**GSB**
PROSPECTION

*Specialising in Shallow*
*and*
*Archaeological Prospection*

• *Consultancy* •

• *Project Design* •

• *Rapid Assessment* •

• *Detailed Survey* •

• *Integrated Research* •

Cowburn Farm
Market Street, Thornton
Bradford, BD13 3HW
Tel: (01274) 835016
Fax: (01274) 830212
E-mail: gsbprospection@cs.com
Web: www.gsbprospection.com

# GEOPHYSICAL SURVEY REPORT 2001/103

# YAVERLAND MANOR FARM
## Isle of Wight

Client:

## SITE SUMMARY SHEET

## 2001 / 103 Yaverland Manor Farm, Isle of Wight

**NGR:** SZ 862 615 (Approximate centre)

### Location, topography and geology

The area of interest is located some 4km northeast of Sandown town centre, Isle of Wight and due east of Brading. The site occupies an arable field, which had been harvested, and a pasture field immediately to the north. The fields were undulating with steep slopes in some areas. The survey area overlies at least three parent geologies: Cretaceous chalks; Eocene/Oligocene sands, clays and loams; marine and river alluvium (SSEW, 1983).

### Archaeology

Excavation during the construction of a plastic water pipe revealed a wealth of buried archaeological deposits including Iron Age features, suggestions of a high status Roman building and post holes indicating an Anglo Saxon structure (K Trott *pers comm.*).

### Aims of Survey

Gradiometer and limited resistance survey was undertaken to determine the nature and extent of buried archaeological deposits discovered during pipeline operations. This work forms part of a wider archaeological investigation being undertaken as part of the **Time Team** series for **Channel 4** television.


### Summary of Results *

The gradiometer survey has produce mixed results. In the main survey area data were severely affected by a pre-existing buried metal pipe, running alongside the plastic water pipe. However, several broad ditch type anomalies were noted though no particular pattern could be established. Resistance survey identified anomalies suggestive of possible structural remains, but excavation revealed these to be naturally occurring chalk outcrops.

A small survey to the northwest of the main area of investigation produced a very weak, sub-circular, magnetic anomaly that proved on excavation to be prehistoric in date.


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

**SURVEY RESULTS**

**2001 / 103 Yaverland Manor Farm, Isle of Wight**

## 1. Survey Area

1.1 Just less than 1 ha of detailed gradiometer survey was undertaken in two areas, together with a small area of resistance survey. The location of the survey areas is shown in Figure 1 at a scale of 1:2500.

1.2 The survey grid was set out by **GSB Prospection** and tied-in by **Time Team.**

## 2. Display

2.1 Figures 2 - 4 are summary greyscale images of the gradiometer and the resistance data produced at a scale of 1:1250, with accompanying interpretation diagrams at the same scale

2.2 Figures 5 – 10 and 14 are XY traces, dot density plots and interpretation diagrams of the gradiometer data, produced at a scale of 1:500. For ease of display as this scale, Area A has been sub-divided. Figures 11 – 13 are greyscale images and an interpretation of the resistance data.

2.3 Numbers in parenthesis refer to specific anomalies highlighted on the interpretation diagram.

2.4 The display formats are discussed in the *Technical Information* section at the end of the text.

## 3. General Considerations - Complicating factors

### Soils

3.1 The survey area overlies at least three parent geologies: Cretaceous chalks; Eocene/Oligocene sands, clays and loams; marine and river alluvium.

3.2 The majority of the survey area lies on the chalks. The soils are grey rendzinas consisting of shallow well drained silts over chalk, although deeper pockets may be found in coombes and dry valleys (342a).

3.3 To the northwest, the ground drops and the parent material grades into marine and river alluvium. The soils, pelo-alluvial gleys, comprise deep clays with some surface peats; the soils are affected by a high groundwater table (813f).

3.4 To the north-east of the chalks, the geology changes to Eocene sands, loams and clays. The soils are stagnogleyic argillic brown earths which comprise deep loams over poorly drained clay subsoils (572j).

**Implications for Gradiometry**

3.5 The soils on the chalk geology will tend to produce favourable conditions for geophysics. The stagnogleyic argillic brown earths formed from Eocene deposits tend to produce 'quiet' gradiometer datasets with any anomalies being rather 'bitty'.

3.6 Soils formed in marine and recent alluvium with a high groundwater table are unfavourable for geophysics. However, as these are probably recently reclaimed soils, historic settlement is unlikely. Gross landscape features, such as palaeochannels, are more likely to be detected.

## 4. Results of Detailed Survey

**Area A**

4.1 The gradiometer data from this area are relatively noisy with the south-eastern portion being dominated by a strong ferrous response from a ferrous pipe that pre-dated the plastic one. The zone of disturbance around this will have masked any weaker responses of possible archaeological interest.

4.2 Several broad ditch type anomalies have been identified within the data. The most prominent of these is a curving response (1) in the eastern half of the survey block. The response is not particularly coherent and there is some suggestion of plough damage. However, one well-defined break (2) may indicate an entrance. There is no clear continuation of this anomaly north of the field boundary, although it is possible that it turns westwards and runs along the fence and anomaly (3) is a continuation of the same feature.

4.3 Just to the east of (1) there are two ditch type anomalies (4) which are likely to be of archaeological interest, and may be associated with the former. Similarly the ditch type anomaly (5) to the west of (1) may be part of the same complex.

4.4 Elsewhere isolated pit type anomalies and trends have been identified but it is difficult to formulate a precise interpretation. Some may have a natural or agricultural origin. The broad response (6) in the north of the survey area is likely to reflect a ploughed out lynchet.

4.5 Limited resistance survey proved disappointing. Although well-defined areas of high resistance were located, excavation revealed them to correspond with naturally occurring chalk. Broad areas of slightly lower resistance are visible over the ditches identified by the gradiometer survey.

**Area B**

4.6 By contrast to Area A this data set is very quiet magnetically. However, a relatively well-defined ring ditch anomaly is visible in the eastern half of the survey block. The isolated nature of this anomaly, together with its location on a topographic high, suggested it was a possible Bronze Age barrow. This was confirmed by excavation.

4.7 A few tentative pit type responses have also been noted but it is likely that these are of natural origin. A few weak trends are apparent within the data, although their lack of a coherent form makes an archaeological interpretation tentative.

## 5. Conclusions

5.1 Although the gradiometer survey has identified lengths of ditch, there is no clear pattern or form to the responses and as such it was not possible to define the limits of the site within the time available. In the main survey area the results were severely affected by a buried metal pipe, running alongside the plastic water pipe. It is possible, therefore, that the relatively high level of magnetic noise may have masked any weaker responses of archaeological interest. It should also be noted that many of the features (post holes, small scoops and burials) are not particularly conducive to being detected by geophysical survey.

5.2 Resistance survey identified discrete areas of high resistance indicating possible structural remains. However, excavation revealed these to be naturally occurring chalk. Similarly excavation failed to find any substantial walls or foundations that were surviving *in situ* but merely shadows of such features. Again, there was nothing surviving that could be detected geophysically.

