

Land at Innsworth, Gloucestershire

geophysical surveys

on behalf of

CgMs Consulting

Report 1359
November 2005

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1. Summary

The project

- 1.1 This report presents the results of geophysical surveys conducted in advance of a proposed development on land at Innsworth, Gloucestershire.
- 1.2 The works were commissioned by CgMs Consulting and conducted by Archaeological Services in accordance with a project design provided by Archaeological Services.

Results

- 1.3 Three separate foci of features pertaining to past settlement have been discovered within the study area, representing multi-phase occupation and exploitation of the landscape; it is possible that a wide range of settlement dates is represented including prehistoric, Romano-British and medieval.
- 1.4 Traces of ridge and furrow cultivation across the majority of the survey area indicate intensive agricultural exploitation of the landscape from the medieval period until the present. Upstanding ridge and furrow earthworks are present in many areas; well-preserved examples exist in Areas 10 and 17.

2. Project background

Location (Figure 1)

- 2.1 The study area was located at Innsworth, Gloucestershire (NGR: SO 850 213). It measured approximately 75ha in total, the majority of which comprised pasture and arable fields bounded by hedgerows to the north and west of Innsworth Lane. Part of the study area to the west was being operated as a landfill and tipping site, whilst other parts were taken up by private residences and gardens.

Development proposal

- 2.2 The surveys have been carried out in advance of a development proposal for residential housing, with associated services and access roads.

Objective

- 2.3 The principal aim of the surveys was to investigate the potential for the presence of the remains of past settlement, activity and land-use and to test for the survival of associated buried archaeological features, to enable an informed assessment of the archaeological impact of the development proposals.

Dates

- 2.4 Fieldwork was undertaken between the 10th October and 4th November 2005. This report was prepared between the 7th and 23rd November 2005.

Personnel

- 2.5 Fieldwork was conducted by Graeme Attwood, Lorne Elliott and Louise Robinson, and supervised by Sam Roberts. This report was prepared by Sam Roberts, with illustrations by Martin Railton. The Project Manager was Duncan Hale.

Archive/OASIS

- 2.6 The site code is **IWG05**, for **Innsworth, Gloucestershire 2005**. The paper and data archive is currently held by Archaeological Services. Archaeological Services is registered with the **Online AccesS to the Index of archaeological investigationS** project (OASIS). The OASIS ID number for this project is **archaeol3-11230**.

3. Archaeological and historical background

- 3.1 Little is known of the archaeological resource in the study area, except for cropmarks of uncertain date showing trackways and possible enclosures noted in the National Monuments Record (NMR No. SO 82 SE 23). The location of the cropmarks lies within Area 1 of this report (NGR: SO 8610 2120).

4. Landuse, topography and geology

- 4.1 At the time of survey the proposed development area comprised 27 arable and pasture fields, and an area currently operating as a tipping site.
- 4.2 The survey area was predominantly level at a mean elevation of *c.*15m OD.
- 4.3 The study area lies within a postglacial alluvial plain that is dominated by the Rivers Severn and Avon. The solid and drift geology comprise mainly sand and mudstones of the Triassic and Jurassic epochs that are overlain by a variety of postglacial alluvial deposits

5. Geophysical survey methods

Standards

- 5.1 The surveys and reporting were conducted in accordance with English Heritage (1995) Research and Professional Services Guideline No.1, *Geophysical survey in archaeological field evaluation*; the Institute of Field Archaeologists Technical Paper No.6, *The use of geophysical techniques in archaeological evaluations* (Gaffney, Gater & Ovenden 2002); and the Archaeology Data Service (2001) *Geophysical Data in Archaeology: A Guide to Good Practice*.

Technique selection

- 5.2 Geophysical surveying enables the relatively rapid and non-invasive identification of potential archaeological features within landscapes and can involve a variety of complementary techniques such as magnetometry, electrical resistivity, ground-penetrating radar and electromagnetic survey. Some techniques are more suitable than others in particular situations, depending on a variety of site-specific factors including the nature of likely targets; depth of likely targets; ground conditions; proximity of buildings, fences or services and the local geology and drift.
- 5.3 In this instance, based on previous work in the area (Archaeological Services 2004), it was considered likely that cut features, such as ditches and pits, might be present on the site, and that other types of feature such as trackways, wall foundations and fired structures (for example kilns and hearths) might also be present.
- 5.4 Given the shallowness of the targets and the non-igneous geological environment of the study area a geomagnetic technique, fluxgate gradiometry, was considered appropriate. This technique involves the use of a hand-held magnetometer to detect and record minute perturbations, or ‘anomalies’, in the vertical component (i.e. gradient) of the Earth’s magnetic field caused by variations in soil magnetic susceptibility or permanent magnetisation, such anomalies can reflect each of the types of feature mentioned above.

Field methods

- 5.5 The study area was divided into 27 separate areas for survey purposes (Areas 1-26 and Area B - Figure 2). The area taken up by the tipping site (Area 25) was not available for survey due to heavy plant operating. Two other areas were also unsuitable due to the height of vegetation and obstacles present (Area 4 and Area 19). Area 18 was surveyed in two parts, 18a and 18b, due to an electric fence subdividing the field.
- 5.6 A 30m grid was established across each survey area and tied-in to known, mapped Ordnance Survey points using a Leica GS50 global positioning system (GPS).
- 5.7 Measurements of vertical geomagnetic field gradient were determined using Bartington Grad601 fluxgate gradiometers with automatic datalogging facilities. A zig-zag traverse scheme was employed and data were logged in 30m grid units. The instrument sensitivity was set to 0.1nT, the sample interval to 0.25m and the traverse interval to 1.0m, thus providing 3600 sample measurements per 30m grid unit.
- 5.8 Data were downloaded on-site into laptop computers for initial processing and storage and subsequently transferred to a desktop computer for processing, interpretation and archiving.

Data processing

- 5.9 Geoplot v.3 software was used to process the geophysical data and to produce both continuous tone greyscale images and trace plots of the raw data. The greyscale images and interpretations are presented in Figures 3-44; the trace plots are provided in Appendix I. In the greyscale images, positive magnetic anomalies are displayed as dark grey and negative magnetic anomalies as light grey. A palette bar relates the greyscale intensities to anomaly values in nanoTesla.
- 5.10 The following basic processing functions have been applied to each dataset:

Clip – clips, or limits data to specified maximum or minimum values; to eliminate large noise spikes; also generally makes statistical calculations more realistic.

Zero mean traverse – sets the background mean of each traverse within a grid to zero; for removing striping effects in the traverse direction and removing grid edge discontinuities.

Destagger – corrects for displacement of anomalies caused by alternate zig-zag traverses.

Despike – locates and suppresses random iron spikes in gradiometer data.

Low pass filter – is useful for smoothing data or for enhancing larger weak features.

Interpolate – increases the number of data points in a survey; to match sample and traverse intervals and so create a smoother appearance to the data. In this instance the gradiometer data have been interpolated to 0.25 x 0.25m intervals.

Anomaly types

- 5.11 Colour-coded geophysical interpretation plans are provided for each survey area. Three types of geomagnetic anomaly have been distinguished in the data:

positive magnetic regions of anomalously high or positive magnetic field gradient, which may be associated with high magnetic susceptibility soil-filled structures such as pits and ditches.

negative magnetic regions of anomalously low or negative magnetic field gradient, which may correspond to features of low magnetic susceptibility such as wall footings and other concentrations of sedimentary rock or voids.

dipolar magnetic paired positive-negative magnetic anomalies, which typically reflect ferrous or fired materials (including fences and service pipes) and/or fired structures such as kilns or hearths.

6. Geophysical survey results (Figures 2-44)

- 6.1 A compilation of the individual survey area greyscales is presented in Figure 2. Colour-coded geophysical and archaeological interpretation plans are provided for each survey area (Figures 3-44). Significant anomalies detected have been assigned feature [F] numbers, some of which represent feature groups, in the following discussion.

Area 1 (Figs 3-5)

- 6.2 A magnetic texture of striations on an east-west alignment present in this area reflects the current plough regime. This texture is not shown on the interpretation figures for reasons of clarity.
- 6.3 A concentration of linear, curvilinear and rectilinear positive magnetic anomalies have been detected in the eastern part of this area. These anomalies reflect relative increases in high magnetic susceptibility materials and almost certainly represent the remains of soil-filled ditches, possibly representing a number of phases of occupation.
- 6.4 Two of the curvilinear anomalies [F1] and [F2], both measuring approximately 15m in diameter, may represent ring-ditches around round-houses. A curvilinear anomaly [F3], measuring approximately 70m in diameter, and seemingly enclosing [F1] may reflect a boundary ditch or enclosure.

- 6.5 A rectilinear positive magnetic anomaly [F4], measuring approximately 100m along its north-south axis, is likely to reflect an enclosure ditch. Parts of the north, east and south sides of the feature have been detected. Although apparently enclosing the curvilinear anomalies [F1], [F2] and [F3] this feature may represent a different phase of occupation.
- 6.6 Two sets of parallel ditch features [F5, F6], may reflect trackways, or elements of other enclosure or boundary features. The possible trackway [F5] interrupts a linear ditch feature [F7], which lies on a northwest-southeast alignment similar to that of [F4].
- 6.7 A number of discrete positive magnetic anomalies detected in this area may reflect pits [F8, F9] or clusters of pit features [F10].
- 6.8 A series of weak linear positive magnetic anomalies [F11], aligned approximately north-south, detected in the northeast corner of the survey area may reflect traces of ridge and furrow cultivation.
- 6.9 Other linear and discrete positive magnetic anomalies detected reflect ditch and pit features which may form elements of the enclosure systems previously identified.
- 6.10 The only other anomalies detected here are small, discrete dipolar magnetic anomalies and dipolar magnetic interference along the boundaries of the survey area. The small anomalies almost certainly reflect items of near-surface ferrous and/or fired debris, such as horseshoes and brick fragments, whilst the magnetic interference arises from the presence of wire fences and gates along hedgelines.
- Area 2** (Figs 6-8)
- 6.11 Linear negative magnetic anomalies detected adjacent to the southern and northern boundaries [F12 and F13 respectively] of Area 2 reflect the edges of the unploughed field margins.
- 6.12 A group of positive magnetic linear and discrete anomalies [F14] detected in the southeast corner of the survey area reflect ditch and pit features, and are almost certainly a continuation of the enclosure systems detected in Area 1.
- 6.13 A series of weak linear positive magnetic anomalies aligned northeast-southwest, spaced at 8-10m intervals, reflect the remains of ridge and furrow cultivation. These remains are most apparent in the north [F15], but are also present towards the centre of the survey area [F16].
- 6.14 A linear positive magnetic anomaly aligned northeast-southwest, branching off to the southeast and southwest and incorporating discrete positive magnetic anomalies along its length, reflects a soil-filled feature [F17], possibly part of a network of field drains.

- 6.15 Two discrete positive magnetic anomalies [F18, F19] at the eastern end of [F17] reflect soil-filled features such as pits.
- 6.16 Other weak linear positive magnetic anomalies detected reflect soil-filled features, such as ditches or gullies. These may be elements of previous field systems or possibly land drains.
- 6.17 A scatter of dipolar magnetic anomalies across the survey area reflects soil litter in the form of ferrous and fired debris. Larger dipolar anomalies situated along the periphery of the survey area are caused by fences and gates on the field boundaries.

Area 3 (Figs 9-11)

- 6.18 Evenly spaced chains of magnetic anomalies [F20] define the ploughed-out remains of ridge and furrow cultivation, a continuation of a field system more apparent in Area 6. The change in nature of the anomalies from Area 6 into Area 3 may be explained as land drains appeared to have been laid along furrows in Area 3.
- 6.19 Weak positive linear magnetic anomalies [F21] and [F22] may reflect former field boundaries, though apparently not contemporary with [F20].
- 6.20 A chain of dipolar anomalies [F23] traversing the survey area may reflect a land drain, possibly feeding into the pond in the southeastern corner.
- 6.21 Intense dipolar magnetic anomalies located in the southern half of the survey area are likely to reflect large ferrous items. Smaller dipolar magnetic anomalies scattered across the area reflect ferrous and fired debris within the topsoil.

Area 4

- 6.22 It was not possible to survey Area 4 due to the height of vegetation and presence of obstacles including piles of wood and metal refuse. Features of note within Area 4 included an air raid shelter, built at some time during the Second World War, and various other sheds and temporary huts, constructed mainly of corrugated iron.

Area 5 (Figs 12-14)

- 6.23 Broad, linear positive and negative magnetic anomalies [F24], aligned north-south, reflect ridge and furrow remains, which still survive as visible undulations within the survey area.
- 6.24 Strong positive magnetic anomalies in the northwestern corner of the survey area reflect soil-filled features [F25] and [F26]. [F25] is part of a larger rectilinear feature which also crosses into Areas 6 and 8. The intensity of the anomalies reflecting these ditch features may indicate that they are filled with organic-rich or burnt material.

- 6.25 Less intense linear positive magnetic anomalies [F27] have also been detected, forming a network of enclosures and trackways spreading across Areas 5, 6, 7 and 8. These enclosures lie on a different alignment to [F25] and may represent a different phase of occupation.
- 6.26 The intense dipolar magnetic anomaly on the northern boundary reflects a watering hole; other dipolar anomalies along the boundaries reflect metal fencelines and gates. A spread of ferrous and fired debris is also present, as evidenced by the smaller dipolar magnetic anomalies detected.

Areas 6 and 7 (Figs 15-17)

- 6.27 A complex of trackways and enclosures has been detected in the southwest corner of survey Area 6, extending into Areas 5, 7 and 8.
- 6.28 This complex is represented by a series of positive magnetic anomalies ([F28], [F29], [F30], [F41] and [F42]). The discrete positive magnetic anomalies [F33], [F34], [F35], [F36] and [F39] are likely to reflect pit features.
- 6.29 Parallel linear positive magnetic anomalies [F31] define a double-ditched trackway along the northern limit of the enclosure complex in Area 6. This trackway lies on a northwest-southeast alignment and crosses Areas 6, 7 and 12. Linear positive magnetic anomalies leading off the trackway east and northeast across Area 6 ([F49] and [F50]), reflect ditch features, possibly boundary ditches for a field system.
- 6.30 A very weak curvilinear positive magnetic anomaly [F32] within one of the enclosures [F29] may reflect a ring ditch. Clusters of discrete positive magnetic anomalies [F33] most probably reflecting pit features are also present within this enclosure. In the northwest corner of [F29] an intense magnetic anomaly [F39] may reflect structural remains.
- 6.31 Linear positive magnetic anomalies [F51] and [F52] aligned northwest-southeast and northeast-southwest respectively, and joining at right-angles to each other, reflect old field boundaries once subdividing Area 6. To the north and south of [F52] linear positive magnetic anomalies at intervals of approximately 10m reflect the remains of ridge and furrow cultivation ([F53], [F54]).
- 6.32 A footpath has been detected as a linear negative magnetic anomaly [F56];
- 6.33 The remains of ridge and furrow cultivation are evident in an area of pasture to the west of the footpath, detected as linear positive magnetic anomalies [F55] on a similar alignment to [F54].
- 6.34 In the northwest corner of Area 6, a concentric arrangement of strong rectilinear positive magnetic anomalies [F57] reflect a double-ditched enclosure with an entrance to the east. The inner ditch measures approximately 40m square, whilst the outer ditch seems to be roughly 60m square, although the western side is obscured by the field boundary.

- 6.35 Dipolar magnetic anomalies spread across the entirety of Areas 6 and 7 reflect the ubiquitous soil-litter of fired and ferrous debris.

Area 8 (Figs 12-14)

- 6.36 The complex of enclosures detected in Areas 5, 6 and 7 continues into the northeast corner of Area 8.
- 6.37 Rectilinear positive magnetic anomalies [F44] and [F46] are likely to be associated with the network of enclosures represented by features [F27], [F28], [F29] and [F41]. A curvilinear positive magnetic anomaly [F45] adjacent to [F44] near the northern boundary of Area 8 may reflect the partial remains of a ring-ditch.
- 6.38 The linear and rectilinear positive magnetic anomalies [F43], [F46] and [F47] may be associated with the enclosure represented by [F30] and [F25] and enclosing pit features [F35] and [F36]. This enclosure is on a different alignment and may represent a different phase of settlement.
- 6.39 Two discrete positive magnetic anomalies [F48] may reflect pit features.
- 6.40 A strong linear positive magnetic anomaly [F58] traversing the survey area on an east-west alignment almost certainly reflects a former field boundary ditch.
- 6.41 Intense dipolar magnetic anomalies around the periphery of the southern half of the survey area reflect the presence of metal fencing. Small dipolar magnetic anomalies spread across the survey area reflect fired and ferrous topsoil litter. Larger dipolar anomalies are likely to reflect near-surface ferrous objects.

Area 9 (Figs 18-20)

- 6.42 Linear positive and negative anomalies [F59] on an east-west alignment reflect the remains of ridge and furrow cultivation.
- 6.43 Concentrations of dipolar magnetic anomalies in the southwest extension and along the eastern boundary of Area 9 reflect spreads of building rubble and metal debris. The linear dipolar magnetic anomaly along the northern boundary reflects a wire fence within the hedgerow whilst the scatter of small, discrete dipolar anomalies corresponds to ferrous and fired debris within the topsoil.

Area 10 (Figs 18-20)

- 6.44 Upstanding earthworks of ridge and furrow, aligned east-west, are present across the whole of the survey area. These are reflected by a series of positive and negative linear magnetic anomalies [F60].
- 6.45 A more intense linear positive magnetic anomaly [F61], also aligned east-west, may reflect a soil filled feature, possibly corresponding to a previous field boundary.

- 6.46 A dipolar magnetic anomaly in the southwest corner of the survey area corresponds to the location of a corrugated iron shed; large dipolar anomalies spread across the survey area correspond to piles of silage left in the field. Smaller dipolar anomalies represent the ubiquitous fired and ferrous soil litter.

Area 11 (Figs 21-23)

- 6.47 A linear positive magnetic anomaly and adjacent small, discrete dipolar magnetic anomalies [F62] reflect the presence of a previous field boundary.
- 6.48 A series of parallel positive and some negative magnetic anomalies [F63] aligned roughly northwest-southeast and at spacings of 6-8m, attest to the remains of ridge and furrow cultivation.
- 6.49 Small dipolar magnetic anomalies again reflect the fired and ferrous items within the topsoil.

Area 12 (Figs 21-23)

- 6.50 Two very weak linear positive magnetic anomalies [F64] in the southwest corner of the survey area on a northwest-southeast alignment are likely to be a continuation of the ditched trackway [F31] detected in Areas 6 and 7.
- 6.51 A group of linear and discrete positive magnetic anomalies [F65], together with a rectilinear positive magnetic anomaly [F66], reflect soil-filled features which may be associated with the adjacent double-ditched enclosure [F57] in Area 6.
- 6.52 A dipolar magnetic anomaly and strong positive magnetic anomaly [F67] in the northwest corner of the survey area may reflect pit features.
- 6.53 A spread of small dipolar magnetic anomalies reflects fired and ferrous soil litter.

Area 13 (Figs 24-26)

- 6.54 An interrupted, curvilinear, positive magnetic anomaly [F68] detected in the southern part of Area 13 reflects a soil-filled feature, possibly an enclosure ditch.
- 6.55 Ridge and furrow cultivation is again evident; two sets of linear negative and positive magnetic anomalies have been detected, one aligned roughly north-south [F69] across most of the field, and the other east-west [F70] in the northern part of the field.
- 6.56 Strong dipolar magnetic anomalies along the eastern boundary of the field reflect wire fencing. Small, discrete dipolar anomalies reflecting soil litter are also present across the survey area as a whole.

Area 14 (Figs 24-26)

- 6.57 A linear dipolar magnetic anomaly reflects the presence of a service pipe crossing the survey area.

- 6.58 A series of linear positive magnetic anomalies [F71] reflects the presence of ridge and furrow remains, aligned north-northeast to south-southwest.
- 6.59 A series of positive linear magnetic anomalies [F72], largely aligned northwest-southeast probably reflect a network of field drains.
- 6.60 A low concentration of dipolar magnetic anomalies is present in this area, reflecting a lower proportion of fired and ferrous debris in the topsoil.

Area 15 (Figs 27-29)

- 6.61 The dipolar magnetic anomaly reflecting a service pipe detected in Area 14 continues into the southeastern corner of area 15.
- 6.62 A series of regularly spaced positive magnetic linear anomalies [F73] on a north-south alignment almost certainly reflect ridge and furrow remains.
- 6.63 Weak, widely spaced, linear positive magnetic anomalies on a rough east-west alignment [F74] are likely to reflect a land drain network.
- 6.64 A spread of small, discrete, dipolar magnetic anomalies reflects fired and ferrous soil litter.

Area 16 (Figs 27-29)

- 6.65 The only anomalies detected in this area are the discrete dipolar magnetic anomalies which reflect near-surface fired and ferrous debris, ubiquitous in modern ploughsoils.

Areas 17, 18a and 18b (Figs 30-32)

- 6.66 Broad negative and positive magnetic anomalies [F75] in Area 17 reflect ridge and furrow remains, spaced at intervals of between 7 and 10m, which are still visible as upstanding earthworks.
- 6.67 Linear positive magnetic anomalies [F76], aligned northwest-southeast, reflecting the remains of ridge and furrow have been detected in the northwest corner of Area 18a. These, however, do not survive as visible earthworks.
- 6.68 The only other magnetic anomalies detected in these areas are the small dipolar anomalies reflecting fired and ferrous debris in the topsoil.

Area 19

- 6.69 Area 19, an area bordering the track leading to Dry Meadow Farm was unable to be surveyed as it was covered with thick undergrowth, which surrounded a number of brick buildings located throughout this area.

Area 20 (Figs 33-35)

- 6.70 No significant archaeological features were detected in this area; concentrations of dipolar magnetic anomalies reflect the presence of farm buildings.

Areas 21 and 22 (Figs 33-35)

- 6.71 Linear positive magnetic anomalies detected in the eastern half of Area 21 [F77], aligned north-northwest by south-southeast, may reflect the remains of ridge and furrow cultivation.
- 6.72 A network of linear positive magnetic anomalies [F78] detected in the southeastern corner of Area 21, and continuing into Area 22, is likely to reflect a drainage system feeding into the large pond to the south.
- 6.73 A high concentration of dipolar magnetic anomalies confined to the northern half of Area 22 may be obscuring linear features beneath, however these features, if present, are likely to be of modern origin and connected to the farm buildings and garden area situated directly to the north.

Area 23 and 24 (Figs 36-38)

- 6.74 Linear positive magnetic anomalies ([F79], [F80]) detected in the northwestern part of Area 23 reflect soil-filled features, possibly land drains feeding into the pond to the north.
- 6.75 Three sets of parallel, linear magnetic anomalies present in Areas 23 and 24, [F81], [F82] and [F83], reflect remains of ridge and furrow cultivation. These groups of features are probably all part of the same field system, and are all evenly spaced, approximately 4-5m apart, on a northwest-southeast alignment.
- 6.76 The eastern part of Area 23 is dominated by concentrations of dipolar magnetic anomalies that almost certainly reflect areas of disturbance.
- 6.77 A linear dipolar magnetic anomaly traversing areas 23 and 24 corresponds to a service pipe. This pipe also crosses Areas 26, 14 and 15.
- 6.78 A scatter of small, discrete dipolar magnetic anomalies across the two survey areas reflects fired and ferrous debris within the topsoil.

Area 25

- 6.79 Area 25 was not surveyed as the whole of the site was taken up by landfill and tipping operations with heavy plant operating.

Area 26 (Figs 39-41)

- 6.80 A linear dipolar magnetic anomaly reflecting the service pipe previously identified in Areas 14, 15, 23 and 24 crosses the northern corner of Area 26.
- 6.81 Intense dipolar magnetic anomalies along the eastern boundary reflect wire fencing separating the survey area from the adjacent technology park. An

intense dipolar magnetic anomaly in the southeastern corner reflects the presence of a metal electricity pylon.

- 6.82 The only other magnetic anomalies detected in this area are a scatter of dipolar anomalies reflecting fired and ferrous debris in the topsoil

Area B (Figs 42-44)

- 6.83 A series of strong sinuous positive magnetic anomalies, together with some areas of relatively lower magnetic susceptibility, are present across the whole of this area [F84]. These features reflect soil-filled features, and may correspond to palaeochannels, however they also strongly resemble anomalies observed on sites which have been subject to leveling episodes and general earth-moving activities (e.g. Archaeological Services 2001 & 2005). These activities can leave greater depths of more magnetically susceptible topsoil along the edges of truncated areas, and the proximity of Area B to the dual carriageway to the south, and the technology park and landfill site to the north and northwest, suggest that these features are modern in origin. A large concentration of dipolar anomalies on the southern boundary corresponds to a raised mound, presumably the remains of earth-moving episodes.
- 6.84 A linear dipolar magnetic anomaly in the northwestern corner of the survey area reflects a service pipe; an intense dipolar anomaly in the northeastern corner corresponds to a gated access point into the field.
- 6.85 The only other anomalies in this area are a scatter of dipolar magnetic anomalies reflecting ferrous and fired debris.

7. Conclusions

- 7.1 Geophysical surveys have been carried out on land at Innsworth, Gloucestershire.
- 7.2 Three separate foci of features pertaining to past settlement have been discovered within the study area, representing multi-phase occupation and exploitation of the landscape.
- 7.3 Ring-ditches, curvilinear and rectilinear enclosures and trackways have been detected in Areas 1 and 2. Multiple phases of occupation are likely to be represented including prehistoric and Romano-British settlement.
- 7.4 A complex palimpsest of rectilinear enclosures, ditches, trackways and pits has been found covering Areas 5, 6, 7 and 8. It appears that multiple phases of settlement are represented.
- 7.5 A double-ditched enclosure is located in the northwestern corner of Area 6, with possible associated features found in Area 12.

- 7.6 Traces of ridge and furrow cultivation have been found across the majority of the survey area, indicating intensive agricultural exploitation from the medieval until the present.

8. Sources

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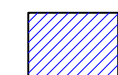
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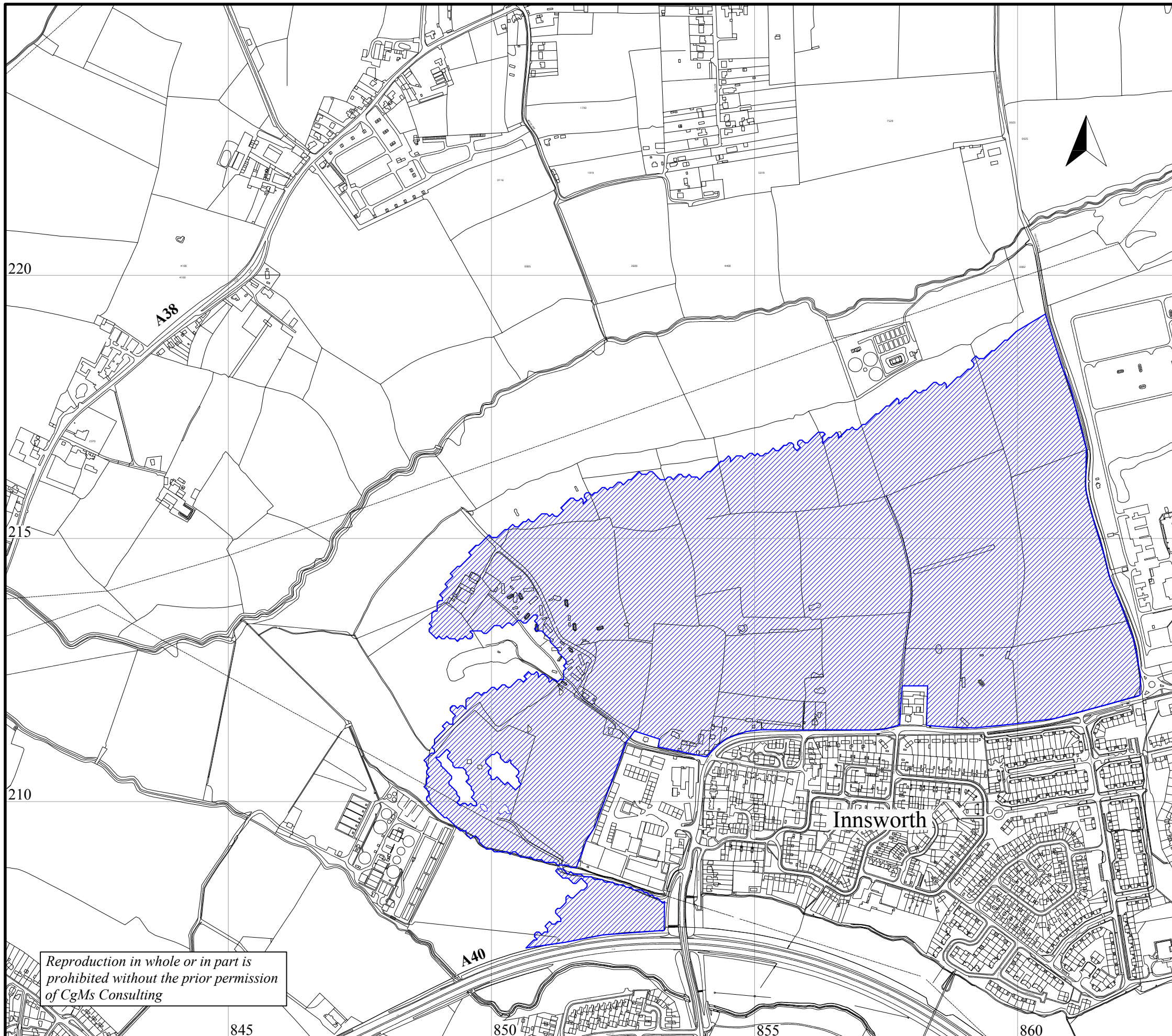
Figure 1

Location map

on behalf of
CgMs Consulting

0 300m
scale 1:7500 - for A3 plot

 study area



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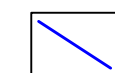

