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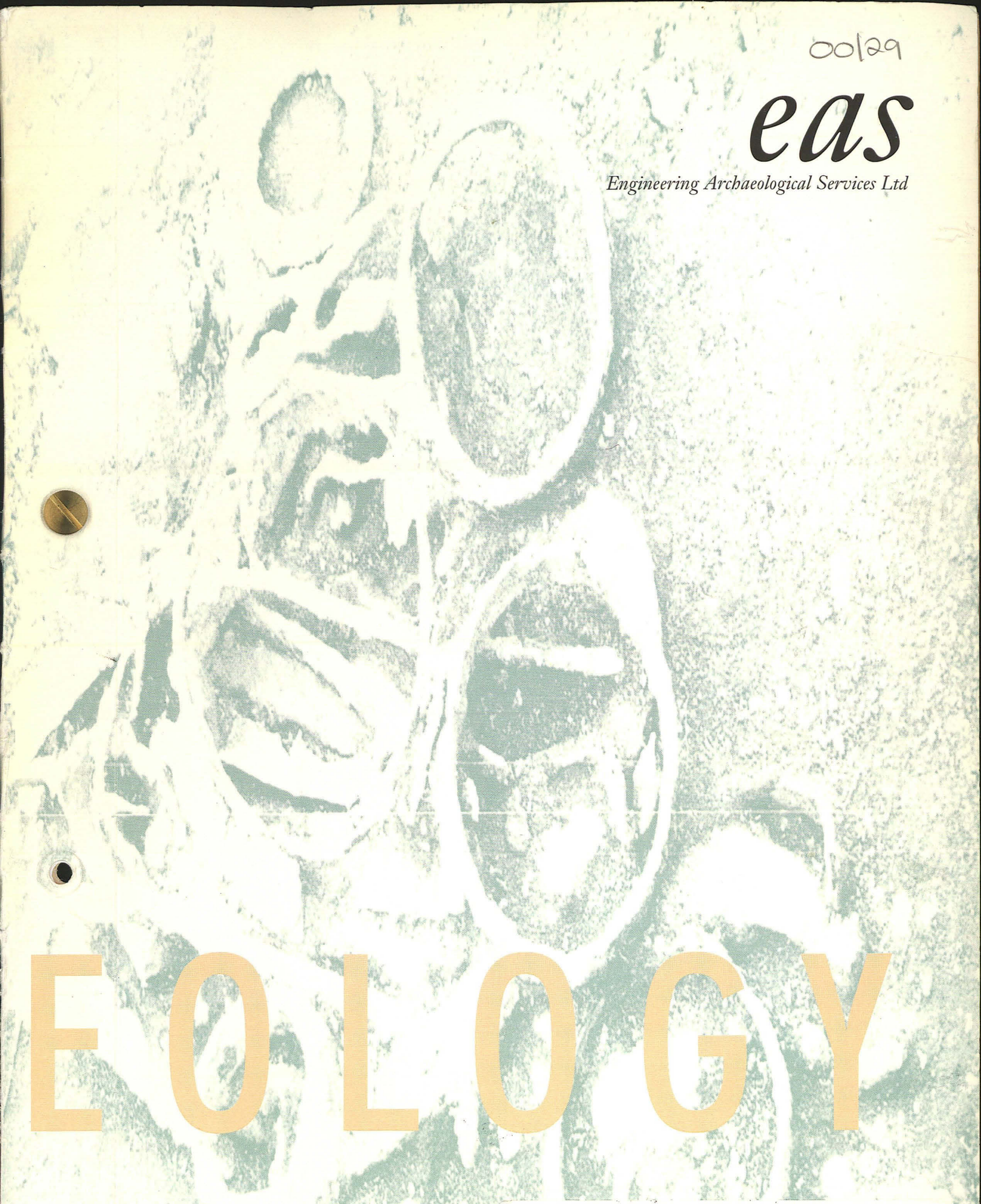
Engineering Archaeological Services Ltd



EOLOGY

Market Deeping
Geophysical Survey

September 2000

Survey Commissioned
by
Archaeological Project Services Ltd.

Surveyed
by
I.P. Brooks and K. Laws
Engineering Archaeological Services Ltd.

registered in England
№ 2869678

Market Deeping
Geophysical Survey

September 2000

CONTENTS

Market Deeping Geophysical Survey - Introduction:

NGR

Centred on TF 14181140

Location and Topography

The survey area was north of Towngate East, Market Deeping between the industrial estate and sports fields. The field was largely flat and under cereal stubble.

