Appendix 8.3

GEOPHYSICAL SURVEY REPORT

APPENDIX 8.3

Geophysical Survey Report

Begbroke,

Oxfordshire

For

Oxford Archaeology

Magnitude Surveys Ref: MSSP1306

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Abstract

A combined fluxgate gradiometer and electromagnetic induction survey was successfully completed across the majority of the survey area, with c. 6.2ha not surveyed due to the presence of a deer farm and overgrown vegetation. A large number of archaeological anomalies have been identified with 8 major foci across the survey area. These includes multiperiod settlement areas, funerary complexes, enclosure systems, and trackways along with other isolated anthropogenic anomalies. The electromagnetic induction has detected areas of low and high conductivity that correspond respectively with sand and gravel bars and inundated zones. The magnetic and EM results provide complementary results, as most of the archaeological foci occur on sand and gravel deposits. Magnetic disturbance, affecting both techniques, is present over services and along parts of the perimeter of the survey area. Within the magnetic data, anomalies relating to the long-term agricultural use of the land have been identified as former mapped and unmapped field boundaries, and evidence of ridge and furrow cultivation. Modern ploughing and drains have been also detected. Anomalies interpreted as areas of possible former mineral extraction have also been detected. Several anomalies have been classified as ‘undetermined’ due to lack context or any clear pattern or morphology that would enable a confident interpretation. Nevertheless, an archaeological origin cannot be excluded.

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1. Introduction

1.1. Magnitude Surveys Ltd (MS) was commissioned by Oxford Archaeology to undertake a geophysical survey over a c. 152.8ha area of land at Begbroke, Oxfordshire (SP 47349 13115).

1.2. The geophysical survey comprised hand-pulled & quad-towed, cart-mounted GNSS-positioned fluxgate gradiometer and electromagnetic (EM) induction survey. The EM data were collected simultaneously with the gradiometer survey on the cart-mounted system. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to 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 featured buildings (SFBs) and industrial activity (David et al., 2008). EM survey provides data related to both soil electrical conductivity and magnetic susceptibility. It provides multiple datasets corresponding to properties of bulk soil volumes at various depths of investigation, and is particularly suited for detecting paleo-landscape features, such as paleochannels variation in superficial deposits, and deeper conductive targets.

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, 2020) and the European Archaeological Council (Schmidt et al., 2015).

1.4. It was conducted in line with a WSI produced by MS (Adams, 2022).

1.5. The survey commenced on 22/8/2022 and took four weeks 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 for Archaeological Prospection).

2.2. The directors of MS are involved in cutting edge 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 has served as 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 Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London and a Member of CIfA, 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, field and office staff have degree qualifications relevant to archaeology or geophysics and/or field experience.

3. Objectives

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

3.2. In line with the OCC Guidance Document, the purpose of this geophysical survey is to determine (as far as is reasonably possible from a limited programme of non-intrusive investigation) the nature of the archaeological resource within the specified area using appropriate methods of study which satisfy the stated and implied aims of the project. This evidence will form the basis of any proposals for further investigation.

4. Geographic Background

4.1. The survey area is located 220m south of Begbroke and consists of several arable and pasture fields (Figure 1). The survey areas are bounded by the A44 to the west and the Oxford Canal to the east, with mixed arable and residential land to the north and south (Figure 2). An area of c. 6.2 ha was not surveyed due to the presence of overgrown vegetation and livestock.

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	The survey area consisted of a harvested, arable field within crop stubble. There were several depressions at the centre of the survey area.	The survey area was bordered by hedgerow and metal fencing to the northeast and west, with a footpath also following the eastern boundary. In the south, the area was bordered by trees and a river. In the southeast of the survey area there was an area of overgrown vegetation.
2	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was bordered by hedges on all sides.
3	The survey area consisted of a harvested, arable field with crop stubble. A footpath followed the southern field boundary.	The survey area was surrounded by hedgerows on all borders. A telegraph pole was next to the north of the eastern boundary with the overhead cable parallel to the boundary running north to south. Overhead cables followed the eastern boundary.
4	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was surrounded by hedgerows on all borders. A telegraph pole was next to the eastern boundary with the overhead cable follow the parallel to the boundary north south.
5	The survey area consisted of a harvested arable field with crop stubble. A public foot path bisected the field east west.	The survey area was bordered by hedgerow to the east, west and south, and by a river and tree-line to the north.
6	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was bordered by hedges to the northwest, east and south, by a river and treeline to the north, by a tarmac farm-track in the southwest. In the middle of the survey area there was a building, and an area surrounded by

		trees. Several telegraph poles were located in the west of the survey area, with overhead cables following the western boundary heading north-south.
7	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was surrounded by trees and hedgerow, with the river to the north and canal to the east. The survey area was bisected by telegraph poles carrying an overhead cable oriented north to south, and by a footpath running northeast to southwest.
8	The survey area consisted of a harvested arable field with crop stubble.	The survey area was surrounded by hedges on all sides.
9	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was bordered by hedges along the north, east and southwest, with wood-and-wire fencing to the northwest and south. A wooden telegraph pole was in the south of the survey area carrying overhead cables oriented northwest to southeast.
10	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was bordered by hedges to the south, by treelines to the west and northwest, and by a tarmac farm track to the northeast and east.
11	The survey area consisted of a pasture field.	The survey area was bordered by hedge to the east, south and north, with the railway, and wire fencing to the west. Telegraph poles carrying overhead cable followed the western border of the field. Two boreholes were noted along the southern edge of the field.
12	The survey area consisted of a pasture field, sloping from the north down to the south.	The survey area was surrounded by wire fencing on all sides. There were 4 chicken coops also located within the field. The survey in this area was halted due to presence of deer.
13	The survey area consisted of a harvested, arable field with crop stubble.	The area was bordered by hedgerow to the north, east and south, and by wire fencing to the west. There were several boreholes across the field. Two sets of parallel telegraph poles and overhead cables were present in the field, one next to the eastern boundary, with the other cutting the middle of the field in the south, parallel to the western boundary.
14	The survey area consisted of a harvested, arable field with crop stubble. There was a slight slope going from the east down to the west.	The survey area was surrounded by hedges, along the eastern border, with the rail-line just beyond. A series of telegraph poles carrying overhead cable bisected the survey area north to south down the centre of the field. There was an area of overgrown vegetation in the south.
15	The survey area consisted of a pasture field.	The survey area was bordered by hedges to the north, east and south, by wire fencing to the west. , A house and garden were located to the

		west of the survey area, beyond which was the railway.
16	The survey area consisted of a pasture field.	The survey area was surrounded by hedges and trees.
17	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was surrounded by hedges, with the canal following beyond the eastern boundary. The survey area was bisected by telegraph poles carrying overhead cable oriented northeast to southeast.
18	The survey area consisted of a harvested, arable field with crop stubble.	The survey area was surrounded by hedges on all sides. The canal followed the eastern boundary on the other side of the hedge. The survey area was bisected by telegraph poles carrying overhead cable oriented northeast to southeast.
19	The survey area consisted of a harvested, arable field with crop stubble, sloping from the north down to the south.	The survey area was surrounded by hedges on all sides. The survey area was crossed by telegraph poles carrying overhead cable oriented northeast southeast. There was an area of overgrown vegetation along the northern boundary. There was an infield geotechnical trial pit noted in the southern corner.
20	The survey area consisted of a harvested, arable field with crop stubble. The field sloped from the northwest down to the southwest.	The survey area was surrounded by hedges on all sides, with the canal following the eastern boundary.

4.3. The underlying geology consists of primarily of alluvium - clay, silt, sand and gravel with Summertown-Radley member sand and gravel in the north (British Geological Survey, 2022). The majority of the survey area is located on mudstone with the northern area situated within a band of siltstone and limestone.

4.4. The soils consist predominantly of freely draining, slightly acid but base-rich soils with slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils to the northeast and loamy soils with naturally high groundwater to the south (Soilscapes, 2022).

5. Archaeological Background

5.1. The following is a summary of a Desk Based Assessment produced by Archaeology Collective, as by Oxford Archaeology (Lord, 2018) and additionally trench evaluation report produced by Cotswold Archaeology and provided by Oxford Archaeology (Tsamis, 2011).

5.2. A trial trench evaluation was carried out in 2001 at Begbroke Science Park, situated in the centre of the survey area. The excavation of 19 trial trenches was carried out across much of the site not occupied by buildings or other structures. Only one archaeological feature was found, this being a small pit cut into the natural gravel, and which contained charcoal in its fill.

5.3. Another trial trench evaluation, located in the southern part of Area 9, was carried out in 2011. Two 'ditch-like' features were identified by this evaluation and roughly corresponded with cropmarks shown on the satellite imagery.

5.4. A series of cropmarks visible on aerial photographs have been noted in the northern part of the survey area. These represent up to three possible Bronze Age round barrows, and two pairs of adjacent ditches.

5.5. A cropmark identified as an Iron Age hut, has been detected 60 m south from the part of Sandy Lane that runs across the survey area. Iron Age and Roman pottery have been found c. 100 m north and c.150 m south of Parker's Farm, located within the survey area.

5.6. The site of a Romano-British settlement, identified by pottery found within a series of storage pits, with the fills being identified as being hearth debris, has been detected c. 107 m south from the part of Sandy Lane that runs across the survey area.

5.7. Finds of pottery and other items dated to the Medieval Period, have been identified within the survey area approximately 50 m west to the Parker's Farm, as well as c.50 m south of Begbroke Science Centre.

5.8. Some undated cropmarks have been identified within the survey area. A square enclosure was located c. 40 m north of Sandy Lane, and a droveway and field system have been detected in the vicinity of Parker's Farm.

6. Methodology

6.1.Data Collection

1.1.1.Geophysical prospection comprised the complementary magnetic & electromagnetic induction methods as described in the following table.

1.1.2.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
Electromagnetic Induction – Conductivity and Magnetic Susceptibility	GF Instruments CMD Explorer in HCP orientation	4m	5Hz reprojected to 0.25m

1.1.3.The magnetic and EM data were collected using MS' bespoke hand-pulled & quad-towed cart system GNSS-positioned system.

1.1.4.MS' cart system comprised Bartington Instruments Grad-13 Digital Three-Axis Gradiometers mounted in parallel, and the GF Instruments CMD Explorer in HCP orientation to facilitate greater depth penetration. Magnetic and EM data were collected simultaneously. 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.

1.1.5. Magnetic, electromagnetic 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.

1.1.6. 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.

6.2. Data Processing

1.1.7. Magnetic data

6.2.1.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.*, 2015: 33 and Section IV.2 in David *et al.,* 2008: 11).

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

<u>Zero Median Traverse</u> – 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.

<u>Projection to a Regular Grid</u> – 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.

<u>Interpolation to Square Pixels</u> – 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.

1.1.8. Electromagnetic data

6.2.1.2. Electromagnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.,* 2015: 33 and Section IV.2 in David *et al.,* 2008: 11).

<u>Zero Median Traverse</u> – 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.

6.3.Data Visualisation and Interpretation

1.1.9.For the magnetic results, this report presents the gradient of the sensors' total field data, as well as the total field data from the lower sensors as greyscale images. 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 plots (Figures 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58 & 61). XY trace plots visualise the magnitude and form of the geophysical response, aiding anomaly interpretation.

1.1.10. The electromagnetic induction (quadrature-phase and in-phase) results are presented as colourscale images. Multiple images at different plotting ranges have been used for data interpretation. The EM interpretation is partly derived from the quadrature-phase, which is a proxy for apparent electrical conductivity. These datasets are referred to as C1, C2 and C3 and roughly correspond to bulk soil volumes equated to c. 2.2m, 4.2m and 6.7m below ground level, respectively. However, as the EM is measuring a bulk soil volume, it will be sensitive to features above and below these theoretical exploration depths. The in-phase roughly corresponds with a bulk soil volume of half that of the quadrature-phase. The different receiving coil responses are referred to as I1, I2, and I3 for the magnetic susceptibility. The various investigation depths are described comparatively here as shallow, middle, and deep soil volumes. From this point onward, the respective quadrature-phase and in-phase datasets will be referred to as EM conductivity and EM magnetic susceptibility, respectively.

1.1.11. Geophysical results have been interpreted using raster images in a layered environment, overlaid against open street maps, satellite imagery, historical maps, LiDAR data, and soil and geology mapping. Google Earth (2022) was also consulted, to compare the results with recent land use.

1.1.12. 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

1.1.13. 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 from further work, in order to constantly improve our knowledge and service.

7.2. Discussion

1.1.14. The geophysical results are presented in combination with satellite imagery and historical maps (Figures 14, 16, 18, 20 & 22).

1.1.15. The respective magnetic and electromagnetic surveys have generally responded well to the environment of the survey area. The EM survey has been effective for understanding the broader geological context of the site. The EM data reveals anomalies that corelate with mapped geological formations of sand and gravel (low conductivity anomalies), alongside further responses that could represent more-deeply buried channels and processes characteristic of a floodplain (high conductivity anomalies). For simplicity, indicative of channels and bars have been categorised in EM results; these generally correlate well with anomalies detected in the magnetic results as well. The total field data present anomalies of natural origins clearer and is useful for mapping shallower superficial deposits, as well as some archaeological anomalies.

1.1.16. A fluxgate gradiometer and electromagnetic induction survey was successfully completed across the majority of the survey area, with c. 6.2ha not surveyed due to the presence of a deer farm and overgrown vegetation. Anomalies of probable and possible archaeological origin have been detected across the survey area, along with anomalies of natural, agricultural, and undetermined origin. It should be noted that additional anomalies, including those of archaeological origin, may be obscured by extensive and long-term agricultural usage of this local landscape and by anomalies related to the background geology. Modern disturbance has mostly been limited to field edges and services. The electromagnetic (EM) survey has produced conductivity data that have been interpreted separately to the magnetic data, and those two understandings then assessed in combination, along with comparisons to secondary sources.

1.1.17. Extensive archaeological activity has been identified within the survey area. This activity is concentrated around 8 main foci. Additionally, several isolated anomalies of probable and possible archaeological origin have been identified. All these anomalies together represent an extensive, multi-period archaeological landscape, with multi-phased settlements and funerary complexes, networks of trackways, and smaller enclosure systems. Some of these anomalies are both visible on satellite imagery as cropmarks and correspond with excavated archaeological evidence, which help establish that this landscape was in use for most of the Prehistoric and Roman Period, and later through to the Medieval Period (See Section 5). It is worth noting that the majority of probable burials correspond with strong, low conductivity anomalies caused by sand, silt, and gravel, interpreted as natural levees within the floodplain. The ring ditches and barrows are therefore located in areas relatively higher in the landscape, typical of features of this type where intervisibility between monuments is thought to be important. It is also interesting to note that features whose morphology suggests an earlier chronology respect the paleo-landscape visualized by the EM data to a greater extent, than structures proposed to date to more recent periods. It appears that both settlement complexes associated with younger chronology (Iron Age and Romano-British Period), spread across both, low and high conductivity areas with no recognition of the presence of a former channel that snakes around the high ground [**EM4**]. This relationship could indicate that this particular watercourse was no longer visible and recognized at the time that the settlement was created and occupied. This relative chronology is further supported by the EM data itself, as these anomalies appear clearly in the deeper responses to the EM coils.

1.1.18. Several further penannular, linear, and curvilinear anomalies have been identified within the survey area and have been categorised as possible archaeology. This categorisation has been ascribed to these anomalies because they have defined edges and morphology consistent with cut features such as ditches or pits, but are weaker than the anomalies discussed above. These may also demonstrate a lack of clear organisation or pattern, and therefore a more confident interpretation cannot be given.

1.1.19. The magnetic and EM data show the changes in local geology. Strong, low conductivity anomalies appear in areas of higher elevation, and are likely caused by the presence of sand and gravel deposits. The strong/weak high conductivity responses present across most of the site match the known changes in the superficial geology, and appear to follow the contour lines in the west of the survey area. The strong, low conductivity anomalies in the northern part of the survey area, correlate with mapped areas of sand and gravel. In the east of the survey area the environmental composition is typical of a floodplain environment, seen especially in the high conductivity areas. Former waterlogged areas have been interpreted in the northwest and east of the survey area (Figures 3 to 8). Across the survey area the archaeological foci appear to correlate with areas of low conductivity, such in [**EM1**], [**EM2**] & [**EM3**].

1.1.20. The magnetic and electromagnetic datasets correlate well with each other. In the northwest of the survey area the strong, positive natural anomalies identified most clearly in the magnetic total field data, align with high conductivity anomalies associated with former channels (Figure 12). In the west of the survey area, natural zones and strong linear anomalies appear to correlate with another high conductivity anomalies (Figure 12). The changes in the contrast caused by different natural background, mostly alluvium zone, could have affected visibility of some anomalies of an archaeological origin around archaeological zones, such as in Area 17.

1.1.21. Previous agricultural activity has been detected in the form of extensive ridge and furrow cultivation identified in the magnetic data, former mapped and unmapped historical field boundaries, drainage features and ploughing trends. The presence of ridge and furrow ploughing regimes indicate that the area has been under cultivation since at least the medieval/post-medieval period.

1.1.22. Throughout most of the survey area, anomalies that have been classified as 'Undetermined' have been identified. Some of these, characterised by strong, dipolar signal might be representative of in-situ burning. All of these anomalies have limited context or lack any clear pattern or morphology to enable a confident interpretation. Nevertheless, an archaeological origin cannot be excluded.

7.3. Interpretation

1.1.23. 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 dipolar anomalies are likely to be the result of isolated pieces of modern ferrous debris on or near the ground surface.

7.3.1.3. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentration of multiple discrete, dipolar anomalies usually resulting from highly magnetic material such as rubble containing ceramic building materials and ferrous rubbish.

7.3.1.4. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures, typically including fencing, pylons, vehicles and service pipes, have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure weaker anomalies relating to nearby features, should they be present, often over a greater footprint than the structure causing them.

7.3.1.5. **Undetermined** – Anomalies are classified as Undetermined when the origin of the geophysical anomaly is ambiguous and there is no supporting contextual evidence to justify 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 distinct from those caused by ferrous sources.

1.1.24. Specific Anomalies (Magnetic)

7.3.1.6. **Probable Archaeology (Focus I: Funerary Complex 1) –** In the central part of Area 1, three annular and three penannular anomalies have been identified [**1a**] (Figures 13, 23, & 24). The location of this complex, corresponds with a sand and gravel bar known from geological mapping (See Section 4.4) and detected on EM data [**EM1**]. Their signal is positive, strong and defined, probably indicating infilled ditch-like features. Their diameter varies between c. 15 m and 10m. These anomalies, correspond with cropmarks visible on satellite imagery and are mentioned in Section 5.4 of the Archaeological Background (Figures 14 & 16). The morphology of these features suggests that they are possible Bronze Age round barrows.

7.3.1.7. **Probable Archaeology (Focus II: Funerary Complex 2) –** A series of annular, penannular and rectilinear anomalies surrounded by multiple circular and linear anomalies have been detected within the northern part of Area 6 [**6a**] (Figures 26 & 27). This complex corresponds with low conductivity anomalies indicative of possible sand and gravel formations [**EM2**]. All anomalies exhibit strong, positive magnetic signals, indicative of filled ditches. The diameter of the anomalies in this complex varies between c. 15 and 10 m, which is the same as ranges recognized above in Focus I. The most clearly recognisable anomaly of this focus is annular in shape and c.15 m in diameter. Its morphology and signal are akin to the anomaly recognized within Focus 1 and interpreted as a Bronze Age round barrow. Given the fact that these foci are located only c. 170 m apart, it is not unlikely that they are related.

7.3.1.8. **Probable Archaeology (Focus III: Possible Enclosure System with Trackways**) – A series of annular, D-shaped, and rectilinear anomalies have been identified in the eastern part of Area 6 [**6b**] (Figures 26, 27, 35 & 36). This focus corresponds with low conductivity anomalies indicative of possible sand and gravel formations [**EM2**]. These are characterized by strong and weak, positive signal and are partially cut by a positive, weak, linear anomaly that constitutes part of what looks to be a double-ditch trackway, running to the northwest and southwest. This would suggest that these two sets of anomalies are not contemporaneous. Immediately to the north of this complex, a double-ditch trackway running southwest–northeast exhibits a similar signal and morphology to the aforementioned anomalies, however they do not seem to be connected [**7a**]. The possible enclosure system could be Bronze Age in date, but the trackway could be of different chronology, as it does not appear to respect the position of the enclosure in the landscape.

7.3.1.9. **Probable Archaeology (Focus IV: Possible Enclosure System) –** In the eastern part of Area 4 continuing into the western part of Area 5, a complex of multiple discontinuous linear, rectilinear, curvilinear and penannular anomalies have been detected [**4a**; **5a**] (Figure 29, 30, 32 & 33). This focus corresponds with low conductivity anomalies indicative of preferentially dry areas where archaeological activity is usually expected. All of these represent strongly enhanced signal suggestive of ditches, which could be related to a broader enclosure system. Parts of this complex are visible on satellite imagery as cropmarks (Figure 14). In the southern part of this focus, annular anomalies have been identified. These also show strong positive signal, indicative of infilled ditches. A sample of these features were investigated by trial trenching (See Section 5.3) and categorised as Bronze Age enclosures.

7.3.1.10. **Probable Archaeology (Focus V: Multiphase Settlement Complex with Trackways 1) –** In the south-eastern part of Area 6 a complex of strong, positive, linear, curvilinear, rectilinear, annular and circular anomalies has been identified [**6c**] (Figures 35 & 36). This focus is partially located within low conductivity anomalies indicative of preferentially dry areas, and high conductivity anomalies that could be related to a former channel. The signals of these anomalies are characteristic of ditches and cover an area of approximately 3 ha, possibly extending into Area 11. The main rectilinear anomaly provides a boundary respected by most of the smaller enclosures within it. There are a series of overlapping anomalies within this focus, which do not respect each other and therefore suggest multi-phased occupation. However, it is hard to differentiate clearly which anomalies within the complex could belong to different phases. In the centre of this complex, anomalies indicating the presence of a double-ditched trackway have been identified. This feature continues to the west, where it bifurcates to form two separate trackways to the northwest [**6d**] and southeast [**10b**] (Figure 32, 33 & 41, 42). The trackway is clearly respected by the layout of the rectilinear settlement which suggests that they are contemporaneous. Finds of Iron Age and Roman, as well as Medieval, pottery and other items (See Section 5) within and in the vicinity of the complex, could suggest continuous settlement in this area throughout the Iron Age to Medieval Period.

7.3.1.11. **Probable Archaeology (Focus VI: Multiphase Settlement Complex with Trackways 2) –** In the centre of Area 13 a multitude of anomalies covering an area of approximately 6 ha has been identified (Figures 47, 48, 50 & 51). This focus is partially located within low conductivity anomalies indicative of preferentially dry areas, and high conductivity anomalies that could be connected to a former channel. Anomalies recognised exhibit positive, strong and weak signals and are linear, curvilinear, rectilinear, annular, penannular and circular in shape. Many anomalies overlap each other, giving the impression of multiple phases of activity, likely relating to settlement, within this complex [**13a**]. Immediately to the west of this complex, a double-ditched track has been identified. It is unclear how the trackway is related to the settlement, but it could be linked to one of the settlement phases. Further to the north, in the vicinity of this focus, the site of a Romano-British settlement has previously been identified (See Section 5.6). This would suggest that this complex could extend to the north and therefore at least some phases of this settlement could be dated to the Roman Period.

7.3.1.12. **Probable Archaeology (Focus VII: Funerary Complex 3)** – In the eastern and south-eastern part of Area 17 a great number of positive, strong and weak, annular and penannular anomalies have been identified [**17a**] (Figures 53, 54, 56 & 57). This focus is situated across the preferentially dry area and preferentially wet zones detected within the EM dataset. These anomalies are accompanied by less numerous linear, curvilinear, and circular anomalies displaying similar strong and weak positive signals, indicative of ditches and pits. This complex of anomalies spreads across approximately 4ha. The diameter of the annular and penannular anomalies varies between 16m and 8 m. Many of these ring-shaped anomalies respect others, creating distinctive clusters only occasionally overlapping other features. The morphology and signal of these anomalies suggest they could be round barrows, and therefore possibly date to the Bronze Age. The quantity and general location of these anomalies suggest intensive, and potentially long-lasting use of this area for burial, with round barrows visible and recognized in the local landscape.

