

SITE SUMMARY SHEET

95 / 48 Bucknall, Lincolnshire

NGR: TF 165 685

Location, topography and geology

The site lies immediately to the rear of Town Hill Farm, at the centre of the village of Bucknall, Lincolnshire, which is on the B1190 road approximately 20km east of Lincoln. The survey area occupies part of a farmyard on generally level ground. The soils are of the Ragdale association and the underlying geology is a chalky till.

Archaeology

Other than a few earthworks along the northern edge of the survey area, there is no information regarding the archaeology of the site. The name Town Hill Farm and its location at the centre of the present village suggest that settlement remains, of possible Medieval date, may be present. However, given the hilltop location of the village, it is possible that the site has been the focus of occupation activity over a longer period.

Aims of Survey

A fluxgate gradiometer survey was undertaken as part an archaeological assessment being carried out by **Archaeological Project Services** in advance of proposed residential development. The aim of the survey was to locate any archaeological features that may survive within the application area.

Summary of Results *

The majority of the site was found to be subject to severe magnetic interference from a number of sources. Despite this, it was thought possible that archaeological features producing strong responses and linear anomalies might be detectable in the results. However, no responses suggesting the presence of archaeological features were observed in the data. It is possible that archaeological remains have survived at the site and that anomalies produced by them have been masked by stronger, ferrous magnetic fields.

* It is essential that this summary is read in conjunction with the detailed results of the survey.

SURVEY RESULTS

95 / 48 Bucknall, Lincolnshire

1. Survey Area

1.1 Two survey areas, separated by a wire fence were examined with the gradiometer and measured a total of 0.3ha. The location of the survey area combined with an interpretation of the survey results, is shown in Figure 1 at a scale of 1:1250.

1.2 The survey grid was set out by **Geophysical Surveys of Bradford** and detailed tie-in information has been lodged with the client.

2. Display

2.1 The results are displayed as X-Y traces and a dot density plot. These display formats are discussed in the *Technical Information* section, at the end of the text.

2.2 Figures 2, 3 and 4 are data plots of the survey results, produced at a scale of 1:500.

3. General Considerations - Complicating factors

3.1 The ground conditions at the time of the survey were variable. Although most of the site was free of obstructions, some parts were overgrown and contained holes and surface debris. The smaller of the two survey areas was under potato cultivation at the time of the survey and hence made walking difficult.

3.2 The site was found to be magnetically disturbed by large quantities of buried debris, fences and adjacent buildings. Part of the site had recently been used as a scrap yard and landscaping and ground consolidation has taken place (Mr Butcher, *pers. comm.*). A pond had recently been restored and material from it spread over the adjacent areas. These factors have contributed to a high level of magnetic disturbance, which will mask responses from archaeological features.

4. Results of Survey

4.1 The results show that the major part of the application area is affected by strong magnetic disturbance due to the factors described in the previous section.

4.2 The two X-Y trace plots in particular indicate the extent of magnetic interference encountered during the survey. If archaeological remains have survived in these areas their responses will have been hidden within this noise.

4.3 Within the few relatively quiet areas of the survey, there is a scatter of ferrous debris likely to be modern in origin. The gradiometer detected no anomalies that can be considered to be of archaeological interest.

5. Conclusions

5.1 The fluxgate gradiometer survey shows that the site is subject to substantial levels of magnetic interference, which will have masked anomalies produced by archaeological remains, if any are present in these areas.

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Date of Survey: 12th May 1995

Date of Report: 26th May 1995

TECHNICAL INFORMATION

The following is a description of the equipment and display formats used in **GEOPHYSICAL SURVEYS OF BRADFORD** reports. It should be emphasised that whilst all of the display options are regularly used, the diagrams produced in the final reports are the most suitable to illustrate the data from each site. The choice of diagrams results from the experience and knowledge of the staff of **GEOPHYSICAL SURVEYS OF BRADFORD**.