Archaeological Background

Aerial photographs and previous archaeological work in the general area has shown the presence of a large scale prehistoric field system together with a second, probable Roman, field system associated with Carr Dyke.

Aims of Survey

To investigate the development area and to record any magnetic anomalies which are probably of archaeological nature.

SUMMARY OF RESULTS

A number of anomalies of potential archaeological nature were located including a major linear feature along the south east end of the survey which joined with a second looping linear anomaly. Other possible linear anomalies were also located together with a series of discrete anomalies which may represent large pits. Ridge and furrow or the modern drainage pattern was also defined. A large anomaly on the south western side of the survey area is associated with a magnetic disturbance probably within the adjacent building.

Market Deeping Geophysical Survey -Results:

Survey Results:

Area

Approximately 2 ha were investigated in a single block, aligned on the modern field boundaries. (Figure 1)

Display

The results are displayed as Grey Scale Image and as X-Y Trace Plots. (Figures 2 and 3)

Results:

Detailed Survey:

Twenty four 30 x 30 m grids were investigated forming a single block approximately 120 x 170 m.

A large anomaly within squares 2, 3 and 4 would appear to be associated with a large magnetic source within the building adjacent to the survey area. This anomaly is shown in blue on Figure 4.

The alignment of either the modern drainage system of the field or, possibly, a previous ridge and furrow field system was also located. This was aligned approximately NE - SW and is shown in green on Figure 4.

A major linear anomaly crosses the south western end of the survey and appears to join a looping anomaly on the north eastern side. It would also appear to be paralleled by a slightly less defined anomaly. Three other potential linear anomalies were also located, one of which runs at an approximate right angle to the major linear anomaly. The other linear anomalies are poorly defined, but do not appear to be aligned with either the modern drainage system or the major linear anomaly.

At least eight discrete anomalies were also located, whilst the largest of these may be associated with a metal object within the plough soil, five appear to be aligned on the major linear anomaly.

Magnetic Susceptibility

Soil samples were taken from the area of detailed survey in order to assess the magnetic susceptibility of the soils. It was possible to obtain a subsoil sample for comparison .

Sample	Volume susceptibility χ_v	Mass susceptibility χ_m
Grid 1	44	37.6
Grid 3	47	37.9
Grid 5	49	40.8
Grid 8	41	35.0
Grid 10	53	47.7
Grid 12	43	37.4
Grid 13	42	45.5
Grid 15	38	33.9
Grid 17	50	45.0
Grid 20	38	31.1
Grid 22	44	39.3
Grid 24	61	50.8
Subsoil	37	32.7

The susceptibilities as measured are relatively consistent with little difference between top soil and subsoil values suggesting that conditions are not ideal for magnetic survey. Grids 10, 13, 17 and 24 have slightly higher values which may be the result of archaeological activity. Whilst Grids 13, 17 and 24 could be seen to directly relate to magnetic anomalies recorded in the survey, this could not be said of Grid 10.

Market Deeping Geophysical Survey -Conclusions:

Conclusions

It is a fundamental axiom of archaeological geophysics that the absence of features in the survey data does not mean that there is no archaeology present in the survey area only that the techniques used have not detected it.

A number of linear and discrete magnetic anomalies were located possibly associated with the prehistoric field system which is know from the area (Malone pers. comm.). Some of the discrete anomalies would appear to be aligned on a major linear feature crossing the south western end of the survey area. The possible edge of an enclosure was also located on the north eastern edge of the survey.

Market Deeping Geophysical Survey - Technical Information:

Techniques of Geophysical Survey:

Magnetometry:

This relies on variations in soil magnetic susceptibility and magnetic remenance which often result from past human activities. Using a Fluxgate Gradiometer these variations can be mapped, or a rapid evaluation of archaeological potential can be made by scanning.

Resistivity:

This relies on variations in the electrical conductivity of the soil and subsoil which in general is related to soil moisture levels. As such, results can be seasonally dependant. Slower than Magnetometry this technique is best suited to locating positive features such as buried walls that give rise to high resistance anomalies.

