ARCHAEOLOGICAL SURVEYS LTD
GEOPHYSICAL SURVEY REPORT

Engine Lane, Nailsea

Magnetometer Survey
for

Nailsea Town Council

David Sabin and Kerry Donaldson
August 2007

Ref. no. 195

ARCHAEOLOGICAL SURVEYS LTD

Engine Lane, Nailsea

Magnetometer Survey

for

Nailsea Town Council

Fieldwork by David Sabin BSc (Hons) MIFA and Francis Sabin
Report by David Sabin and Kerry Donaldson BSc (Hons)

Survey date – **8th and 16th August 2007**
Ordnance Survey Grid Reference – **ST 458 695**

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SUMMARY

A magnetometry survey was carried out across approximately 4ha of agricultural land off Engine Lane to the south west of Nailsea. A number of anomalies located by the survey could not be characterised and have been classified as uncertain in origin. Within the western half of the survey area there is a widespread response to the underlying geological and pedological conditions, it is possible that a number of anomalies of uncertain origin are also natural features. A series of parallel anomalies associated with agricultural activity are located within the south eastern part of the site; a distinct northern boundary to these anomalies and a series of positive and negative linear anomalies suggest a former field boundary. Two zones of magnetic debris were located and may represent ground make-up or consolidation with waste material.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Nailsea Town Council to undertake a geophysical survey of an area of land to the west of Engine Lane, Nailsea. The survey forms part of an archaeological and environmental assessment of the site.

1.1.2 Nailsea lies within the western part of the Bristol and Somerset Coalfield. Coal extraction has been carried out extensively across the region over a long period. It is likely that coal was first exploited within the Romano-British period, the most intensive periods of activity being in the 18th and 19th centuries. There is a high potential within Nailsea and the surrounding region for remains and ground disturbance associated with former areas of mining and associated industries.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin or may represent environmental hazards. The results of the survey would provide information on the archaeological potential of the site and in addition would highlight features that may require environmental assessment.

1.2.2 Magnetometry survey was carried out in order to meet the objectives of the survey; the technique is efficient and suitable for the assessment of archaeological potential or/and the location of ground disturbance and dumping.

1.3 Site location, description and survey conditions

1.3.1 The site is located off Engine Lane, Nailsea in North Somerset. Ordnance Survey Grid Reference ST 458 695.

1.3.2 The geophysical survey covers an area of approximately 4 ha of agricultural land crossing three fields. For the purposes of this report fields have been labelled 1-3, Figure 02. Land cover during the survey consisted of grazed pasture although the central part of the site contains briars, thistles etc. and boggy areas; survey was not possible across a number of small zones, mainly within Field 2, where land cover prevented access or surface conditions were unsuitable for traversing.

1.3.3 The southern half of Field 1 is generally flat but tends to slope down with an increasing gradient towards the northern corner. Western and southern boundaries are formed mainly by overgrown drystone walls formed by the local Pennant sandstone. The eastern boundary is a mixed mature hedgerow. Field 2 forms a separate central section to the site and is surrounded by mature hedgerows on three sides, the south eastern boundary separating Field 2 from Field 3 was poorly defined by thistles and briars. Field 3 boundaries are formed by overgrown drystone walls along the southern and eastern sides with mature hedgerows along the western side.

1.4 Site history and archaeological potential

1.4.1 No specific information was made available to Archaeological Surveys Ltd. The site lies within a region of extensive coal extraction over a long period and there is some potential for features associated with this activity.

1.5 Geology and soils

1.5.1 The underlying geology is sandstone and shale associated with the Upper Coal Measures of the Carboniferous (BGS 1993).

1.5.2 The overlying soils across the site are from the Neath association which are typical brown earths. These consist of well drained fine loamy soils over rock. (Soil Survey of England and Wales 1983).

1.5.3 The underlying geology and soils are generally regarded as good for magnetic survey, however, where solid geology is relatively shallow, natural anomalies may occur.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features such as pits and ditches can produce magnetic anomalies that can be mapped during magnetic prospection. Additional technical details can be found in Appendix A.

2.1.2 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth or associated with other industrial processes. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.3 The localised variations in magnetism are measured as sub-units of the Tesla which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT) which are equivalent to 10^{-9} Tesla (T).

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a Bartington Grad601-2 gradiometer. This instrument effectively measures a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally. The instrument is extremely sensitive and is able to measure magnetic variation to 0.1nanoTesla (nT). All readings are saved to an integral data logger for analysis and presentation.

2.2.2 The instrument is operated according to the manufacturer's instructions with consideration given to the local conditions. An adjustment procedure is required prior to collection of data in order to balance the sensors and remove the effects of the Earth's magnetic field, further adjustment is required during the survey due to instrument drift often associated with temperature change. It is often very difficult to obtain optimum balance for the sensors due to localised magnetic vectors that can be associated with large ferrous objects, geological/pedological features, 'magnetic' debris within the topsoil and natural temperature fluctuations. Imperfect balance results in a heading error often visible as striping within the data; this can be effectively removed by software processing and generally has little effect on the data unless extreme. Archaeological Surveys use a non-magnetic tripod with an additional supporting structure to raise the instrument during the set-up procedure, this has been found to improve the sensor balance.

2.2.3 The Bartington gradiometer undergoes regular servicing and calibration which is carried out by the manufacturer. A current assessment of the instrument is shown in Table 1 below.