7.3.1.13. **Probable Archaeology (Focus VIII: Possible Enclosure System)** – In the south-eastern part of Area 18, multiple linear, curvilinear, rectilinear, and circular anomalies have been detected (Figures 56, 57, 59 & 60). All of these present strong and weak positive signals, indicative of ditch-like features and pits [**18a**]. Anomalies overlap each other frequently and are most probably associated with multiple enclosures.

7.3.1.14. **Probable Archaeology (Scattered Anomalies)** – Across the survey area, several anomalies of probable archaeological origin have been identified. These are isolated from the main foci of archaeological activity described above, and their relation to these centres is unknown. All these anomalies are located within preferentially dry areas detected within the EM dataset which are preferably used in antiquity. Within Area 9 two anomalies of annular [**9a**] and rectilinear [**9b**] shape have been detected. Both exhibit strong, positive signal that indicates ditch-like features (Figures 41 & 42). The ring ditch [**9a**] is approximately 10m wide and could represent a round barrow of Bronze Age date. The rectilinear anomaly could be associated with a small enclosure. In the southwest corner of Area 10, a rectilinear, strong, positive anomaly has been identified [**10a**] (Figures 41 & 42). It could represent an enclosure with visible entrances. The anomaly is also visible on satellite imagery as a cropmark (See Section 5. 8) (Figure 18). In the south-eastern part of Area 13 a positive, weak, rectilinear anomaly has been identified [**13b**] (Figures 50 & 51). There is an internal anomaly to its eastern boundary that would suggest a double-ditch structure and some undetermined anomalies in the western part, that are obscured broadly by natural zone, so they can't be defined better. Its signal and morphology suggest the existence of yet another enclosure, possibly related to settlement activity nearby; nevertheless existence of a double ditch and some possible inside structures could suggest different function and possibly Romano-British chronology. In the northern part of Area 19, annular, linear and circular anomalies have been detected (Figures 59 & 60). These anomalies create a cluster with two possible ring diches of 8m diameter each in the centre [**19a**]. Their signal is positive and weak, but despite their ephemerality could indicate the existence of more round barrows.

7.3.1.15. **Possible Archaeology (Strong/Weak)** – Across the survey area several positive, weak, penannular, and strong, curvilinear anomalies have been identified (Figures 23 to 60). Most of these anomalies have the potential to be anthropogenic in origin, and therefore a possible archaeological categorisation has been given. These anomalies could form part of a former field system, parts of enclosures, or be indicative of ring ditches, yet they lack clear characteristics that would allow for a confident interpretation.

7.3.1.16. **Ridge and Furrow (Trend) –** Arrangements of regularly-spaced, weak, linear and curvilinear anomalies have been detected across the survey area (Figures 23 to 60). These anomalies are indicative of ridge-and-furrow regimes and have been identified as following two different alignments. In many areas it is difficult to distinguish between drainage and ploughing trends.

7.3.1.17. **Agricultural (Weak & Strong)** – Several weak linear, and strong discrete, anomalies have been identified crossing Areas 2, 4, 5, 6, 9, 11, 13 & 15 (Figures 26, 27, 29, 30, 32, 33, 35, 36, 38, 39, 44, 45, 47, 48, 50, 51). Some of these anomalies broadly align with field boundaries recorded on 2nd Edition Ordnance Survey (OS) mapping, or with footpaths visible on satellite images (Figures 23 to 60). Others have been interpreted as being unmapped field boundaries due to their similarities in magnetic signal to the mapped field boundaries.

7.3.1.18. **Agricultural (Trend)** – Weak linear trends have been identified across the survey area. These anomalies correspond with modern ploughing visible on satellite imagery (Figures 23 to 60).

7.3.1.19. **Drainage Features** –Several linear anomalies are noted in Areas 6, 9, 10, & 18. Two types of magnetic responses have been recorded. The first type of response consists of strong, negative, linear signal. The second type of anomalies have a weak, dipolar signal indicative of modern ceramic drains (Figures 35, 36, 41, 42 56 & 57).

7.3.1.20. **Natural (Strong/Weak/Spread)** - Across the survey area, strong and weak, linear and discrete anomalies have been detected (Figures 23 to 60). These anomalies are likely a result of alluvial superficial deposits. These anomalies also correlate with changes in conductivity seen in the electromagnetic results. Many strong and weak magnetic anomalies have been detected overlapping with high conductivity zones indicating the courses of former channels in a floodplain, for example, in Areas 10, 18, 19 & 20.

7.3.1.21. **Undetermined (Strong/Weak/Spread)** –Multiple linear, curvilinear, and discrete anomalies have been identified across the survey area (Figures 23 to 60). Some of these, characterised by strong, dipolar signals might be representative of in-situ burning activity [**2a**] (Figures 29 & 30). Other anomalies do not have any supporting contextual evidence and may be partially obscured by the spreads of anomalies indicating geological variation across the area. These anomalies are themselves likely to be the result of geological or agricultural processes, although an archaeological origin cannot be entirely ruled out.

7.3.1.22. **Industrial (Spread/ Weak) –** Within Area 1 several rectangular anomalies the largest of which is c. 100m x c.10m, and roughly square anomalies in areas 10& 19 have been identified (Figures 23, 24, 59 & 60). The anomalies in the northern part of the survey area appear to represent trenches with a distinct cut edge being visible as the possible infill appears more magnetic than the undisturbed material around them [**1b**]. These have been interpreted as being possible extraction pits/trenches, or possible unrecorded evaluation trenches (archaeological or geotechnical). Another similar anomaly is located within Area 10 [**10c**] and assigned to the same category due to presenting a similar morphology (Figures 41 & 42). The anomaly within eastern corner of Area 19 was a geotechnical trench.

1.1.25. Specific Anomalies (Electromagnetic)

7.3.1.23. **High conductivity (Strong and Weak**) – Large amorphous anomalies of high conductivity have been interpreted across the survey area (Figures 3 to 8). High conductivity anomalies could represent the locations of former watercourses. Within the north and east of the survey area these appear to be near to the modern course of the canal and relate to natural processes characteristic of those occurring within floodplains or other commonly inundated areas (Figures 3 to 8). The EM results reveal sinuous, high conductivity anomalies that snake north-south in the central part (Areas 5, 6 & 10) of the survey area respecting the slope [**EM4**]. Their clear detection in the deeper EM coils indicate they may reflect more-deeply buried channels and landforms.

7.3.1.24. **Low conductivity (Strong and Weak)** – The survey has detected large, amorphous low-conductivity anomalies across the survey area (Figures 3 to 8). Very strong low-conductivity responses correlate with the mapped sand and gravel superficial geology within Area 1 [EM1]. Pockets of low-conductivity responses along the former channel, may indicate the further presence of sand and gravel [EM2; EM3]. Within the centre and north of the survey area these appear to match changes in the superficial geology of sands and gravels.

8. Conclusions

1.2. A fluxgate gradiometer and an electromagnetic induction survey were successfully completed across the majority of the survey area, with c. 6.2ha not surveyed due to the presence of overgrown vegetation and livestock. Although the magnetic and EM survey results were targeting different types of physical characteristics, the respective results have proven complementary as many of the archaeological and natural anomalies detected in the magnetic survey appear to respect landform changes identified in the EM survey.

1.3. The natural variations within the survey area are evident in both magnetic and EM survey results. The EM is more effective at delineating the paths of former waterlogged areas, channels and the locations of sand and gravel bars.

1.4. The survey has detected an extensive amount of archaeology across the whole survey area, with 8 major foci of activity identified. Other more-isolated anomalies can also be interpreted as possibly/probably archaeological in origin. All these anomalies together represent an extensive, multi-period archaeological landscape, with settlements likely existing through multiple phases of occupation, burial complexes, networks of trackways, and smaller enclosure systems. The archaeological foci, especially those with potentially early chronology, appear to be connected to the preferentially dry areas of sand and gravel, possibly suggesting a preference for these areas in some periods, whereas archaeology related to potentially later periods do not respect this order strictly.

1.5. Long term agricultural use of the land within the survey area has been detected in the form of extensive ridge and furrow cultivation, former mapped and unmapped historic field boundaries, drainage features and ploughing trends identified in the magnetic data.

1.6. Magnetic disturbance affecting both techniques is present close to services and along parts of the perimeter of the survey area. Anomalies interpreted as filled trenches, possibly for mineral extraction or for site evaluation, have been detected in several locations across the survey area.

1.7. Several anomalies have been classified as 'Undetermined' due to lack of context, or any clear pattern or morphology which would enable a confident interpretation. Nevertheless, an archaeological origin for these cannot be excluded.

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 any dictated time embargoes.

10. Copyright

10.1. Copyright and 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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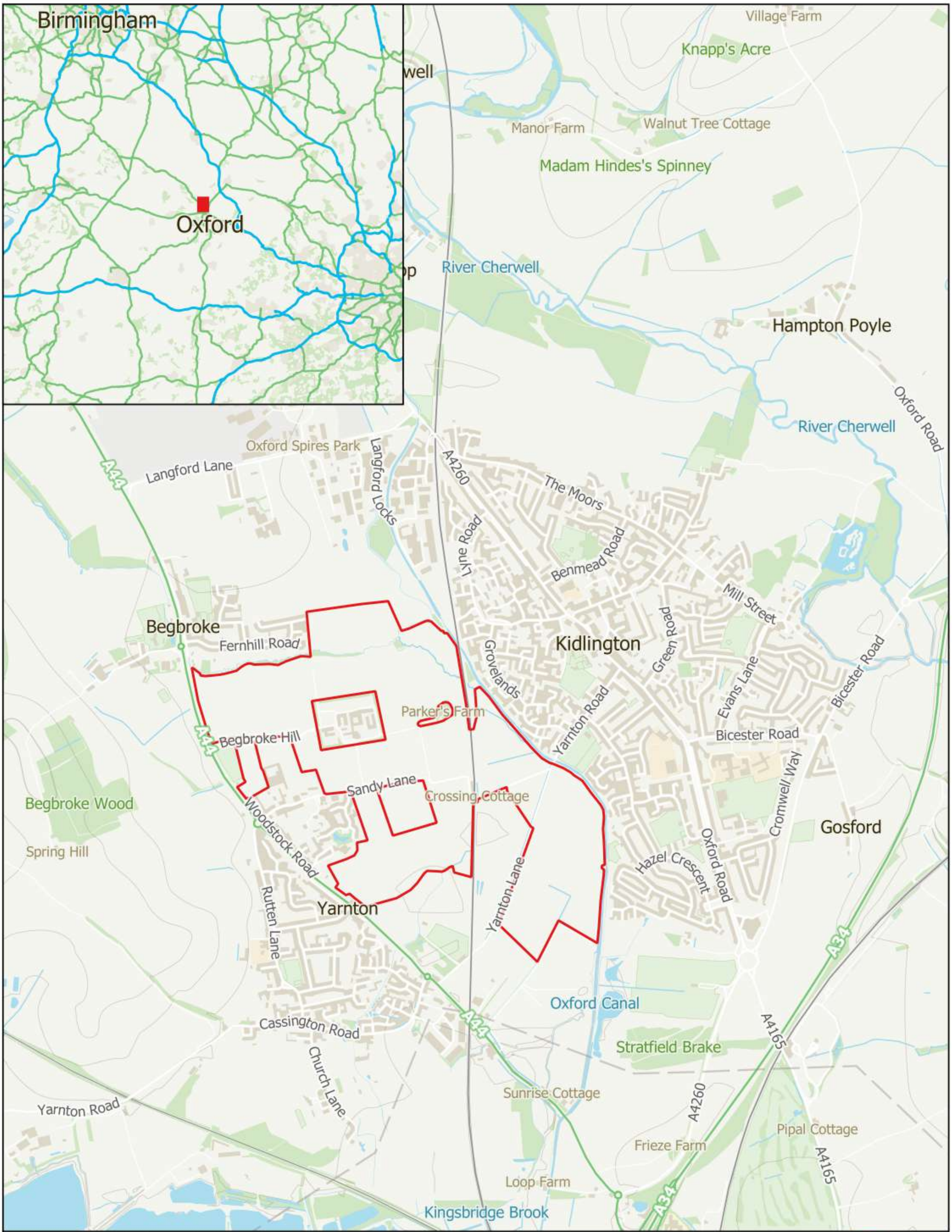
12. Project Metadata

MS Job Code	MSSP1306
Project Name	Begbroke, Oxfordshire
Client	Oxford Archeaology
Grid Reference	SP 47349 13115
Survey Techniques	Magnetometry, Electromagnetic Induction – Conductivity and Magnetic Susceptibility
Survey Size (ha)	c. 152.8ha (Magnetometry & Electromagnetic Induction)
Survey Dates	2022-8-22 to 2022-9-14
Project Lead	Dr Anna Chmielowska PCIfA
Project Officer	Dr Anna Chmielowska PCIfA
HER Event No	TBC
OASIS No	TBC
S42 Licence No	NA
Report Version	0.3

13. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	AC, FC	CH	14 October 2022
0.2	Draft for Director's Approval	AC	PJS	18 October 2022
0.3	Draft after Director's corrections	AC	AJS	22 October 2022



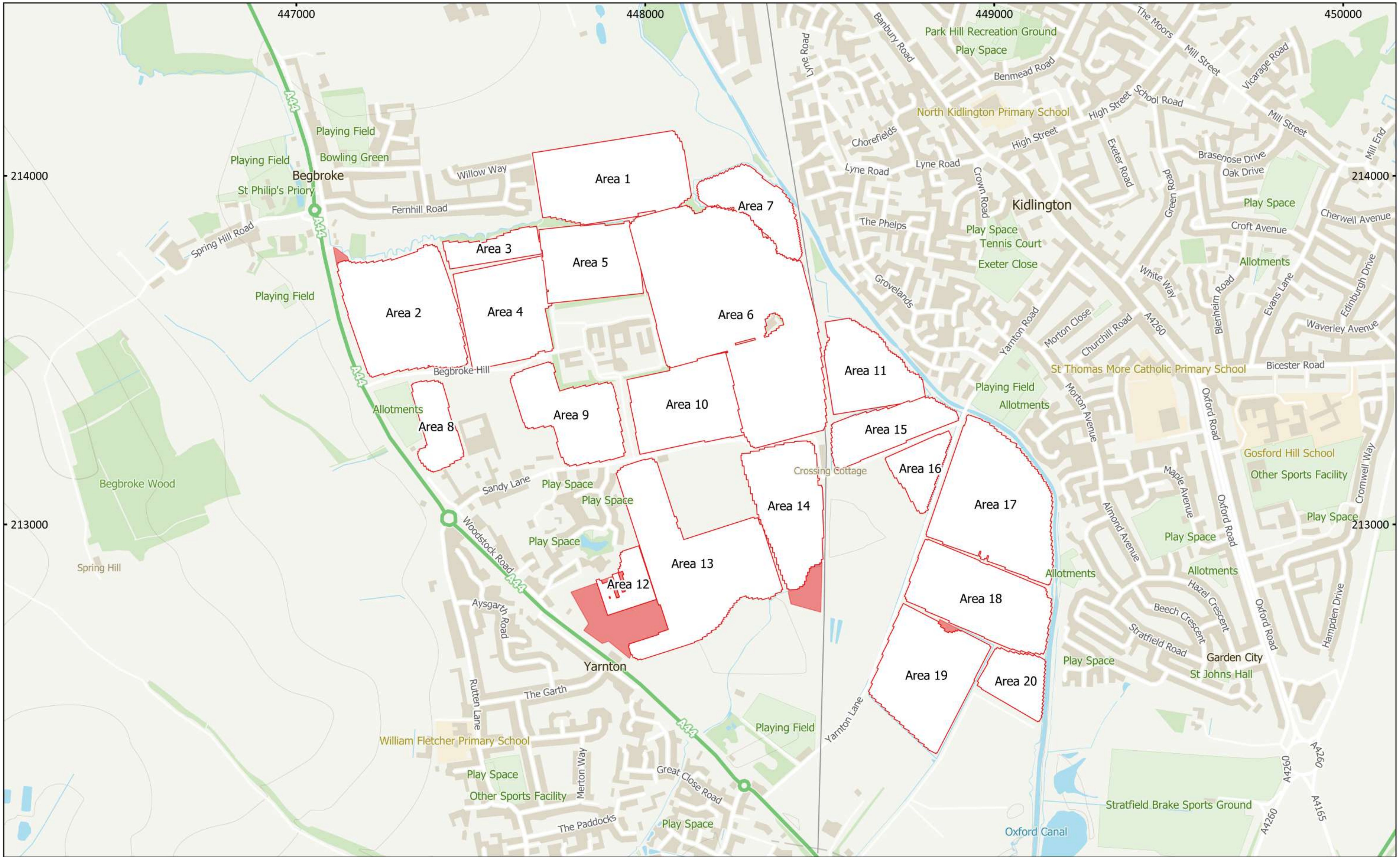
MSSP1306 - Begbroke, Oxfordshire

Figure 1 - Site Location

1:25,000 @ A4

Site Boundary

magnitude surveys



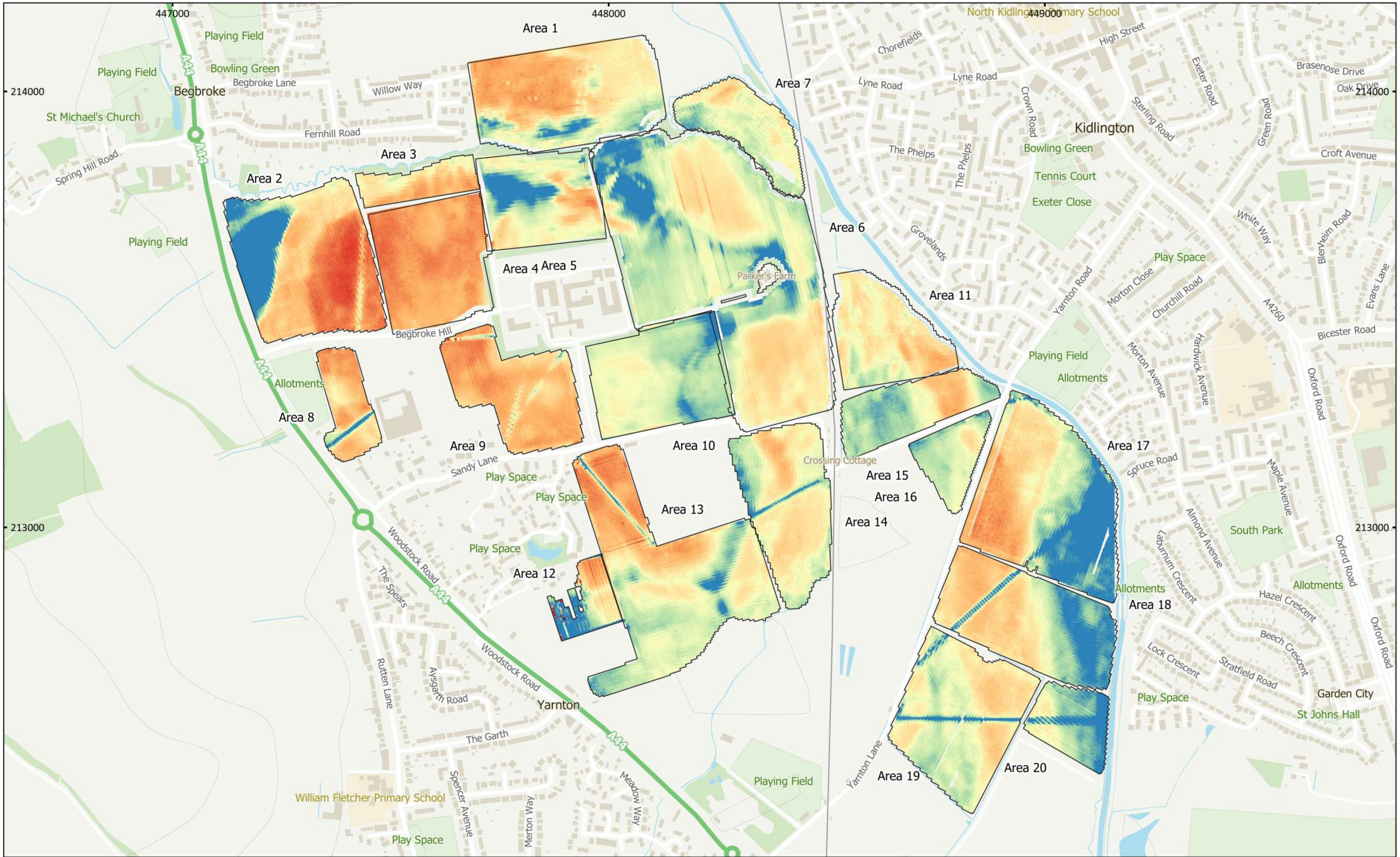
MSSP1306 - Begbroke, Oxfordshire
Figure 2 - Location of Survey Area
1:10,000 @ A3

Survey Area
Unsurveyable Area

N

0 250 500 750 m

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 3 - Electromagnetic Conductivity: Conductivity Coil 1 (Overview)
1:8,000 @ A3

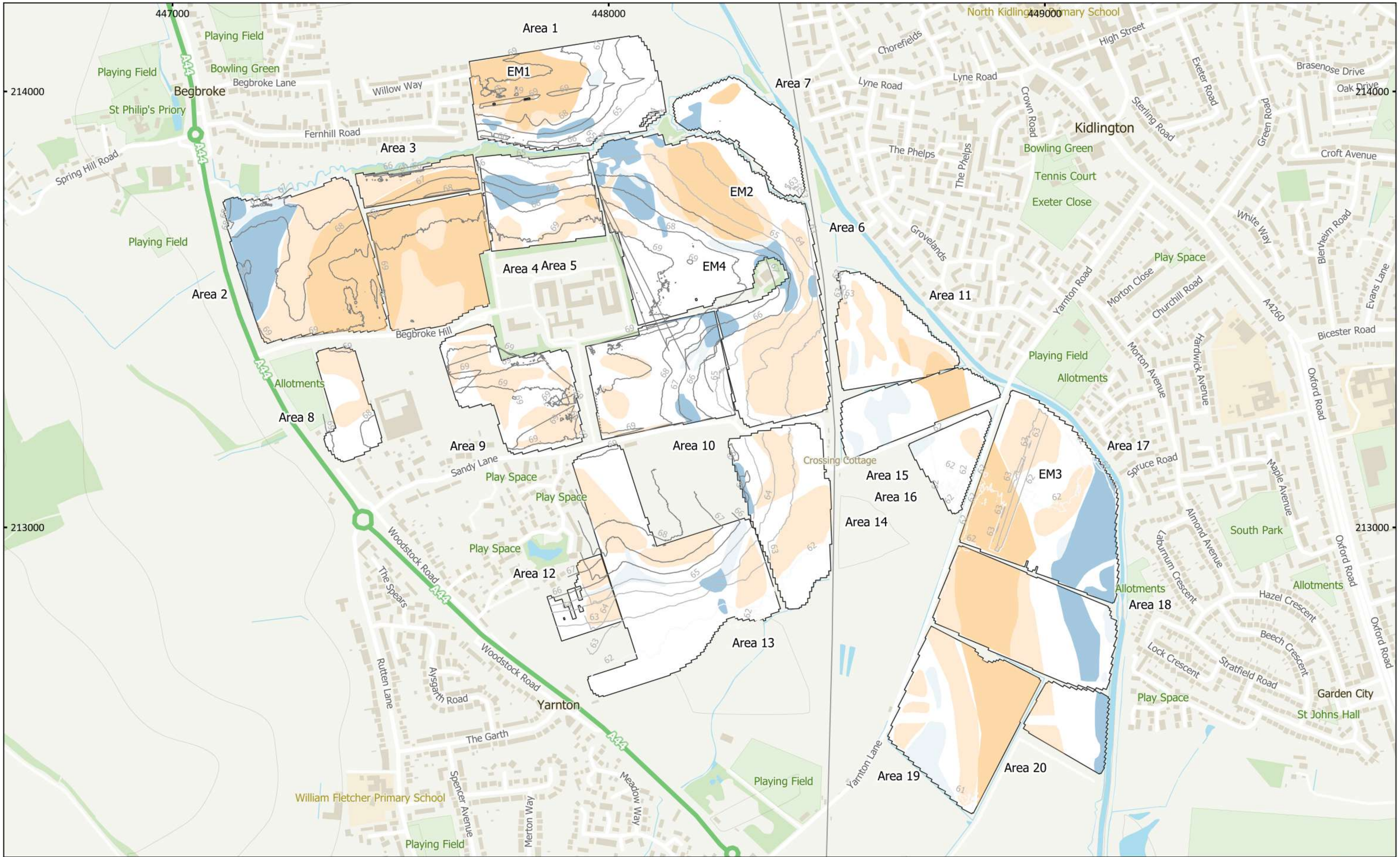
Conductivity Coil 1 - Approximate Depth: c.2.2m