Resistance Tomography

Builds up a vertical profile or pseudosection through deposits by taking resistivity readings along a transect using a range of different probe spacings

Magnetic Susceptibility:

Variations in soil magnetic susceptibility occur naturally but can be greatly enhanced by human activity. Information on the enhancement of magnetic susceptibility can be used to ascertain the suitability of a site for magnetic survey and for targeting areas of potential archaeological activity when extensive sites need to be investigated. Very large areas can be rapidly evaluated and specific areas identified for detailed survey by gradiometer.

Instrumentation:

1. Fluxgate Gradiometer - Geoscan FM36

2. Resistance Meter - Geoscan RM4/DL10

3. Magnetic Susceptibility Meter - Bartington MS2

4. Geopulse Imager 25 - Campus

Methodology:

For Gradiometer and Resistivity Survey 20m x 20m or 30m x 30m grids are laid out over the survey area. Gradiometer readings are logged at either 0.5m or 1m intervals along traverses 1m apart. Resistance meter readings are logged at 1m intervals. Data is down-loaded to a laptop computer in the field for initial configuration and analysis. Final analysis is carried out back at base.

For scanning transects are laid out at 10m intervals. Any anomalies noticed are where possible traced and recorded on the location plan.

For Magnetic Susceptibility survey a large grid is laid out and readings logged at 20m intervals along traverses 20m apart, data is again configured and analysed on a laptop computer.

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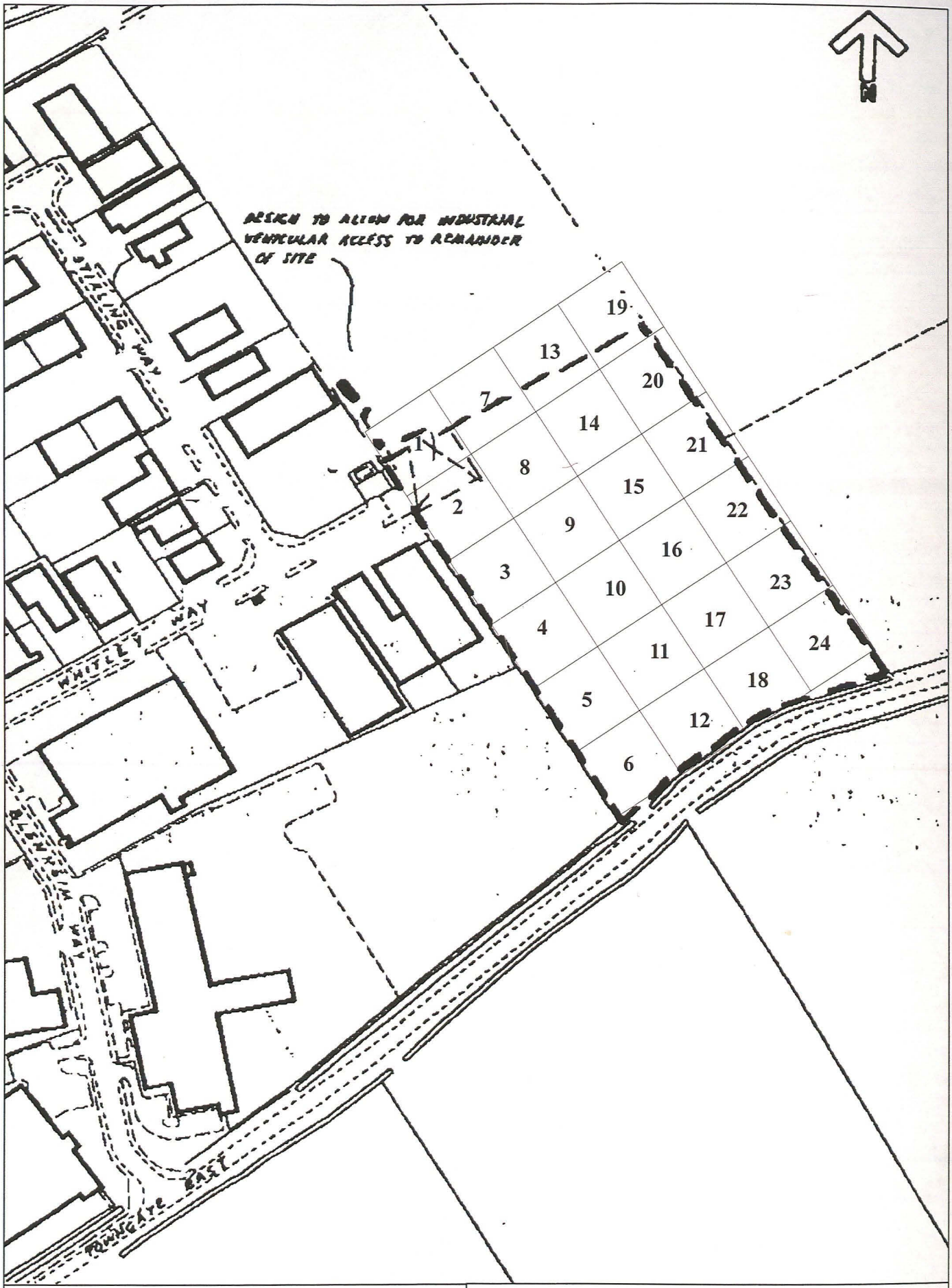

