D Freke. For comment 2/2002

GSB
PROSPECTION

Specialising in Shallow and Archaeological Prospection

• *Consultancy* •

• *Project Design* •

• *Rapid Assessment* •

• *Detailed Survey* •

• *Integrated Research* •

CowburnFarm
MarketStreet,Thornton
Bradford,BD133HW
Tel: (01274) 835016
Fax: (01274) 830212
E-mail: gsbprospection@cs.com
Web: www.gsbprospection.com

GEOPHYSICAL SURVEY REPORT 2001/111

A303 STONEHENGE VII

Client:

Wessex Archaeology

SITE SUMMARY SHEET

2001 / 111 A303 Stonehenge VII

NGR: ST 065 410 (Approximate centre)

Location, topography and geology

The field under investigation lies immediately north of the A303 road and west of Scotland Lodge Farm, about 1km west of the village of Winterbourne Stoke, Wiltshire. The topography is gently undulating with the ground sloping down to the north and a ground cover of rolled earth. The soils comprise well drained calcareous silty soils of the Upton 1 Association (342a), overlying chalk (SSEW 1983)

Archaeology

Previous geophysical survey (GSB 1992, 1994 & 2001) identified a significant settlement site comprising a large oval enclosure with adjacent rectilinear enclosures. Subsequent excavation revealed well preserved Iron Age/ Romano British deposits (Chris Moore *pers. comm*) A clear ring ditch was also identified at the eastern edge of the field.

Aims of Survey

The aims of the survey were to locate and identify the nature and extent of any archaeological remains that may be present within the remainder of the field and also to determine whether the large settlement complex extended beyond the previous survey limits. The work forms part of a wider archaeological assessment being undertaken by **Wessex Archaeology**.

Summary of Results *

Survey has recorded a number of anomalies of potential archaeological interest, in particular evidence for a rectangular enclosure to the southwest of the main settlement site. The responses are likely to relate to a relict field system

Viewing the results of all the data from previous and current surveys it is now possible to show the limits of the core occupation activity of the Iron Age Romano-british settlement found in Field 17 during earlier survey

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

SURVEY RESULTS

2001 / 111 A303 Stonehenge VII

1. Survey Area

1.1 A total of 16.5ha were subject to detailed gradiometer survey. The area consisted of the remainder of Field 17 (**Mott Macdonald** field numbering system) which had not been subject to previous geophysical survey (GSB 1992, 1994 & 2001). The location of both the current and previous survey blocks is shown in Figure 1 at a scale of 1:3500.

1.2 The survey grid was set out by **GSB Prospection** using an EDM system and re-established to the Ordnance Survey grid.

2. Display

2.1 Figures 2 and 3 are a summary greyscale image and summary interpretation diagram produced at a scale of 1:3500.

2.2 Figures 4 to 45 are XY traces, dot density plots and interpretation diagrams produced at a scale of 1:625. For ease of display at this scale the survey area has been sub-divided into 14 sections (Areas A to N), although the results are discussed as a whole in the report.

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

3. General Considerations - Complicating factors

3.1 Generally conditions for survey were good with the site being free from obstructions and the ground comprising of rolled earth with no vegetational cover.

3.2 Numerous isolated ferrous responses have been recorded in all of the survey areas and are considered to reflect modern ferrous debris in the topsoil. The most prominent of these are noted on the interpretation diagrams, but are not referred to in the text unless considered relevant.

3.3 Numbers in parentheses in the report refer to anomalies noted on the summary interpretation diagram.

4. Results of Detailed Survey

4.1 Several weak anomalies (1) and a stronger ditch type response (2) have been recorded at the western end of the survey and may be of archaeological interest. These coincide with recorded cropmarks, although there does not appear to be any direct correlation. The responses do not form any recognisable pattern, but it is possible that they could be part of a relict field system associated with the settlement complex. However, a natural or more recent origin for the anomalies cannot be wholly discounted.

4.2 A clear rectilinear response (3) is visible southeast of the above responses and would appear to be part of a rectangular enclosure that directly correlates with recorded cropmarks. Whilst this enclosure is archaeological, the lack of associated responses perhaps means it is unlikely to be connected with settlement activity

4.3 A weak linear (4) is apparent running parallel to the northwestern field boundary with two linear responses running perpendicular to it. It is thought that these may be of interest and could indicate the remains of a field system. Another weak trend parallel and north of (4) is thought to be due to modern ploughing, although it is possible that these two anomalies could indicate the presence of trackway. However, this interpretation is cautious given the weak nature of the responses.

4.4 At the northeastern end of anomaly (4) is an 'L' shaped response (5), which is also considered to be archaeological and may relate to (4) and be part of a former field system

4.5 A rectilinear anomaly (6) lies immediately to the west of the main settlement site. This would appear to form the northern boundary of the rectangular enclosure noted in the previous surveys (GSB 1994 and 2001).

4.6 In the northern half of the survey ditch type anomalies have been recorded (7) and (8). These are considered to be archaeological and are likely to be associated with former field divisions. The two linears (8) are a continuation of anomalies recorded in a previous survey. Several weaker linear responses have also been recorded near to (7) and (8) and whilst these may be archaeological the weak nature of the responses makes any interpretation tentative.

4.7 Survey in the southeast corner of the field has identified a linear response (9) of potential interest. To the east of this anomaly is a broad band of magnetic noise which may be natural in origin or the remains of a ploughed out farm track. Another weak linear trend is visible parallel to the southern boundary and whilst this could be archaeological it is more likely to relate to modern ploughing.

4.8 A rectilinear response (10) is also apparent in the southeastern corner and is considered to be archaeological and is likely to reflect part of a relict field system. South of this response are three parallel linear trends orientated east-west. These could also be of interest, but given the strength and nature of the anomalies they are more likely to relate to more recent agricultural activity.

4.9 Numerous pit type responses have been recorded throughout the survey blocks. These may be of archaeological interest, especially those that lie near to the settlement complex. However, it is possible that some of the anomalies have a natural or modern origin.

4.10 A multitude of weak linear trends have been recorded in all of the survey areas, and whilst some of these could be archaeological the weak and indistinct nature of the responses means any interpretation is tentative.

4.11 Several parallel linear trends are apparent along the northwestern boundary and at the western end of the field and are considered to be the result of modern ploughing.

4.12 The ferrous responses along the western, northwestern and southern edges of the survey are due to adjacent metal fences. The ferrous responses in the southeastern corner of Area N are associated with a barn.

5. Conclusions

5.1 Survey has identified a number of anomalies of archaeological interest, and in particular evidence for a rectangular enclosure lying to the southwest of the main settlement complex.

5.2 Whilst anomalies of potential interest have been identified in this report, they are not indicative of settlement but are likely to reflect relict field systems. The combined results from all the magnetic surveys conducted in Field 17 clearly show the limits of the main area of occupation.

Project Co-ordinator: I. Harvey
Project Assistants: R. Friel, J. Leigh and D. Shiel.

Date of Survey: 12th to 23rd November 2001
Date of Report: 4th December 2001

References:

GSB 1992 Report on the Geophysical Survey *A303 Amesbury to Berwick Down, Report No 92/03.* GSB Prospection Unpublished Report

GSB 1994 Report on the Geophysical Survey *A303 IV Brown Route Options, Report No. 94/67.* GSB Prospection Unpublished Report.

GSB 2001 Report on the Geophysical Survey *Stonehenge VI, Report No. 2001/82* GSB Prospection Unpublished Report.

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

List of Figures

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 nano Tesla (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

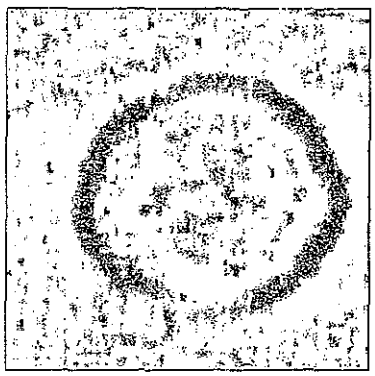
This measures the electrical resistance of the earth, using a system of four electrodes (two current and two potential.) Depending on the arrangement of these electrodes an exact measurement of a specific volume of earth may be acquired. This resistance value may then be used to calculate the earth resistivity. 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.

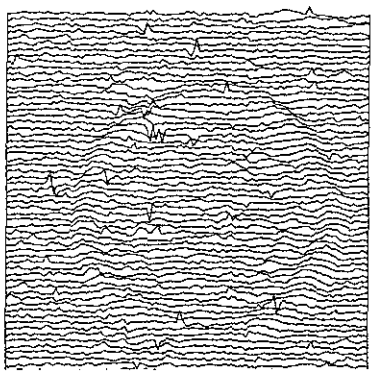
Display Options

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.



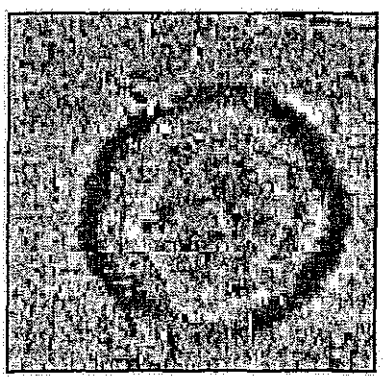
(a) Dot Density

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.

GSB PROSPECTION	PROJECT: 2001/111 A303 STONEHENGE VII	TITLE: Location Diagram	Reproduced from the Ordnance Survey Map with the permission of the Controller of HMSO © Crown Copyright (AL 100018665)

Figure 1

GSB PROSPECTION	PROJECT: 2001/111 A303 STONEHENGE VII	TITLE: Summary Greyscale Image	Reproduced from the Ordnance Survey Map with the permission of the Controller of HMSO © Crown Copyright (AL100018665)

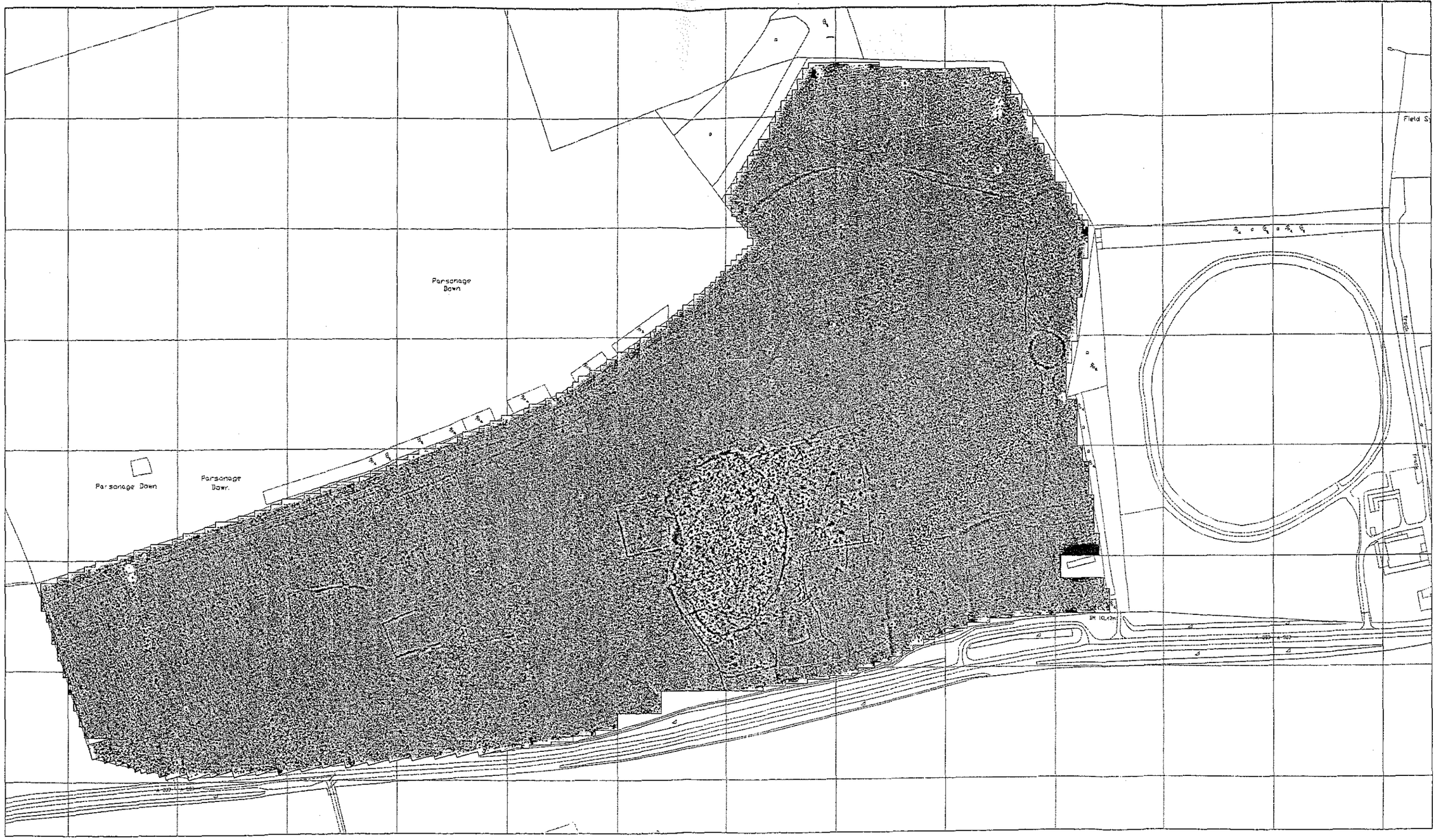


Figure 2

GSB PROSPECTION	PROJECT: 2001/111 A303 STONEHENGE VII	TITLE: Summary Interpretation Diagram