Date of calibration/service	21st May 2007
Sensor type	Bartington Grad - 01 – 1000 Nos. 084 and 085
Bandwidth	12Hz (100nT range) both sensors
Noise	<100pT peak to peak
Adjustable errors	<2nT

Table 1: Bartington fluxgate gradiometer sensor calibration results

The instrument was considered to be in good working order prior to the survey with no known faults or defects.

2.2.4 Data was collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids giving 3600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 1995).

2.2.5 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS. The GPS is used in conjunction with Leica's Smartnet service where positional corrections are sent via a mobile telephone link. Positional accuracy of around 10 – 20mm is possible using the system.

2.2.6 The fixed orientation of survey grids based on the OSGB36 datum was considered appropriate given that the orientation of land boundaries and obstructions was variable and consequently partial survey grids were unavoidable. In addition there is an optimum north – south traverse direction for magnetic survey (English Heritage,1995). Survey in this direction exploits the greater contrast of magnetic features which is a function of their presence within the Earth's magnetic field. A fixed grid across the site also simplifies its relocation should that be required.

2.3 Data processing and presentation

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger are analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display. Survey grids are assembled to form an overall composite of data (composite file) creating a dataset of the complete survey area. Appendix B contains specific information concerning the survey and data attributes and is derived directly from ArcheoSurveyor, this should be used in conjunction with information provided by Figure 02.

2.3.2 Only minimal processing is carried out in order to enhance the results of the survey for display. Raw data are always analysed as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey:

- clipping of the raw data at ±50nT to improve greyscale resolution,

- clipping of processed data at ±3nT to enhance low magnitude anomalies,
- clipping of the trace plot at ±100nT in order to minimise strong readings obscuring low magnitude responses,
- de-stagger is used to enhance linear anomalies,
- zero median/mean traverse is applied in order to balance readings along each traverse.

(Reference should be made to Appendix B for processing details).

Data processing explanation notes:

Clipping
Clipping replaces the values outside the specified minimum and maximum with those values. The process is useful for displaying detail as extreme values are removed allowing greyscale shades to be allocated to a narrower range of values which improves the definition of anomalies.

Zero Median/Mean Traverse
The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise slight differences between the set-up and stability of gradiometer sensors and is used to remove striping.

De-stagger
Compensates for small positional errors within data collection by shifting the position of the readings along each traverse by a specified amount.

2.3.3 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. A brief summary of each anomaly with an appropriate reference number is set out in list form within the results (Section 3), to allow a rapid assessment of features. Where further interpretation is possible or where a number of possible origins should be considered, further more detailed discussion is set out in Section 4.

2.3.4 The main form of data display used in this report is the greyscale plot. Magnetic data are also displayed as a trace plot. Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot.

2.3.5 Graphic raster images in Bitmap format are initially prepared in ArcheoSurveyor. Regardless of survey orientation, data captured along each traverse is displayed and processed by ArcheoSurveyor from left to right; this corresponds to a direction of south to north in the field. Prior to displaying against base mapping, raster graphics require a rotation of 90° anticlockwise t o restore north to the top of the image. Greyscale images are rotated using Paint Shop Pro, traceplots are rotated using ArcheoSurveyor. Rotated traceplots are derived from interpolated datasets and can be considered as representative only as the raw data will have been modified to a minor degree.

2.3.6 The raster images are combined with base mapping using AutoCAD LT 2007 creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method etc.. A digital archive including raster images is produced with this report allowing separate analysis if necessary, see 2.4 below.

2.4 Archive

2.4.1 Survey results are produced in hardcopy using A4 for text and A3 for plots (all plots are scaled for A3). In addition digital data created during the survey are supplied on CD. Further information on the production of the report and the digital formats involved in this creation are set out below.

2.4.2 This report has been prepared using the following software on a Windows XP platform:

- ArcheoSurveyor version 2.1.2.2 (geophysical data analysis),
- AutoCAD LT 2007 (report figures),
- JASC Paint Shop Pro 8 (image rotation),
- OpenOffice.org 2.2 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

2.4.3 Digital data are supplied on CD ROM and includes the following files:

- ArcheoSurveyor grid and composite files,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as OpenOffice.org odt file,
- report text as Word 2000 doc file,
- report text as rich text format (RTF),
- report text as PDF,
- PDFs of all figures.

2.4.4 The CD ROM structure is formed from a tree of directories under the title J195 Nailsea – CD. Directory titles include Data, Documentation, CAD, PDFs and Photos. Multiple directories exist under Data and hold Grid, Composite and Graphic files with CSV composite data held in Export.

2.4.5 The CAD file contains externally referenced graphics that may be rotated, see 2.3.5, with separate A3 size layouts for each figure. Layouts are fixed using frozen layers and named views allowing straightforward plotting or analysis on screen. (Note – CAD files are prepared using AutoCAD's eTransmit function to produce a directory containing the digital drawing along with any externally referenced graphics which may need reloading).

3 RESULTS

3.1 General overview

3.1.1 The detailed magnetic survey was carried out over an area of approximately 4ha. Geophysical anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance, anomalies associated with geological/pedological features and strong discrete dipolar anomalies relating to ferrous objects. Anomalies located within each survey area have been numbered and will be outlined below with subsequent discussion in Section 4.

3.1.2 The listing of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation. Sub-headings are then used to group anomalies with similar characteristics.

Anomalies with an uncertain origin

Positive anomalies

Negative anomalies

The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features but equally relatively modern features, geological/pedological features and agricultural features should be considered.