Figure 1: Location	Market Deeping Scale 1:2000

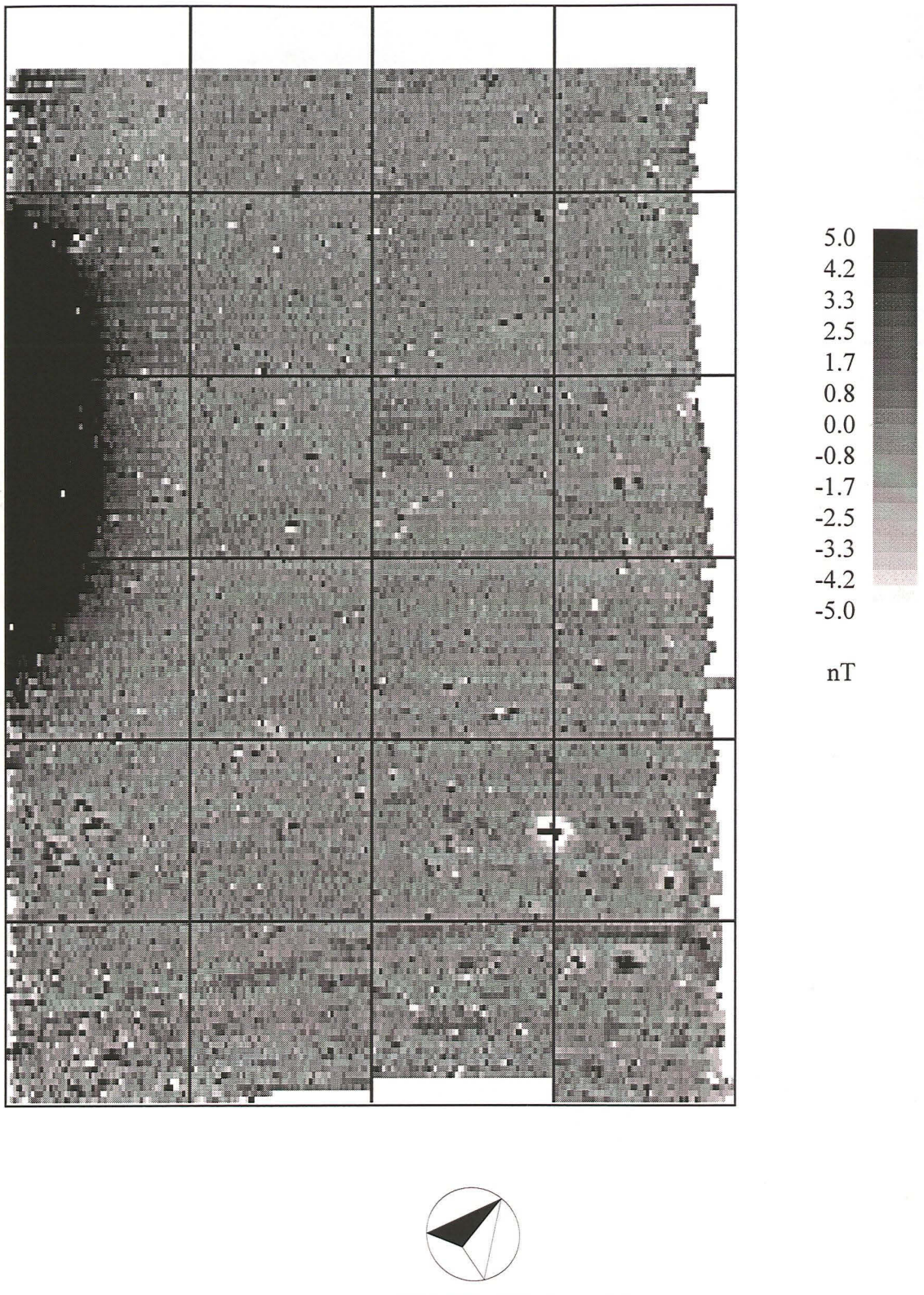

Figure 2: Market Deeping