All survey reports are prepared and submitted on the basis that whilst they are based on a thorough survey of the site, no responsibility is accepted for any errors or omissions.

Magnetic readings are logged at 0.5m intervals along one axis in 1m traverses giving 800 readings per 20m x 20m grid, unless otherwise stated. Resistance readings are logged at 1m intervals giving 400 readings per 20m x 20m grid. The data are then transferred to portable computers and stored on 3.5" floppy discs. Field plots are produced on a portable Hewlett Packard Thinkjet. Further processing is carried out back at base on computers linked to appropriate printers and plotters.

Instrumentation

(a) Fluxgate Gradiometer - Geoscan FM36

This instrument comprises of two fluxgates mounted vertically apart, at a distance of 500mm. The gradiometer is carried by hand, with the bottom sensor approximately 100-300mm from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is conventionally measured in nanoTesla (nT) or gamma. The fluxgate gradiometer suppresses any diurnal or regional effects. Generally features up to one metre deep may be detected by this method.

(b) Resistance Meter - Geoscan RM4 or RM15

This measures the electrical resistance of the earth, using a system of four electrodes (two current and two potential.) Depending on the arrangement of these electrodes an exact measurement of a specific volume of earth may be acquired. This resistance value may then be used to calculate the earth resistivity. The "Twin Probe" arrangement involves the pairing of electrodes (one current and one potential) with one pair remaining in a fixed position, whilst the other measures the resistance variations across a fixed grid. The resistance is measured in Ohms and the calculated resistivity is in Ohm-metres. The resistance method as used for area survey has a depth resolution of approximately 0.75m, although the nature of the overburden and underlying geology will cause variations in this generality. The technique can be adapted to sample greater depths of earth and can therefore be used to produce vertical "pseudo sections".

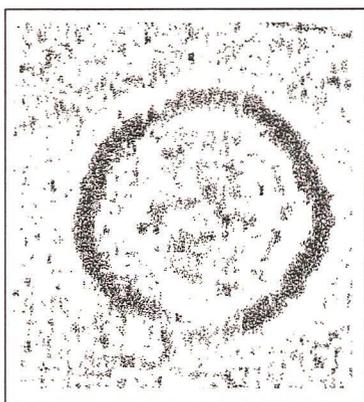
(c) Magnetic Susceptibility

Variations in the magnetic susceptibility of subsoils and topsoils occur naturally, but greater enhanced susceptibility can also be a product of increased human/anthropogenic activity. This phenomenon of susceptibility enhancement can therefore be used to provide information about the "level of archaeological activity" associated with a site. It can also be used in a predictive manner to ascertain the suitability of a site for a magnetic survey. The instrument employed for measuring this phenomenon is either a field coil or a laboratory based susceptibility bridge. For the latter 50g soil samples are collected in the field.

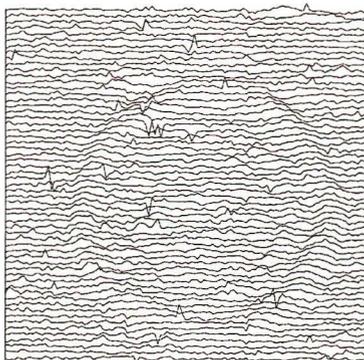
Display Options

The following is a description of the display options used. Unless specifically mentioned in the text, it may be assumed that no filtering or smoothing has been used to enhance the data. For any particular report a limited number of display modes may be used.