Conductivity
Low High

N

0 150 300 450 m

magnitude surveys



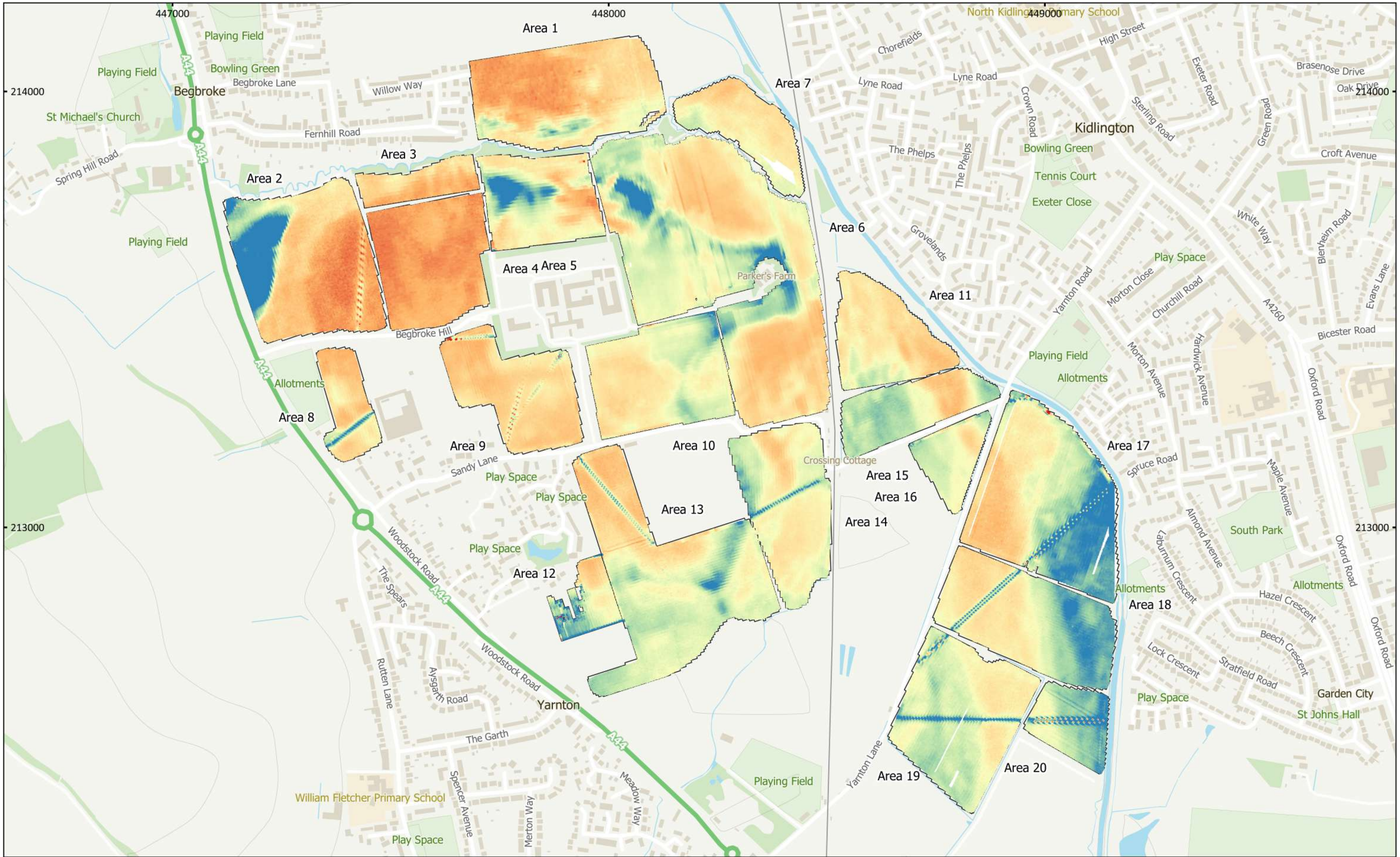
MSSP1306 - Begbroke, Oxfordshire
Figure 4 - EM conductivity Compsite Interpretation C1
1:8,000 @ A3

High Conductivity (Strong)
High Conductivity (Weak)
Low Conductivity (Strong)
Low Conductivity (Weak)
Contour

N

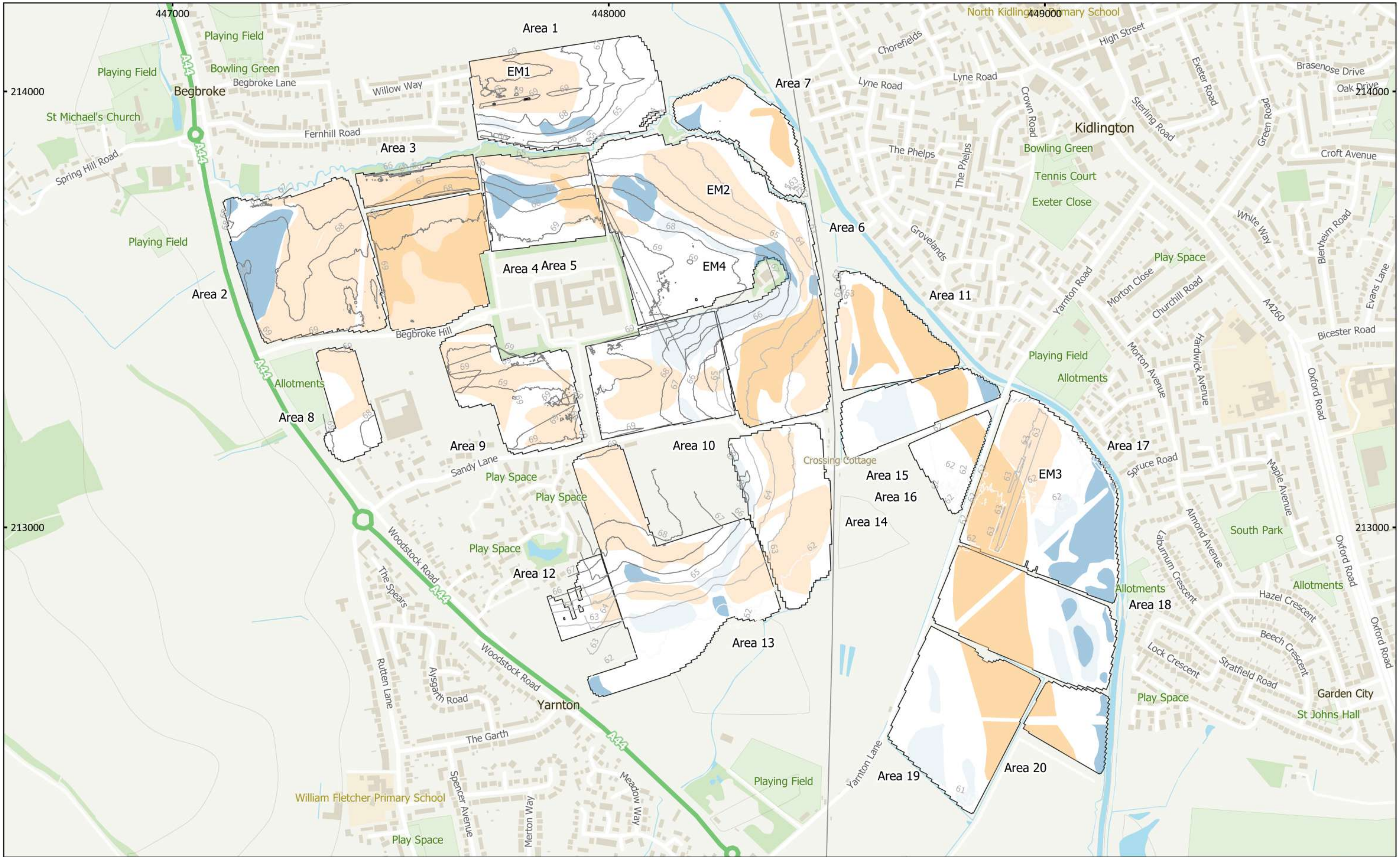
0 150 300 450 m

magnitude surveys



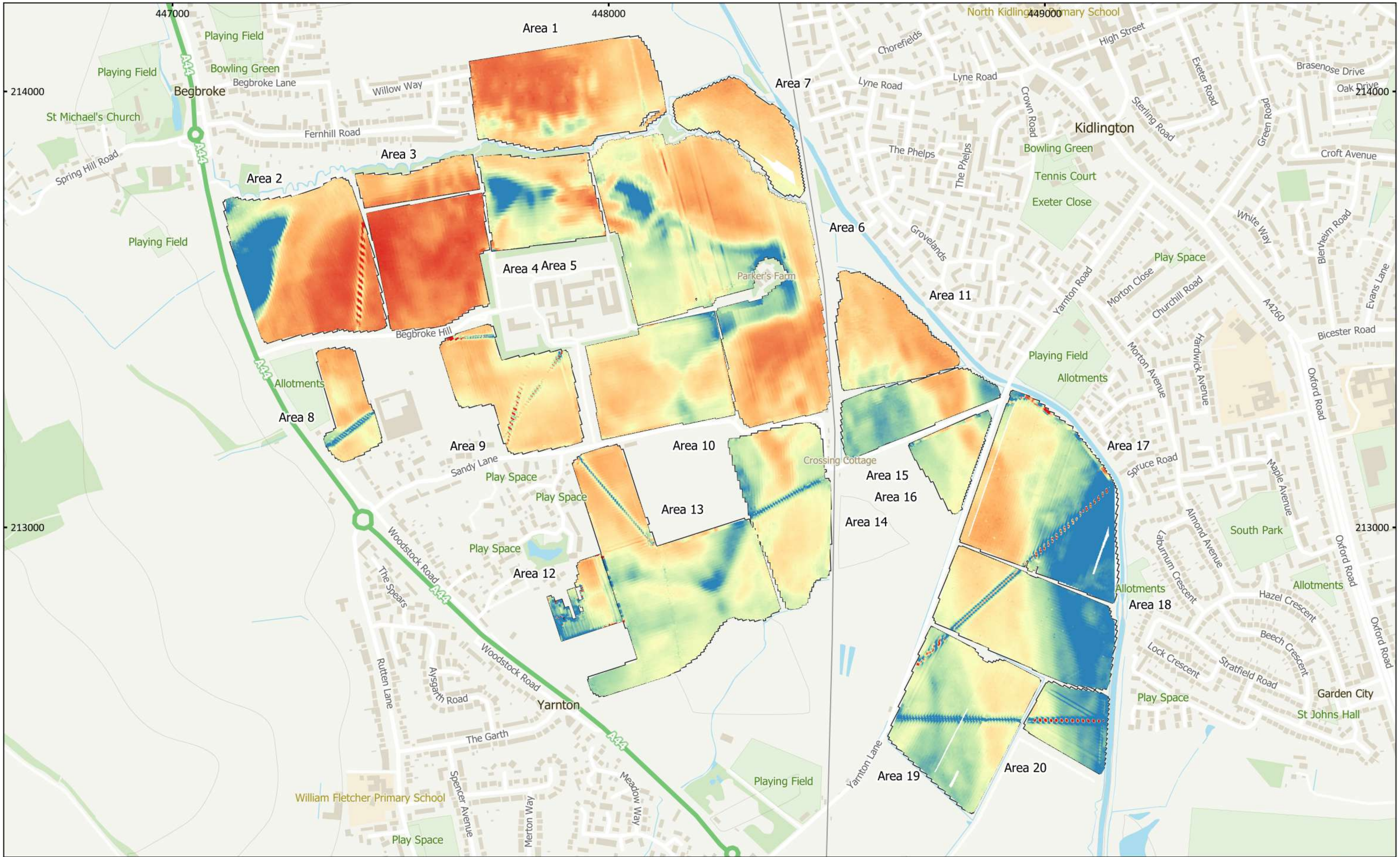
MSSP1306 - Begbroke, Oxfordshire
Figure 5 - Electromagnetic Conductivity: Conductivity Coil 2 (Overview)
1:8,000 @ A3

Conductivity Coil 2 - Approximate Depth: c.4.2m



MSSP1306 - Begbroke, Oxfordshire
Figure 6 - EM conductivity Compsite Interpretation C2 (Overview)
1:8,000 @ A3

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 7 - Electromagnetic Conductivity: Conductivity Coil 3 (Overview)
1:8,000 @ A3

Conductivity Coil 3 - Approximate Depth: c.6.7m

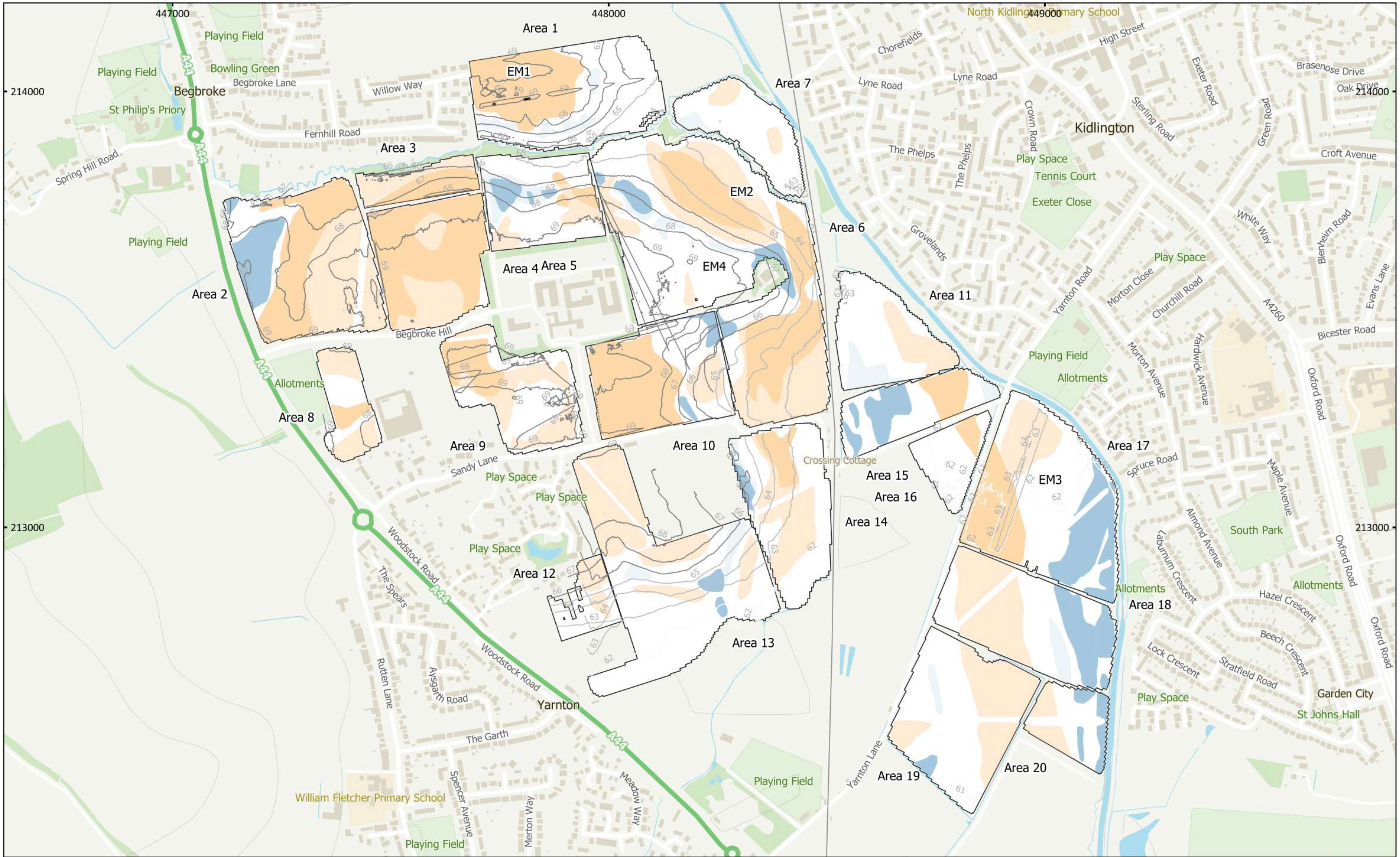
Conductivity

Low High

N

0 150 300 450 m

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 8 - EM conductivity Compsite Interpretation C3 (Overview)
1:8,000 @ A3

High Conductivity (Strong)
High Conductivity (Weak)
Low Conductivity (Strong)
Low Conductivity (Weak)
Contour

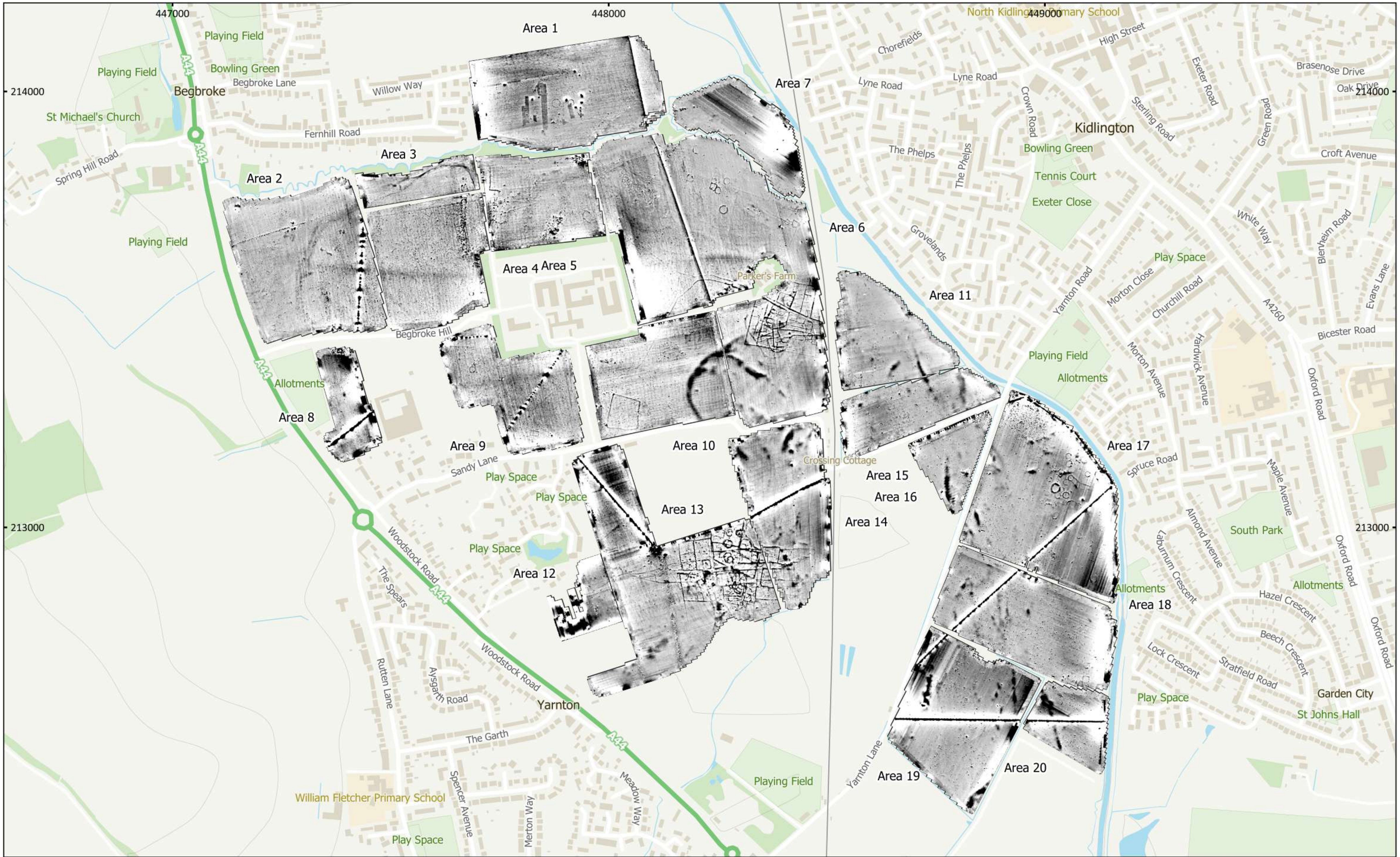
N

0 150 300 450 m

magnitude surveys

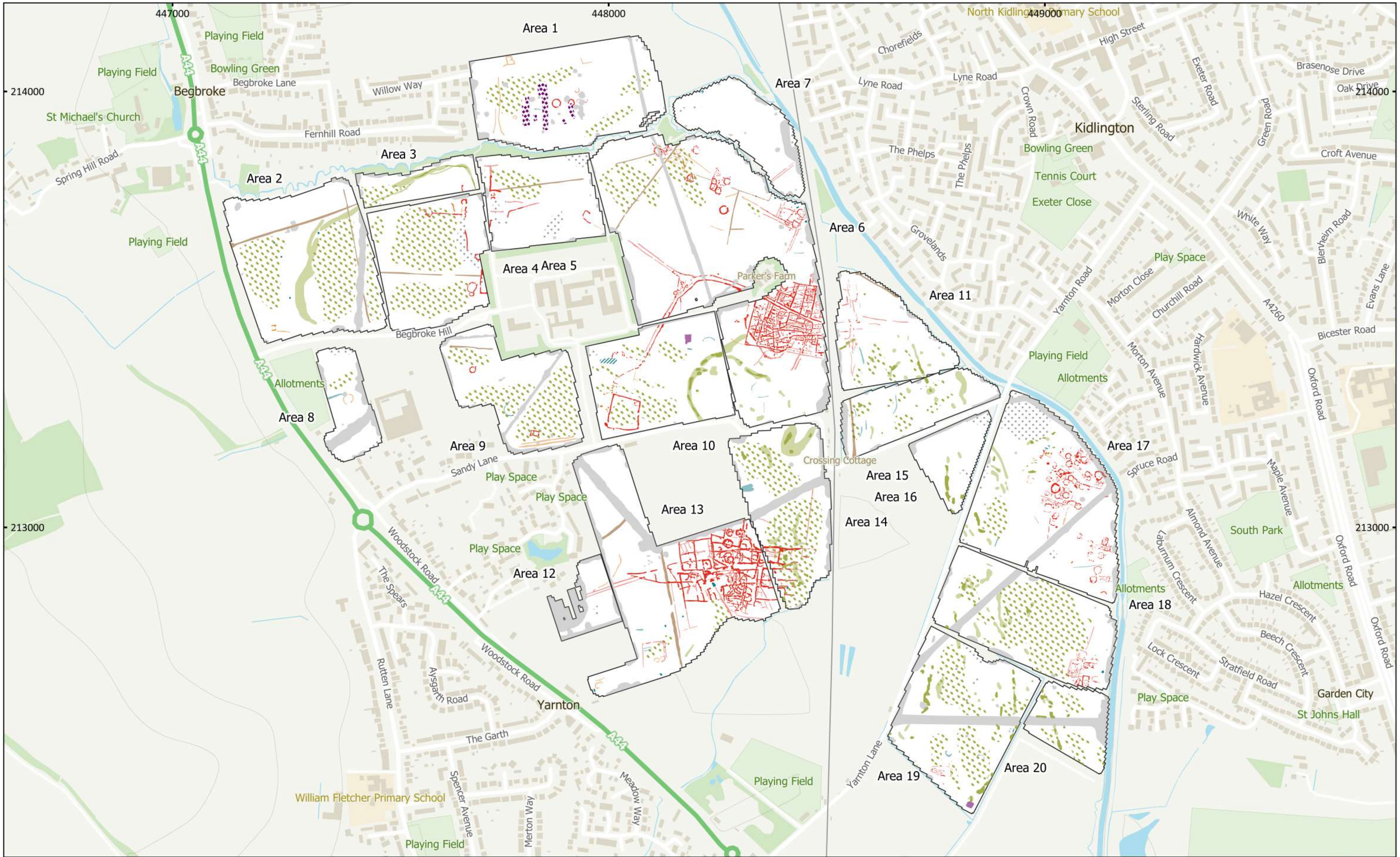
MSSP1306 - Begbroke, Oxfordshire
Figure 9 - Magnetic Gradient
1:8,000 @ A3