Grey Scale Plot Scale 1:1000

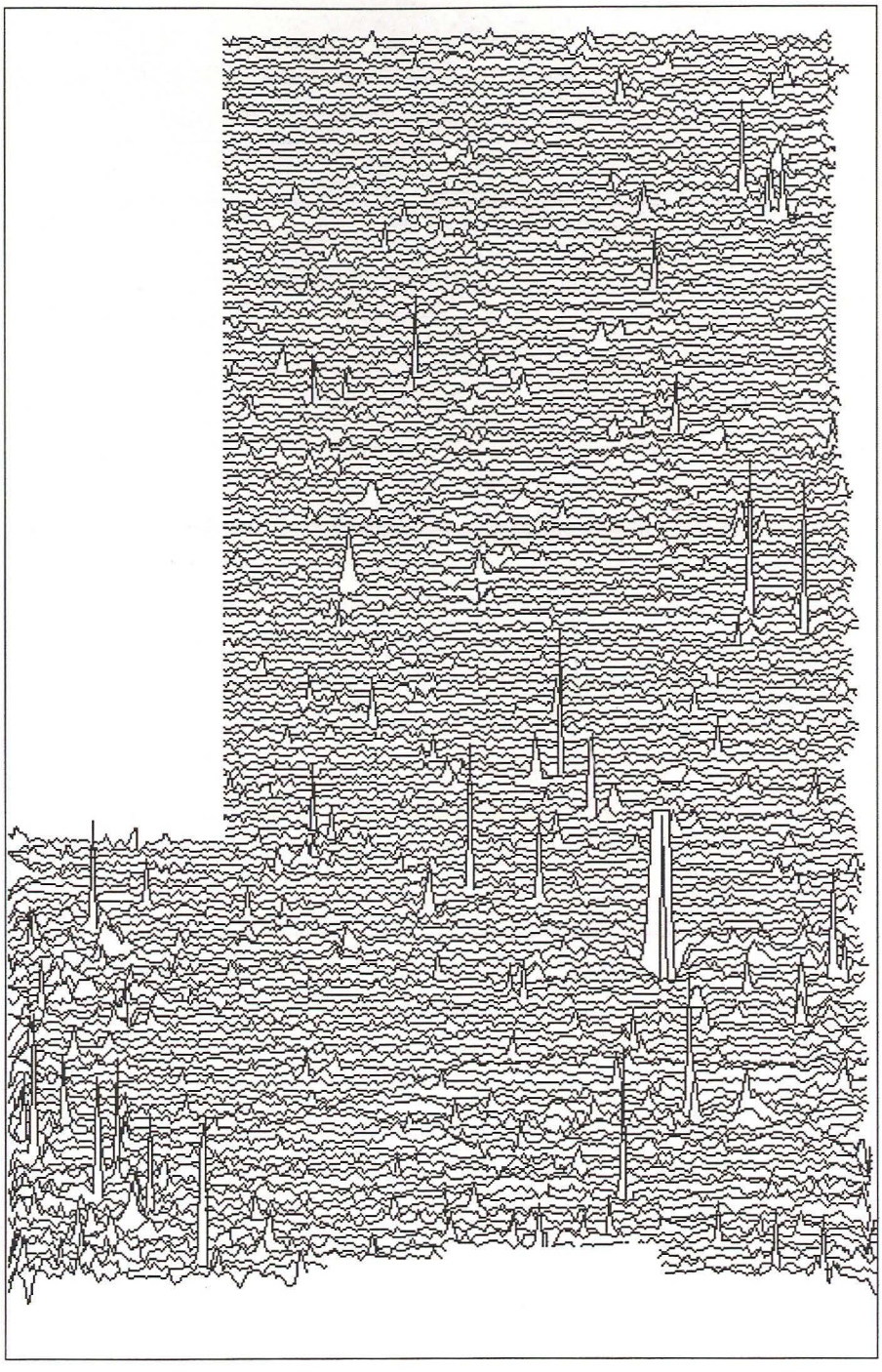

Figure 3: Market Deeping