5.3 A small survey to the northwest of the main area of investigation located a ring ditch that proved on excavation to be prehistoric in date.

**Project Co-ordinator:** J Gater
**Project Assistants:** L Couch, Dr C Gaffney, J Leigh, Dr S Ovenden-Wilson and Dr D Weston

**Date of Survey:** 14th – 17th October 2001
**Date of Report:** 4th December 2001

**References:**

SSEW 1983. *Soils of England and Wales. Sheet 3, Midland and Western England.* Soil Survey of England and Wales.

# TECHNICAL INFORMATION

The following is a description of the equipment and display formats used in **GSB Prospection (GSB)** 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 **GSB.**

*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.*

## 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. Readings are normally logged at 0.5m intervals along traverses 1.0m apart.

### (b) Resistance Meter - Geoscan RM15

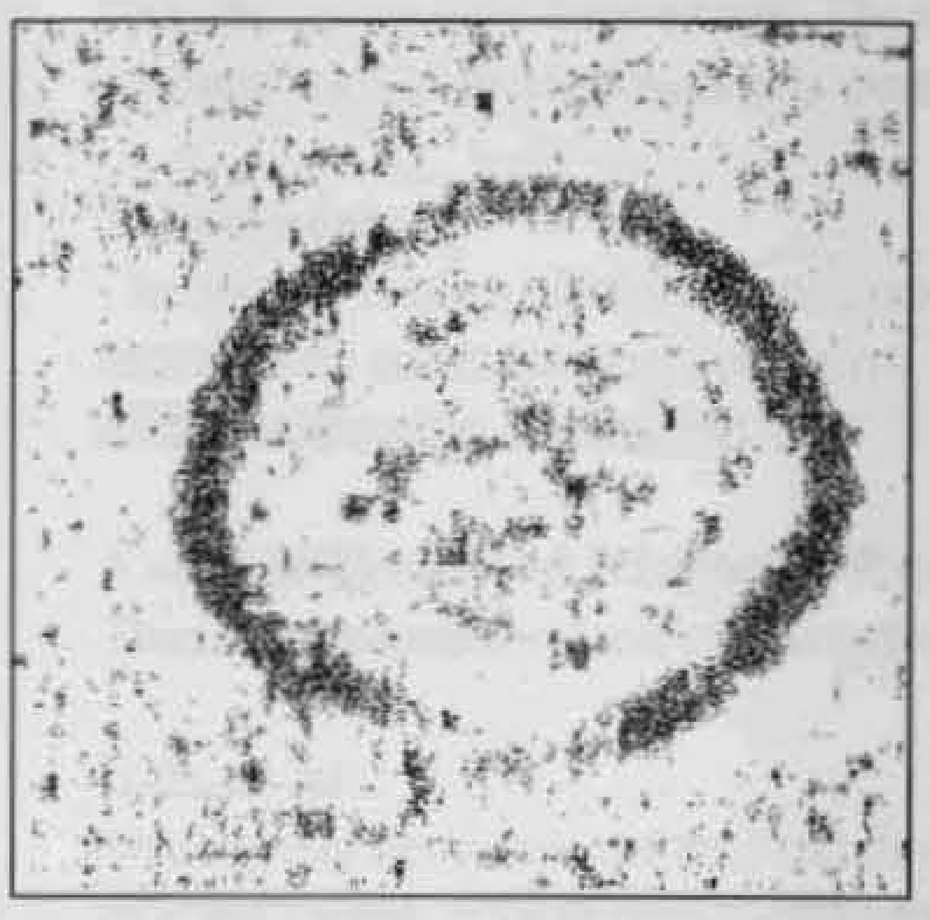
This measures the electrical resistance of the earth, using a system of four electrodes (two current and two potential.) Depending on the arrangement of these electrodes an exact measurement of a specific volume of earth may be acquired. This resistance value may then be used to calculate the earth resistivity. The "Twin Probe" arrangement involves the paring 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". In area survey readings are typically logged at 1.0m x 1.0m intervals.

### (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. Sampling intervals vary widely but are often at the 10m or 20m level. The instrument employed for measuring this phenomenon is either a field coil or a laboratory based susceptibility bridge. The field coil measures the susceptibility of a volume of soil. The laboratory procedure determines the susceptibility of a specific mass of soil. For the latter 50g soil samples are collected in the field. These are then air-dried, ground down and sieved to exclude the coarse earth (>2mm) fraction. Readings are made using an AC-coil and susceptibility bridge, with results being expressed either as SI/kg x $10^{-8}$ or $m^3/kg$.

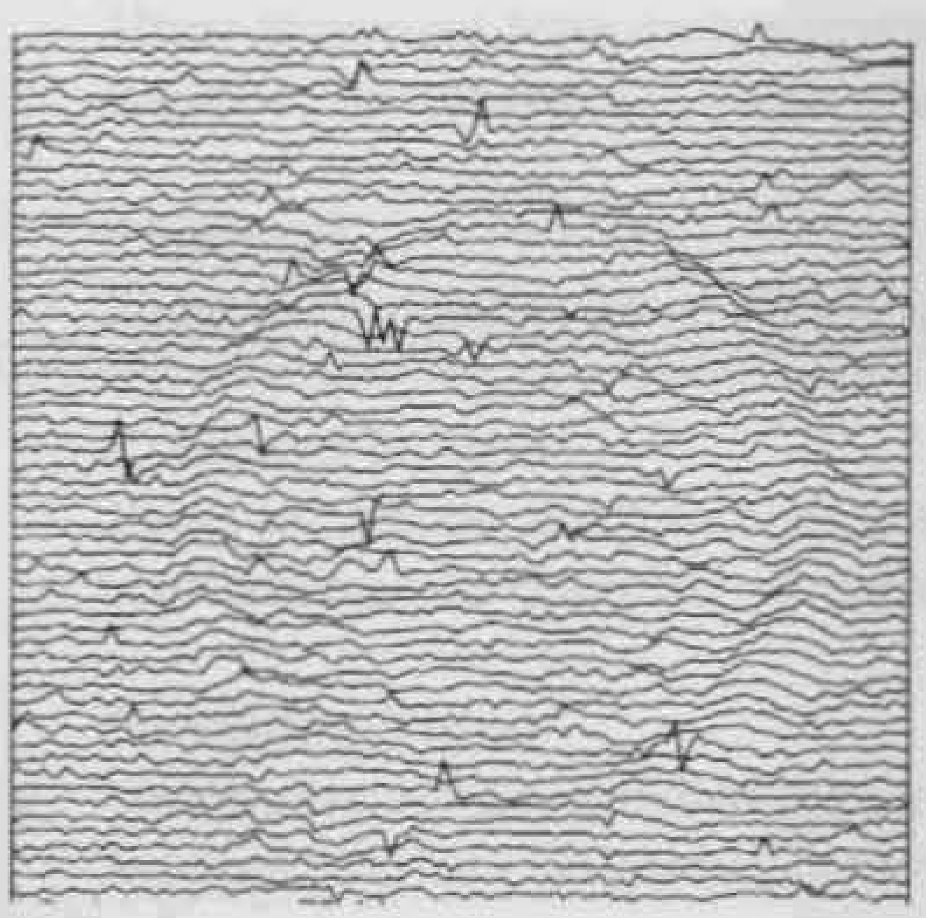
## Display Options

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 will appear white, whilst any value above the maximum will be black. Values that lie between these two cut-off levels are depicted with a specified number of dots depending on their relative position between the two levels. Assessing a lower than normal reading involves the use of an inverse plot that 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. However, this display is favoured for producing plans of sites, where positioning of the anomalies and features is important.