Archaeology

?Archaeology

?Natural

Ploughing

Increased Magnetic Response

Trend

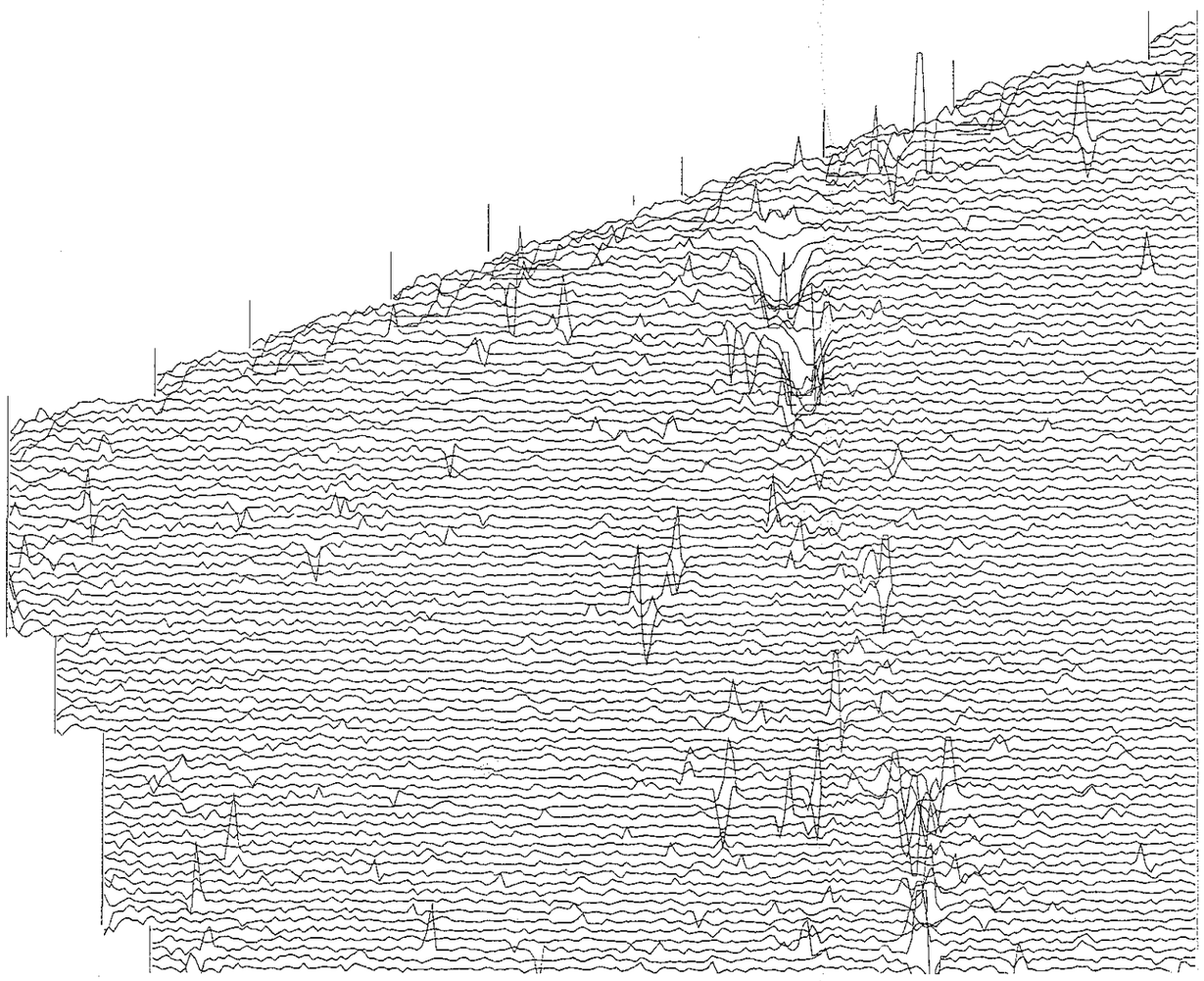
Ferrous

0 metres 140

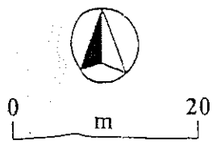
Figure 3

A303 STONEHENGE VII

Area A



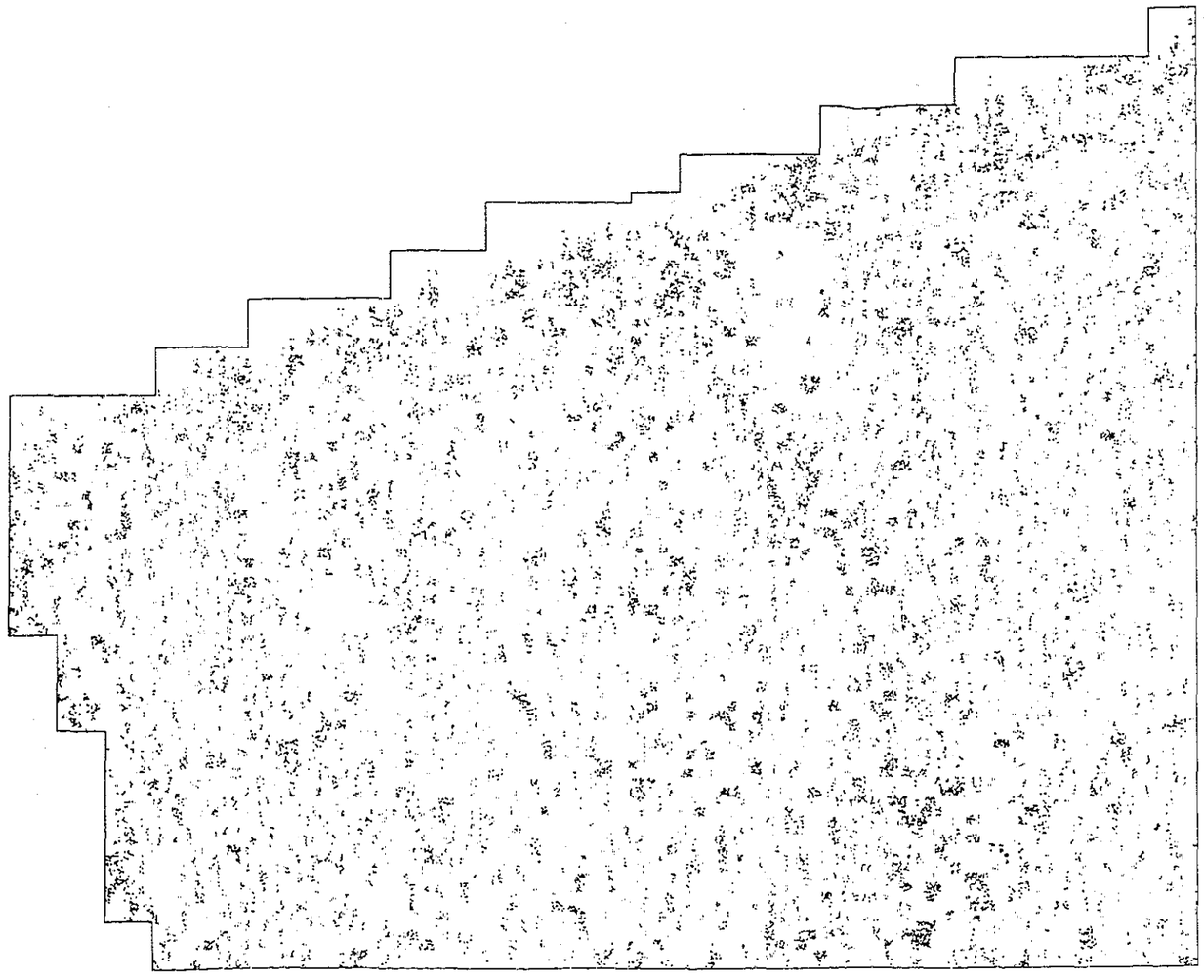
15 nT

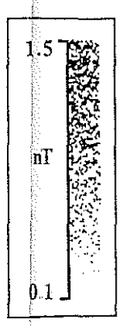


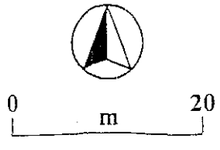
GSB Prospection 2001/111

Figure 4

A303 STONEHENGE VII
Area A



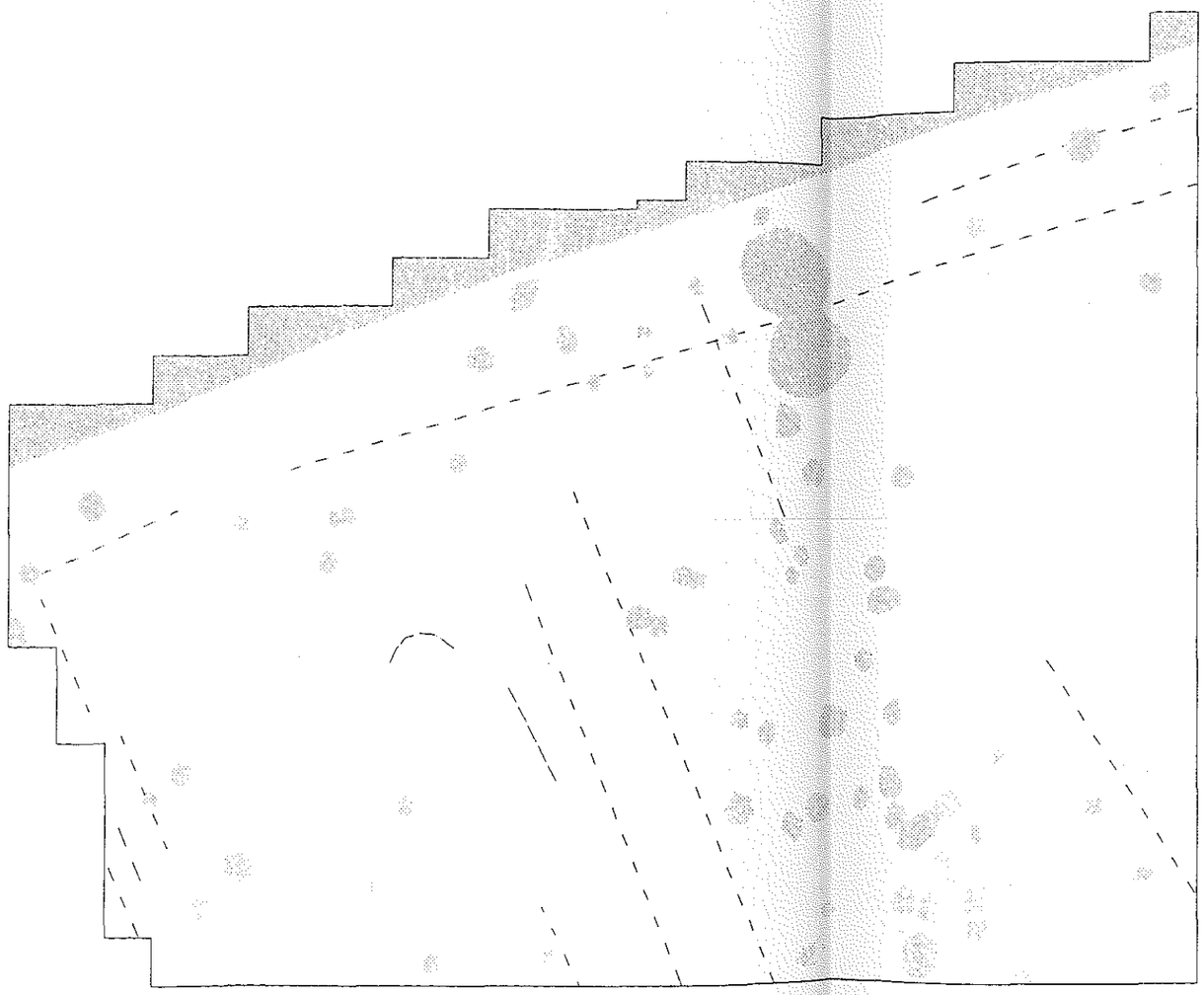




GSB Prospection 2001/111

Figure 5

A303 STONEHENGE VII
Area A



Trend

Ploughing Trend

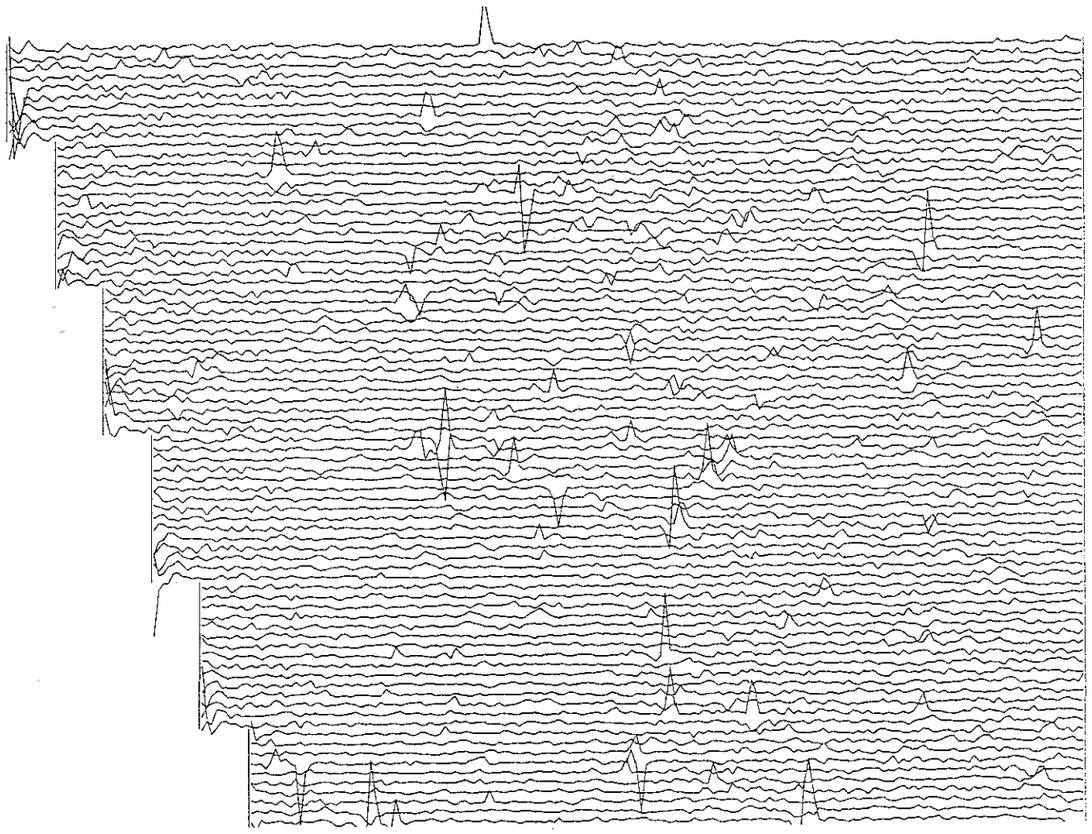
Ferrous

0 m 20

GSB Prospection 2001/111

Figure 6

A303 STONEHENGE VII
Area B



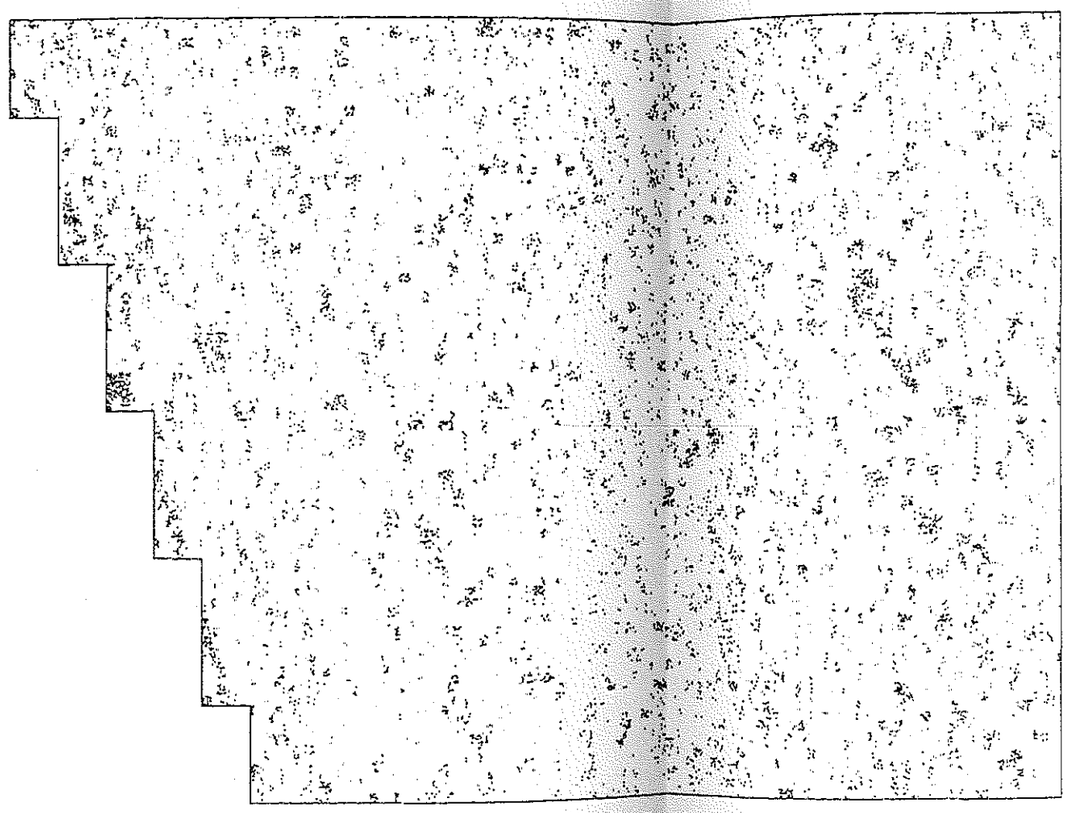
15 nT

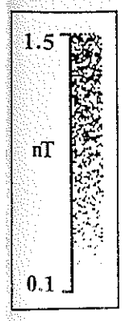
0 m 20

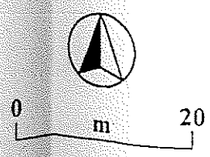
Figure 7

GSB Prospection 2001/111

A303 STONEHENGE VII
Area B



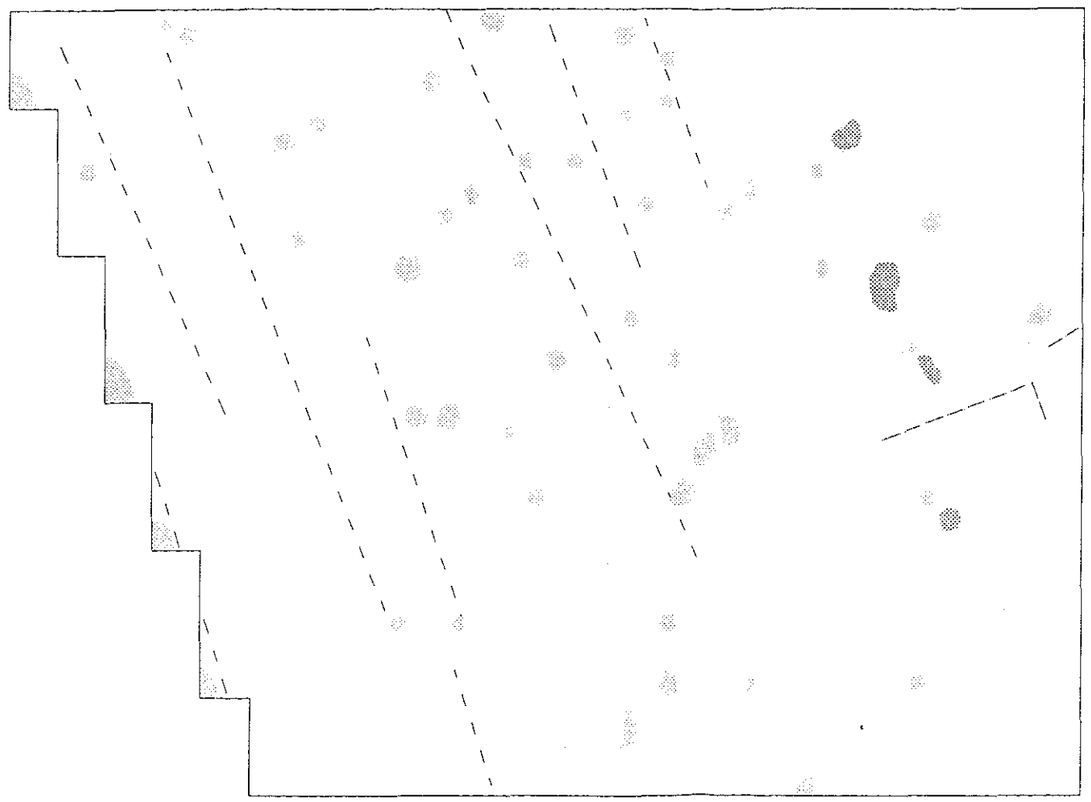




GSB Prospection 2001/111

Figure 8

A303 STONEHENGE VII
Area B



?Archaeology

Trend

Ploughing Trend

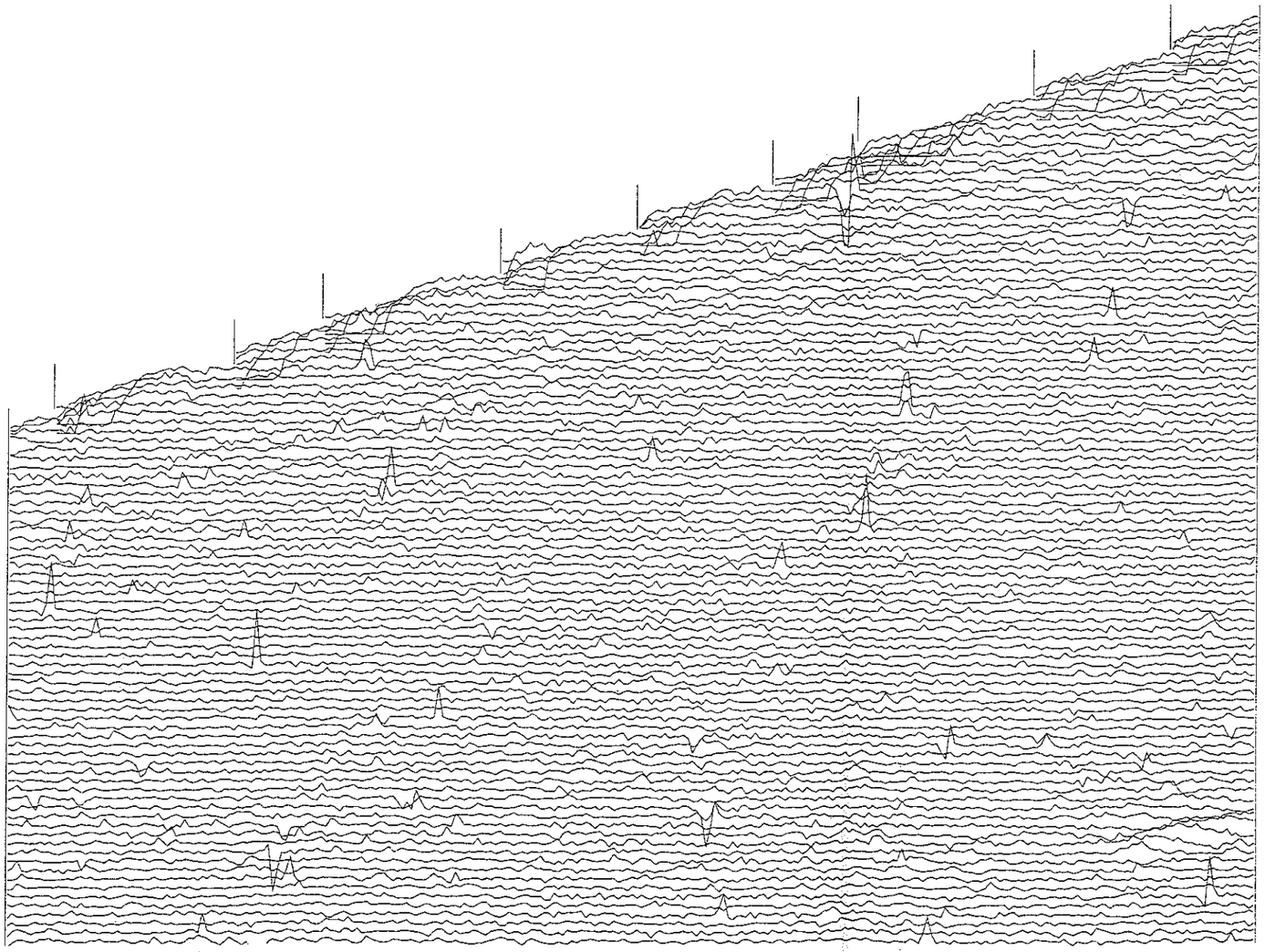
Ferrous

0 m 20

GSB Prospection 2001/111

Figure 9

A303 STONEHENGE VII
Area C



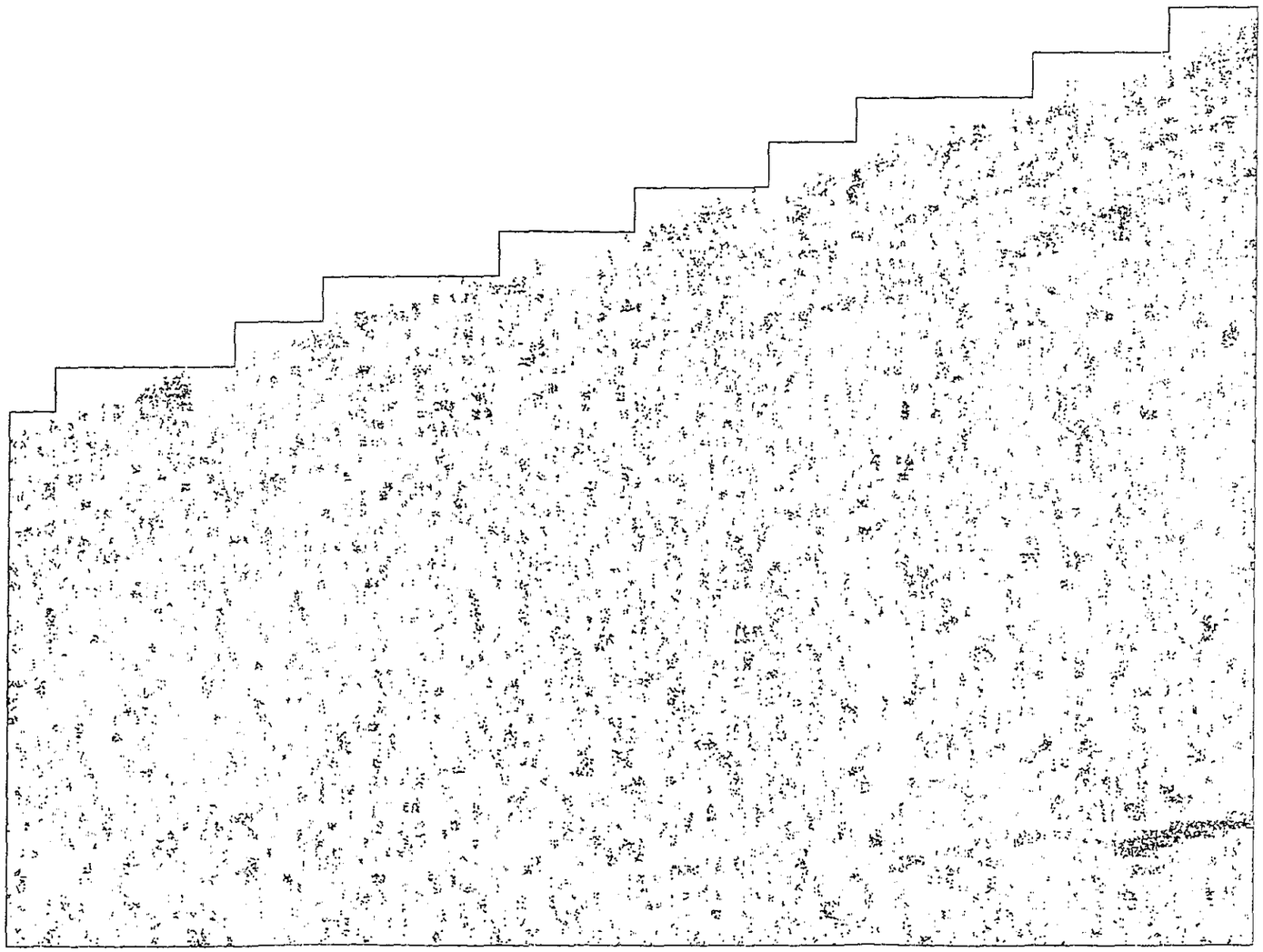
15 nT

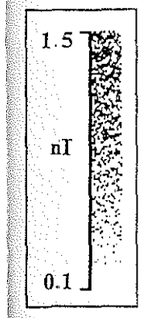
0 m 20

GSB Prospection 2001/111

Figure 10

A303 STONEHENGE VII
Area C





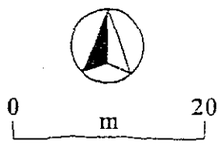
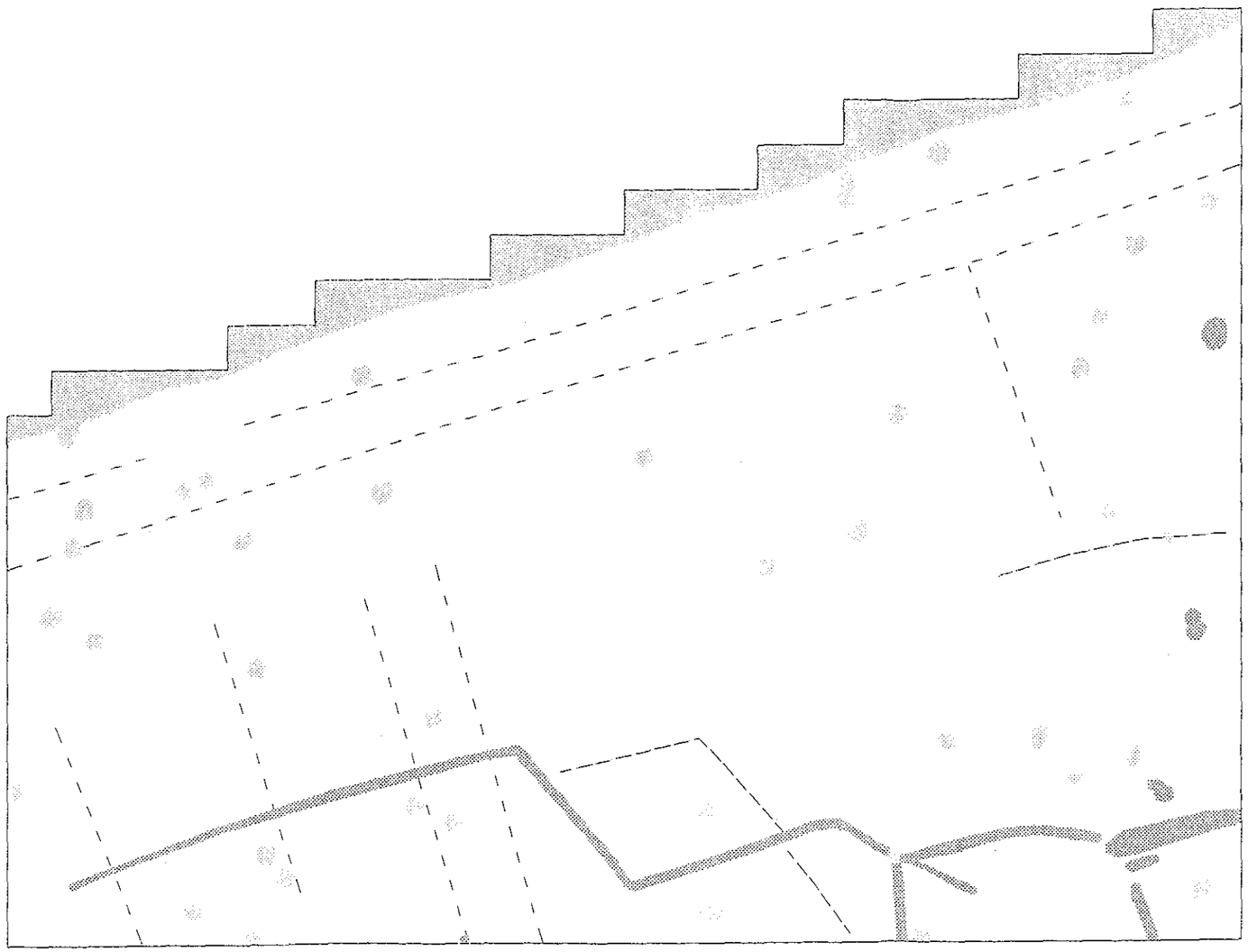