Anomalies with an agricultural origin

Agricultural anomalies

Where confidence is high that anomalies have been caused by agricultural features this category is applied. The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to modern ploughing.

Anomalies associated with land boundaries

Field boundary

Positive and negative linear response may be associated with earthwork remains and ditches typical of former field boundaries. The anomalies may be projections of or lie perpendicular to extant boundaries.

Anomalies with a modern origin

Magnetic disturbance

Strong multiple dipolar linear anomaly - pipeline/service

The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance – such disturbance can effectively obscure low magnitude anomalies if they are present.

Anomalies associated with magnetic debris

Magnetic debris

Strong discrete dipolar anomaly

The response often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. Magnetic debris often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, or hearths and may therefore be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.

3.2 List of anomalies

Area centred on OS NGR 345892, 169530 see Figures 03 – 06

Anomalies with an uncertain origin

(1) – Several broad positive and negative linear anomalies located across the survey area are of very low magnitude. These anomalies may be associated with natural geological/pedological features.

(2) – A positive linear anomaly close to the southern boundary of Field 1 may be a response to a track although could be associated with a buried service.

(3) – Several parallel negative and positive linear anomalies cross Field 3. It is possible that they represent the course of a buried service although they may be associated with agricultural activity.

(4) – Several low magnitude positive and negative linear anomalies were located by the survey, it is not possible to interpret these anomalies.

(5) – A number of discrete positive anomalies were located within Fields 1 and 3. Although this type of response may represent pit-like features, it is possible that some are related to natural pedological variation.

Anomalies associated with land boundaries

(6) – Relatively strong positive and negative linear or curvilinear response correlates with a distinct break of slope and slight linear depression within Field 3. The feature lies at the northern boundary of a series of parallel linear agricultural anomalies and it is likely that it marks the position of a former field boundary.

Anomalies related to geological/pedological conditions

(7) – A large zone of amorphous positive and negative anomalies is likely to represent an area of shallow solid geology.

Anomalies associated with magnetic debris

(8) – An area of magnetic debris within the southern part of Fields 2/3 contains high magnitude readings typical of ferrous objects. It is possible that this represents dumped waste material in an attempt to make-up the ground surface or infill a boggy area.

(9) – An area of magnetic debris close to the eastern boundary of Field 3 may represent dumped material with a high ferrous content.

Anomalies with a modern origin

(10) – Several areas of magnetic disturbance within Fields 1, 2 and 3 have been caused by modern features including steel gates and electricity poles.

All fields contain strong dipolar anomalies typical of shallow ferrous objects.

Anomalies with an agricultural origin

(11) – A series of parallel linear anomalies were located within the southern part of Field 3. It is likely that these have been formed by ploughing or other agricultural processes.

4 DISCUSSION

4.1

4.1.1 No features of significant archaeological potential were defined by the magnetometry survey. A number of anomalies are of uncertain origin and it is possible that they relate to cut features with some archaeological potential, however, agricultural and natural features should also be considered. No anomalies could be directly attributed to former coal extraction although two zones of magnetic debris may be associated with former industrial activity within the site or adjacent areas, see 4.1.4.

4.1.2 Several linear anomalies relating to a probable former land boundary were located within Field 3 (anomalies labelled 6, Figure 06). The boundary appears to define a change in former land use as agricultural marks related to ploughing or similar soil disturbance (11, Figure 06) are restricted to the south of the feature. Lower lying land to the north of the boundary was clearly damper during the survey period and probably less suitable for arable activity.

4.1.3 A widespread zone of amorphous positive and negative anomalies located in Field 1 has been interpreted as of natural geological or/and pedological origin (labelled 7, Figure 06). This pattern has been observed from the results of other surveys within the region and is probably a result of shallow rock or an uneven rock – soil interface. The response may mask discrete features of anthropogenic origin. Other low magnitude positive and negative linear anomalies (labelled 1, Figure 06) may possibly also represent geological features.

4.1.4 Two zones of magnetic debris (labelled 8 and 9, Figure 06) may represent areas of dumping or ground make-up with waste materials. The material is of high ferrous content and of relatively shallow depth below or within the topsoil; it is not possible to determine the actual thickness of the deposit from the geophysics. The larger zone, labelled 9 in Figure 06, is located adjacent to a very damp area within Field 2 and it is possible that dumping has occurred as an attempt to improve the drainage and the ground conditions within this area. The smaller zone of magnetic debris close to the eastern boundary may represent an area of dumping accessed easily from Engine Lane.

5 CONCLUSION

5.1

5.1.1 The magnetometry survey located a number of anomalies that could not be confidently interpreted, the archaeological potential of these features is low but should be considered. A series of positive and negative linear and curvilinear anomalies located within the eastern part of the site have been interpreted as a former land boundary. A number of positive discrete anomalies may represent pit-like features.

5.1.2 A zone of amorphous positive and negative responses within the eastern part of the site has been interpreted as being geological or pedological in origin. Other broad positive and negative linear anomalies of low magnitude may also be related to the underlying geology.

5.1.3 Two areas of magnetic debris may represent areas of dumping and ground make-up. The magnetic responses suggest a high ferrous content, however, further investigation into the nature of this material would be required in order to fully understand its origin.