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 10 - Magnetic Total Field (Lower Sensor)
1:8,000 @ A3

magnitude surveys



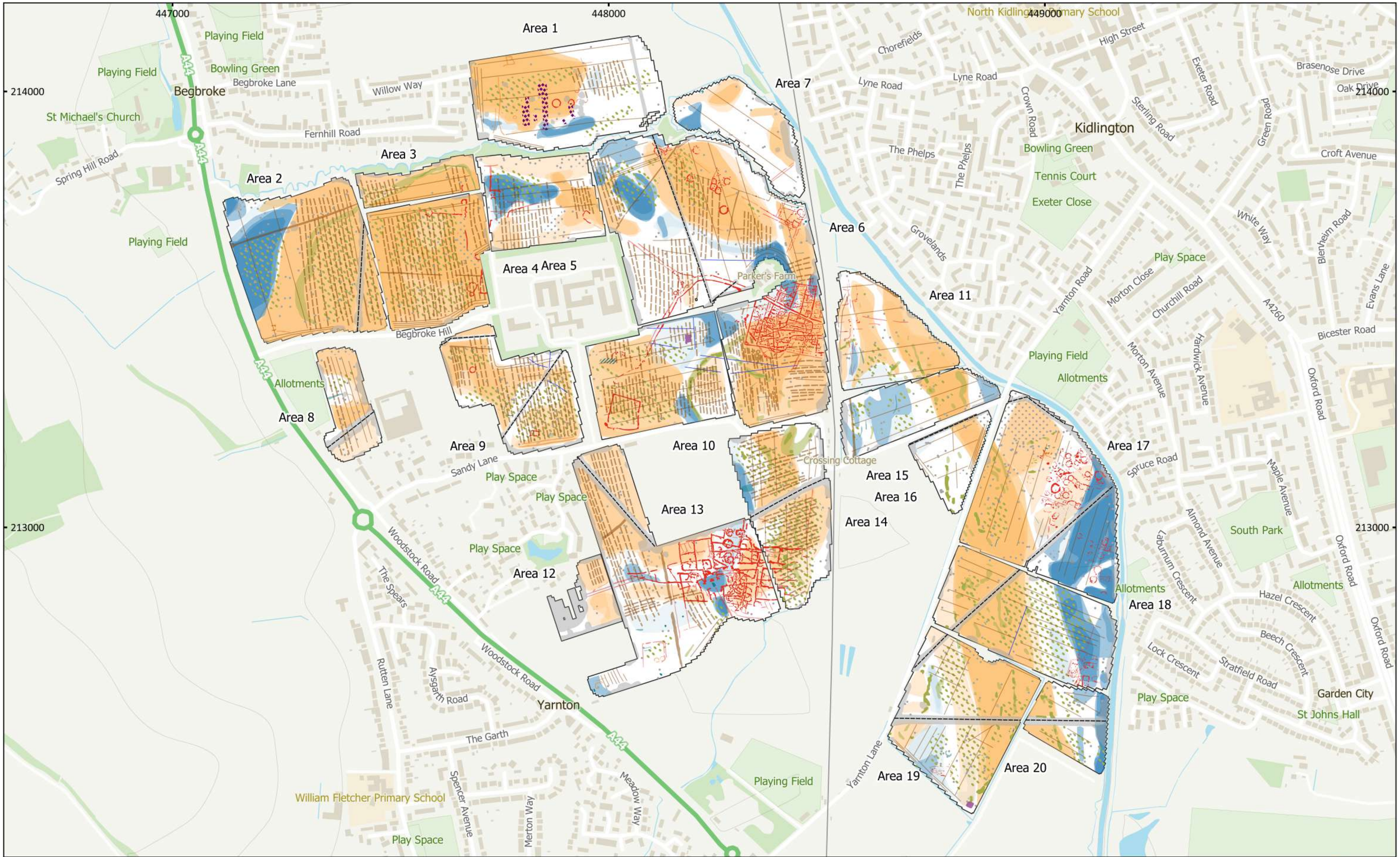
MSSP1306 - Begbroke, Oxfordshire
Figure 11 - Magnetic Interpretation (Overview)
1:8,000 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Agricultural (Strong)
Agricultural (Weak)
Industrial/Modern
Industrial/Modern (Spread)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)
Undetermined (Spread)

N

0 150 300 450 m

magnitude surveys

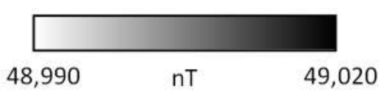


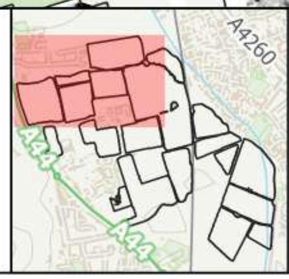
MSSP1306 - Begbroke, Oxfordshire
Figure 12 - Magnetic Interpretation and EM conductivity Compsite
Interpretation C1, C2 & C3
1:8,000 @ A3

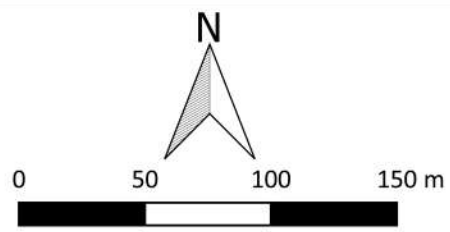
- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Industrial/Modern
- Industrial/Modern (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Undetermined (Spread)
- Agricultural (Trend)
- Service
- Ridge and Furrow (Trend)
- Drainage Feature
- Ferrous (Spike)
- High Conductivity (Strong)
- High Conductivity (Weak)
- Low Conductivity (Strong)
- Low Conductivity (Weak)

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 13 - Magnetic Total Field (Lower Sensor) (Overview) (Northwest Area)
1:3,000 @ A3







magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 14 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Overview) (Northwest Area)
1:3,000 @ A3

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Industrial/Modern
- Industrial/Modern (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Service
- Ridge and Furrow (Trend)
- Drainage Feature
- Ferrous (Spike)

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 15 - Magnetic Total Field (Lower Sensor) (Overview) (Northeast Area)
1:3,000 @ A3

48,990 nT 49,020

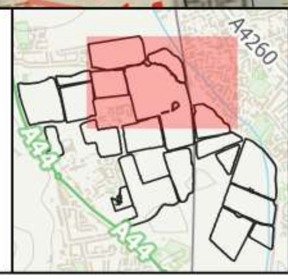
N

0 50 100 150 m

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 16 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Overview) (Northeast Area)
1:3,000 @ A3

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Industrial/Modern
- Industrial/Modern (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Service
- Ridge and Furrow (Trend)
- Drainage Feature
- Ferrous (Spike)



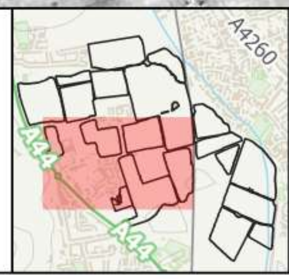
N

0 50 100 150 m

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 17 - Magnetic Total Field (Lower Sensor) (Overview) (Central Area)
1:3,000 @ A3

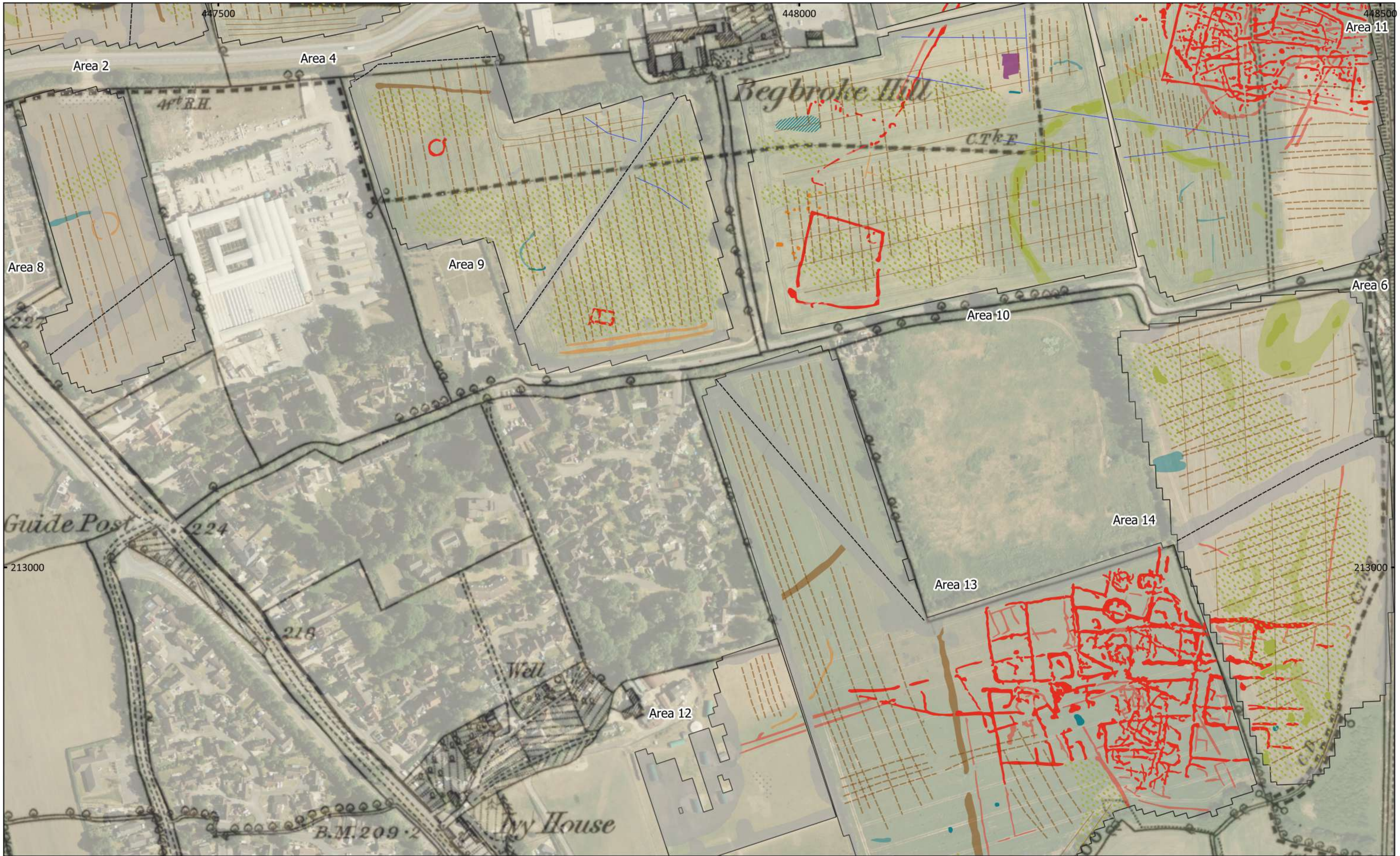
48,990 nT 49,020



N

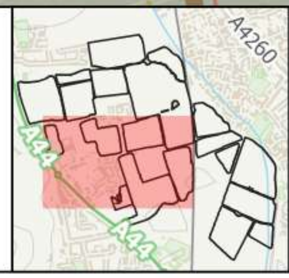
0 50 100 150 m

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 18 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Overview) (Central Area)
1:3,000 @ A3

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Industrial/Modern
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Undetermined (Spread)
- Agricultural (Trend)
- Service
- Ridge and Furrow (Trend)
- Drainage Feature
- Ferrous (Spike)



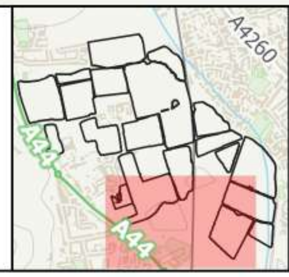
N

0 50 100 150 m

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 19 - Magnetic Total Field (Lower Sensor) (Overview) (Southern Area)
1:3,000 @ A3

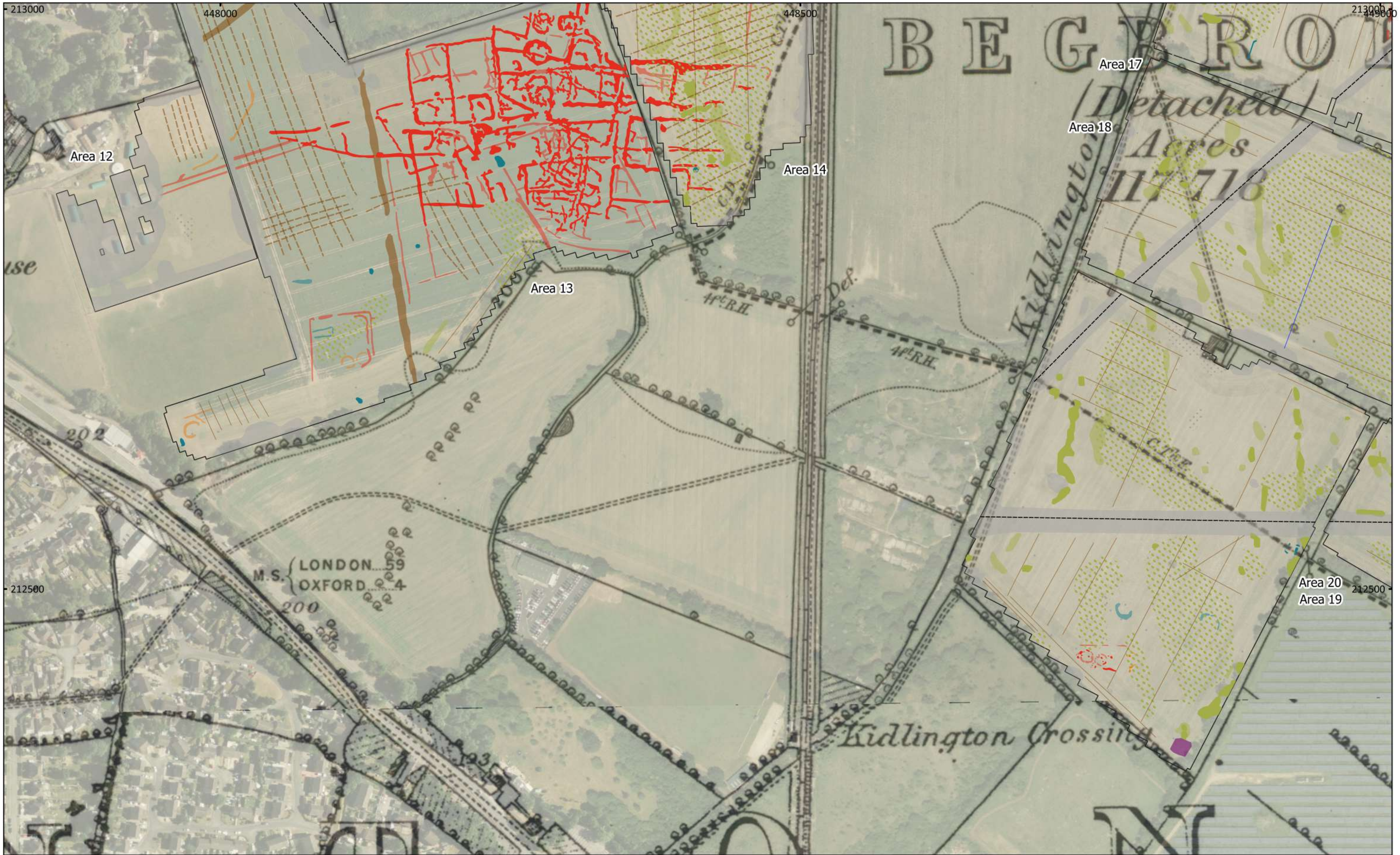
48,990 nT 49,020



N

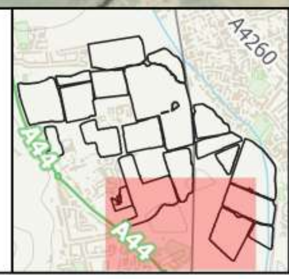
0 50 100 150 m

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 20 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Overview) (Southern Area)
1:3,000 @ A3

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Industrial/Modern
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Service
- Ridge and Furrow (Trend)
- Drainage Feature
- Ferrous (Spike)

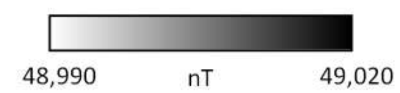


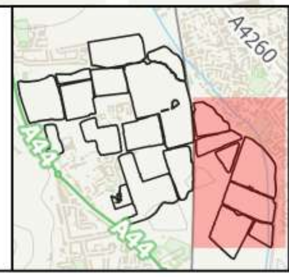
N

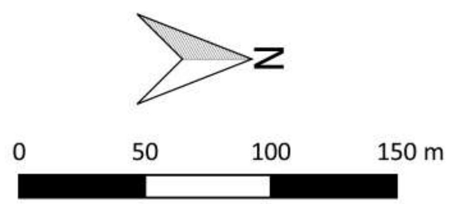
0 50 100 150 m

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 21 - Magnetic Total Field (Lower Sensor) (Overview) (East Area)
1:3,000 @ A3



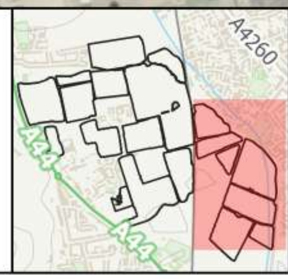




magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 22 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Overview) (East Area)
1:3,000 @ A3

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Service
- Drainage Feature
- Ferrous (Spike)



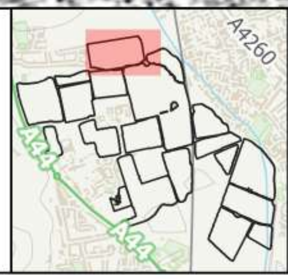
N

0 50 100 150 m

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 23 - Magnetic Gradient (Areas 1, 5, 6 & 7)
1:1,500 @ A3

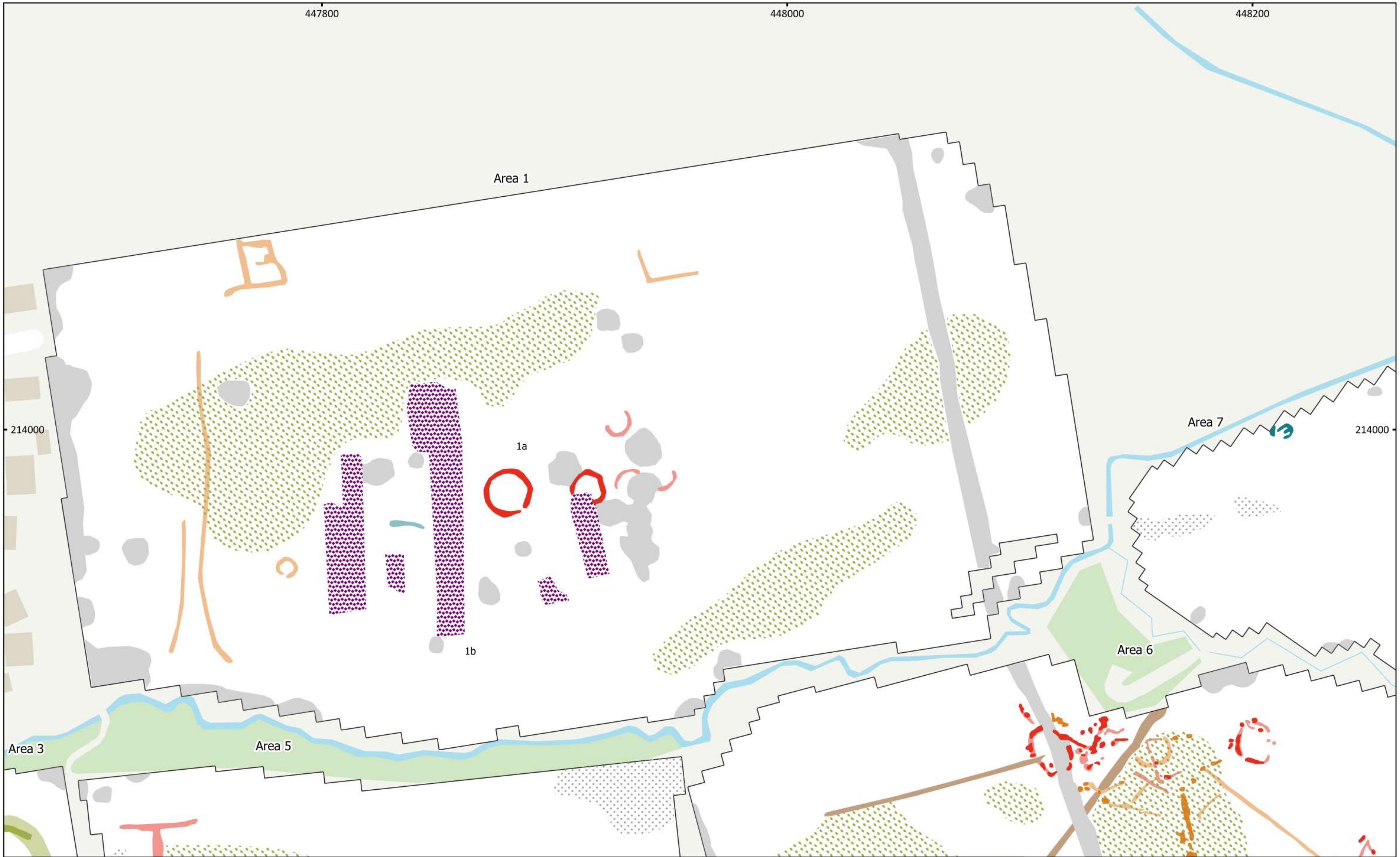
-1 nT 2



N

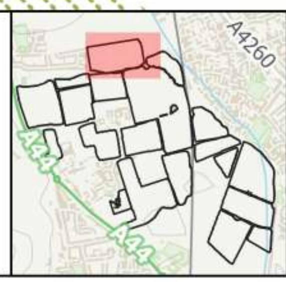
0 25 50 75 m

magnitude surveys



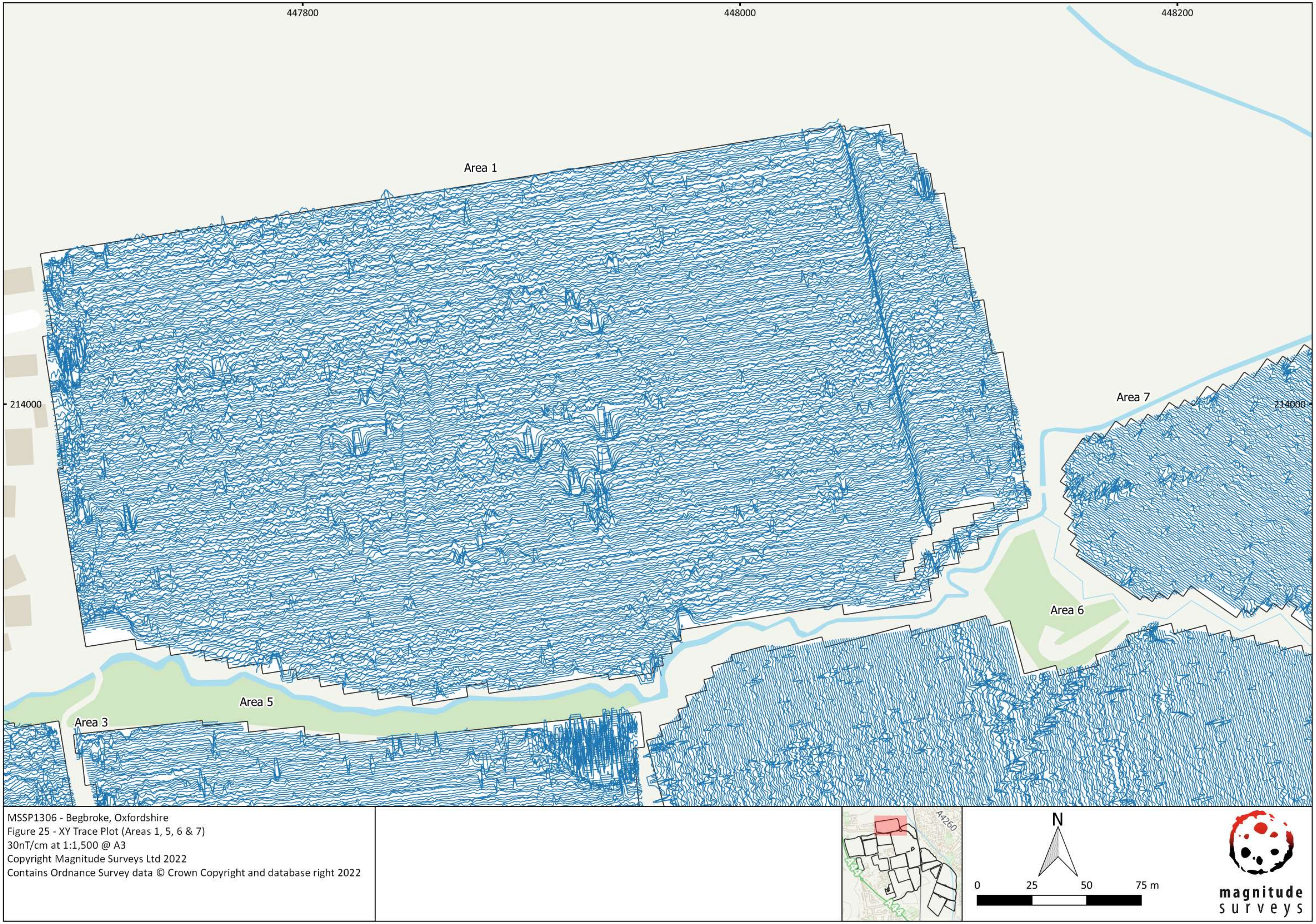
MSSP1306 - Begbroke, Oxfordshire
Figure 24 - Magnetic Interpretation (Areas 1, 5, 6 & 7)
1:1,500 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Agricultural (Weak)
Industrial/Modern (Spread)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)