**(b) XY 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. The 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. The display may also be changed by altering the horizontal viewing angle and the angle above the plane. The output may be either colour or black and white.

**(c) Greyscale**

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, greyscales tend to be more informative.

## Terms commonly used in the graphical interpretation of gradiometer data

**Ditch / Pit**
This category is used only when other evidence is available that supports a clear archaeological interpretation e.g. cropmarks or excavation.

**Archaeology**
This term is used when the form, nature and pattern of the response is clearly or very probably archaeological but where no supporting evidence exists. These anomalies, whilst considered anthropogenic, could be of any age. If a more precise archaeological interpretation is possible then it will be indicated in the accompanying text.

**? Archaeology**
The interpretation of such anomalies is often tentative, with the anomalies exhibiting either weak signal strength or forming incomplete archaeological patterns. They may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.

**Areas of Increased Magnetic Response**
These responses show no visual indications on the ground surface and are considered to have some archaeological potential.

**Industrial**
Strong magnetic anomalies, that due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.

**Natural**
These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions e.g. palaeochannels or magnetic gravels.

**? Natural**
These are anomalies that are likely to be natural in origin i.e geological or pedological.

**Ridge and Furrow**
These are regular and broad linear anomalies that are presumed to be the result of ancient cultivation. In some cases the response may be the result of modern activity.

**Ploughing Trend**
These are isolated or grouped linear responses. They are normally narrow and are presumed modern when aligned to current field boundaries or following present ploughing.

**Trend**
This is usually an ill-defined, weak or isolated linear anomaly of unknown cause or date.

**Areas of Magnetic Disturbance**
These responses are commonly found in places where modern ferrous or fired materials are present e.g. brick rubble. They are presumed to be modern.

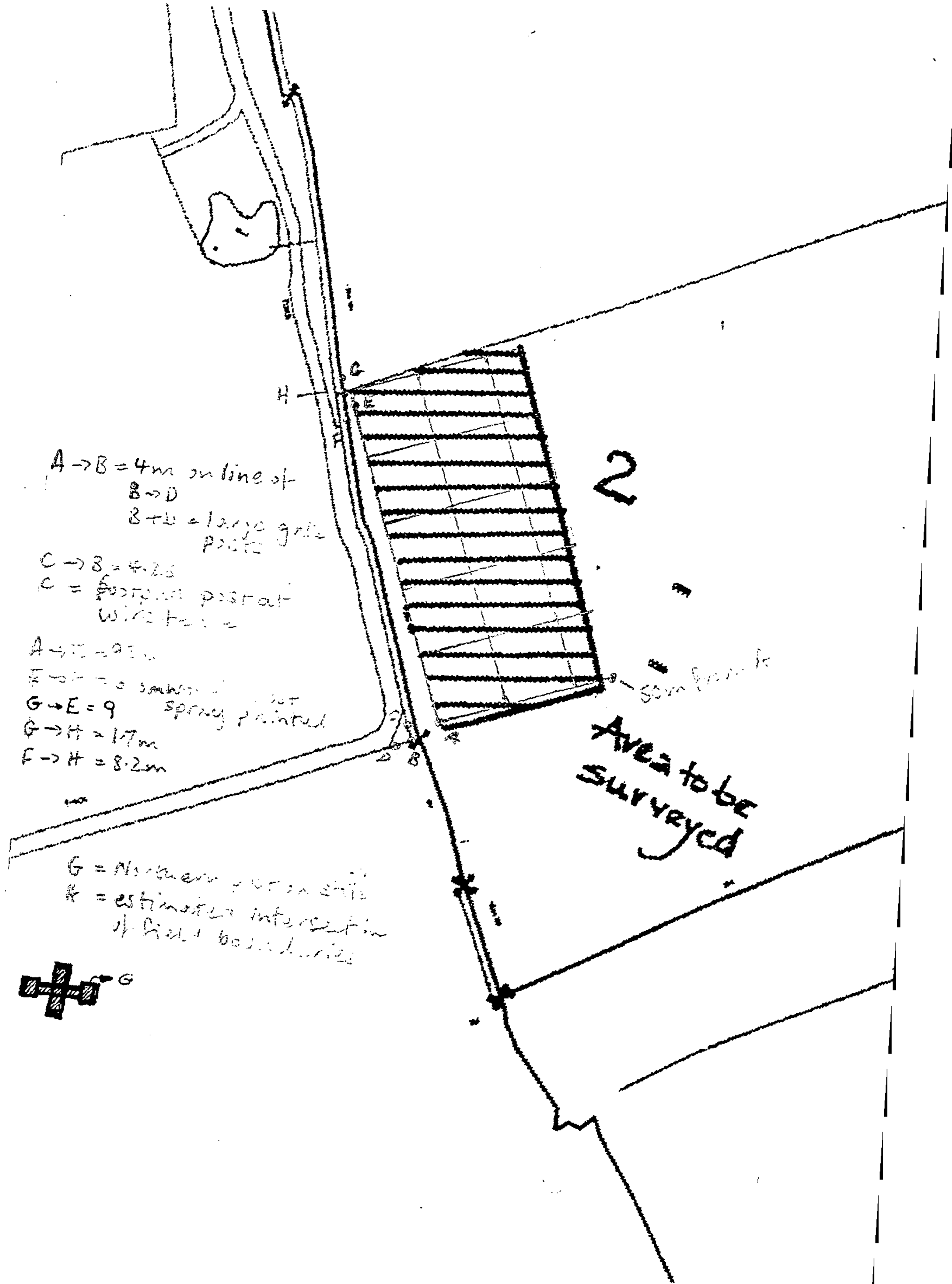
**Ferrous Response**
This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes or above ground features such as fencelines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.

