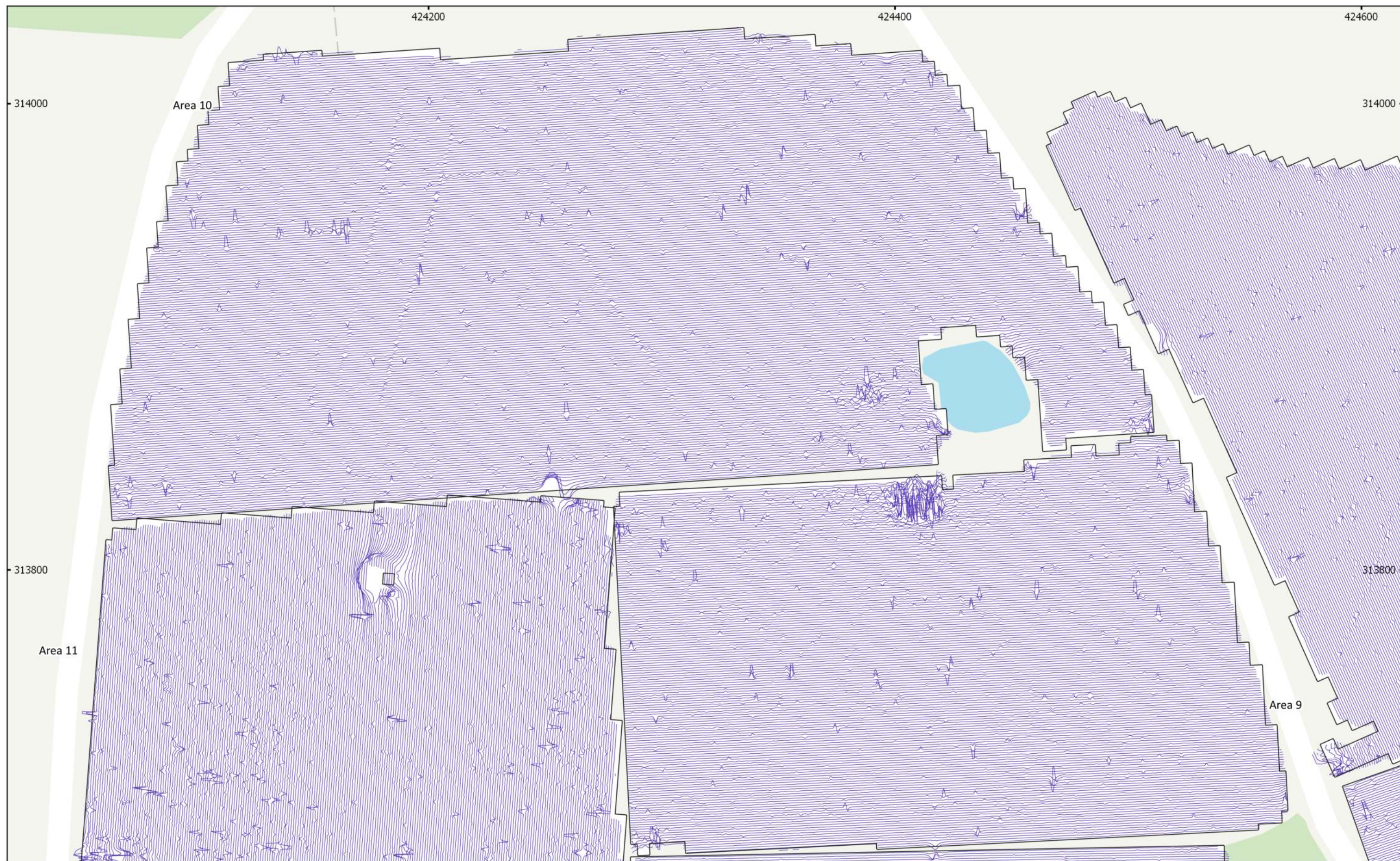




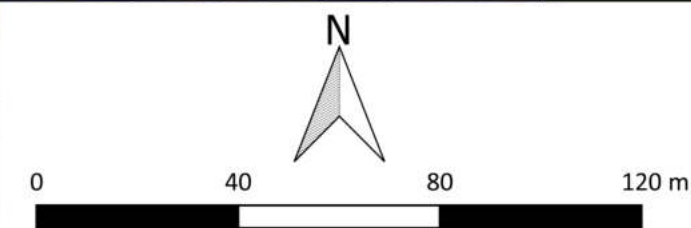
MSSK804 - Lullington, south Derbyshire
 Figure 8 - Magnetic Interpretation (Northwest)
 1:1,500 @ A3
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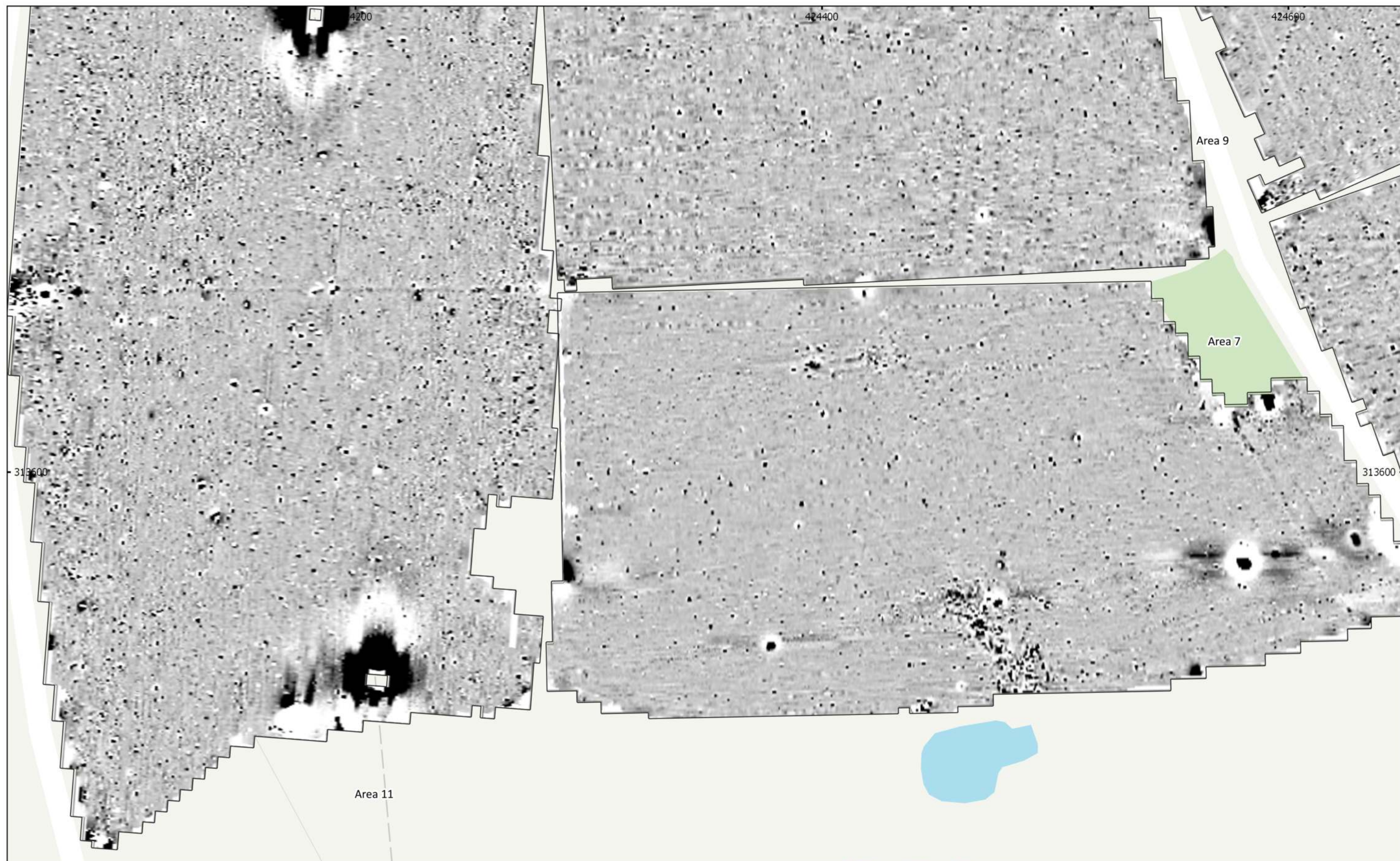
- | | | |
|-----------------------|--------------------------|------------------|
| Agricultural (Strong) | Ferrous/Debris (Spread) | Drainage Feature |
| Agricultural (Weak) | Agricultural (Trend) | Ferrous (Spike) |
| Magnetic Disturbance | Ridge and Furrow (Trend) | |



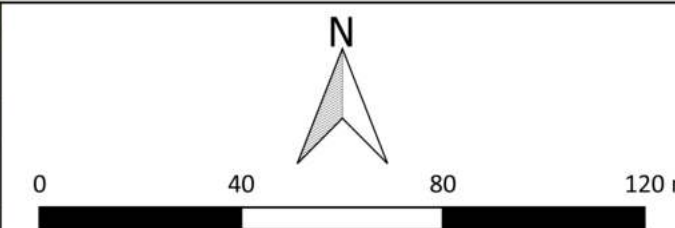
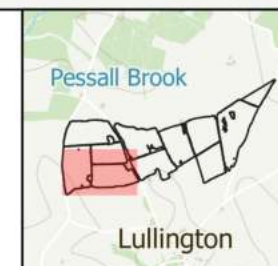
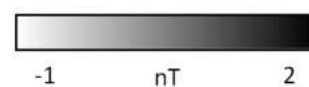