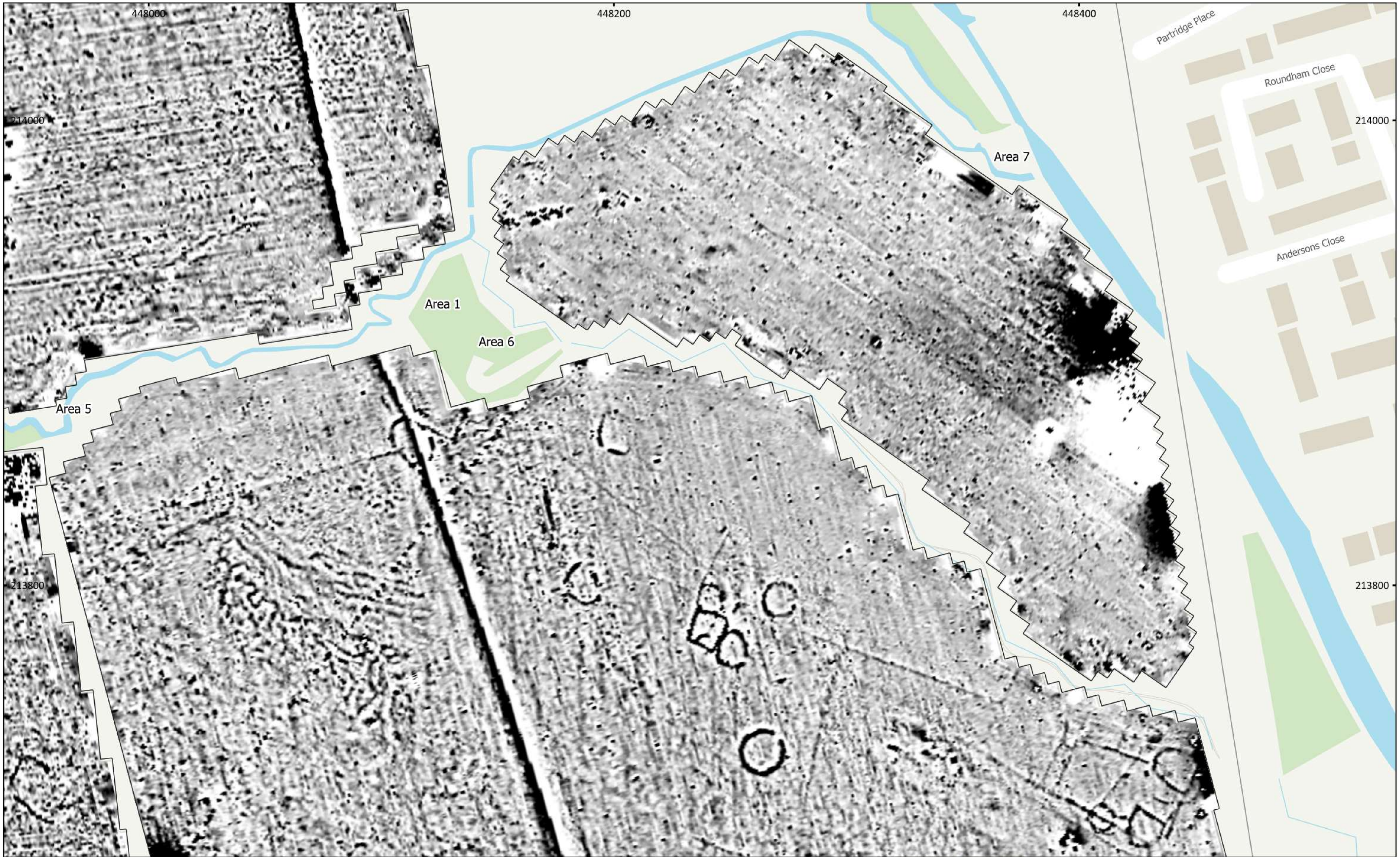


N
0 25 50 75 m

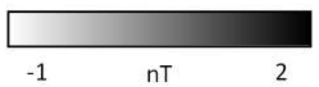
magnitude surveys

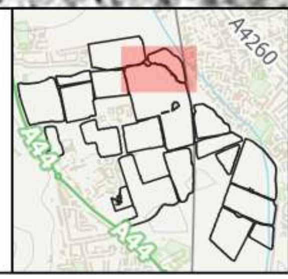


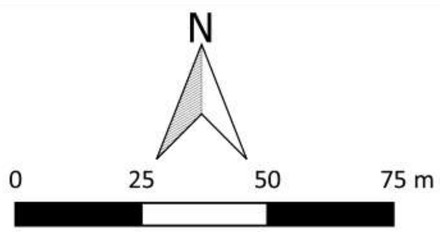
MSSP1306 - Begbroke, Oxfordshire
Figure 25 - XY Trace Plot (Areas 1, 5, 6 & 7)
30nT/cm at 1:1,500 @ A3



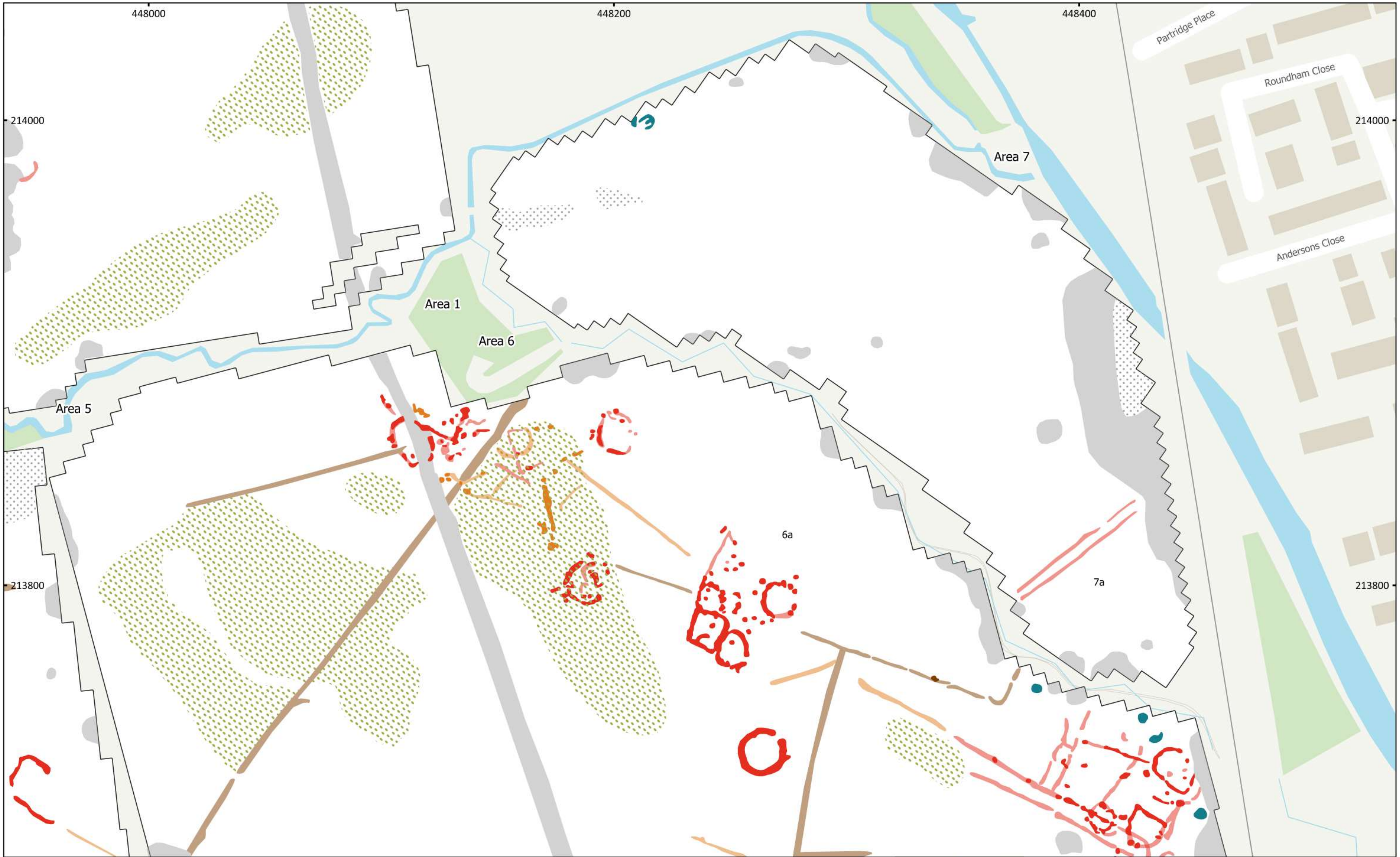
MSSP1306 - Begbroke, Oxfordshire
Figure 26 - Magnetic Gradient (Areas 1, 5, 6 & 7)
1:1,500 @ A3





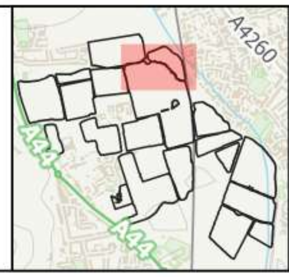


magnitude surveys



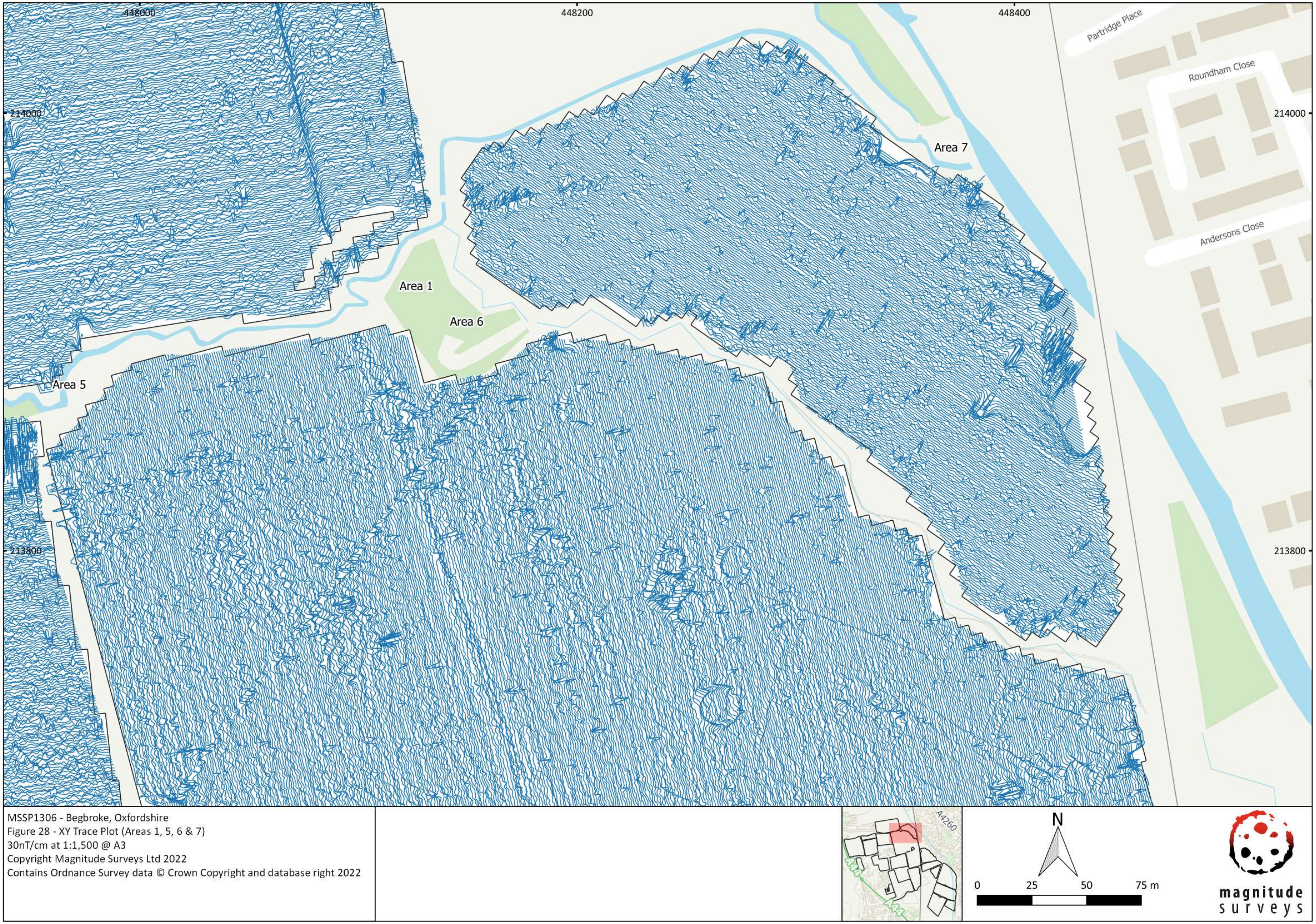
MSSP1306 - Begbroke, Oxfordshire
Figure 27 - Magnetic Interpretation (Areas 1, 5, 6 & 7)
1:1,500 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Agricultural (Strong)
Agricultural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)



N
0 25 50 75 m

magnitude surveys

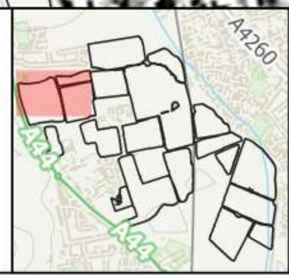


MSSP1306 - Begbroke, Oxfordshire
Figure 28 - XY Trace Plot (Areas 1, 5, 6 & 7)
30nT/cm at 1:1,500 @ A3

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 29 - Magnetic Gradient (Areas 2, 3 & 4)
1:1,500 @ A3

-1 nT 2

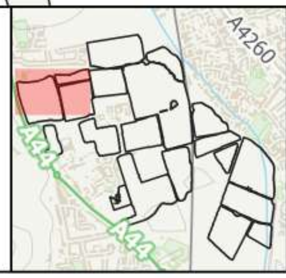


N
0 25 50 75 m

magnitude surveys

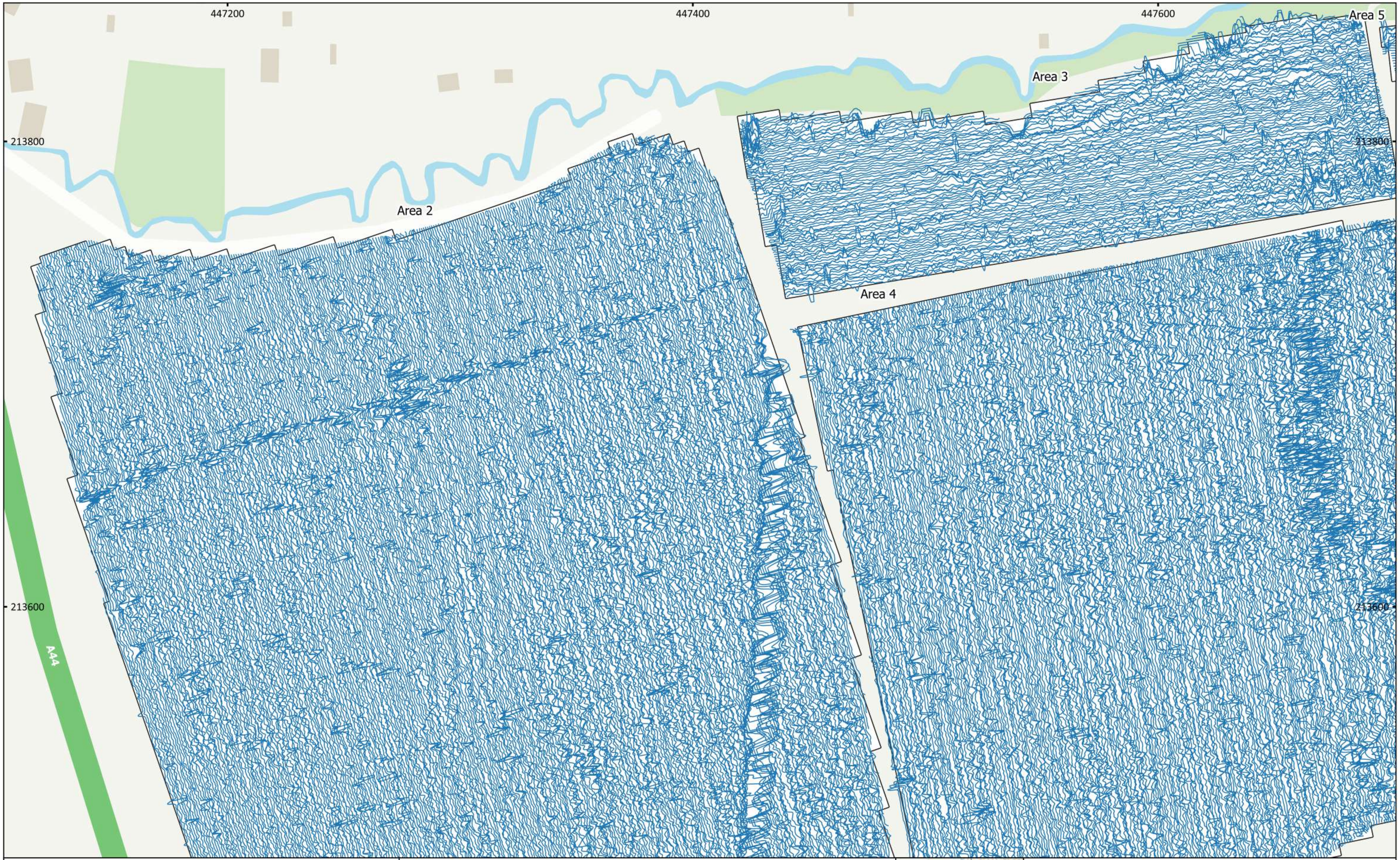
MSSP1306 - Begbroke, Oxfordshire
Figure 30 - Magnetic Interpretation (Areas 2, 3 & 4)
1:1,500 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Agricultural (Weak)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)



N
0 25 50 75 m

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 31 - XY Trace Plot (Areas 2, 3 & 4)
30nT/cm at 1:1,500 @ A3

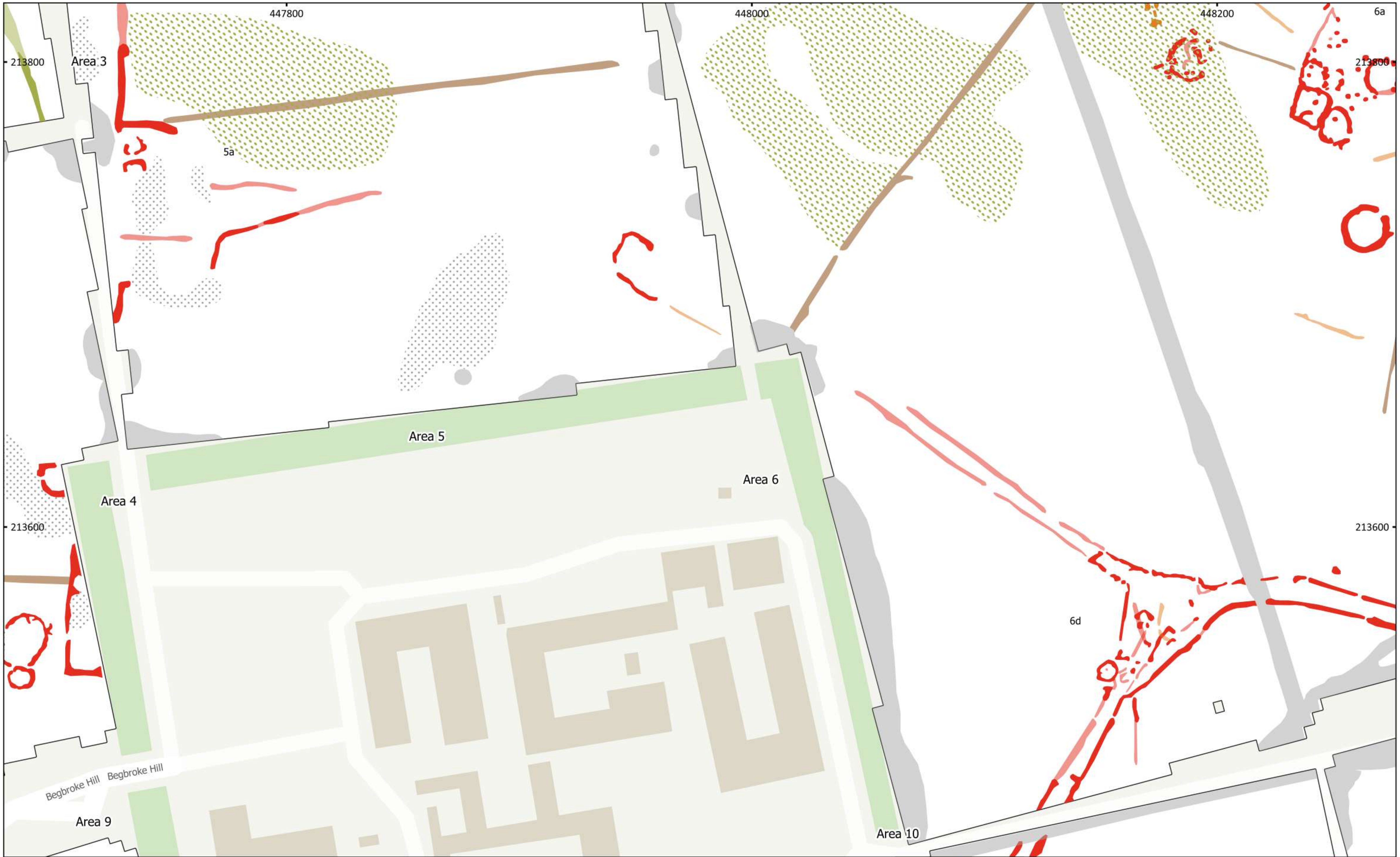
magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 32 - Magnetic Gradient (Areas 3, 4, 5, 6 & 10)
1:1,500 @ A3