Figure 11

A303 STONEHENGE VII
Area C



?Archaeology

Trend

Ploughing Trend

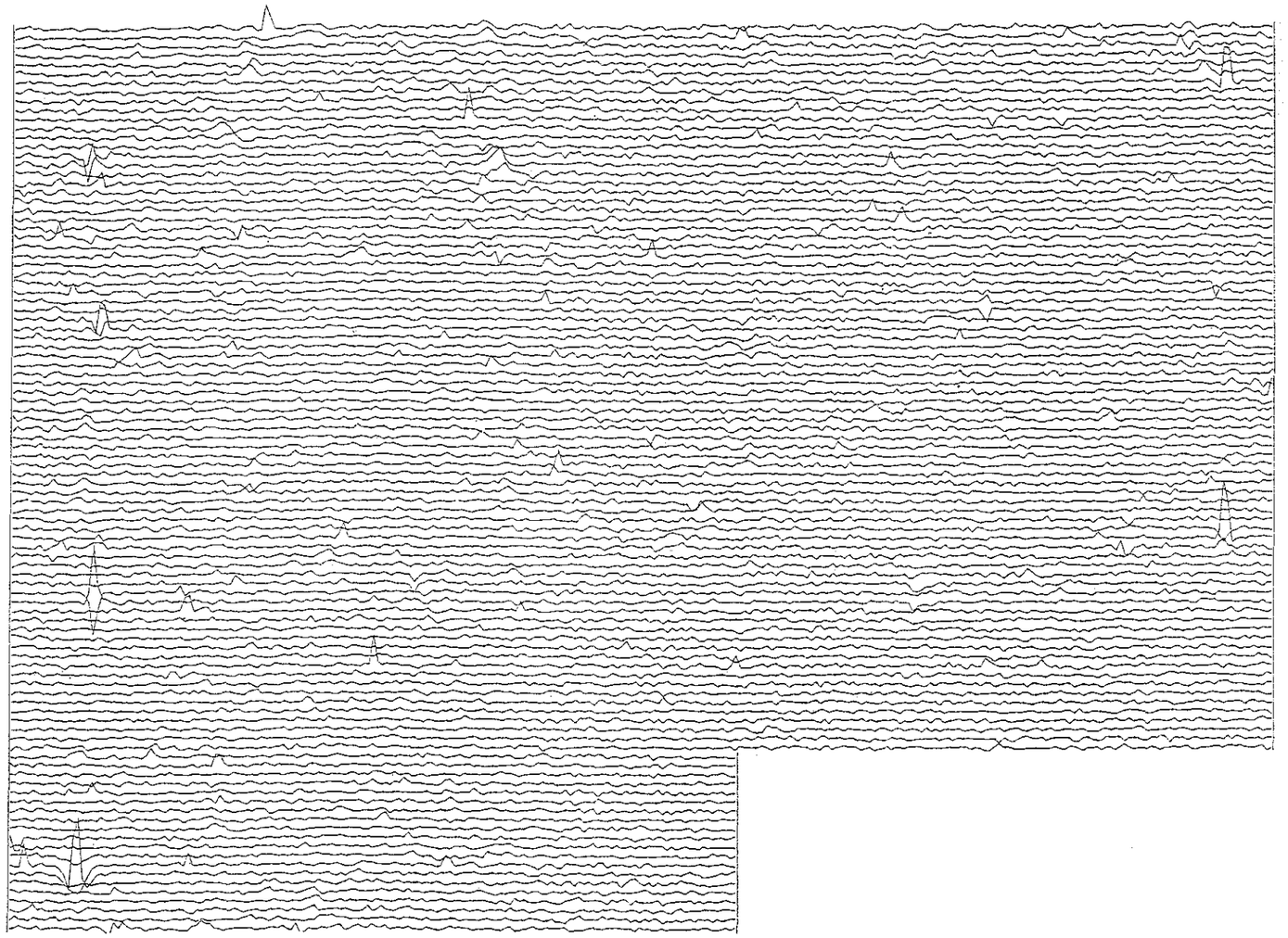
Ferrous

0 m 20

GSB Prospection 2001/111

Figure 12

A303 STONEHENGE VII
Area D



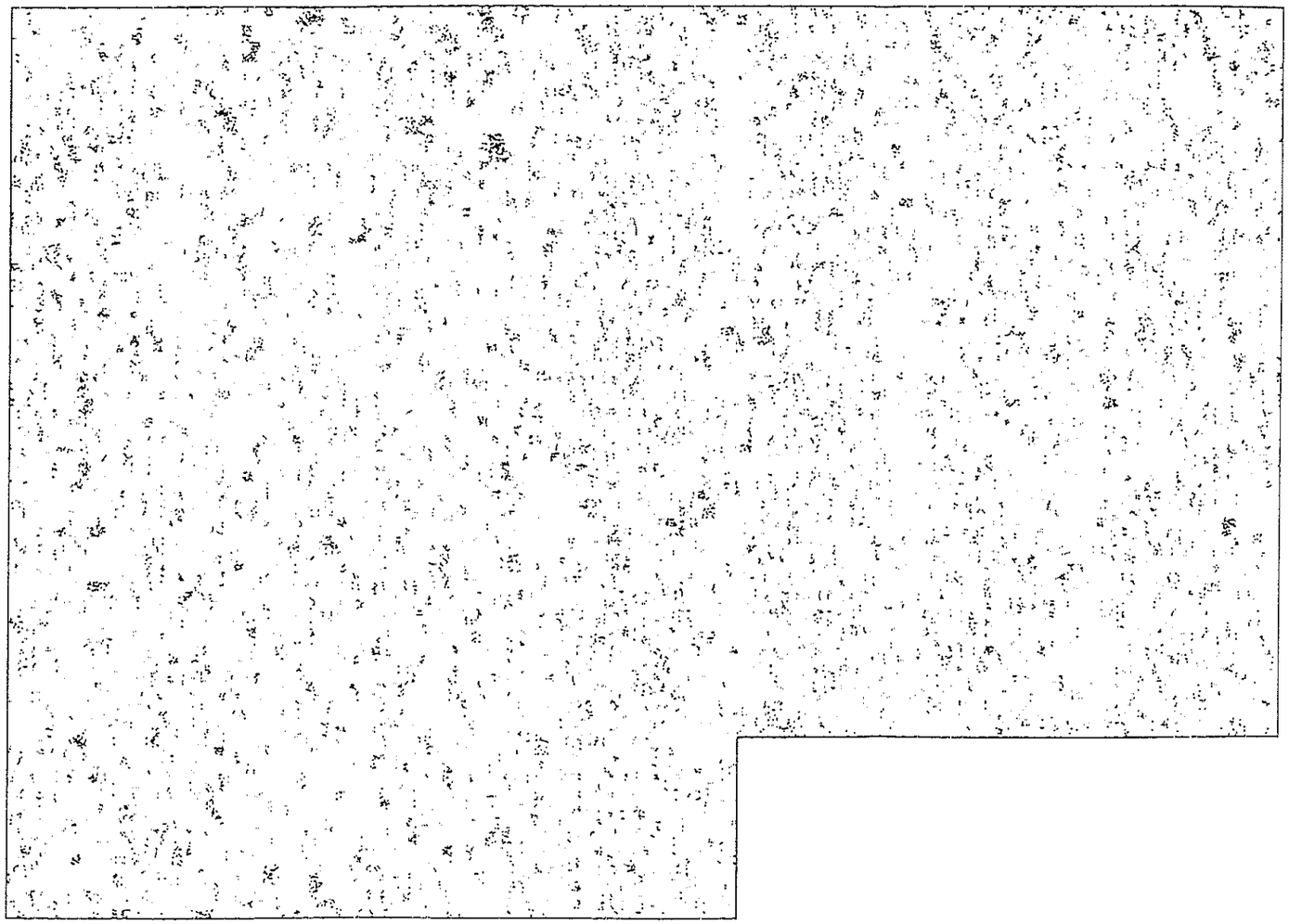
15 nT

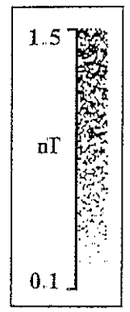
0 m 20

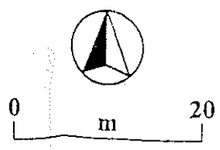
GSB Prospection 2001/111

Figure 13

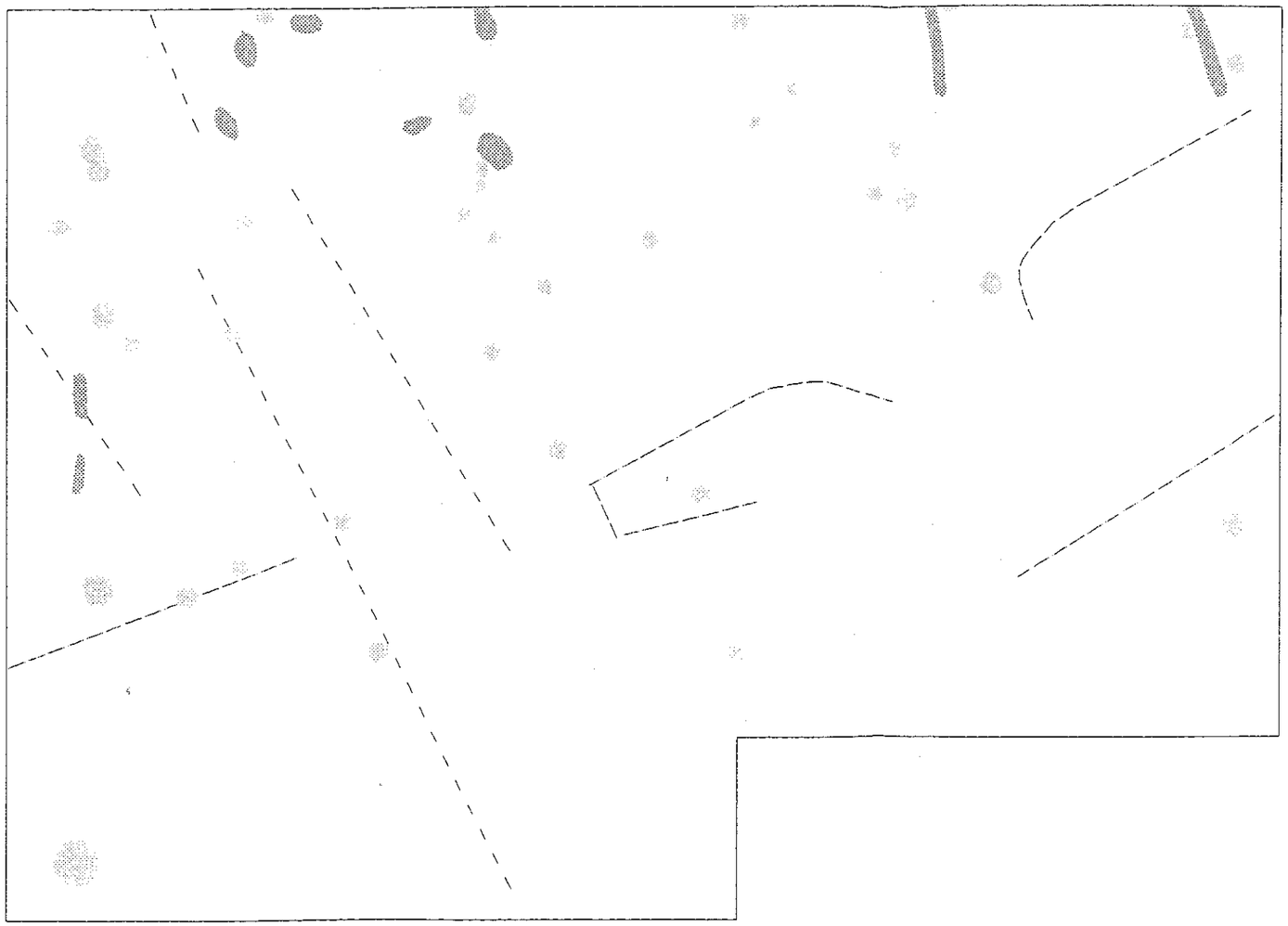
A303 STONEHENGE VII
Area D







A303 STONEHENGE VII
Area D



?Archaeology

Trend

Ploughing Trend

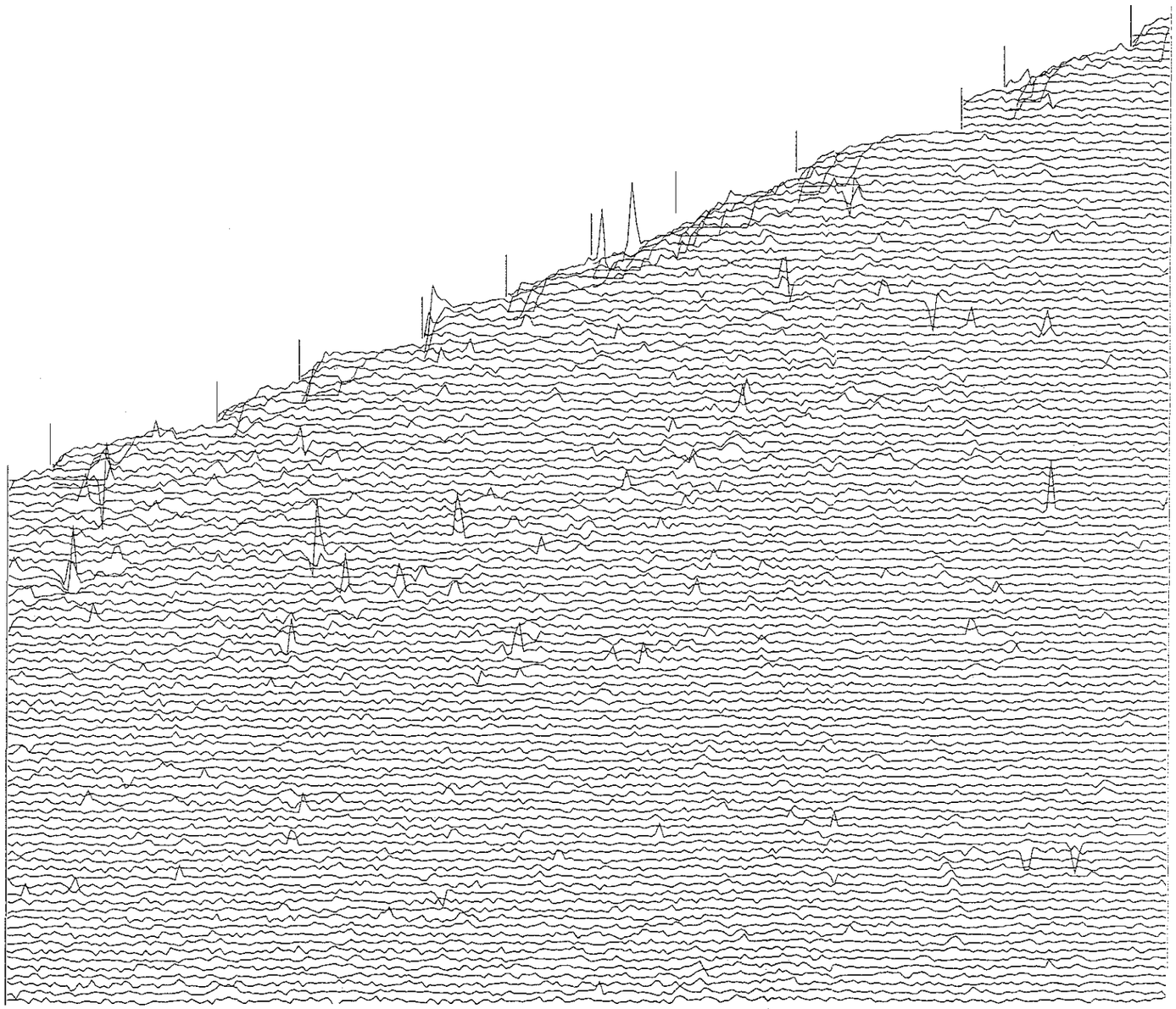
Ferrous

0 m 20

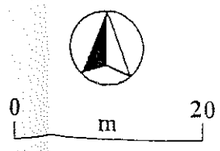
GSB Prospection 2001/111

Figure 15

A303 STONEHENGE VII
Area E



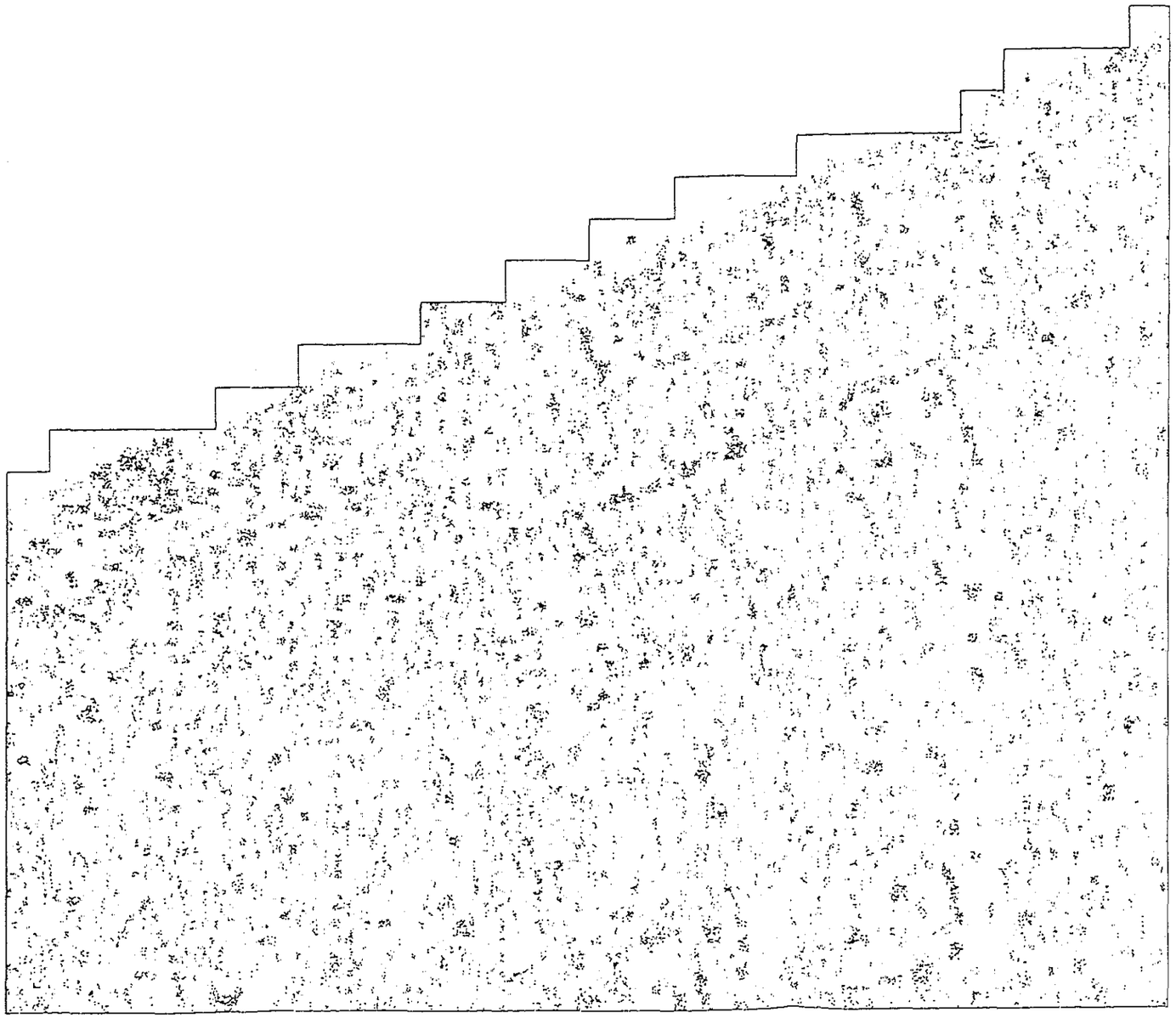
15 nT

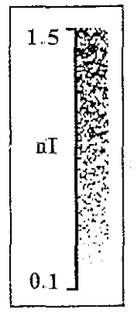


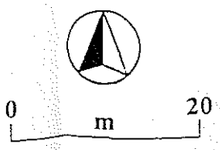
GSB Prospection 2001/111