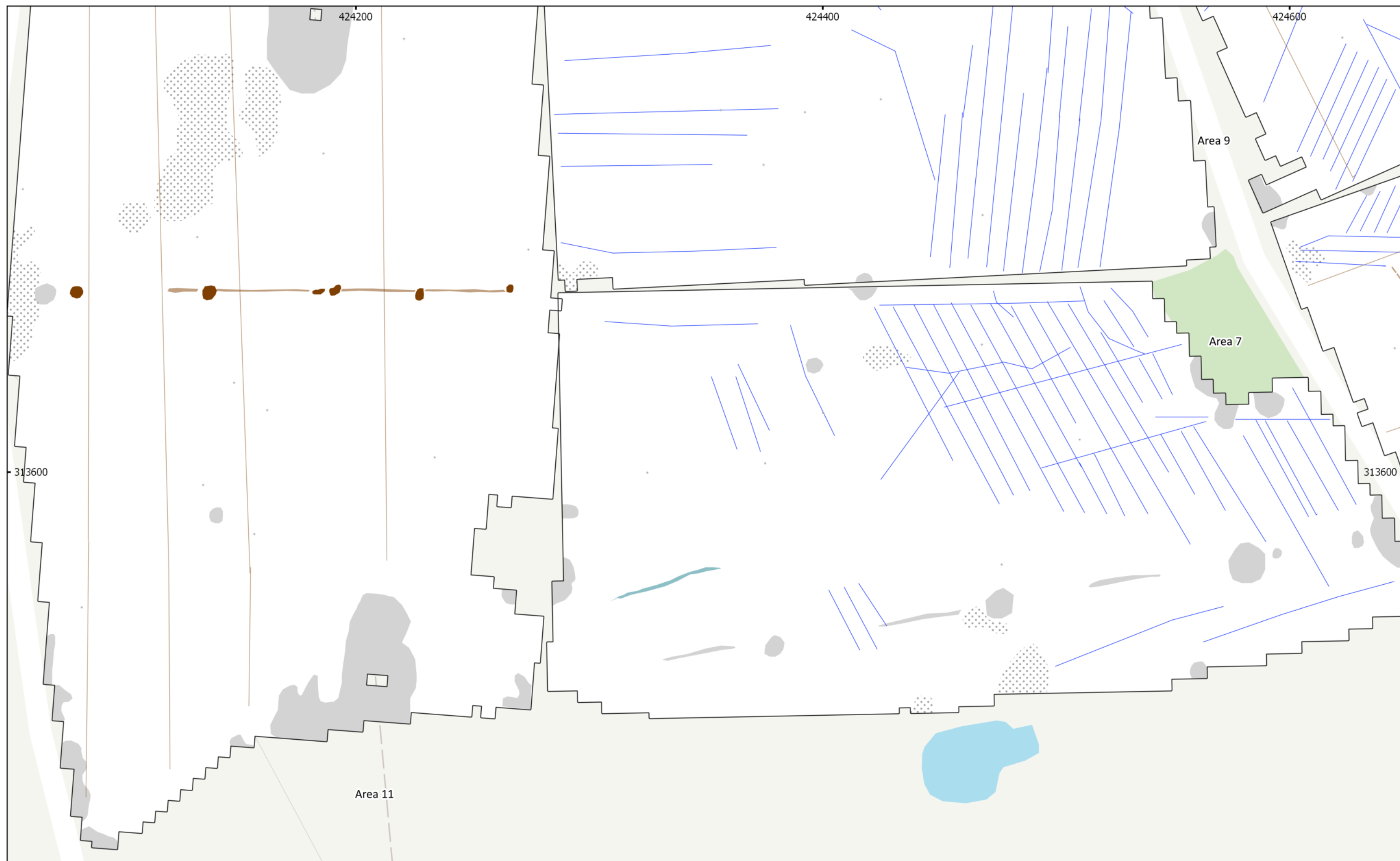
MSSK804 - Lullington, south Derbyshire
Figure 9 - XY Trace Plot (Northwest)
30nT/cm at 1:1,500 @ A3
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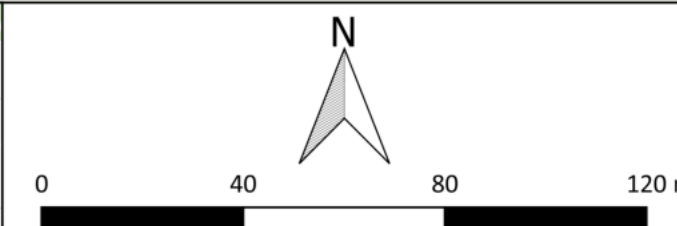
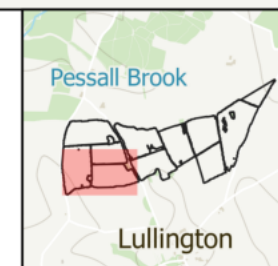
MSSK804 - Lullington, south Derbyshire
 Figure 10 - Magnetic Gradient (Southwest)
 1:1,500 @ A3
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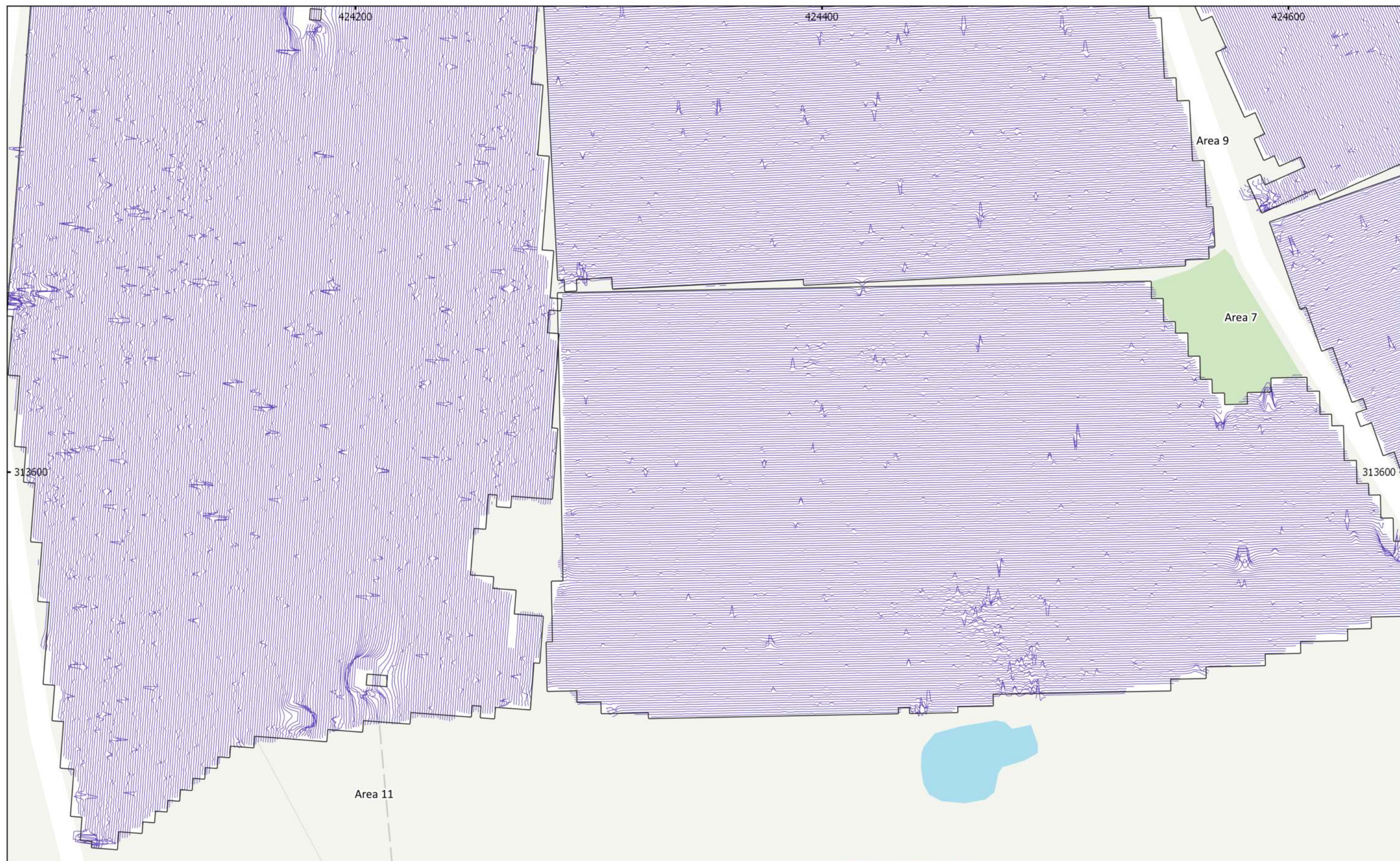




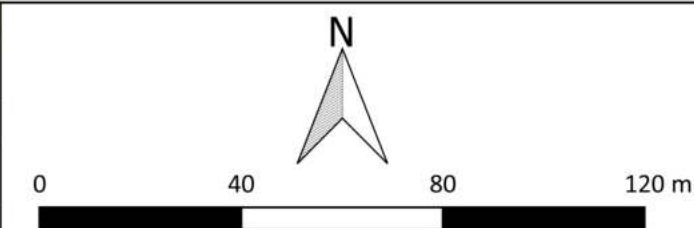
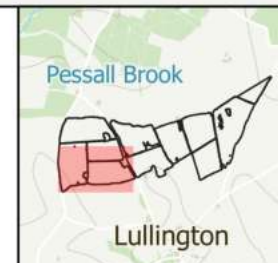
MSSK804 - Lullington, south Derbyshire
 Figure 11 - Magnetic Interpretation (Southwest)
 1:1,500 @ A3
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- | | | |
|-----------------------|-------------------------|--------------------------|
| Agricultural (Strong) | Ferrous/Debris (Spread) | Ridge and Furrow (Trend) |
| Agricultural (Weak) | Undetermined (Weak) | Drainage Feature |
| Magnetic Disturbance | Agricultural (Trend) | Ferrous (Spike) |



