

pre-construct geophysics<sup>LTD</sup>

**ARCHAEOLOGICAL GEOPHYSICAL SURVEY**

**LAND OFF STATION ROAD  
KIRTON IN LINDSEY  
LINCOLNSHIRE**

**SITE CENTRED AT NGR SK 93055 99154**

**REPORT PREPARED FOR  
PRE-CONSTRUCT ARCHAEOLOGICAL SERVICES LTD  
ON BEHALF OF LARKFLEET LTD  
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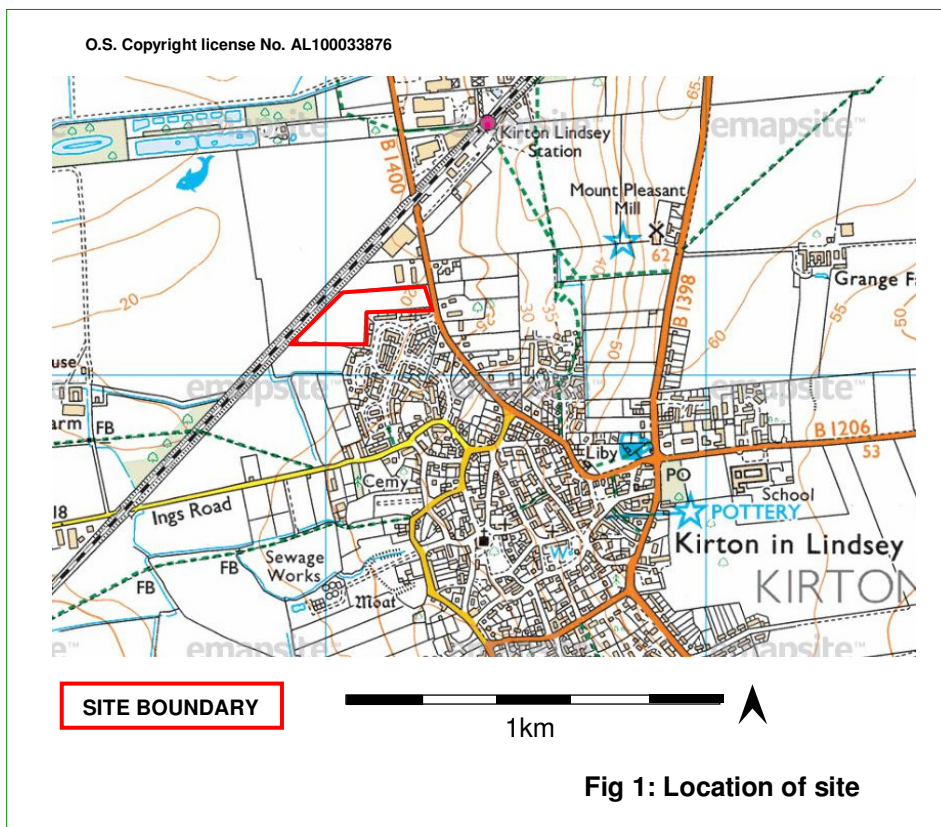
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### Non-technical summary

- A fluxgate gradiometer survey undertaken on land at Kirton in Lindsey, Lincolnshire. The survey has recorded only limited geophysical evidence that archaeological remains might lie within the site - in the form of a possible 'L' – shaped ditch in the southern part of the site and a number of potential pits in the north-eastern region.
- Widespread traces of ridge and furrow cultivation were registered, with the majority of stronger responses seemingly indicative of modern boundary 'ferrous'.



## 1.0 Introduction

Acting for Larkefleet Ltd, Pre-Construct Archaeological Services Ltd (PCAS) commissioned a fluxgate gradiometer survey on c.3ha of land off Station Road, Kirton in Lindsey, North Lincolnshire. This was to establish the presence/absence of magnetically anomalous archaeological features and, if recorded, define their extent and, where possible, the nature of such anomalies in order to inform the planning and development process.

This report incorporates information that has been selectively extracted from an Archaeological Desk Based Assessment prepared PCAS (Evans, 2016).

