ARCHAEOLOGICAL SERVICES
DURHAM UNIVERSITY

on behalf of
AECOM
for
Northumberland County Council

Morpeth Northern Bypass
Morpeth
Northumberland

geophysical survey

report 2381
March 2010

Durham University

Contents

Figures

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1. Summary

The project

1.1 This report presents the results of a geophysical survey conducted in advance of a proposed bypass development to the north of Morpeth in Northumberland. The works comprised the geomagnetic survey of nine areas, totalling approximately 10ha.

1.2 The works were commissioned by AECOM for Northumberland County Council and conducted by Archaeological Services Durham University.

Results

1.3 The remains of soil-filled features of possible archaeological origin were detected in most areas. However, based on the generally weak and disjointed nature of the anomalies, such features would appear to be truncated, with the possible exception of some small pits.

1.4 Former ridge and furrow cultivation was almost certainly detected in Areas 1, 2, 5, 6 and 9.

1.5 Probable service pipes were also detected in most areas.

Recommendations

1.6 A programme of archaeological trial trenching is recommended to help establish the nature, state of preservation and date of the potential archaeological features identified in the geophysical survey.

2. Project background

Location (Figures 1 & 2)

2.1 The study area comprised a proposed bypass road corridor to the north of Morpeth in Northumberland (NGR linear: NZ 18489 87242 to NZ 19812 87903). The bypass route extends over a wider area but geophysical survey was only required over the central part of the route; the eastern part of the scheme has previously been subject to mining activity and the western end was surveyed in 2002 as part of the A1-A192 Link Road proposals (not yet built). The A192 road lay to the west of the current survey area; to the north, east and south was open farmland. Nine surveys totalling approximately 10ha were conducted across nine land parcels.

Development proposal

2.2 The proposed development is the Morpeth Northern Bypass.

Objective

2.3 The principal aim of the survey was to assess the nature and extent of any sub-surface features of potential archaeological significance within the proposed development area, so that an informed decision may be made regarding the nature and scope of any further scheme of archaeological works that may be required in relation to the development. The survey was undertaken as part of pre-application evaluation works as part of an Environmental Impact Assessment.

Methods statement

2.4 The surveys have been undertaken in accordance with a specification provided by AECOM and with current national guidance (see para. 5.1 below).

Dates

2.5 Fieldwork was undertaken between 8th and 15th March 2010. This report was prepared for 31st March 2010.

Personnel

2.6 Fieldwork was conducted by Edward Davies and Natalie Swann (Supervisor). The geophysical data were processed by Natalie Swann. This report was prepared by Natalie Swann, with illustrations by Edward Davies, and edited by Duncan Hale, the Project Manager.

Archive/OASIS

2.7 The site code is **MNB10**, for **M**orpeth **N**orthern **B**ypass 20**10**. The survey archive will be supplied on CD to the client for deposition with the project archive in due course. Archaeological Services Durham University is registered with the **O**nline **A**cces**S** to the **I**ndex of archaeological investigation**S** project (OASIS). The OASIS ID number for this project is **archaeol3-74636**.

3. Historical and archaeological background

3.1 The following information is based on the specification prepared by AECOM (Appendix). There are 80 recorded sites of archaeological and cultural heritage interest within 500m of the proposed road, including one Scheduled Monument consisting of two lozenge-shaped pillboxes constructed during World War II.

3.2 The recorded archaeological sites within the wider area predominantly consist of later prehistoric and Romano-British settlement sites, mainly identified from aerial photographs. An Iron Age and Romano-British settlement was excavated at Pegswood Moor Farm, which lies to the east of the surveyed area. Medieval and post-medieval field boundaries and areas of ridge and furrow cultivation have also been identified from aerial photographs.

4. Landuse, topography and geology

4.1 At the time of the survey the proposed development area comprised seven fields of pasture (Areas 2, 4-9) and two fields of arable (Areas 1, 3). The Kater Dene passes through Area 8.

4.2 There was a gentle slope from 65m OD in Area 1 (at the eastern end) to 67m OD in Area 3 (central). Between Areas 3 and 9 (at the western end) the site is generally level, varying from 67m OD to 68m OD, with the exception of Area 8 where there is a steep drop down to approximately 55m OD at the Kater Dene.

4.3 The underlying solid geology of the area comprises Upper Carboniferous Sandstone, which is overlain by glacial drift geology of boulder clays, sands and gravels.

5. Geophysical survey

Standards

5.1 The surveys and reporting were conducted in accordance with English Heritage guidelines, *Geophysical survey in archaeological field evaluation* (David, Linford & Linford 2008); the Institute for Archaeologists Technical Paper No.6, *The use of geophysical techniques in archaeological evaluations* (Gaffney, Gater & Ovenden 2002); and the Archaeology Data Service *Geophysical Data in Archaeology: A Guide to Good Practice* (Schmidt 2002).