(a) Dot-Density



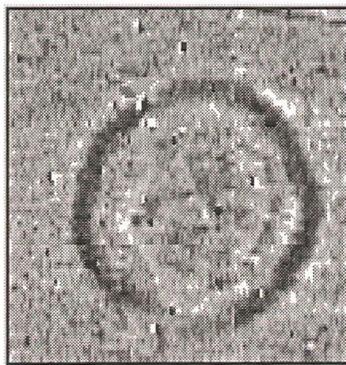
In this display, minimum and maximum cut-off levels are chosen. Any value that is below the minimum cut-off value will appear white, whilst any value above the maximum cut-off value will appear black. Any value that lies between these two cut-off levels will have a specified number of dots depending on the relative position between the two levels. The focus of the display may be changed using different levels and a contrast factor (C.F.). Usually the C.F. = 1, producing a linear scale between the cut-off levels. Assessing a lower than normal reading involves the use of an inverse plot, This plot simply reverses the minimum and maximum values, resulting in the lower values being presented by more dots. In either representation, each reading is allocated a unique area dependent on its position on the survey grid, within which numbers of dots are randomly placed. The main limitation of this display method is that multiple plots have to be produced in order to view the whole range of the data. It is also difficult to gauge the true strength of any anomaly without looking at the raw data values. This display is much favoured for producing plans of sites, where positioning of the anomalies and features is important.



(b) X-Y Plot

This involves a line representation of the data. Each successive row of data is equally incremented in the Y axis, to produce a stacked profile effect. This display may incorporate a hidden-line removal algorithm, which blocks out lines behind the major peaks and can aid interpretation. Advantages of this type of display are that it allows the full range of the data to be viewed and shows the shape of the individual anomalies. Results are produced on a flatbed plotter.

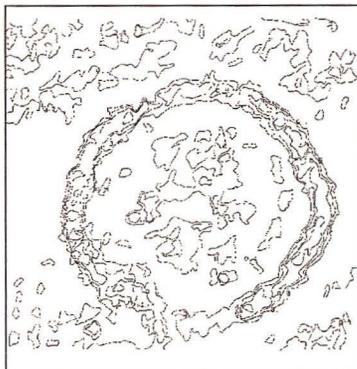
Display Options cont'd



(c) Grey-Scale

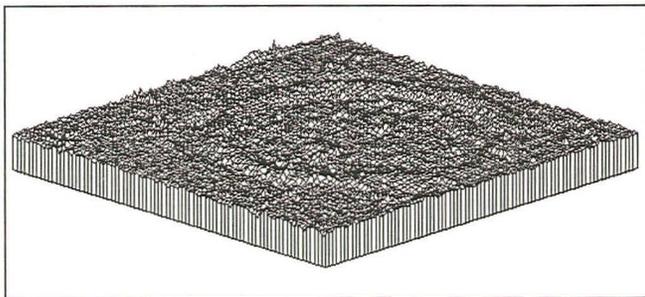
This format divides a given range of readings into a set number of classes. These classes have a predefined arrangement of dots or shade of grey, the intensity increasing with value. This gives an appearance of a toned or grey scale.

Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. While colour plots can look impressive and can be used to highlight certain anomalies, grey-scales tend to be more informative.