Figure 16

A303 STONEHENGE VII
Area E



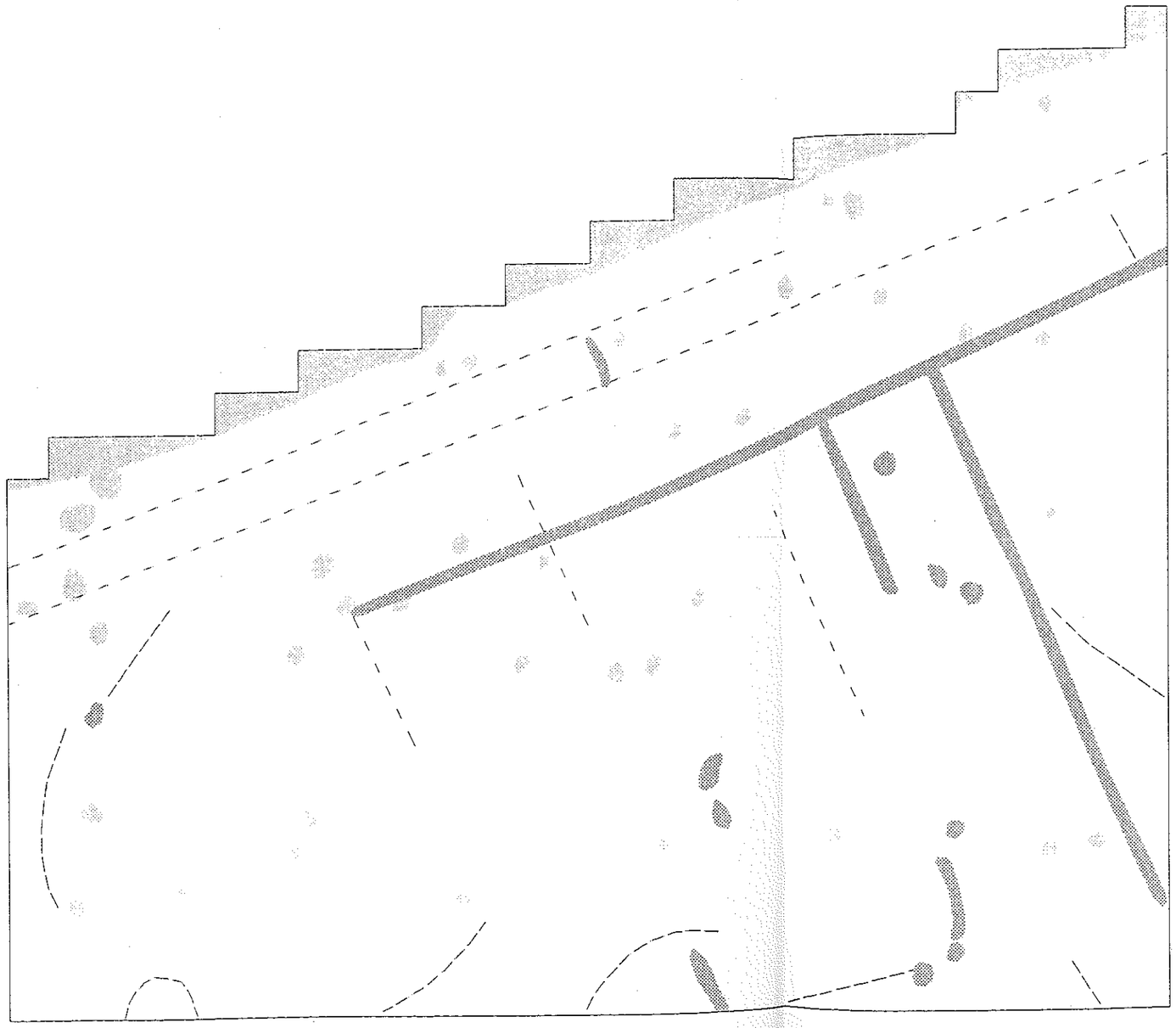




GSB Prospection 2001/111

Figure 17

A303 STONEHENGE VII
Area E



?Archaeology

Trend

Ploughing Trend

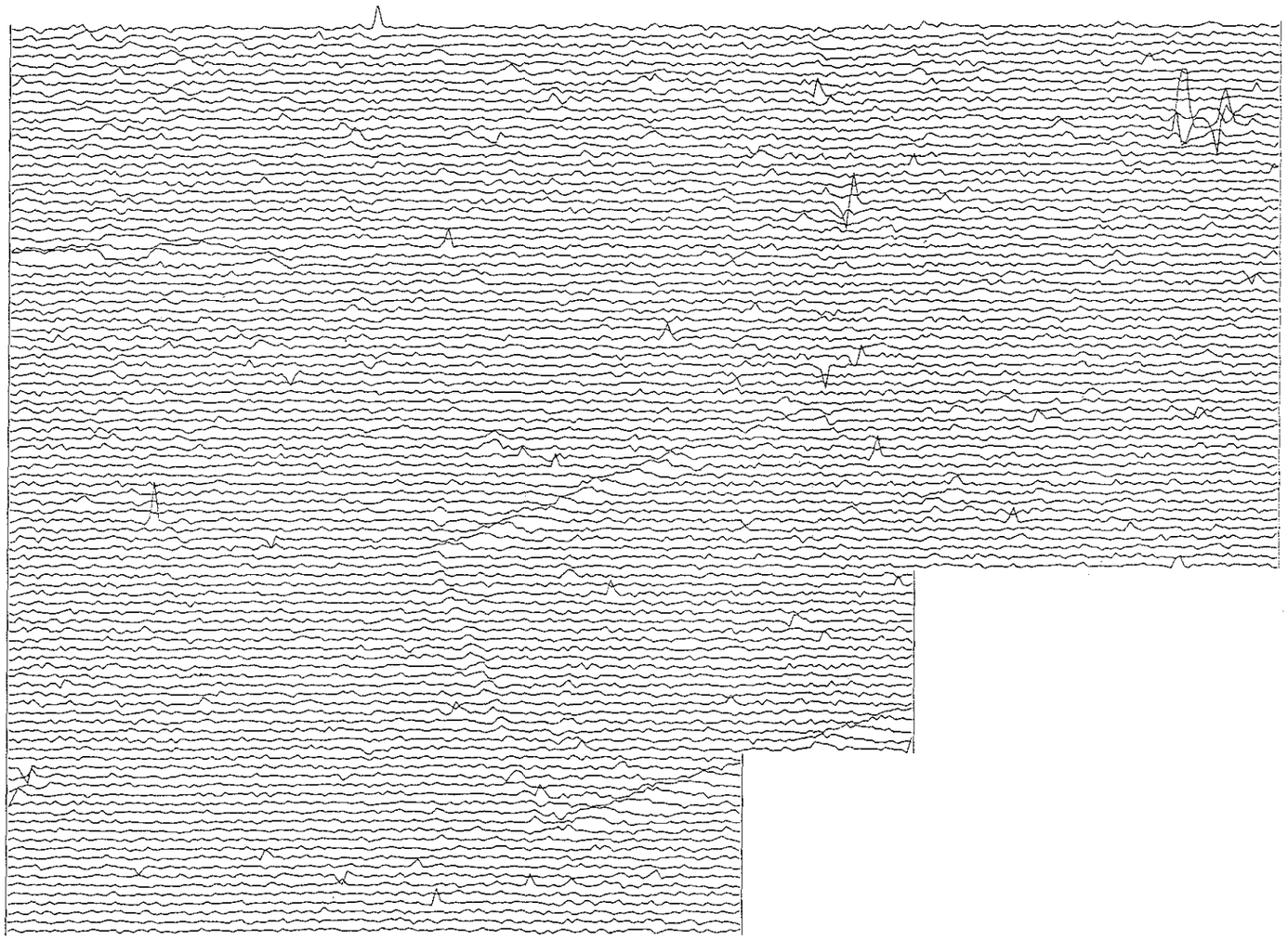
Ferrous

0 m 20

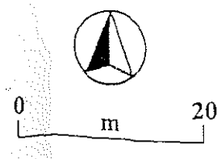
GSB Prospection 2001/111

Figure 18

A303 STONEHENGE VII
Area F



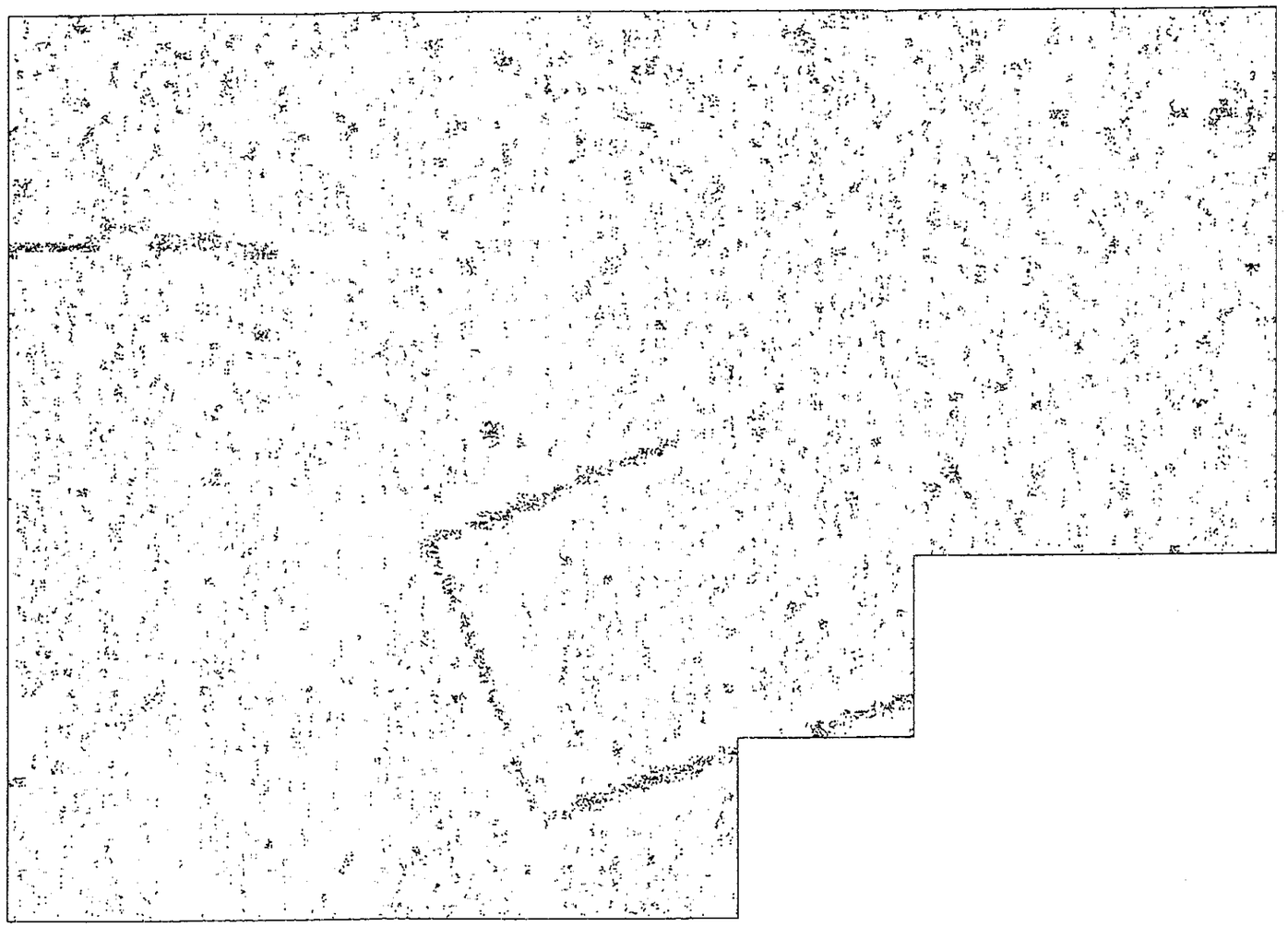
15 nT

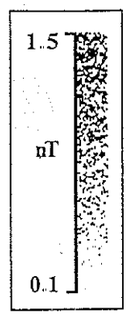


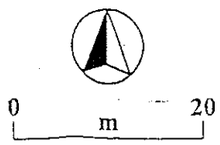
GSB Prospection 2001/111

Figure 19

A303 STONEHENGE VII
Area F



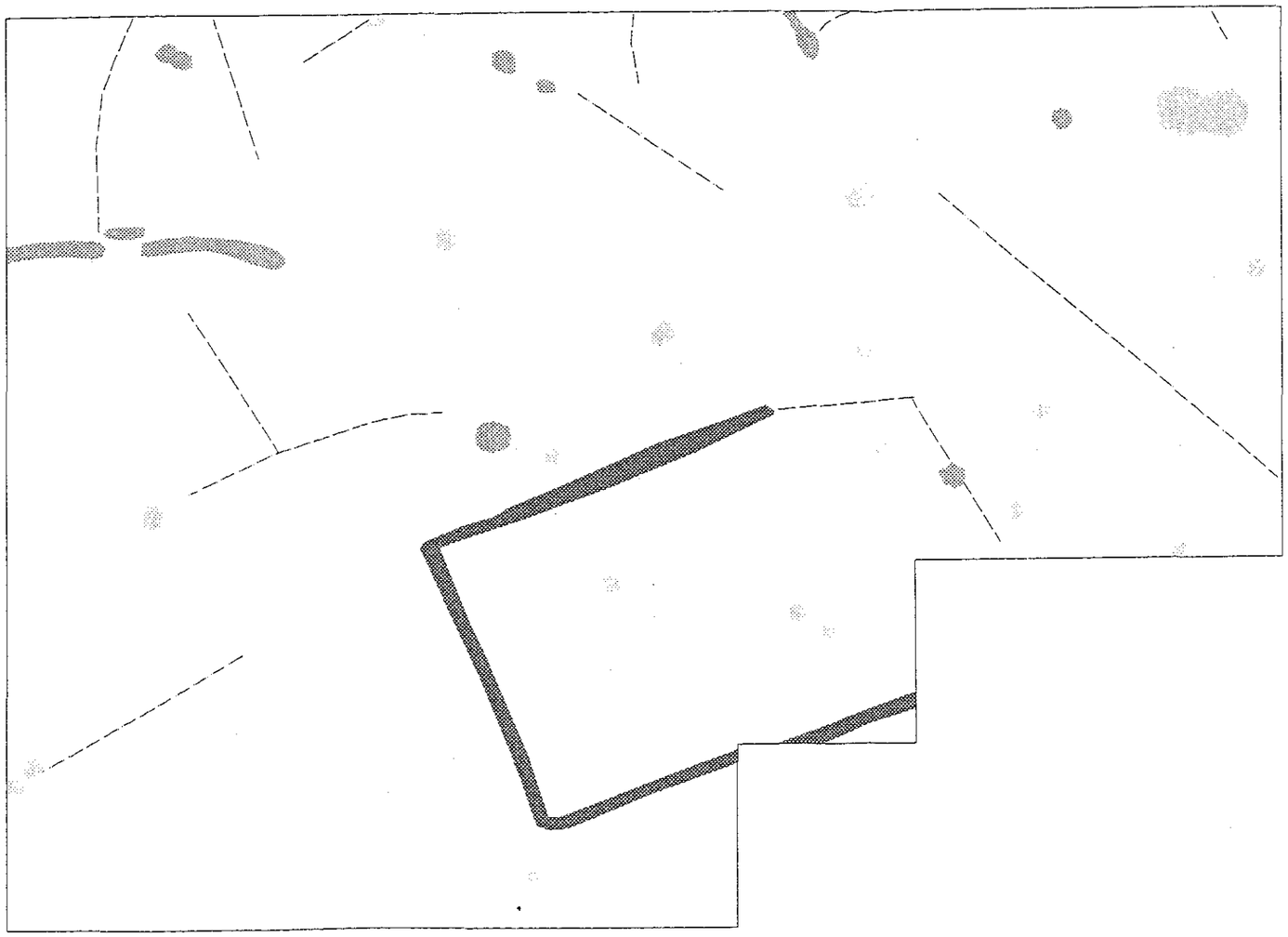




GSB Prospection 2001/111

Figure 20

A303 STONEHENGE VII
Area F



Archaeology

?Archaeology

Trend

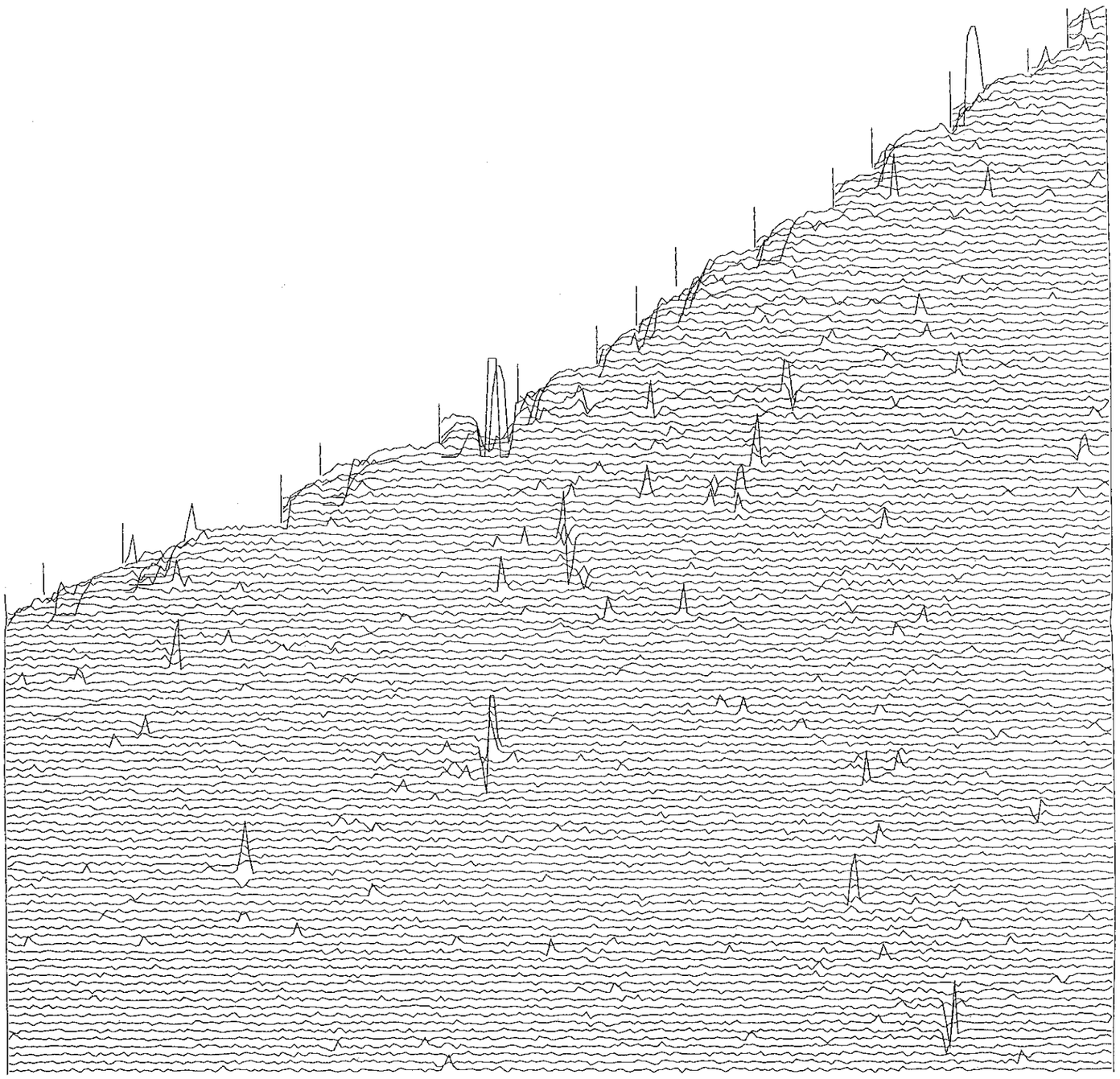
Ferrous

0 m 20

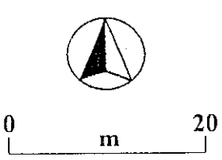
GSB Prospection 2001/111