6 REFERENCES

British Geological Survey, 1993. *Bristol District, England and Wales Special Sheet, Solid and Drift Edition, One -Inch Series.*

English Heritage, 1995. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1.*

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 5 South West England.*

Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetica field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

Appendix B – survey and data information

Raw magnetometry

COMPOSITE
Filename: Mag-raw.xcp
Instrument Type: Grad 601 (Magnetometer)
Units: nT
Surveyed by: DJS on 16/08/2007
Assembled by: DJS on 16/08/2007
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 960 x 330
Grid Size: 30 x 30
X Interval: 0.25
Y Interval: 1

Stats
Max: 50.00
Min: -50.00
Std Dev: 6.02
Mean: -0.39

Processes: 2
1 Base Layer
2 Clip from -50 to 50

Source Grids: 54
1 Col:0 Row:0 grids\51.asg
2 Col:0 Row:1 grids\52.asg
3 Col:0 Row:2 grids\53.asg
4 Col:0 Row:3 grids\29.asg
5 Col:0 Row:4 grids\30.asg
6 Col:0 Row:5 grids\31.asg
7 Col:0 Row:7 grids\06.asg
8 Col:0 Row:8 grids\01.asg
9 Col:0 Row:9 grids\02.asg
10 Col:1 Row:0 grids\48.asg
11 Col:1 Row:1 grids\49.asg
12 Col:1 Row:2 grids\50.asg
13 Col:1 Row:3 grids\32.asg
14 Col:1 Row:4 grids\33.asg
15 Col:1 Row:5 grids\34.asg
16 Col:1 Row:6 grids\07.asg
17 Col:1 Row:7 grids\08.asg
18 Col:1 Row:8 grids\03.asg
19 Col:1 Row:9 grids\04.asg
20 Col:1 Row:10 grids\05.asg
21 Col:2 Row:1 grids\46.asg
22 Col:2 Row:2 grids\47.asg
23 Col:2 Row:3 grids\35.asg
24 Col:2 Row:4 grids\36.asg
25 Col:2 Row:5 grids\37.asg
26 Col:2 Row:6 grids\09.asg
27 Col:2 Row:7 grids\10.asg
28 Col:2 Row:8 grids\11.asg
29 Col:2 Row:9 grids\12.asg
30 Col:2 Row:10 grids\13.asg
31 Col:3 Row:1 grids\44.asg
32 Col:3 Row:2 grids\45.asg
33 Col:3 Row:3 grids\38.asg
34 Col:3 Row:4 grids\39.asg
35 Col:3 Row:5 grids\55+40.asg
36 Col:3 Row:6 grids\16.asg
37 Col:3 Row:7 grids\17.asg
38 Col:3 Row:8 grids\14.asg
39 Col:3 Row:9 grids\15.asg
40 Col:4 Row:2 grids\43.asg
41 Col:4 Row:3 grids\41.asg
42 Col:4 Row:4 grids\42.asg
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44 Col:4 Row:6 grids\18.asg
45 Col:4 Row:7 grids\19.asg
46 Col:4 Row:8 grids\20.asg
47 Col:5 Row:5 grids\23.asg
48 Col:5 Row:6 grids\22.asg
49 Col:5 Row:7 grids\21.asg
50 Col:6 Row:5 grids\24.asg
51 Col:6 Row:6 grids\25.asg
52 Col:6 Row:7 grids\27.asg
53 Col:7 Row:6 grids\26.asg
54 Col:7 Row:7 grids\28.asg

Processed magnetometry

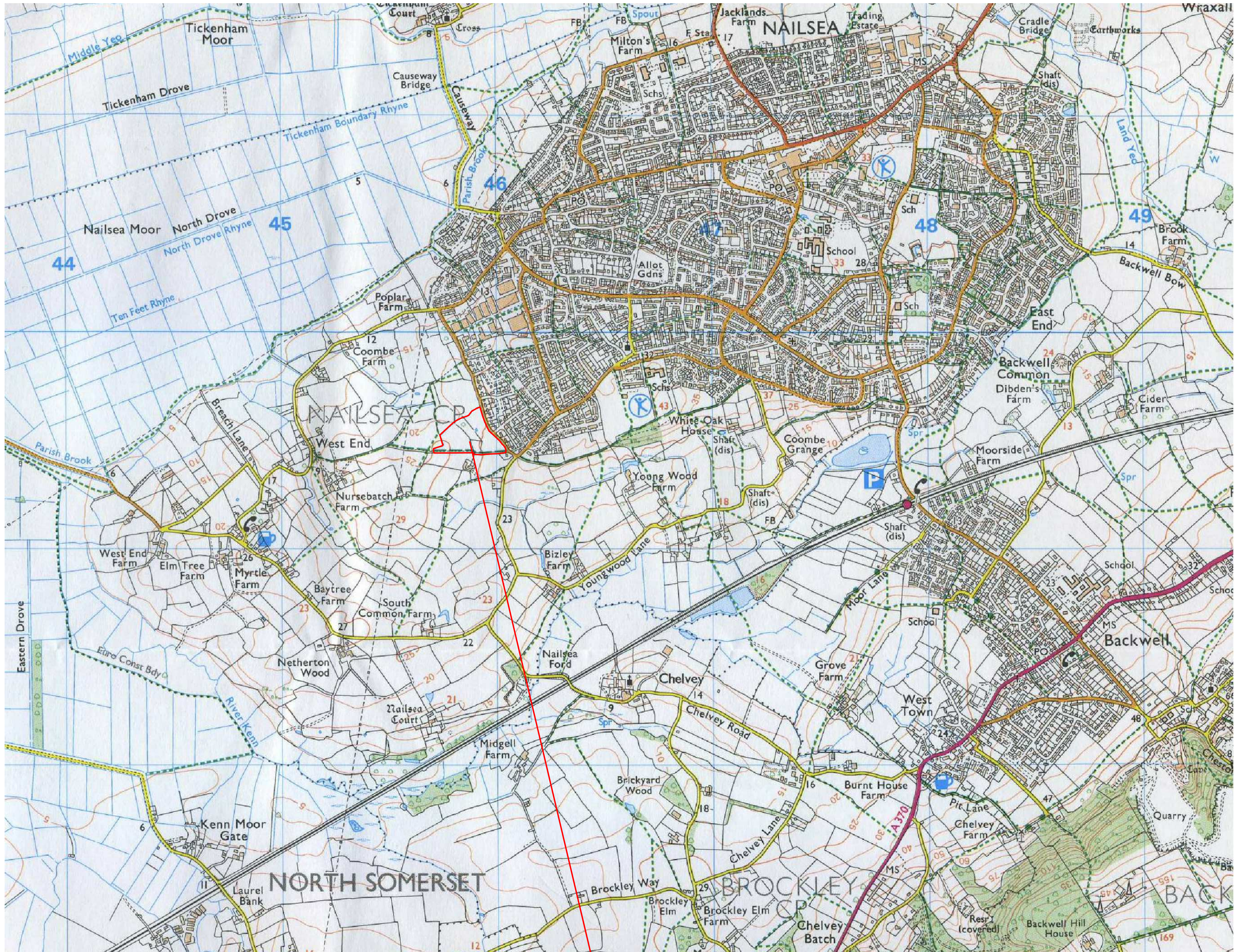
COMPOSITE
Filename: Mag-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.30
Mean: -0.04