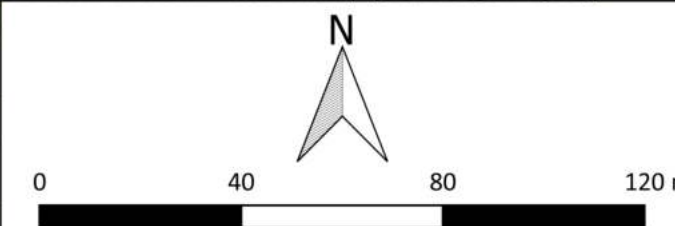
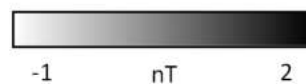


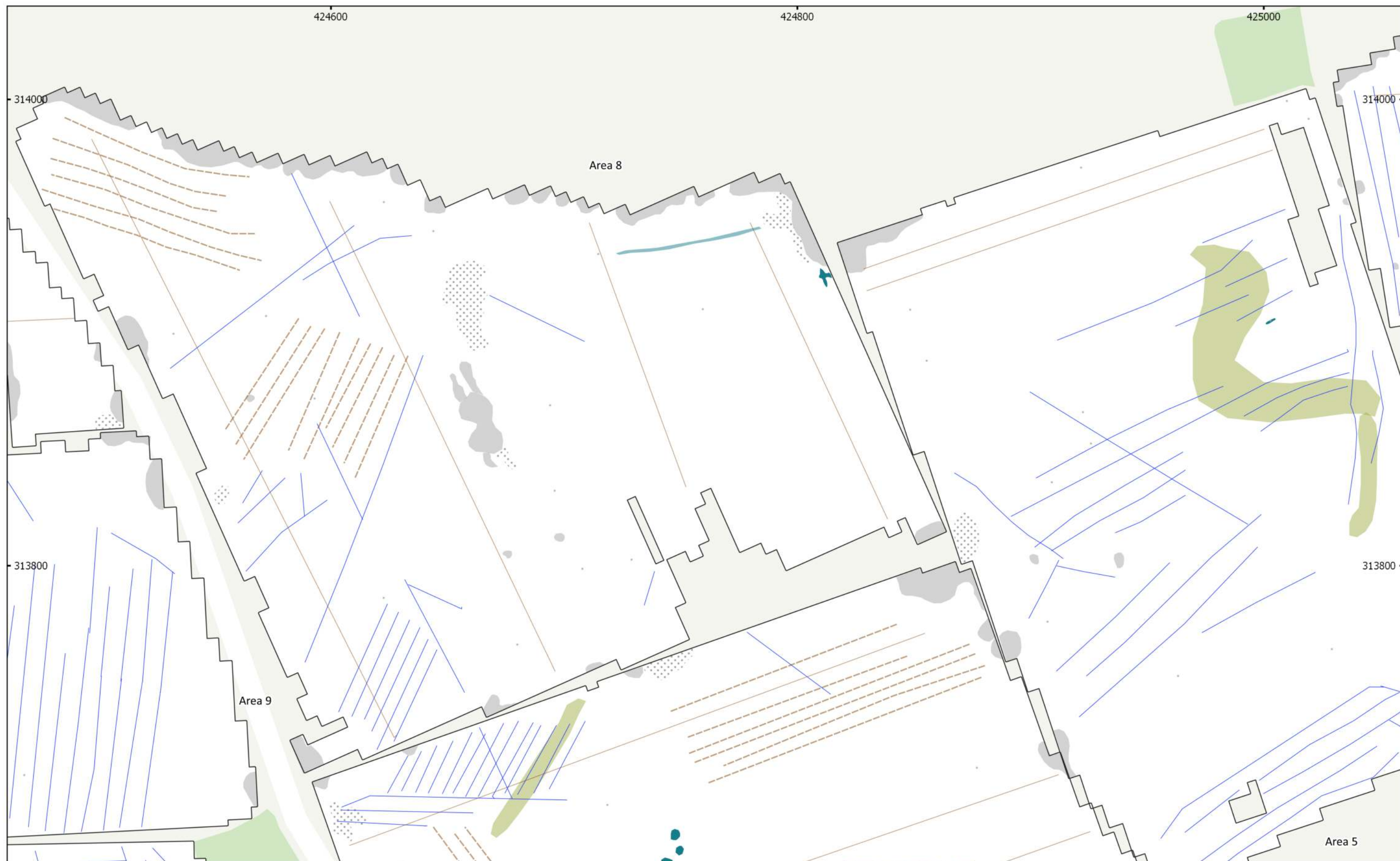
MSSK804 - Lullington, south Derbyshire
Figure 12 - XY Trace Plot (Southwest)
30nT/cm at 1:1,500 @ A3
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Figure 13 - Magnetic Gradient (Centre-North)
1:1,500 @ A3
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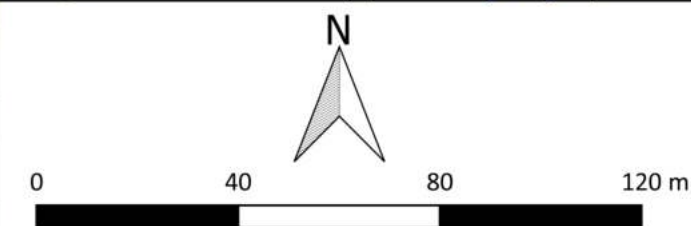


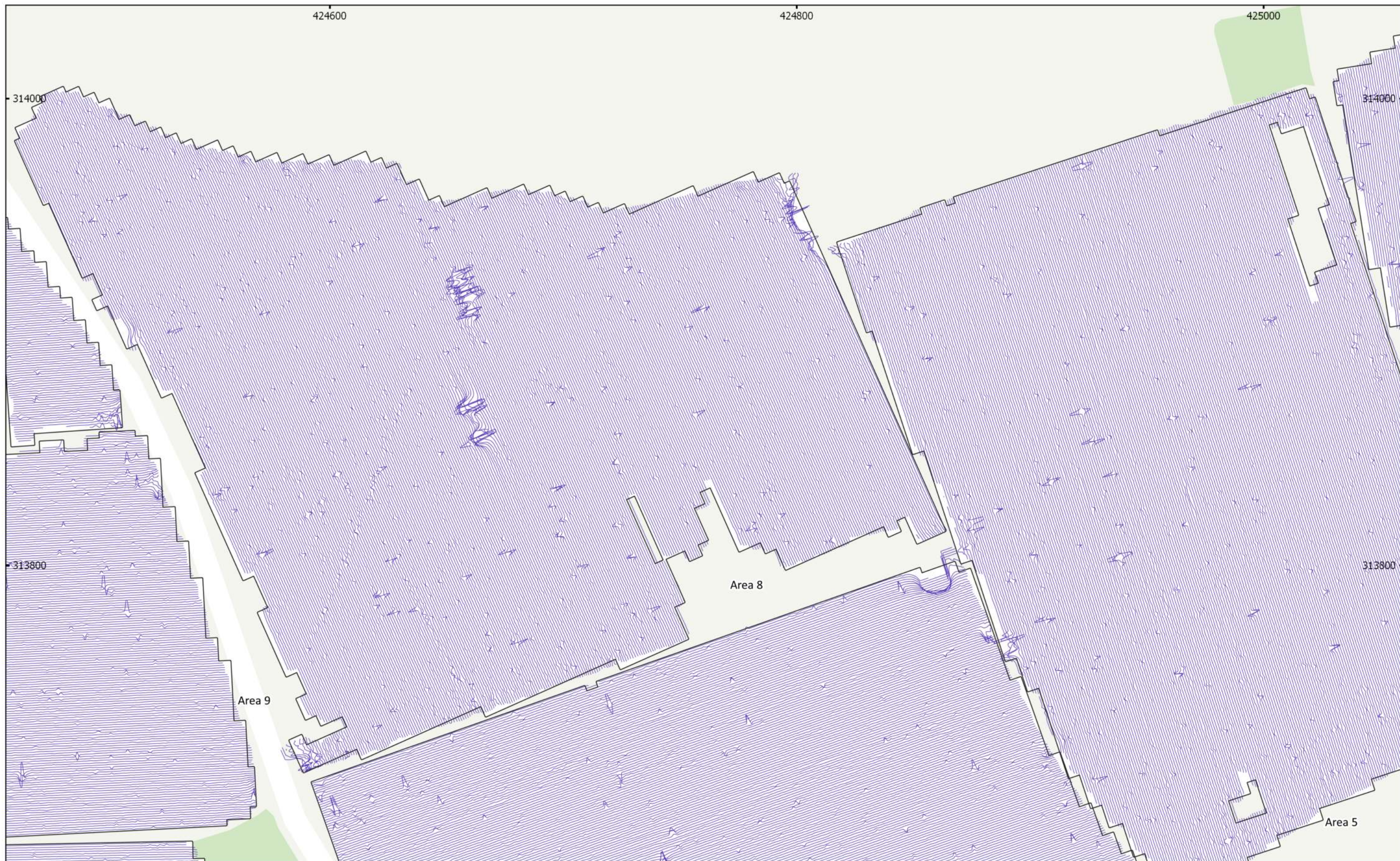


MSSK804 - Lullington, south Derbyshire
Figure 14 - Magnetic Interpretation (Centre-North)
1:1,500 @ A3