Technique selection

5.2 Geophysical survey enables the relatively rapid and non-invasive identification of sub-surface features of potential archaeological significance and can involve a suite of complementary techniques such as magnetometry, earth electrical resistance, ground-penetrating radar, electromagnetic survey and topsoil magnetic susceptibility survey. Some techniques are more suitable than others in particular situations, depending on 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 and aerial photographic evidence, 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 anticipated shallowness of targets and the non-igneous geological environment of the study area a geomagnetic technique, fluxgate gradiometry, was considered appropriate for detecting the types of feature mentioned above. This technique involves the use of hand-held magnetometers to detect and record anomalies in the vertical component of the Earth's magnetic field caused by

variations in soil magnetic susceptibility or permanent magnetisation; such anomalies can reflect archaeological features.

Field methods

5.5 A 30m grid was established across each survey area and tied-in to known, mapped Ordnance Survey points using a Trimble Pathfinder Pro XRS global positioning system with real-time correction.

5.6 Measurements of vertical geomagnetic field gradient were determined using Bartington Grad601-2 dual fluxgate gradiometers. A zig-zag traverse scheme was employed and data were logged in 30m grid units. The instrument sensitivity was 0.03nT, the sample interval 0.25m and the traverse interval 1.0m, thus providing 3,600 sample measurements per 30m grid unit.

5.7 Data were downloaded on site into a laptop computer for initial processing and storage and subsequently transferred to a desktop computer for processing, interpretation and archiving.

Data processing

5.8 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 (minimally processed) data. The greyscale images and interpretations are presented in Figures 2-8; the trace plots are provided in Figure 9. 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.

5.9 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 iron spikes in gradiometer data.
interpolate	increases the number of data points in a survey to match sample and traverse intervals. In this instance the data have been interpolated to 0.25m x 0.25m intervals.

Interpretation: anomaly types

5.10 Colour-coded geophysical interpretation plans are provided. 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.

Interpretation: features

General comments

5.11 Colour-coded archaeological interpretation plans are provided.

5.12 Small, discrete dipolar magnetic anomalies have been detected in each of the survey areas. These almost certainly reflect items of near-surface ferrous and/or fired debris, such as horseshoes and brick fragments, and in most cases have little or no archaeological significance. A sample of these is shown on the geophysical interpretation plans, however, they have been omitted from the archaeological interpretation plans and the following discussion.

5.13 Geotechnical boreholes were present in most of the survey areas; these are evident in the survey data as large, intense dipolar magnetic anomalies.

Area 1

5.14 A series of linear positive magnetic anomalies has been detected aligned approximately east-west across the survey area; these anomalies almost certainly reflect ploughed-out ridge and furrow cultivation, which is evident as upstanding earthworks to the immediate west, in Area 2. The current plough direction follows that of the former ridge and furrow.

5.15 Several very weak curvilinear and linear positive magnetic anomalies were detected in the northeast corner of the survey area; these could possibly reflect the truncated remains of soil-filled features such as ditches.

5.16 A dipolar magnetic anomaly detected near the centre of the survey area corresponds to a geotechnical borehole; a similarly intense anomaly just to the north of this probably reflects a large, buried ferrous item.

Area 2

5.17 Two series of parallel, alternate positive and negative magnetic anomalies have been detected in this area. One series is aligned approximately northwest-southeast and the second is aligned broadly east-west. These anomalies correspond to upstanding ridge and furrow earthworks.

5.18 Weak linear negative magnetic anomalies aligned at right angles to the ridge and furrow at the eastern end of the survey area could reflect traces of plough furrows along a headland or field drains.

5.19 The broad, sinuous band of negative and dipolar magnetic anomalies along the centre of the survey area reflects a stream channel with a track on its south side.

5.20 Several small, discrete and linear positive magnetic anomalies have been detected across the survey area, which could possibly reflect soil-filled features such as pits and ditches.

5.21 Two geotechnical boreholes were present, next to the stream. The intense dipolar magnetic anomaly near the northwestern edge of the survey area almost certainly reflects a large, buried ferrous object.

Area 3

5.22 Several broad, weak and diffuse, linear positive magnetic anomalies have been detected across the central part of this area; these may reflect soil-filled features such as former field boundaries or ditches.

5.23 Several discrete positive magnetic anomalies were detected across the survey area, which could reflect soil-filled features such as pits.

5.24 The linear positive magnetic anomaly aligned northeast-southwest throughout much of the survey area reflects an existing track. Two geotechnical boreholes were present within the survey area.

Area 4

5.25 The chain of dipolar magnetic anomalies aligned northwest-southeast across the western end of this area almost certainly reflects a ferrous service pipe. The dipolar magnetic anomalies along the northern side of the survey area reflect an electric fence. One geotechnical borehole was present in this survey area.

5.26 The small rectilinear positive magnetic anomaly in the northeastern corner of the survey area could reflect a soil-filled feature.