Processes: 7
1 Base Layer
2 Clip from -50 to 50
3 DeStripe Median Traverse: Grids: 51.asg 52.asg 53.asg 29.asg 30.asg 31.asg 06.asg 01.asg 02.asg 48.asg 49.asg 50.asg 32.asg 33.asg 34.asg 03.asg 04.asg 05.asg 46.asg 47.asg 35.asg 36.asg 37.asg 11.asg 13.asg 44.asg 45.asg 38.asg 39.asg 55+40.asg 16.asg 17.asg 14.asg 15.asg 43.asg 41.asg 42.asg 18.asg 19.asg 20.asg 23.asg 22.asg 21.asg 24.asg 25.asg 27.asg
4 Clip from -10 to 10
5 DeSlope (Area: Top 150, Left 480, Bottom 164, Right 600) using Horz Polynomial
6 De Stagger: Grids: All Mode: Both By: -1 intervals
7 Clip from -3 to 3

Archaeological Surveys Ltd

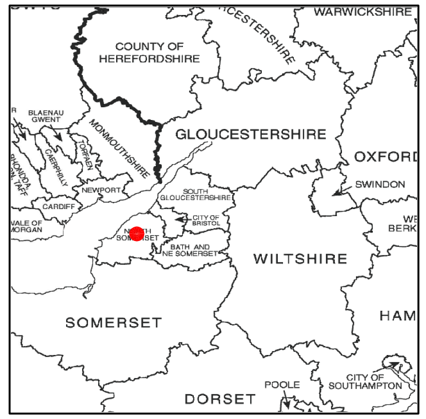
Geophysical Survey
Engine Lane, Nailsea



Survey area

Map of survey area

Reproduced from OS Explorer map no.154 1:25 000 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100043739.