**NB** This is by no means an exhaustive list and other categories may be used as necesssary.

## List of Figures

| GSB PROSPECTION |
| --- |
| PROJECT: 2001/103 Yaverland Farm |
| TITLE: Location of Survey Areas |
| Baseplan supplied by Time Team |


Figure 1


G
H
E
F
A → B = 4m on line of
B → D
C → B = 4.25
G → E = 9
spray painted
G → H = 1.7m
F → H = 8.2m
D
B
2
Area to be surveyed
G

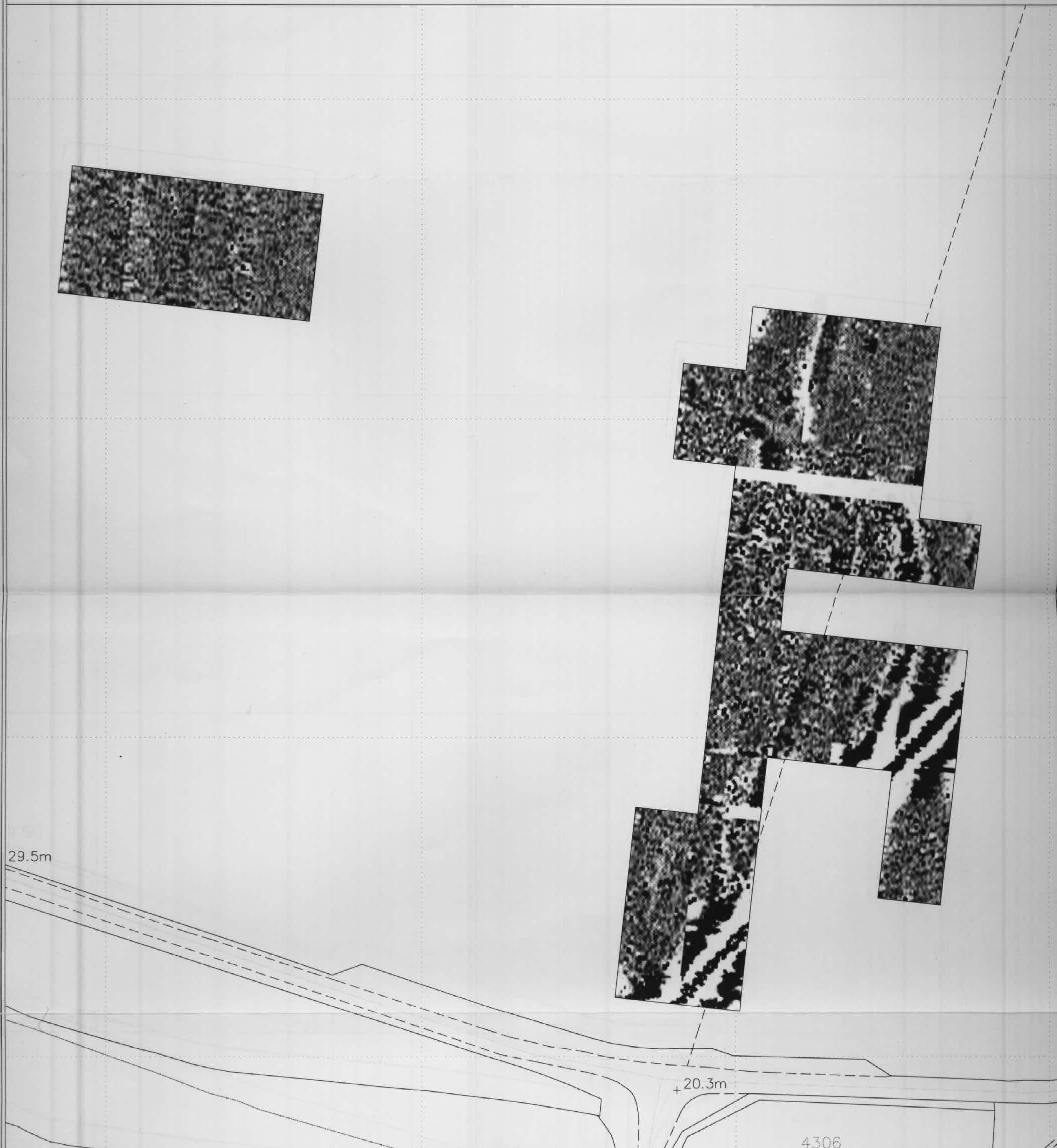
**GSB PROSPECTION**

PROJECT: 2001/103 Yaverland Manor Farm