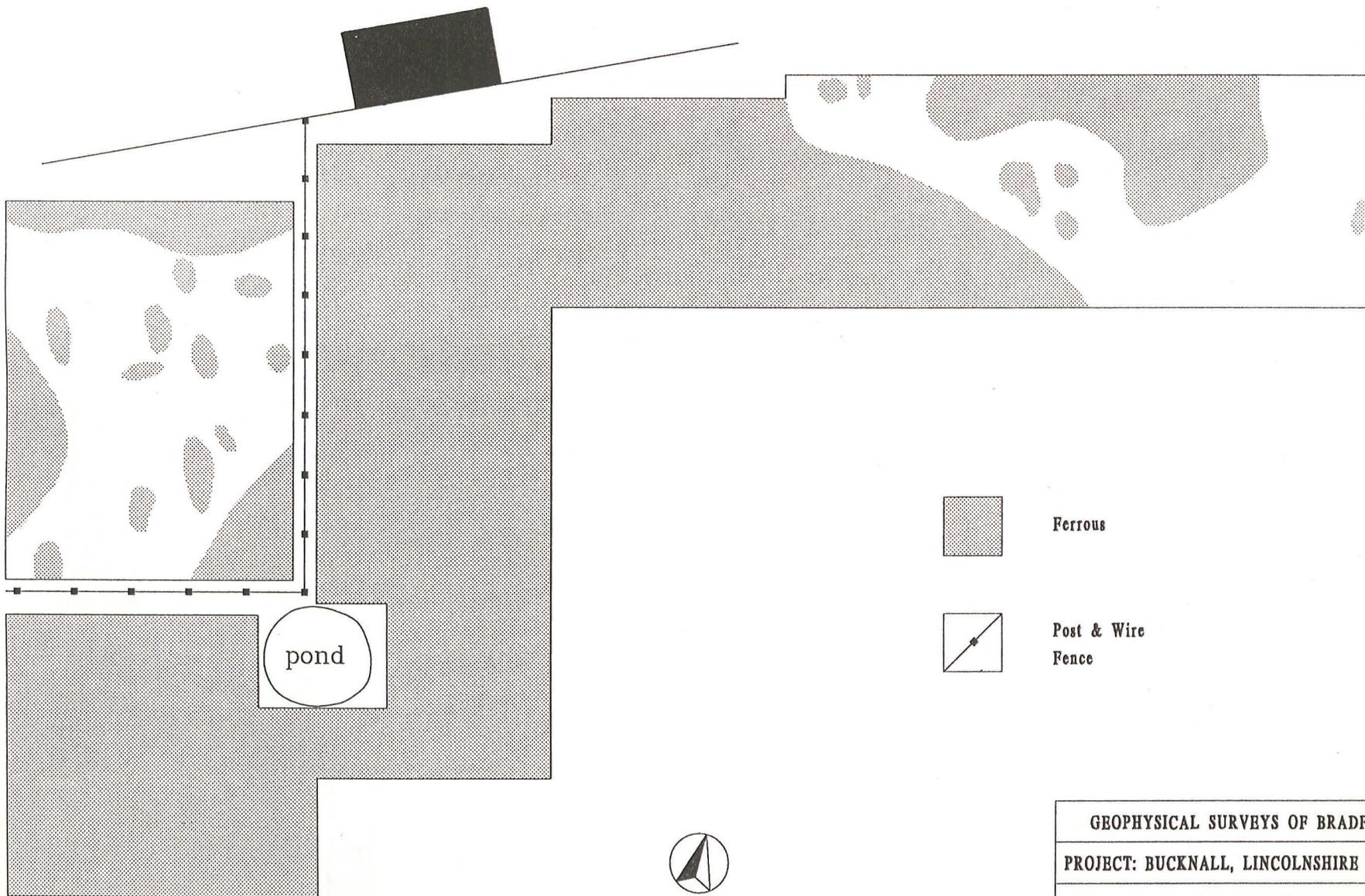
(d) Contour

This display format is commonly used in cartographic displays. Data points of equal value are joined by a contour line. Closely packed contours indicate a sharp gradient. The contours therefore highlight an anomalous region. The range of contours and contour interval are selected manually and the display is then generated on the computer screen or plotted directly on a flat bed plotter / inkjet printer.



(e) 3-D Mesh

This display joins the data values in both the X and Y axis. The display may be changed by altering the horizontal viewing angle and the angle above the plane. The output may be either colour or black and white. A hidden line option is occasionally used (see (b) above).