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Figure 2

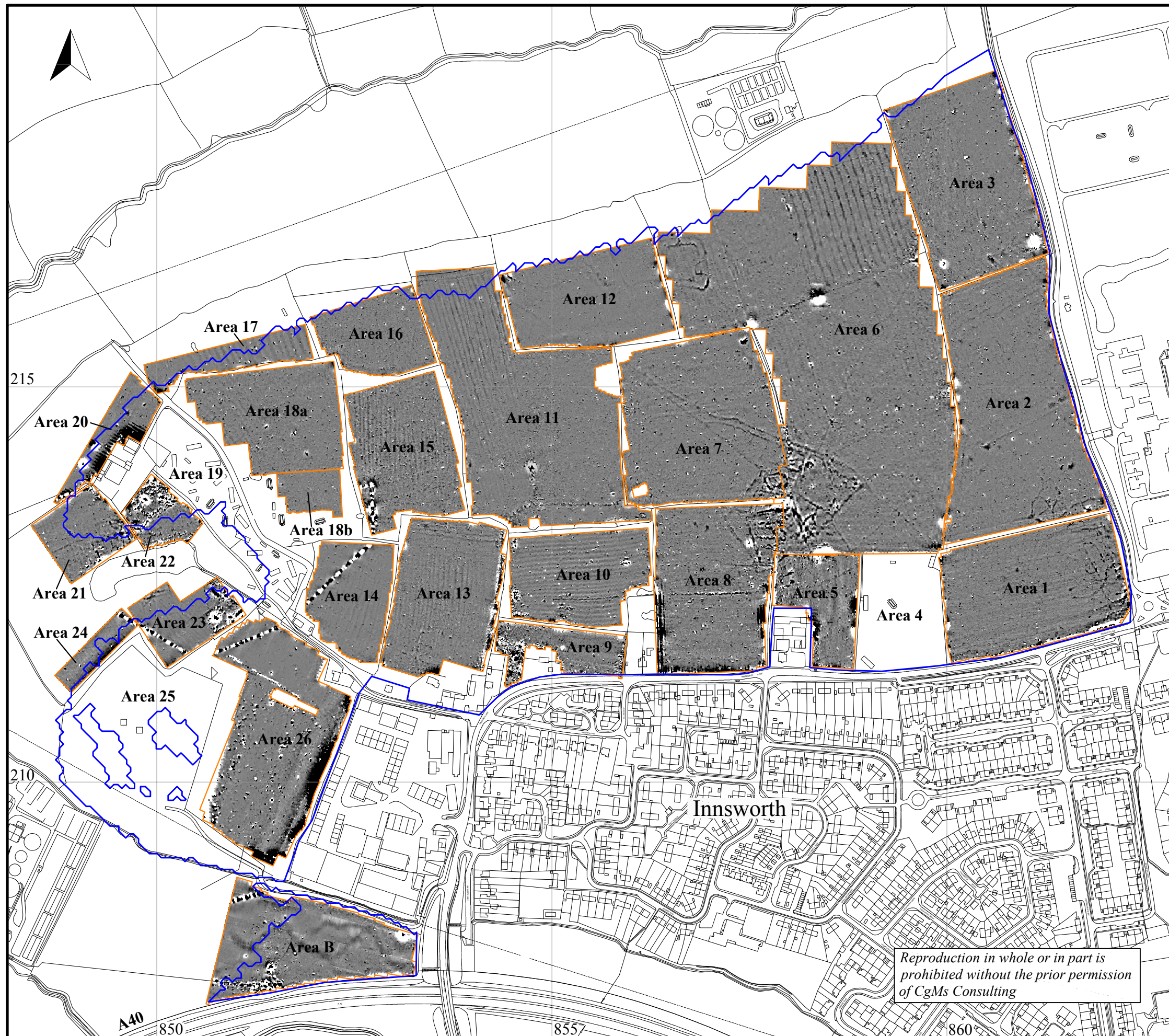
Geophysical survey areas

on behalf of
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scale 1:5000 - for A3 plot

 outline of study area
 outline of survey area

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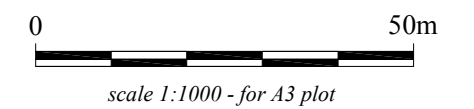
**Land at Innsworth, Gloucestershire
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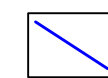

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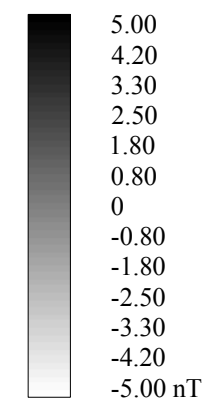
Figure 3

Geomagnetic survey of Area 1

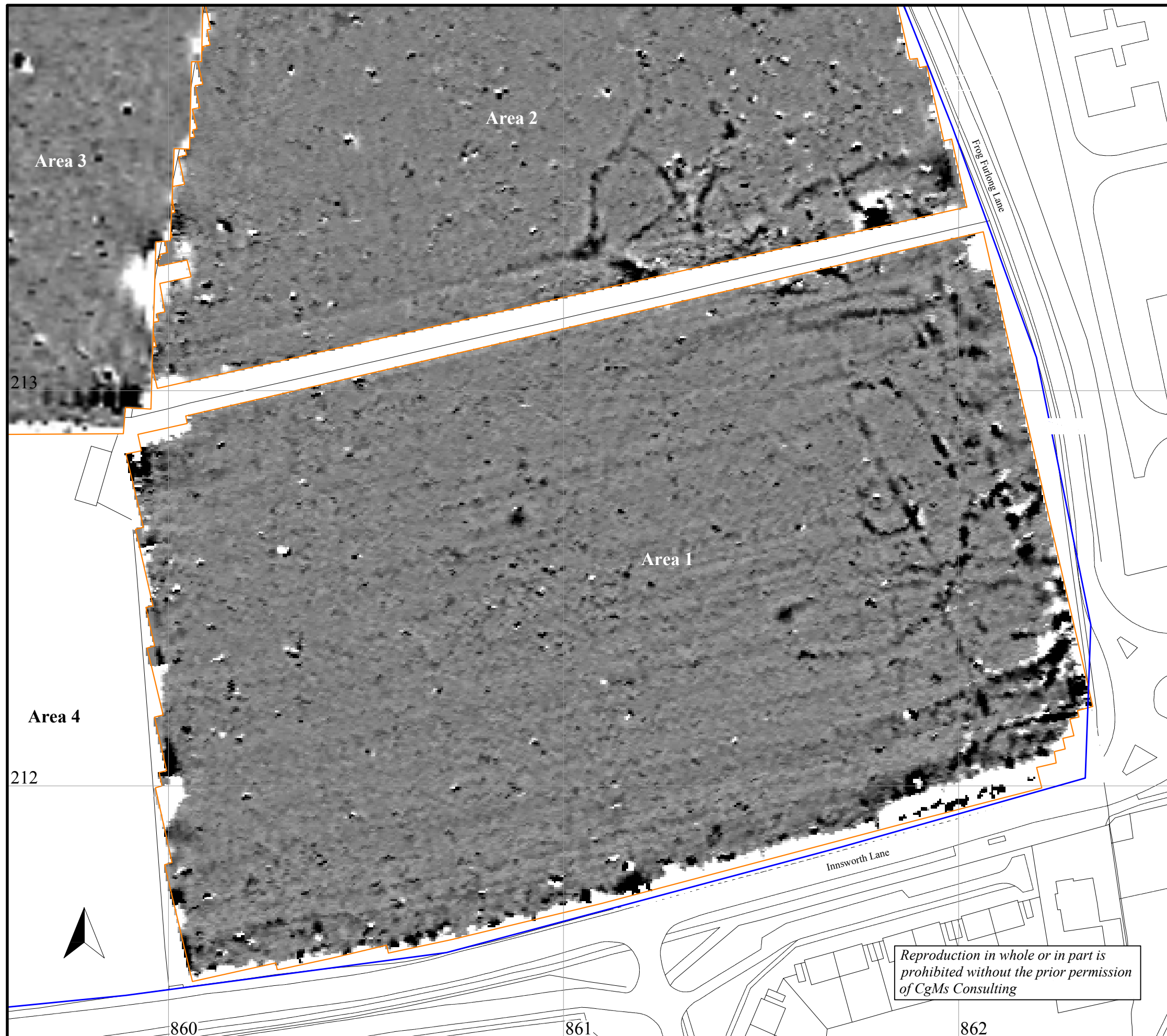
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-  outline of study area
-  outline of survey area



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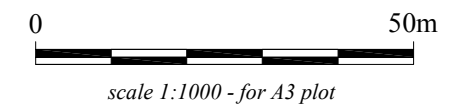
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 geophysical surveys**

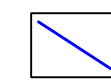

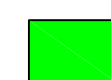
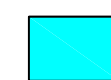

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Figure 4

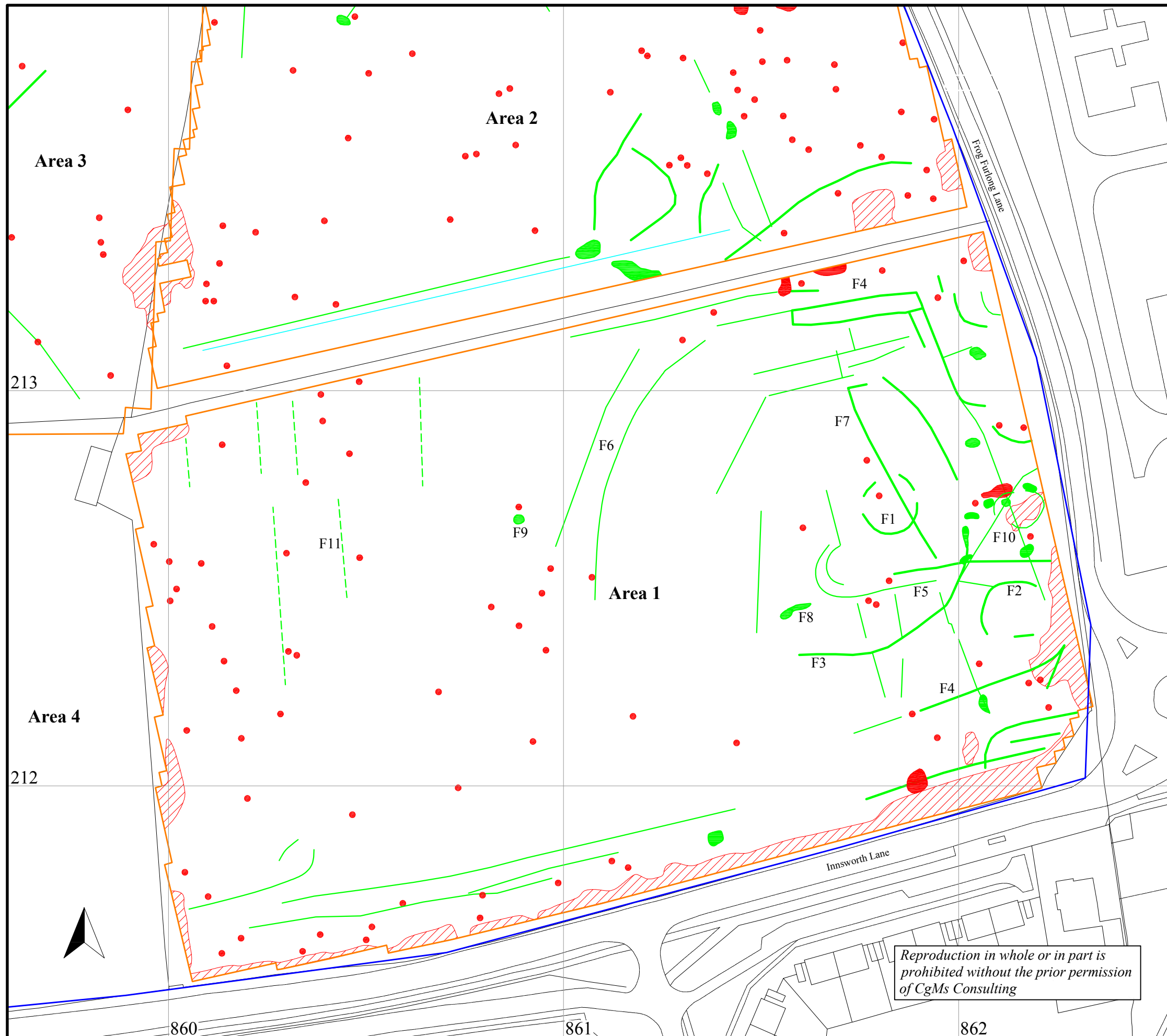
Geophysical interpretation of Area 1

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CgMs Consulting



-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies

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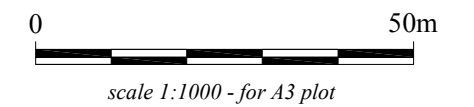
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geophysical surveys**



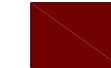

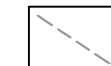
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Figure 5

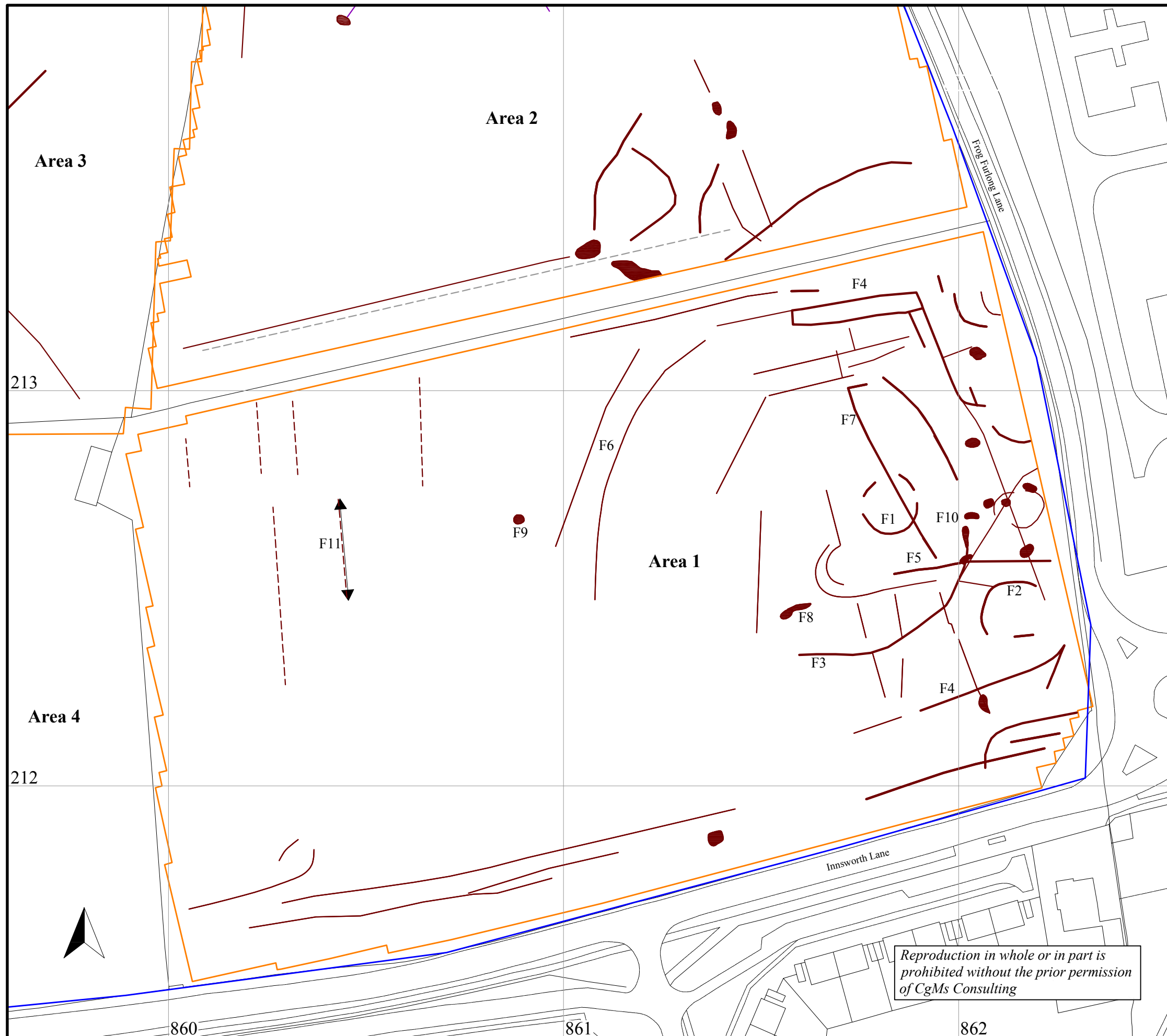
*Archaeological interpretation
of Area 1*

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow
-  limit of ploughing

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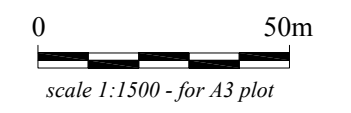
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




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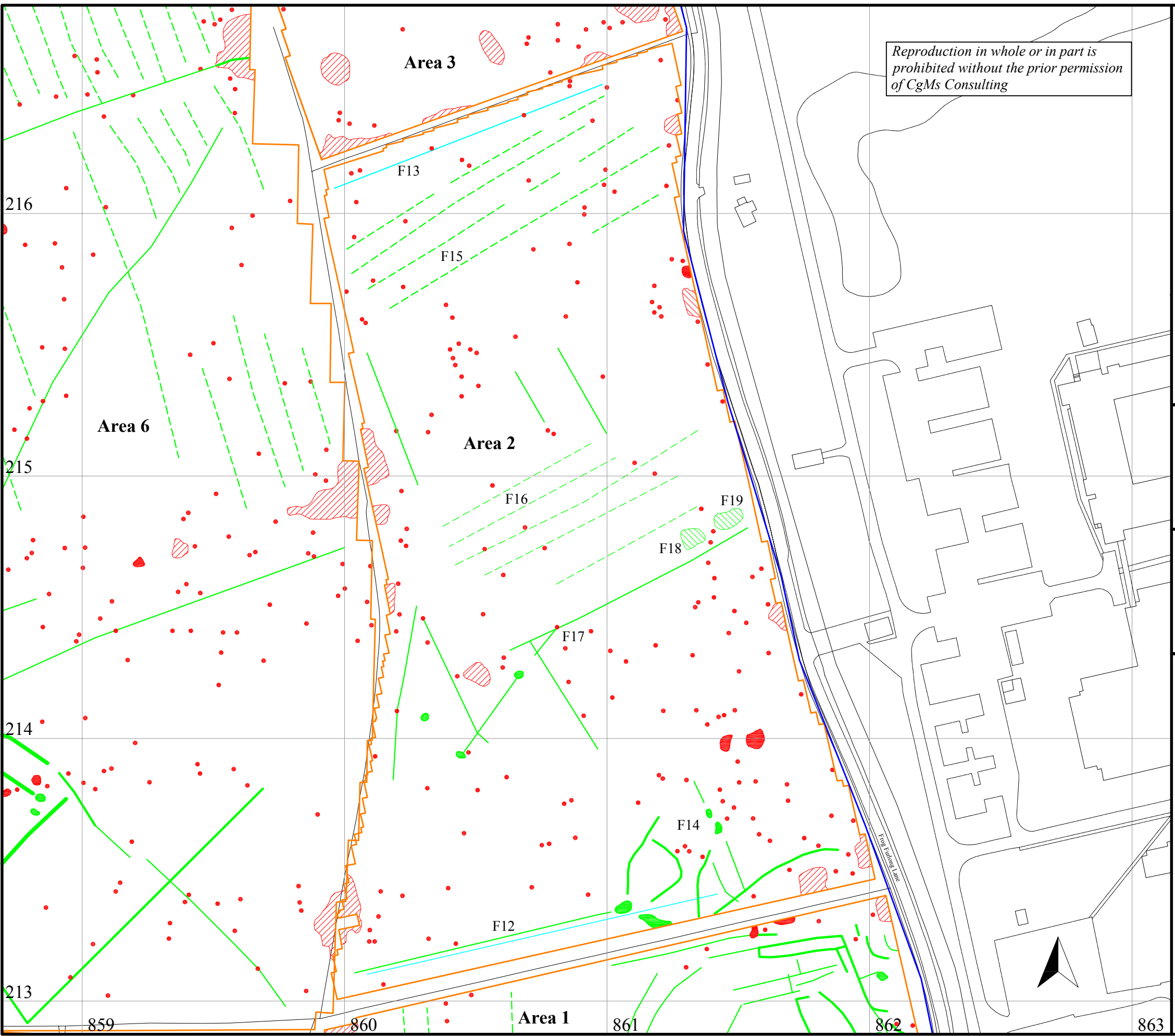
Figure 7

Geophysical interpretation of Area 2

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-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies



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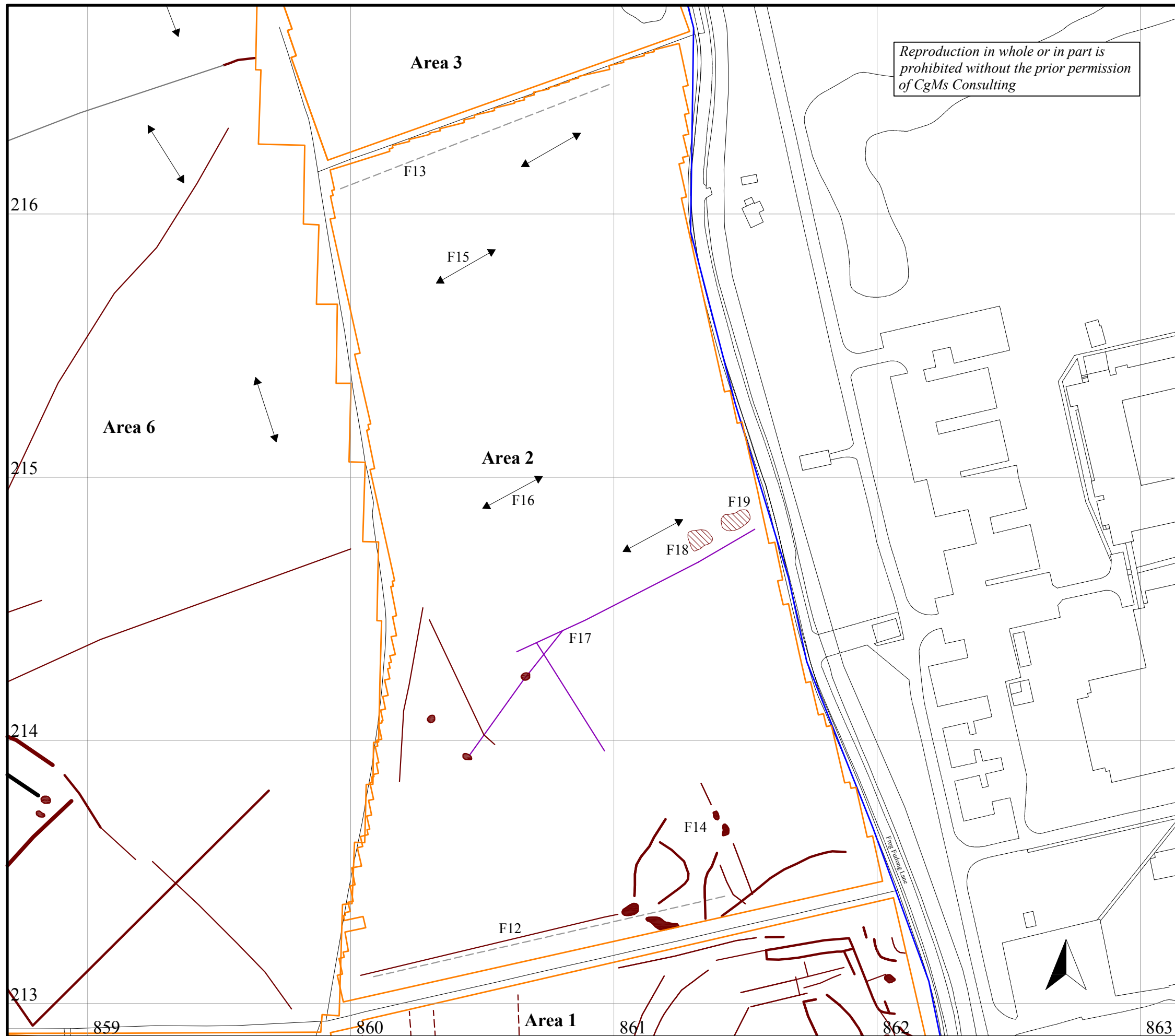
Figure 8

Archaeological interpretation
of Area 2

on behalf of
CgMs Consulting

0 50m
scale 1:1500 - for A3 plot

- outline of study area
- outline of survey area
- soil-filled features
- orientation of ridge and furrow
- limit of ploughing
- field drain



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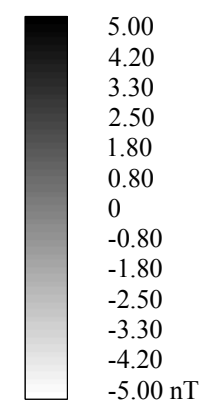
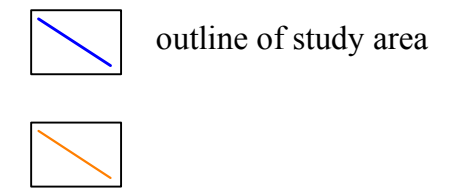
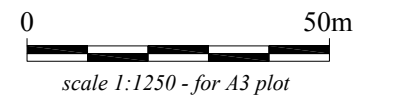
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Figure 9

Geomagnetic survey of Area 3

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




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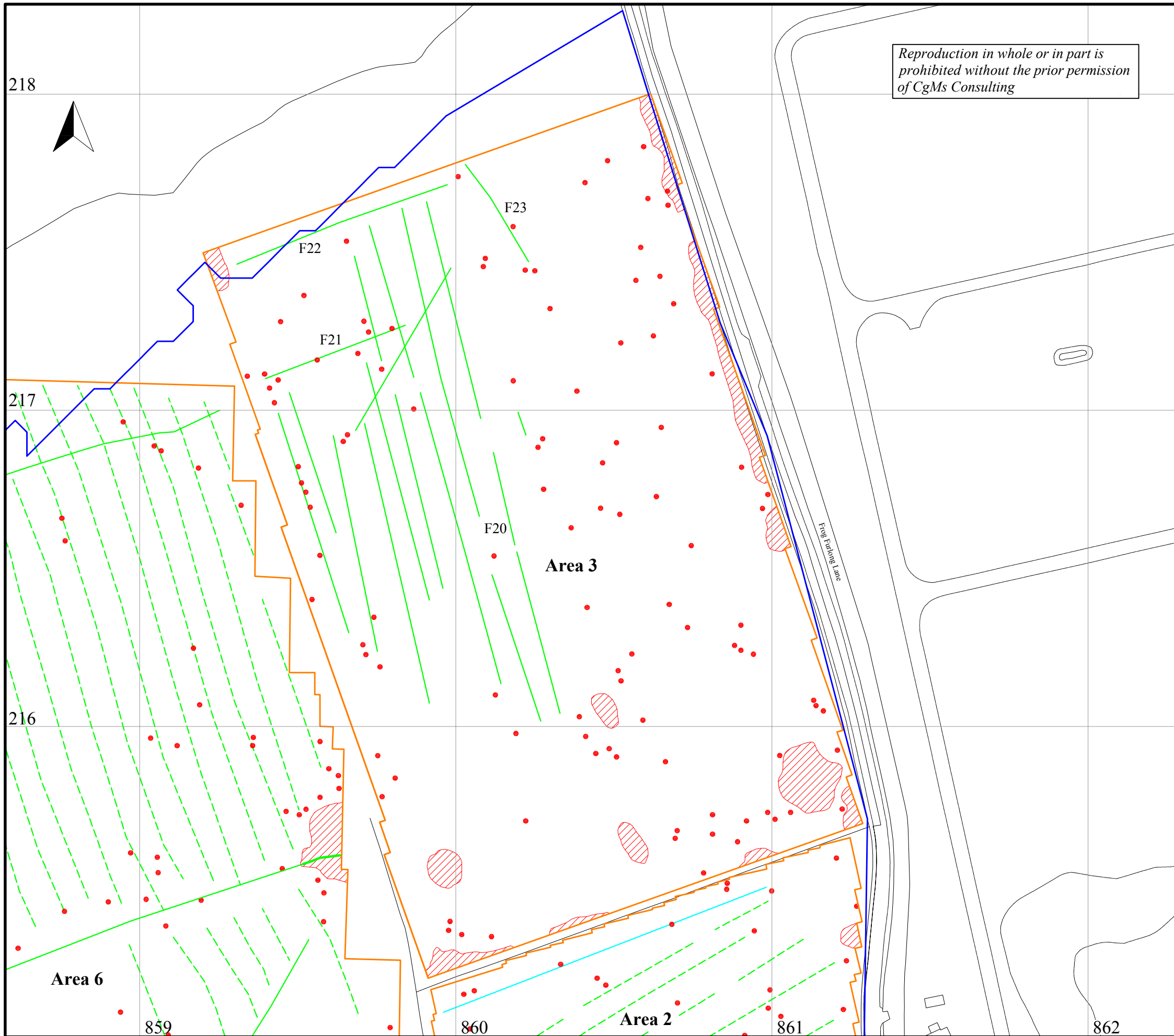
Figure 10