Area 5

5.27 A series of parallel positive magnetic anomalies aligned approximately north-south was detected across this survey area. These anomalies are likely to reflect former ridge and furrow cultivation of the area.

5.28 A line of discrete positive magnetic anomalies aligned with the ridge and furrow may reflect a row of small pits, or postholes along a former field boundary.

5.29 Two weak, linear positive magnetic anomalies aligned obliquely to the ridge and furrow, and a few very weak curvilinear positive magnetic anomalies, were also detected. These anomalies could possibly reflect the truncated remains of soil-filled ditches.

5.30 The broad positive magnetic anomaly in the southwest of this survey area reflects a seasonal stream course which continues into Area 7. One geotechnical borehole was present in this survey area.

Area 6

5.31 The linear positive magnetic anomalies aligned northeast-southwest across the survey area may reflect a former plough regime.

5.32 A few weak, narrow linear positive magnetic anomalies were detected on different alignments to the ploughing. These anomalies may reflect soil filled ditches and some appear to form part of a rectilinear enclosure, possibly associated with similar features in Area 7.

5.33 Two chains of intense dipolar magnetic anomalies were also detected across this area; these almost certainly reflect ferrous service pipes. Two geotechnical boreholes were also present within the survey area.

Area 7

5.34 As in Area 6, above, a number of linear positive magnetic anomalies have been detected, which could possibly reflect soil-filled ditches, some forming part of a rectilinear enclosure.

5.35 The broad positive magnetic anomaly in the northeastern corner of this survey area reflects a continuation of the seasonal stream course evident in Area 5.

5.36 Two large and intense dipolar magnetic anomalies have been detected, which almost certainly reflect large buried ferrous objects. One geotechnical borehole was present in this survey area.

5.37 The linear dipolar magnetic anomaly, aligned northeast-southwest, almost certainly reflects the continuation of a ferrous service pipe detected in Area 6.

Area 8

5.38 The chain of dipolar magnetic anomalies aligned approximately north-south in the western half of the survey area almost certainly reflects a ferrous service pipe. The dipolar magnetic anomaly crossing the northern corner of the area almost certainly reflects the continuation a second ferrous service pipe, continued from Area 6.

5.39 Two bands of small dipolar magnetic anomalies, one along the western edge of the survey area and one just west of Kater Dene; both reflect existing tracks.

5.40 Six geotechnical borehole were present in this small, steep-sided area. Other dipolar magnetic anomalies within this area probably reflect disturbed ground.

Area 9

5.41 The parallel positive magnetic anomalies detected across this survey area almost certainly reflect former ridge and furrow cultivation of the area. Slight earthworks of the ridge and furrow were noted in the field.

5.42 Two of the linear positive magnetic anomalies crossing the central part of the survey area could possibly reflect a former track, and are aligned with a gate into the field.

5.43 The chain of dipolar magnetic anomalies along the western edge of the field may reflect the wire fence there and possibly also a ferrous pipe.

6. Conclusions and recommendations

6.1 A geomagnetic survey covering approximately 10ha was undertaken to the north of Morpeth, Northumberland, prior to the proposed construction of a bypass.

6.2 The remains of soil-filled features of possible archaeological origin were detected in most areas. However, based on the generally weak and disjointed nature of the anomalies, such features would appear to be truncated, with the possible exception of some small pits.

6.3 Former ridge and furrow cultivation was almost certainly detected in Areas 1, 2, 5, 6 and 9.

6.4 Probable service pipes were also detected in most areas.

6.5 A programme of archaeological trial trenching is recommended to help establish the nature, state of preservation and date of the potential archaeological features identified in the geophysical survey.

7. Sources

David, A, Linford, N, & Linford, P, 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage

Gaffney, C, Gater, J, & Ovenden, S, 2002 *The use of geophysical techniques in archaeological evaluations*. Technical Paper **6**, Institute of Field Archaeologists

Schmidt, A, 2002 *Geophysical Data in Archaeology: A Guide to Good Practice.* Archaeology Data Service, Arts and Humanities Data Service

Appendix: Project specification

Project: **Proposed Morpeth Northern Bypass** Job No: **60095823**
Subject: **Specification for an Archaeological GeophysicalSurvey**
Date: **02 February 2010**
Site Location: The site lies on the northern outskirts of Morpeth within a rural area.
NGR (linear): NZ 18489 87242 to NZ 19812 87903.
Proposal: The proposed development is for a bypass to the north of the town of Morpeth in Northumberland.
Planning ref: Pre-application.
Site area: 30m each side of the route corridor.
Land use: Agricultural land.
Client: Northumberland County Council.