Ferrous



Post & Wire
Fence



0 metres 20

GEOPHYSICAL SURVEYS OF BRADFORD	
PROJECT: BUCKNALL, LINCOLNSHIRE	
TITLE: Interpretation of Gradiometer Survey	
Survey Location Details based on measurements taken in the field by GSB	Figure 1

BUCKNALL Lincolnshire

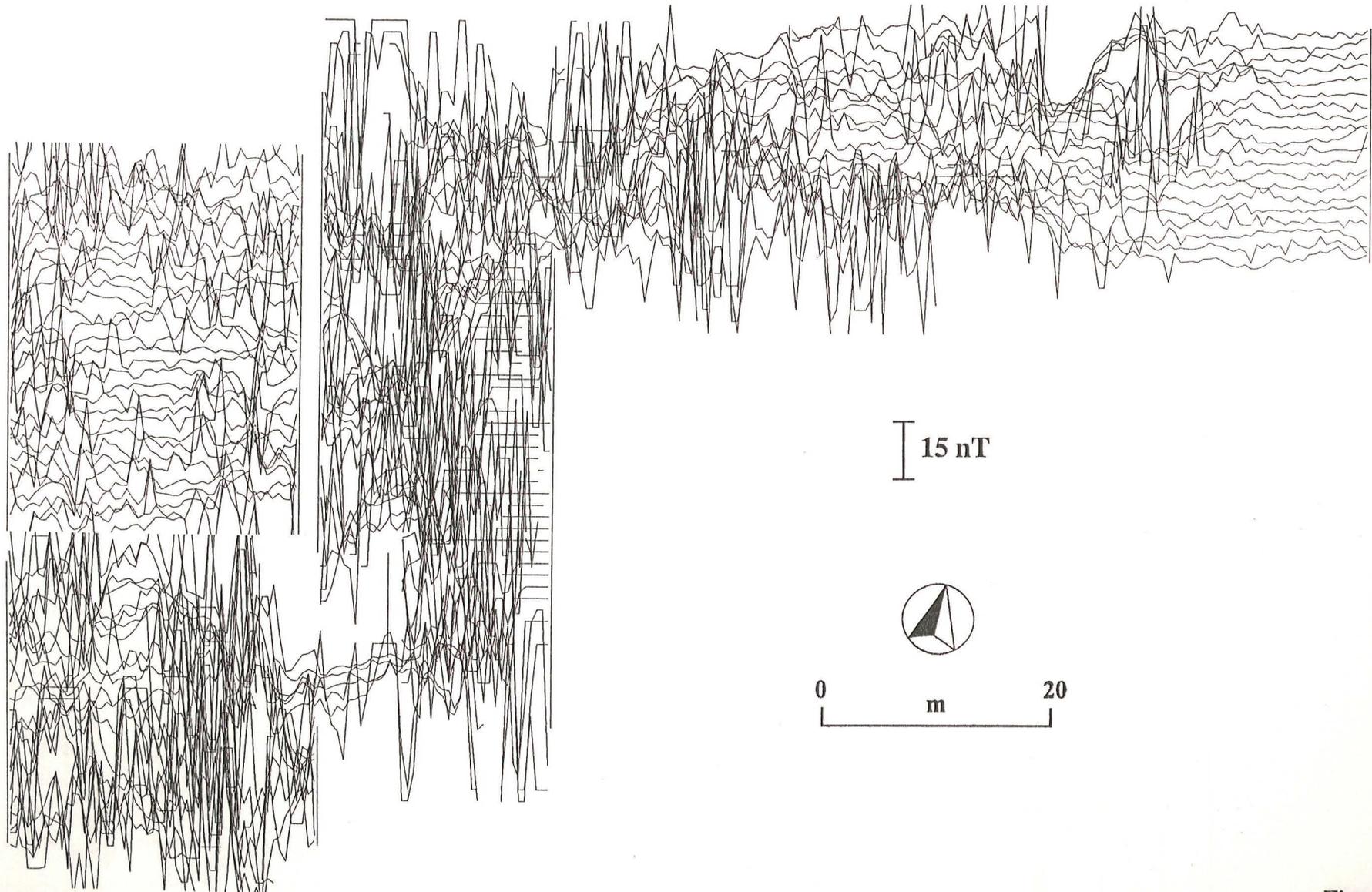


Figure 2