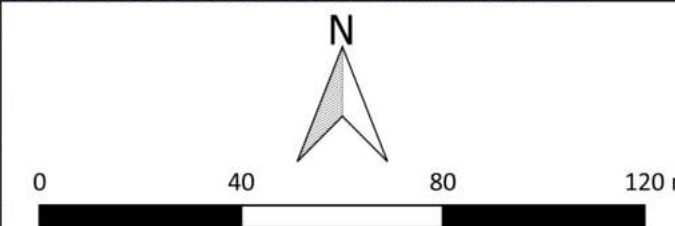
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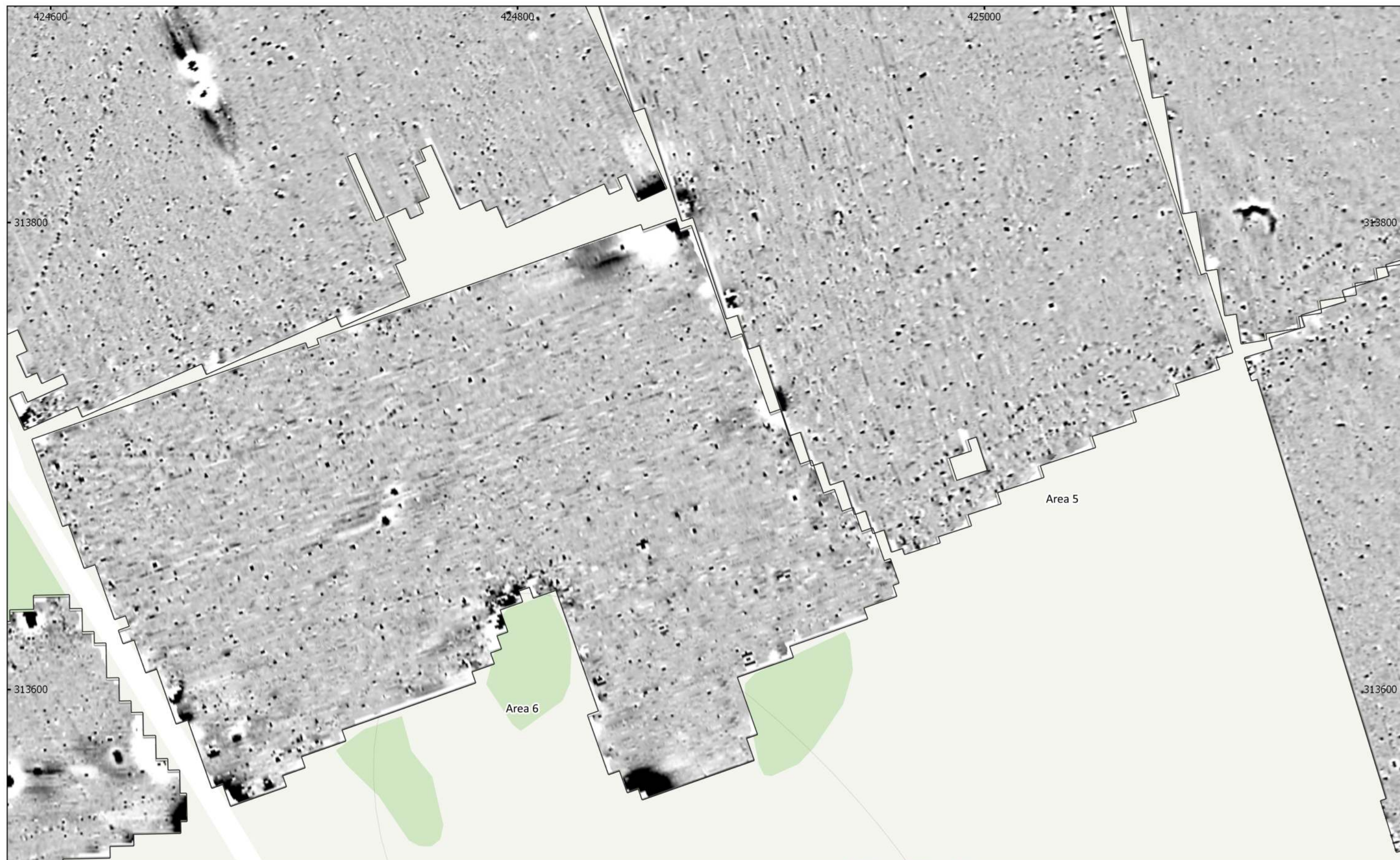
- | | | |
|-------------------------|-----------------------|--------------------------|
| Natural (Weak) | Undetermined (Strong) | Ridge and Furrow (Trend) |
| Magnetic Disturbance | Undetermined (Weak) | Drainage Feature |
| Ferrous/Debris (Spread) | Agricultural (Trend) | Ferrous (Spike) |



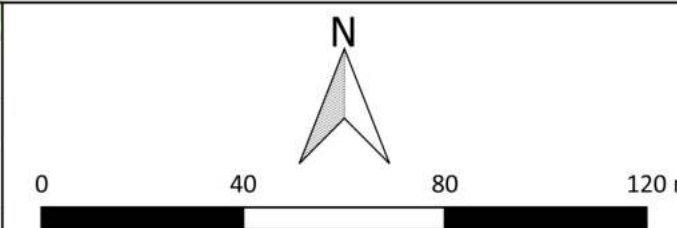
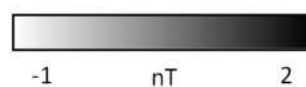


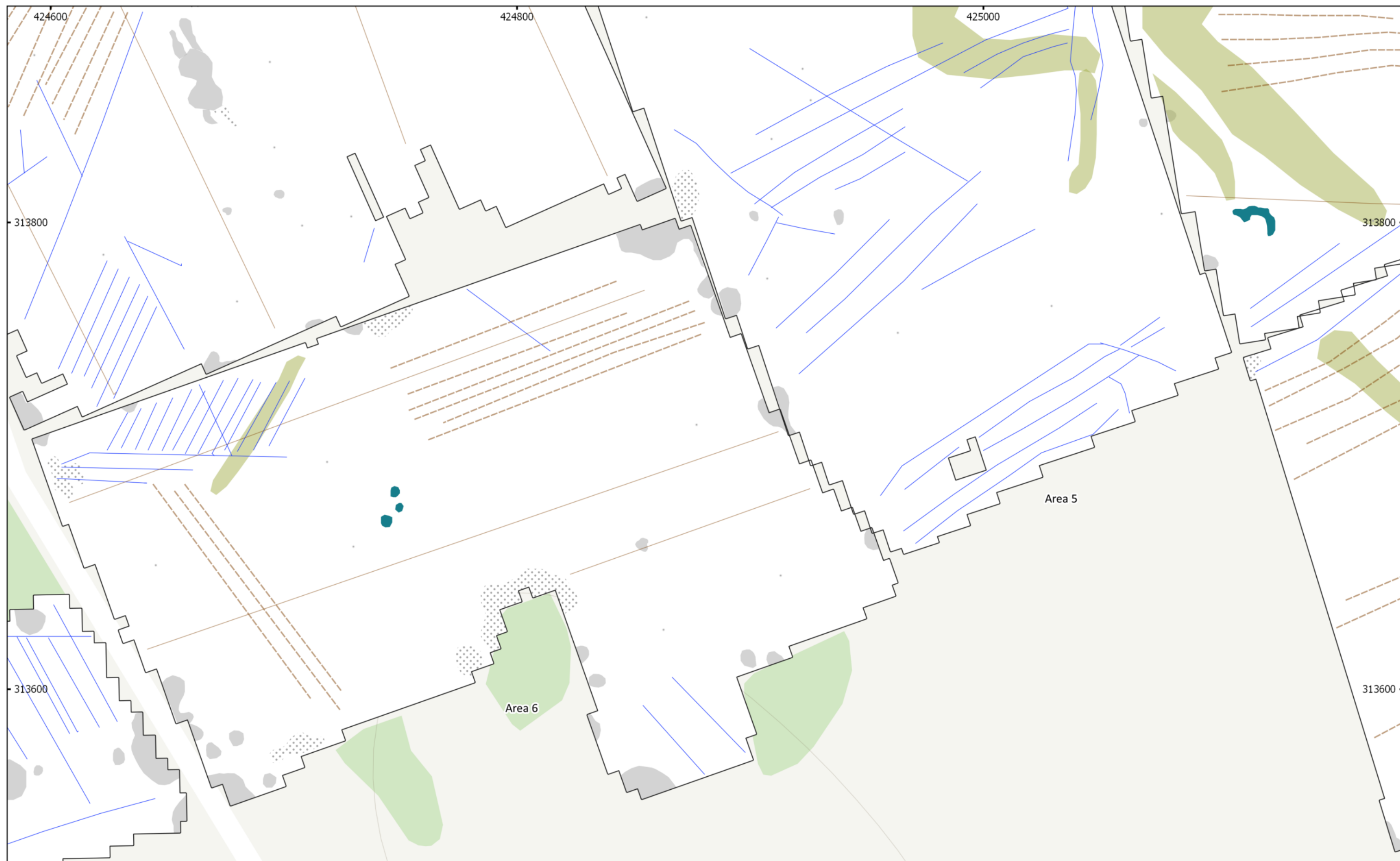
MSSK804 - Lullington, south Derbyshire
Figure 15 - XY Trace Plot (Centre-North)
30nT/cm at 1:1,500 @ A3
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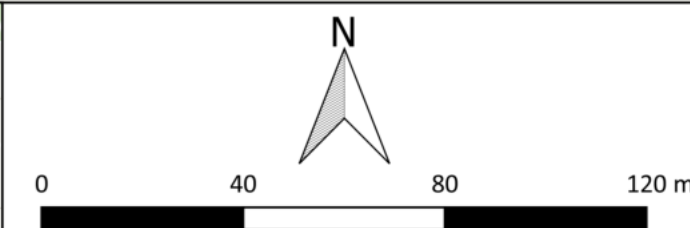
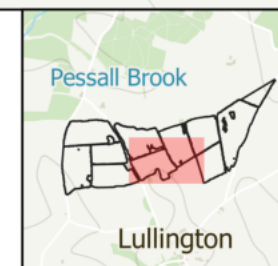
MSSK804 - Lullington, south Derbyshire
Figure 16 - Magnetic Gradient (Centre-South)
1:1,500 @ A3
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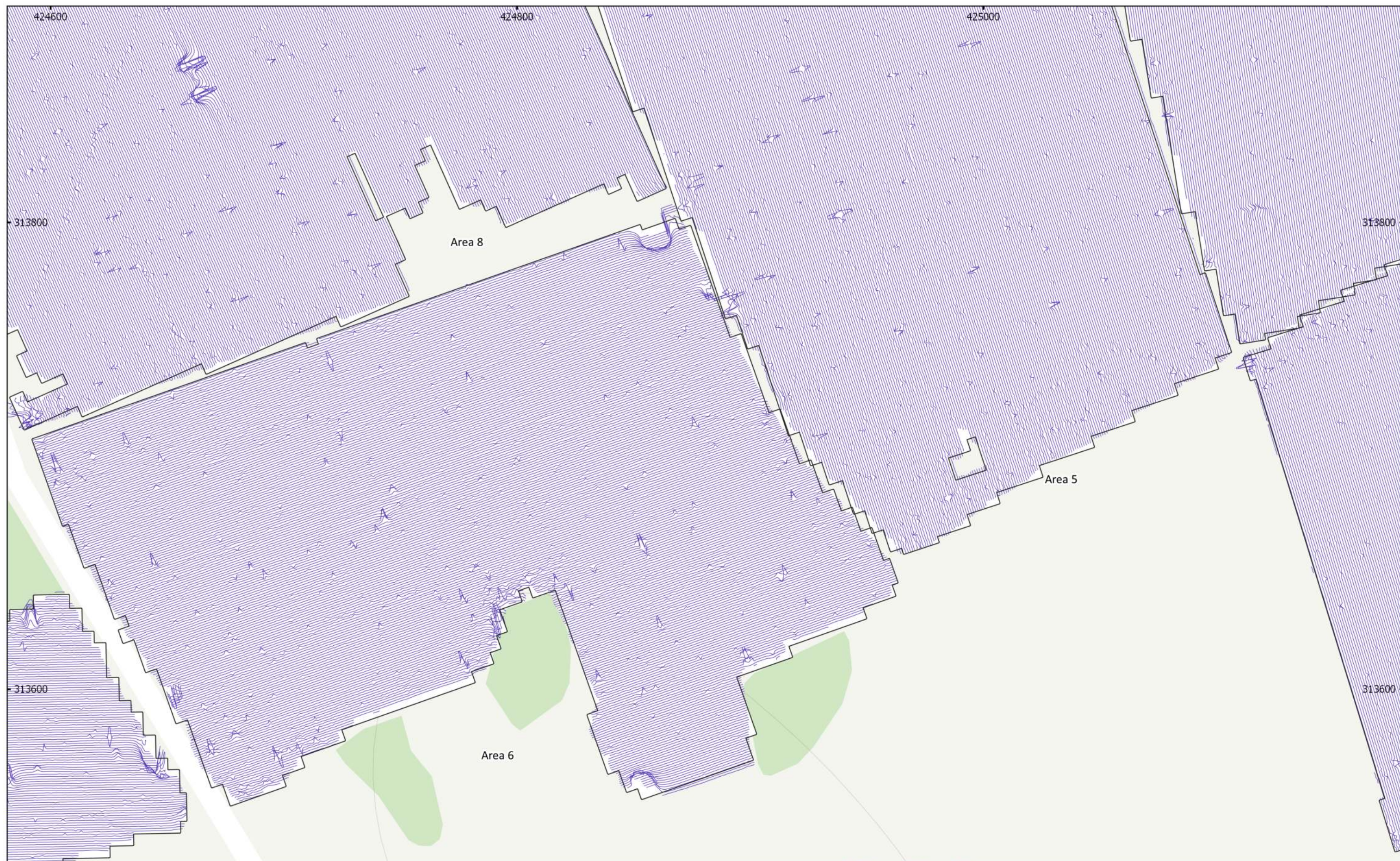