Figure 21

A303 STONEHENGE VII
Area G



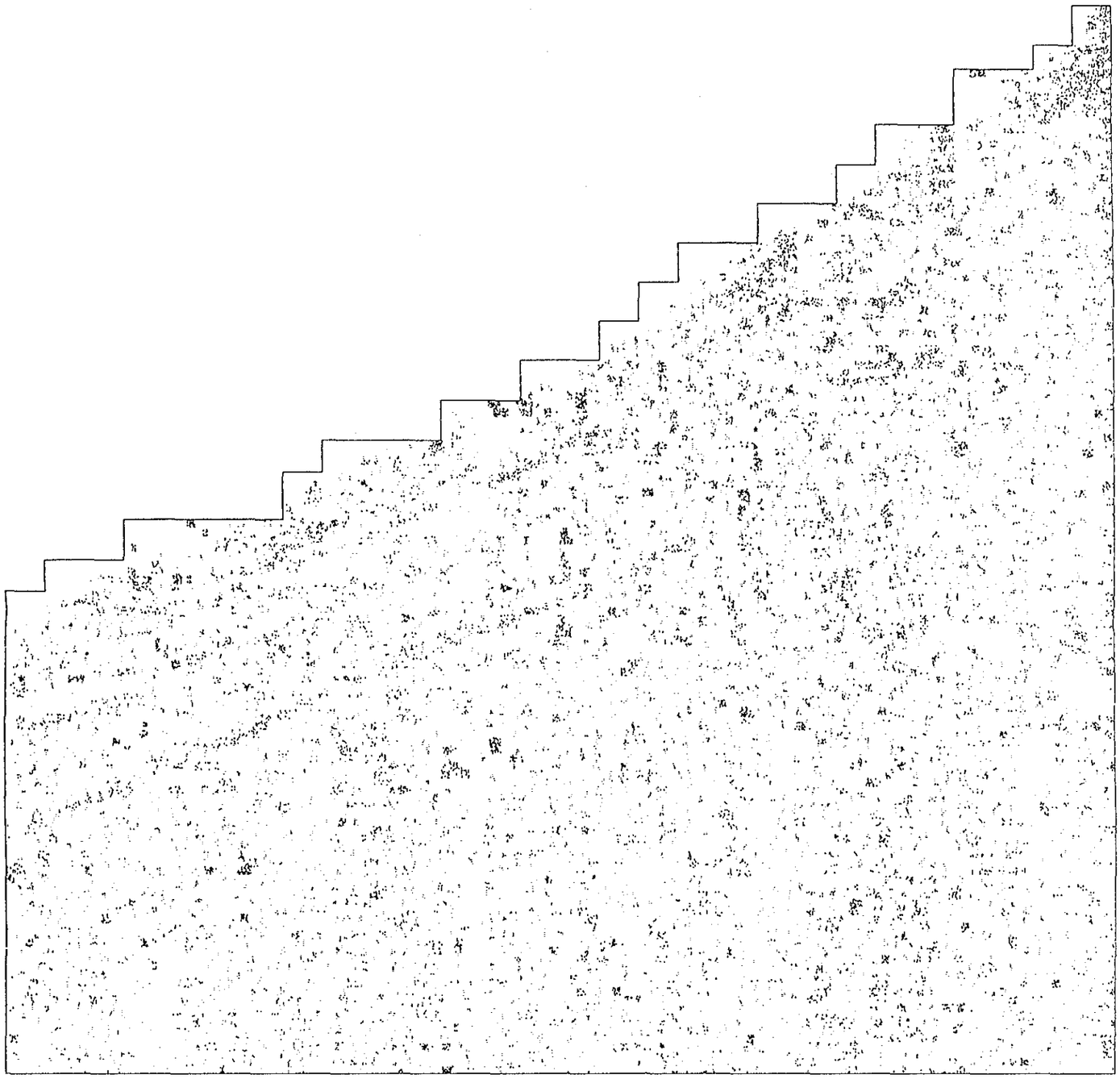
15 nT

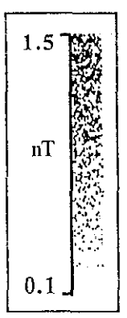


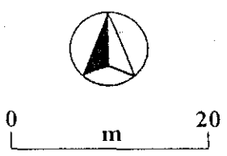
GSB Prospection 2001/111

Figure 22

A303 STONEHENGE VII
Area G



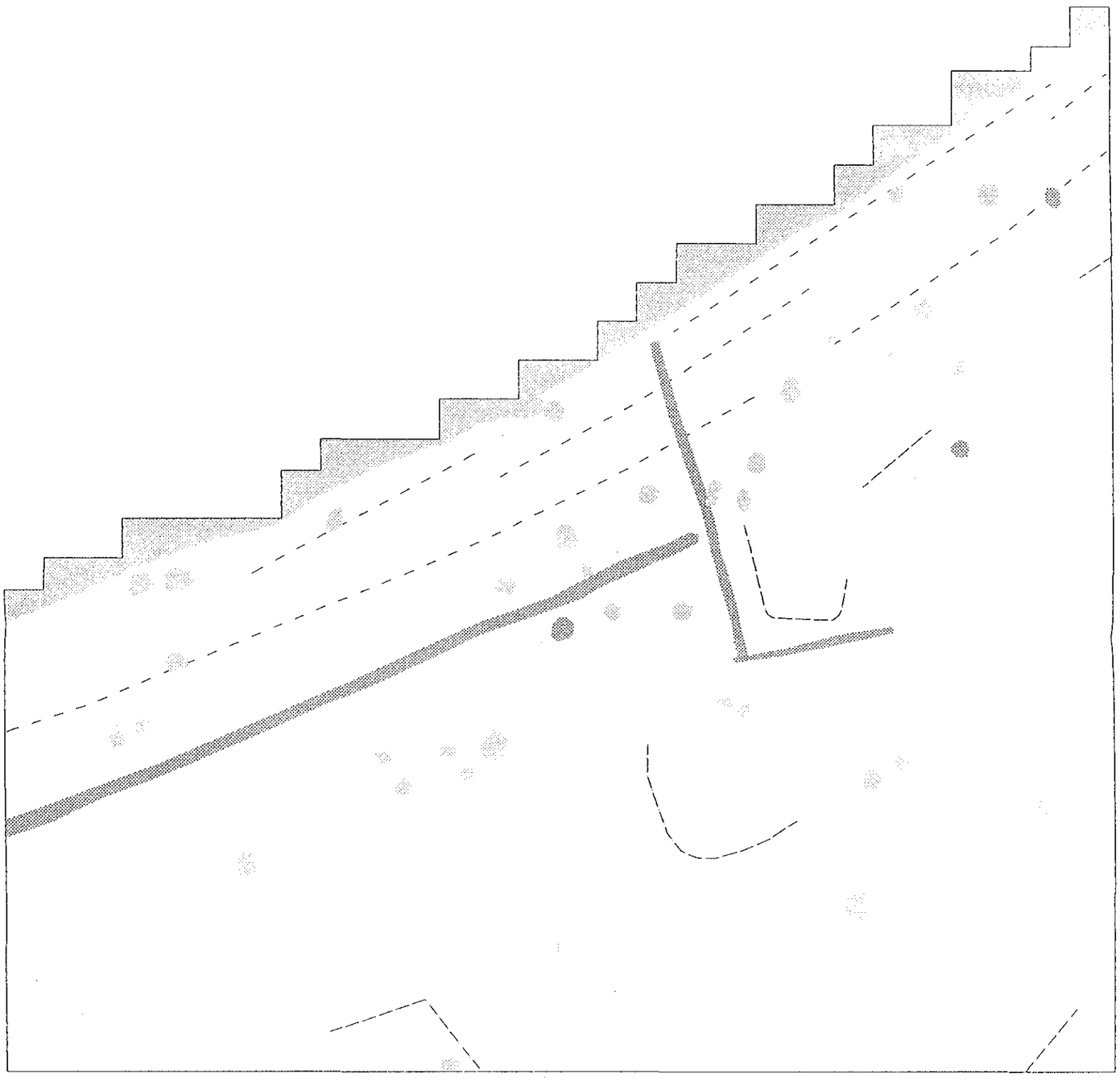




GSB Prospection 2001/111

Figure 23

A303 STONEHENGE VII
Area G



?Archaeology

Ploughing Trend

Trend

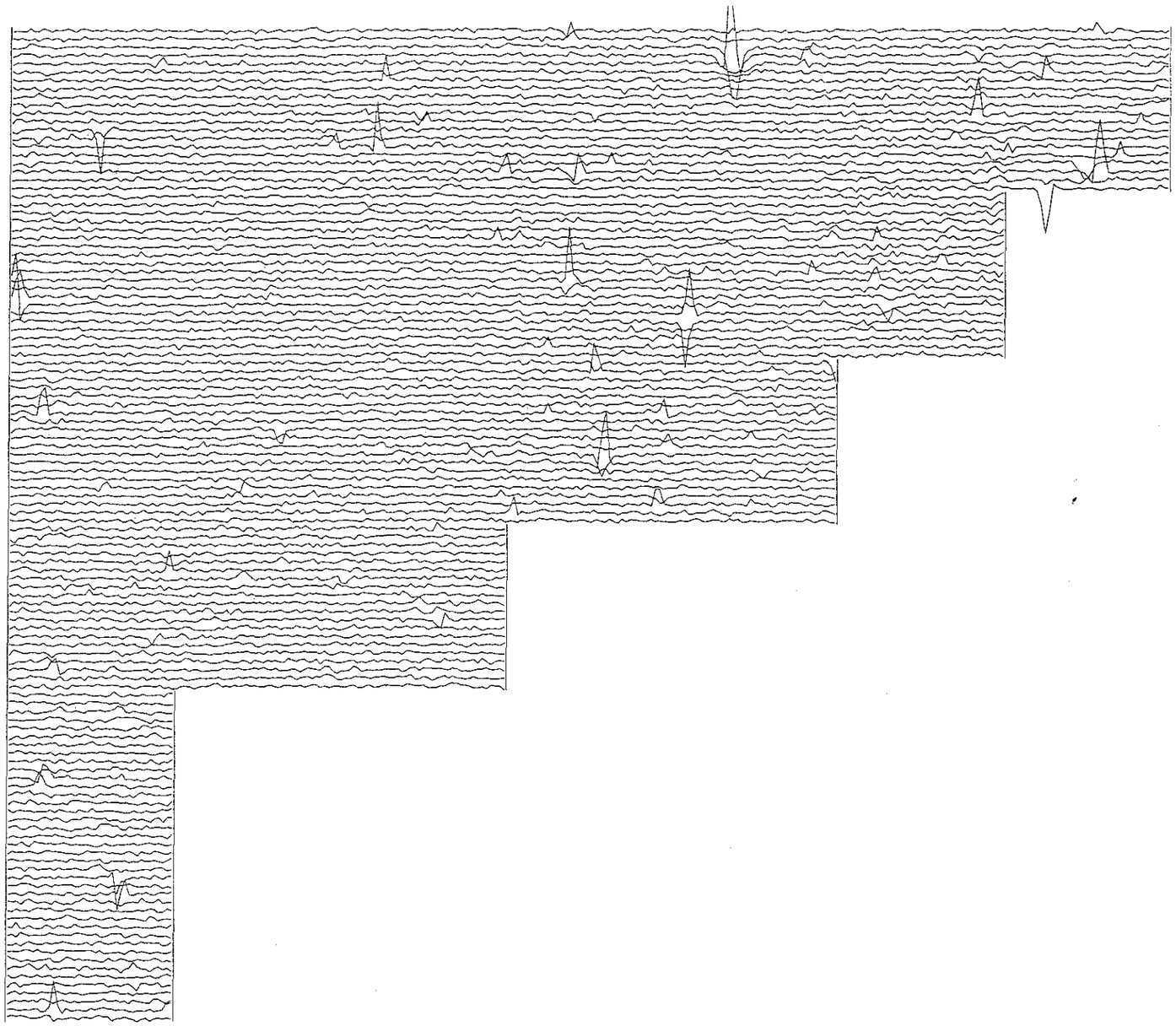
Ferrous

0 m 20

GSB Prospection 2001/111

Figure 24

A303 STONEHENGE VII
Area H



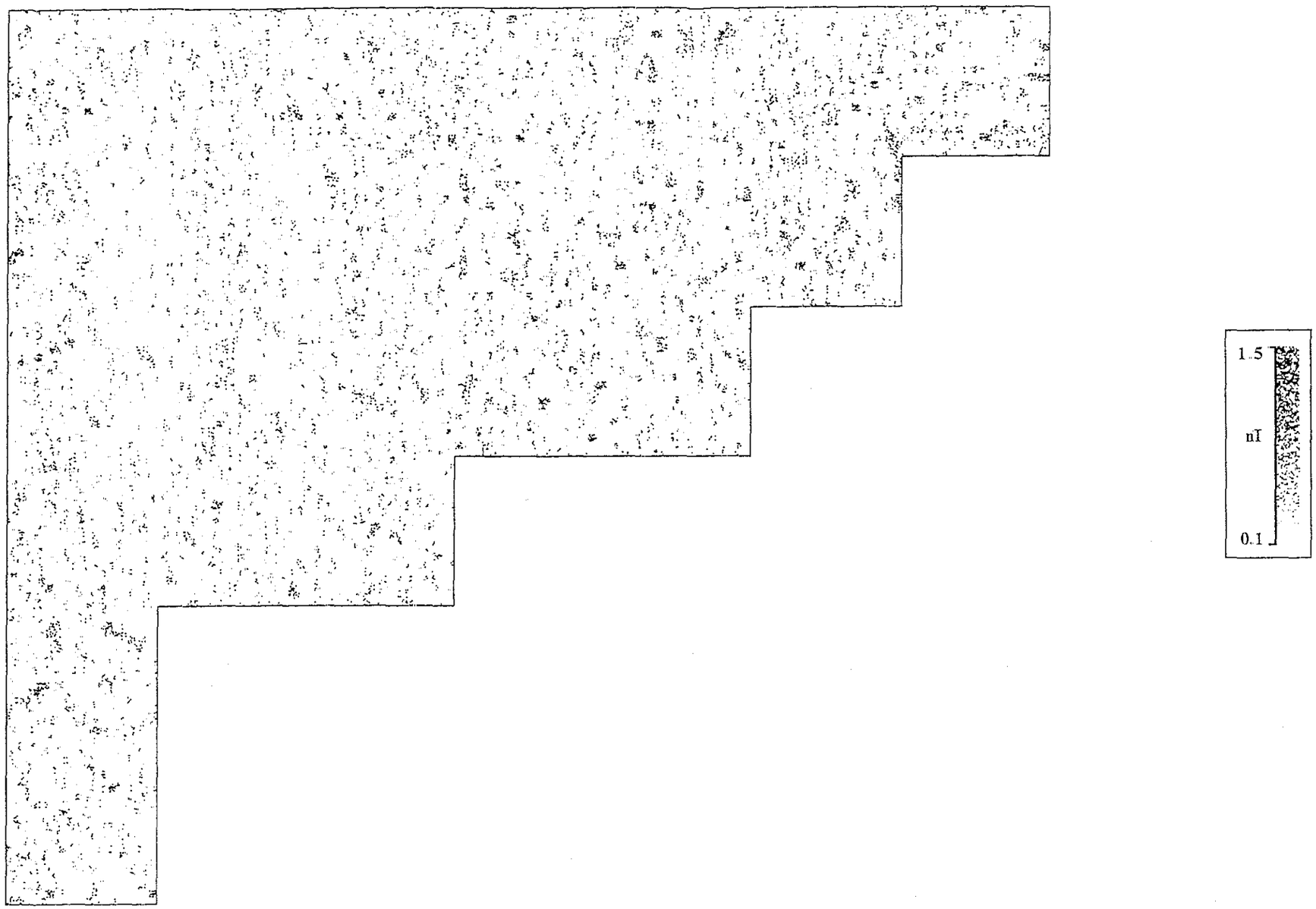
15 nT

0 m 20

GSB Prospection 2001/111

Figure 25

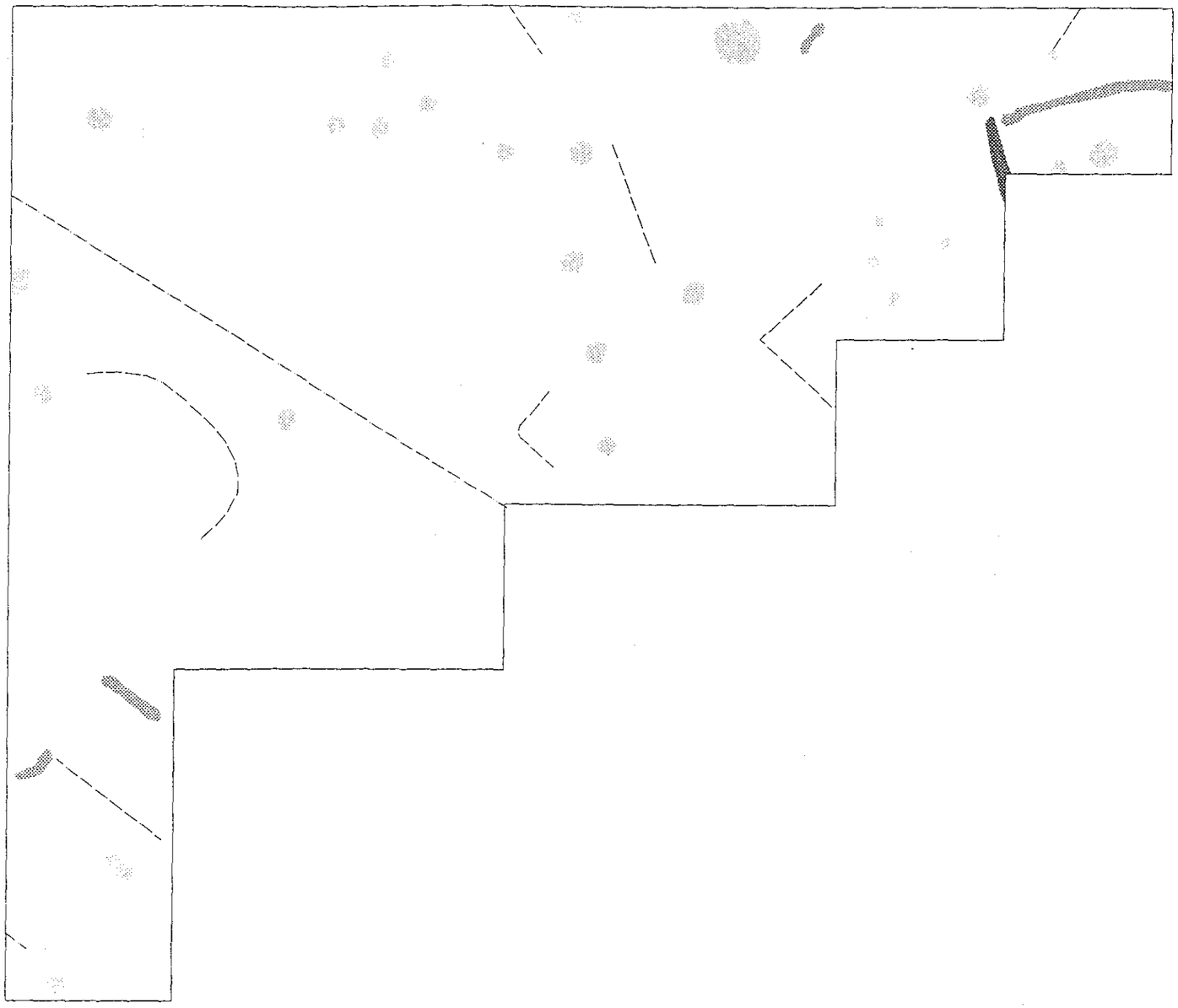
A303 STONEHENGE VII
Area H



GSB Prospection 2001/111

Figure 26

A303 STONEHENGE VII
Area H



Archaeology

?Archaeology

Trend

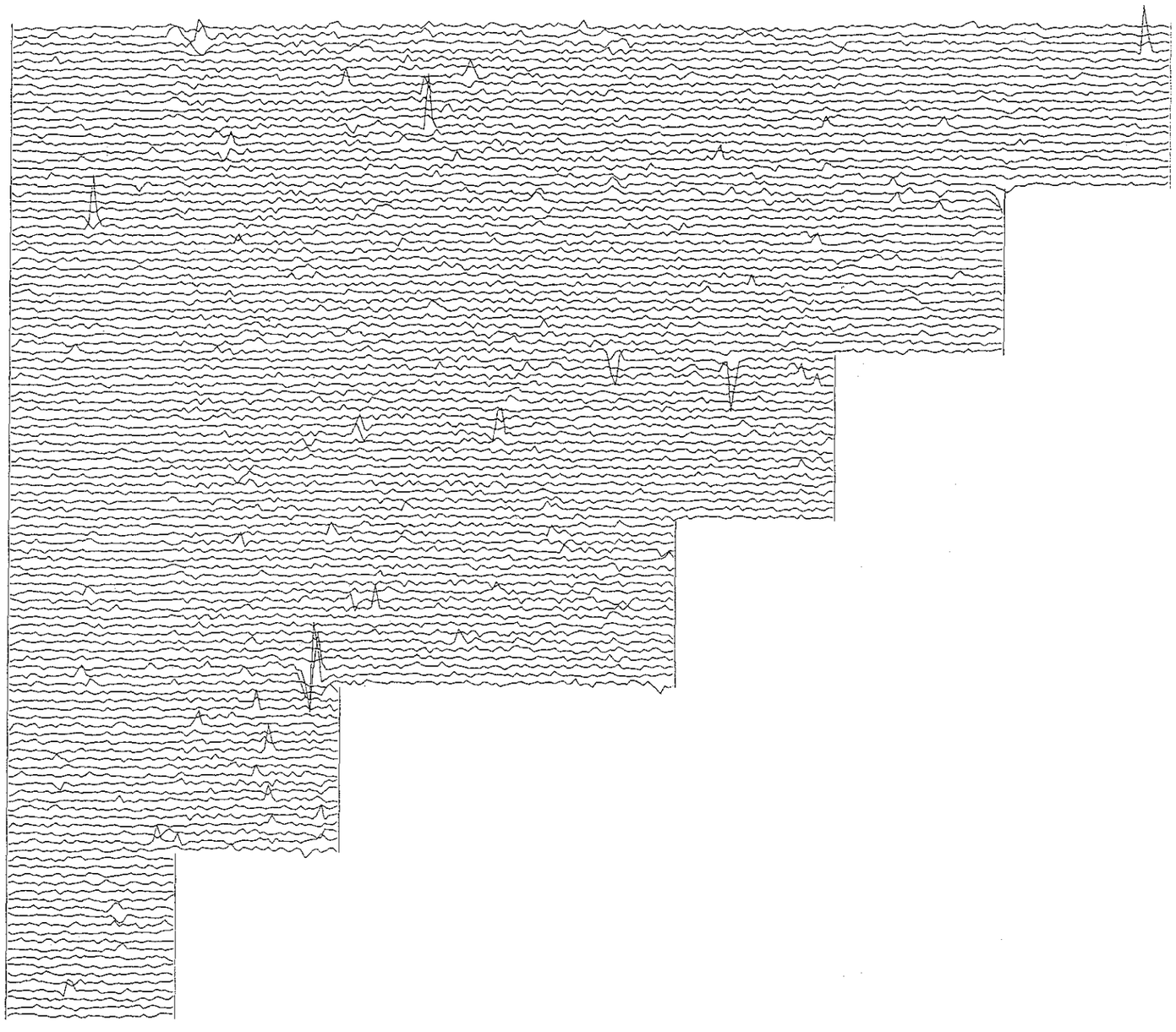
Ferrous