BUCKNALL Lincolnshire

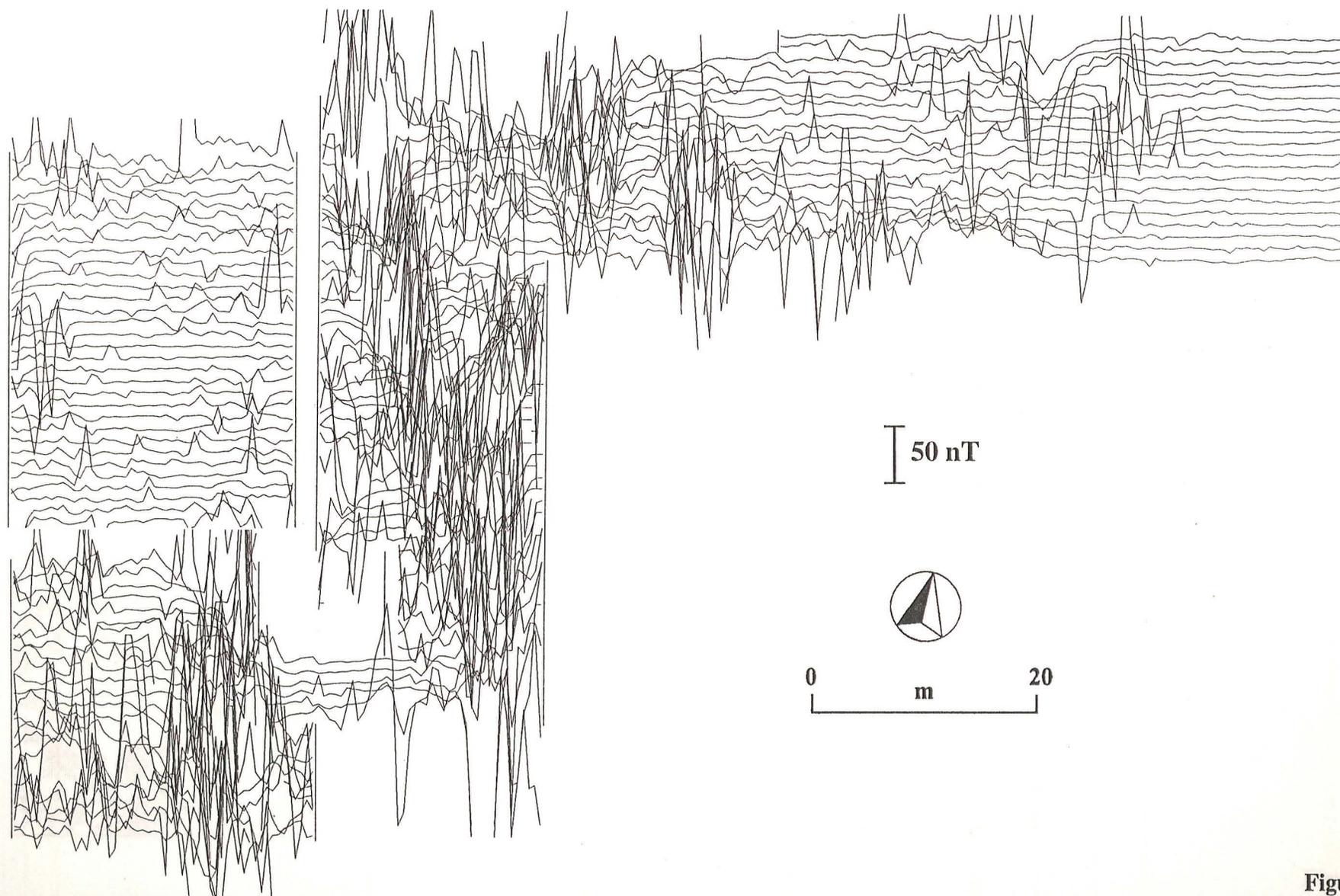


Figure 3

BUCKNALL Lincolnshire

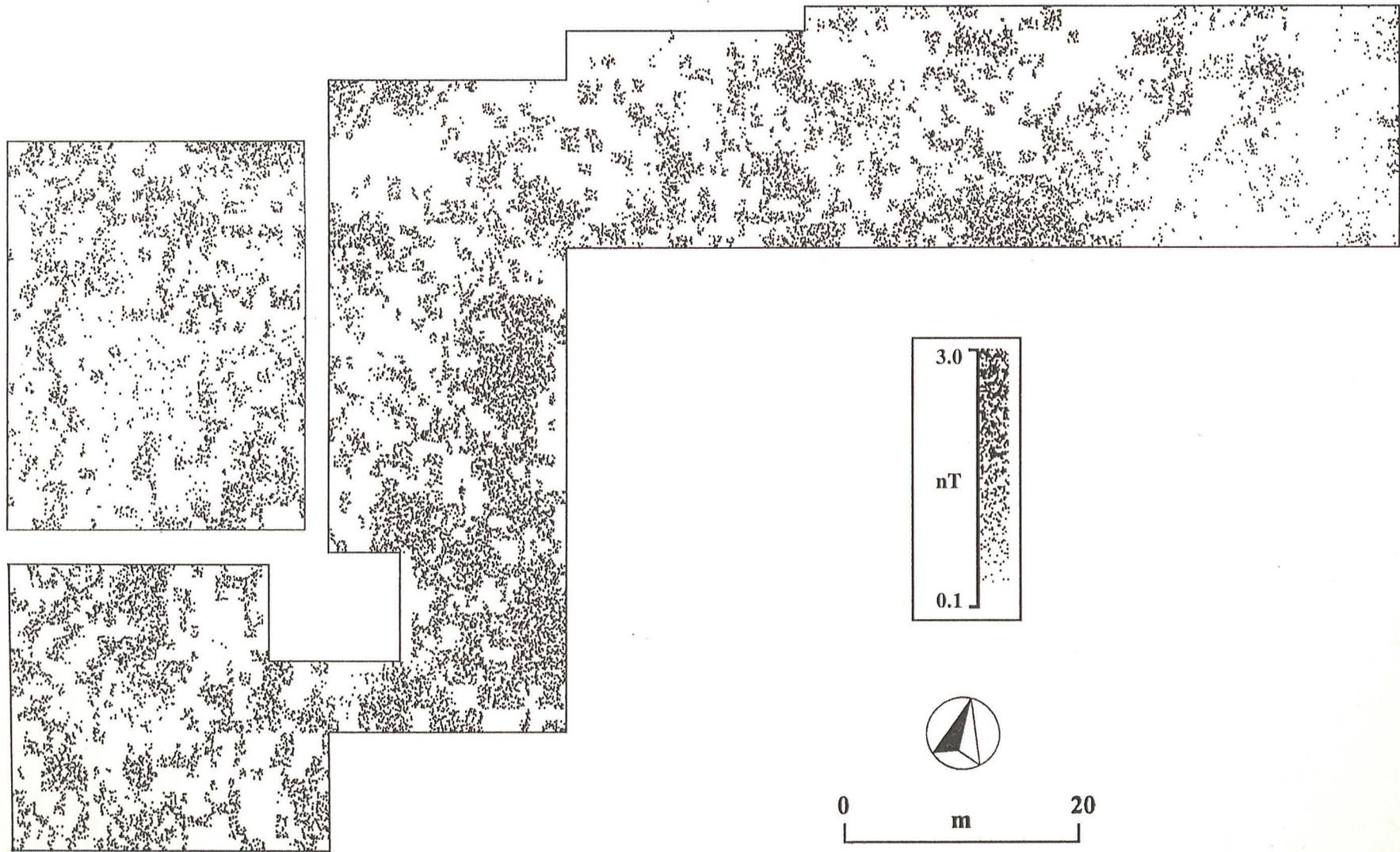


Figure 4