## 2.0 Location and description (Figs. 1 – 2)

Kirton-in-Lindsey is a small town and civil parish in North Lincolnshire. It is situated 2.4 km west from the A15 road, and c. 11 km south-east from Scunthorpe. The area of the proposed development lies to the west of Station Road, south of the railway line, to the north-west of the main town (Fig. 1).

Site centred at NGR: SK 93055 99154.

## 3.0 Geology and topography

The solid geology of the area comprises mudstone (Charmouth Mudstone Formation) - sedimentary bedrock formed approximately 183 to 197 million years ago during the Jurassic Period in a local environment previously dominated by shallow seas<sup>1</sup>. Superficial deposits are not recorded.

The site is generally level and lies at a height of approximately 20m AOD.

## 4.0 Archaeological and historical context (Evans, 2016)

*There is a Moderate – High potential for encountering heritage assets dating from the Prehistoric – medieval periods within the area of the proposed development. The position of the proposed development area within an area of agricultural land since the medieval period suggests that there would be only a Low – Negligible potential for encountering previously unknown heritage assets of Post-medieval and Modern date within the proposed development area.*

## 5.0 Methodology

The survey methodology was based upon English Heritage guidelines: ‘*Geophysical Survey in Archaeological Field Evaluation*’ (English Heritage, 2008).

**5.1 Fluxgate Gradiometry** is a non-intrusive scientific prospecting tool that is used to determine the presence/absence of some classes of sub-surface archaeological features (e.g. pits, ditches, kilns, and occasionally stone walls).

The use of magnetic surveys to locate sub-surface ceramic materials and areas of burning, as well as magnetically weaker features is well established, particularly on large green field sites. The detection of anomalies requires the use of highly sensitive instruments; in this instance the Bartington 601 Dual Fluxgate Gradiometer. This is accurately calibrated to the mean magnetic value of each survey area. Two sensors mounted vertically and separated by 1m, measure slight, localised distortions of the earth’s magnetic field, which are recorded via a data logger.

**5.2** The survey was undertaken by G Bunn and G Ward Stevens on 4<sup>th</sup> May 2016. The zigzag traverse methodology was employed, with readings taken at 0.25m intervals along 1.0m wide traverses.

The survey grid was established by Global Positioning Satellite using a Leica GS015 RTX, to an accuracy of +/- 0.1m.

Data was processed using *Terrasurveyor V3*.

The raw data are presented on Fig. 4 (clipped to +/-10nT to enhance resolution).

The 'Despike' function was applied to reduce the effect of extreme readings induced by metal objects, and 'Destripe' to eliminate striping introduced by zigzag traversing. The data were clipped to +/- 20nT on the trace plot (Fig. 5) and +/-3nT on the greyscale image of the processed data (Fig. 2).

Anomalies in excess of +/-10nT are highlighted pink and blue on the interpretive image (Fig. 3). These are characterised magnetically as dipolar 'iron spikes', often displaying strong positive and/or negative responses, which reflect ferrous-rich objects (particularly apparent on stacked trace plots). Examples include those forming/deposited along current or former boundaries (e.g. wire fencing), services and random scatters of horseshoes, ploughshares etc across open areas. Fired (ferro-enhanced) material, such as brick/tile fragments (often where the latter are introduced during manuring or land drain construction) usually induce a similar though predominately weaker response, closer to +/-5nT (highlighted in pink/blue on interpretive images). Collectively, concentrations of such anomalies indicate probable rubble spreads, such as backfilled ponds/ditches and demolished buildings. On a cautionary note, fired clay associated with early activity has the same magnetic characteristics as modern brick/tile rubble. As such, the interpretation of such variation must consider the context in which it occurs.

## **7.0 Results and discussion (Figs. 3 - 6)**

The survey recorded an 'L'-shaped linear anomaly in the southern part of the site (Fig. 3: red line). Whereas this has been highlighted as a potential ditch, an alternative origin as ridge and furrow should not be discounted, with the shorter c.N-S aligned example possibly signifying a headland. Indeed, extensive traces of ridge and furrow were registered across most of the site (dotted orange lines).