0 m 20

GSB Prospection 2001/111

Figure 27

A303 STONEHENGE VII
Area I



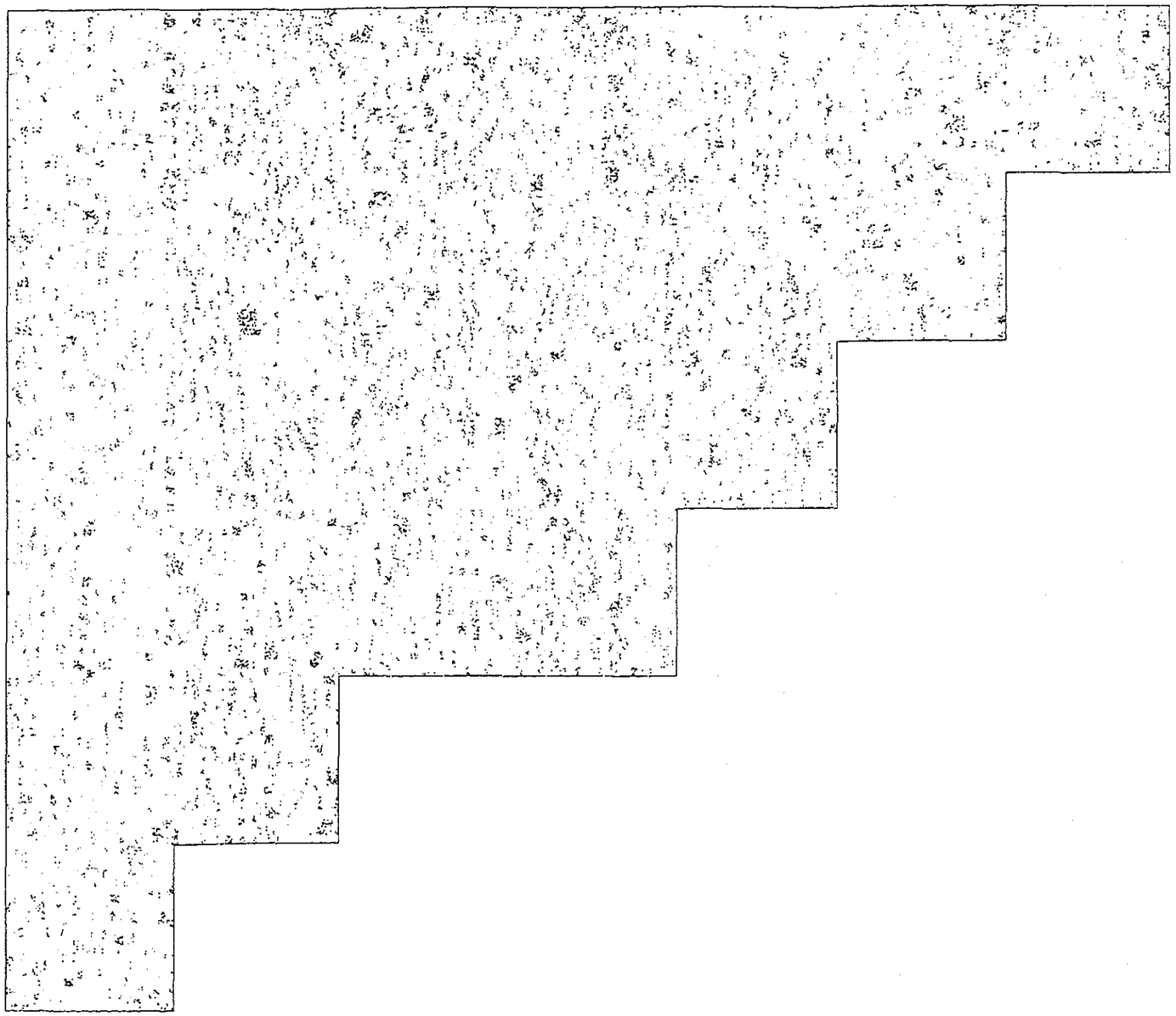
15 nT

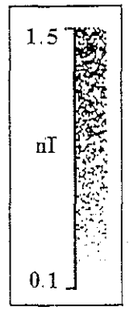
0 m 20

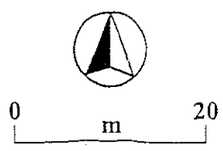
GSB Prospection 2001/111

Figure 28

A303 STONEHENGE VII
Area I



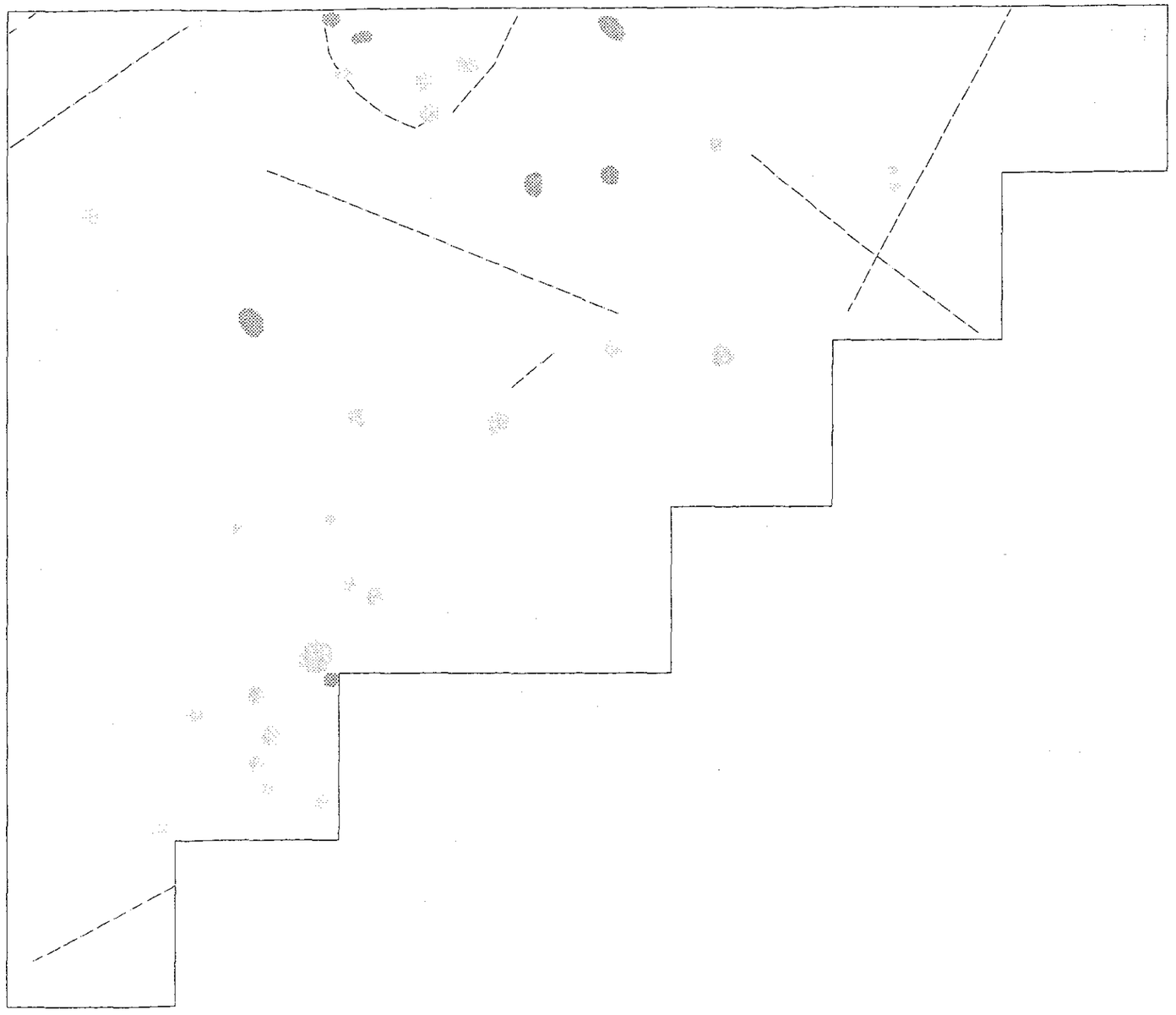




GSB Prospection 2001/111

Figure 29

A303 STONEHENGE VII
Area I



?Archaeology

Trend

Ploughing Trend

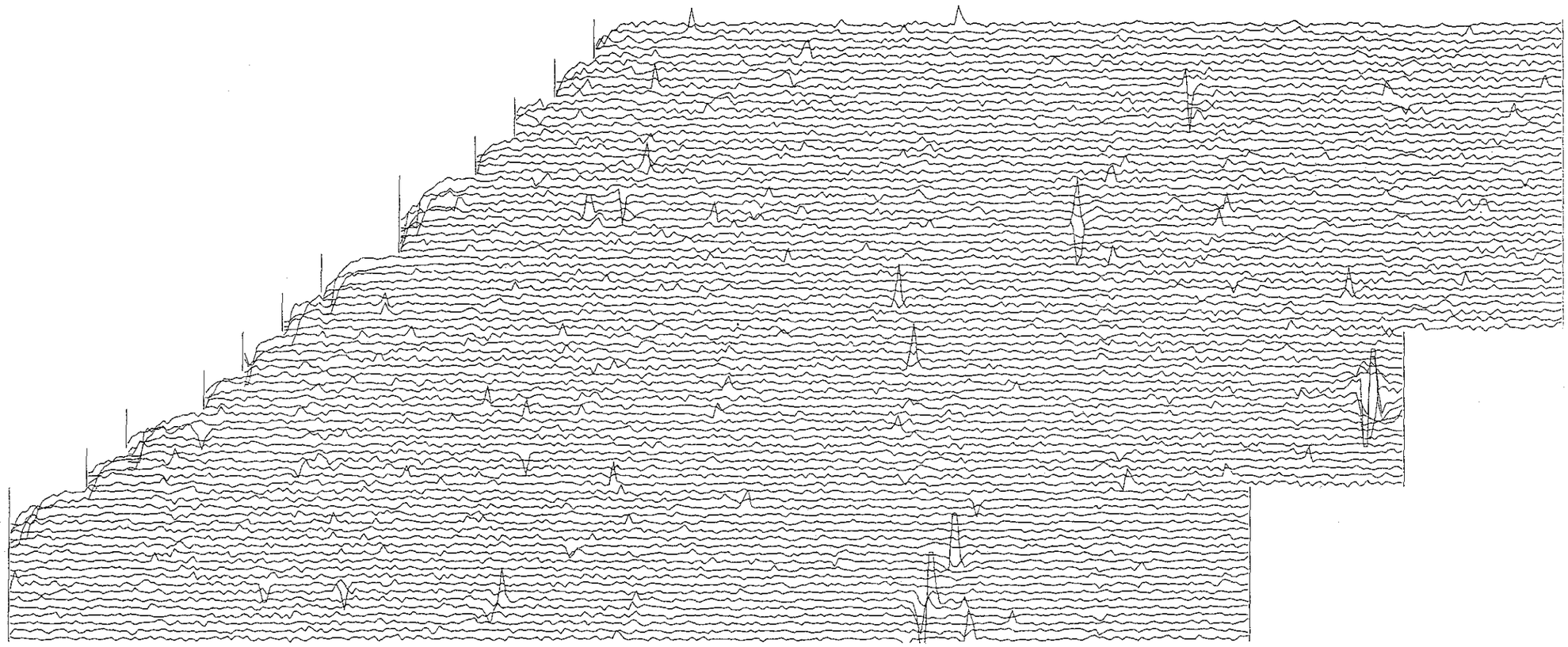
Ferrous

0 m 20

GSB Prospection 2001/111

Figure 30

A303 STONEHENGE VII
Area J



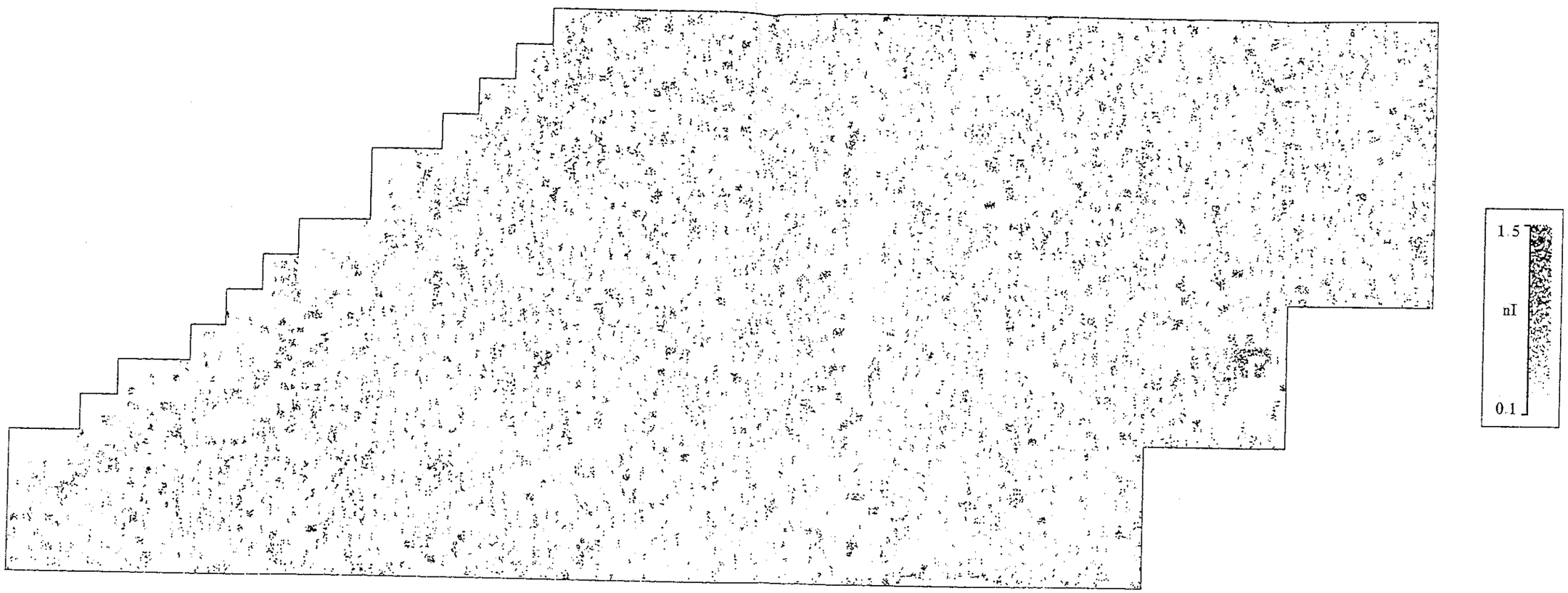
15 nT

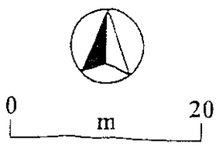
0 m 20

GSB Prospection 2001/111

Figure 31

A303 STONEHENGE VII
Area J

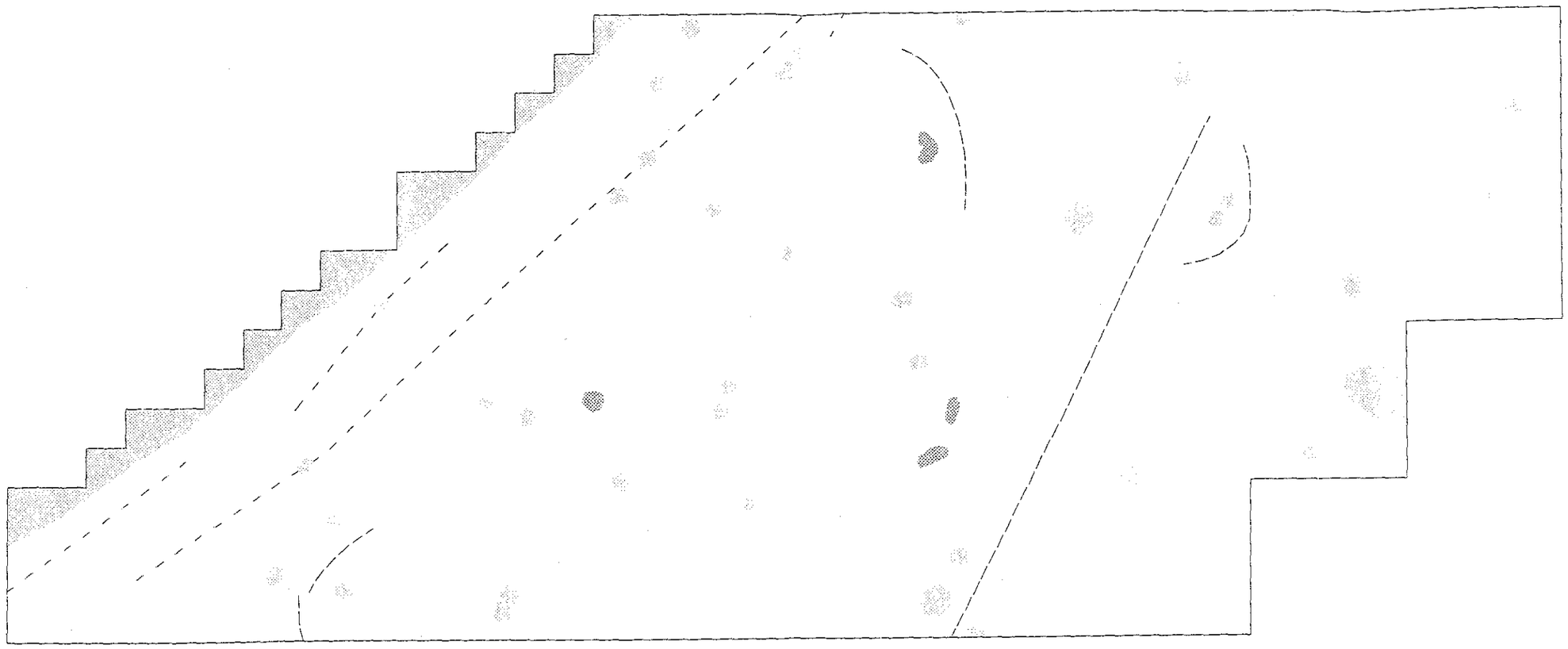




GSB Prospection 2001/111

Figure 32

A303 STONEHENGE VII
Area J



?Archaeology

