pre-construct geophysics

FLUXGATE GRADIOMETER SURVEY: NEWARK DEPOT, NEWARK, NOTTINGHAMSHIRE

NGR: SK 8152 5525

REPORT PREPARED FOR SCOTT WILSON LTD,

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Contents

Illustrations

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Summary

- *A fluxgate gradiometer survey took place at the site of a proposed road salting depot at Newark in Nottinghamshire.*
- *The magnetic anomalies recorded resolve as a possible service or backfilled ditch (dominant feature) and a series of isolated features; probably buried iron objects/rubble in the topsoil.*
- *The survey has not identified any clear traces of significant archaeological activity.*

Fig.1: General site location 1:25,0000

1.0 Introduction

Scott Wilson Ltd, on behalf of AMScott, commissioned Pre-Construct Geophysics to undertake a fluxgate gradiometer survey on land to the northeast of Newark-on-Trent, Nottinghamshire. The surveyed site is to be development as a new road salting depot which will include an area of car and LGV parking, a salt barn, a weighbridge, a wash down area, and a small block of offices (planning ref: 06/00954/FUL).

2.0 Location and description (Figs 1-2)

Sections 2 and 3 include information contained within a specification for geophysical survey (Broughton, 2006).

The proposed development is located c. 2km to the northeast of the historic centre of Newark, off Stephenson Way, on land sandwiched between an industrial estate and the A1 (Figure 1). .

The site extends to c. 0.7ha and is currently grassland. It slopes gently downwards from northeast to southwest (a drop in elevation of approximately 1m).

An area of 0.5ha was surveyed.

The geology of the area comprises Upper Triassic mudstone formations of the Mercia Mudstone Group, overlain by drift deposits of alluvial sands and gravels. The response of the latter to magnetic survey is average to poor.

NGR: SK 8152 5525

3.0 Archaeological background

There is no record of activity within the proposed development area until at least the Civil War. The Parliamentarians laid siege to Newark in 1643 and constructed a series of earthworks, otherwise known as 'lines of circumvallation', that encircled the town.

It is hypothesised that traces of siege earthworks may lie within/close to the proposed development area, although their precise position is not known. Following the cessation of hostilities, most of the earthworks were demolished and levelled.

4.0 Methodology

The survey methodology was based upon English Heritage guidelines (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).

Instrument	Bartington Grad-601
Grid size	30m x30m
Sample interval	0.25
Traverse interval	1.0m
Traverse method	Zigzag
Sensitivity	0.1nT
Processing software	*ArcheoSurveyor 1.3.2.7.*
Weather conditions	Fine
Area surveyed	C.0.5ha
Date of survey	7/10/2002
Survey personnel	David Bunn, Gareth Ward-Stevens
National Grid Reference	SK 8152 5525

Table 1: Summary of survey parameters

5.0 Results and conclusions (Figs. 2-6)

The results indicate a very strong linear anomaly, orientated NNW to SSE, and this feature dominates the images presented in figures 3-6 (Fig. 6: blue line). Its position and orientation is similar to the conjectured orientation of elements of the Civil War defences, although this is probably coincidental; the strong magnetic readings that define this particular feature almost certainly reflect modern ferrous materials, probably indicating a service or possibly a rubble-filled ditch. The latter hypothesis makes reference to the irregular and somewhat fragmented nature of the magnetic readings, whereas as metal pipelines and buried cables typically respond as regularly spaced alternate positive and negative readings. In either case, this feature is considered to have low archaeological value. (It should be noted that the 1st Edition Ordnance Survey map (dated 1884) does not indicate a boundary in this position.)

Strong readings along the southern boundary suggest the presence of a service to the immediate south of the survey area (Fig. 6: dashed blue line).

Randomly dotted around elsewhere are some isolated but relatively strong anomalies, and these probably reflect buried ferrous materials within the topsoil, such as iron objects and/or rubble (Fig. 6: examples circled in pink).

6.0 Conclusions

The survey has not identified any clear traces of significant archaeological activity at the site.

Extreme magnetic readings recorded along a linear feature suggest the presence of a service, or possibly the ferrous back-fill of a former ditch. If the latter is accurate, then it would seem unlikely that this relates to Civil War defences.

Isolated examples of strong magnetic variation probably represent buried rubble and/or iron objects (e.g. ploughshares).

7.0 Acknowledgements

Pre-Construct Geophysics would like to thank Scott Wilson Ltd for this commission.

8.0 References

Clark, A. J. 1990 *Seeing beneath the soil.* London, Batsford.

David, A. 1995 Research & Professional Services Guidelines No **1**: *Geophysical Survey in Archaeological Field Evaluation. London*

Broughton, L. 2006. *Newark Depot: Specification for Geophysical Survey.* Scott Wilson Ltd, unpublished document.