X - Y Plot. Scale 1:1000

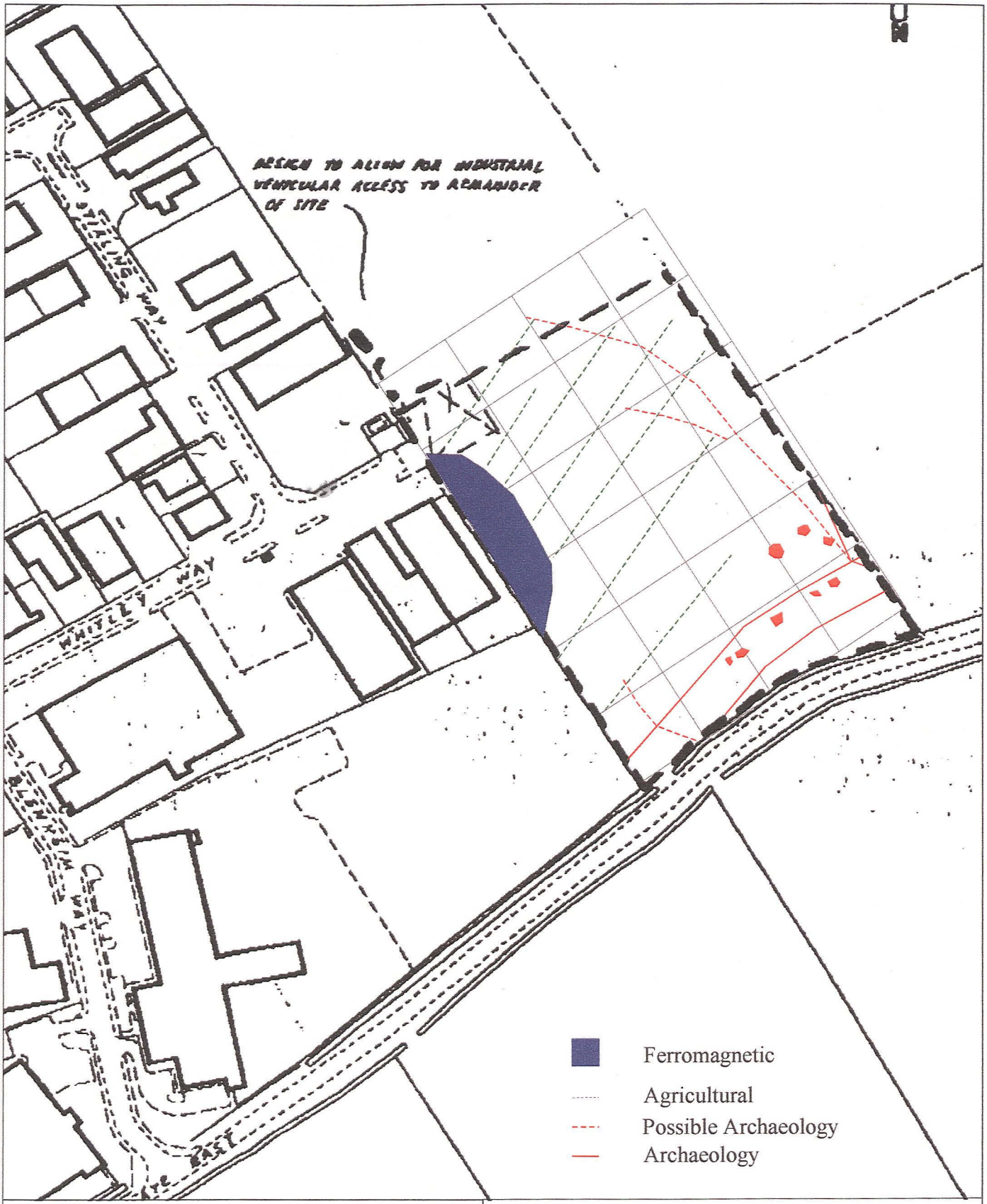

Figure 4: Interpretation

Market Deeping
Scale 1:2000