1.0 Site location and description

1.1 The site is located within an area north of Morpeth predominantly made up of agricultural land. The area required for survey runs west to east and runs between grid references NZ 18489 87242 and NZ 19812 87903. The route extends over a wider area but only a portion of the area is required for geophysical survey. The eastern part of the scheme has been subject to mining activity and the western end was surveyed in 2002 as part of the A1-A192 Link Road proposals. This link road has not been built.

1.2 The solid and drift geology along the proposed road corridor consists of Upper Carboniferous sandstone strata overlain by glacial drift comprising boulder clays, sands and gravels. The soils comprise slowly permeable seasonally waterlogged fine loamy soils over clayey soils.

1.3 The approximate area for survey can be seen on the attached plan. An area of 30m each side of the route corridor should be surveyed. The area includes the proposed roundabout and link roads to the local road network.

1.4 The suitability of the area for geophysical survey should be confirmed by the contractor and agreed with AECOM.

1.5 An area of ridge and furrow survives as earthworks. These may affect the results of the survey. The tender should include an assessment of feasibility for geophysical survey within this area.

2.0 Archaeological and historical background

2.1 An Environmental Impact Assessment is currently being undertaken for the proposed development. The geophysical survey is being commissioned as part of this assessment and to help inform on the requirements for further work.

2.2 There are 80 previously recorded sites of archaeological and cultural heritage interest within approximately 500m of the proposed road. There is one Scheduled Monument consisting of two lozenge-shaped pillboxes constructed during World War II. This is located away from the area to be surveyed.

2.3 The recorded archaeological and cultural heritage assets within the study area predominantly consist of later prehistoric and Romano-British settlement sites, many identified from aerial photographs, and medieval or post-medieval field boundaries and areas of ridge and furrow cultivation. Additional sites, mainly post-medieval, are present within the study area but are of lower frequency.

2.4 Most of the land has been in agricultural use for the past three centuries and consequently there has been a lack of intrusive archaeological investigations. Where these have taken place, at Pegswood Moor Farm, extensive archaeological remains have been identified. Cropmarks suggest that habitation and activity was intensive along the northern side of the River Wansbeck. The lack of development may be beneficial to the preservation of underlying deposits of an archaeological nature although ploughing may have had an impact.

3.0 Requirement for work

3.1 The geophysical survey is required to examine the area for potential archaeological features. This information will be used to inform the requirement for further work. The survey will be undertaken as part of pre-determination evaluation works as part of an Environmental Impact Assessment.

3.2 The aim of the geophysical survey is to gather sufficient information to establish the location and extent of any archaeological features within the route corridor, and, where possible, to characterise

the archaeology thus located. The surveys should be undertaken following standard practice to achieve the best results.

3.3 The survey will result in the preparation of a report, which should follow the report outline in the standards and guidance listed in 3.5 below.

3.4 In addition to the required project design (see 4.1 below) a list of key personnel must be supplied along with details of their relevant experience in Curriculum Vitae for each member of staff as appropriate. Details of relevant experience and an insurance statement are also required.

3.5 The surveys should be carried out in accordance with the Institute for Archaeologists (IfA) *Standards & Guidance: Field Evaluation* (2008), *IFA Paper No. 6: The Use of Geophysical Techniques in Archaeological Evaluations* (2002) and English Heritage *Geophysical Survey in Archaeological Field Evaluation* (2008).

4.0 Methodology

4.1 The successful contractor will be required to prepare a project design to be agreed with the County Archaeologist. The project design should include sufficient information to detail the field methodology. The following should also be covered:

- Summary and introduction
- A written statement on the project's overall objectives, strategy and methods
- Field methodology
- Report preparation and contents
- Publication and dissemination proposals
- Timetable
- Staffing and responsibilities (including and sub-contractors and/or specialists)
- Health and safety policy and implementation
- Insurance

4.4 The surveys should be undertaken within a grid independently re-locatable on the ground by a third party, by measuring to a permanent feature.

4.5 A detailed geophysical survey should be undertaken using a fluxgate gradiometer, utilising traverses of 1m with readings taken at intervals of 0.25m within a 20mx20m survey grid. If it becomes evident that discrete features such as postholes exist in some areas, it may be necessary to reduce the traverse width to 0.5m.

4.6 The actual areas of survey, and any features of possible archaeological interest, should be accurately located on a site plan and recorded in a written description sufficient to permit the preparation of a report on the site.

4.7 During fieldwork a record should be made of surface and weather conditions that may have a bearing on subsequent interpretation of field data.

5.0 Monitoring arrangements

5.1 To ensure that archaeological work is conducted in accordance with the agreed project design, monitoring of fieldwork and post-fieldwork analysis may be required. This may be by AECOM staff or the County Archaeologist for Northumberland.

5.2 The monitors are not liable in any way for the failings of the archaeological contractor and such monitoring is not intended to take the place of proper self-regulation.