Geophysical interpretation of Area 3

on behalf of
CgMs Consulting

0 50m
scale 1:1250 - for A3 plot

-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies



218

217

216

Area 6

Area 3

Area 2

859

860

861

862

Footpath Lane

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geophysical surveys

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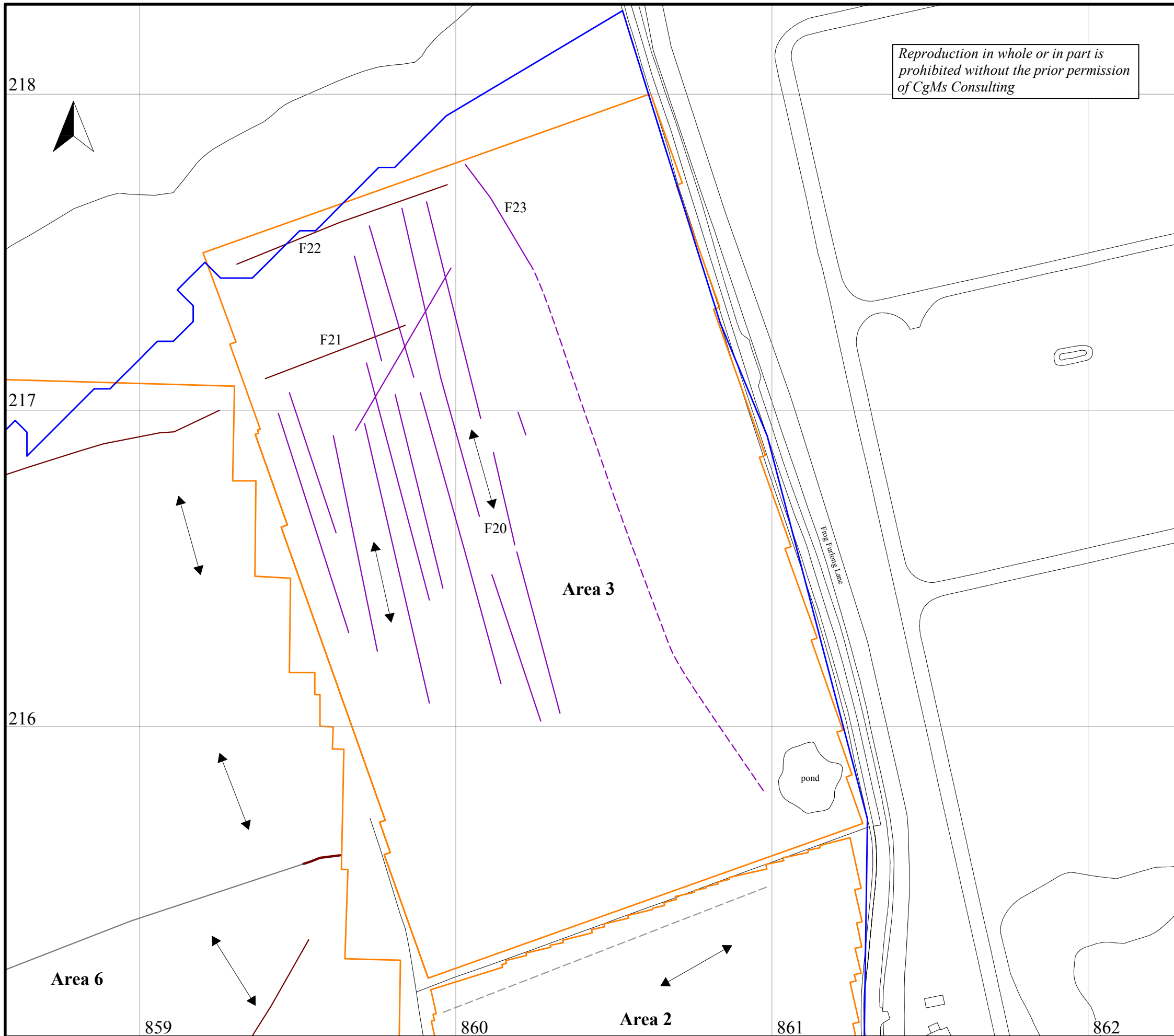
Figure 11

Archaeological interpretation
of Area 3

on behalf of
CgMs Consulting

0 50m
scale 1:1250 - for A3 plot

- outline of study area
- outline of survey area
- soil-filled features
- orientation of ridge and furrow
- limit of ploughing
- field drain



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Area 7

Area 6

Area 8

Area 5

Area 4

Innsworth Lane

857

858

859

213

212



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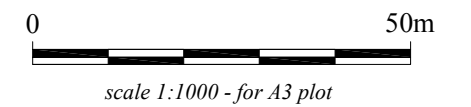
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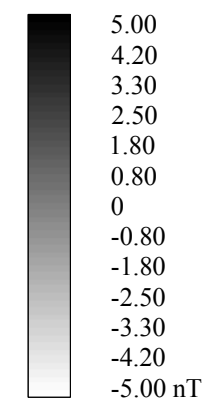
Figure 12

Geomagnetic surveys of Area 5 and
Area 8

on behalf of
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- outline of study area
- outline of survey area



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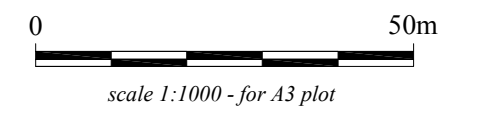
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

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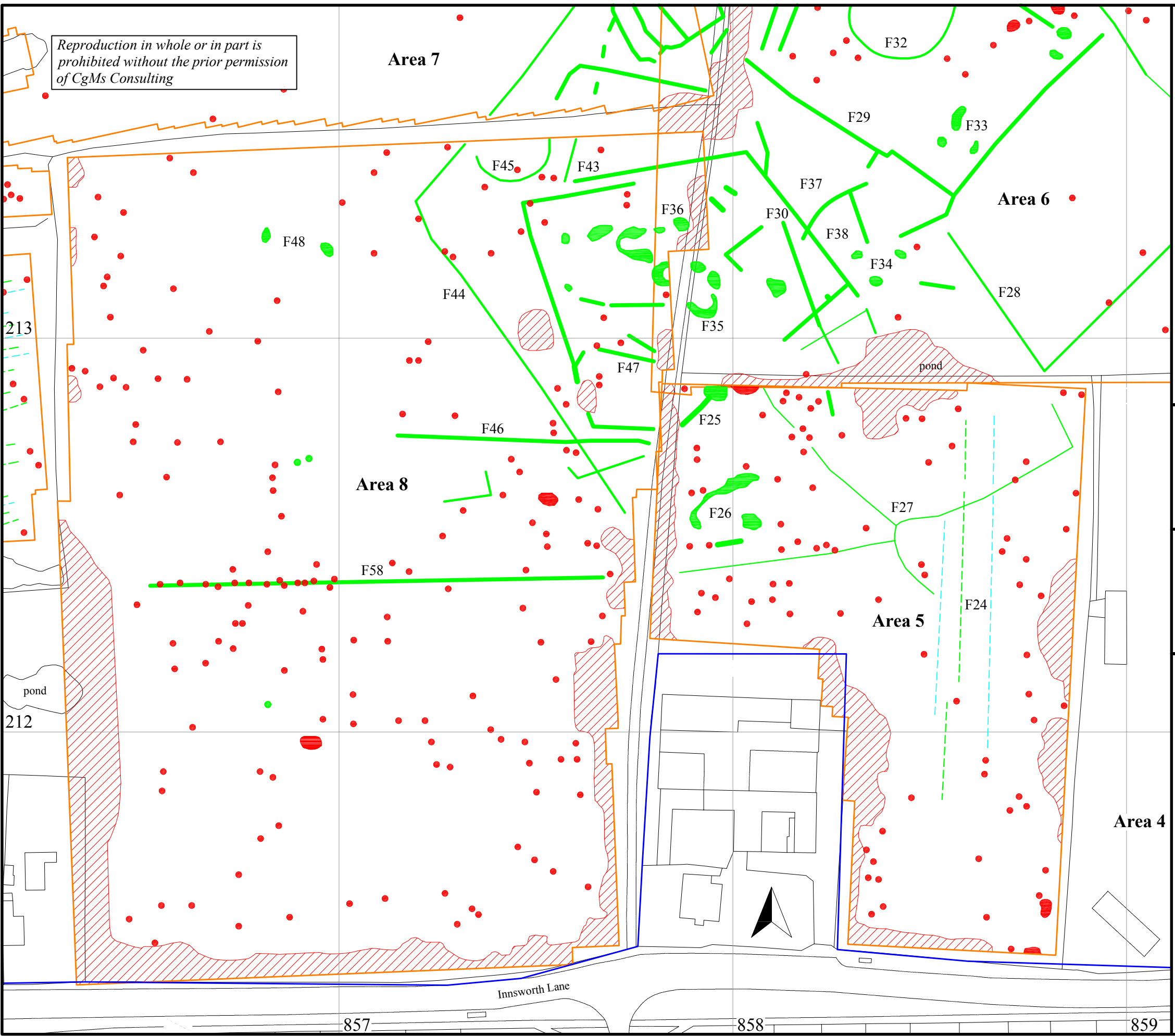
Figure 13

Geophysical interpretation of Area 5
and Area 8

on behalf of
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-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  dipolar magnetic anomalies



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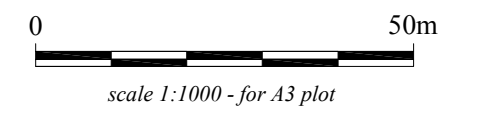
Land at Innsworth, Gloucestershire
geophysical surveys






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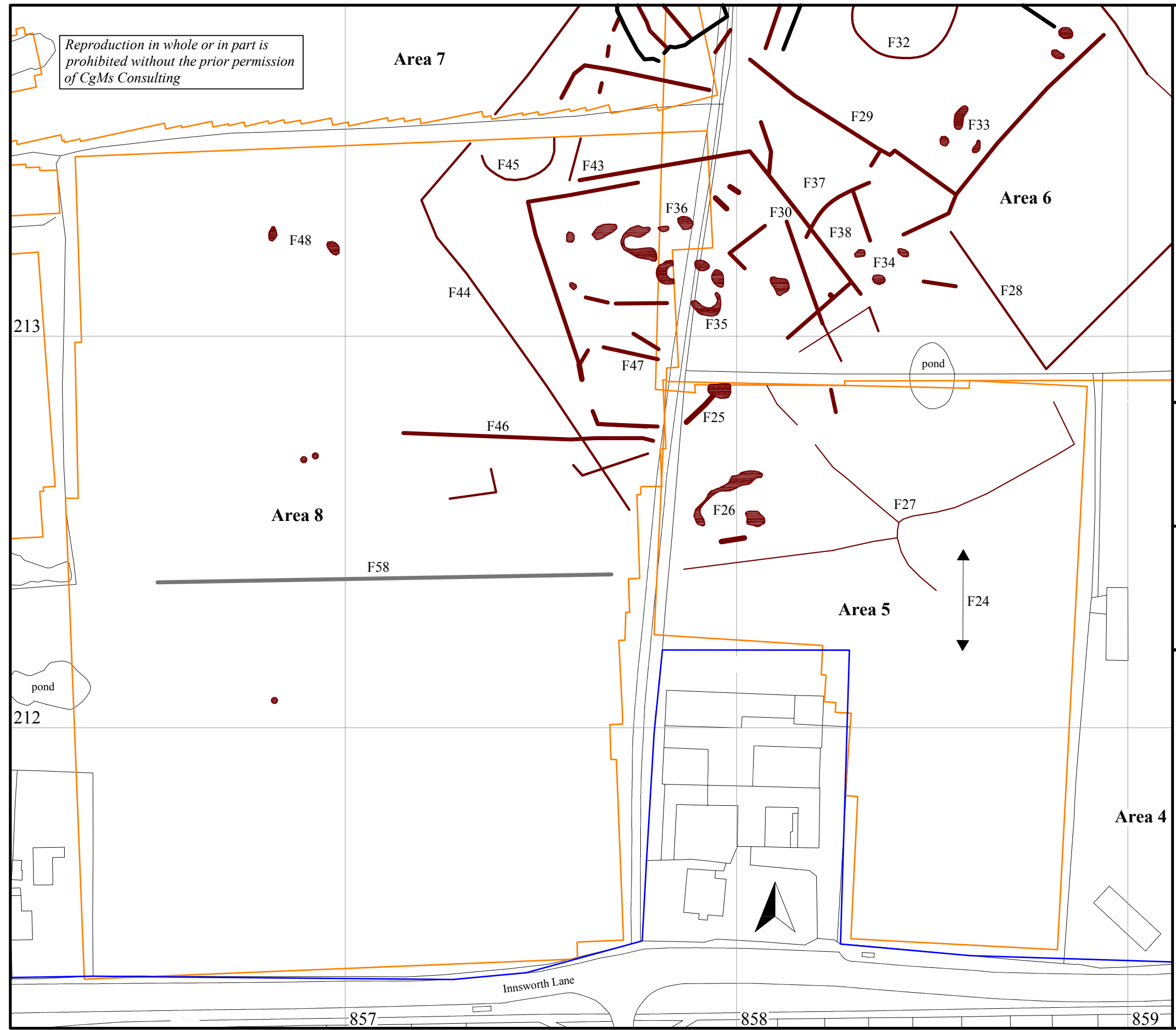
Figure 14

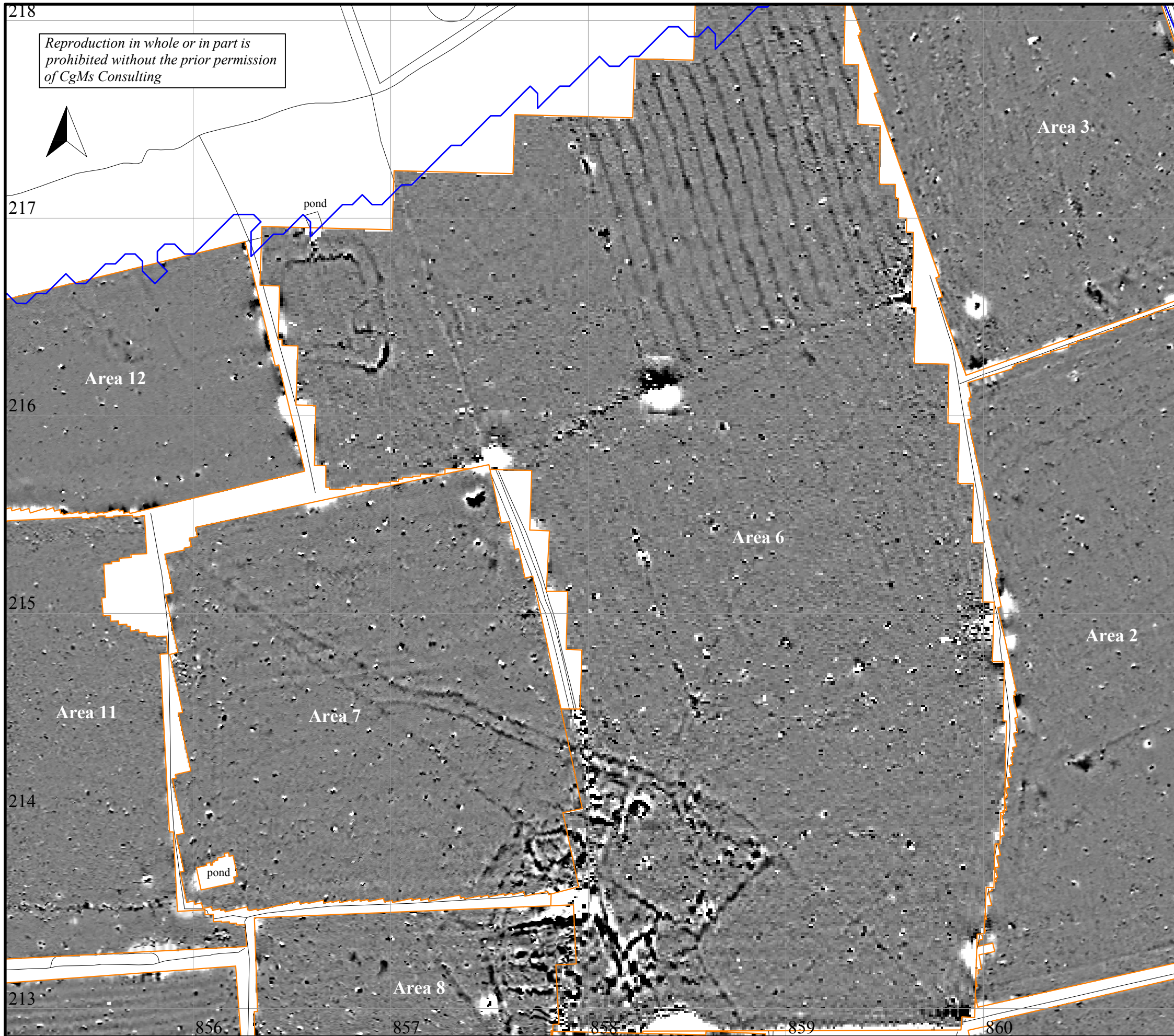
Archaeological interpretation
of Area 5 and Area 8

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow
-  former field boundary





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Figure 15

*Geomagnetic surveys of Area 6 and
Area 7*

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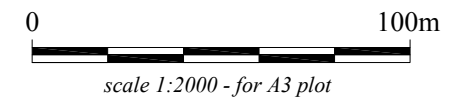
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geophysical surveys





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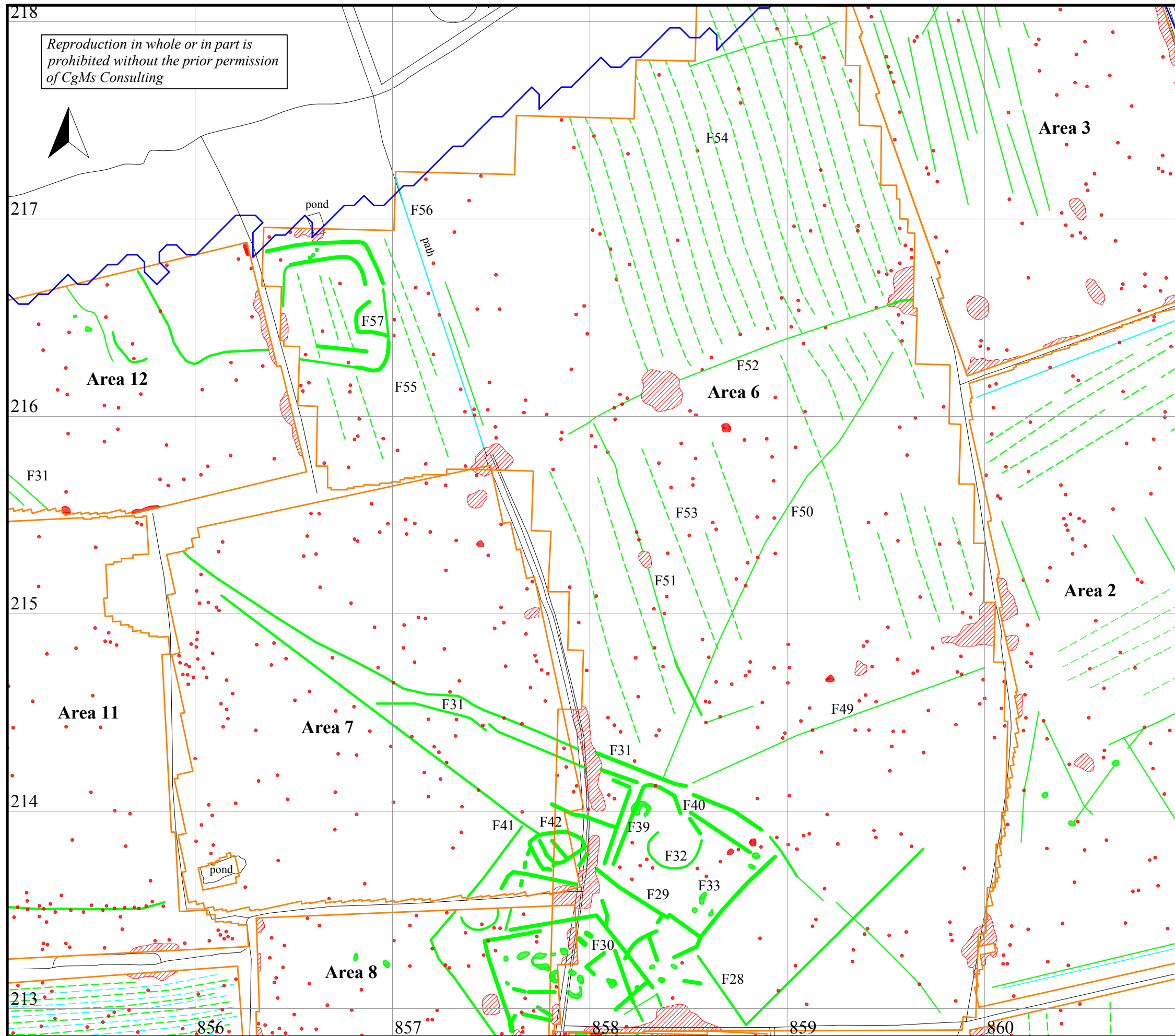
Figure 16

Geophysical interpretation of Area 6
and Area 7

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  dipolar magnetic anomalies



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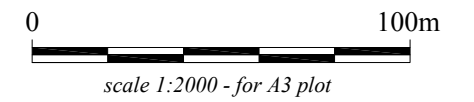
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





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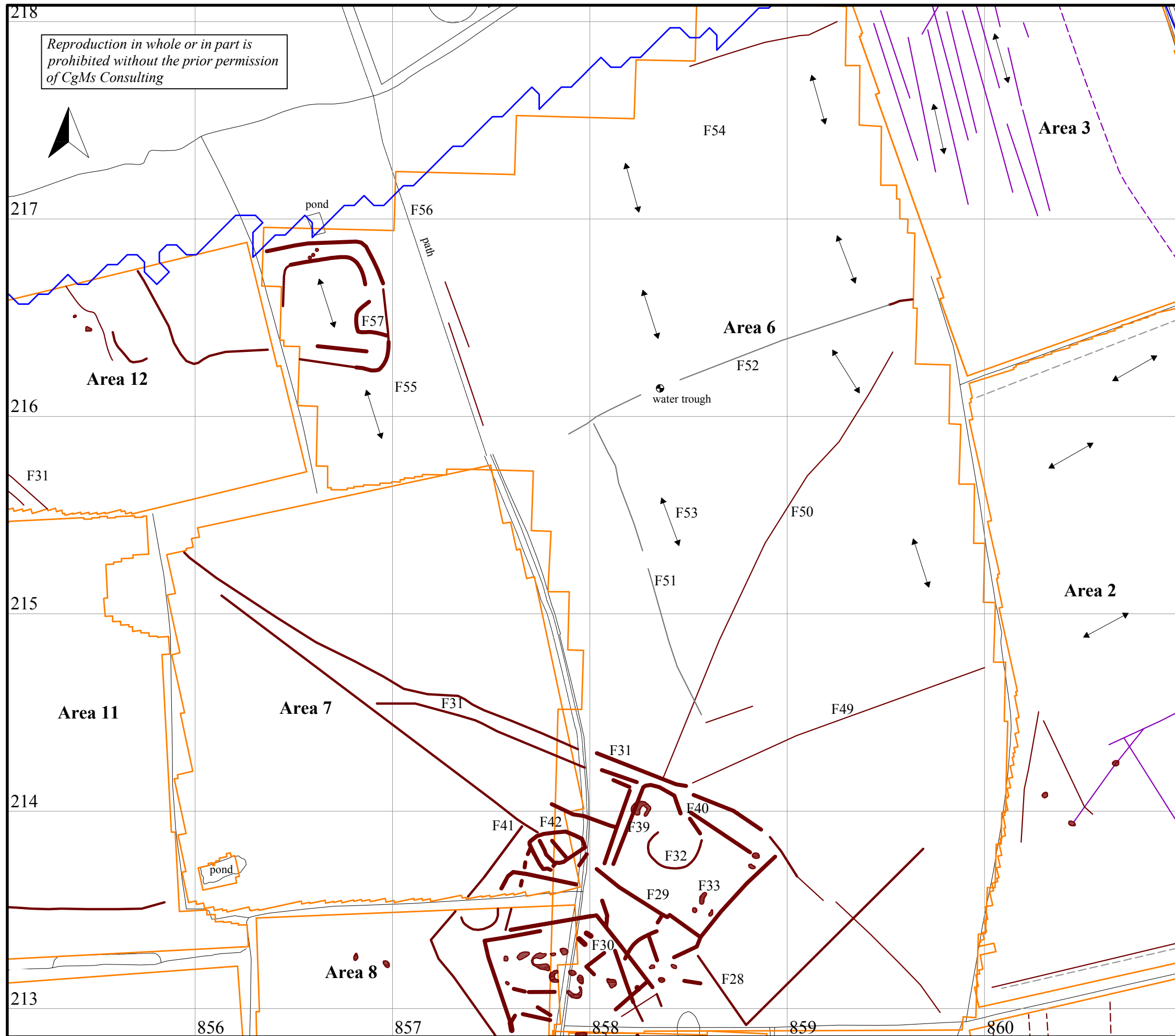
Figure 17

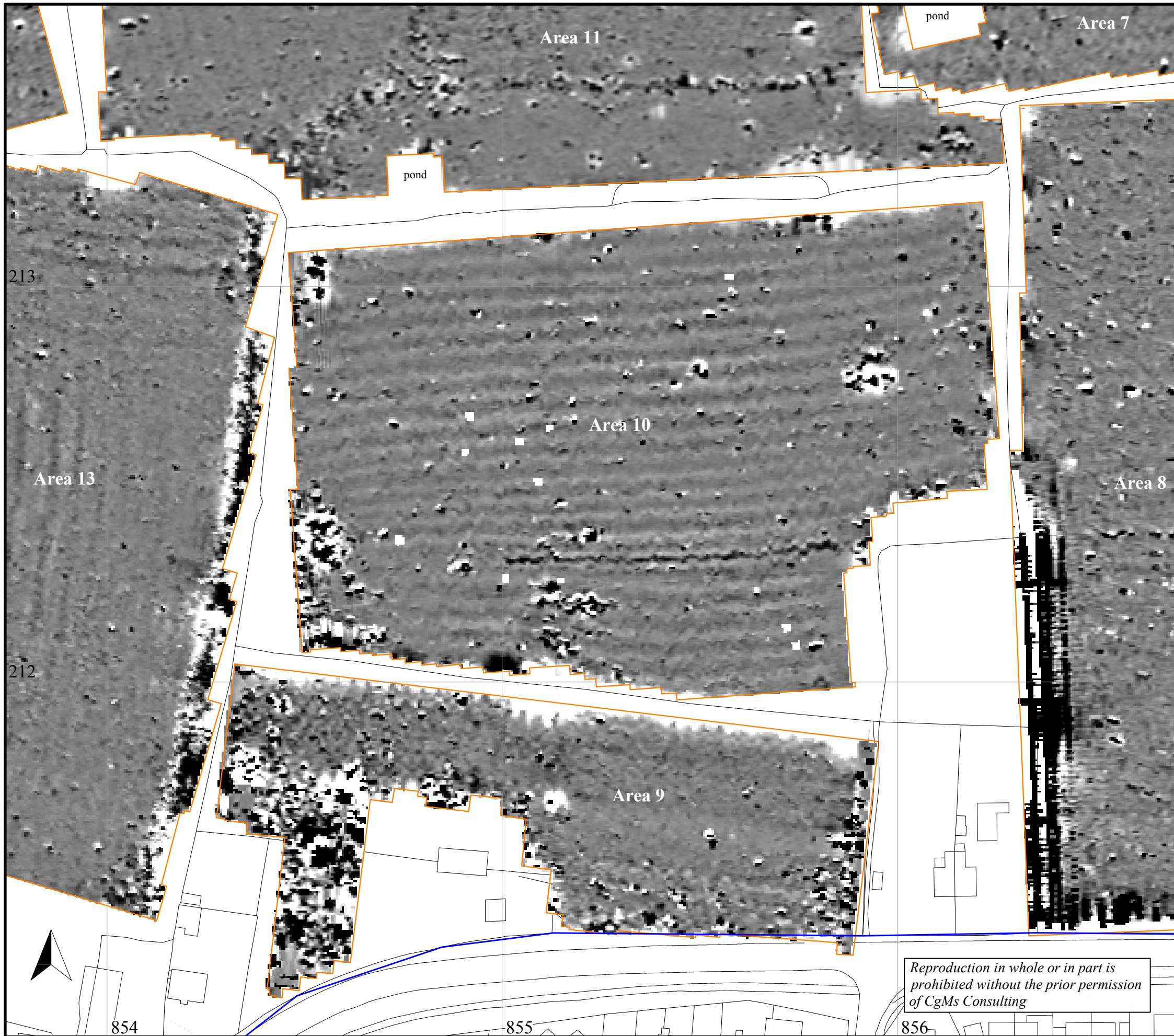
Archaeological interpretation
of Area 6 and Area 7

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow
-  former field boundary
-  field drain





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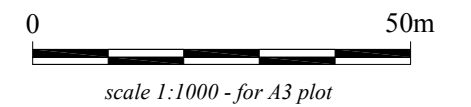
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

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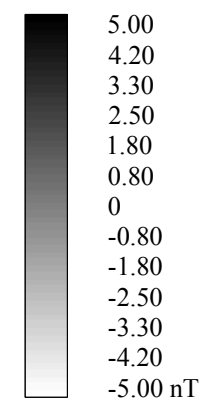
Figure 18

*Geomagnetic surveys of Area 9 and
Area 10*

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area



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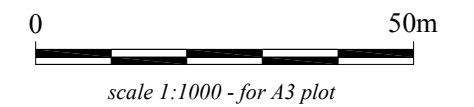
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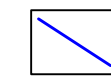
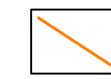
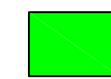
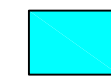

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Figure 19

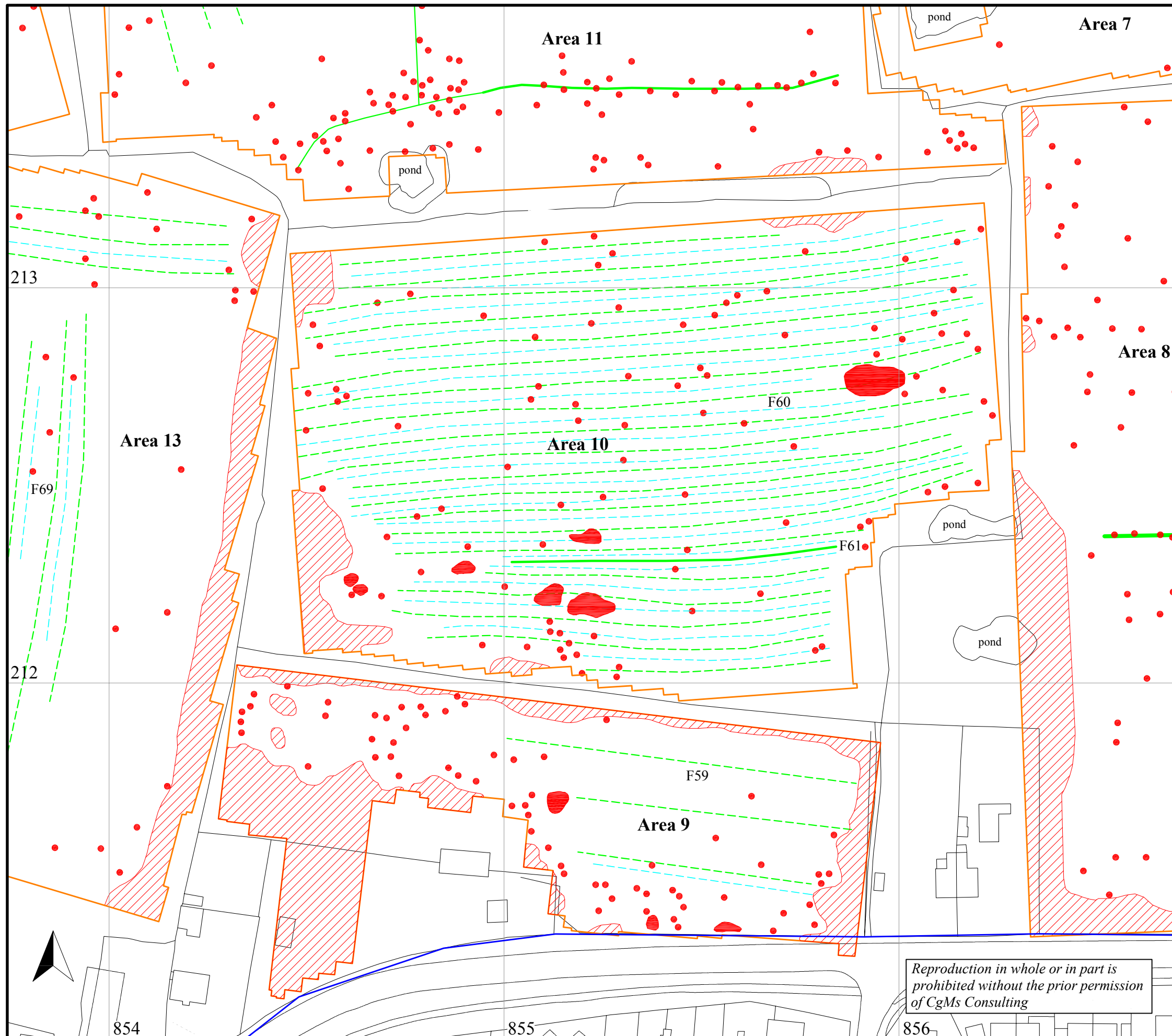
*Geophysical interpretation of Area 9
and Area 10*