-1 nT 2

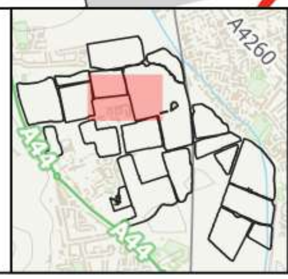
N
0 25 50 75 m

magnitude surveys



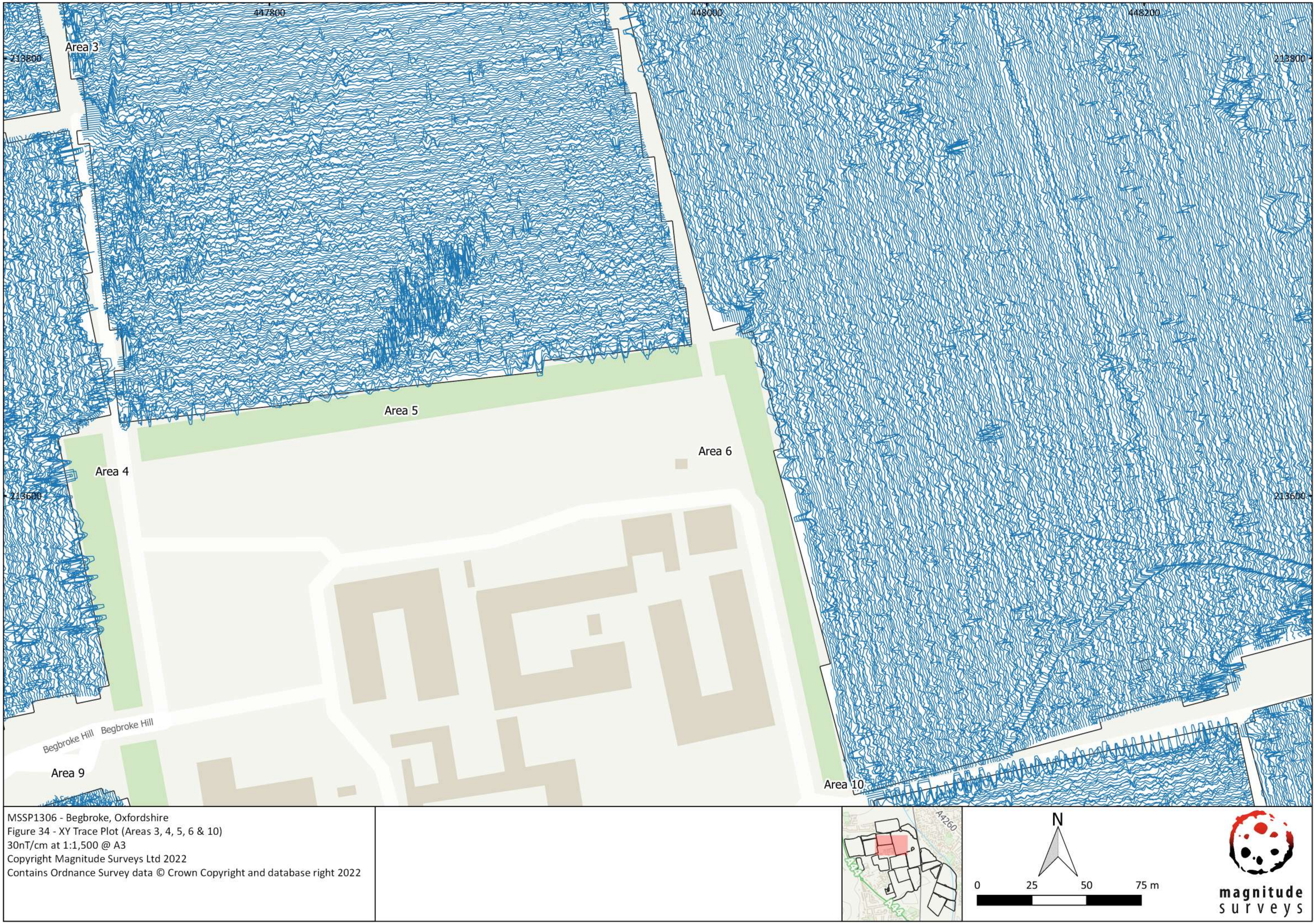
MSSP1306 - Begbroke, Oxfordshire
Figure 33 - Magnetic Interpretation (Areas 3, 4, 5, 6 & 10)
1:1,500 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Agricultural (Weak)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)



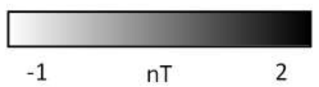
N
0 25 50 75 m

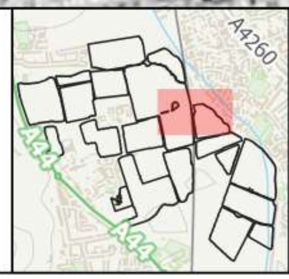
magnitude surveys

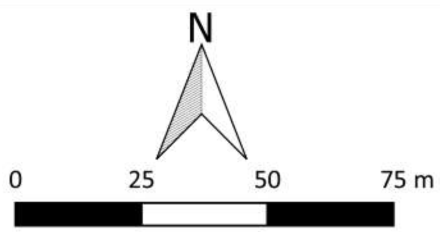


MSSP1306 - Begbroke, Oxfordshire
Figure 34 - XY Trace Plot (Areas 3, 4, 5, 6 & 10)
30nT/cm at 1:1,500 @ A3

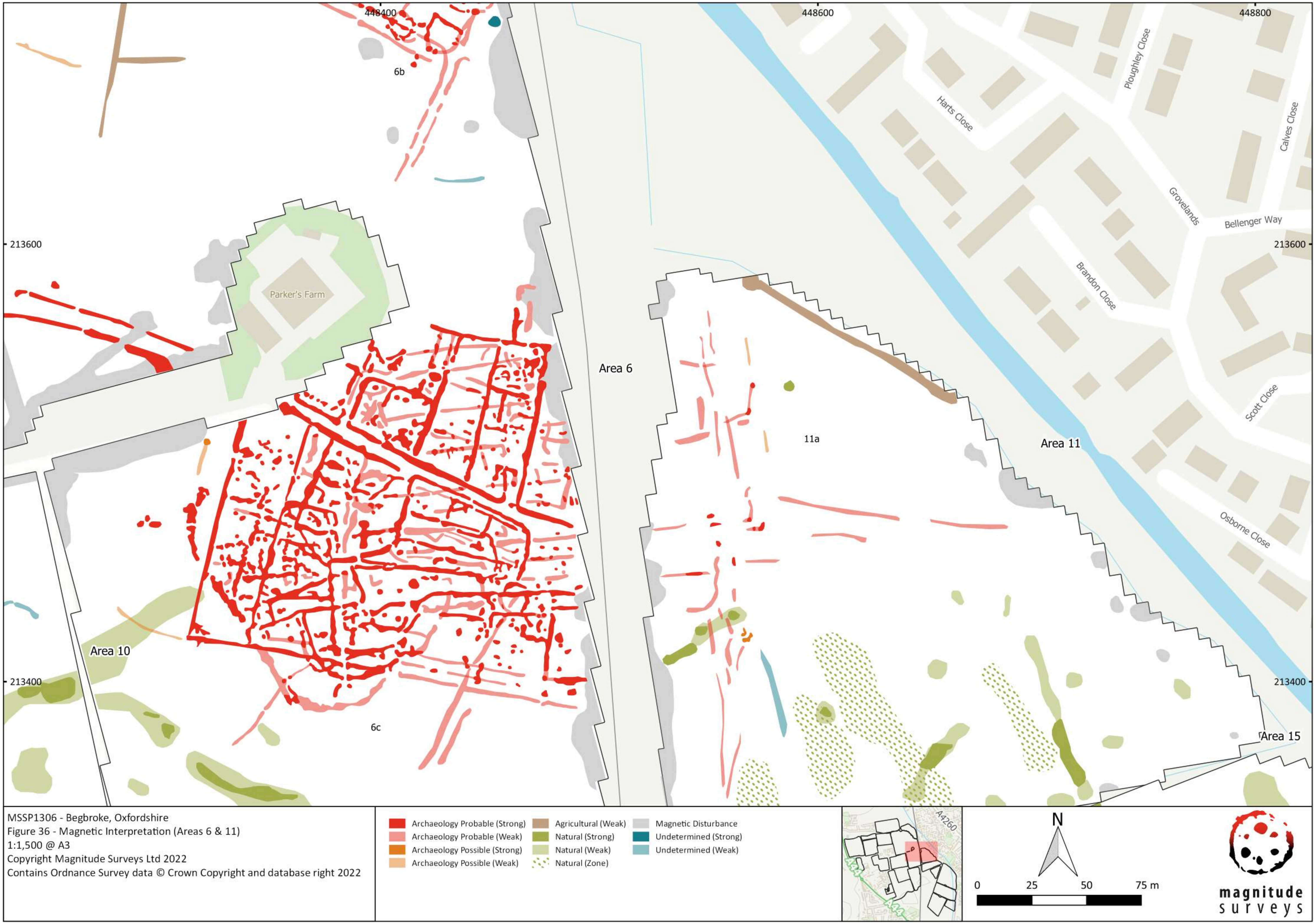
MSSP1306 - Begbroke, Oxfordshire
Figure 35 - Magnetic Gradient (Areas 6 & 11)
1:1,500 @ A3



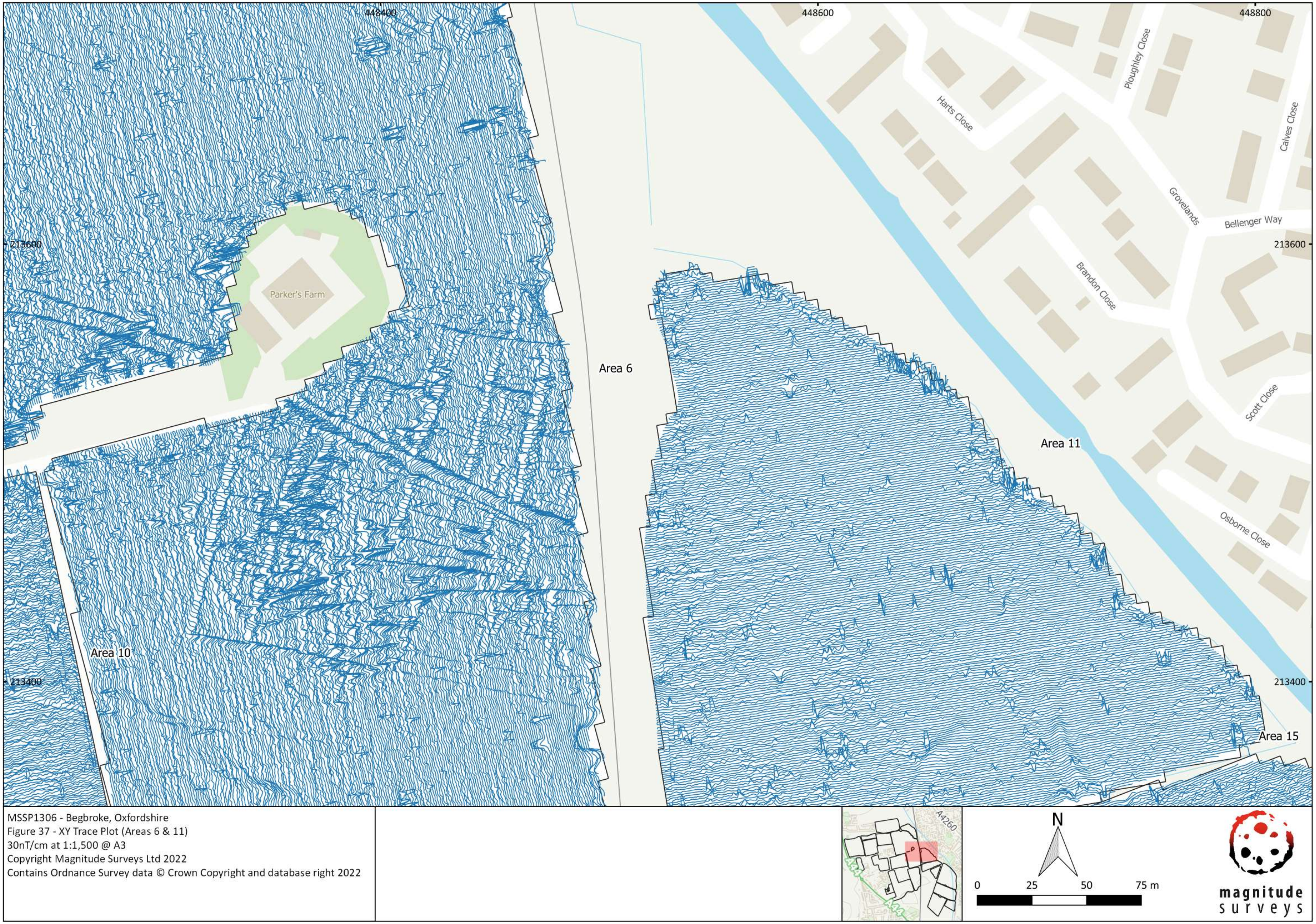




magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 36 - Magnetic Interpretation (Areas 6 & 11)
1:1,500 @ A3



MSSP1306 - Begbroke, Oxfordshire
Figure 37 - XY Trace Plot (Areas 6 & 11)
30nT/cm at 1:1,500 @ A3

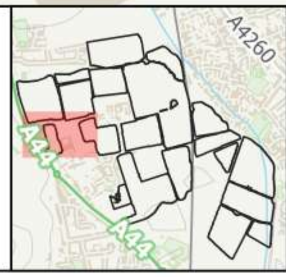
MSSP1306 - Begbroke, Oxfordshire
Figure 38 - Magnetic Gradient (Areas 2, 4, 8 & 9)
1:1,500 @ A3

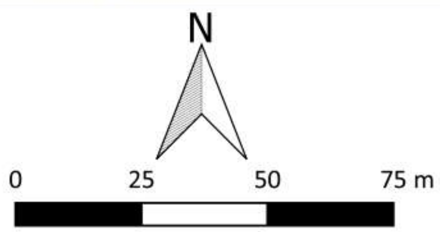
-1 nT 2

N
0 25 50 75 m

magnitude surveys

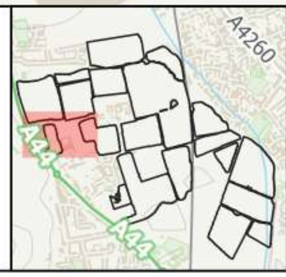
MSSP1306 - Begbroke, Oxfordshire
Figure 39 - Magnetic Interpretation (Areas 2, 4, 8 & 9)
1:1,500 @ A3





magnitude surveys

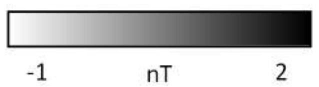
MSSP1306 - Begbroke, Oxfordshire
Figure 40 - XY Trace Plot (Areas 2, 4, 8 & 9)
30nT/cm at 1:1,500 @ A3

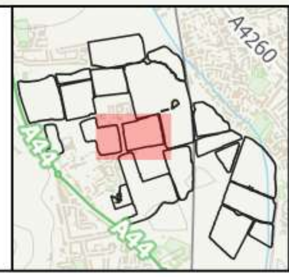


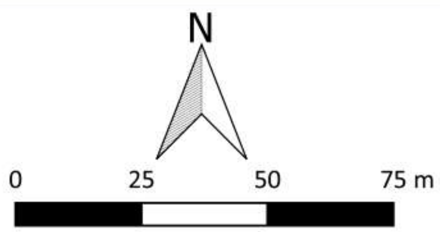
N
0 25 50 75 m

magnitude surveys

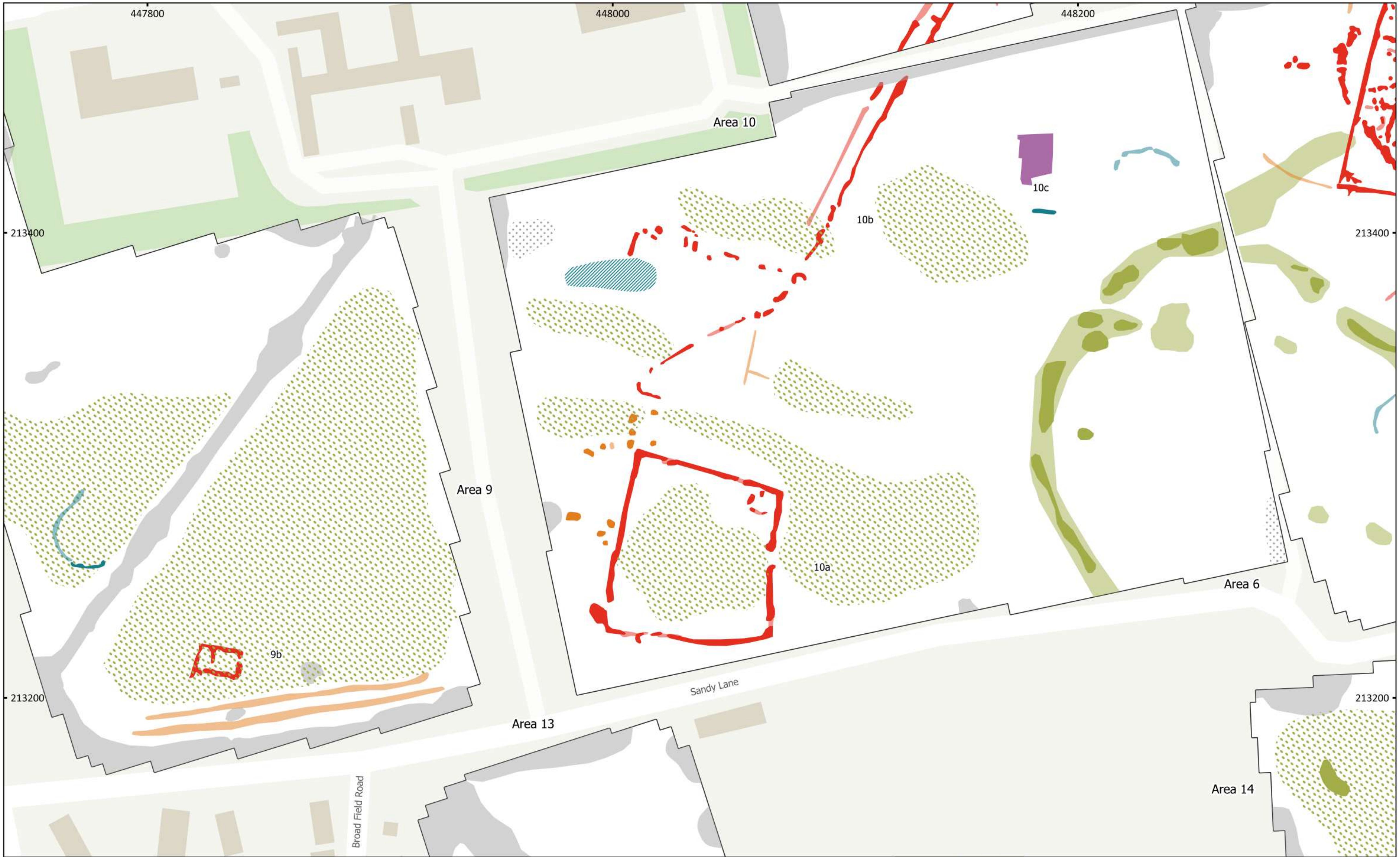
MSSP1306 - Begbroke, Oxfordshire
Figure 41 - Magnetic Gradient (Areas 6, 9, 10, 13 & 14)
1:1,500 @ A3







magnitude surveys

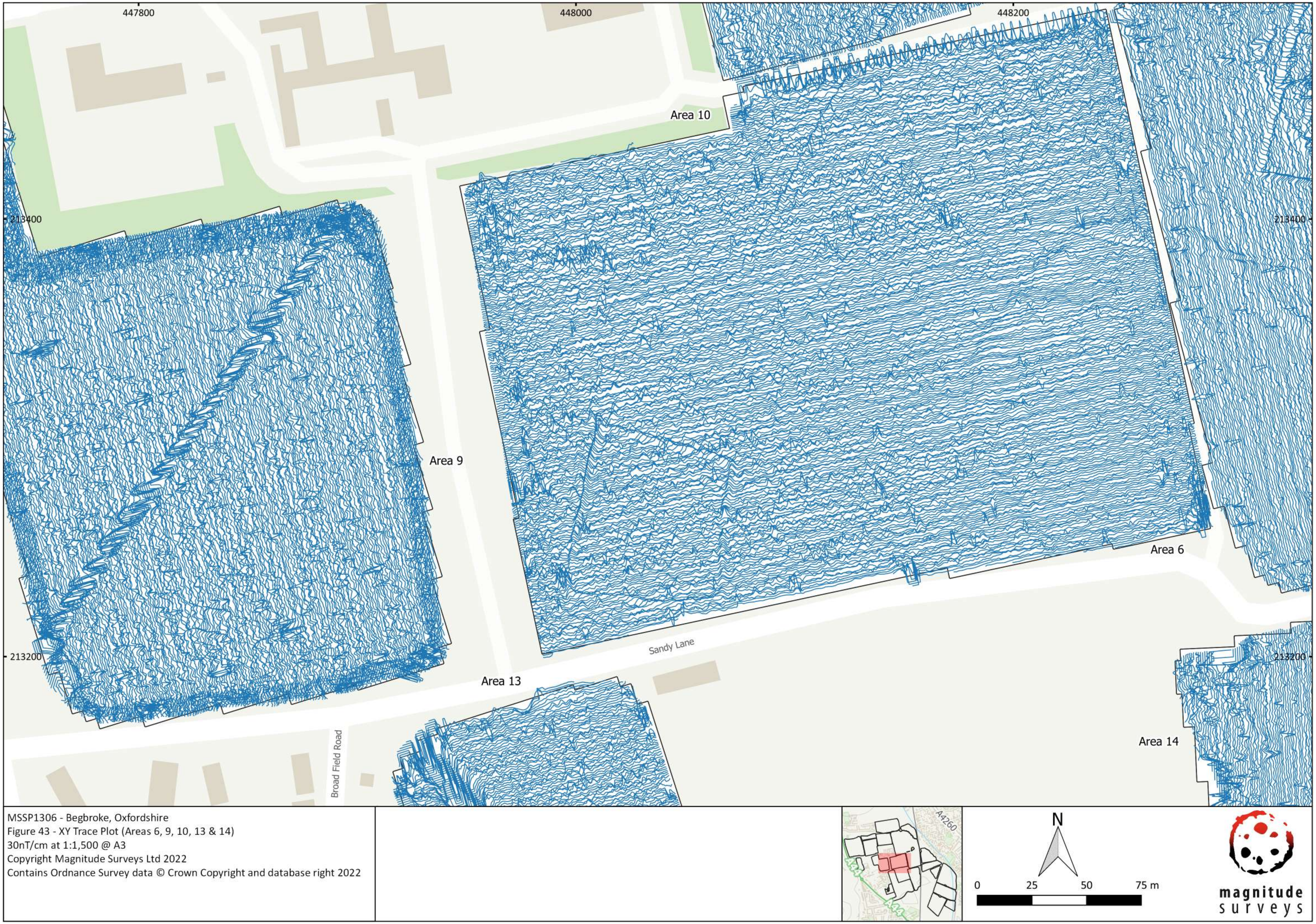


MSSP1306 - Begbroke, Oxfordshire
Figure 42 - Magnetic Interpretation (Areas 6, 9, 10, 13 & 14)
1:1,500 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Industrial/Modern
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)
Undetermined (Spread)