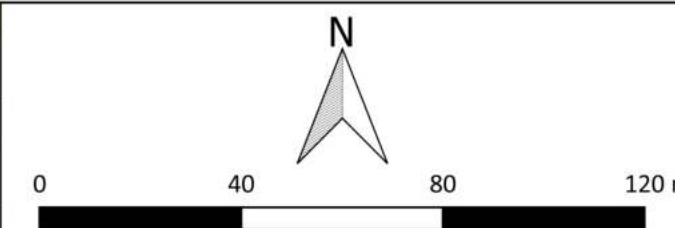
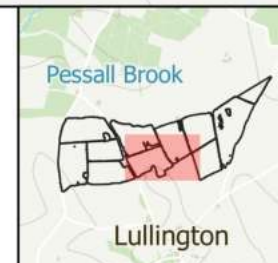
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 Figure 17 - Magnetic Interpretation (Centre-South)
 1:1,500 @ A3
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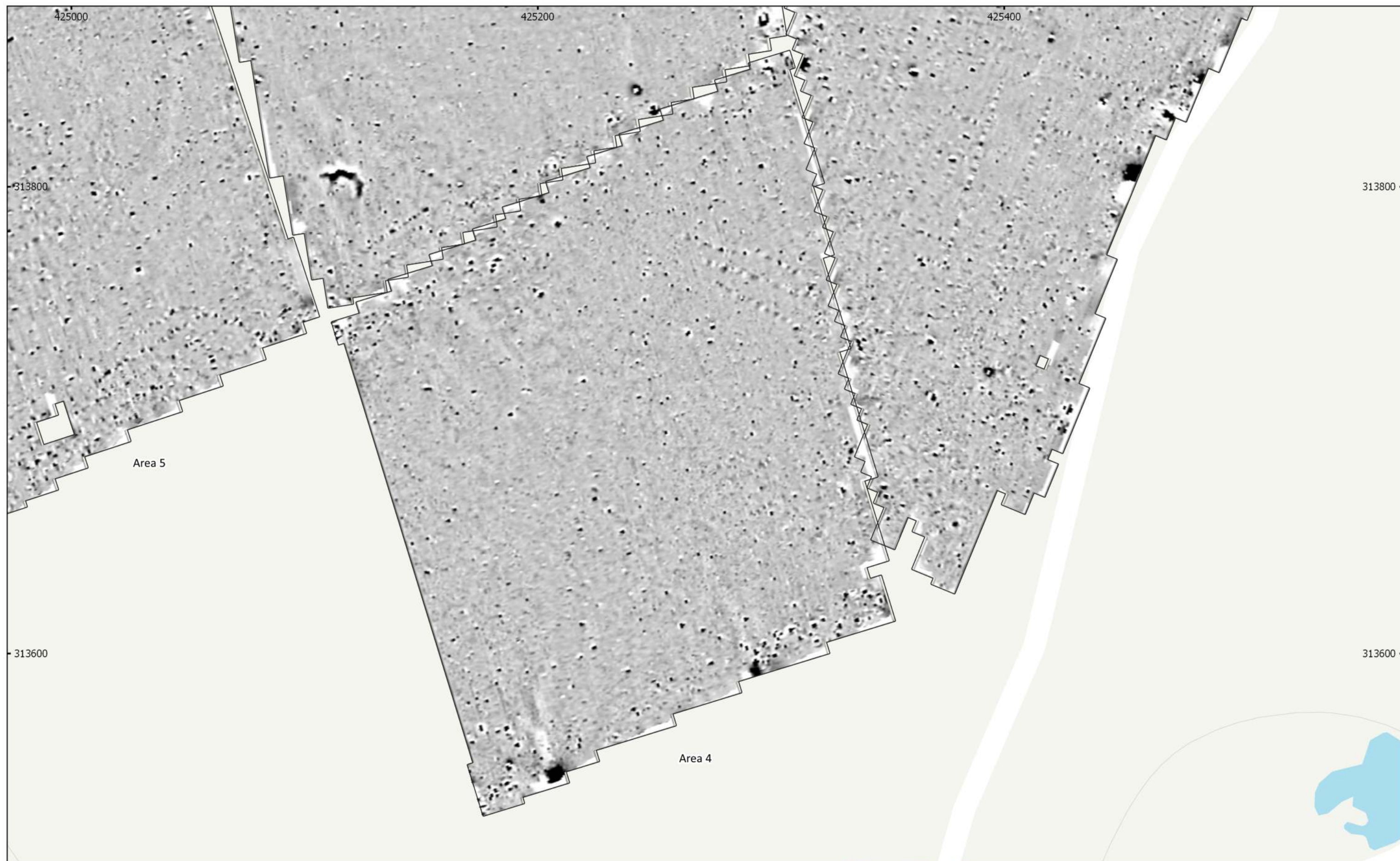
- | | | |
|---|--|--|
|  Natural (Weak) |  Undetermined (Strong) |  Drainage Feature |
|  Magnetic Disturbance |  Agricultural (Trend) |  Ferrous (Spike) |
|  Ferrous/Debris (Spread) |  Ridge and Furrow (Trend) | |



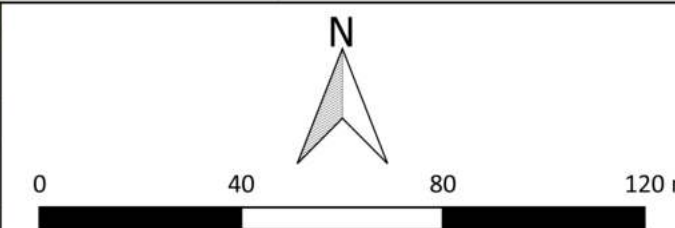
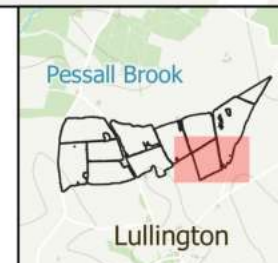
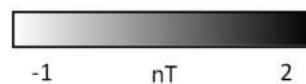