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies

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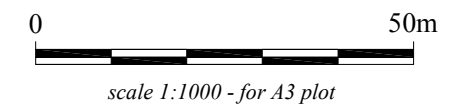
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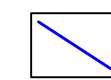



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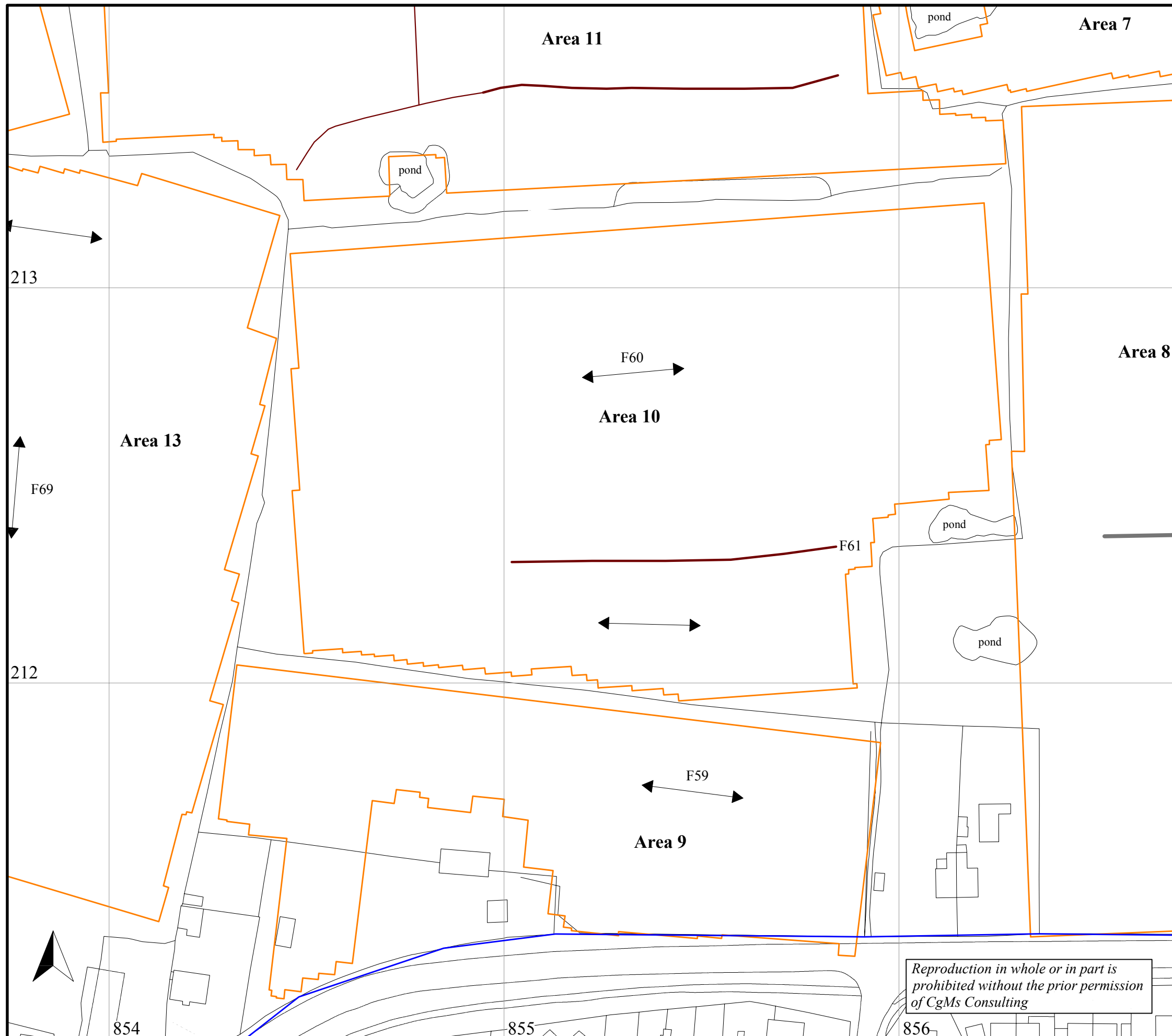
Figure 20

*Archaeological interpretation
of Area 9 and Area 10*

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CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow



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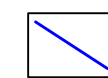

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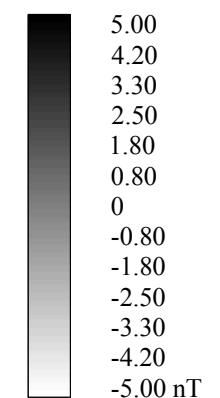
Figure 21

*Geomagnetic surveys of Area 11 and
Area 12*

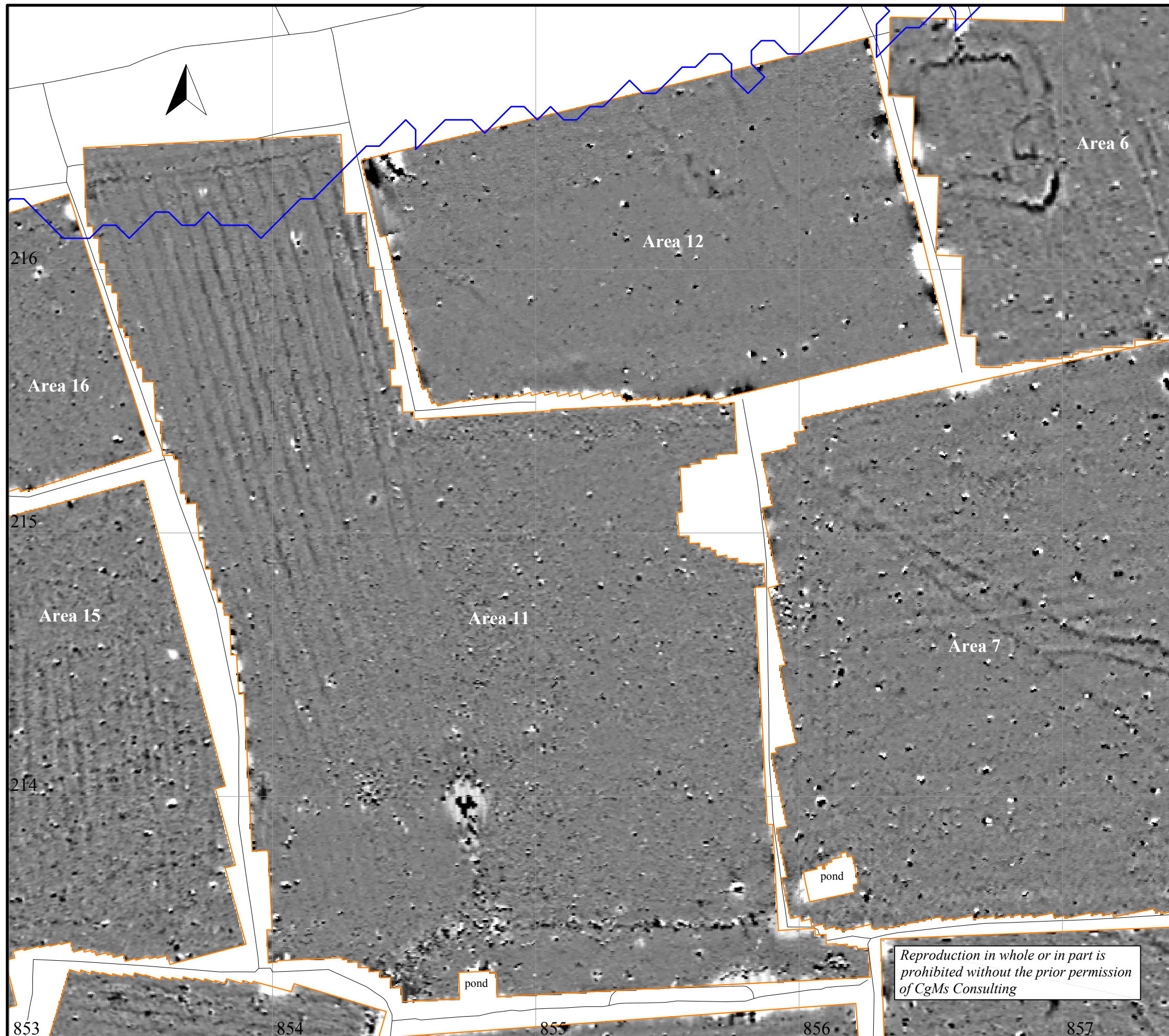
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0 50m

scale 1:1500 - for A3 plot

-  outline of study area
-  outline of survey area



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 geophysical surveys**






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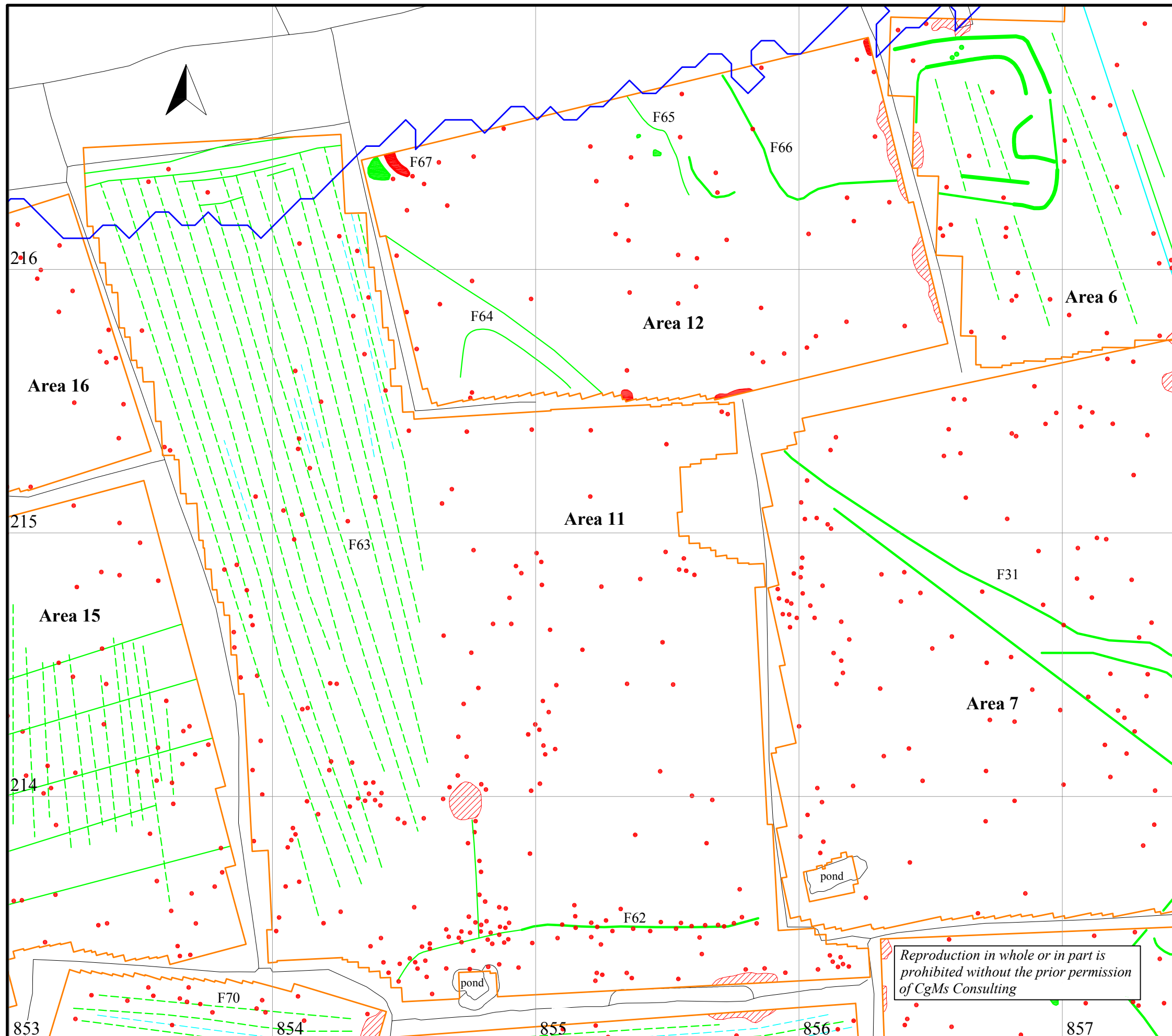
Figure 22

*Geophysical interpretation of Area 11
 and Area 12*

on behalf of
CgMs Consulting

0 50m

 scale 1:1500 - for A3 plot

-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies



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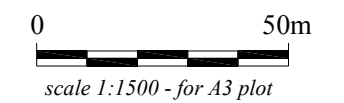
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 geophysical surveys**

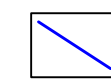




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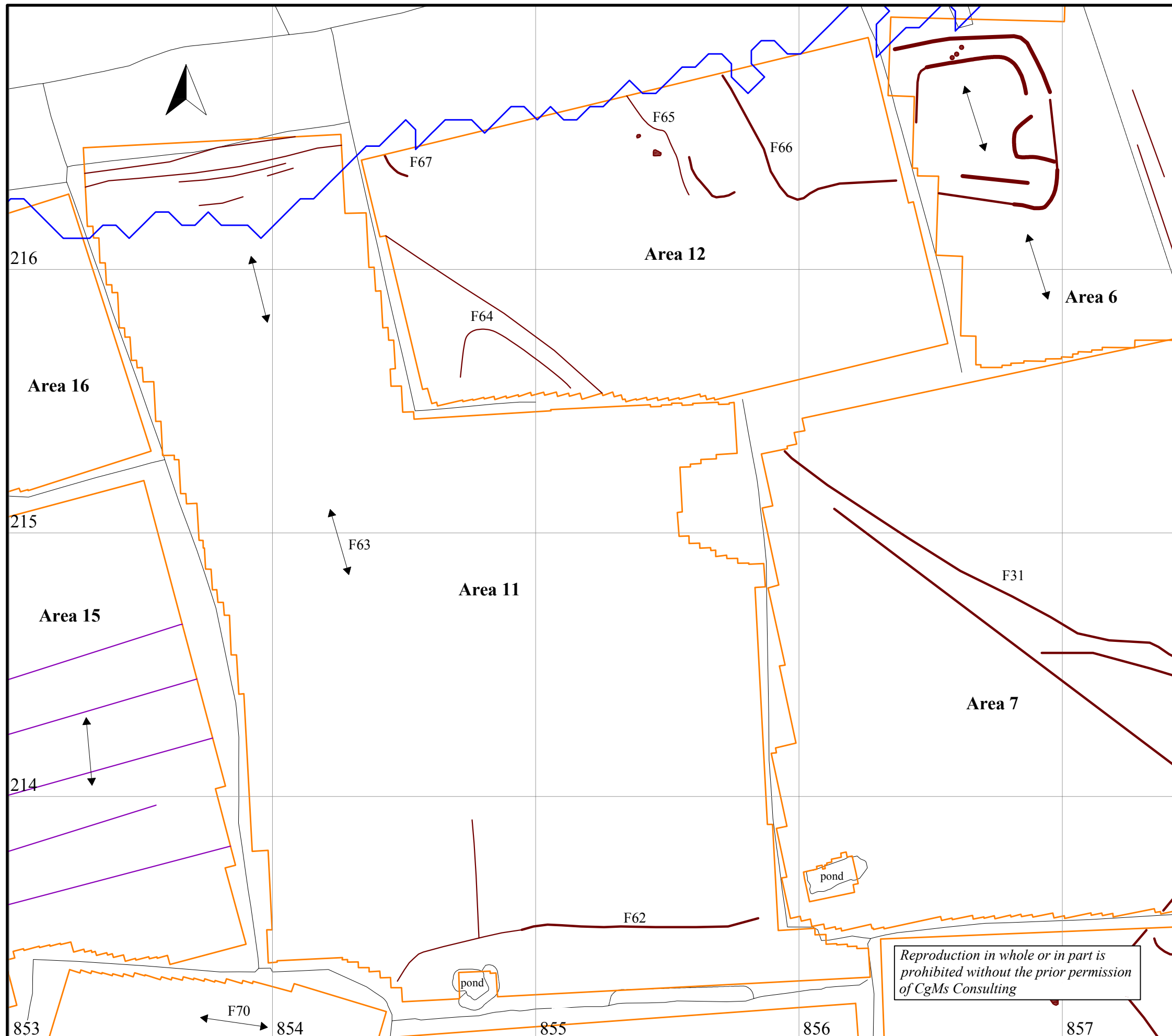
Figure 23

*Archaeological interpretation
 of Area 11 and Area 12*

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow
-  field drain



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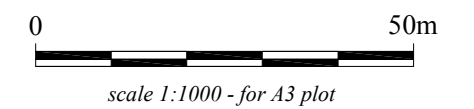
**Land at Innsworth, Gloucestershire
geophysical surveys**

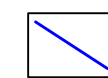

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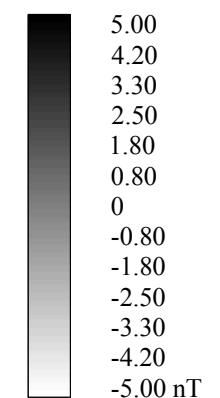
Figure 24

*Geomagnetic surveys of Area 13 and
Area 14*

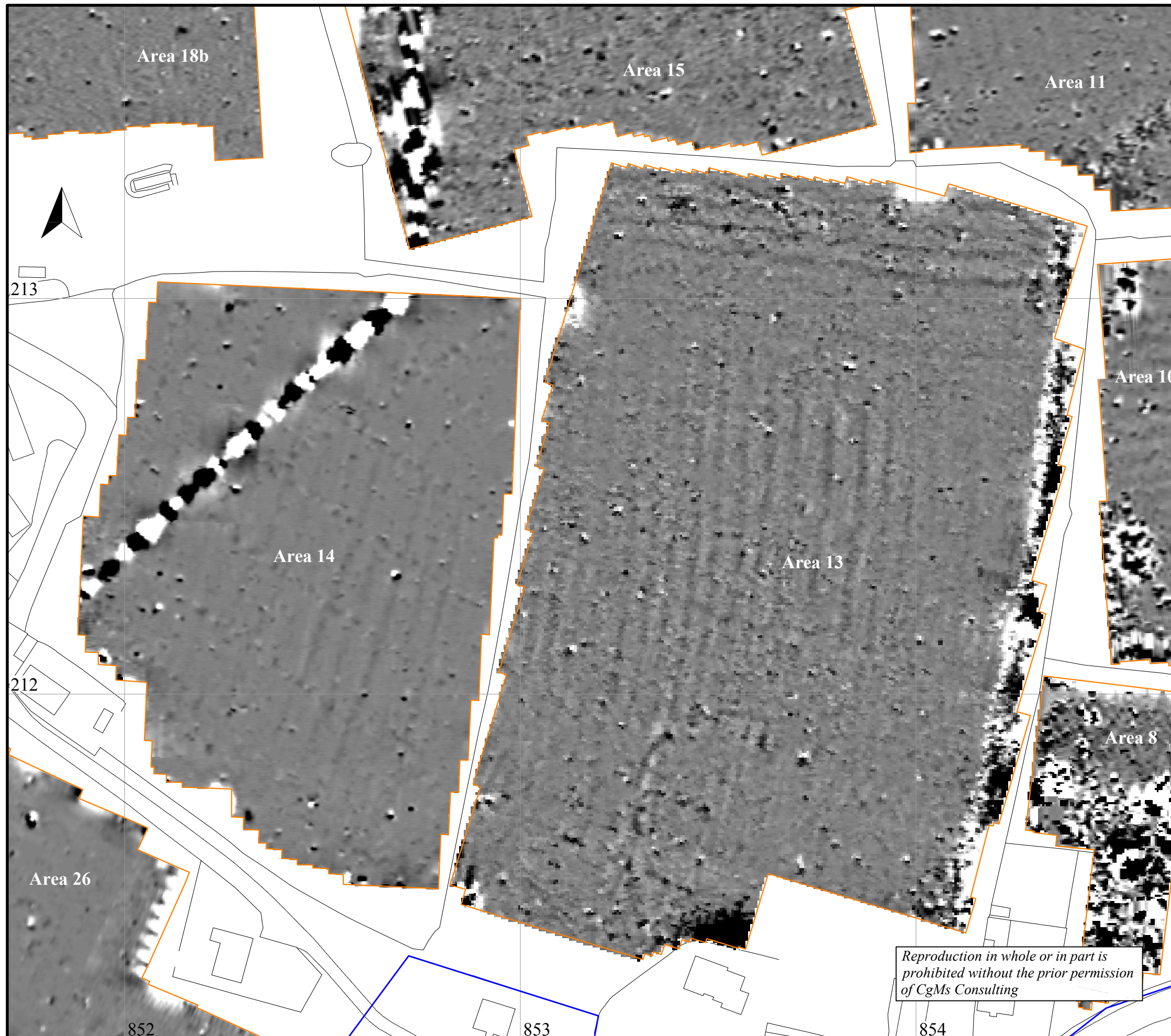
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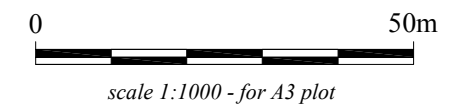
-  outline of study area
-  outline of survey area








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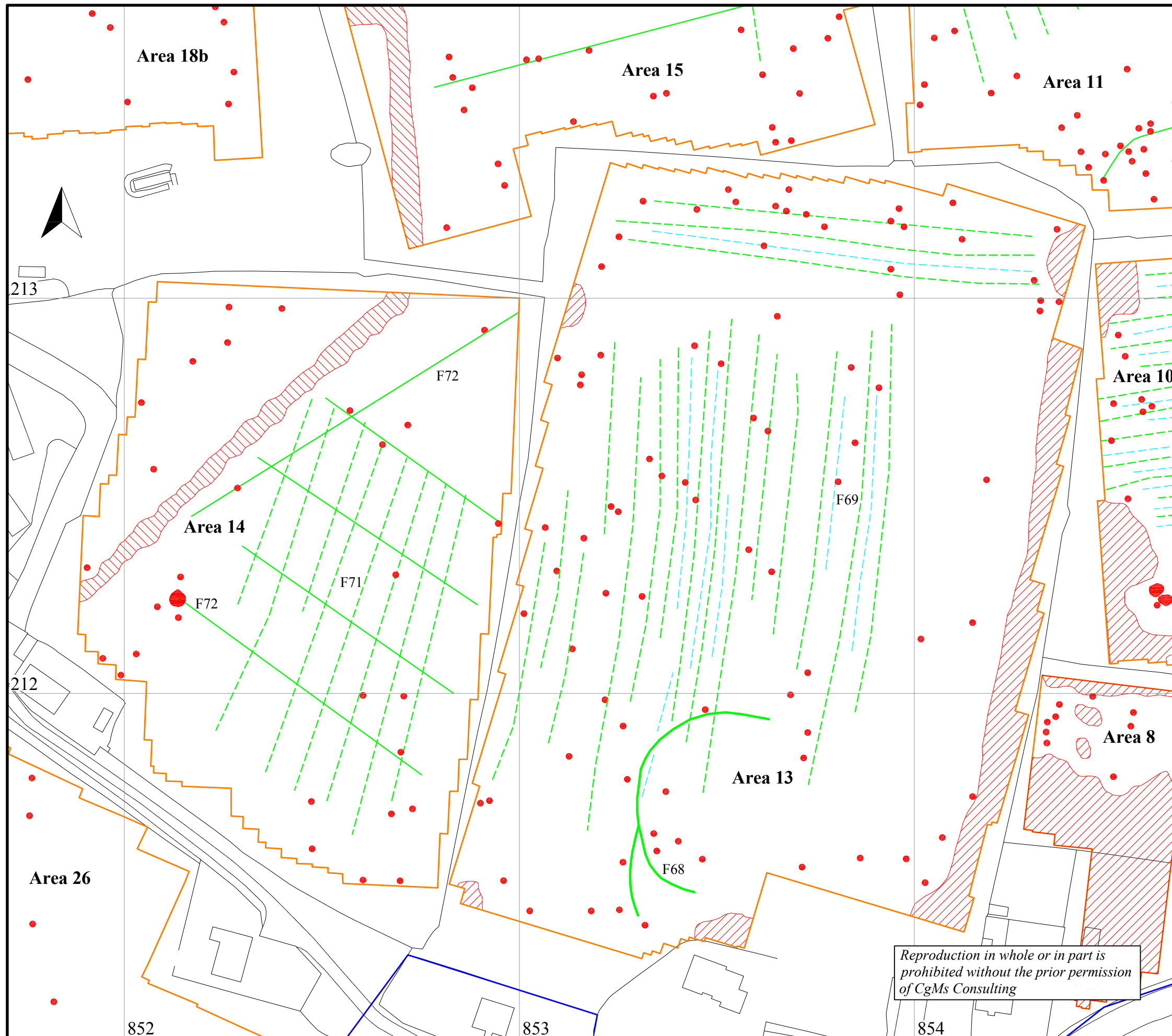


on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies

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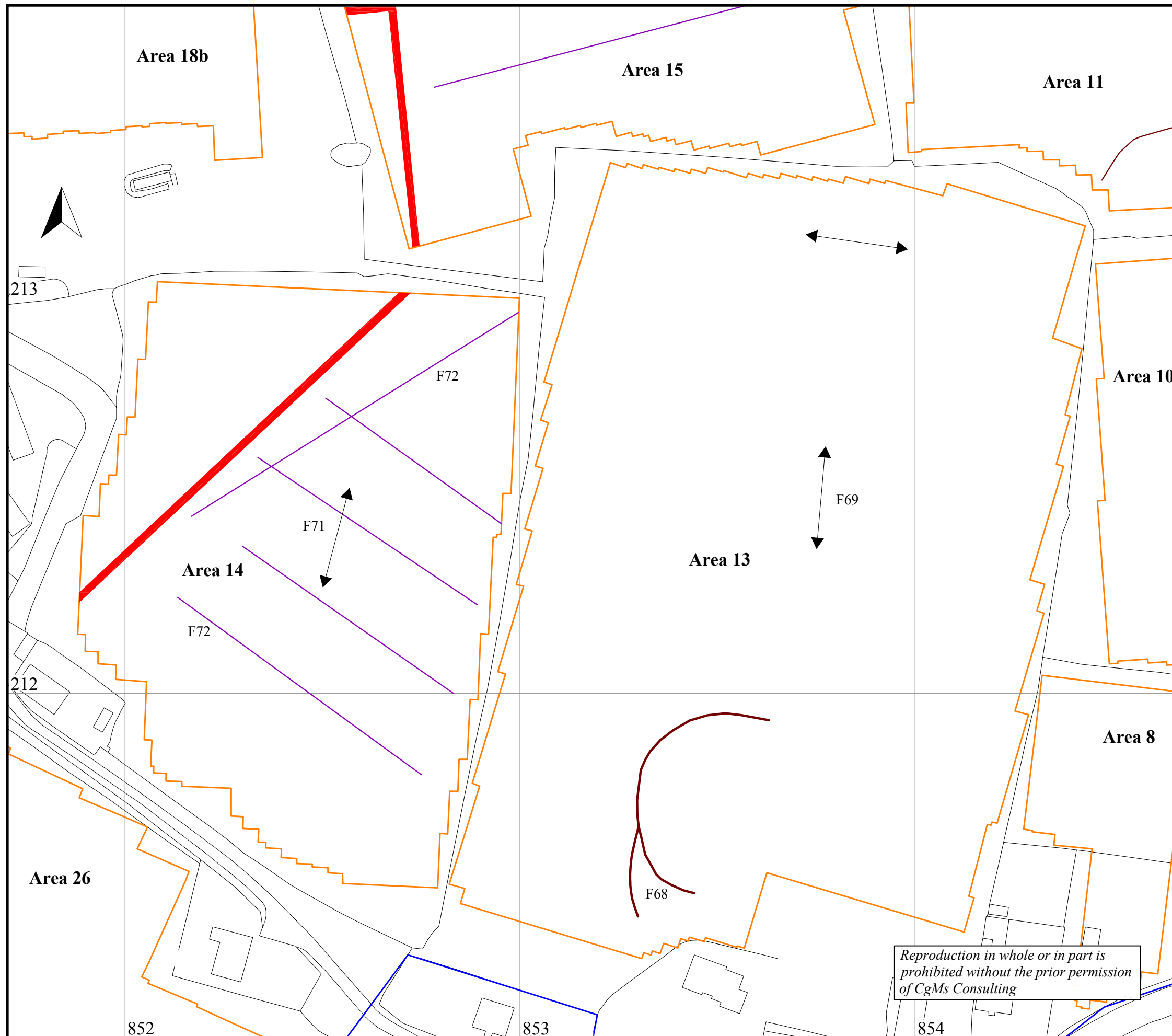
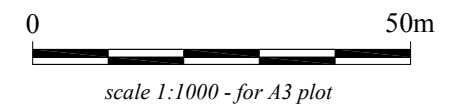
**Land at Innsworth, Gloucestershire
 geophysical surveys**

