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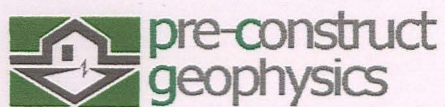
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**FLUXGATE GRADIOMETER SURVEY:
PROPOSED MACHINE DRIVING AREA,
UNIVERSITY OF LINCOLN, RISEHOLME
CAMPUS, LINCOLNSHIRE.**

**REPORT PREPARED FOR LINDSEY ARCHAEOLOGICAL
SERVICES**

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Table 1: Summary of survey parameters

Summary

- A fluxgate gradiometer survey was undertaken on a proposed machine driving area at the University of Lincoln Riseholme Campus, Lincolnshire.
- The survey results suggest that the site has low archaeological potential. A possible ditch and a scatter of pit-like features were recorded, although the latter could resolve as natural or modern features.
- Other features reflect modern activity and ferrous materials of no archaeological merit. These include three probable services, farm machinery, and a scatter of modern ferrous materials.

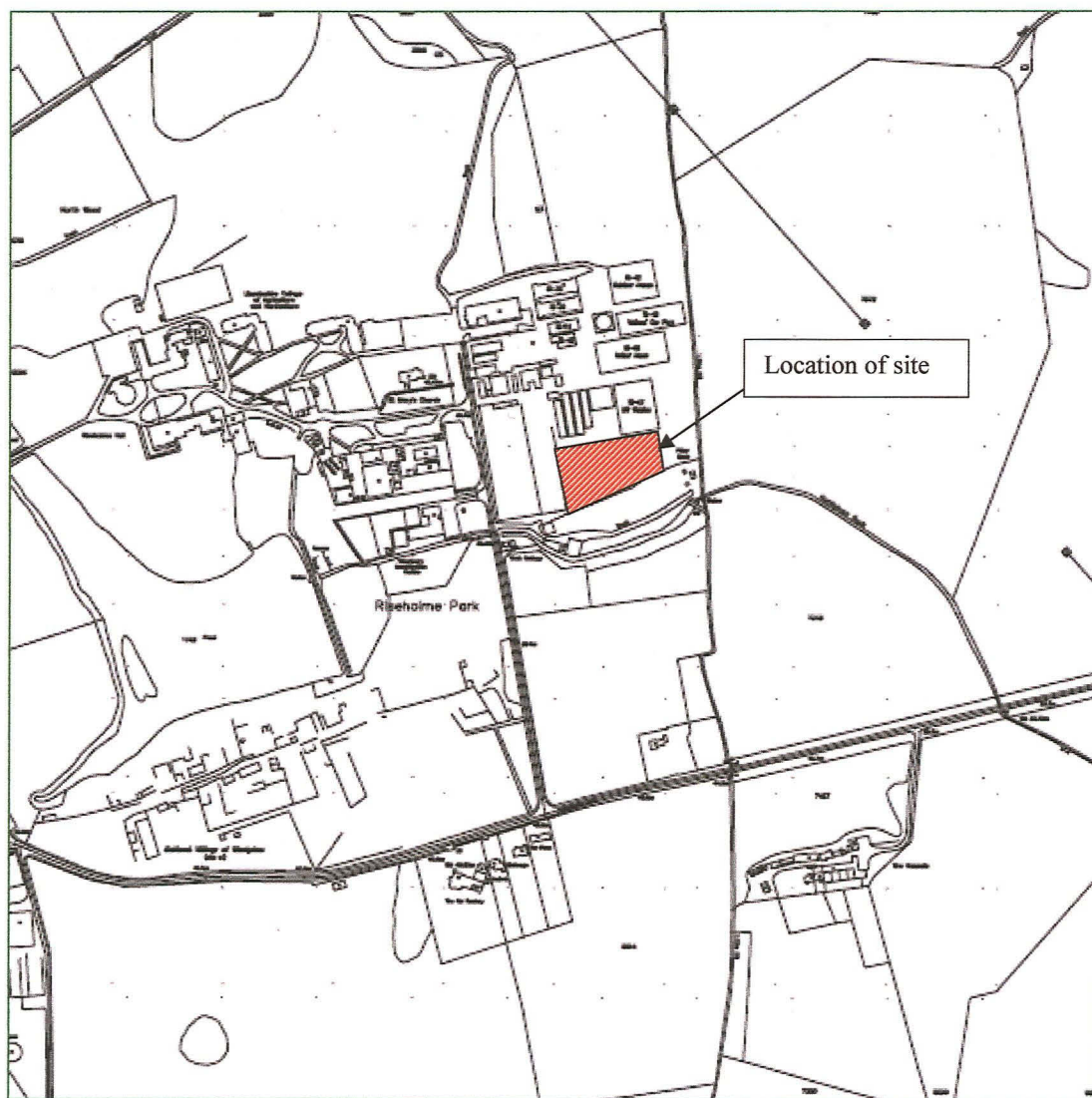


Fig. 1: Location of site 1: 25,000

1.0 Introduction

Lindsey Archaeological Services commissioned Pre-Construct Geophysics to undertake a fluxgate gradiometer survey on a proposed machine driving area at the University of Lincoln, Riseholme Campus, Lincolnshire. The survey was undertaken to evaluate the archaeological potential of the area.

2.0 Location and description (Figs. 1-2).

Sections 2 and 3 contain information extracted from a desk-based assessment (Tann, G. 2002) and a fluxgate gradiometer survey report (Rylatt & Bunn. 2002).

Riseholme campus lies c.7km to the north of Lincoln and c.1km to the east of the A15. The c. 0.5ha site is situated towards the eastern end of the campus and is currently used as a storage area for farm machinery (some of which prevented survey in the southern and western parts of the site). It is proposed that the site will be utilised as a 'machine driving area'.

A manhole lies in the mid part of the site (Figs. 2-6), suggesting that services extend across the proposed development area.

The underlying geology of the area is limestone of Middle Jurassic date. It is a sedimentary rock largely composed of calcite which contains various amounts of silica in the form of flint or chert and various amounts of clay.

3.0 Archaeological and historical context

Approximately 200m to the south-west of the site there are two recorded cropmarks that exhibit the characteristics of Iron Age/Romano-British settlements. c.1km to the west of the site is the A15 which follows the route of a major Roman road (Ermine Street). To the east there are a number of boundary ditches that probably date from the Late Bronze Age/Iron Age.