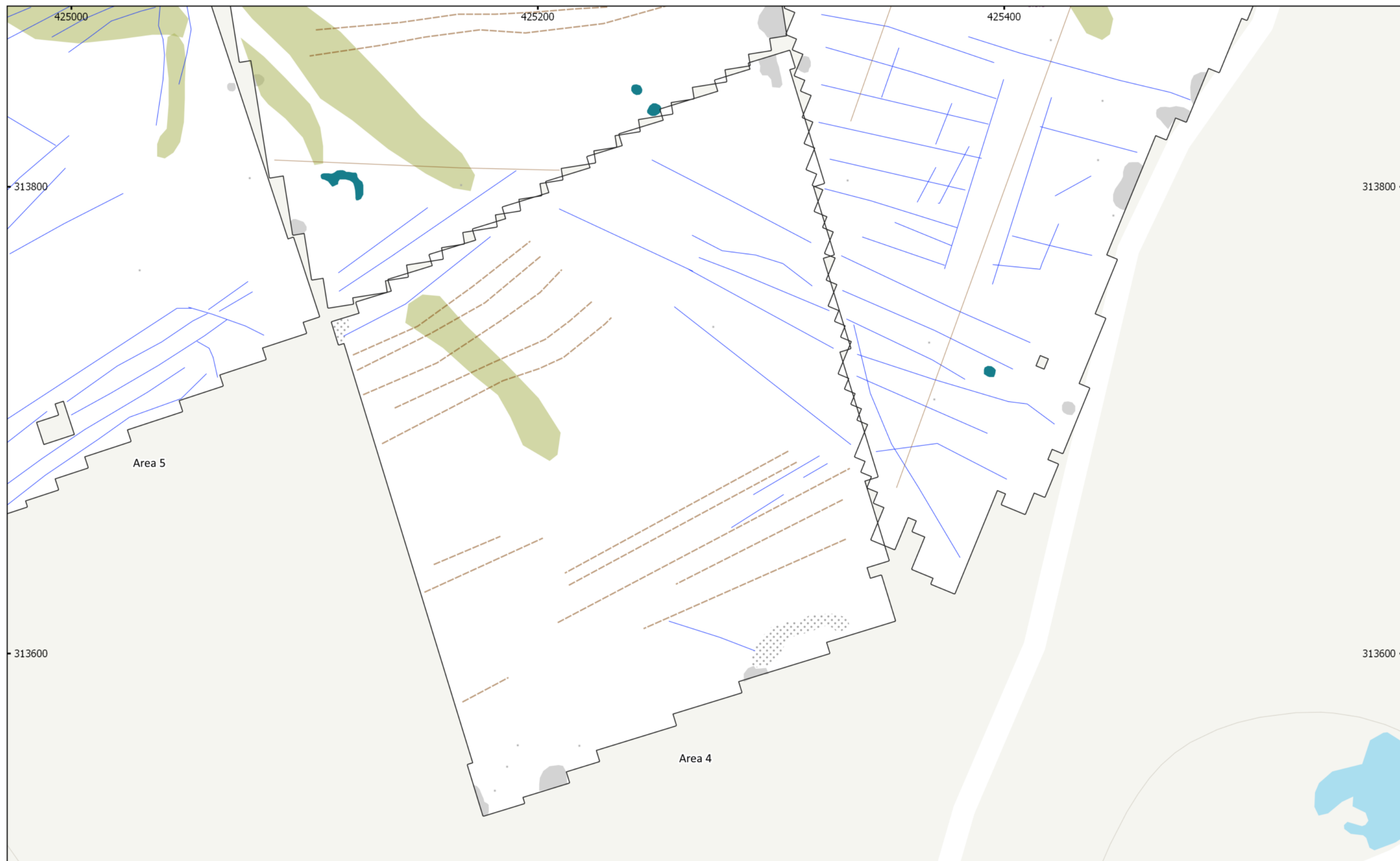
MSSK804 - Lullington, south Derbyshire
Figure 18 - XY Trace Plot (Centre-South)
30nT/cm at 1:1,500 @ A3
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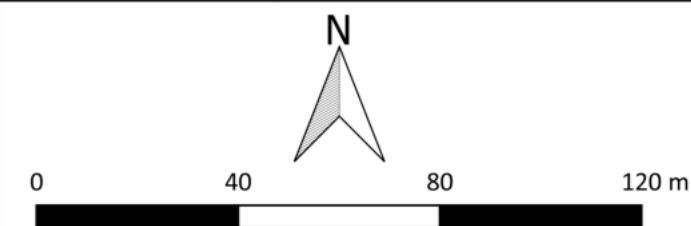
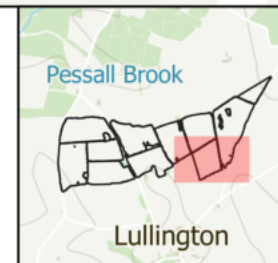
MSSK804 - Lullington, south Derbyshire
Figure 19 - Magnetic Gradient (Southeast)
1:1,500 @ A3
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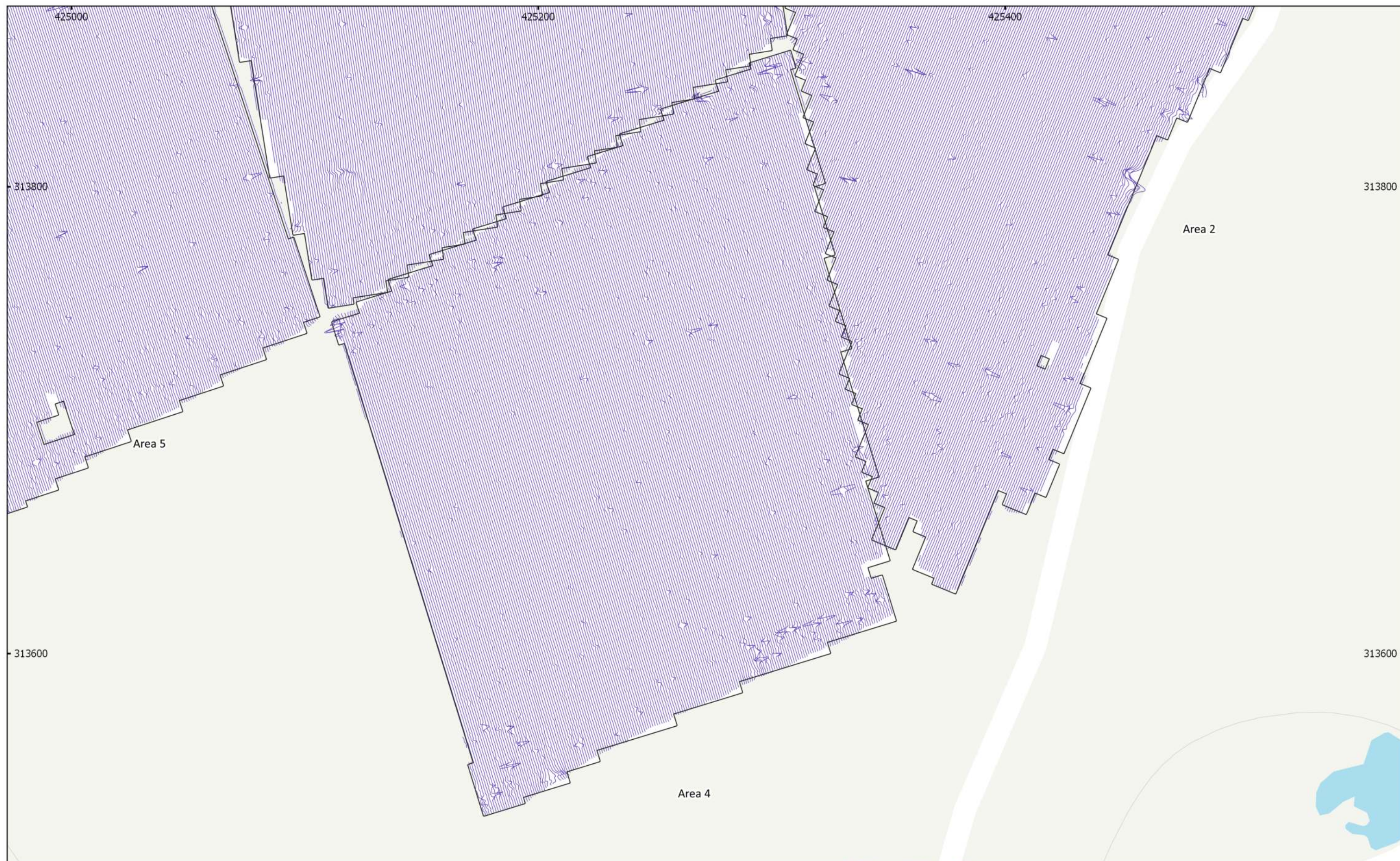