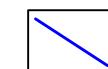





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Figure 26

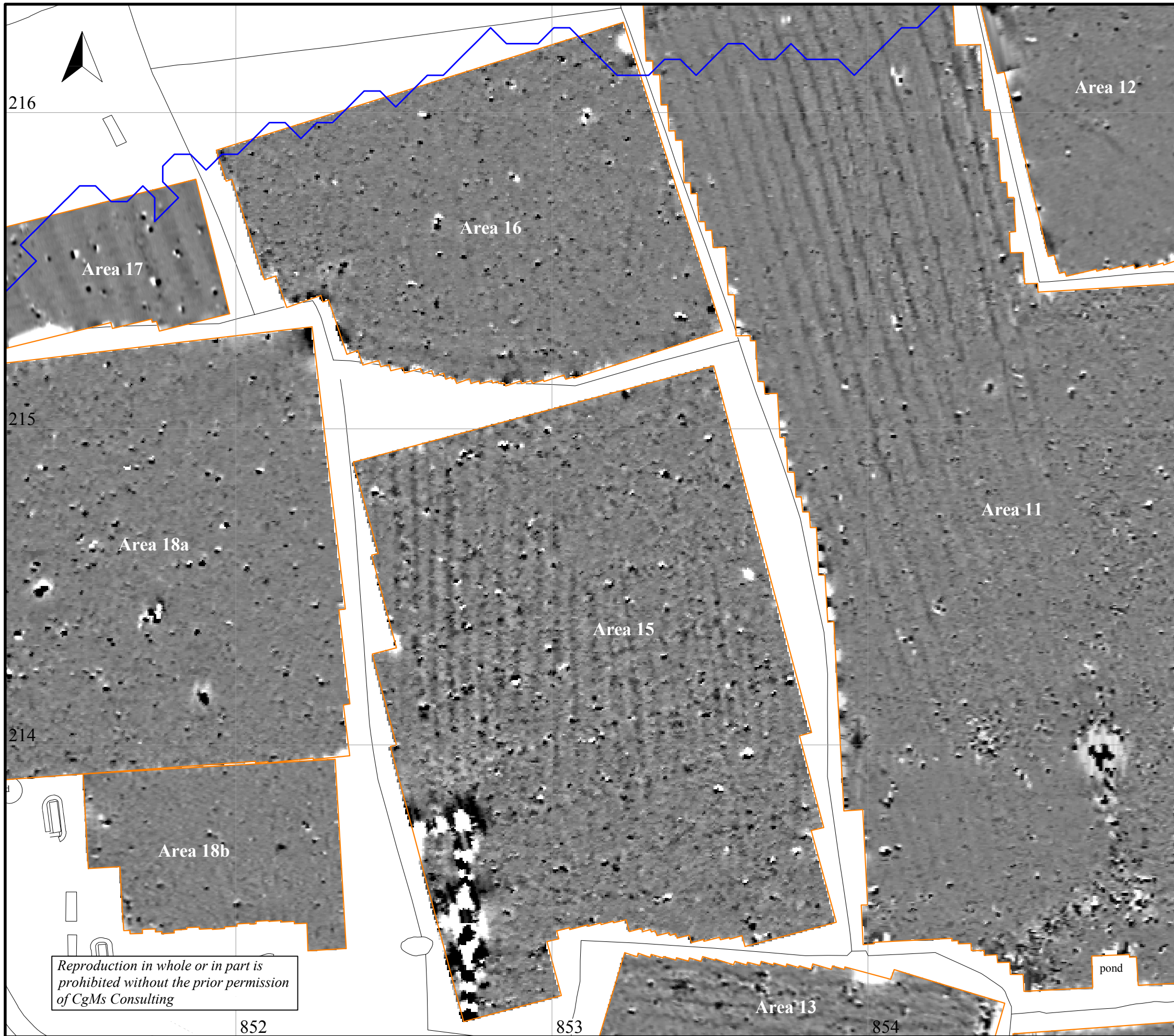
*Archaeological interpretation
 of Area 13 and Area 14*

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  service pipe
-  orientation of ridge and furrow
-  field drain

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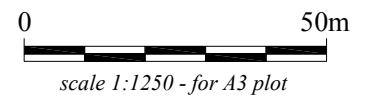
**Land at Innsworth, Gloucestershire
 geophysical surveys**



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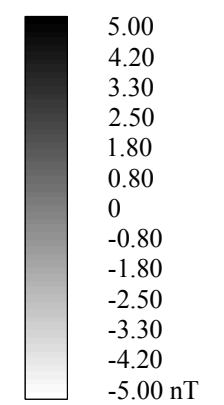
Figure 27

*Geomagnetic survey of Area 15 and
 Area 16*

on behalf of
CgMs Consulting



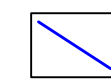

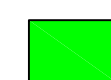
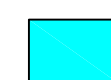

-  outline of study area
-  outline of survey area

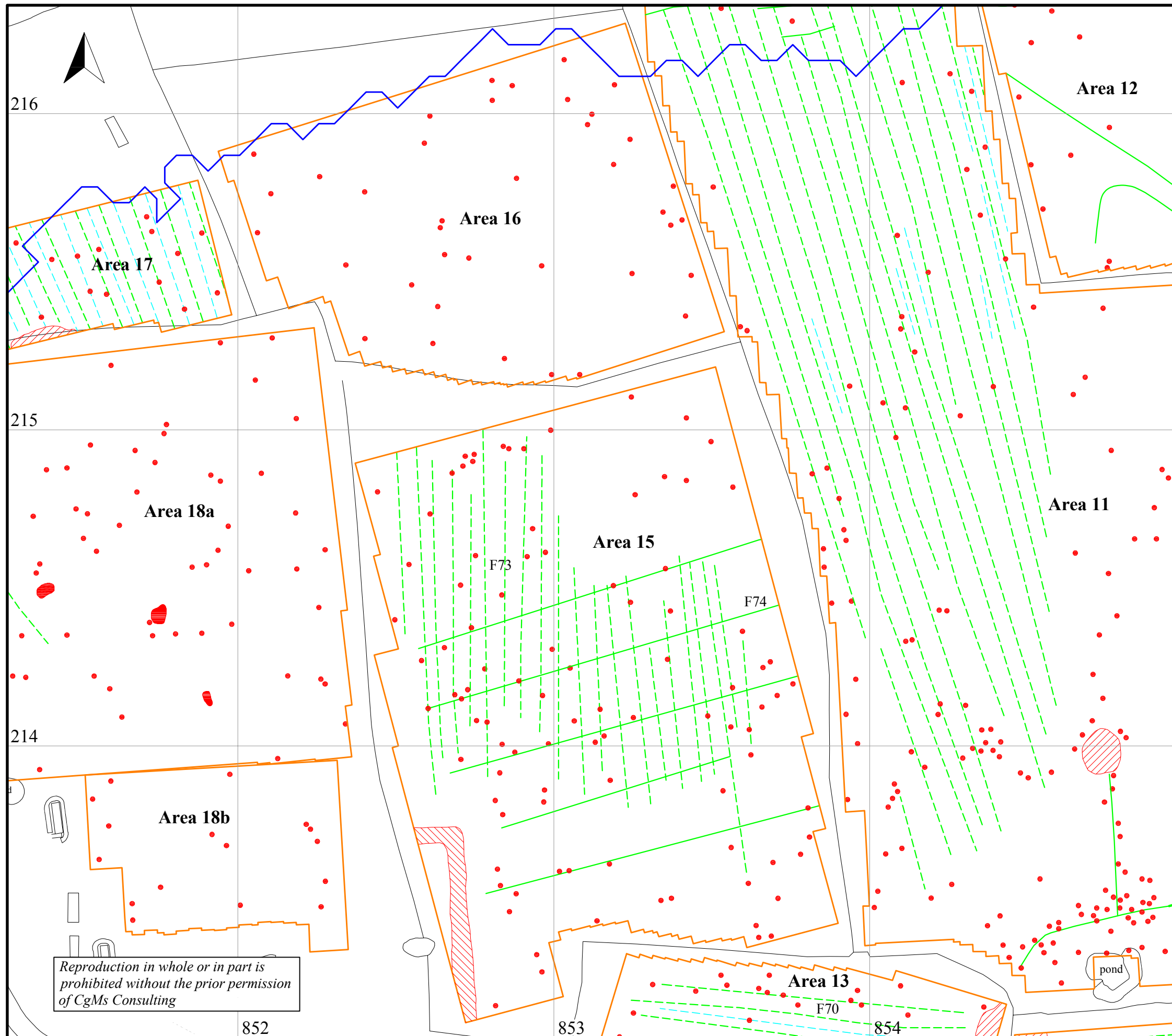


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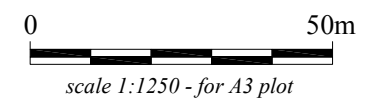
on behalf of
CgMs Consulting

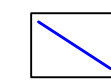
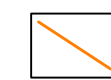


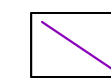

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scale 1:1250 - for A3 plot

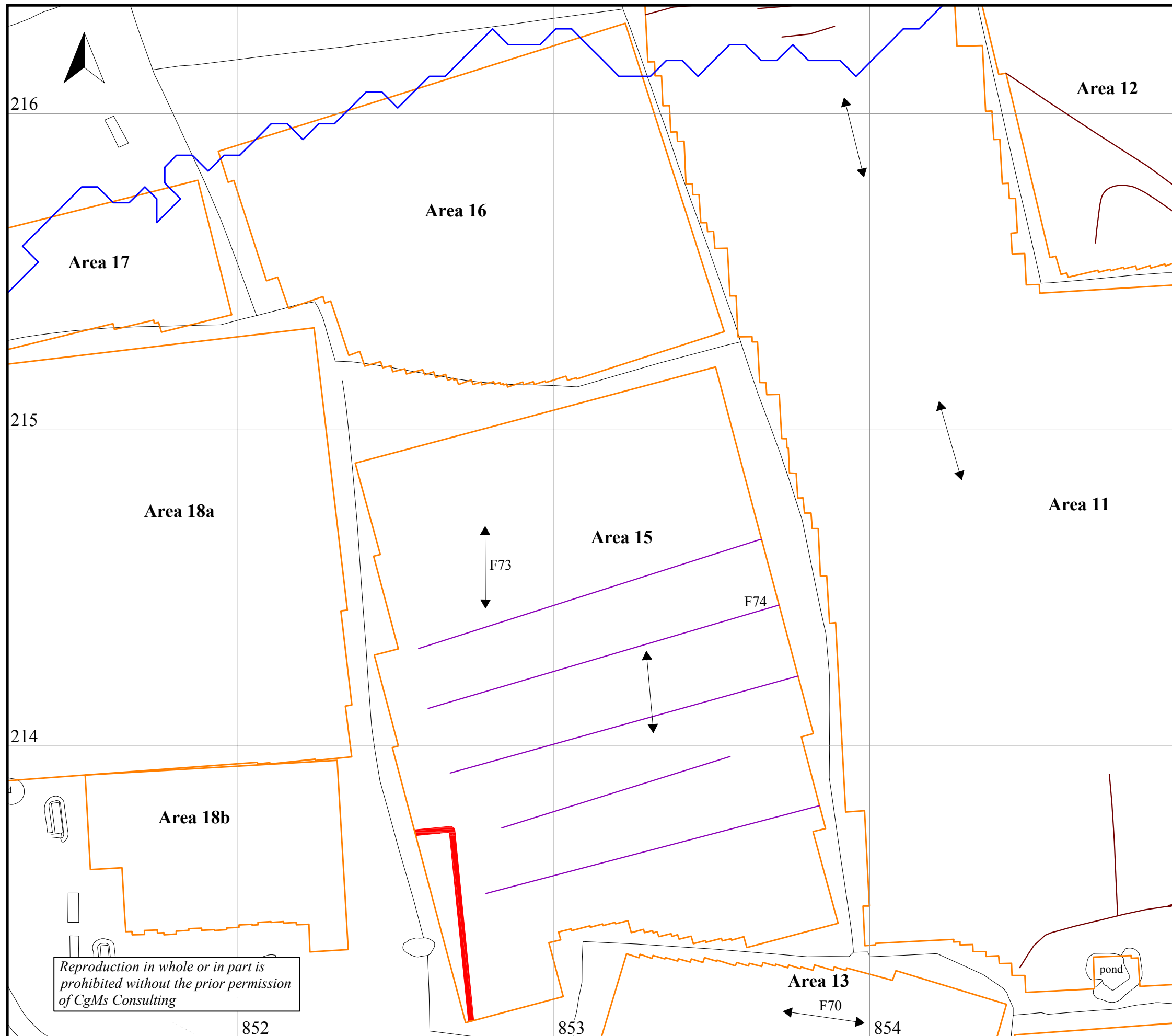
-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies



on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow
-  field drains
-  service pipe



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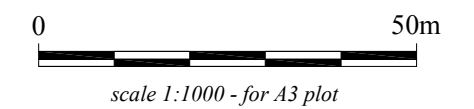
**Land at Innsworth, Gloucestershire
geophysical surveys**

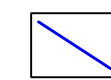

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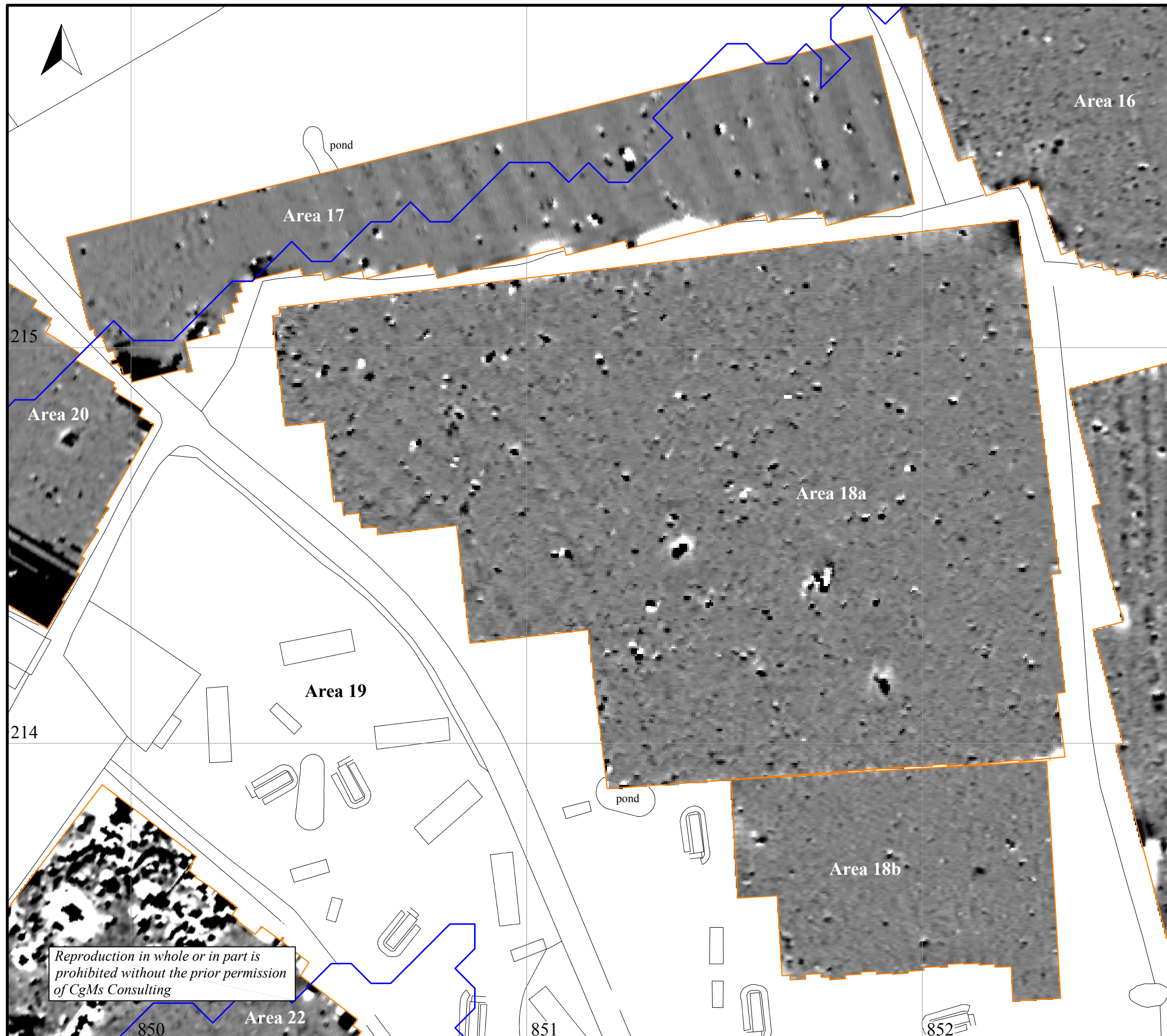
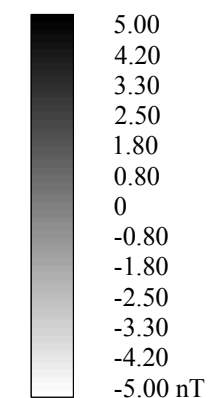
Figure 30

*Geomagnetic surveys of Area 17,
Area 18a and Area 18b*

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area



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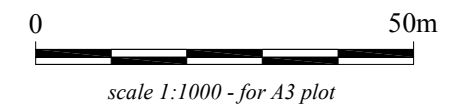
**Land at Innsworth, Gloucestershire
 geophysical surveys**

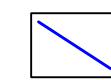




Report 1359

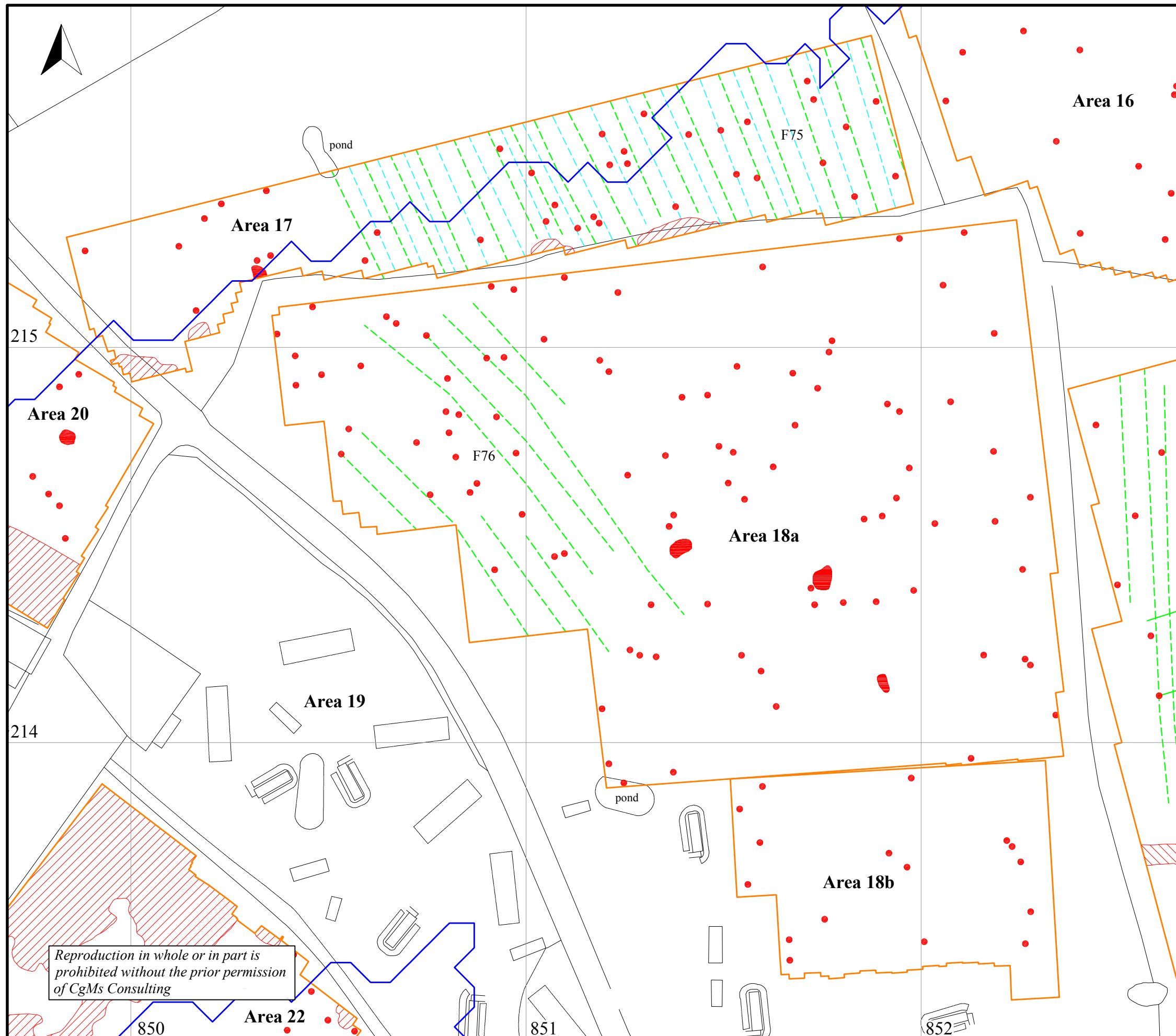
Figure 31

*Geophysical interpretation of Area 17,
 Area 18a and Area 18b*

on behalf of
CgMs Consulting

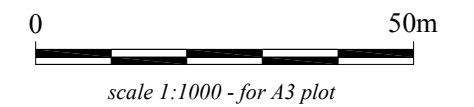


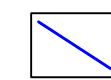




-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies

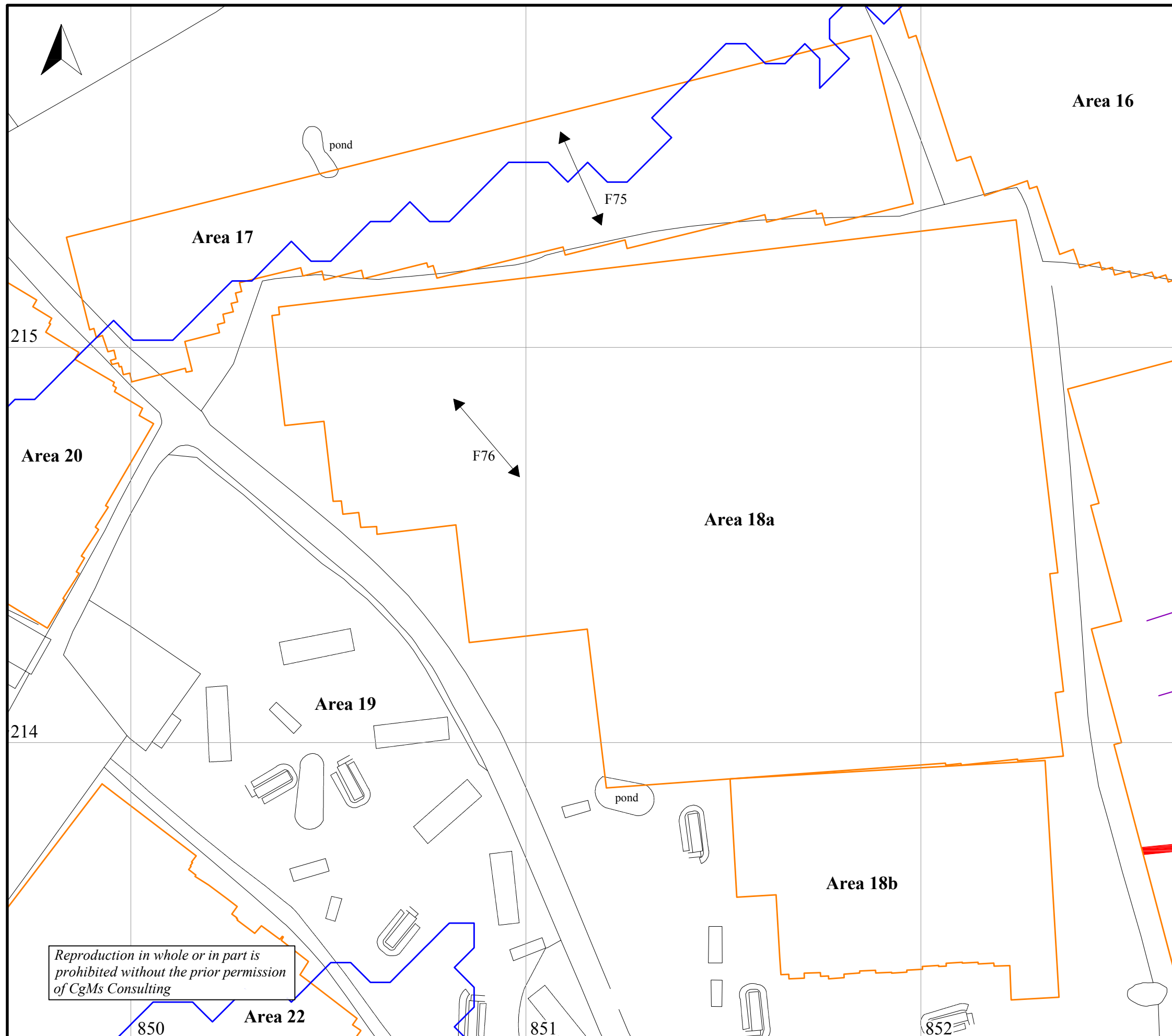


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-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow
-  field drains



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**Land at Innsworth, Gloucestershire
geophysical surveys**

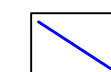

Report 1359

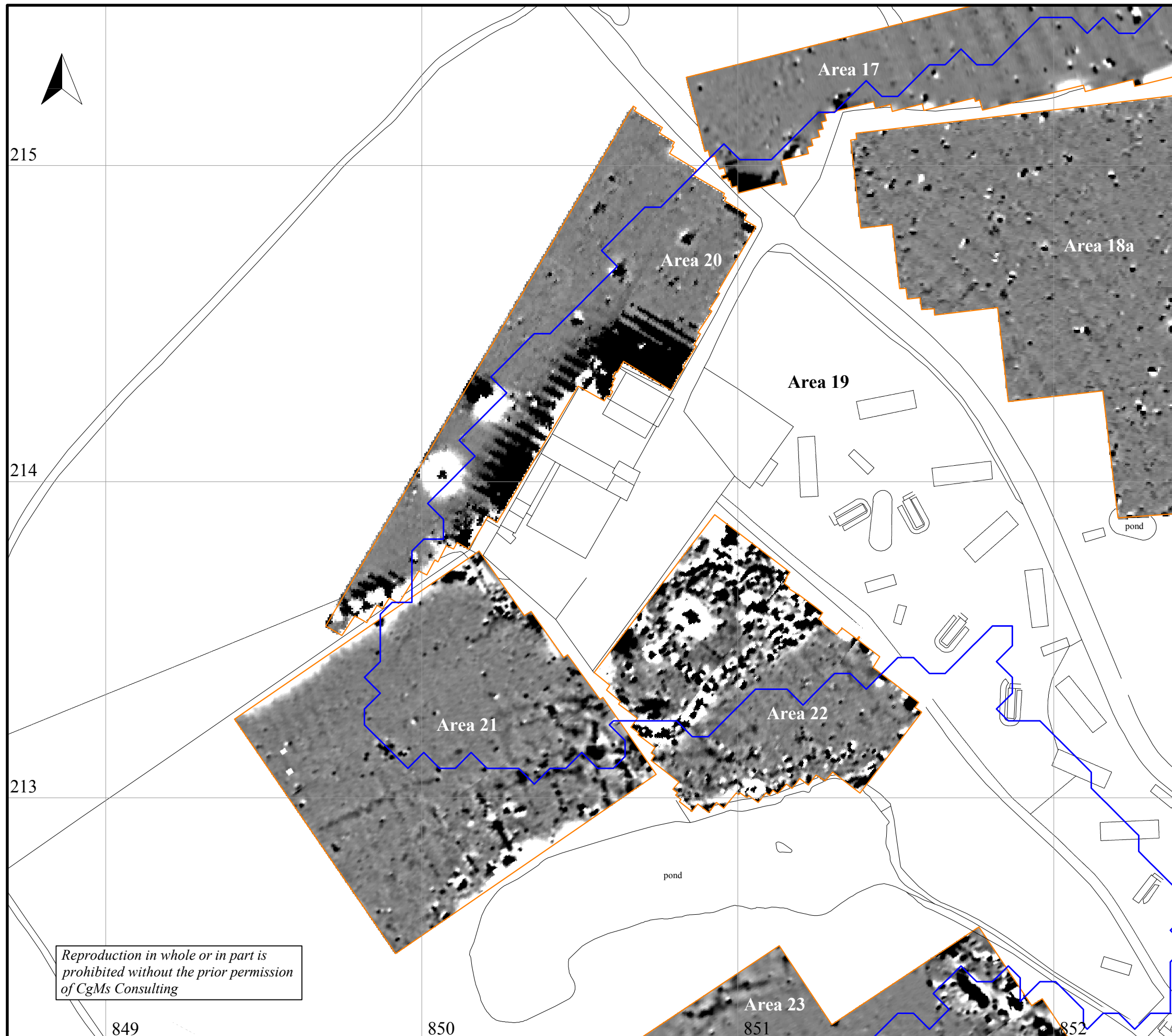
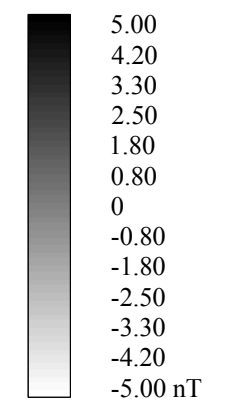
Figure 33