6.0 Report requirements

6.1 Essentially the report must define the location, extent and significance of archaeological features recorded as part of the survey. The final report should follow the guidance in the standards and guidance listed in paragraph 3.5 above, specifically page 9 of the 2008 English Heritage guidance, but is likely to consist of the following sections:

1) Title page
2) List of contents, figures, tables, etc
3) Non-technical summary
4) Introduction
5) 10 Figure National Grid Reference
6) Archaeological and historical background
7) Aims and Objectives
8) Methodology
9) Results – Supported by a survey location plan (minimum scale 1:2500), a plot of the raw data (minimum scale 1:1000, grey-scale format, and/or X-Y trace format as appropriate), a plot of enhanced data and one or more interpretative plots (minimum scale of 1:1000).

10) Discussion
11) Recommendations
12) Conclusion
13) References to all primary and secondary sources consulted.
14) OASIS reference number

6.2 The final report on the site should be presented in Word format and any digital images in tiff format and should be produced within four weeks of completion of fieldwork. Interim results should be provided within two weeks.

6.3 Copies of the final report should be provided to the following:

- AECOM (hard copy and pdf), including copies for distribution to the client
- Northumberland County Council Historic Environment Record (hard copy and pdf)
- OASIS (pdf)

7.0 Health and Safety, Staffing and Insurance

7.1 Health and safety will take priority over archaeological matters. All archaeologists undertaking fieldwork must comply with all Health and Safety Legislation. All archaeologists or archaeological organisations undertaking the fieldwork should ensure that they, or any proposed subcontractors, are appropriately qualified and adequately insured to undertake such projects.

7.2 The geophysicist appointed will need to provide a copy of their Health and Safety policy. In addition, a site specific risk assessment should be undertaken.

8.0 Programme

8.1 It is anticipated that the survey will be commissioned by the end of February at the latest.

8.2 The fieldwork should take place as soon as possible.

8.3 Submission of the final report to AECOM should take place within four weeks of the completion of fieldwork. Interim results should be provided within two weeks.

9.0 Tendering

9.1 In response to this specification, the archaeological contractor shall, if they wish to tender for the contract, submit a quotation for the work as specified above.

9.2 The contractor should also submit appropriate documentation to support their quotation as they feel necessary to demonstrate their experience and capability to undertake the surveys as detailed in section 3.4 above.

9.3 Questions on this specification and the tender process should be directed to James Lawton using the contact details below.

9.4 If the contractor wishes to tender for the project a proposal should be returned no later than 9th February 2010. Tender submissions should be returned to:

Helen Maclean
AECOM
2 City Walk
Leeds
LS11 9AR
Tel: 0113 391 6232
Fax: 0113 391 6899
helen.maclean@aecom.com

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on behalf of
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for
Northumberland County Council

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Figure 1: Site location

survey area

proposed route layout

0 1km
scale 1:25 000 for A4 plot

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proposed route layout

-5 nT 5

0 200m
scale 1:4000 for A3 plot

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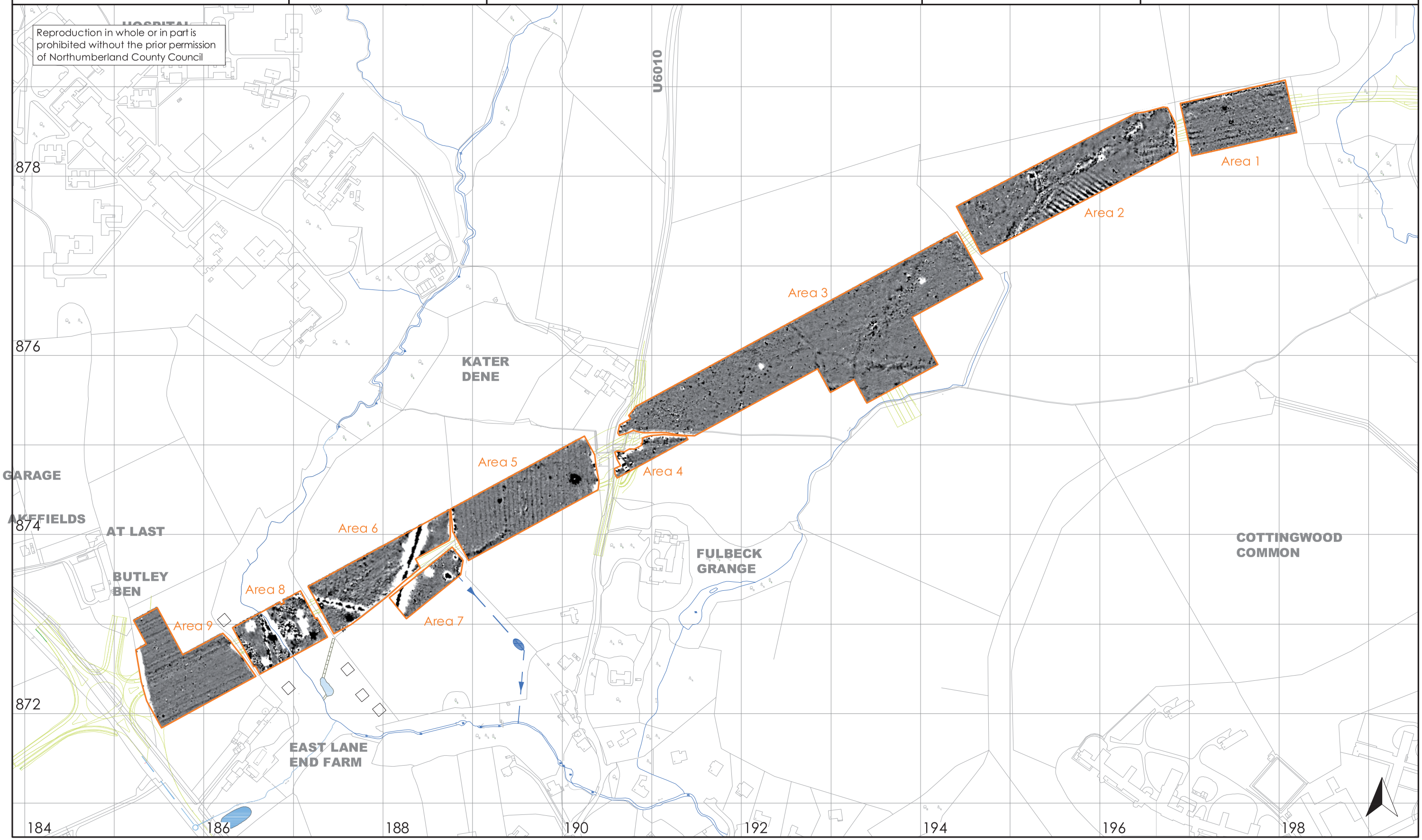
Figure 2: Geophysical survey overview