TITLE: Summary Greyscale

Baseplan supplied by Time Team

0 metres 50




1.5
nT
-1

Figure 2

**GSB PROSPECTION**

PROJECT: 2001/103 Yaverland Manor Farm

TITLE: Summary Interpretation

Baseplan supplied by Time Team

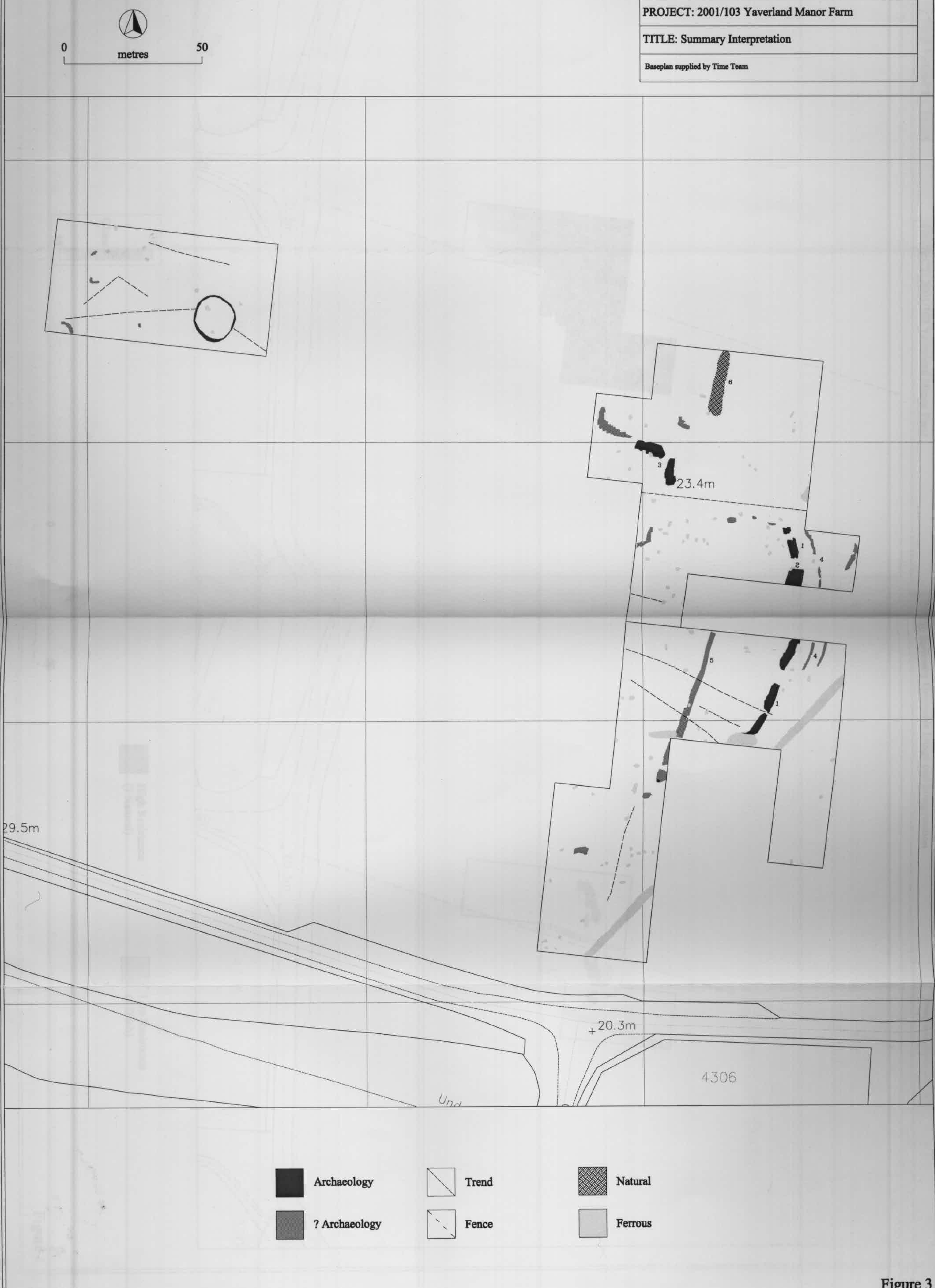


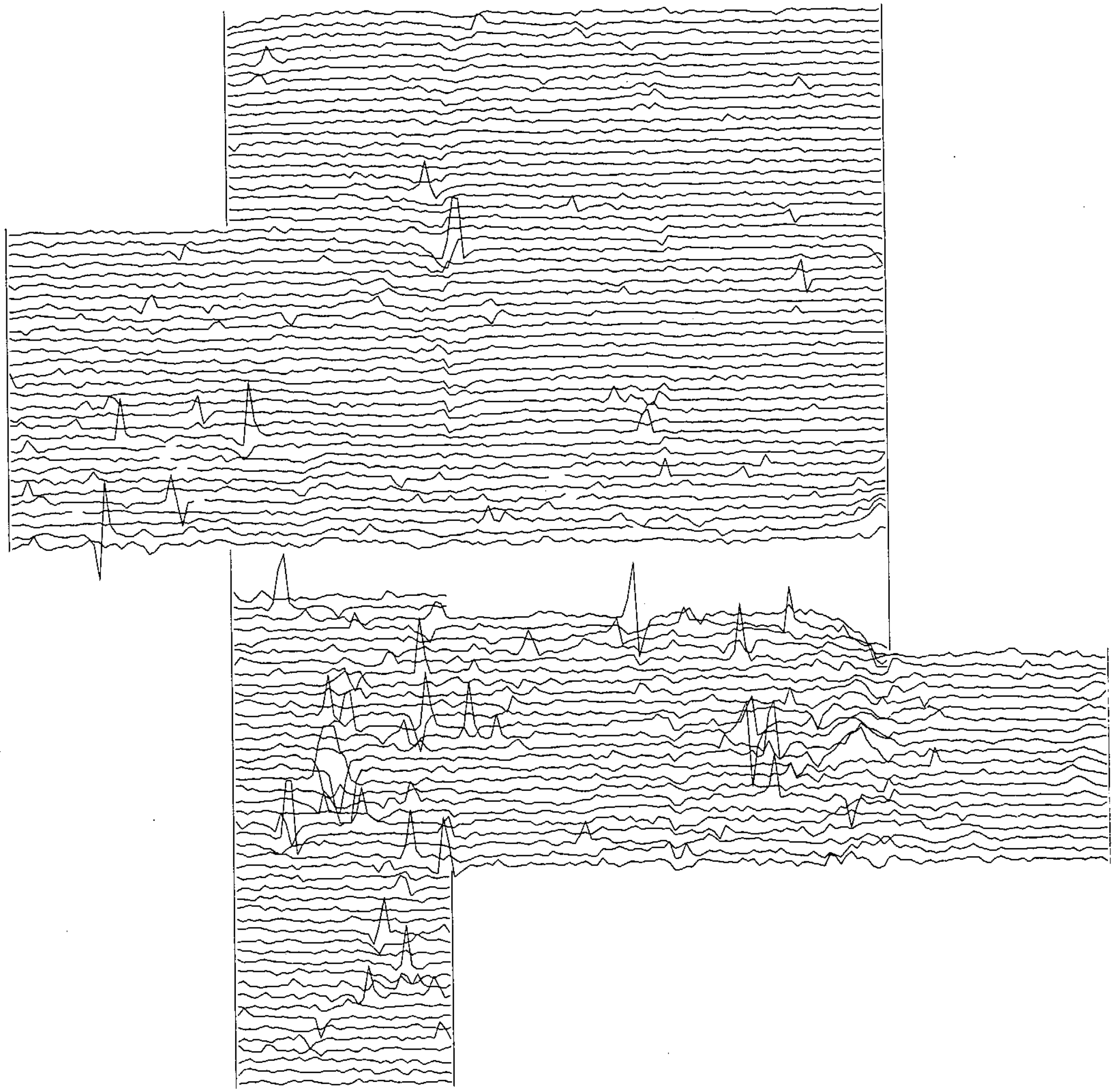

Figure 3

| GSB PROSPECTION | PROJECT: 2001/103 Yaverland Manor Farm | TITLE: Summary Greyscale Image and Interpretation | Baseplan supplied by Time Team |
|---|---|---|---|