4.0 Methodology

The survey methodology was based on guidelines set out by English Heritage (David, 1995).

Gradiometry is a non-intrusive scientific prospecting technique that is used to determine the presence/absence of some classes of sub-surface archaeological remains (eg pits, ditches, kilns, and occasionally stone walls). By scanning the soil surface, geophysicists identify areas of varying magnetic susceptibility and can interpret such variation by presenting data in various graphical formats and identifying images that share morphological affinities with diagnostic archaeological remains.

The area survey was conducted using a Bartington Grad 601 dual fluxgate gradiometer with a DL601 data logger set to take 4 readings per metre (a sample interval of 0.25m). The zigzag traverse method of survey was used, along 1m wide traverses. The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla.

The data was processed using *ArcheoSurveyor 1.3.2.7*. It was clipped to reduce the distorting effect of extremely high or low readings caused by discrete pieces of ferrous metal on the site. The results are plotted as trace, colourscale, greyscale and interpretive images (Figs. 3-6).

The survey location was recorded using a Leica GPS instrument and by manual measurement to permanent features (Fig. 2).

If required, the survey area can be relocated using five GPS points and/or two fixed pegs (indicated on Fig. 2).

Instrument	Bartington Grad-601
Grid size	30m x30m
Sample interval	0.25
Traverse interval	1.0m
Traverse method	Zigzag
Sensitivity	0.1nT
Processing software	<i>ArcheoSurveyor 1.3.2.7.</i>
Weather conditions	Fine
Area surveyed	c.0.5ha
Date of survey	28-02-07
Survey personnel	Neil Jefferson

Table 1: Summary of survey parameters

5.0 Results

The survey recorded three linear features, two of which intersect at the location of the manhole cover; this suggests that they are modern services (Fig. 6: blue lines). A fourth east-west aligned linear feature (in the mid south part of the survey) could also be related to the services, however this could also resolve as a ditch (fig. 6: red line).

The results also show a random scatter of pit-like features (circled red). These anomalies probably resolve as modern or natural features such as tree bowls.

Strong magnetic responses in the southern and western parts of the survey were created by the close proximity of farm machinery (enclosed in pink). Randomly dotted across the survey are some relatively strong anomalies, which probably reflect modern ferrous materials buried within the topsoil such as iron objects and/or ceramic rubble (examples circled in pink).