879
878
877
876
875

U6010

Area 1
Area 2
Area 3
Area 4

191 192 193 194 195 196 197 198

-5 nT 5

0 50m
scale 1:1000 for A1 plot

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Figure 3: Geophysical surveys east (Areas 1-3)

KATER DENE

LDS

AT LAST

BUTLEY BEN

EAST LANE END FARM

FULBECK GRANGE

Area 4

Area 5

Area 6

Area 7

Area 8

Area 9

876
875
874
873
872

185 186 187 188 189 190 191 192

-5 nT 5

0 50m
scale 1:1000 for A1 plot

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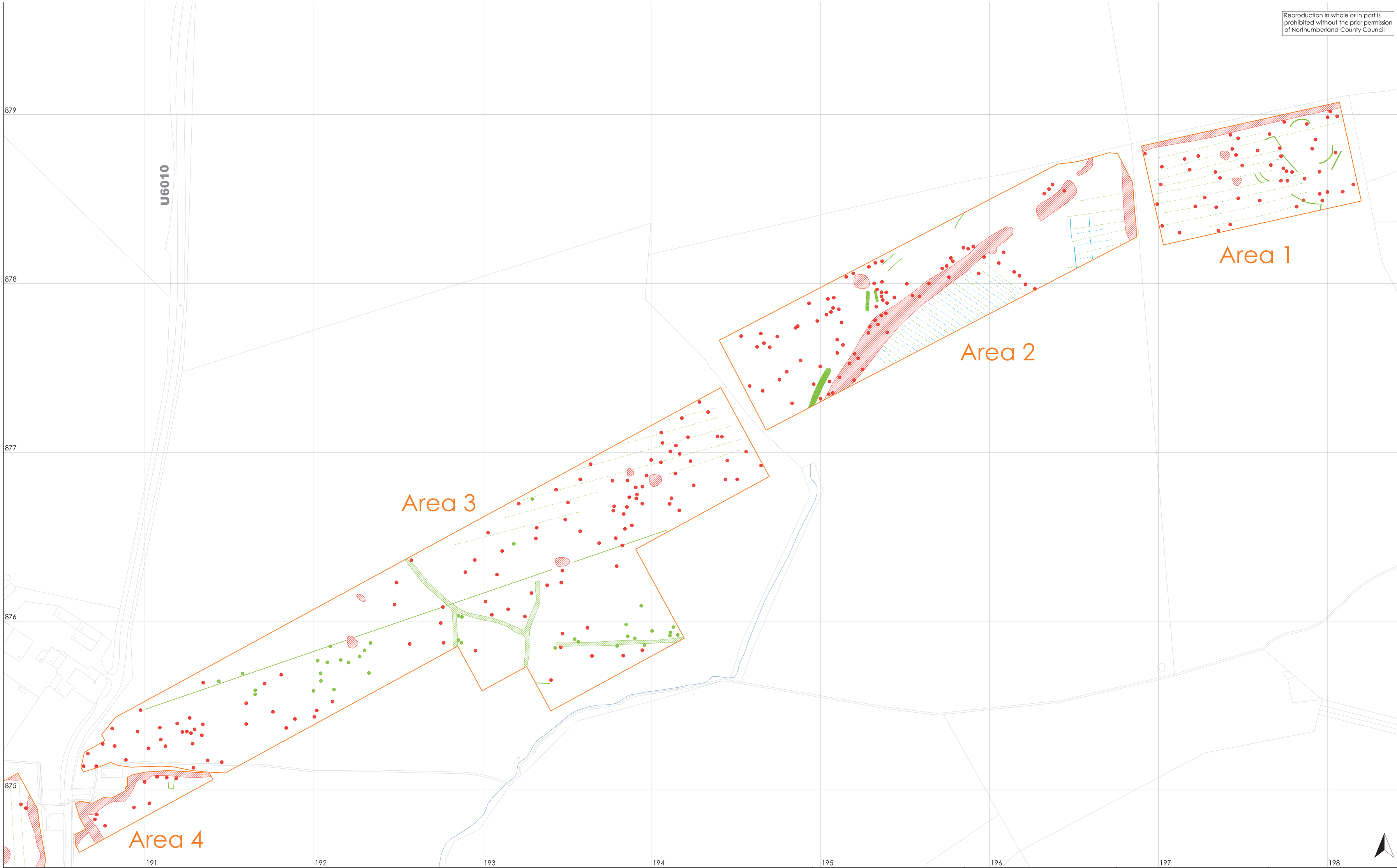
Figure 4: Geophysical surveys west (Areas 4-9)