*Geomagnetic surveys of Area 20,
Area 21 and Area 22*

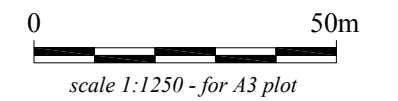
on behalf of
CgMs Consulting

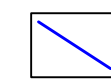




0 50m
scale 1:1250 - for A3 plot

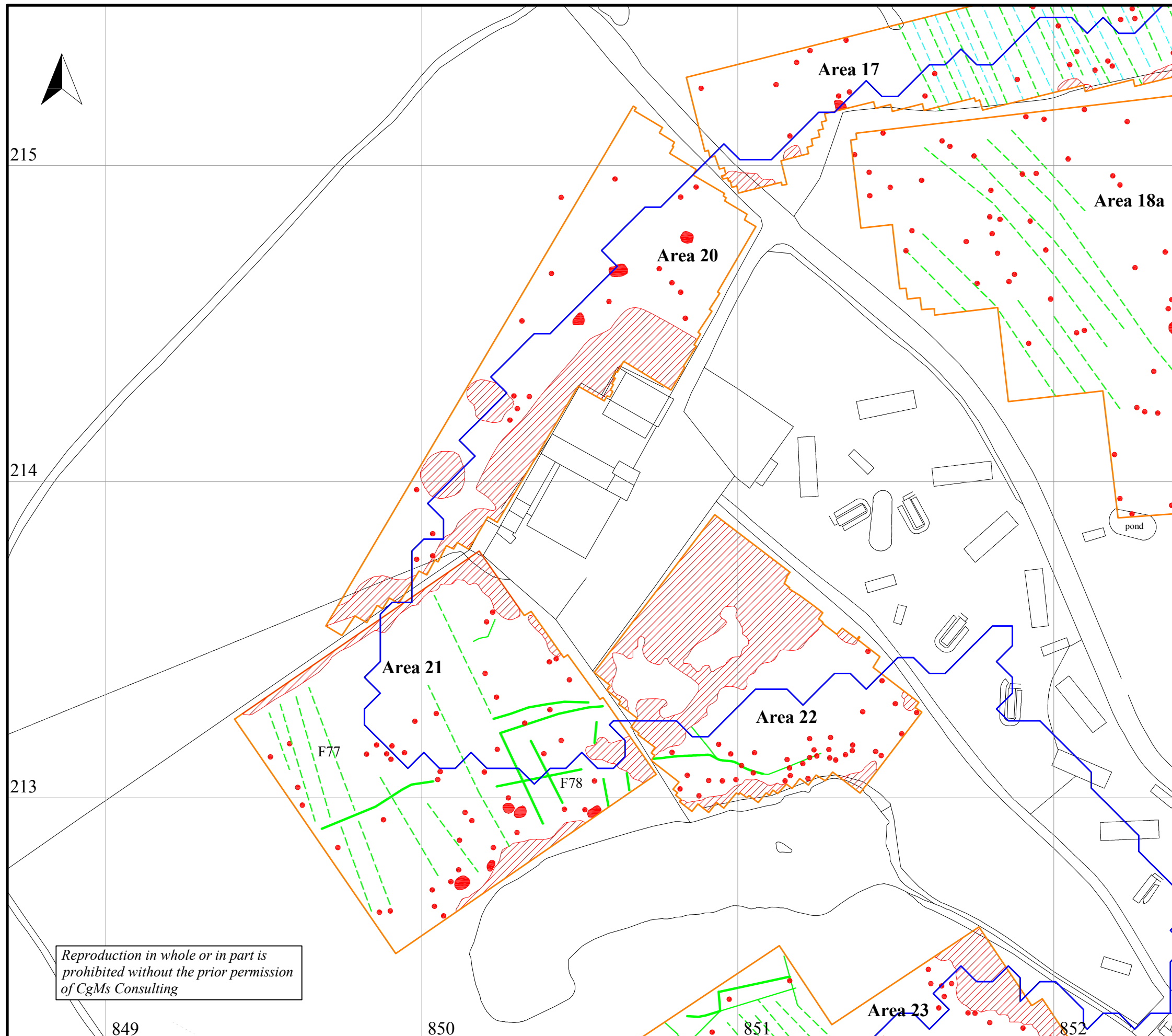
 outline of study area
 outline of survey area



on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies



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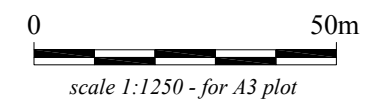
**Land at Innsworth, Gloucestershire
 geophysical surveys**

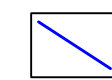


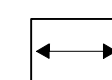
Report 1359

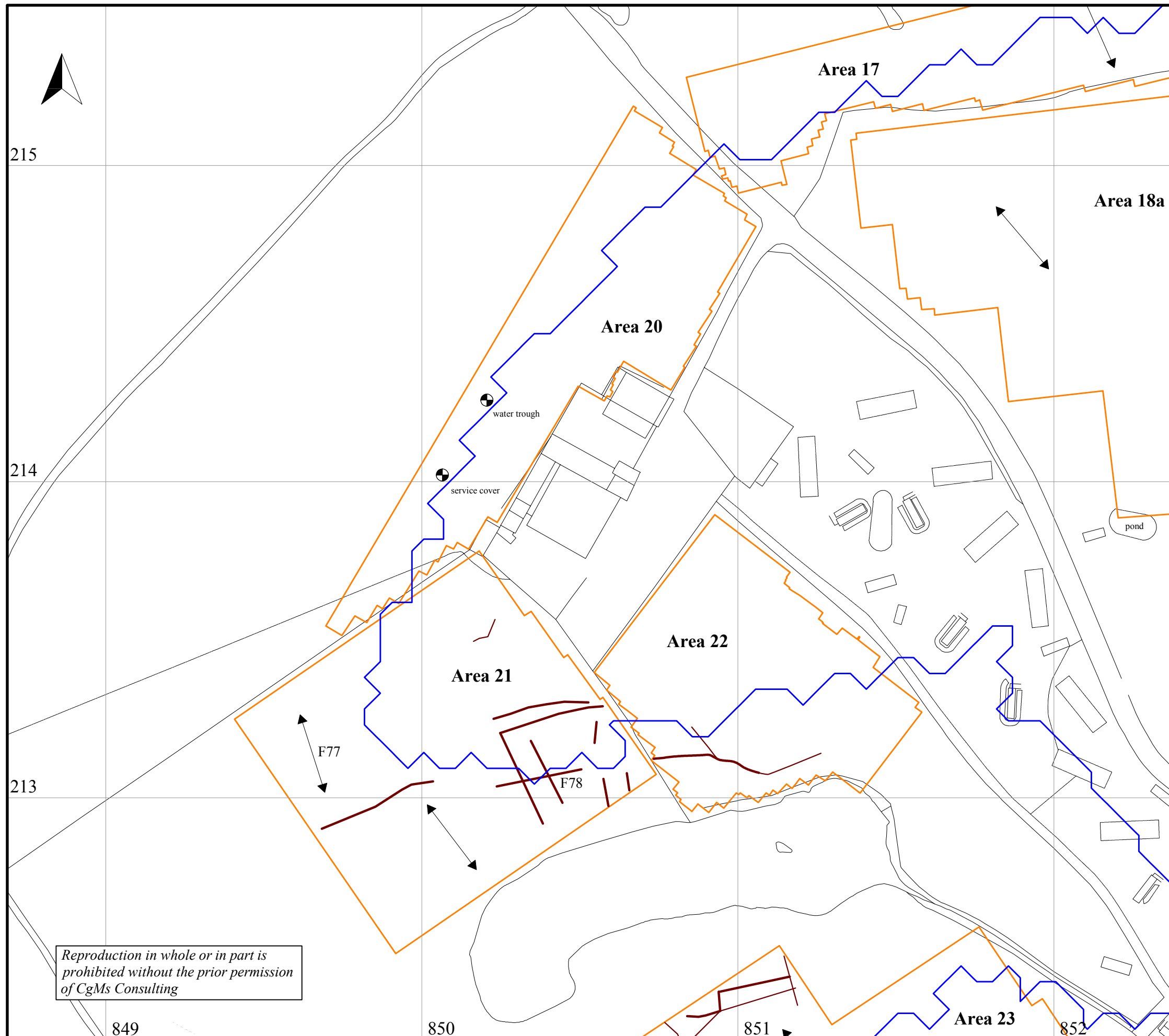
Figure 35

*Archaeological interpretation
 of Area 20, Area 21 and Area 22*

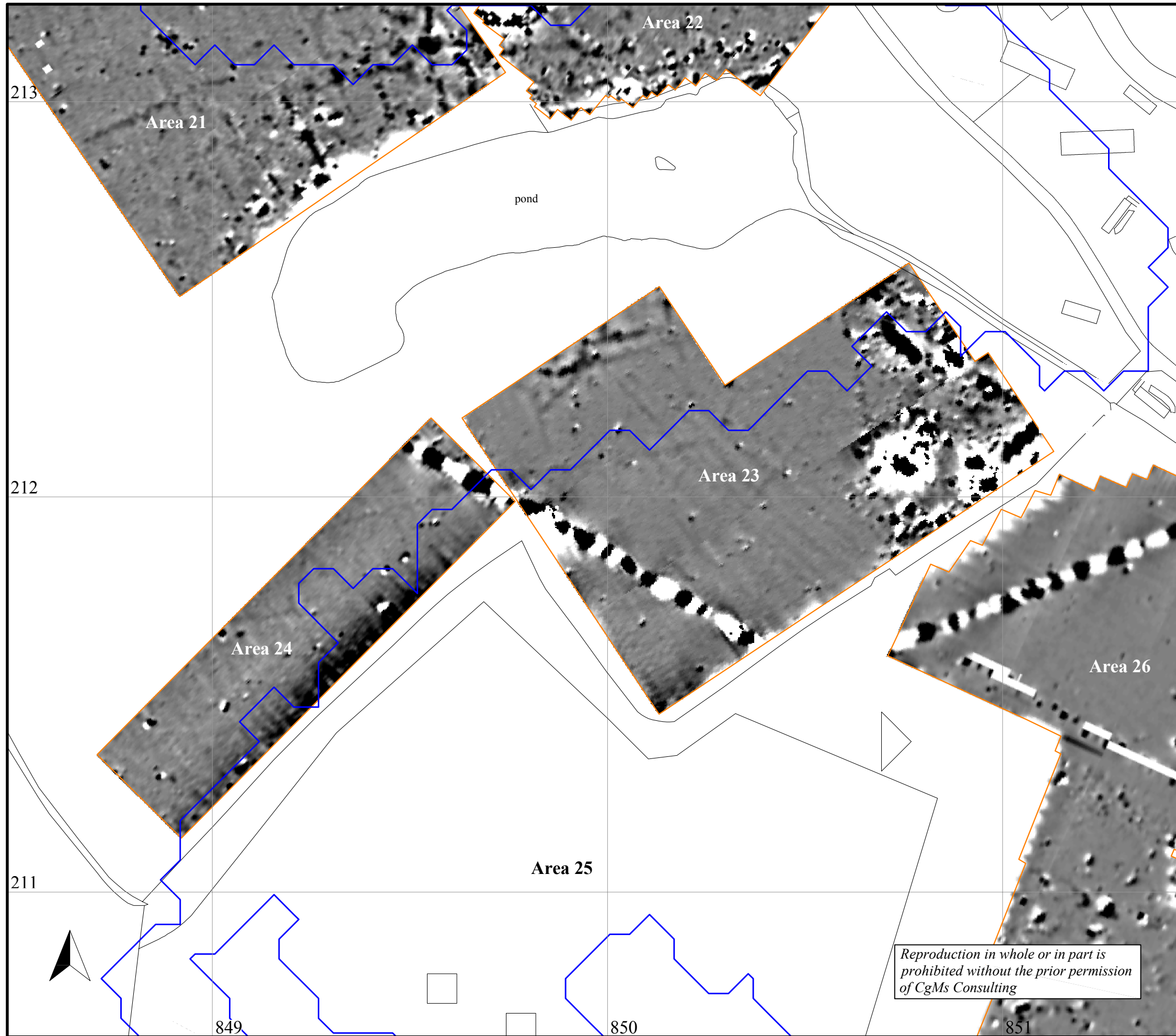
on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  orientation of ridge and furrow



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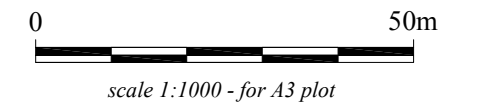
**Land at Innsworth, Gloucestershire
geophysical surveys**



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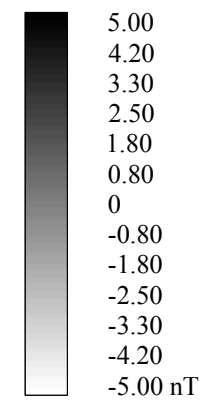
Figure 36

*Geomagnetic surveys of Area 23 and
Area 24*

on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area



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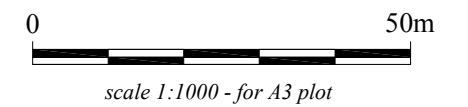
**Land at Innsworth, Gloucestershire
geophysical surveys**





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Figure 37

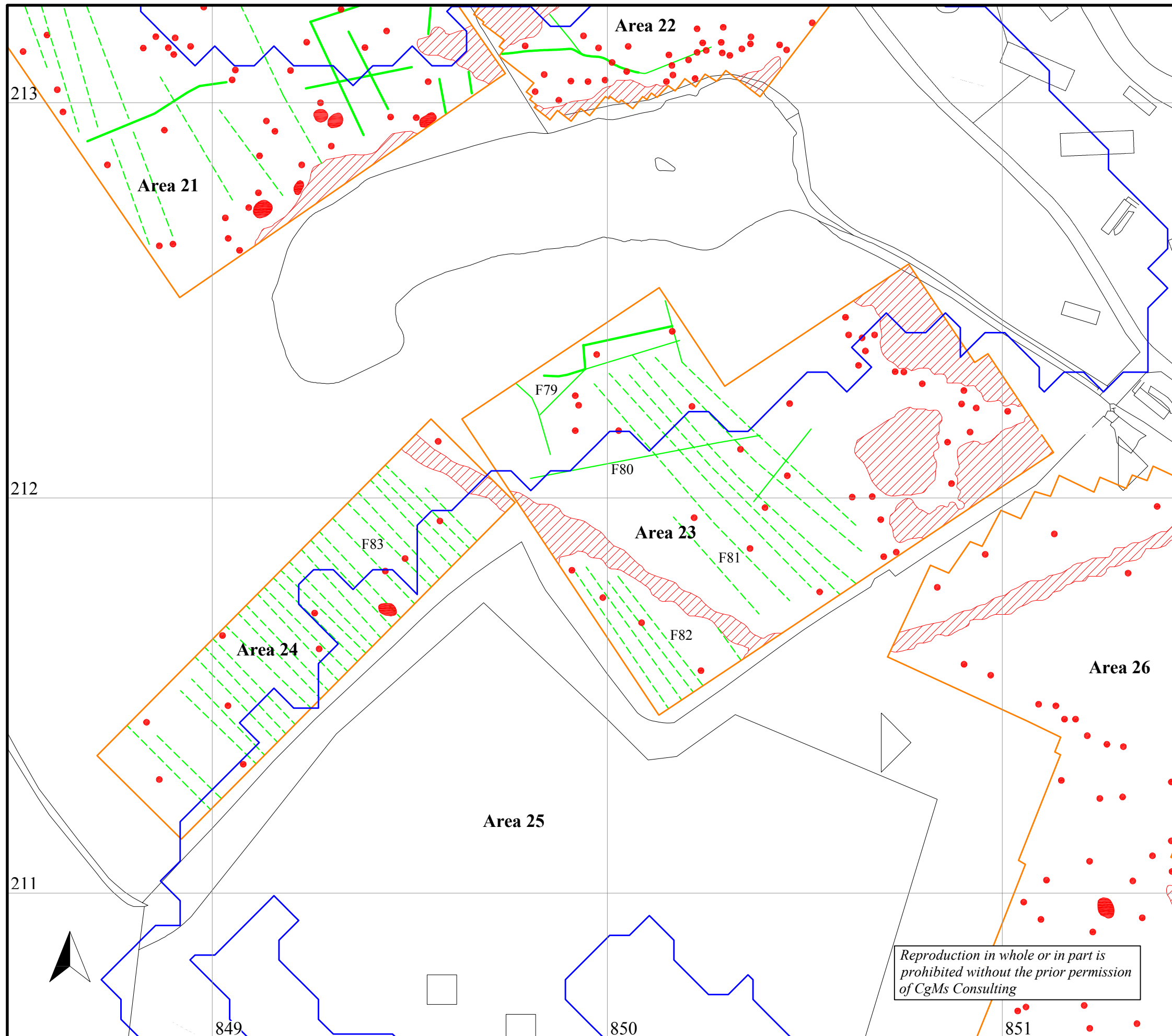
*Geophysical interpretation of Area 23
and Area 24*

on behalf of
CgMs Consulting

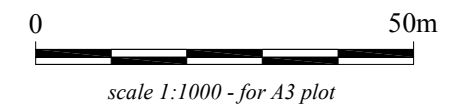


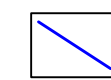




-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  dipolar magnetic anomalies

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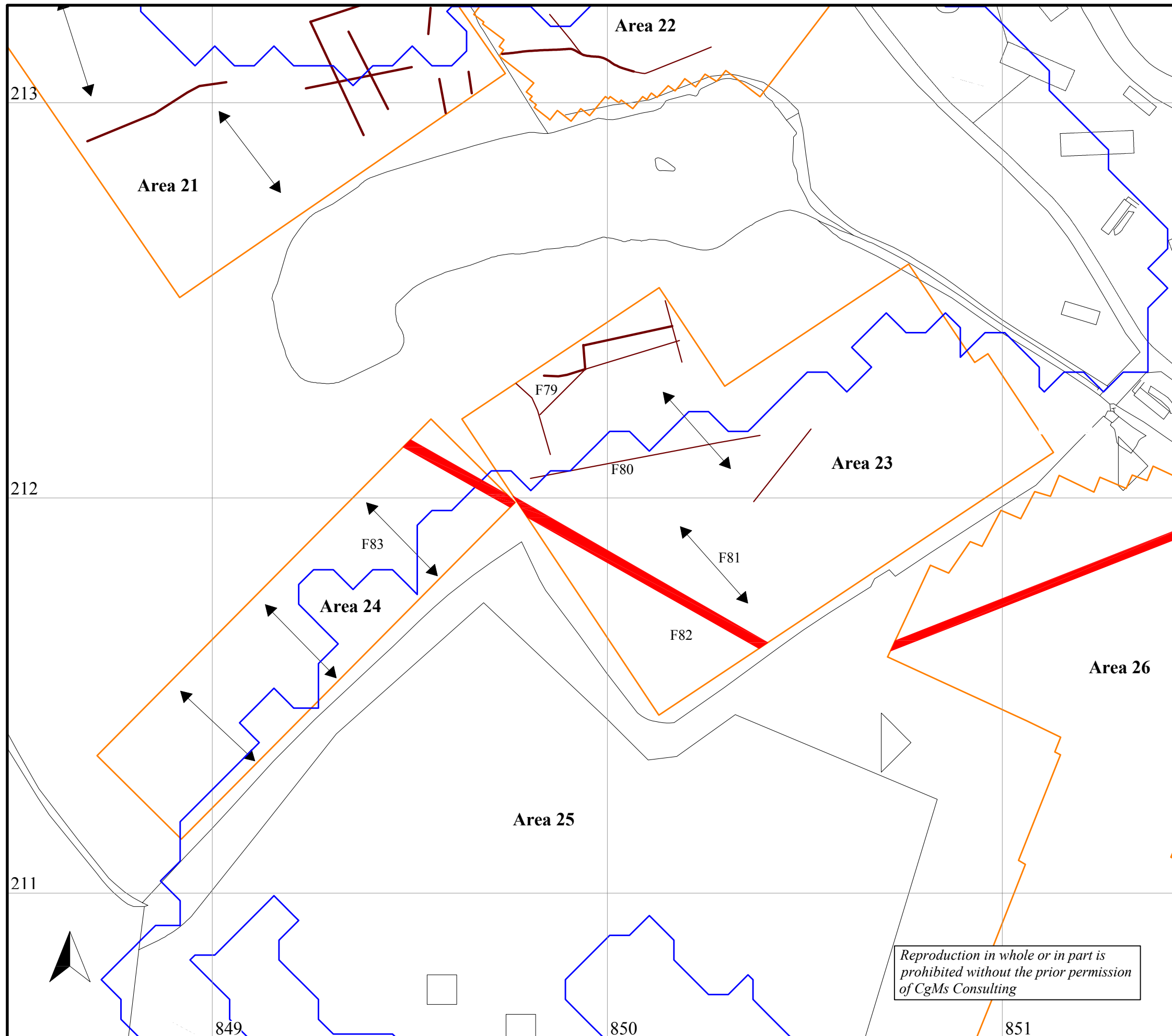


on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  service pipes
-  orientation of ridge and furrow

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geophysical surveys**

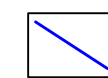

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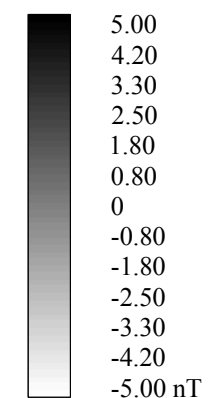
Figure 39

Geomagnetic survey of Area 26

on behalf of
CgMs Consulting

0 50m
scale 1:1250 - for A3 plot

-  outline of study area
-  outline of survey area

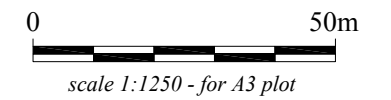






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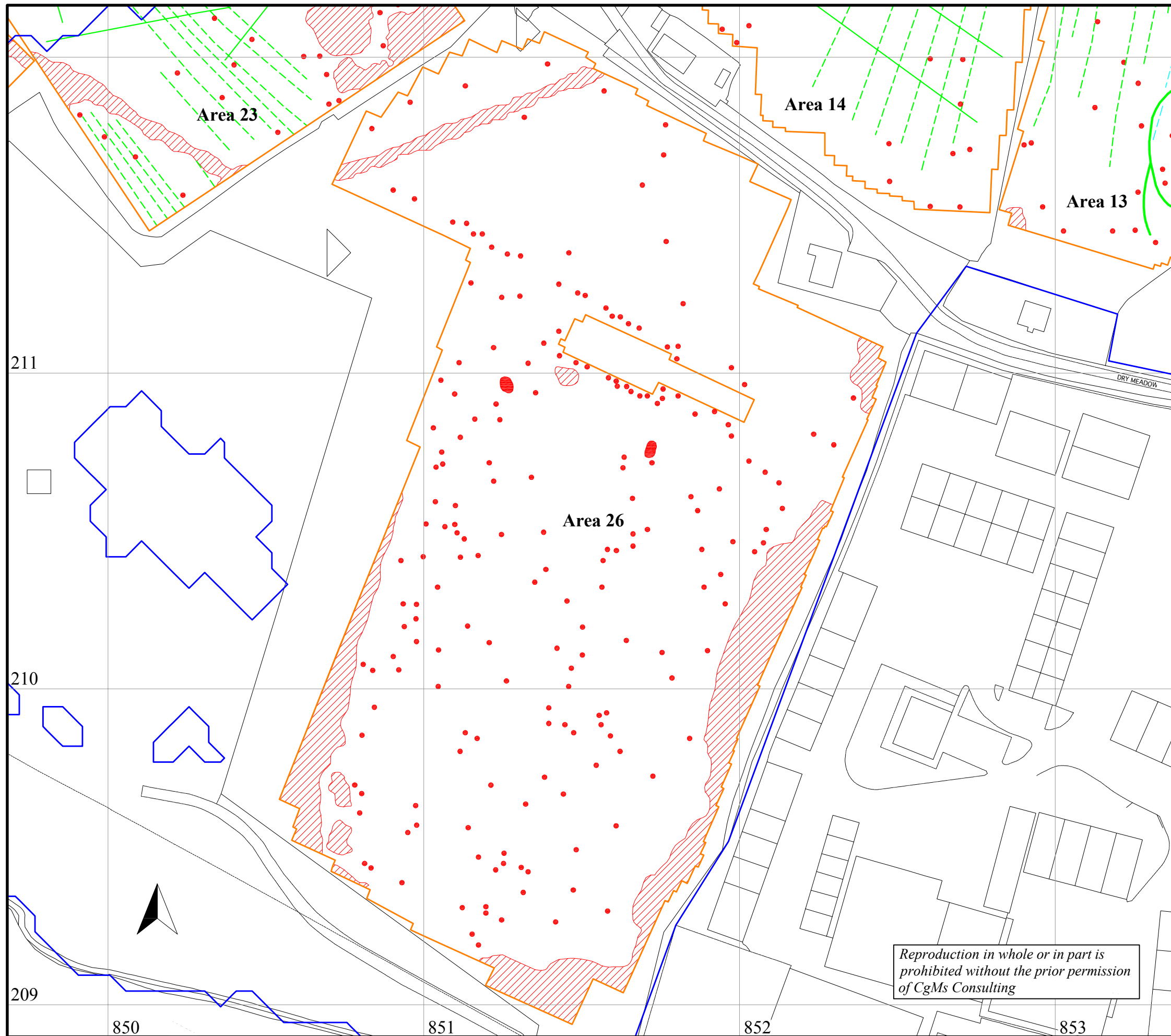


on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  dipolar magnetic anomalies

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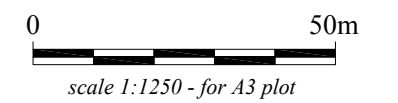
Land at Innsworth, Gloucestershire
geophysical surveys







Report 1359

Figure 41

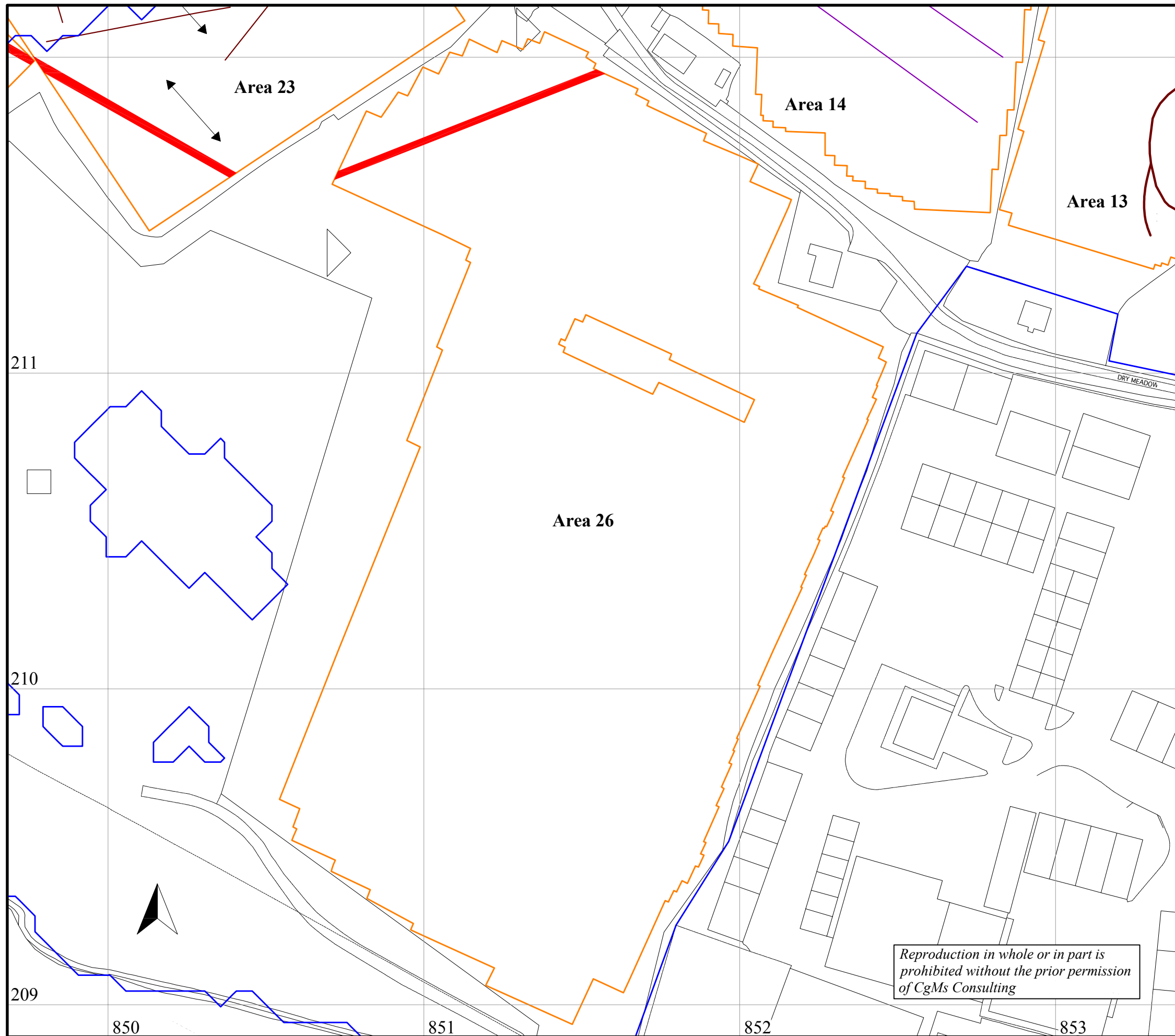
*Archaeological interpretation
of Area 26*

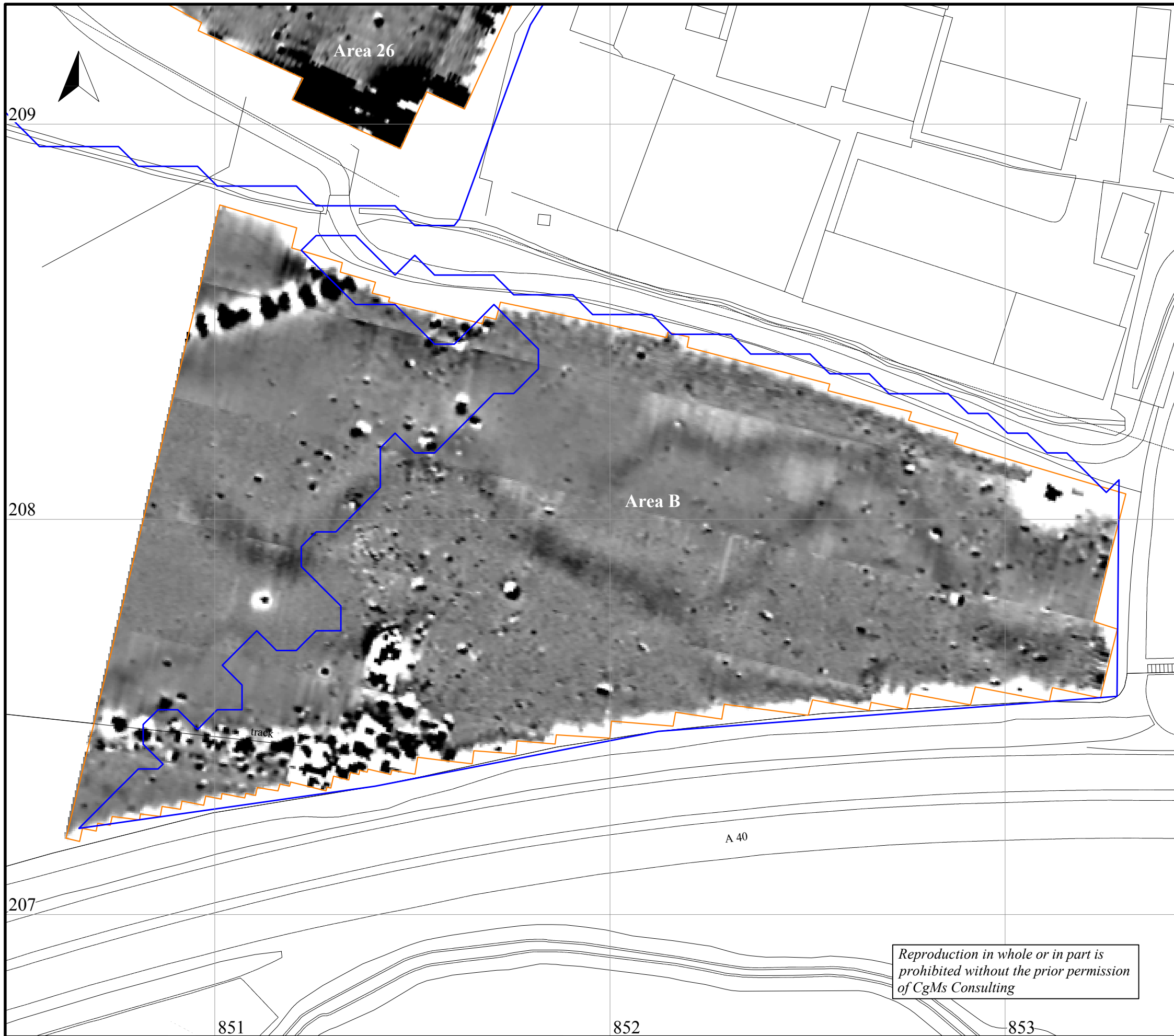
on behalf of
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-  outline of study area
-  outline of survey area
-  soil-filled features
-  service pipes
-  orientation of ridge and furrow
-  field drains