Figure 4

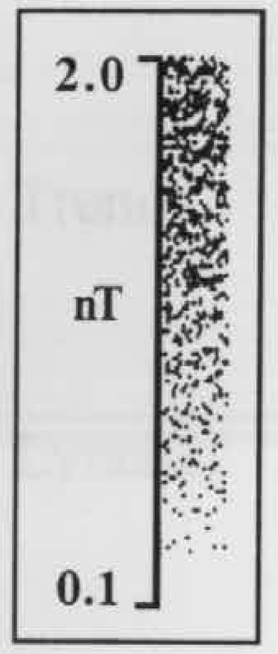
# YAVERLAND MANOR FARM, Isle of Wight

## Area A1 Gradiometer Data



# YAVERLAND MANOR FARM, Isle of Wight

## Area A1 Gradiometer Data



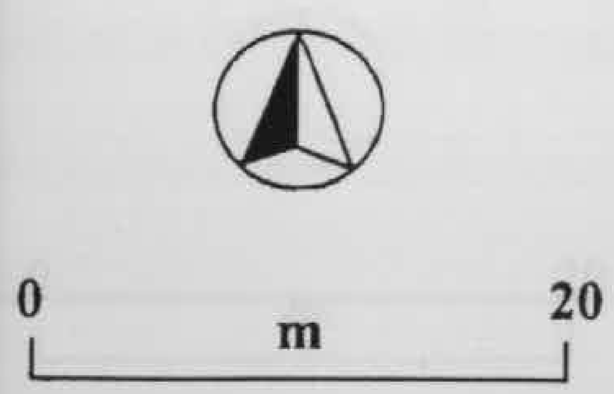






Figure 6

# YAVERLAND MANOR FARM, Isle of Wight

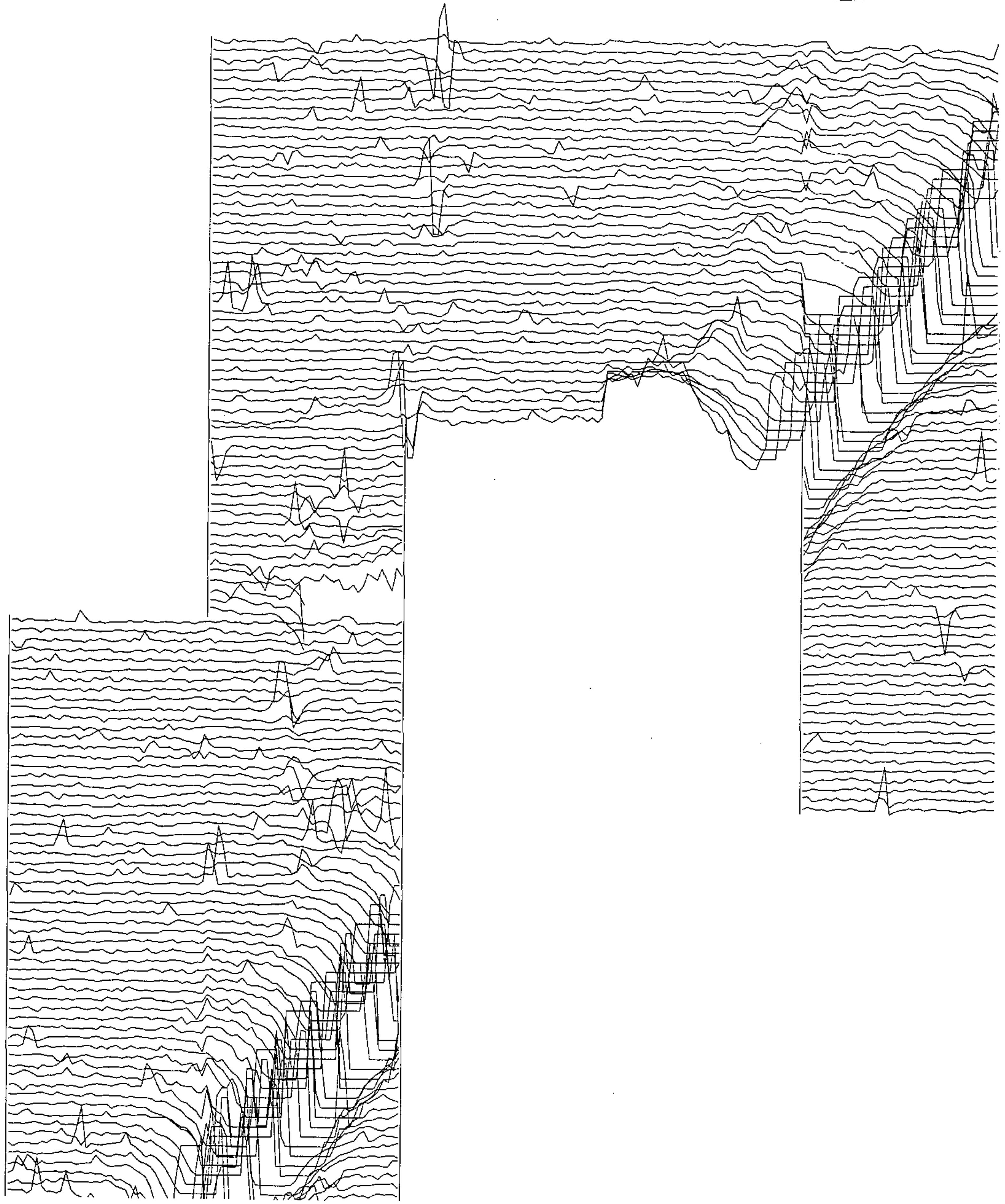
## Area A1 Gradiometer Data


GSB Prospection 2001/103