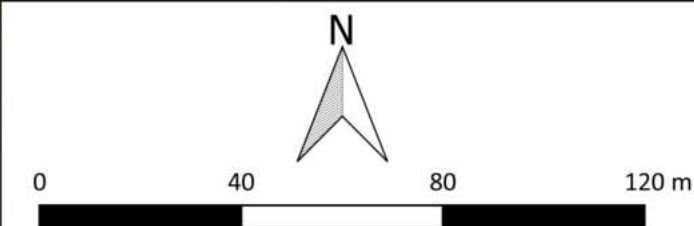
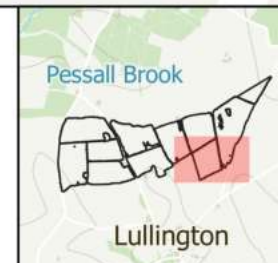
MSSK804 - Lullington, south Derbyshire
 Figure 20 - Magnetic Interpretation (Southeast)
 1:1,500 @ A3
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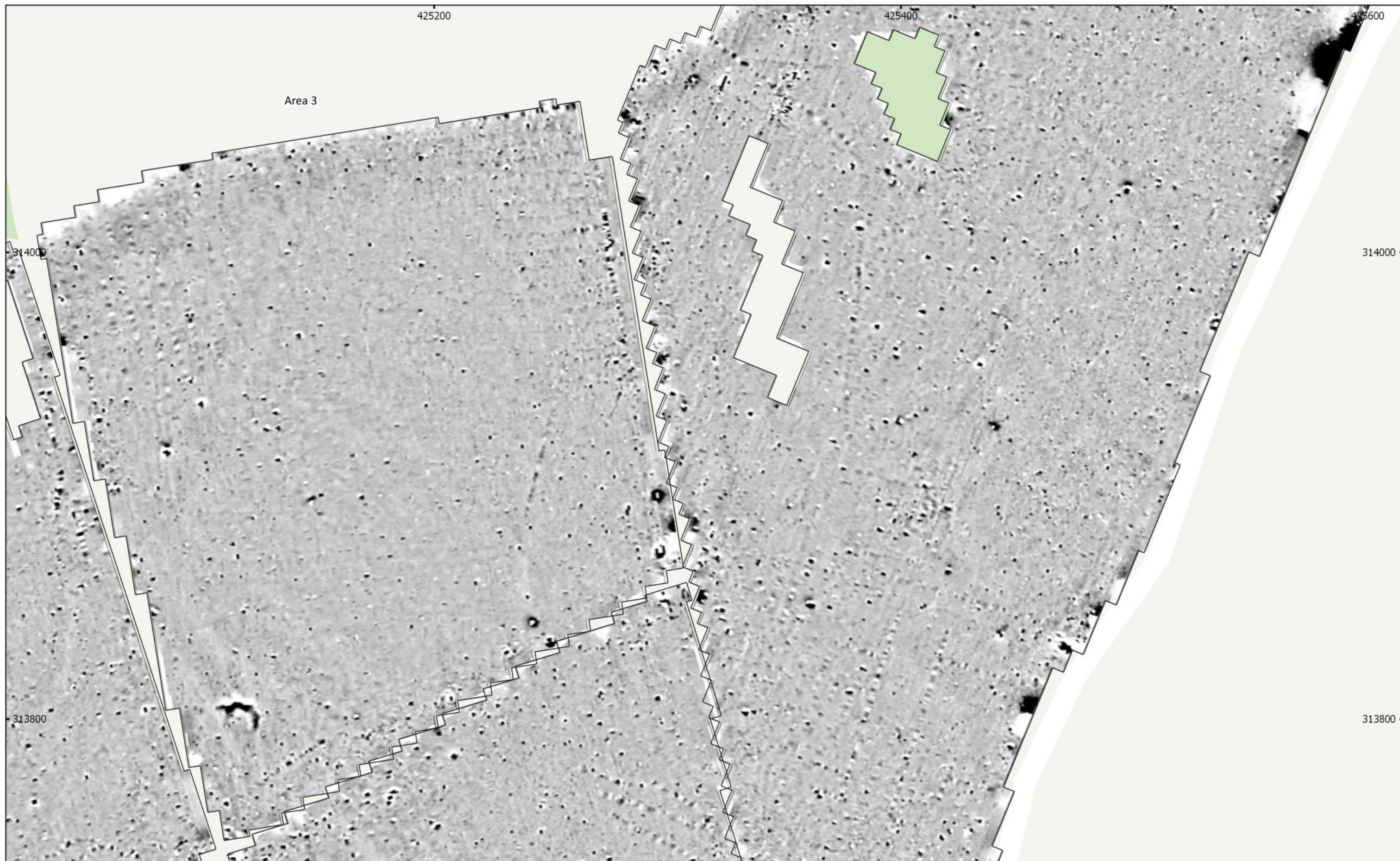
- | | | |
|----------------------|-------------------------|--------------------------|
| Pond (Former) | Ferrous/Debris (Spread) | Ridge and Furrow (Trend) |
| Natural (Weak) | Undetermined (Strong) | Drainage Feature |
| Magnetic Disturbance | Agricultural (Trend) | Ferrous (Spike) |



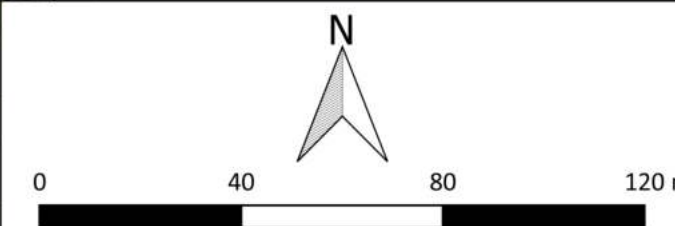
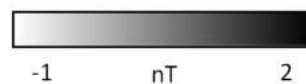


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Figure 21 - XY Trace Plot (Southeast)
30nT/cm at 1:1,500 @ A3
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Figure 22 - Magnetic Gradient (East)
1:1,500 @ A3
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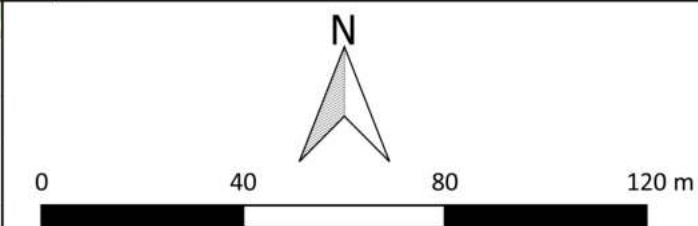
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Figure 23 - Magnetic Interpretation (East)

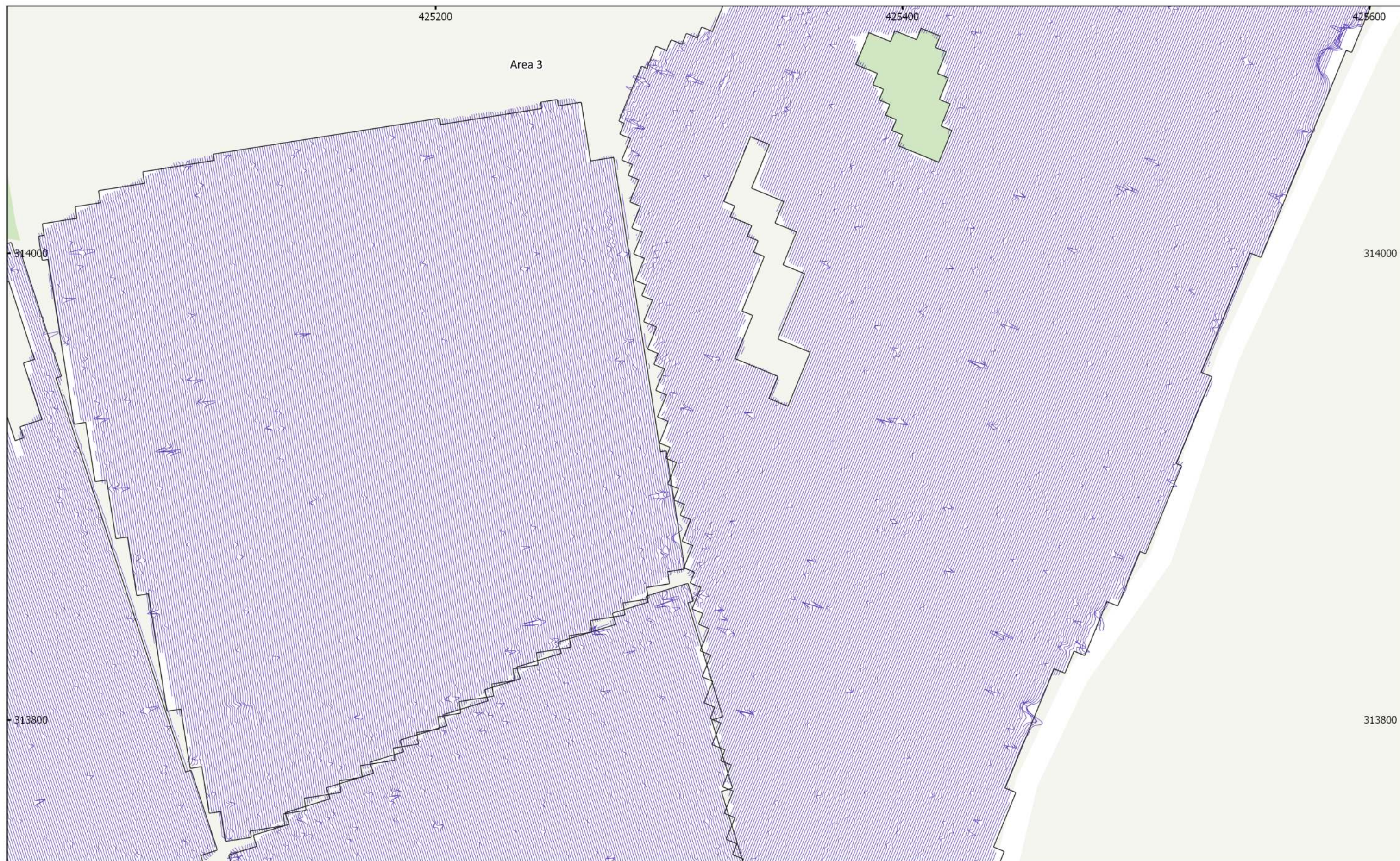
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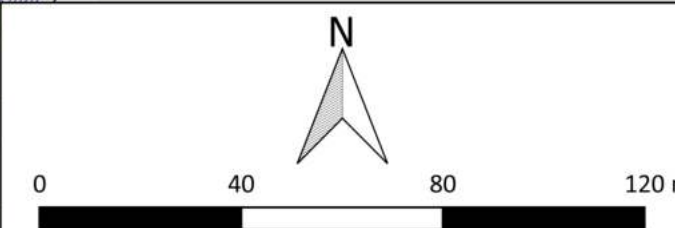
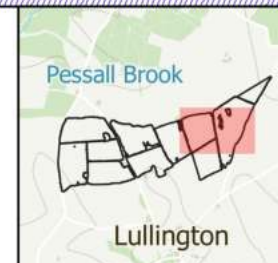
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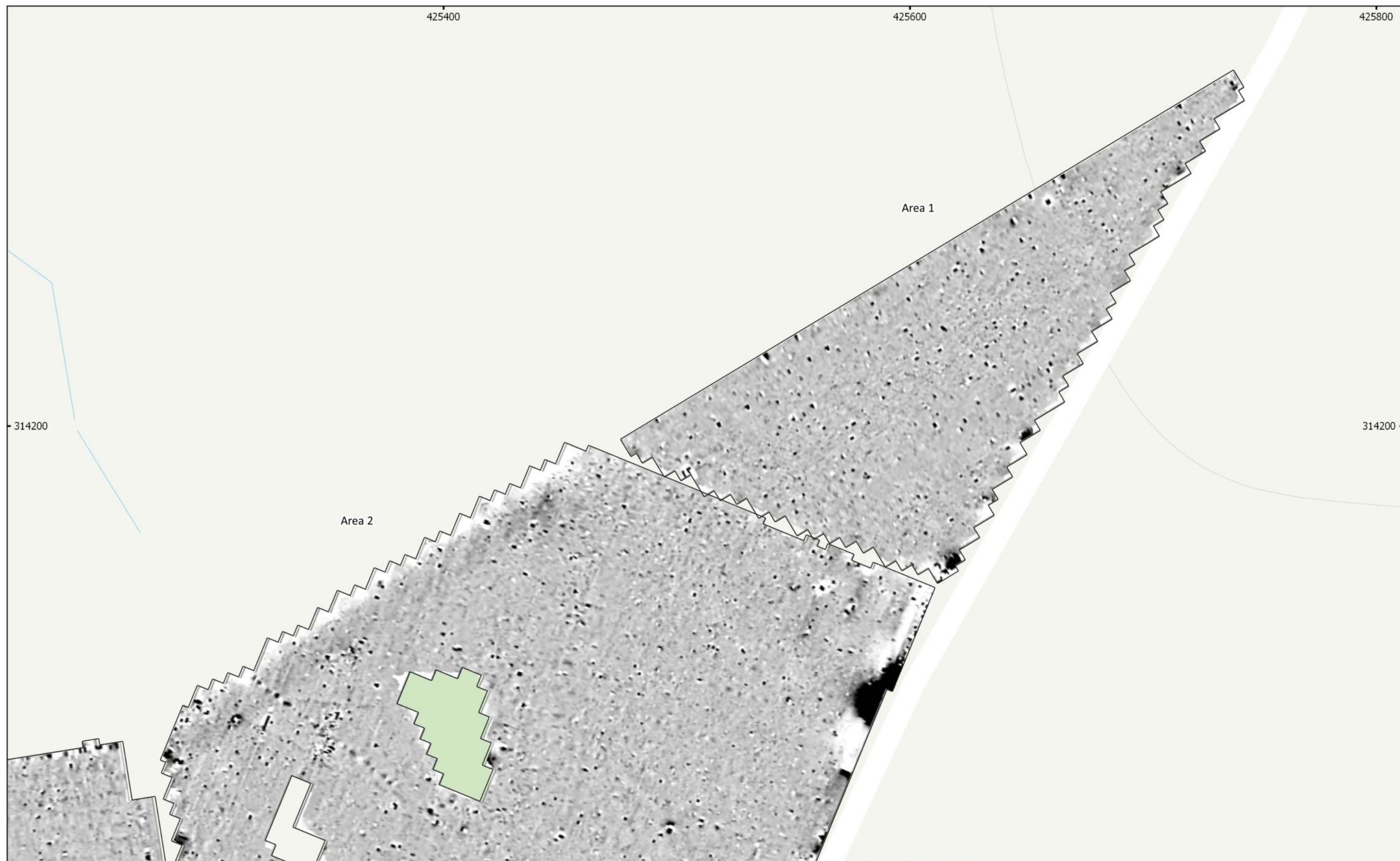
- | | | |
|----------------------|-------------------------|--------------------------|
| Pond (Former) | Ferrous/Debris (Spread) | Ridge and Furrow (Trend) |
| Natural (Weak) | Undetermined (Strong) | Drainage Feature |
| Magnetic Disturbance | Agricultural (Trend) | Ferrous (Spike) |