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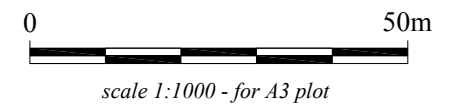
**Land at Innsworth, Gloucestershire
geophysical surveys**



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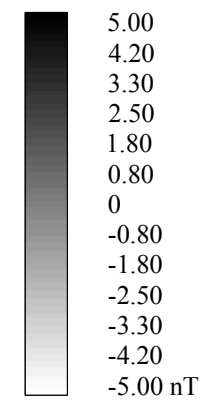
Figure 42

Geomagnetic survey of Area B

on behalf of
CgMs Consulting



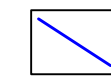
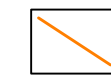
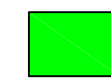
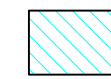

-  outline of study area
-  outline of survey area



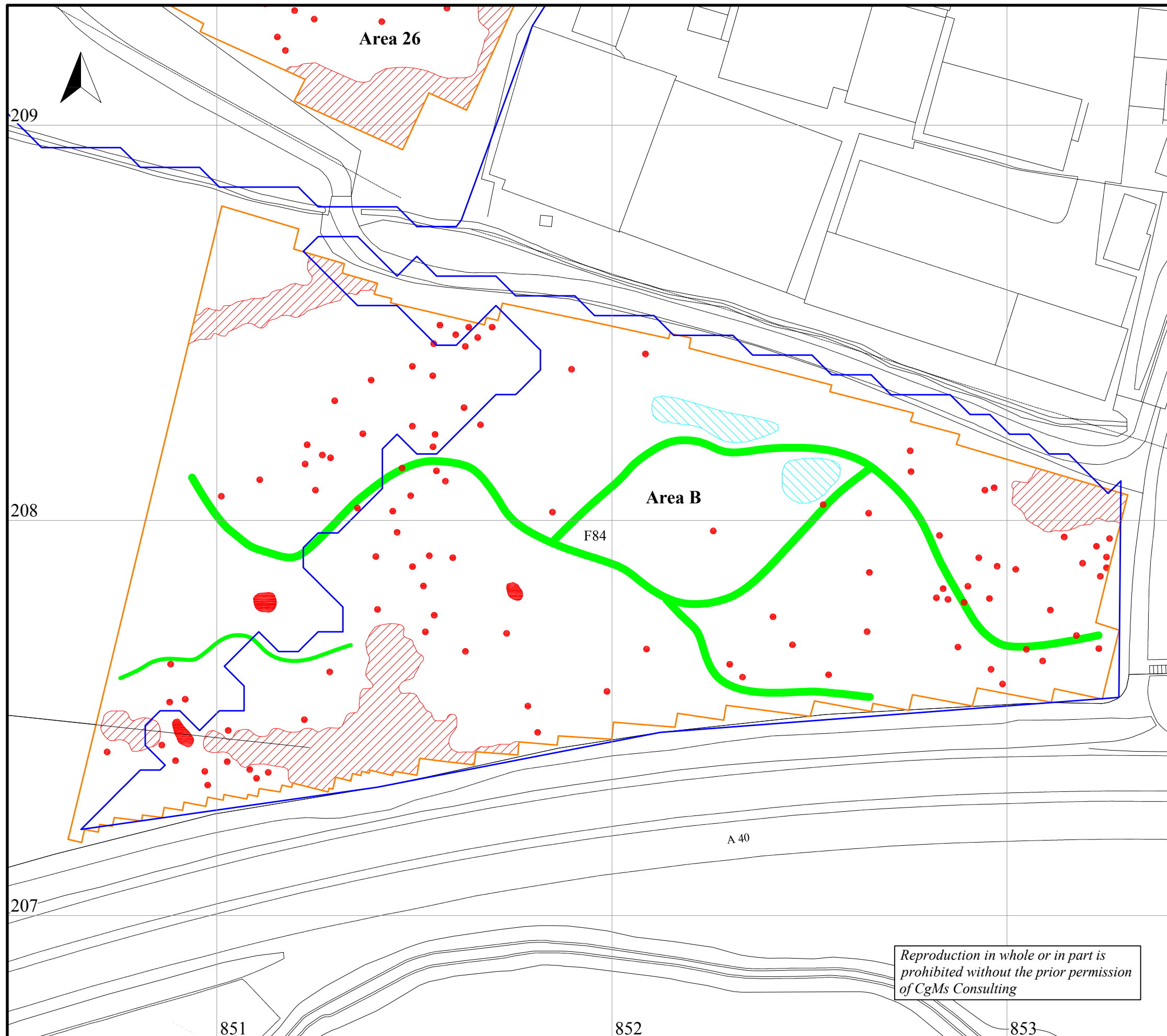
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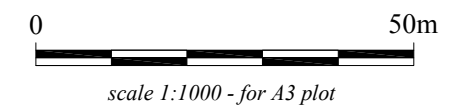
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scale 1:1000 - for A3 plot

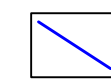




-  outline of study area
-  outline of survey area
-  positive magnetic anomalies
-  negative magnetic anomalies
-  dipolar magnetic anomalies

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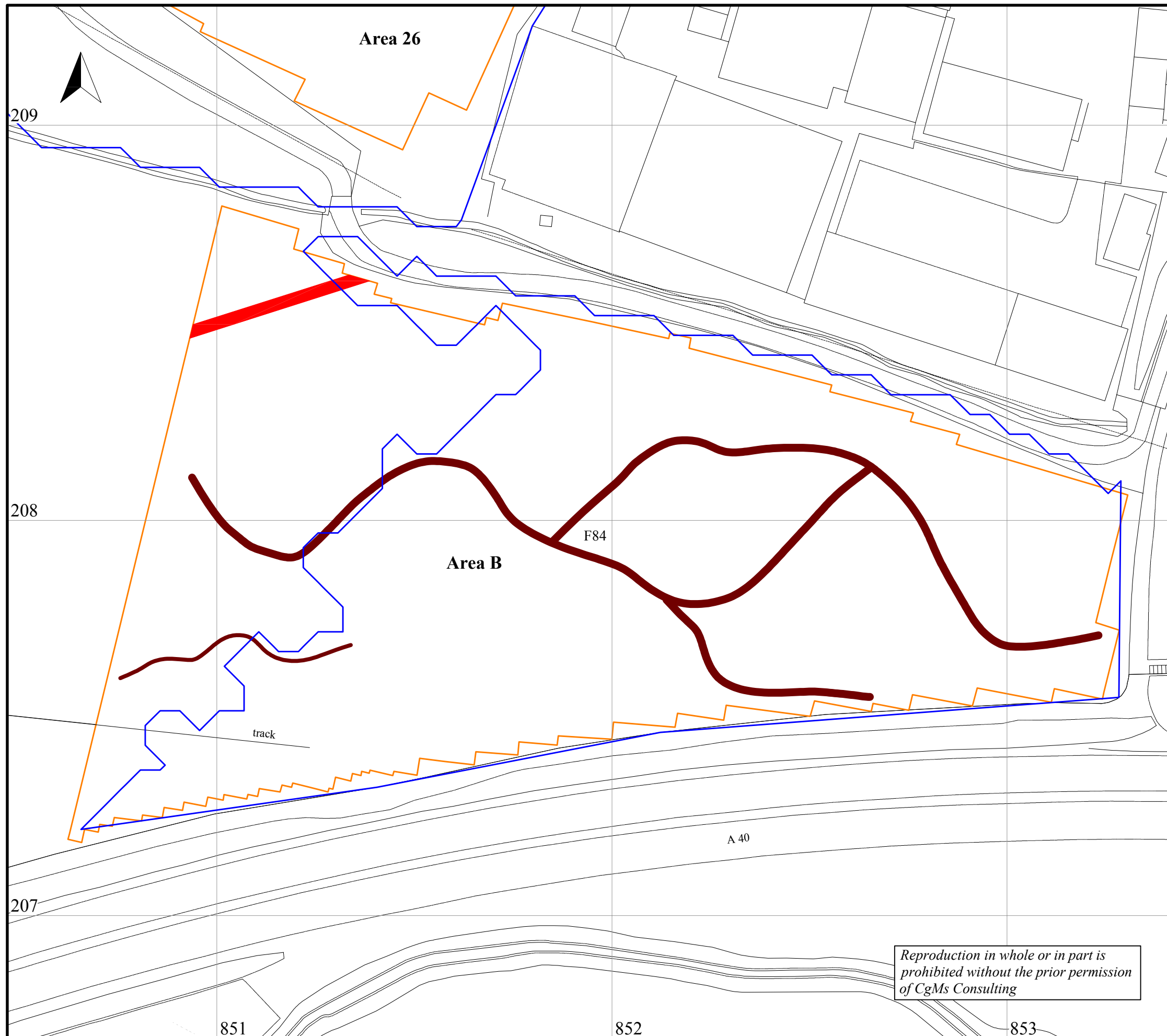


on behalf of
CgMs Consulting



-  outline of study area
-  outline of survey area
-  soil-filled features
-  service pipe
-  orientation of ridge and furrow

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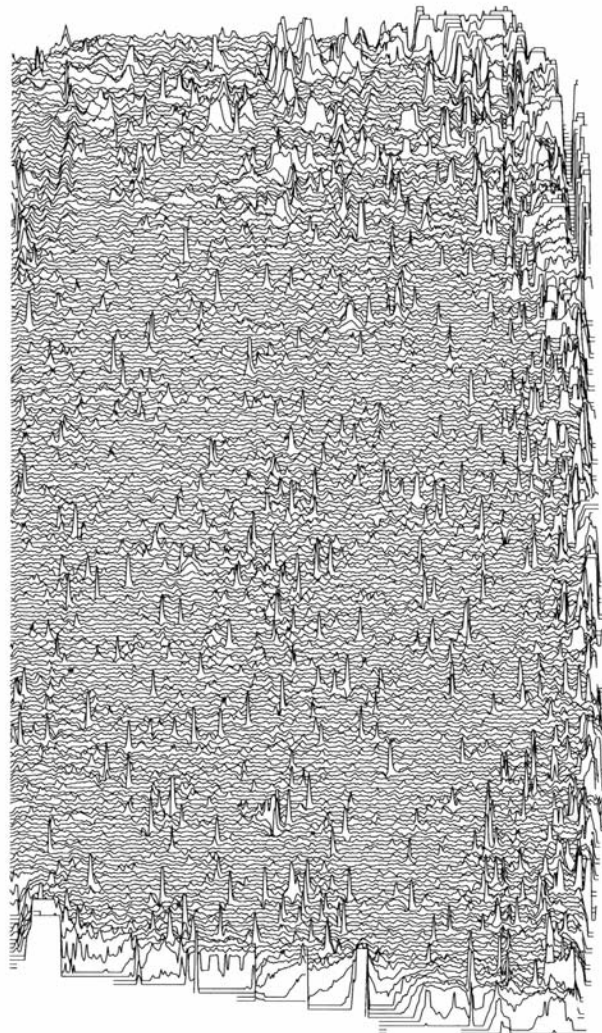
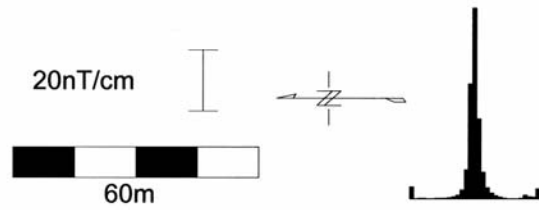


Appendix I: Trace plots of geophysical data

Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

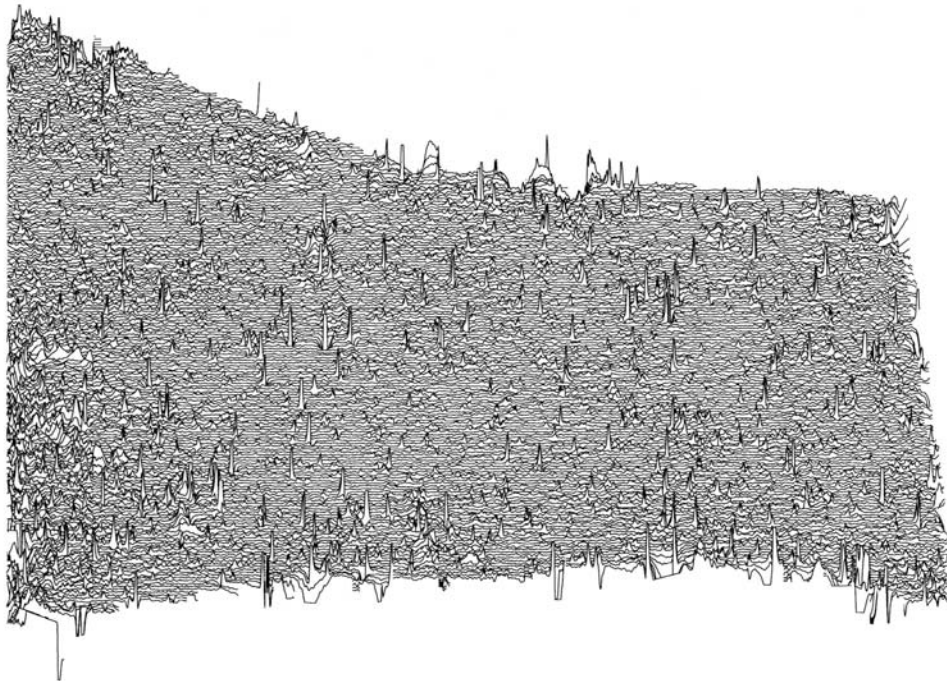
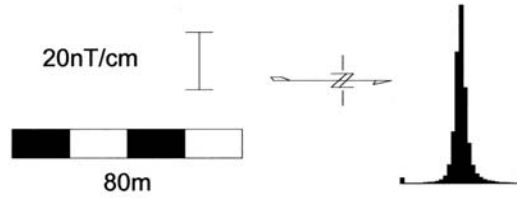
Area 1, 1:1500 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

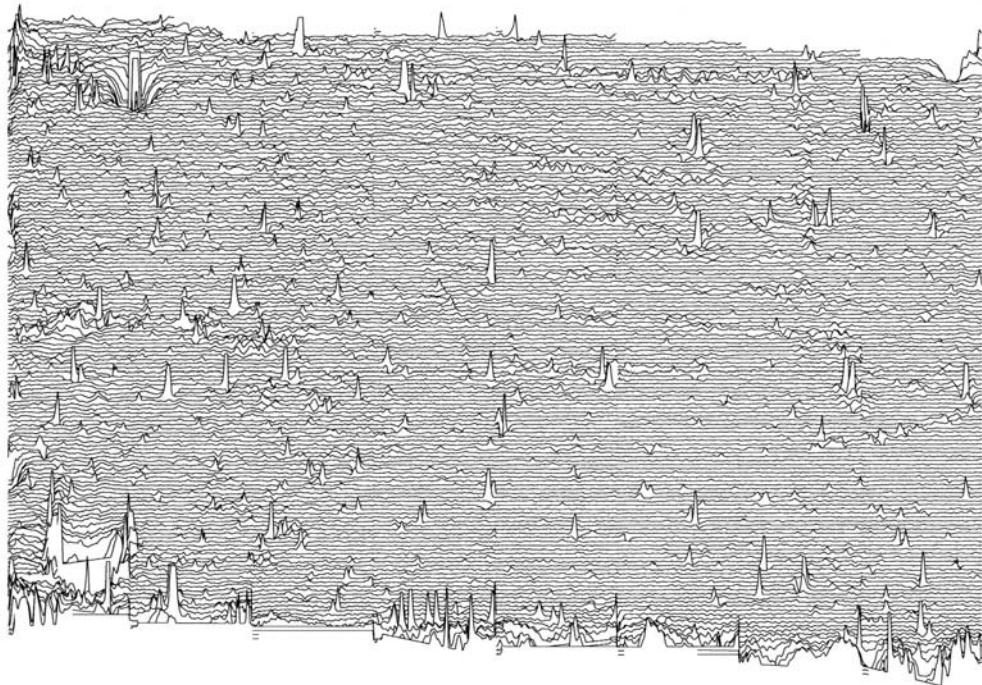
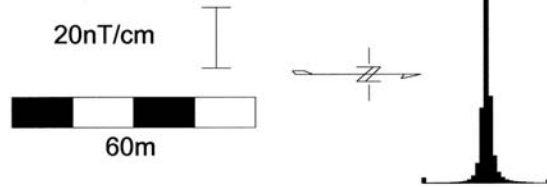
Area 2, 1:2000 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

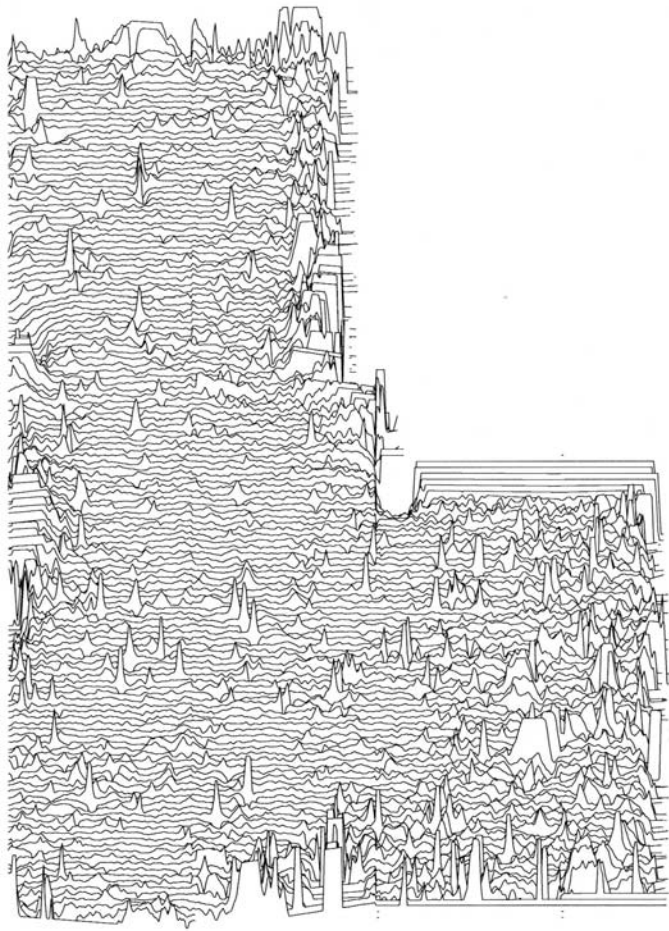
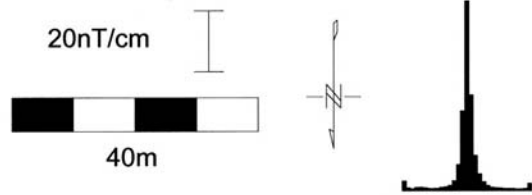
Area 3, 1:1500 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

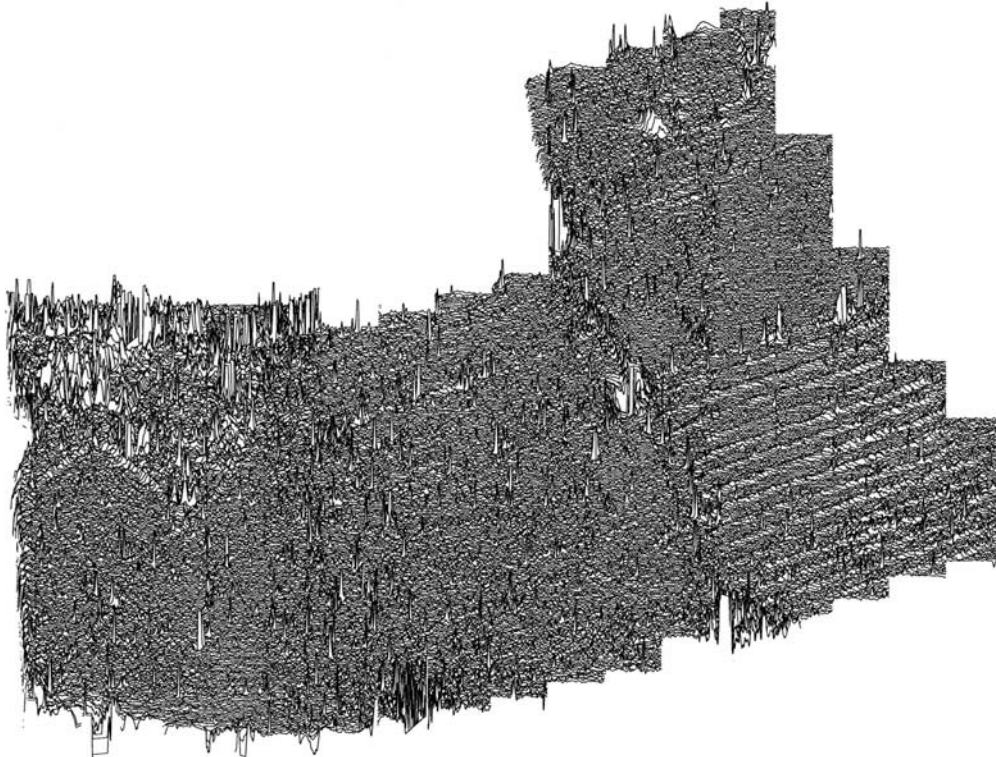
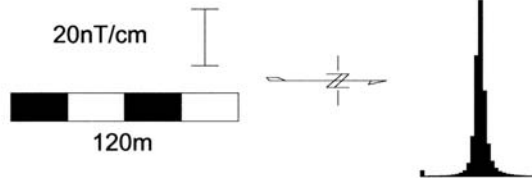
Area 5, 1:1000 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

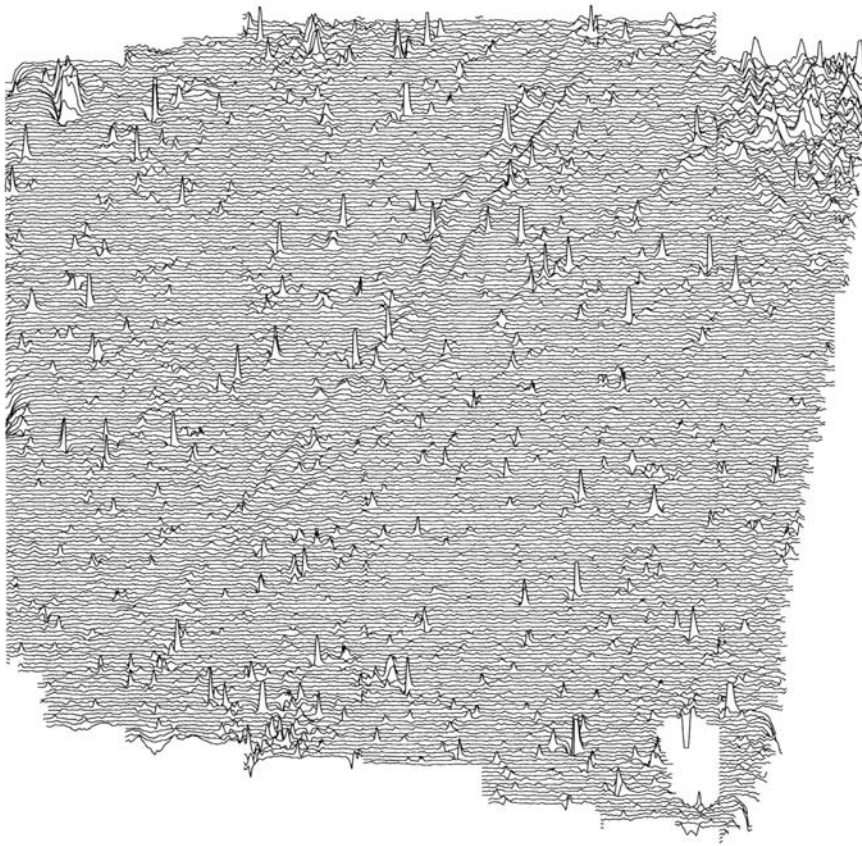
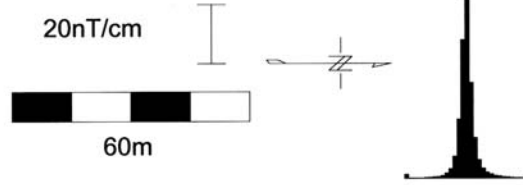
Area 6, 1:3000 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

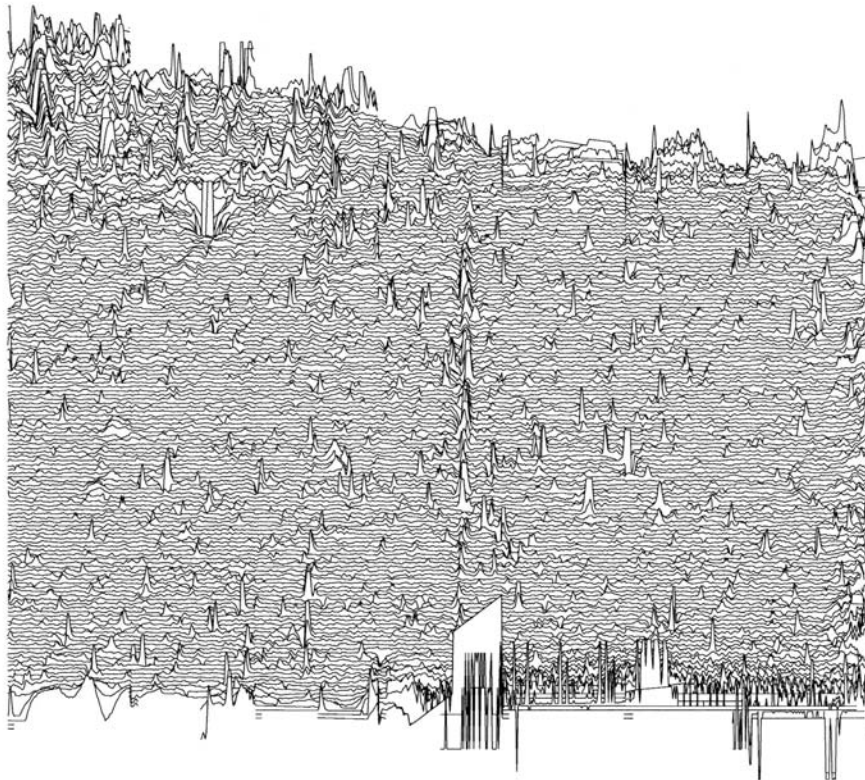
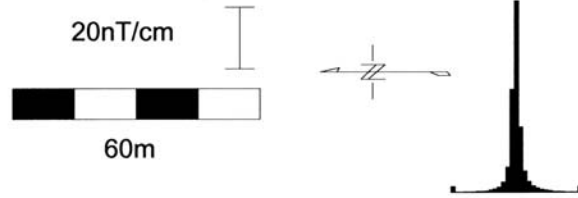
Area 7, 1:1500 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

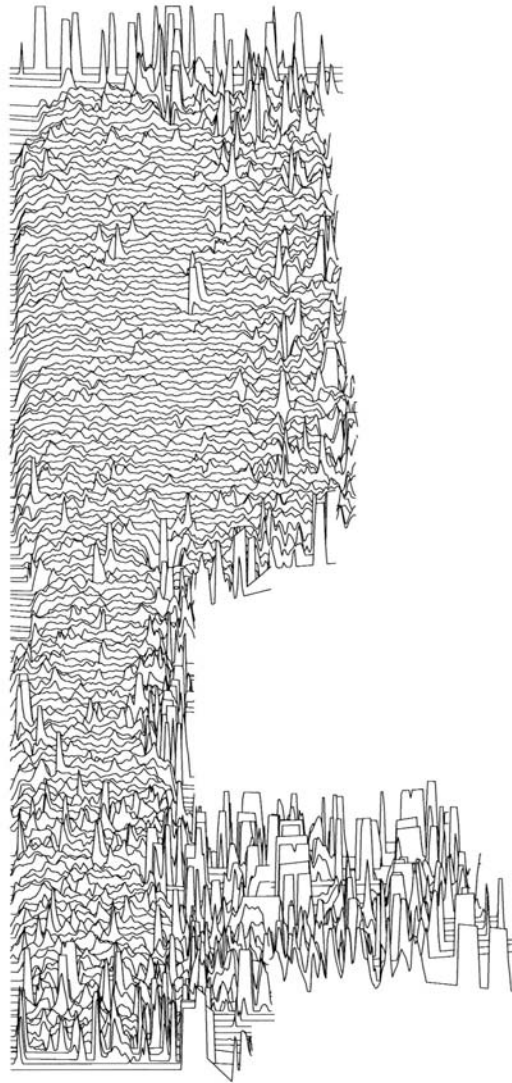
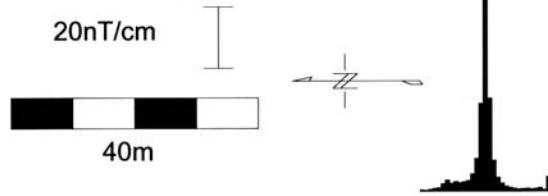
Area 8, 1:1500 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