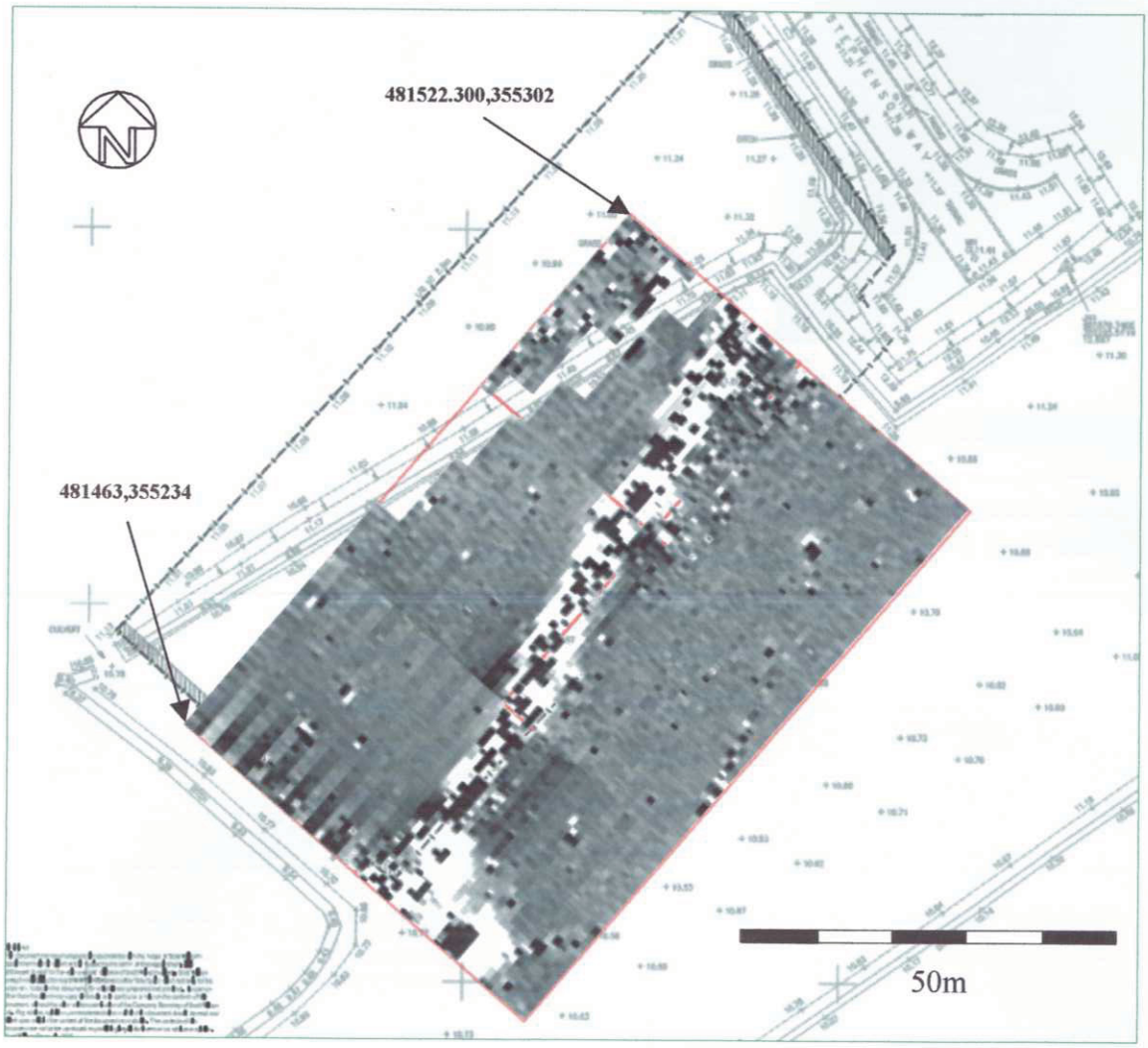

Fig.2: Location of survey 1:1000

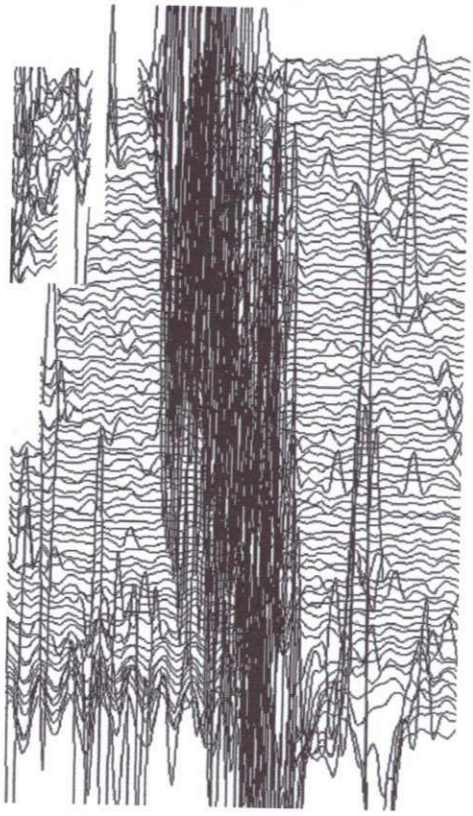

Fig.3: Trace plot
(data clipped to +/-100nT)

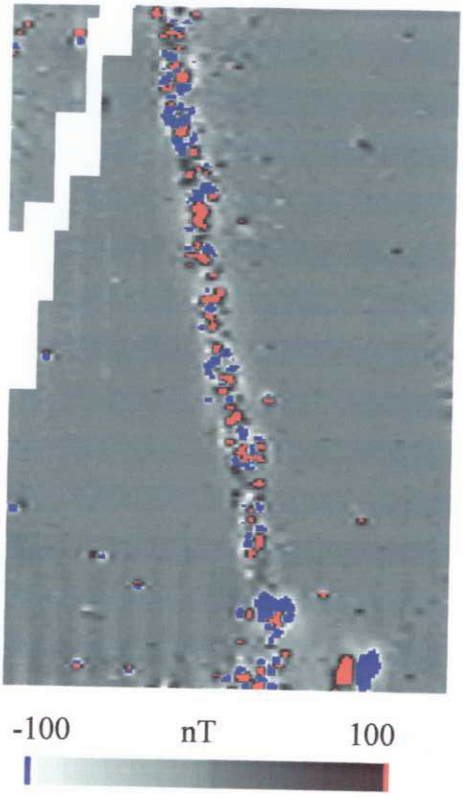