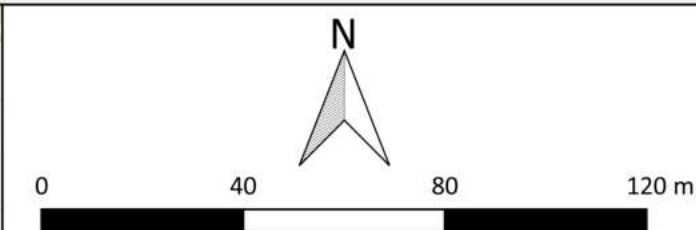
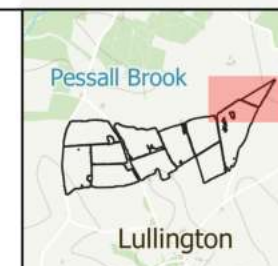
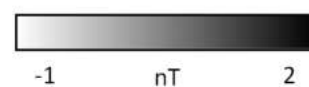


MSSK804 - Lullington, south Derbyshire
Figure 24 - XY Trace Plot (East)
30nT/cm at 1:1,500 @ A3
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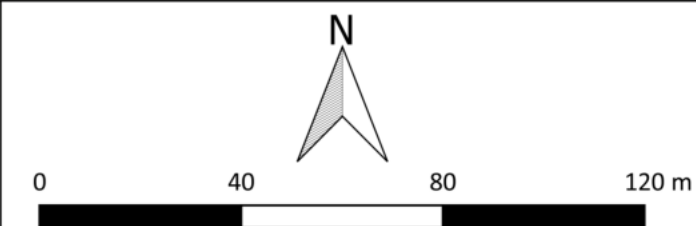
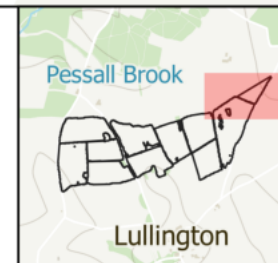
MSSK804 - Lullington, south Derbyshire
 Figure 25 - Magnetic Gradient (Northeast)
 1:1,500 @ A3
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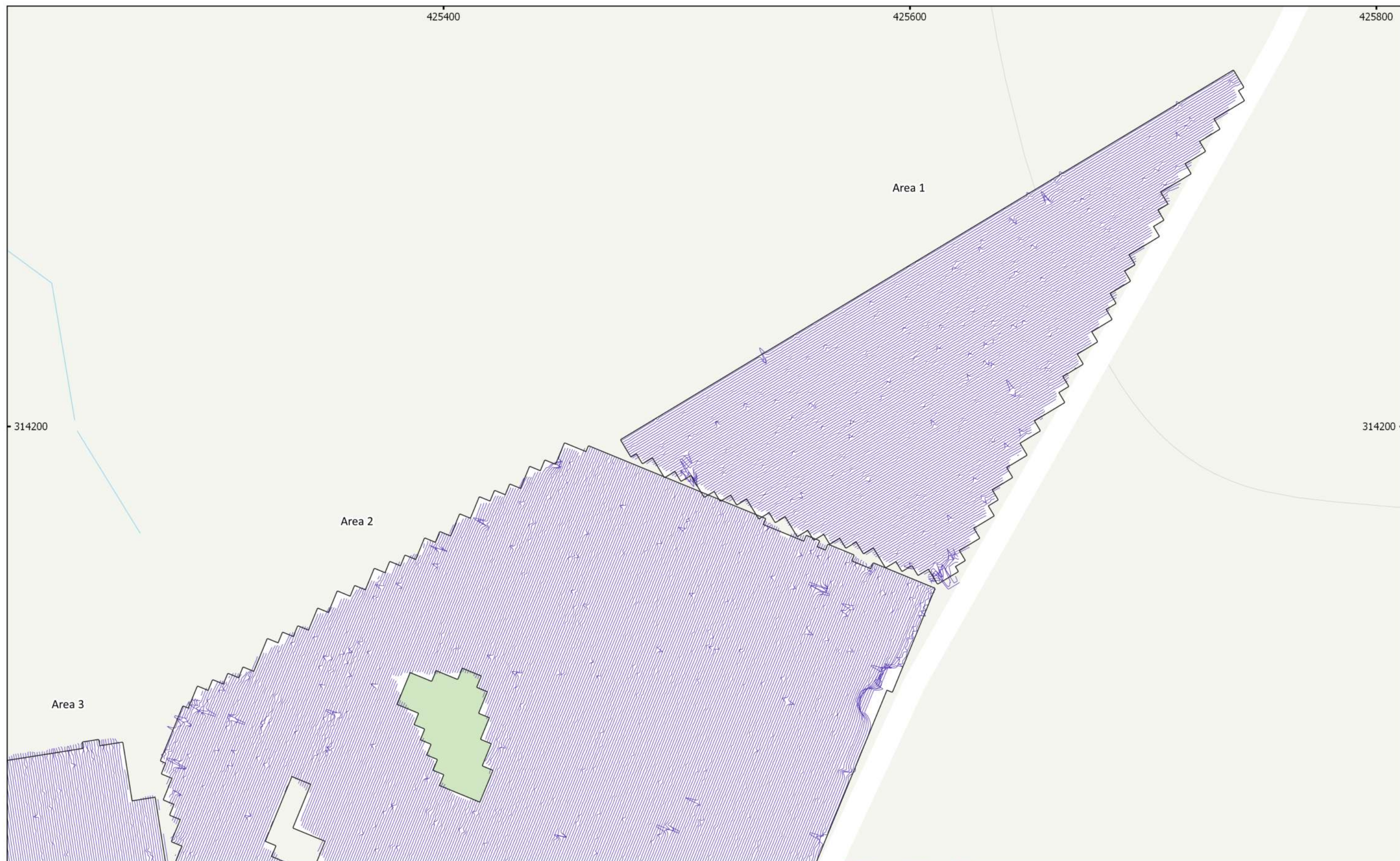




MSSK804 - Lullington, south Derbyshire
 Figure 26 - Magnetic Interpretation (Northeast)
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- | | | |
|--|---|--|
|  Natural (Weak) |  Ferrous/Debris (Spread) |  Drainage Feature |
|  Magnetic Disturbance |  Agricultural (Trend) |  Ferrous (Spike) |





MSSK804 - Lullington, south Derbyshire
Figure 27 - XY Trace Plot (Northeast)
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