N
0 25 50 75 m

magnitude surveys



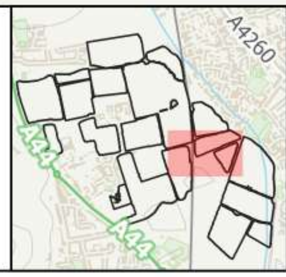
MSSP1306 - Begbroke, Oxfordshire
Figure 43 - XY Trace Plot (Areas 6, 9, 10, 13 & 14)
30nT/cm at 1:1,500 @ A3

magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 44 - Magnetic Gradient (Areas 6, 11, 14, 15, 16 &17)
1:1,500 @ A3

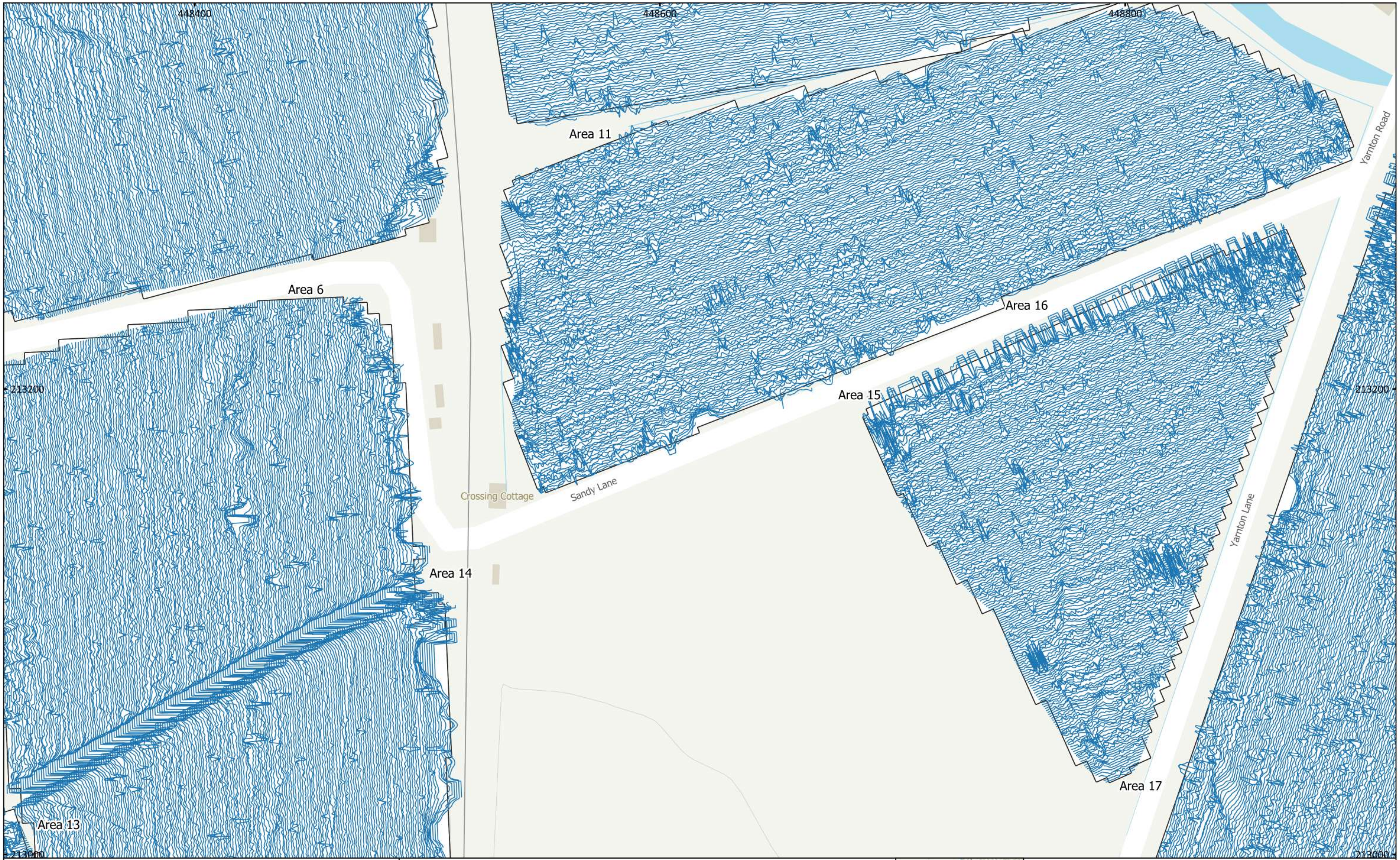
MSSP1306 - Begbroke, Oxfordshire
Figure 45 - Magnetic Interpretation (Areas 6, 11, 14, 15, 16 &17)
1:1,500 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Agricultural (Weak)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Weak)

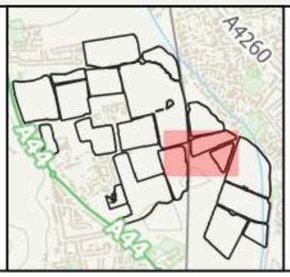


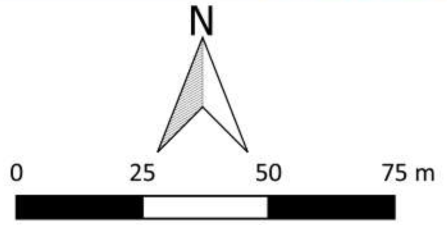
N
0 25 50 75 m

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 46 - XY Trace Plot (Areas 6, 11, 14, 15, 16 &17)
30nT/cm at 1:1,500 @ A3

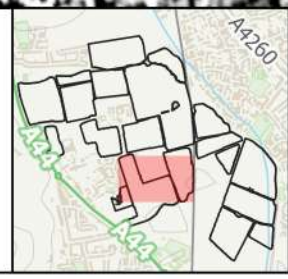




magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 47 - Magnetic Gradient (Areas 12, 13 & 14)
1:1,500 @ A3

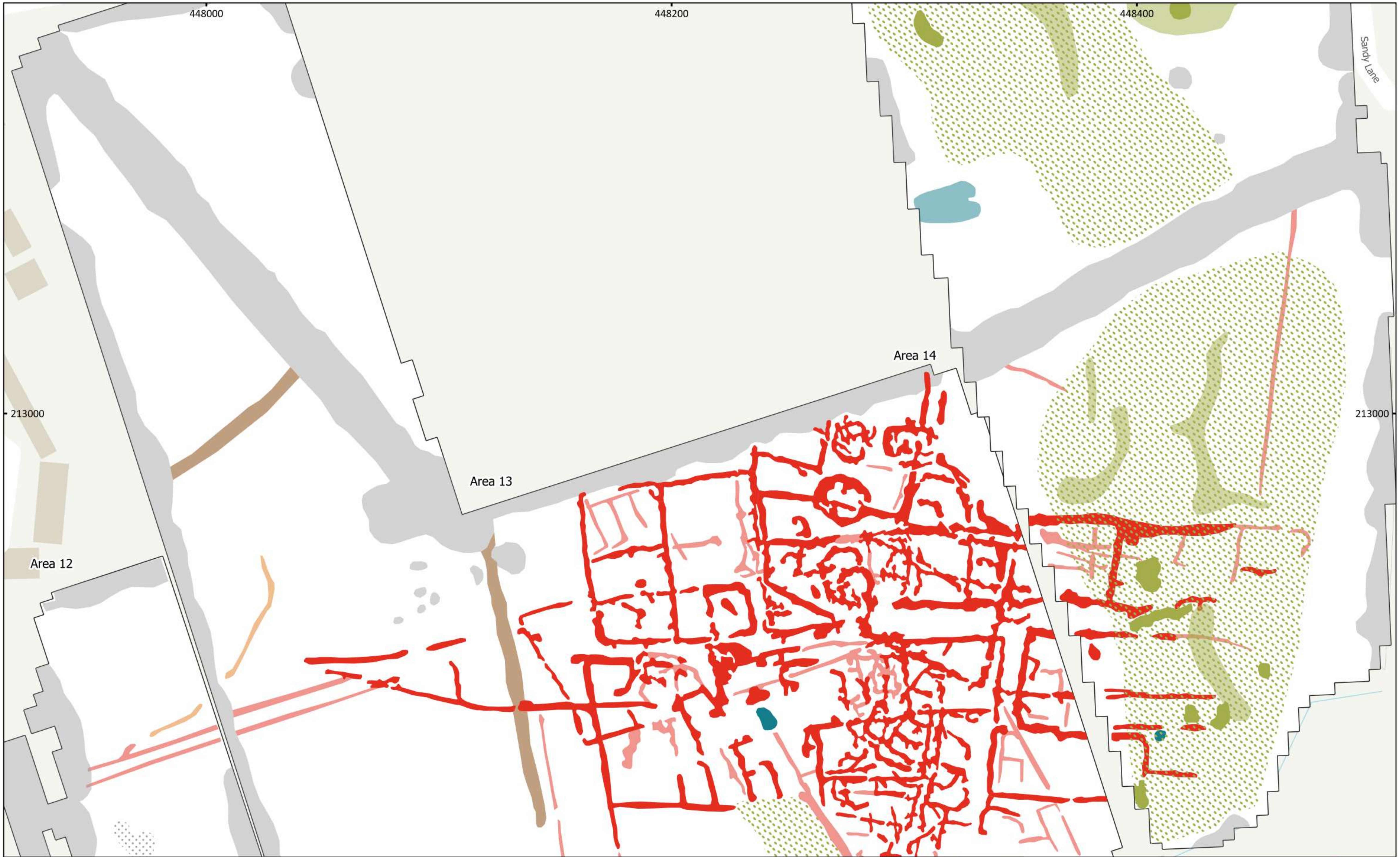
-1 nT 2



N

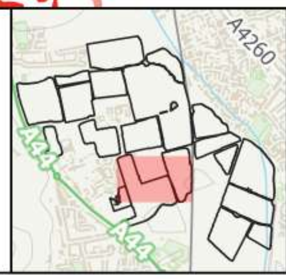
0 25 50 75 m

magnitude surveys



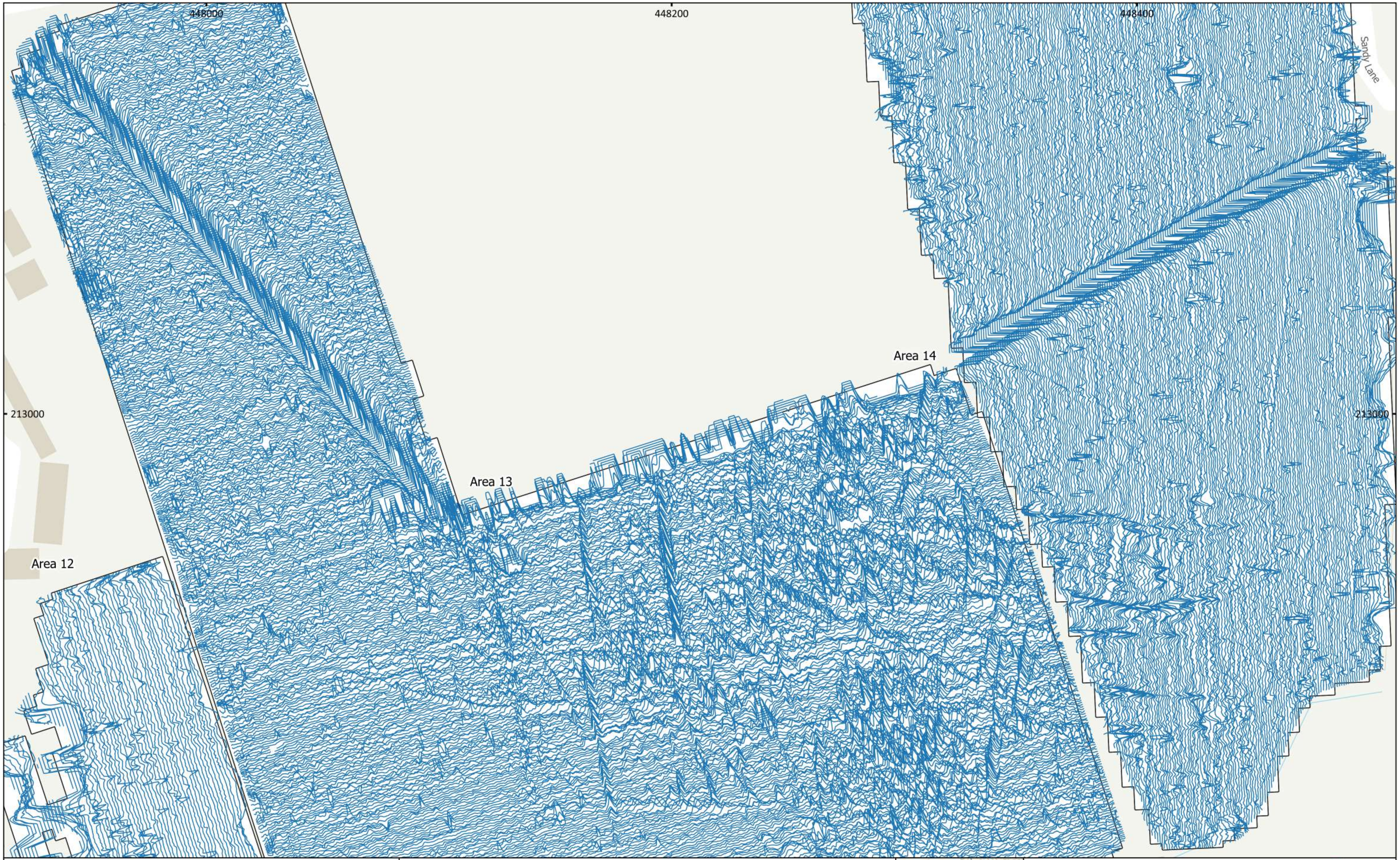
MSSP1306 - Begbroke, Oxfordshire
Figure 48 - Magnetic Interpretation (Areas 12, 13 & 14)
1:1,500 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Possible (Weak)
Agricultural (Weak)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)

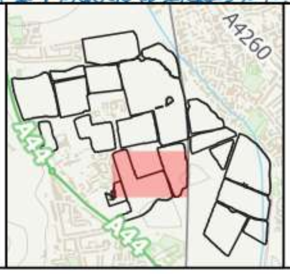


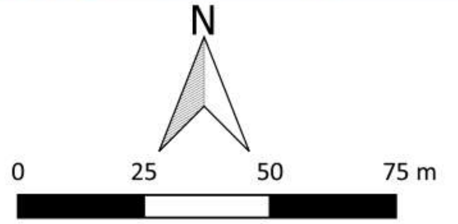
N
0 25 50 75 m

magnitude surveys



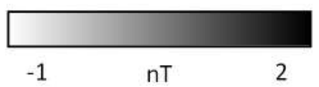
MSSP1306 - Begbroke, Oxfordshire
Figure 49 - XY Trace Plot (Areas 12, 13 & 14)
30nT/cm at 1:1,500 @ A3

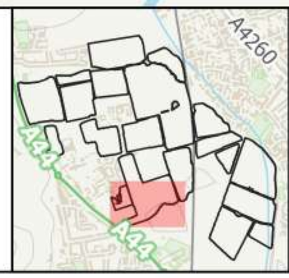


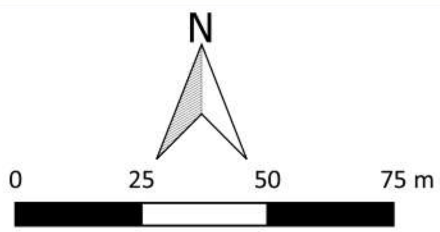


magnitude surveys

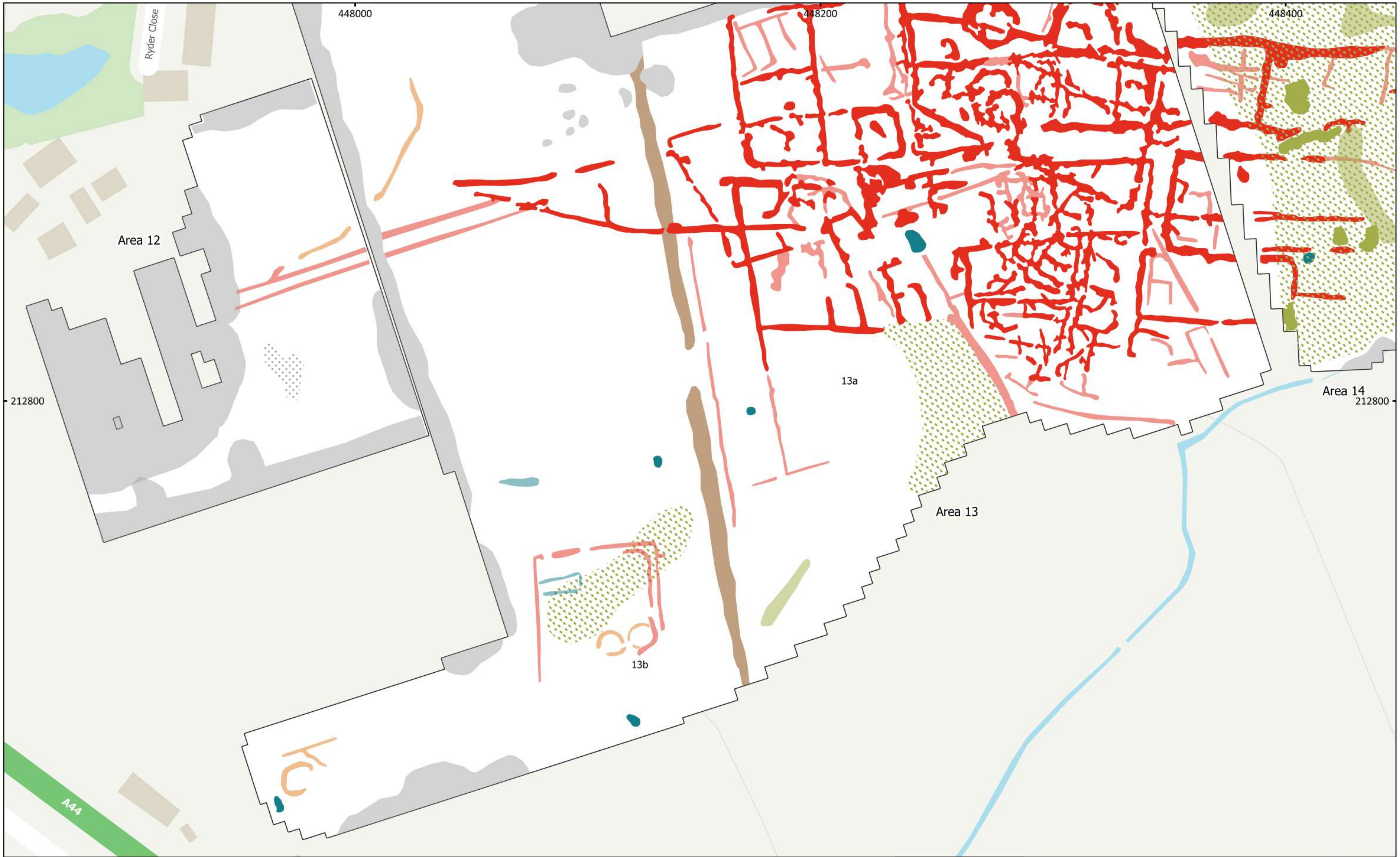
MSSP1306 - Begbroke, Oxfordshire
Figure 50 - Magnetic Gradient (Areas 12, 13 & 14)
1:1,500 @ A3





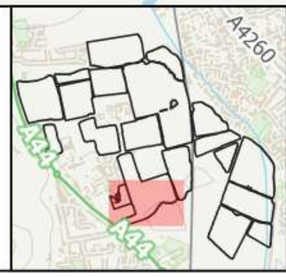


magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 51 - Magnetic Interpretation (Areas 12, 13 & 14)
1:1,500 @ A3

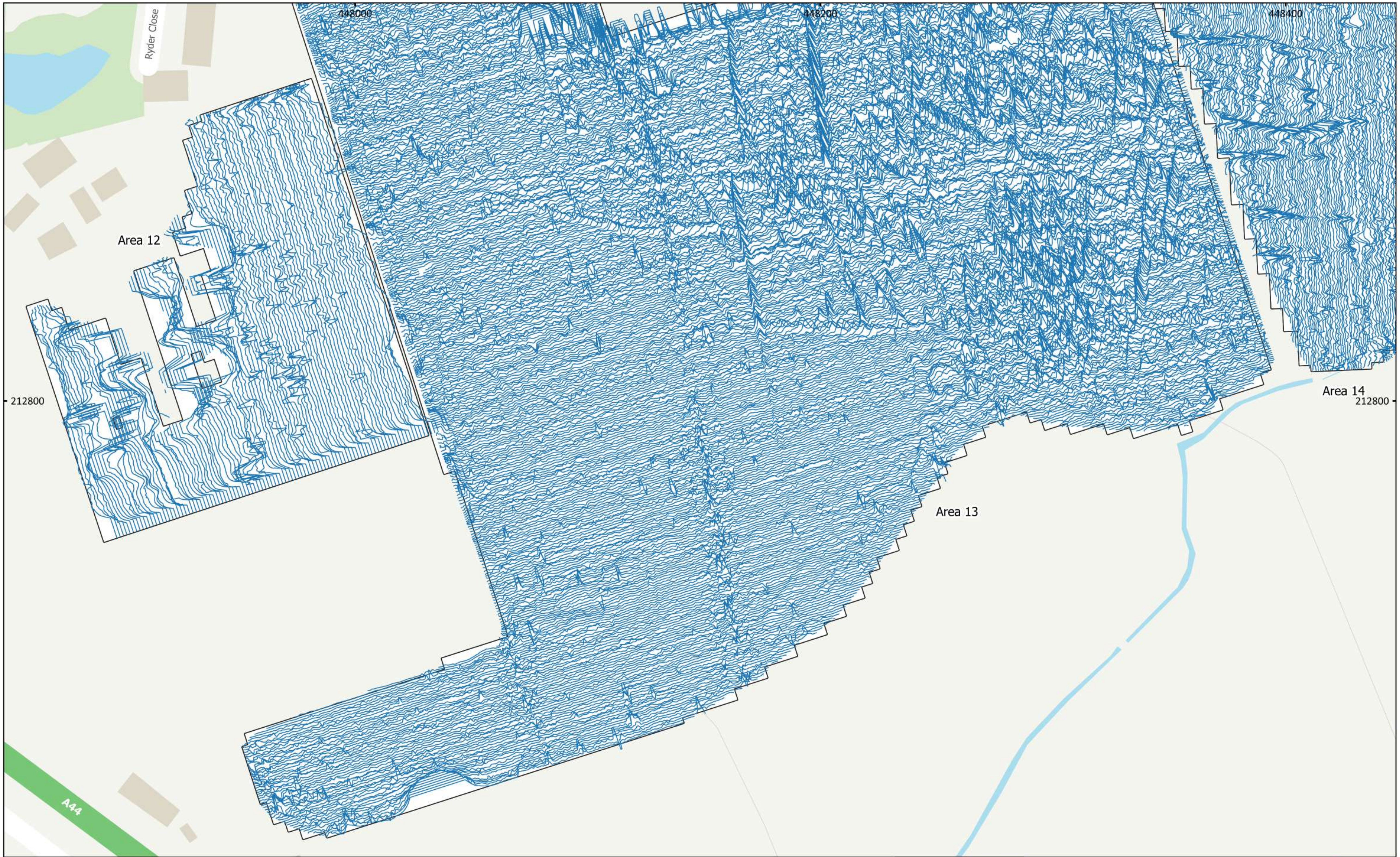
- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)