Ploughing Trend

Trend

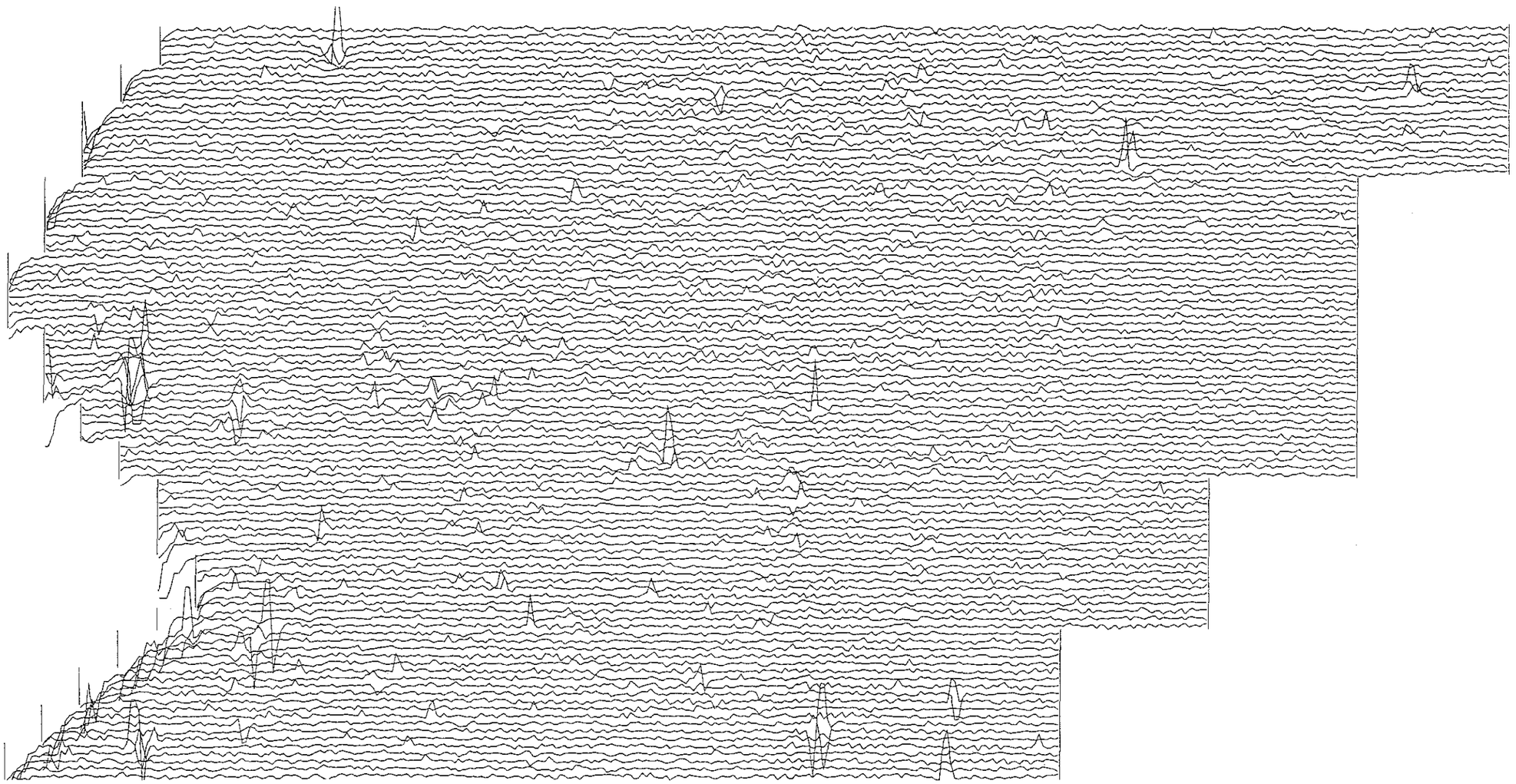
Ferrous

0 m 20

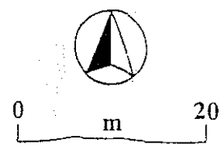
GSB Prospection 2001/111

Figure 33

A303 STONEHENGE VII
Area K



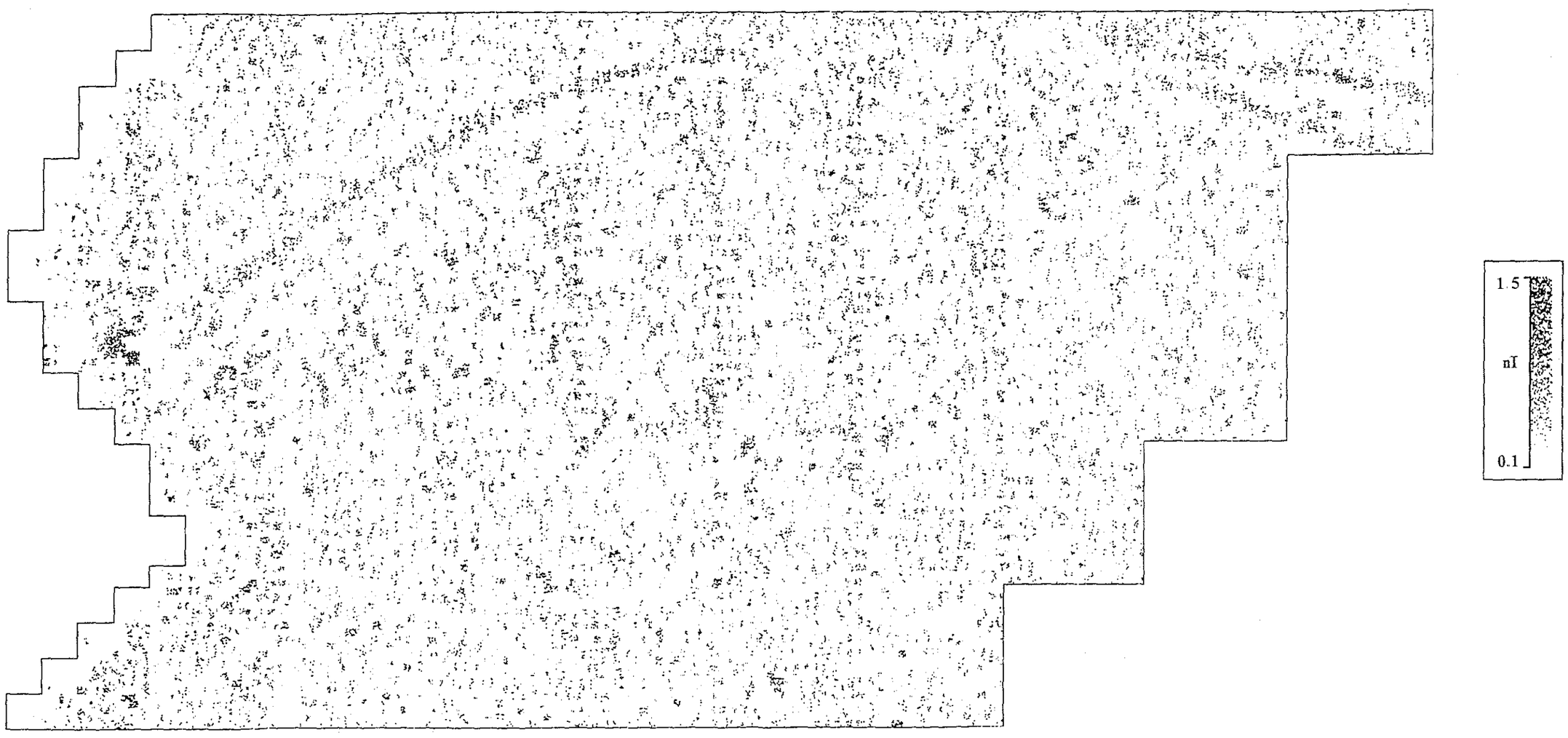
15 nT



GSB Prospection 2001/111

Figure 34

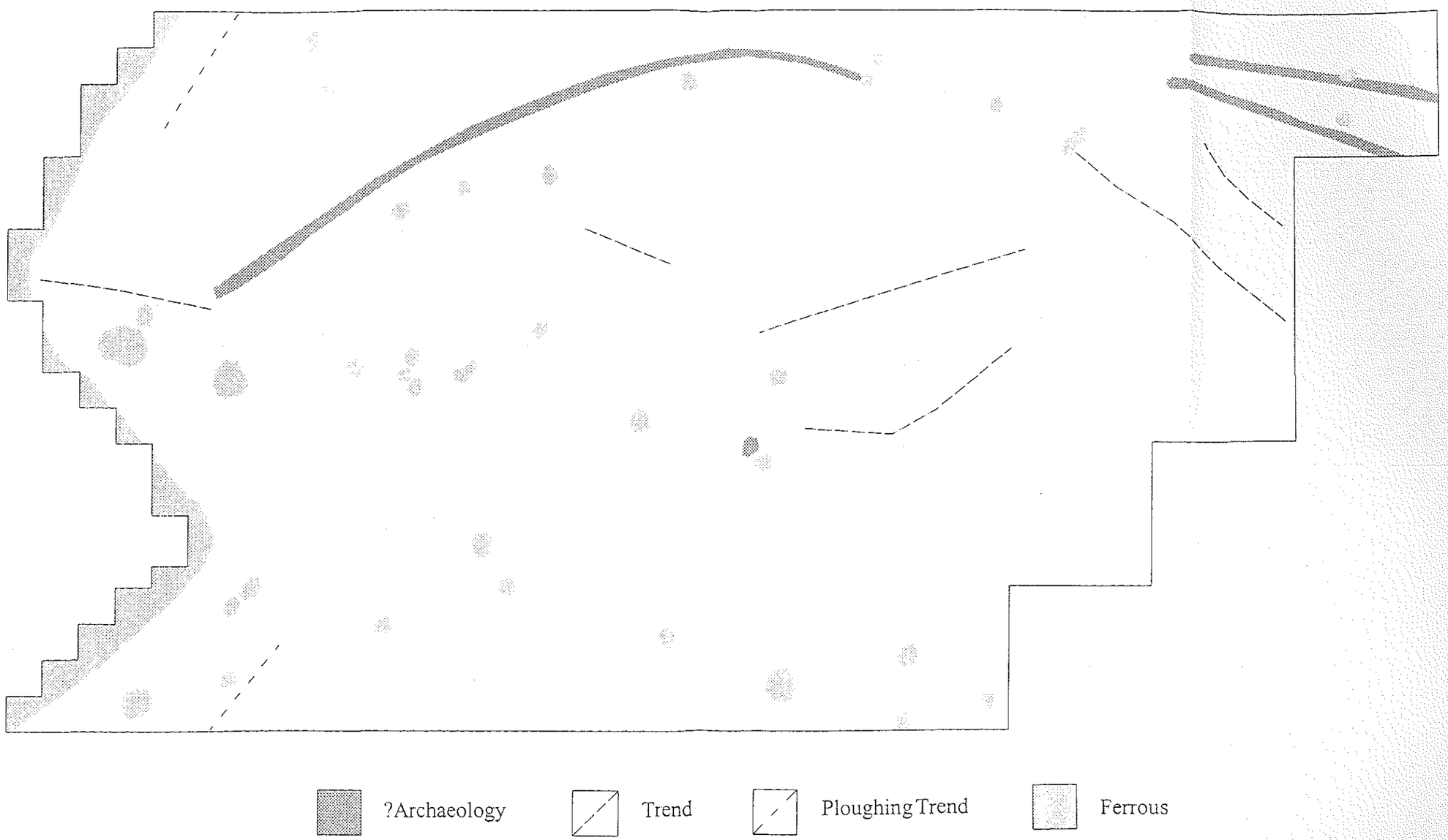
A303 STONEHENGE VII
Area K



GSB Prospection 2001/111

Figure 35

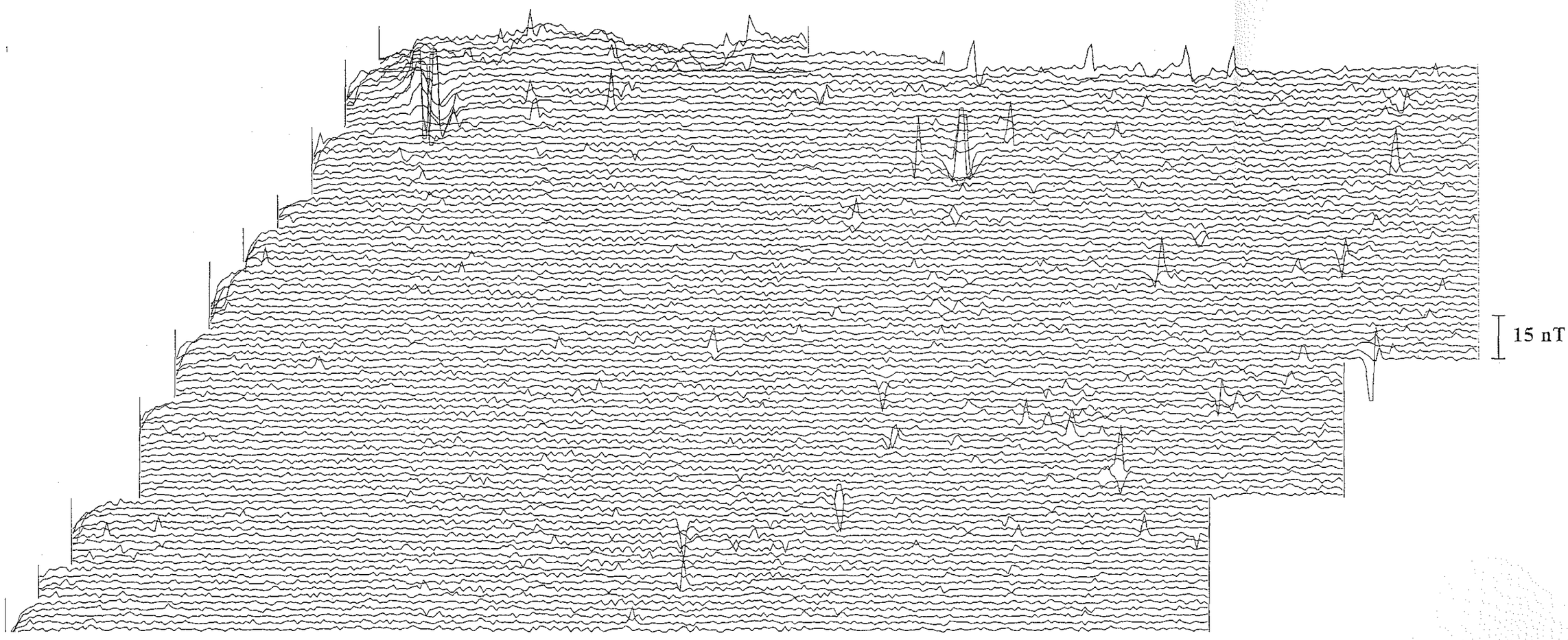
A303 STONEHENGE VII
Area K

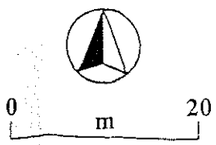


GSB Prospection 2001/111

Figure 36

A303 STONEHENGE VII
Area L

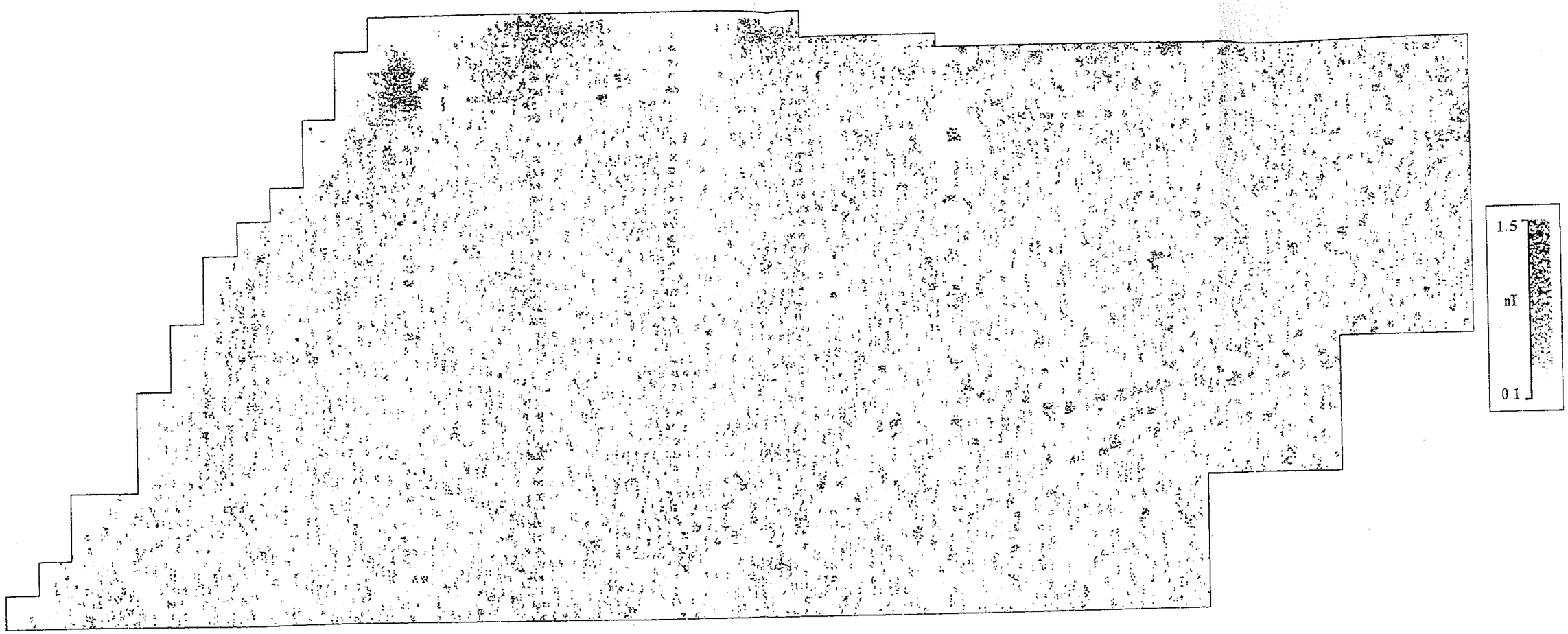




GSB Prospection 2001/111

Figure 37

A303 STONEHENGE VII
Area L



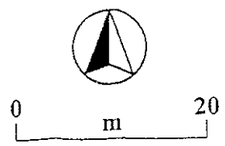
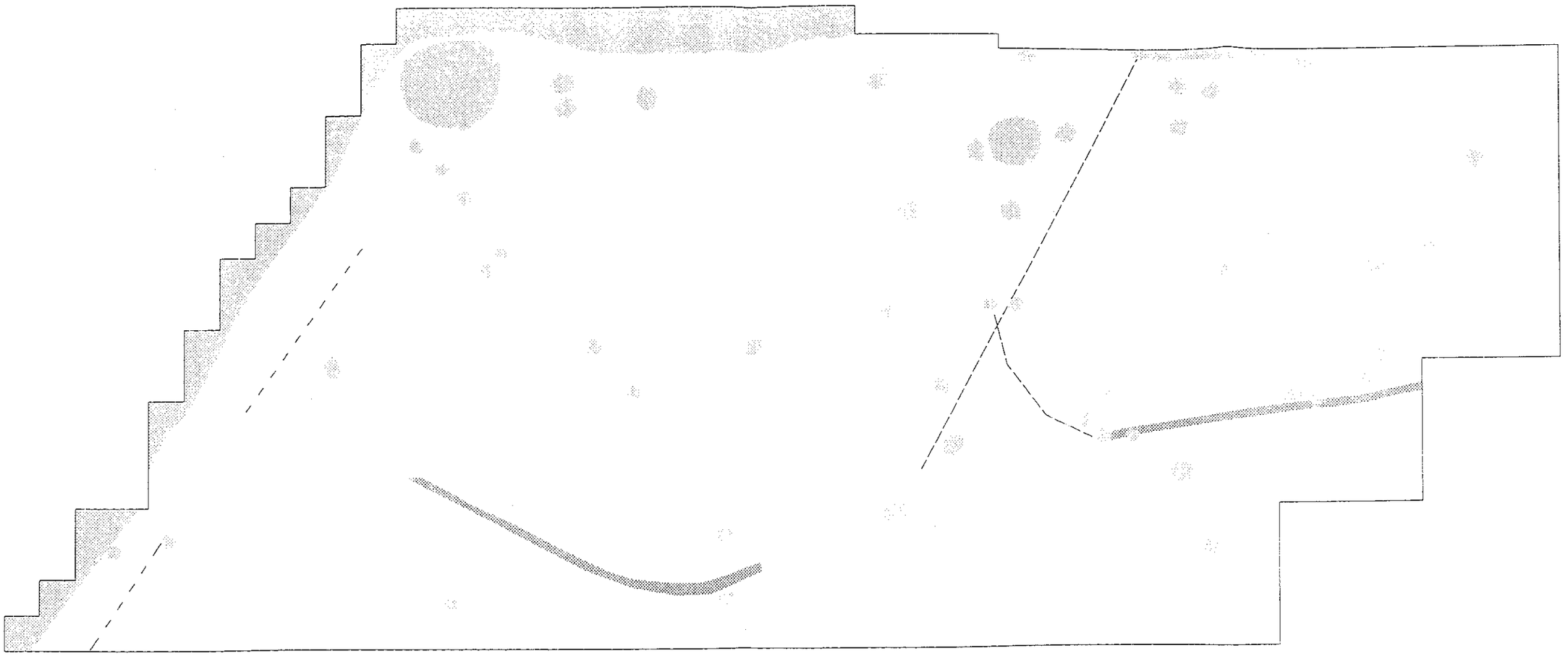


Figure 38

GSB Prospection 2001/111

A303 STONEHENGE VII
Area L