A limited number of discrete anomalies in the north-eastern region exhibit some potential as buried pits (red dots).

For the most part, stronger variation (pink and blue) is clearly associated with ferrous-rich materials along and adjacent to modern boundaries, with more isolated examples similarly indicative of modern material and objects.

## **8.0 Conclusions**

The survey has recorded only limited geophysical evidence that archaeological remains might lie within the site, in the form of a possible 'L' – shaped ditch in the southern part of the site and a number of potential pits in the north-eastern region.

Widespread traces of ridge and furrow cultivation were registered, with the majority of stronger responses seemingly indicative of modern boundary 'ferrous'.

## **10.0 References**

English Heritage. 2008 Geophysical Survey in Archaeological Field Evaluation. London, English Heritage.

Evans, P. 2016 *Station Rd, Kirton in Lindsey, Lincolnshire*. Archaeological Desk Based Assessment. Pre-Construct Archaeological Services Ltd, Job No. 1679, unpublished.

<sup>1</sup>[http://maps.bgs.ac.uk/geologyviewer\\_google/googleviewer.html](http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html), 1:50,000. British Geological Survey, Keyworth.

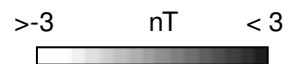
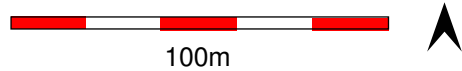
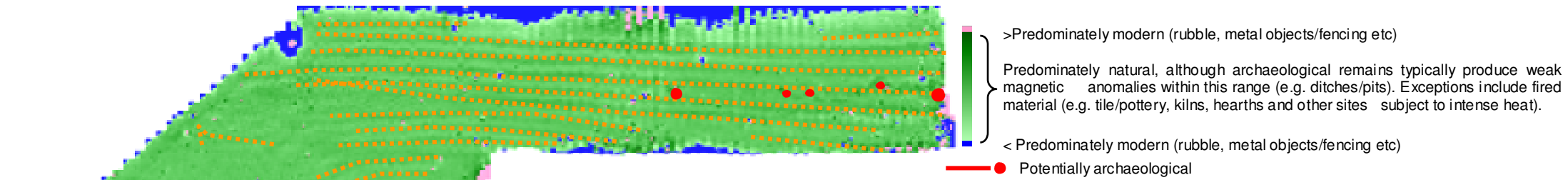
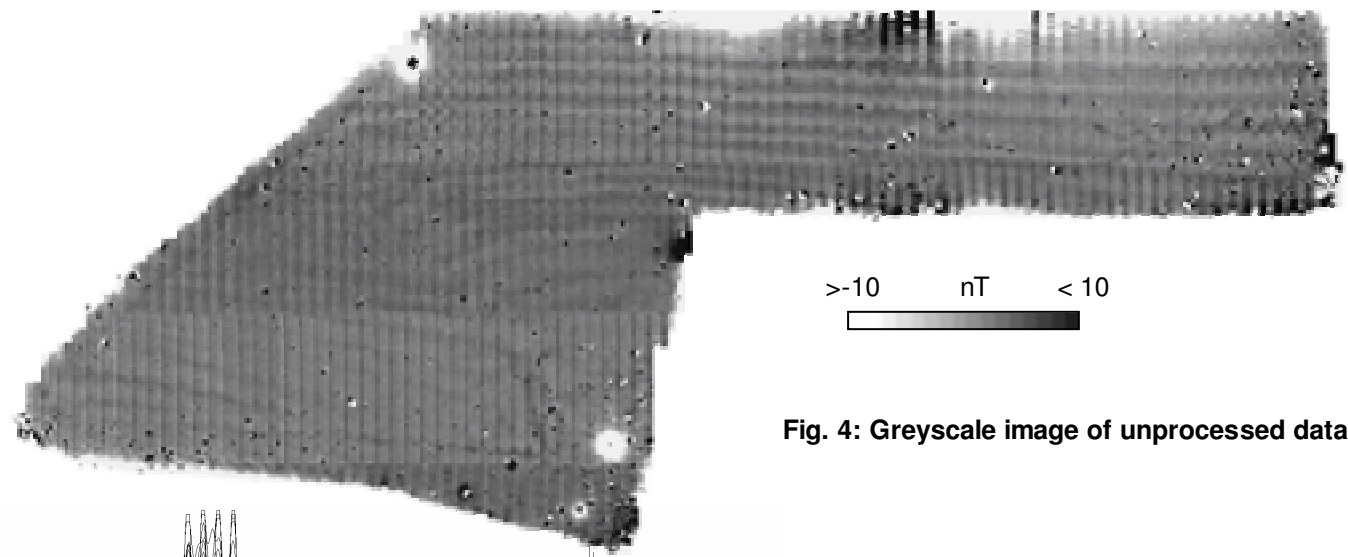