N

0 25 50 75 m

magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 52 - XY Trace Plot (Areas 12, 13 & 14)
30nT/cm at 1:1,500 @ A3

magnitude surveys

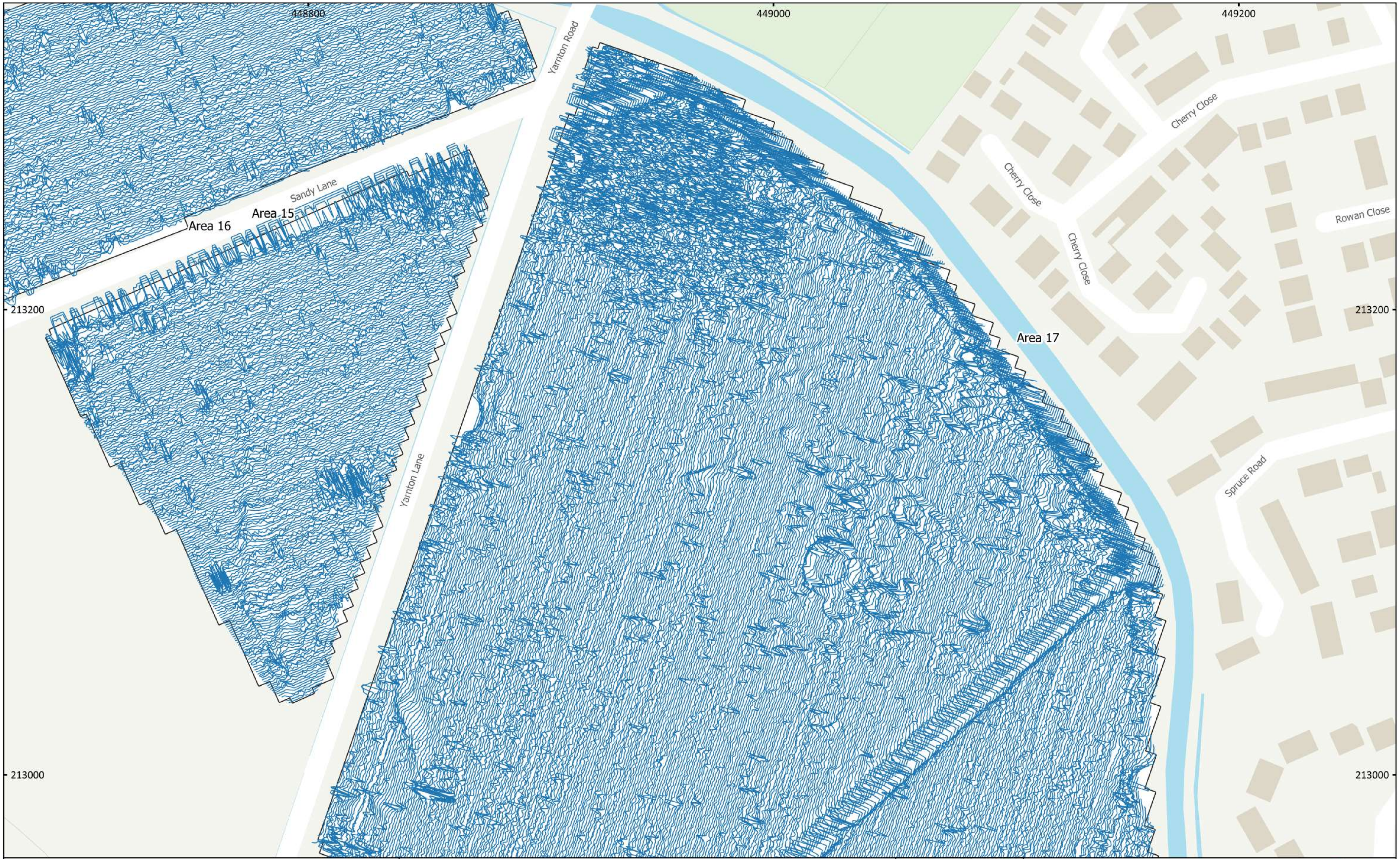
MSSP1306 - Begbroke, Oxfordshire
Figure 53 - Magnetic Gradient (Areas 15, 16 & 17)
1:1,500 @ A3

magnitude surveys

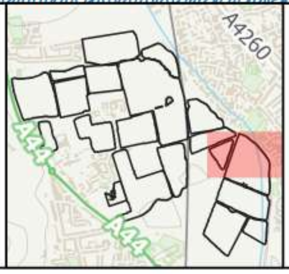
MSSP1306 - Begbroke, Oxfordshire
Figure 54 - Magnetic Interpretation (Areas 15, 16 & 17)
1:1,500 @ A3

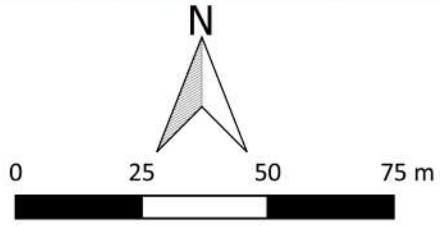
- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)

magnitude surveys

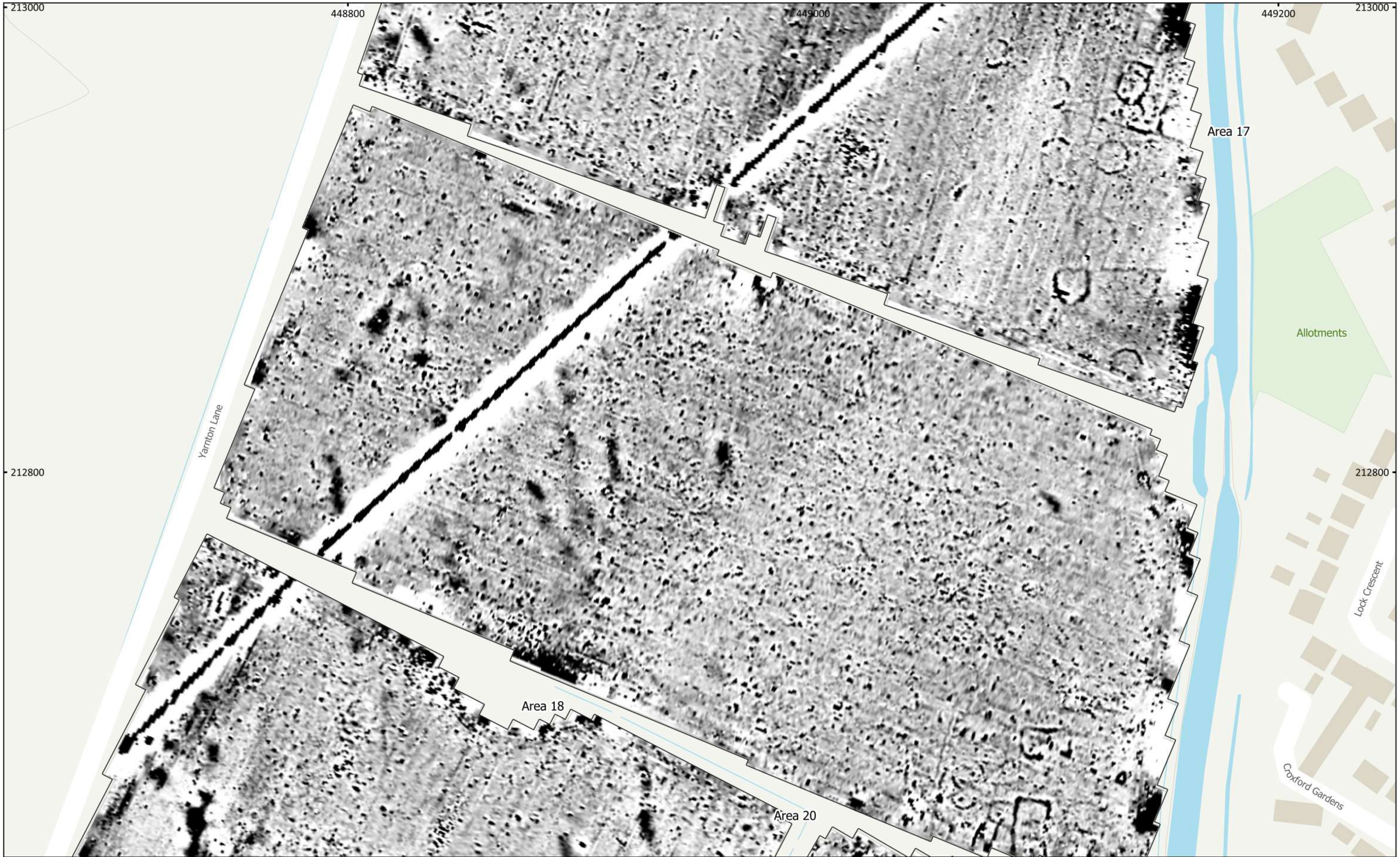


MSSP1306 - Begbroke, Oxfordshire
Figure 55 - XY Trace Plot (Areas 15, 16 & 17)
30nT/cm at 1:1,500 @ A3



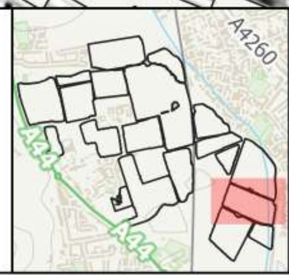


magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 56 - Magnetic Gradient (Areas 17, 18 & 19)
1:1,500 @ A3

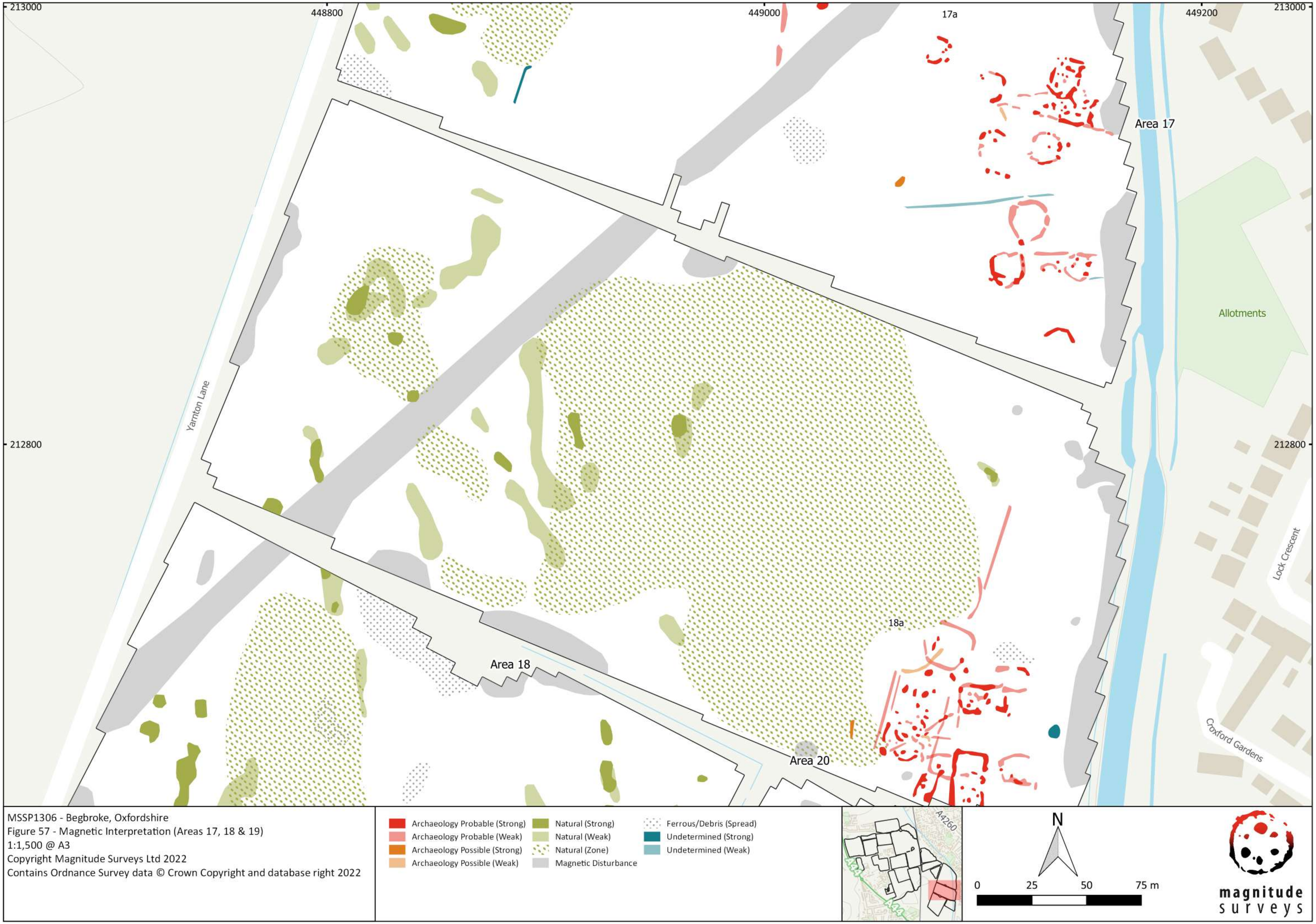
-1 nT 2



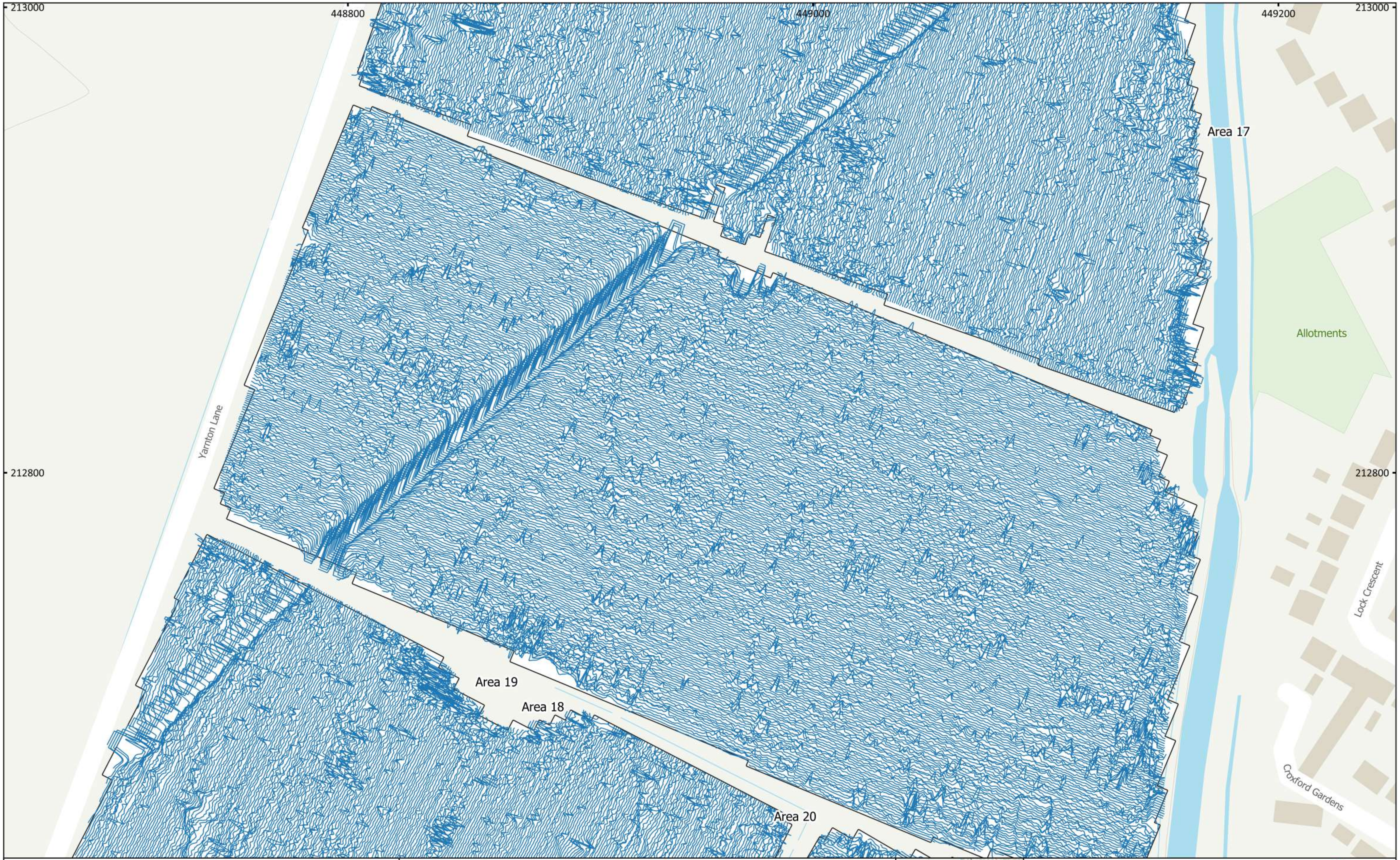
N

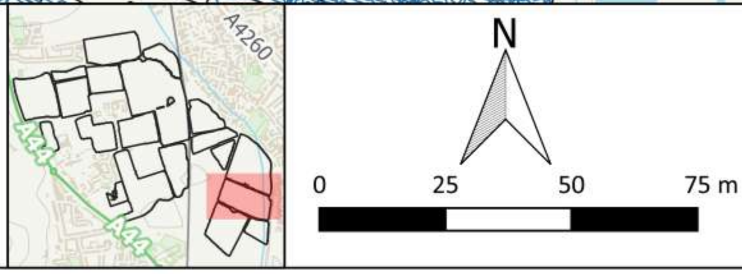
0 25 50 75 m

magnitude surveys



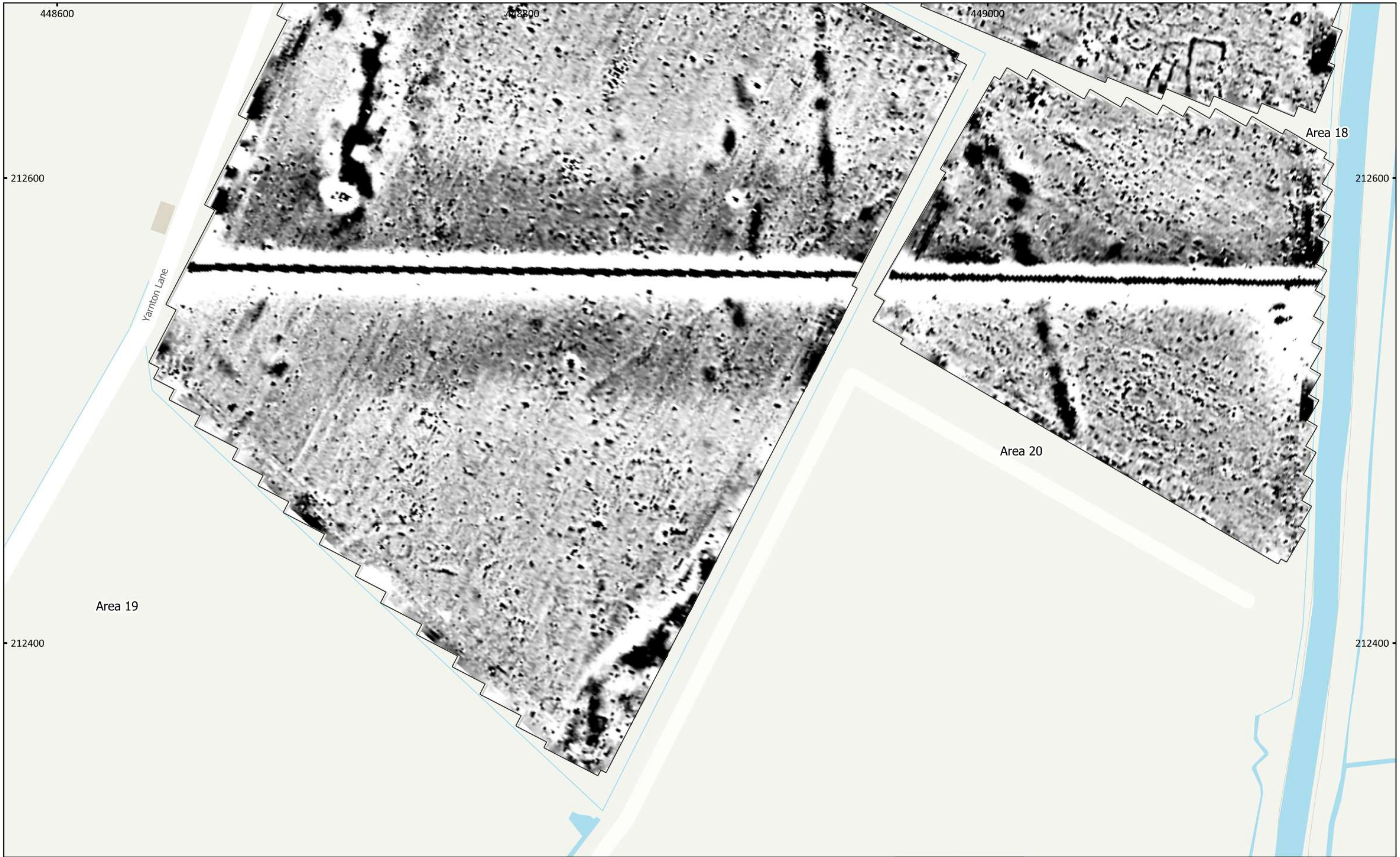
MSSP1306 - Begbroke, Oxfordshire
Figure 57 - Magnetic Interpretation (Areas 17, 18 & 19)
1:1,500 @ A3



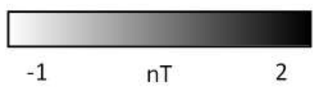


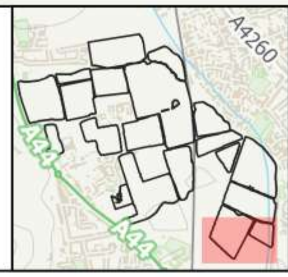
MSSP1306 - Begbroke, Oxfordshire
Figure 58 - XY Trace Plot (Areas 17, 18 & 19)
30nT/cm at 1:1,500 @ A3

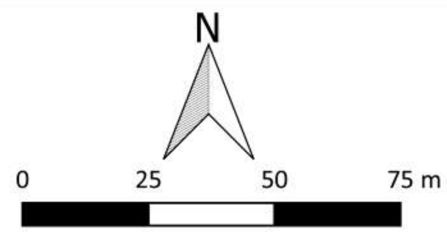
magnitude surveys



MSSP1306 - Begbroke, Oxfordshire
Figure 59 - Magnetic Gradient (Areas 18, 19 & 20)
1:1,500 @ A3



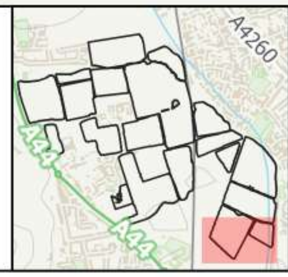


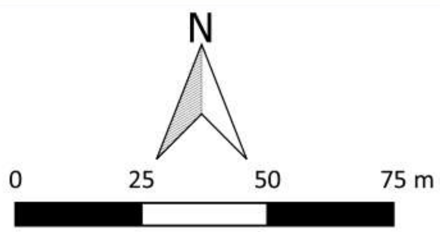


magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 60 - Magnetic Interpretation (Areas 18, 19 & 20)
1:1,500 @ A3

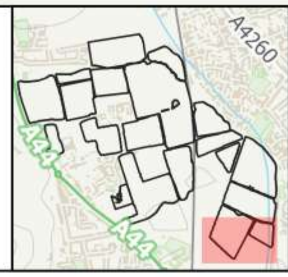
- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Industrial/Modern
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)





magnitude surveys

MSSP1306 - Begbroke, Oxfordshire
Figure 61 - XY Trace Plot (Areas 18, 19 & 20)
30nT/cm at 1:1,500 @ A3



N

0 25 50 75 m

magnitude surveys