6.0 Conclusions

It is concluded that the site has low archaeological potential. A possible ditch and a scatter of pit-like features were recorded. The latter however may have natural or modern origins.

Other responses resolve as modern features such as farm machinery, services and a scatter of modern ferrous materials.

7.0 Acknowledgments

Pre-Construct Geophysics would like to thank Lindsey Archaeological Services for this commission.

8.0 References

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- David, A. 1995 *Geophysical Survey in Archaeological Field Evaluation*. London, English Heritage: Research & Professional Guidelines No.1.
- Tann, G. 2002. *University of Lincoln, Riseholme Campus, Propose Equine/Animal Behaviour Facility*. Lindsey Archaeological Services. Archaeological Desk-Based Assessment.
- Rylatt, J. & Bunn, D. 2002. *Fluxgate Gradiometer Survey: University of Lincoln Campus, Riseholme, Lincolnshire*. Pre-Construct Geophysics.

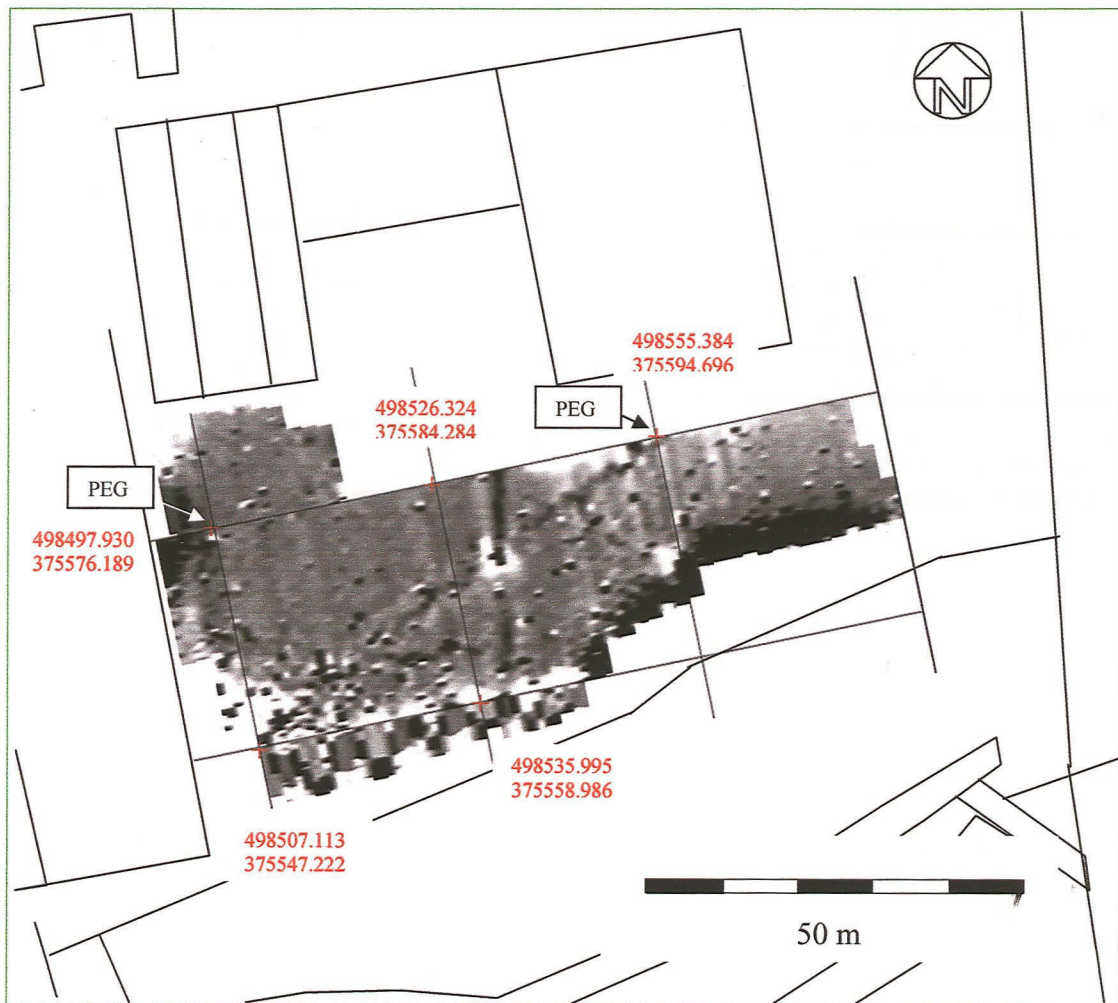


Fig.2: Location of survey

1:1000

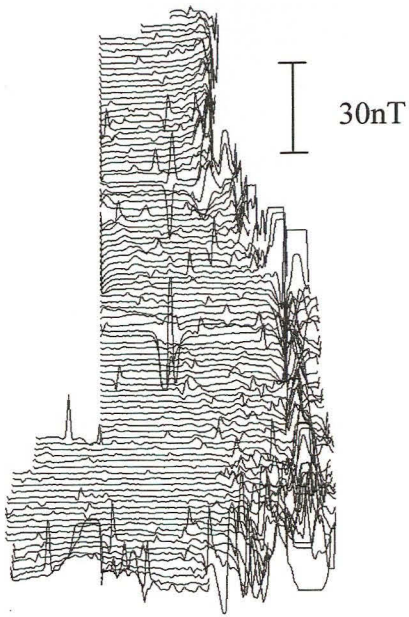


Fig. 3: Trace plot
(data clipped to +/-100nT)

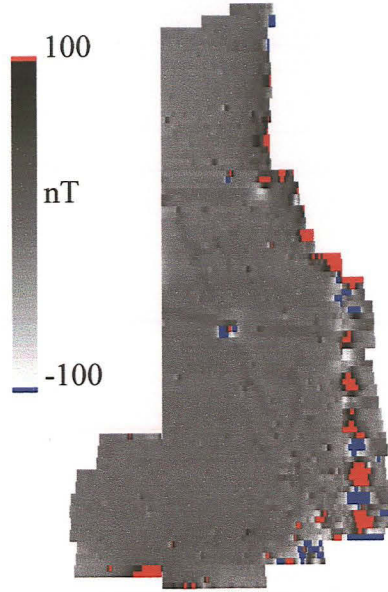


Fig. 4: Colourscale image
(data clipped to +/-100nT)



50m

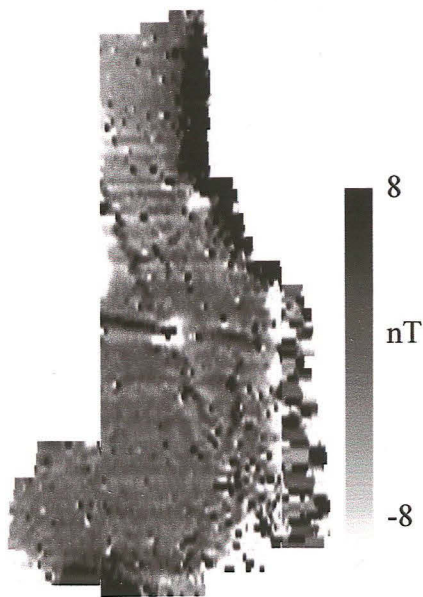


Fig. 5: Greyscale image
(data clipped to +/-8nT)

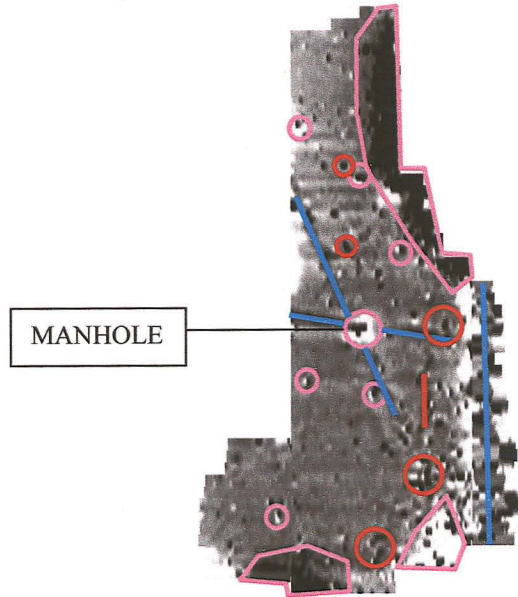







Fig. 6: Interpretive image

Scale 1:1250

-  Possible ditch
-  Pit-like (examples)
-  Ferrous (examples)
-  Zones of strong magnetic variation
-  Drain/service