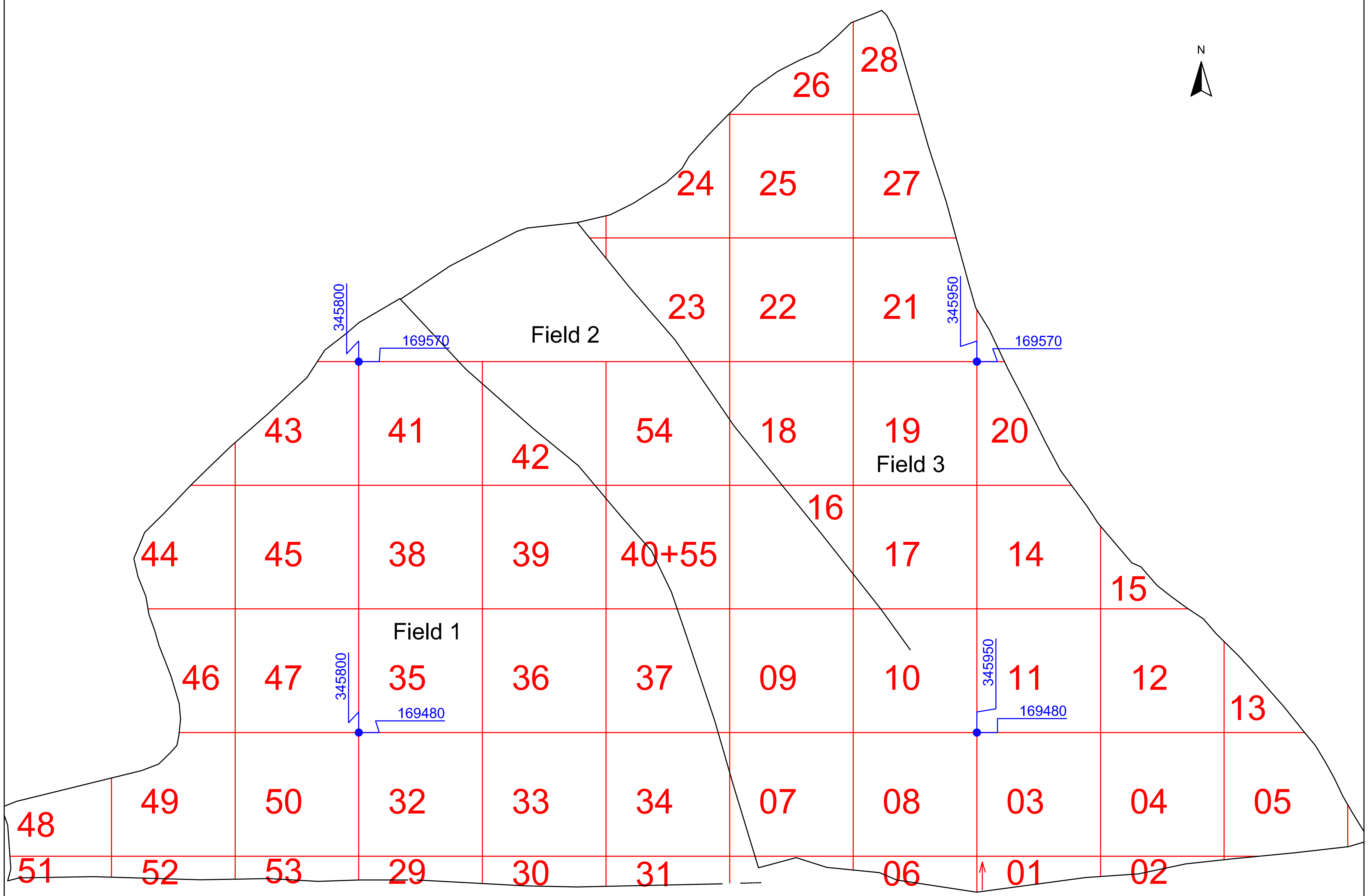
● Survey location

Site centred on OS NGR
ST 458 695

SCALE 1:25 000

0m 500m 1000m

FIG 01



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Geophysical Survey
Engine Lane, Nailsea

Referencing information

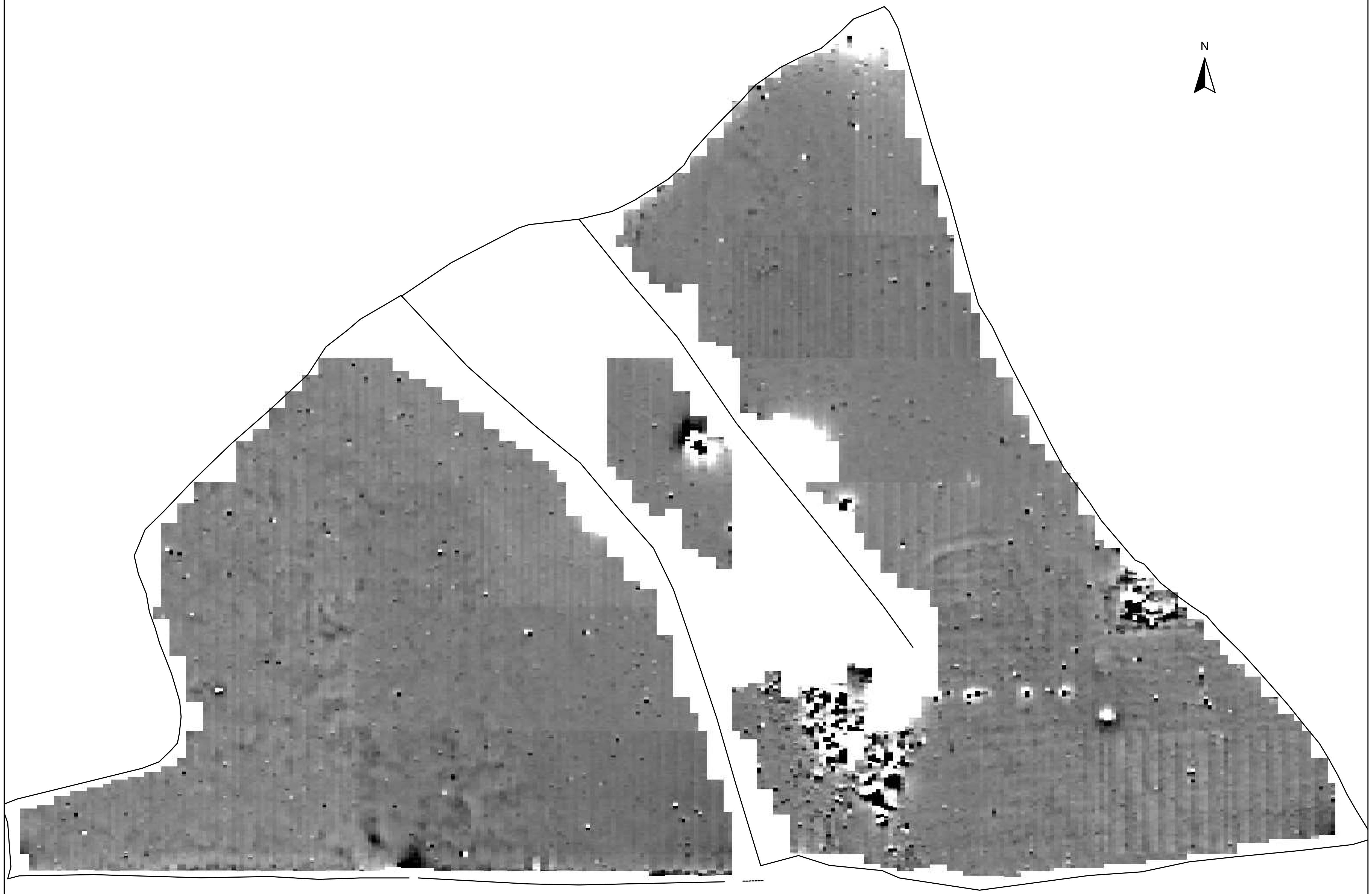
Based on OS coordinates (OSGB36)