dipolar magnetic anomalies

positive magnetic anomalies

negative magnetic anomalies

0 50m
scale 1:1000 for A1 plot

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Figure 5: Geophysical interpretations east (Areas 1-3)

KATER DENE

LDS AT LAST

BUTLEY BEN

EAST LANE END FARM

FULBECK GRANGE

Area 4

Area 5

Area 6

Area 7

Area 8

Area 9

876
875
874
873
872

185 186 187 188 189 190 191 192

dipolar magnetic anomalies
positive magnetic anomalies
negative magnetic anomalies

0 50m
scale 1:1000 for A1 plot

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Figure 6: Geophysical interpretations west (Areas 4-9)

879
878
877
876
875

U6010

Area 1

Area 2

Area 3

modern plough

Area 4

191 192 193 194 195 196 197 198

soil-filled features
stream bed
large ferrous object
service pipes
ridge and furrow
track
geotechnical borehole
proposed road layout

0 50m
scale 1:1000 for A1 plot

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Figure 7: Archaeological interpretations east (Areas 1-3)

KATER DENE

LDS

AT LAST

BUTLEY BEN

FULBECK GRANGE

EAST LANE END FARM

Area 4

Area 5

Area 6

Area 7

Area 8

Area 9

876
875
874
873
872

185 186 187 188 189 190 191 192

soil-filled features
stream bed
large ferrous object
service pipes
ridge and furrow
track
geotechnical borehole
proposed road layout

0 50m
scale 1:1000 for A1 plot

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Figure 8: Archaeological interpretations west (Areas 4-9)

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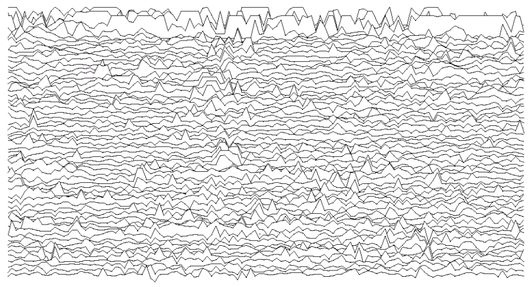
Figure 9:
Trace plots of geomagnetic data