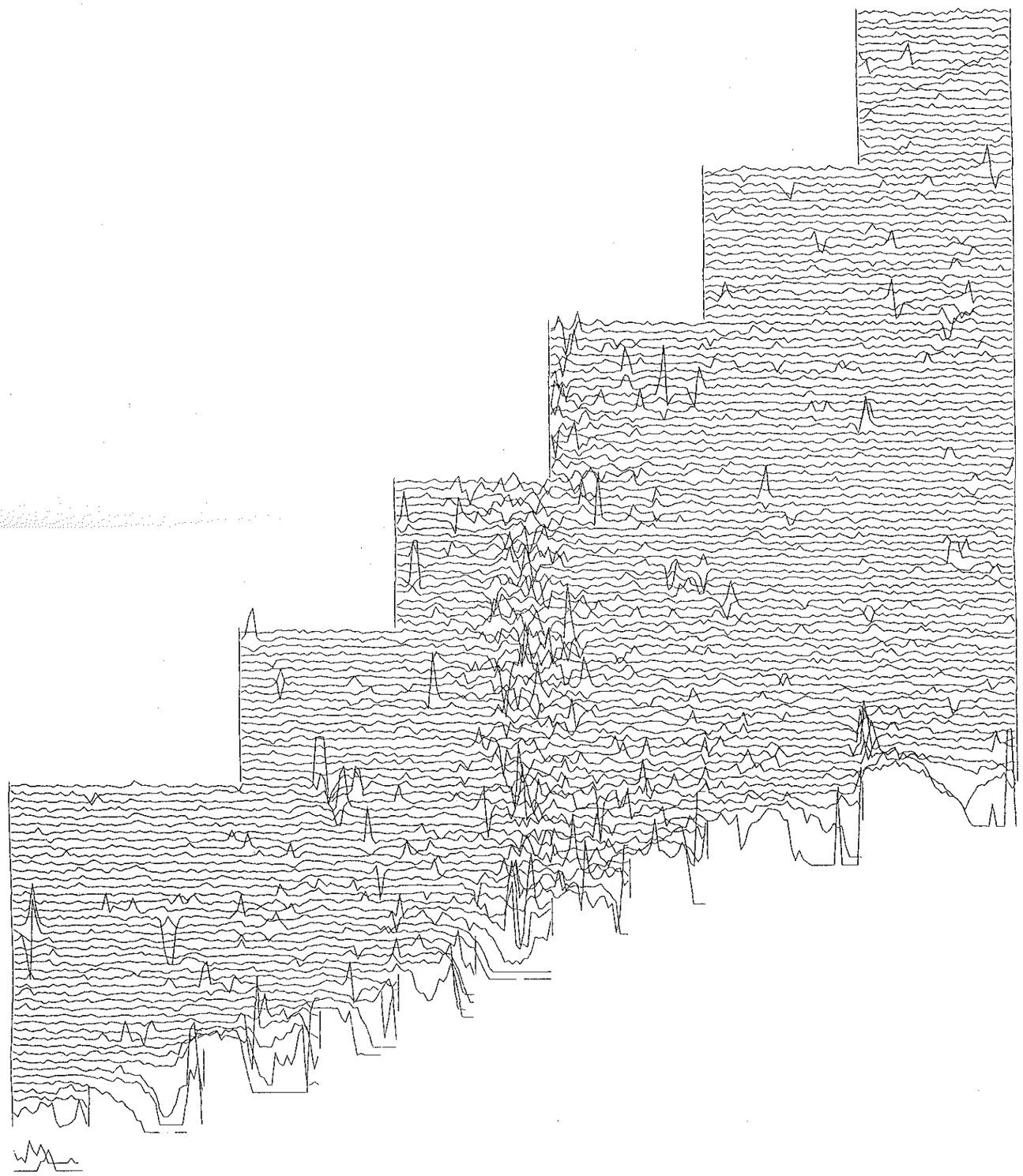
?Archaeology Trend Ploughing Trend Ferrous

0 m 20

GSB Prospection 2001/111

Figure 39

A303 STONEHENGE VII
Area M



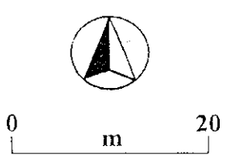
15 nT

0 m 20

GSB Prospection 2001/111

Figure 40

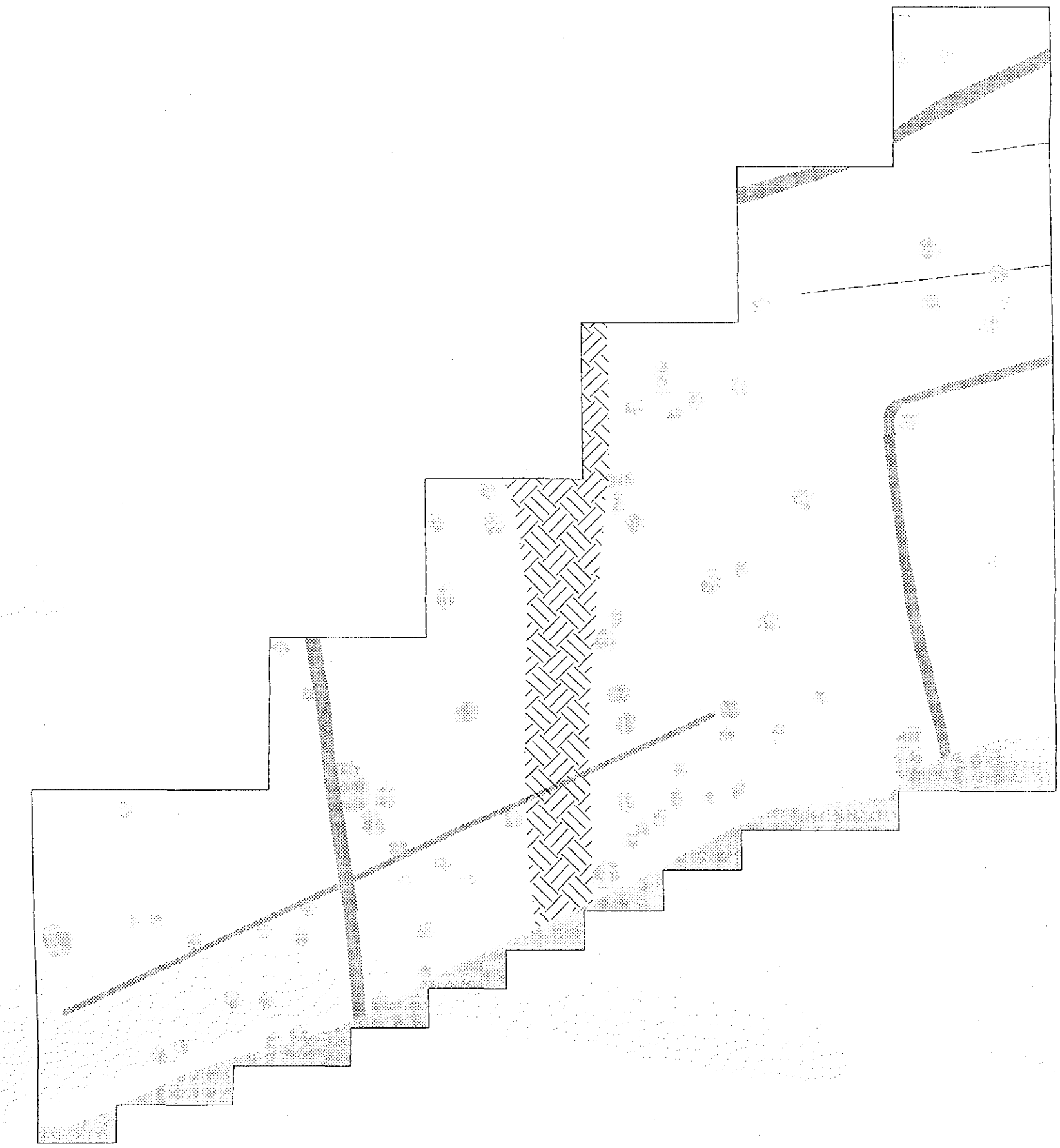
A303 STONEHENGE VII
Area M



GSB Prospection 2001/111

Figure 41

A303 STONEHENGE VII
Area M



?Archaeology

?Natural

Trend

Ferrous

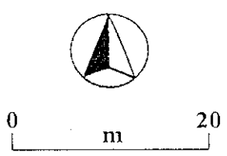
0 m 20

GSB Prospection 2001/111

Figure 42

A303 STONEHENGE VII
Area N

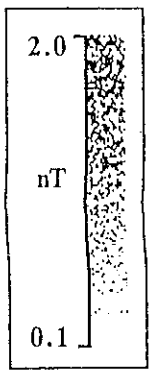
15 nT

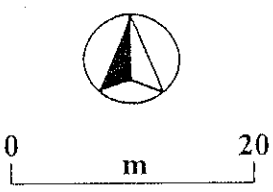


GSB Prospection 2001/111

Figure 43

A303 STONEHENGE VII
Area N





GSB Prospection 2001/111

Figure 44

A303 STONEHENGE VII
Area N

?Archaeology

Trend

Ferrous

0 m 20

GSB Prospection 2001/111

Figure 45