Survey start and traverse direction

SCALE 1:1000

0m 10 20 30 40 50m

FIG 02



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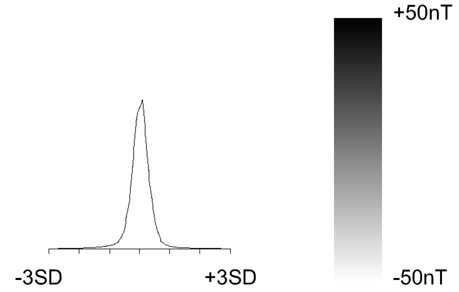
Geophysical Survey
Engine Lane, Nailsea

Greyscale plot of raw magnetometer data



SCALE 1:1000

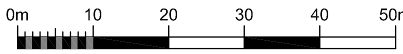
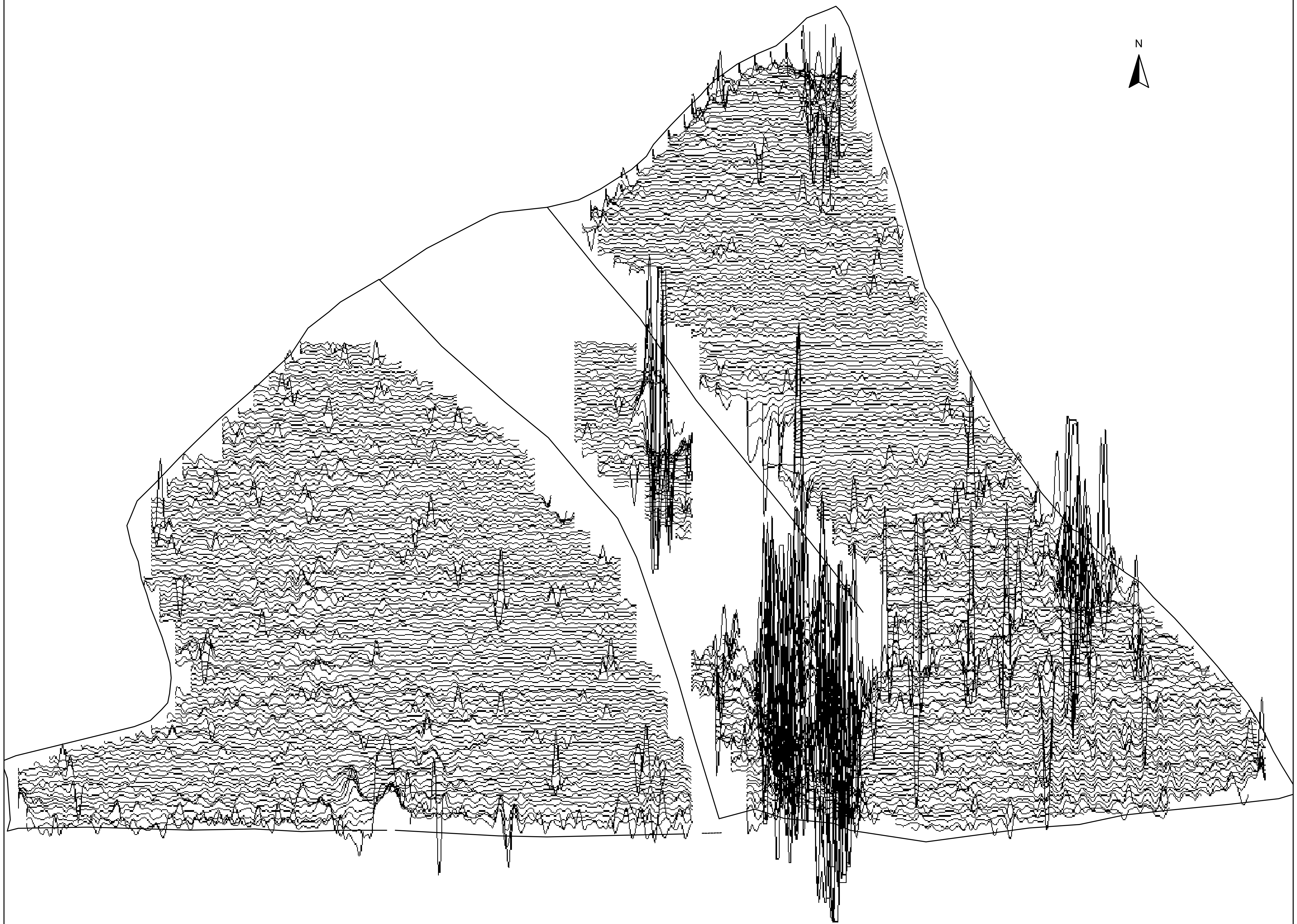