Fig.4: Colourscale image
(data clipped to +/-100nT)

50m

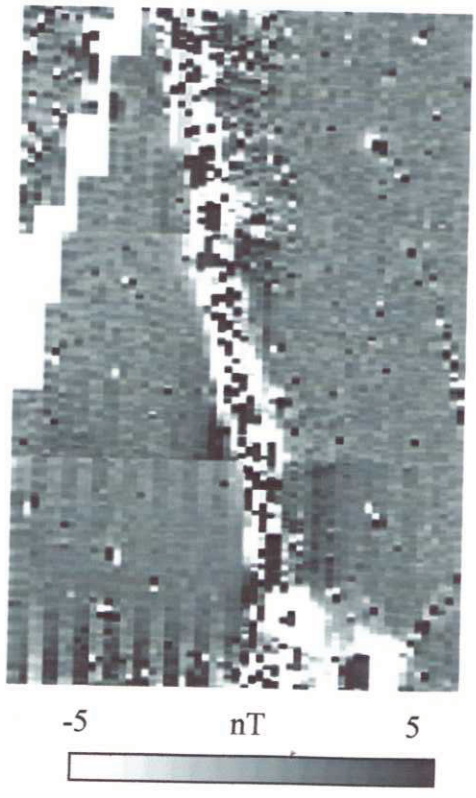

Fig.5: Greyscale image
(data clipped to +/-5nT)

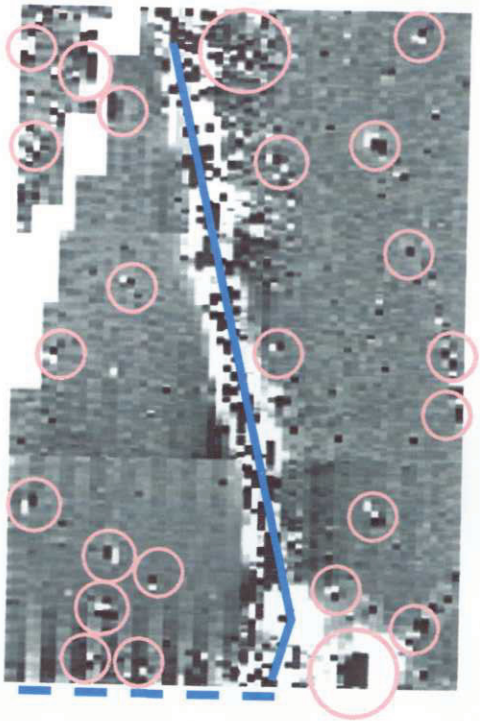

Fig.6: interpretive image