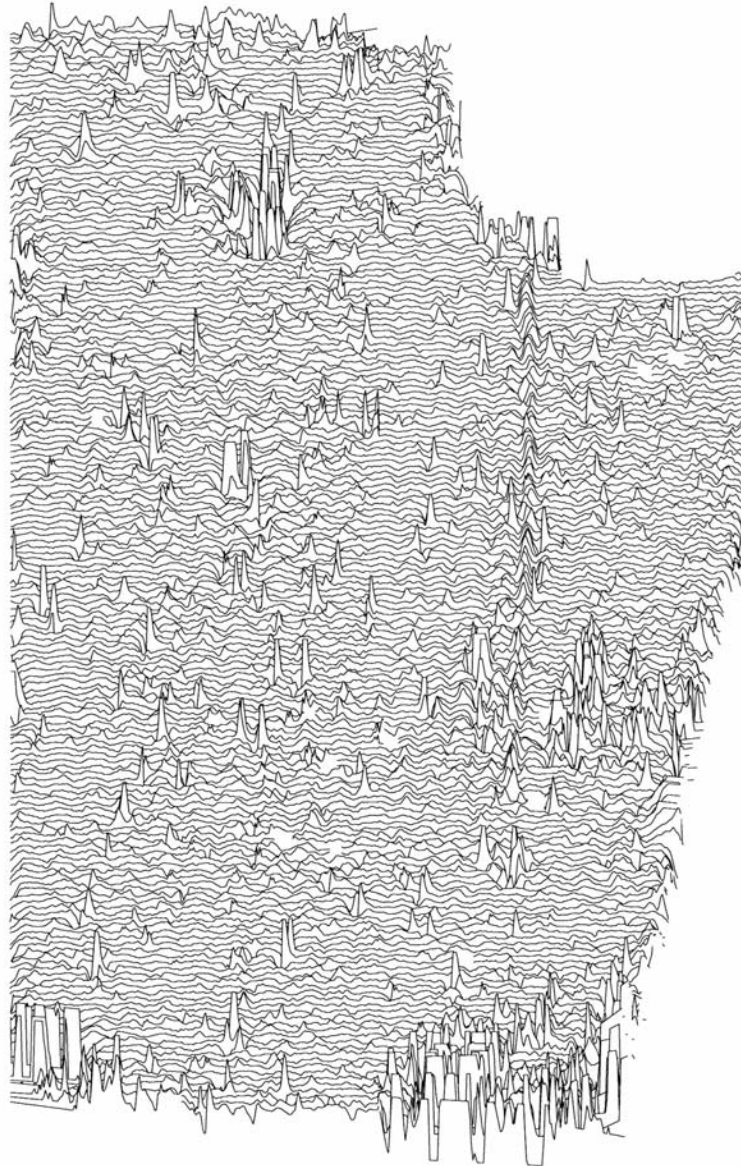
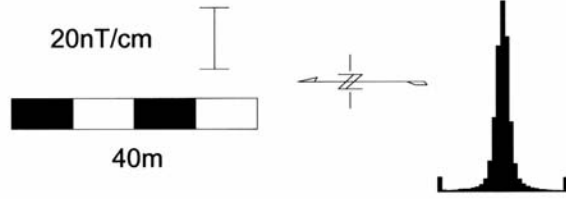
Area 9, 1:1000 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

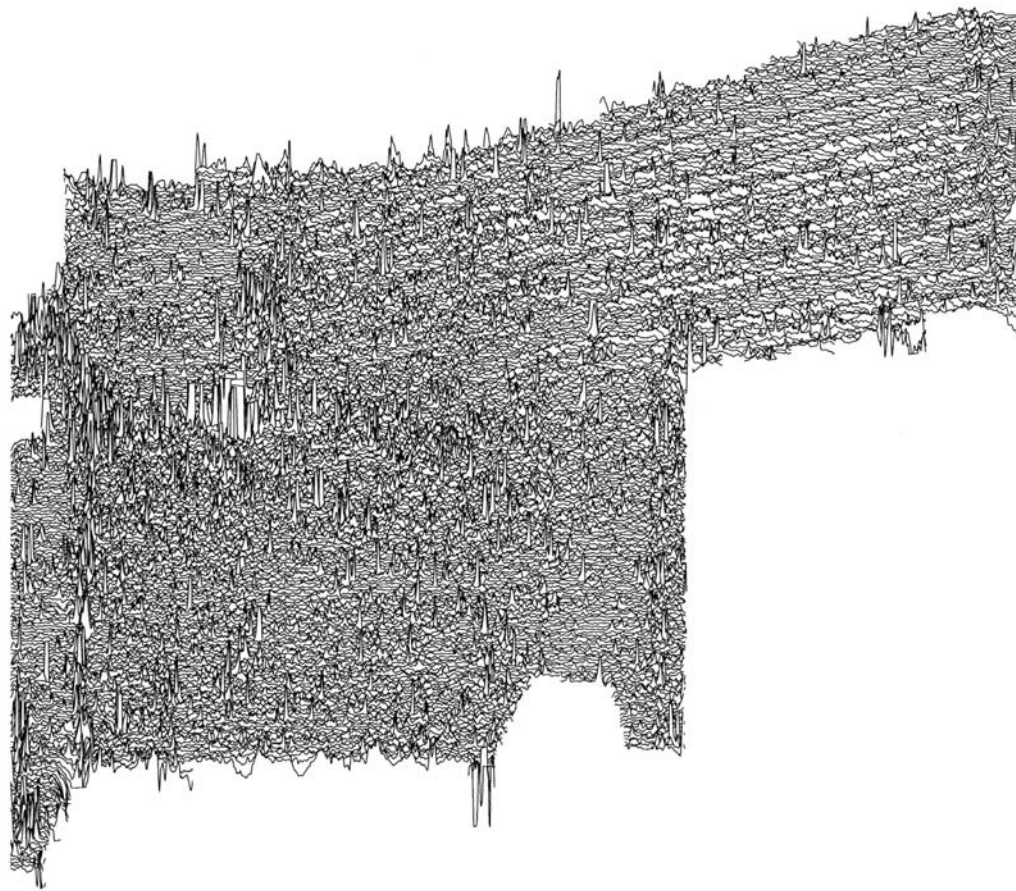
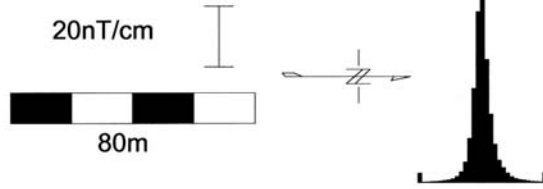
Area 10, 1:1000 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

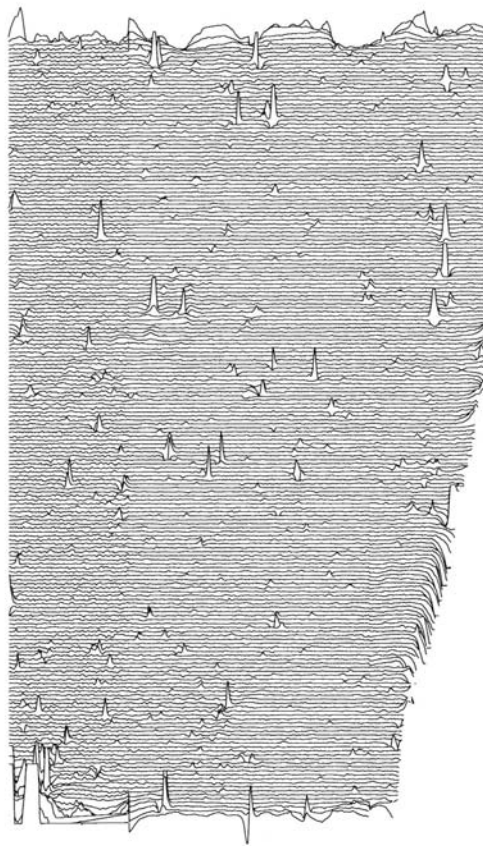
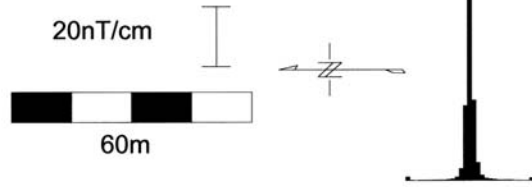
Area 11, 1:2000 @ A4



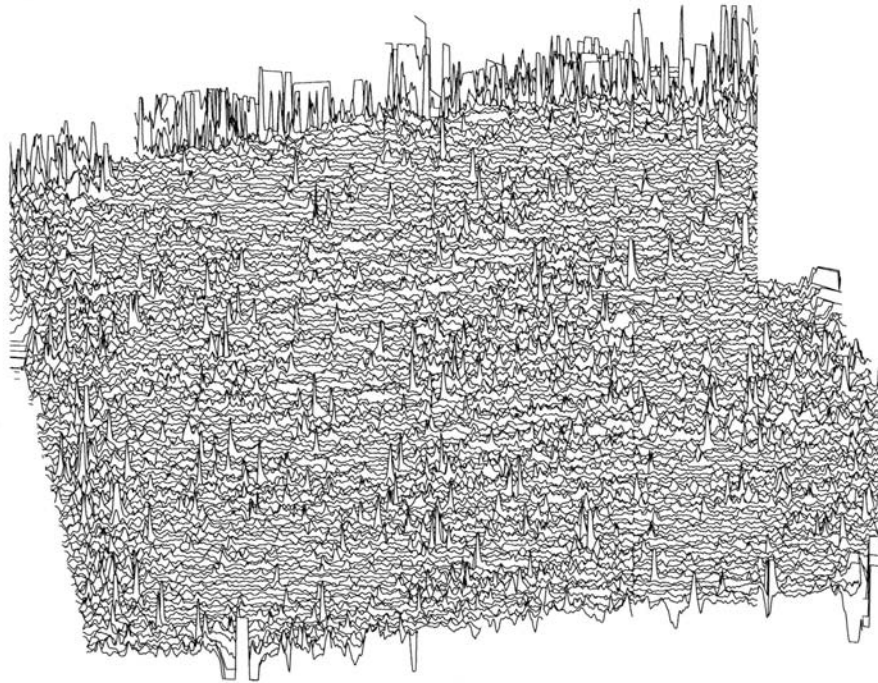
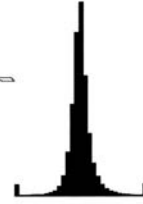
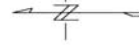
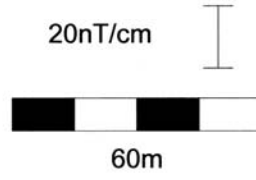
Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

Area 12, 1:1500 @ A4



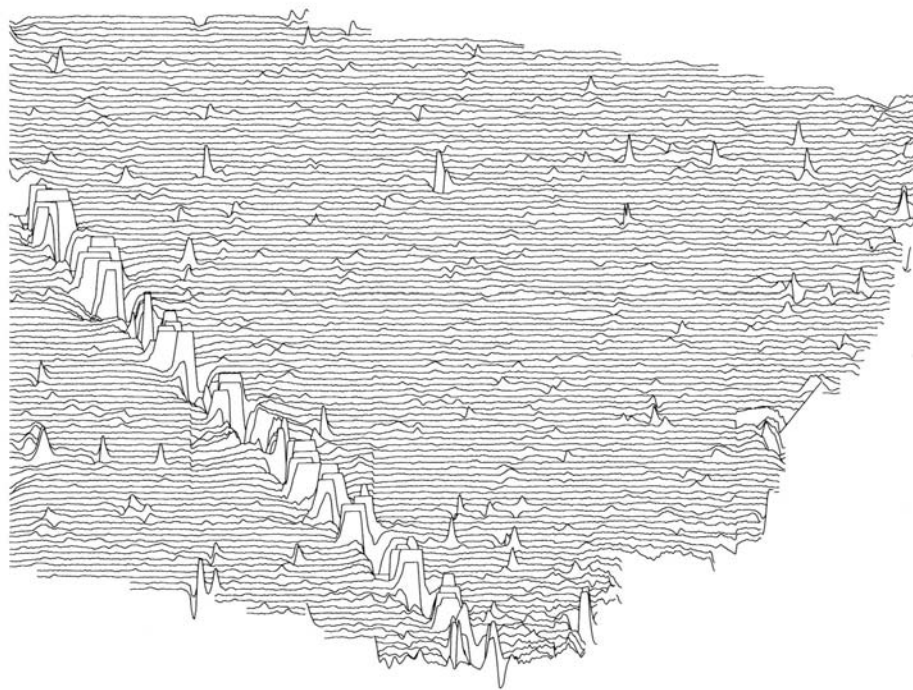
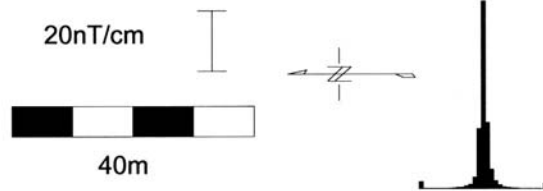
Land at Innsworth, Gloucestershire
Trace plot of geomagnetic data
Area 13, 1:1500 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

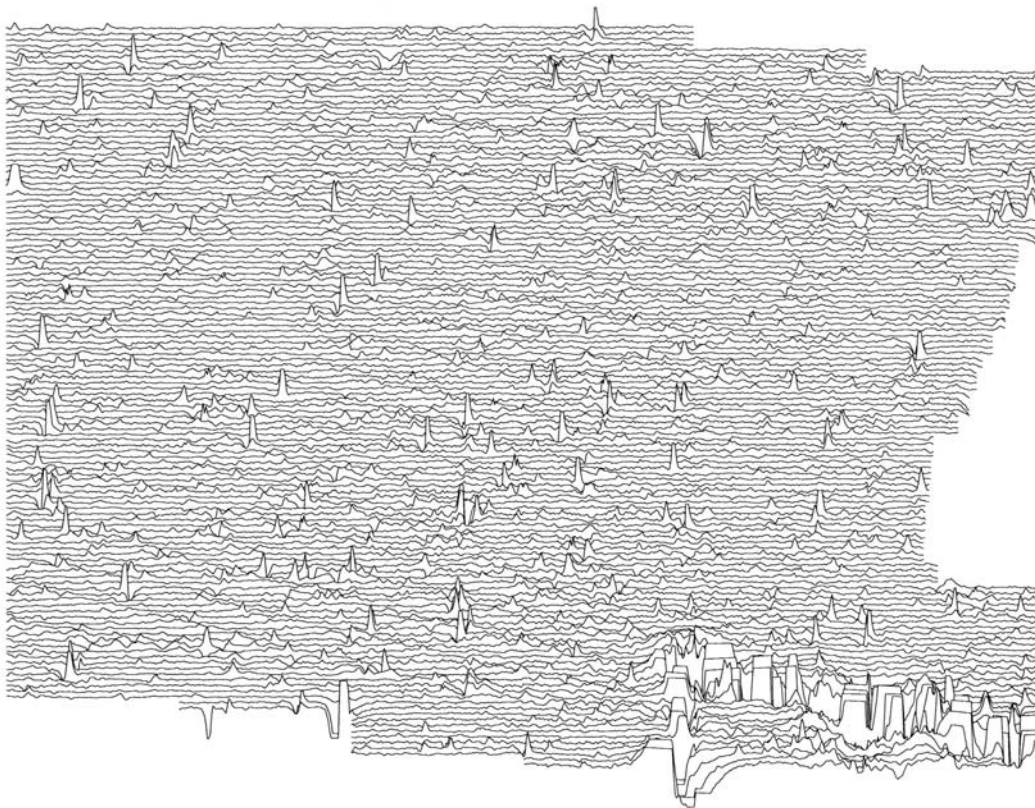
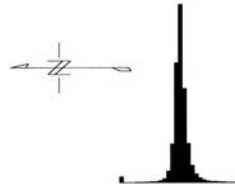
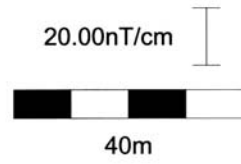
Area 14, 1:1000 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

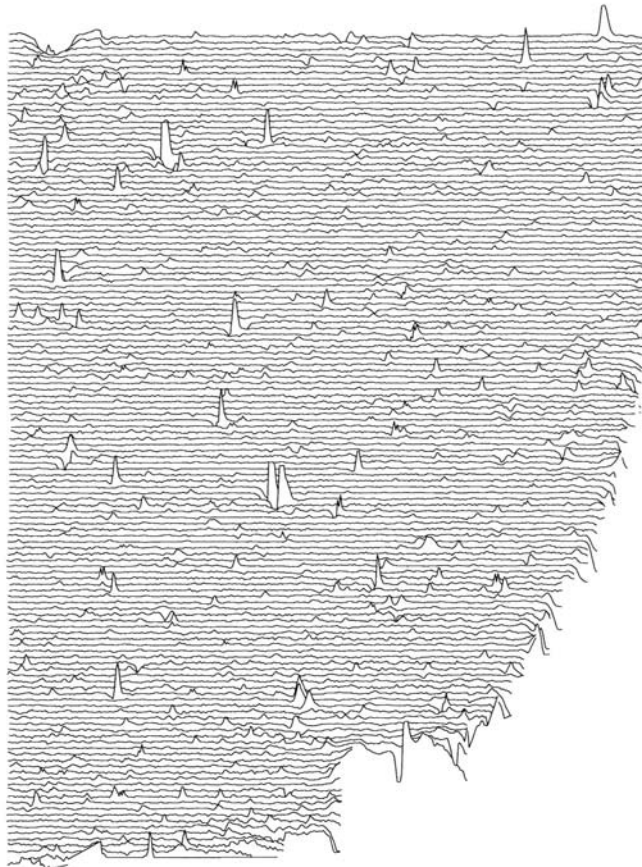
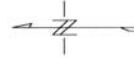
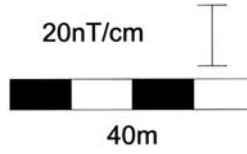
Area 15, 1:1500 @ A4



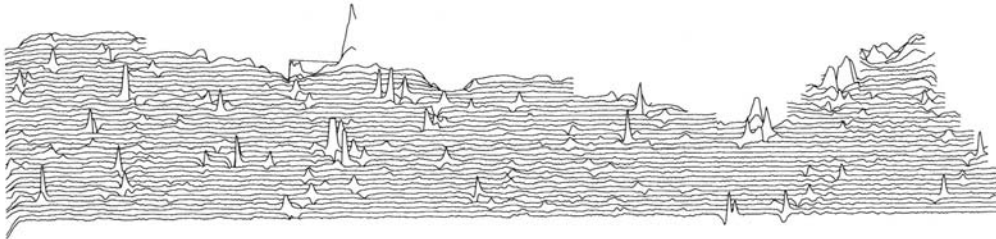
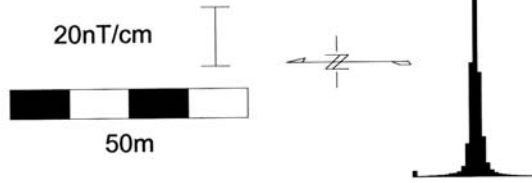
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Trace plot of geomagnetic data

Area 16, 1:1000 @ A4



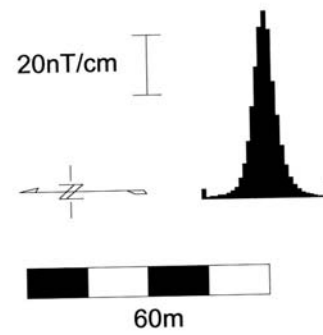
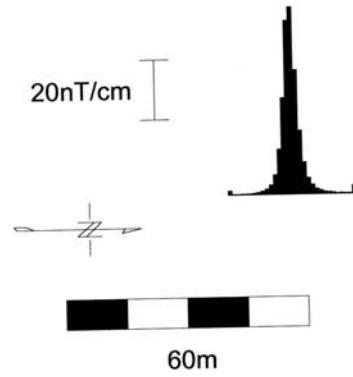
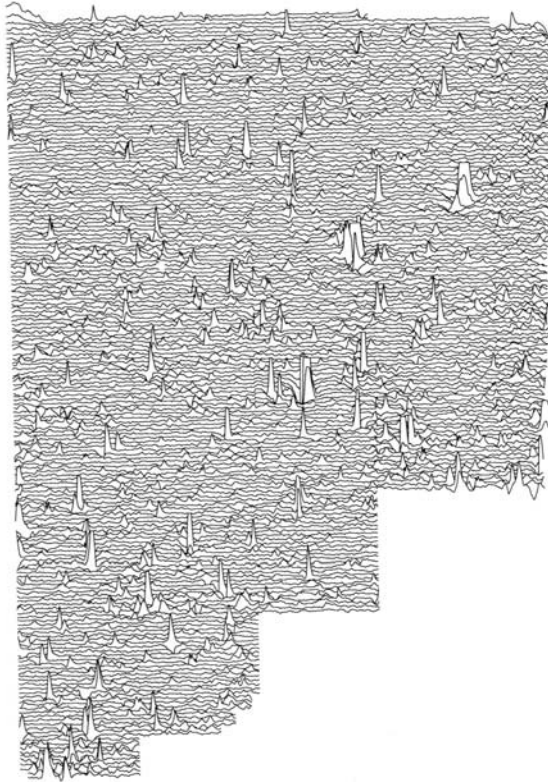
Land at Innsworth, Gloucestershire
Trace plot of geomagnetic data
Area 17, 1:1250 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

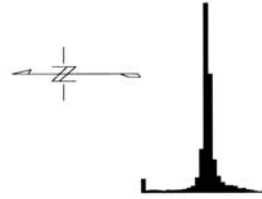
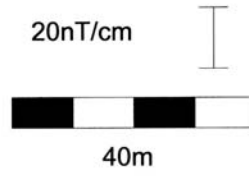
Area 18, 1:1500 @ A4



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Trace plot of geomagnetic data

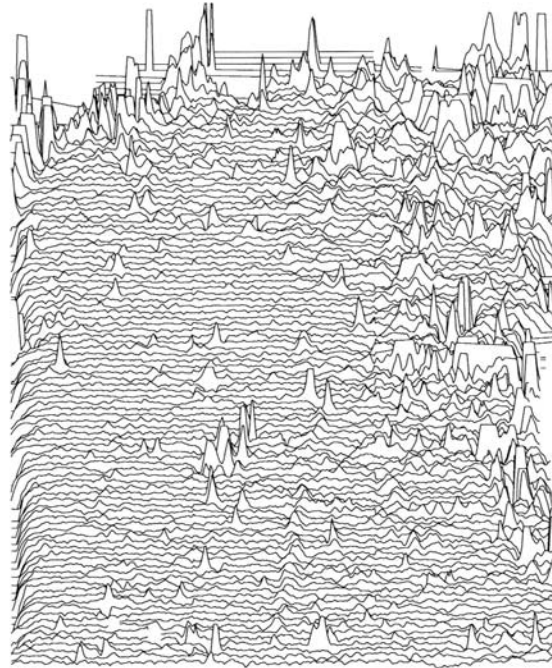
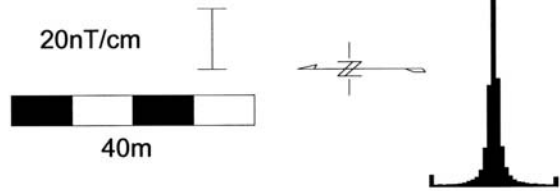
Area 20, 1:1000 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

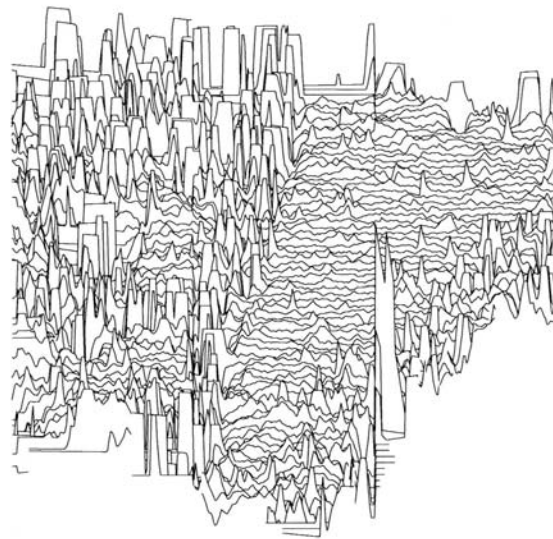
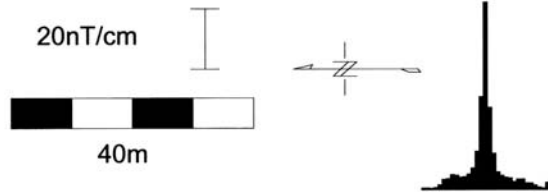
Area 21, 1:1000 @ A4



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Trace plot of geomagnetic data

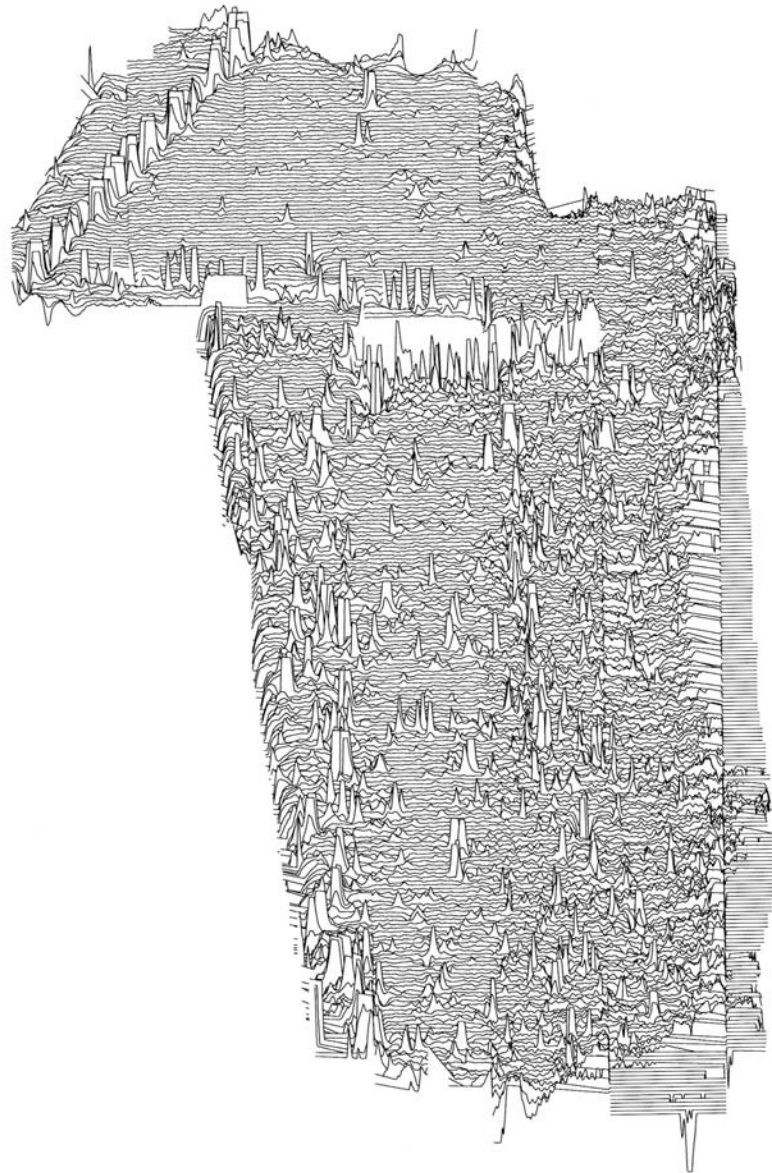
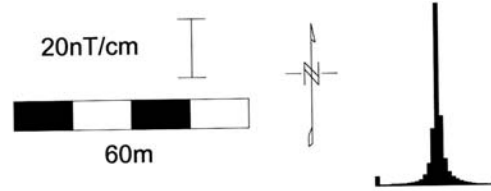
Area 22, 1:1000 @ A4



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Trace plot of geomagnetic data

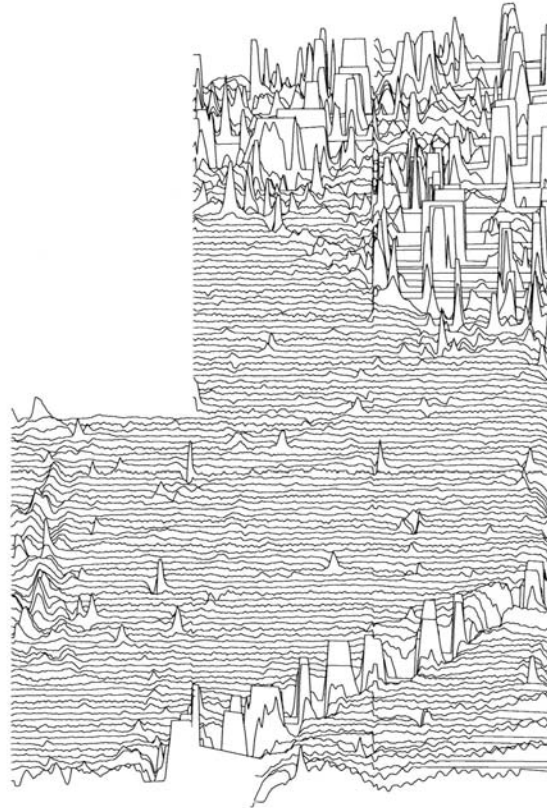
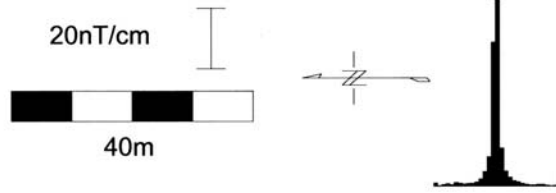
Area 26, 1:1500 @ A4



Land at Innsworth, Gloucestershire

Trace plot of geomagnetic data

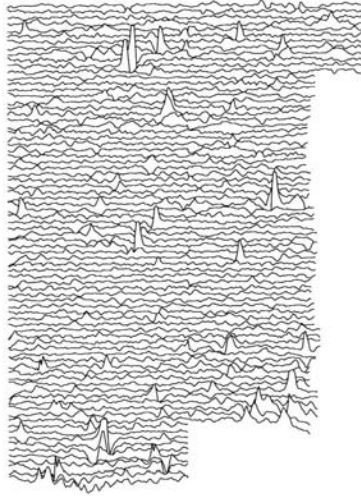
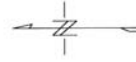
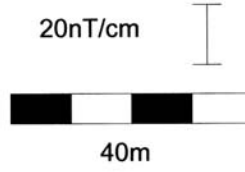
Area 23, 1:1000 @ A4



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Trace plot of geomagnetic data

Area 24, 1:1000 @ A4



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Trace plot of geomagnetic data

Area B, 1:1500 @ A4