FIG 03



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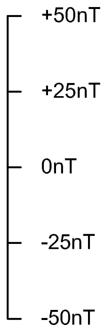
Traceplot of raw magnetometer data



SCALE 1:1000

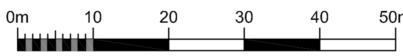


FIG 04

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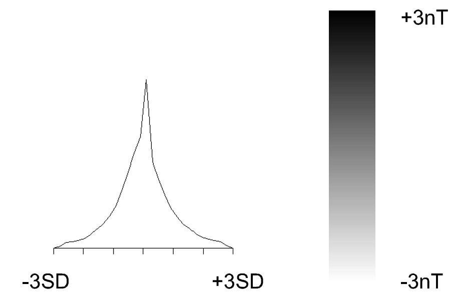
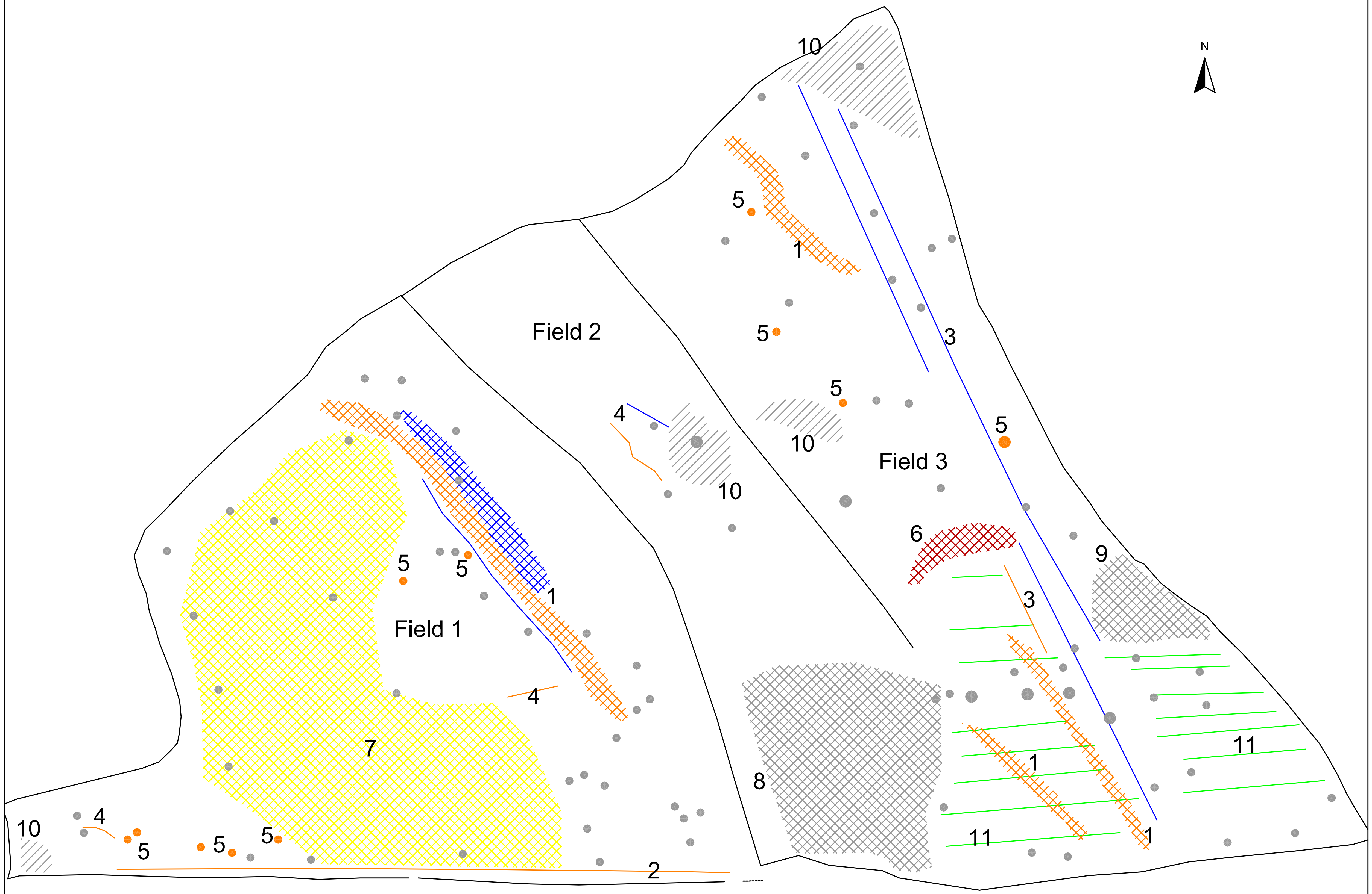
Greyscale plot of processed magnetometer data



SCALE 1:1000

0m 10 20 30 40 50m

FIG 05



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Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - of uncertain origin
- Linear anomaly - of agricultural origin
- Negative linear anomaly - of uncertain origin
- Positive/negative anomalies - possible former land boundary
- Positive anomaly - uncertain origin
- Negative anomaly - uncertain origin
- Positive and negative amorphous anomalies - possible geology
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance - response to ferrous material
- Strong dipolar anomaly - ferrous object in topsoil

SCALE 1:1000

0m 10 20 30 40 50m

FIG 06