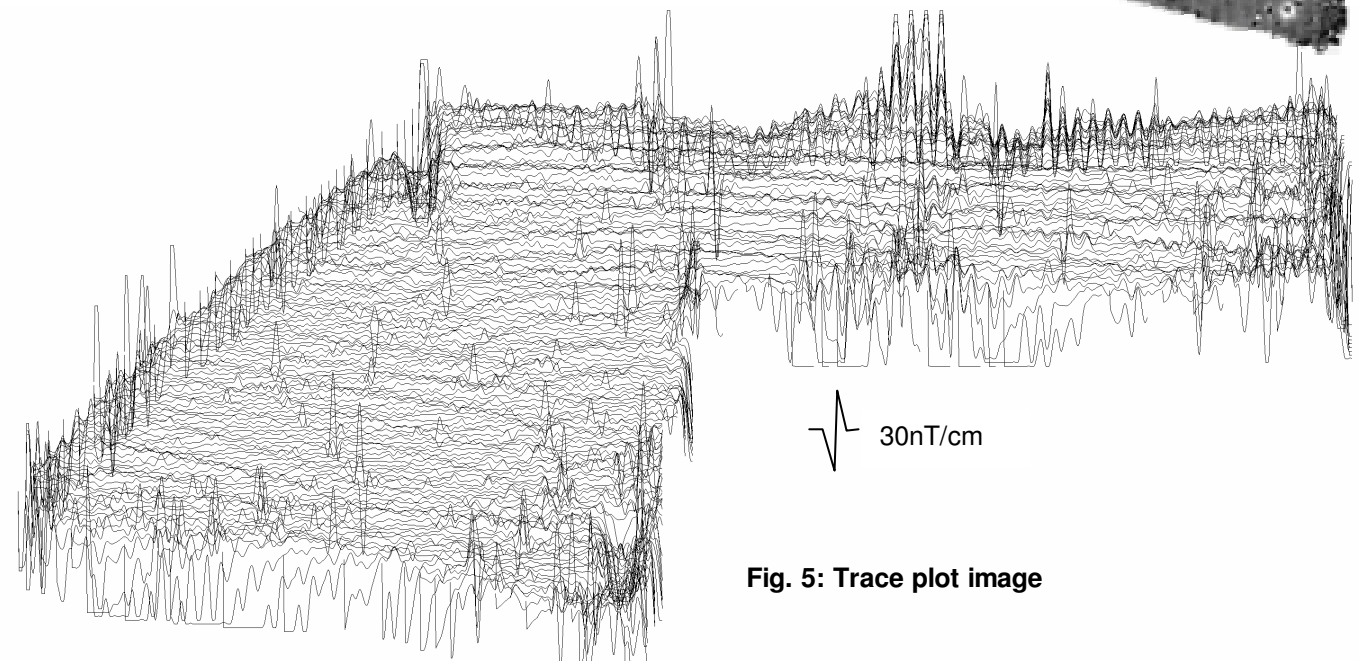
Fig. 2: Greyscale image of processed data



**Fig. 3: Interpretation**



**Fig. 4: Greyscale image of unprocessed data**



**Fig. 5: Trace plot image**