**Figure 7**

# YAVERLAND MANOR FARM,
# Isle of Wight

## Area A2
## Gradiometer Data



# YAVERLAND MANOR FARM,
# Isle of Wight

## Area A2
## Gradiometer Data

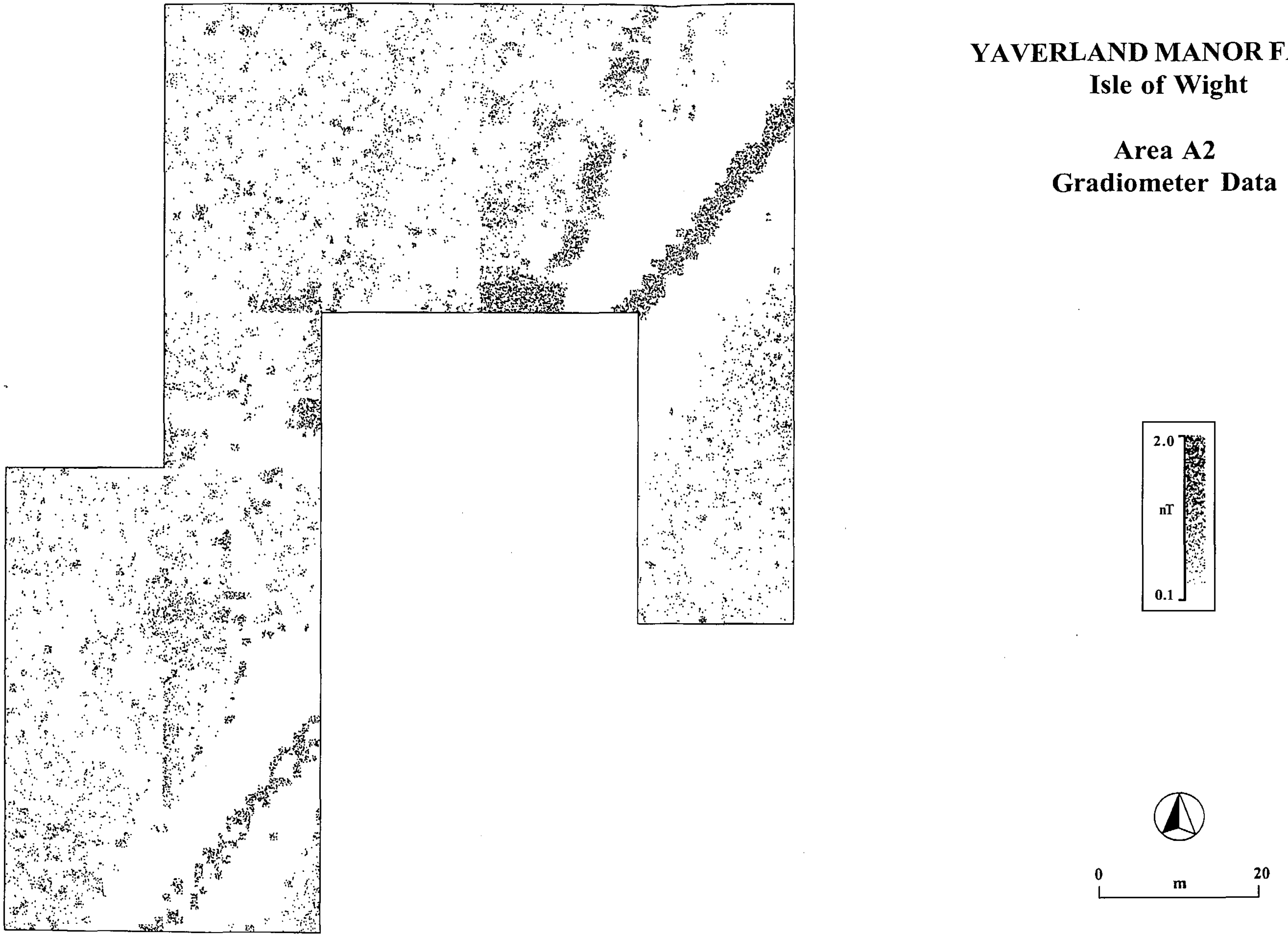





Figure 9


# YAVERLAND MANOR FARM, Isle of Wight

## Area A2 Gradiometer Data

Archaeology

?Archaeology

Trend

Ferrous

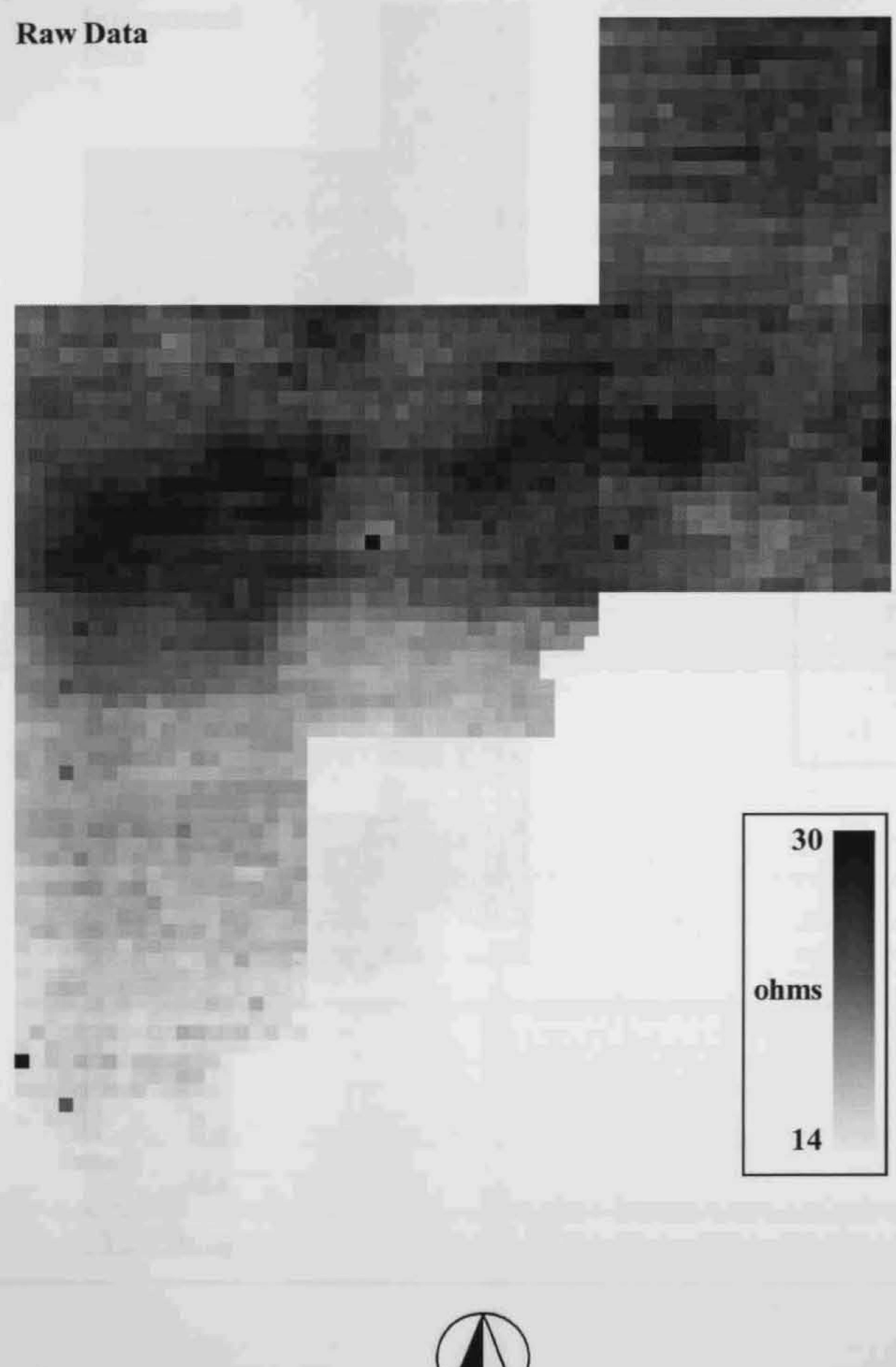
0 m 20

GSB Prospection 2001/103

Figure 10

# YAVERLAND MANOR FARM,
# Isle of Wight

## Area A
## Resistance Data



# YAVERLAND MANOR FARM,