Area 1

24.00nT/cm

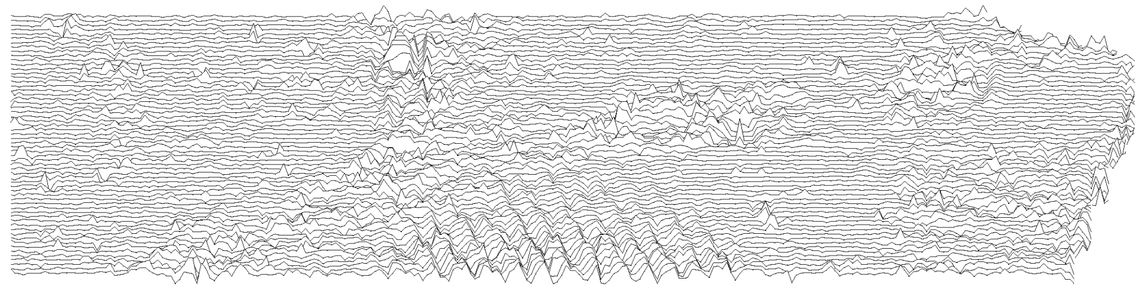
0 50m
scale 1:1000



Area 2

39.9nT/cm

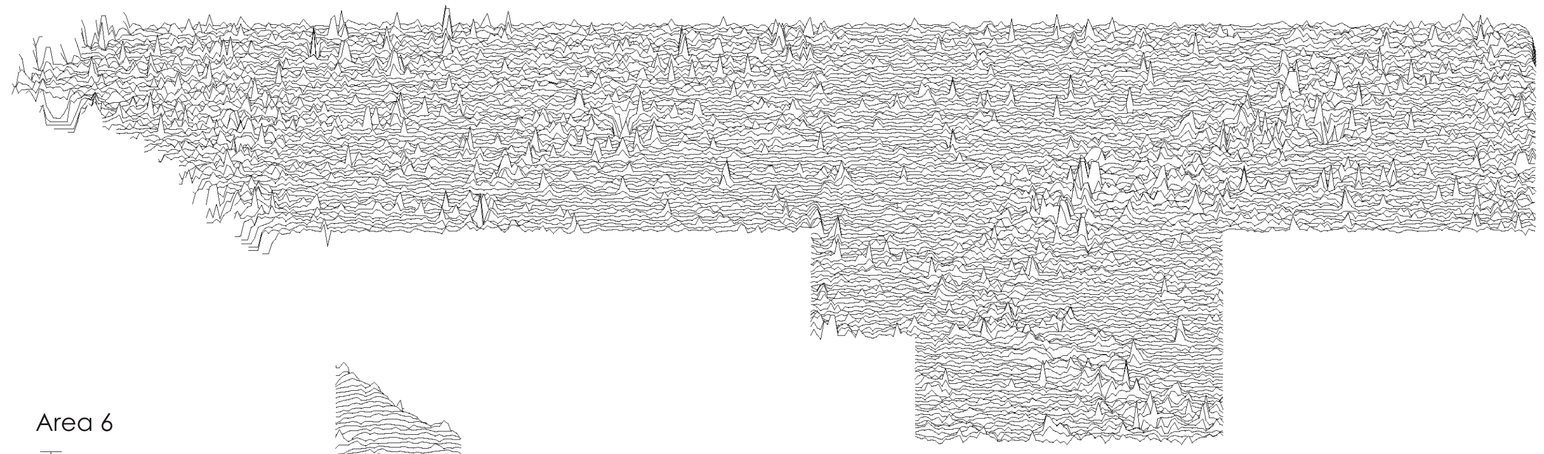
0 50m
scale 1:1000



Area 3

20.00nT/cm

0 50m
scale 1:1000



Area 4

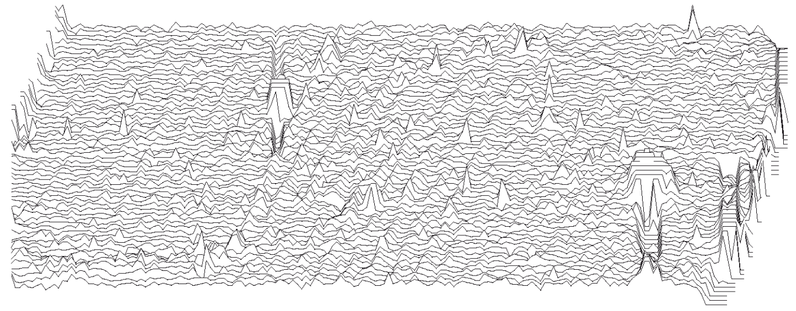
40.00nT/cm

0 50m
scale 1:1000

Area 5

20.00nT/cm

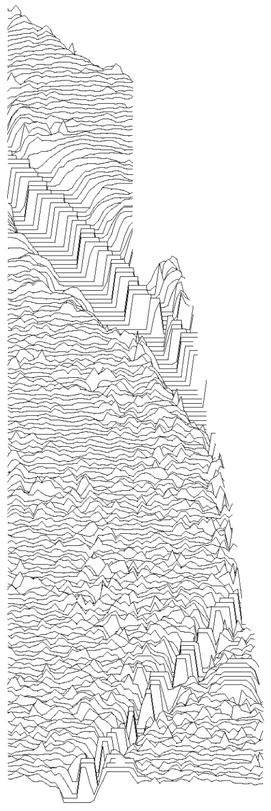
0 50m
scale 1:1000



Area 6

28.00nT/cm

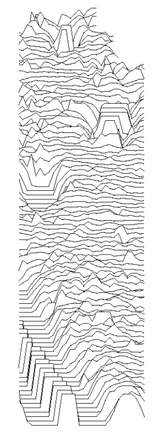
0 50m
scale 1:1000



Area 7

28.00nT/cm

0 50m
scale 1:1000



Area 8

40.00nT/cm

0 50m
scale 1:1000

Area 9

12.00nT/cm

0 50m
scale 1:1000