# Isle of Wight

## Area A
## Resistance Data

**Interpolated Data**

**High Pass Filter Data**

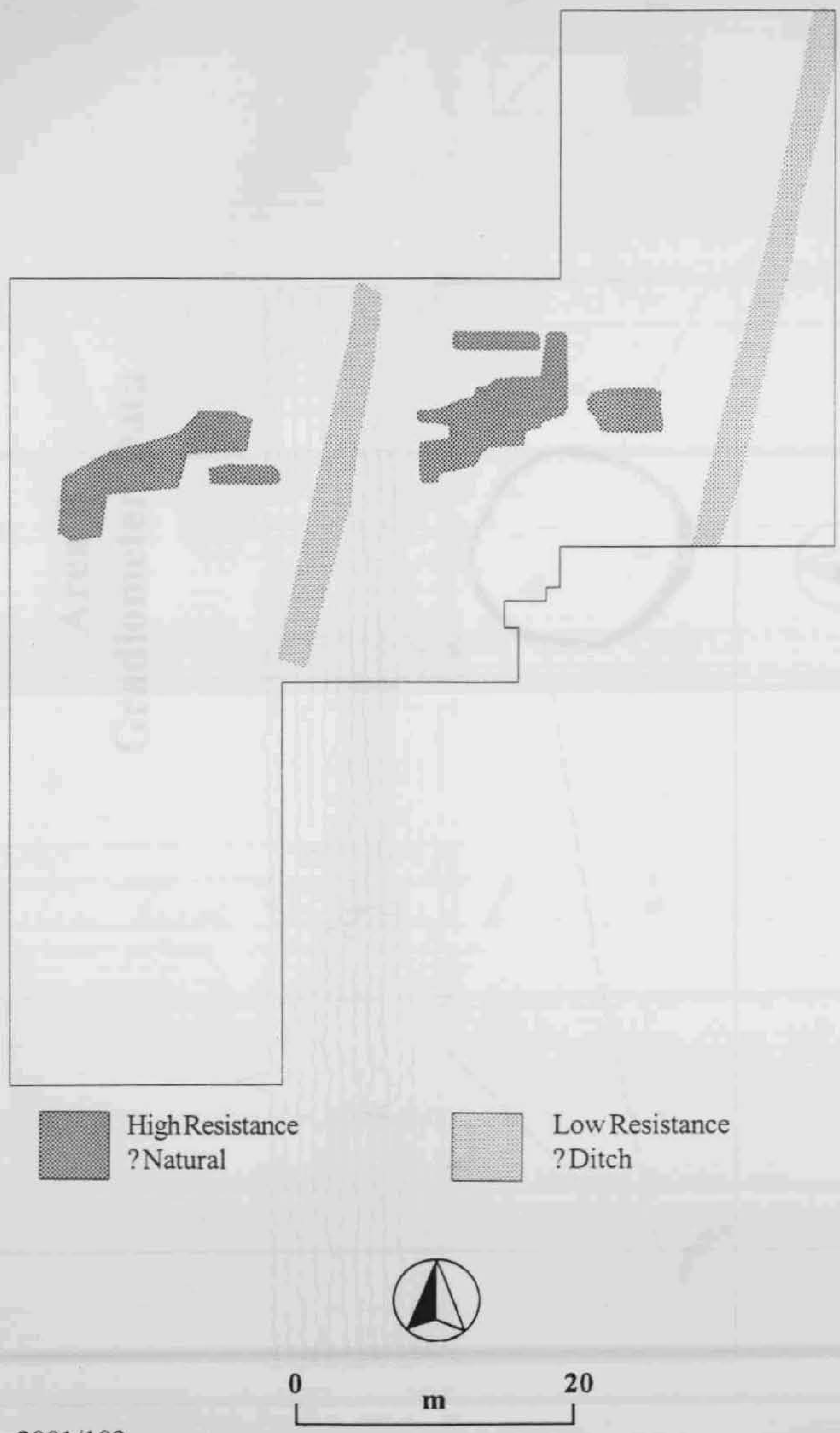




**Figure 12**

# YAVERLAND MANOR FARM,
## Isle of Wight

## Area A
## Resistance Data

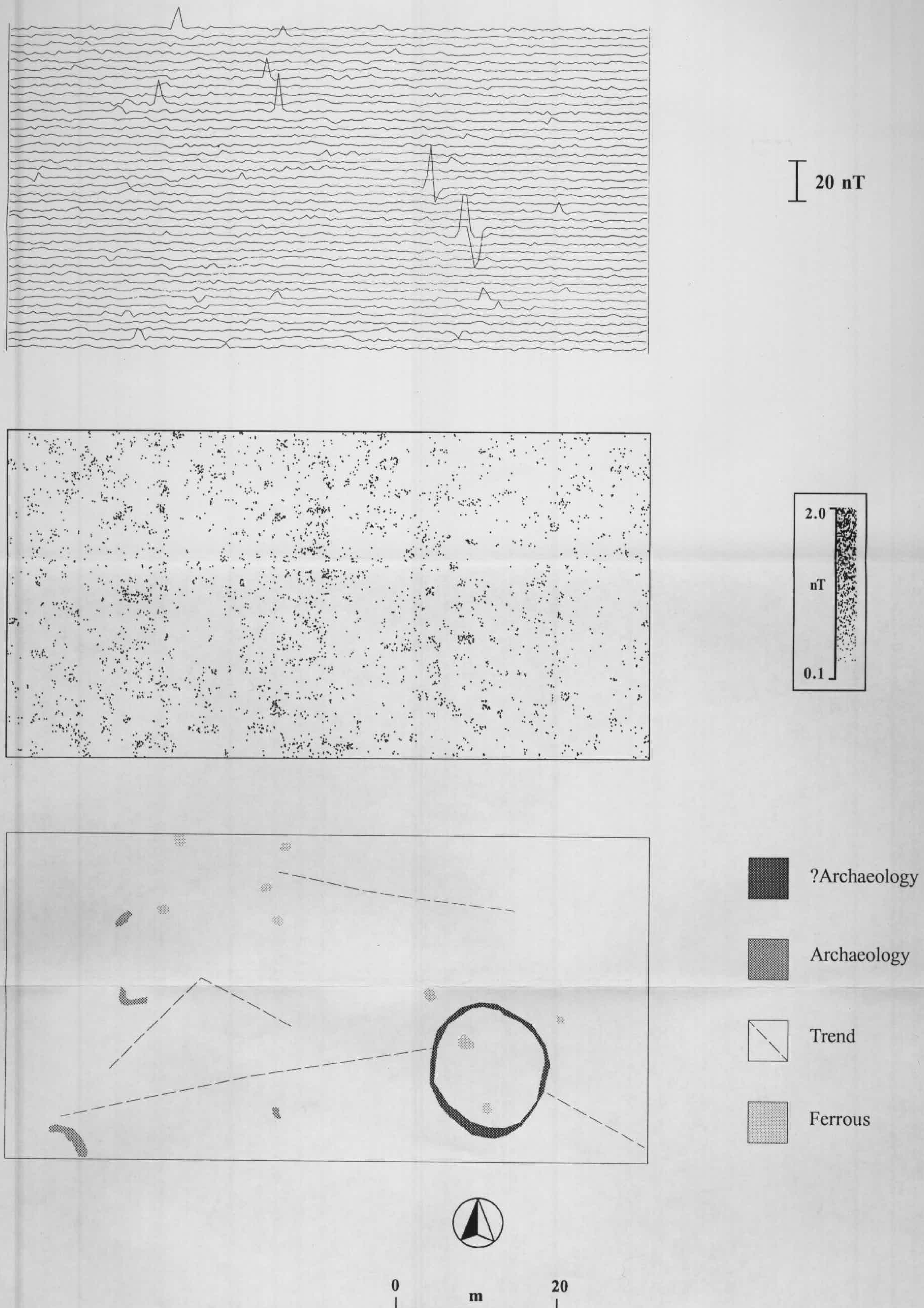



GSB Prospection 2001/103

**Figure 13**

# YAVERLAND MANOR FARM,
## Isle of Wight

## Area B
## Gradiometer Data




GSB Prospection 2001/103

**Figure 14**

**GSB**

PROSPECTION