Proposed Able UK Ltd Marine Energy Park North Killingholme, North Lincolnshire

Report on Archaeological Geophysical Survey 2012

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Introduction

This geophysical survey was undertaken as part of an archaeological field evaluation of a proposed development site at North Killingholme, Lincolnshire. The survey is required in support of a proposal by Able UK Ltd to construct a Marine Energy Park at a site centred at NGR TA167186. Much of the proposed development area has already been the subject of a geophysical investigation by GSB Prospection in 2010 (GSB report 2010/73). The present survey covers three areas (as cross hatched on the enclosed location plan, illustration1) which were not previously accessible for geophysical coverage.

The previous survey produced a number of positive archaeological findings, some of which have now been shown to extend into the newly surveyed areas of the site.

The survey was commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford by the Hereford office of Headland Archaeology (UK) Ltd. Fieldwork for the survey was done between April 19-23 2012.

The Site

The site is an area of open agricultural land adjacent to the Humber estuary, and 2km east of North Killingholme village. The underlying geology is described in the project brief (Document ACW 283/4/0, as supplied by Able UK) as composed of glacial tills of the Middle Marsh at between 5m and 10m OD. This gives rise to slowly permeable and seasonally waterlogged soils.

The magnetic susceptibility readings taken during the course of the survey (as shown on the plot inset in illustration 7) were uniformly high (mean = 43 SI; standard deviation = 9), which indicates that conditions at the site should be favourable for the magnetic detection of archaeological findings. It is probable also, on a magnetically responsive soil, that non-archaeological features will be detected. It is often the case on marshland, or on wetlands subject to alluvial deposition, that strong natural magnetic anomalies will be detected. These may relate to the formation of iron pan in the subsoil, or to variations in the depth or distribution of silt, but are usually distinguishable from archaeological features on the basis of their characteristic broad and irregular plan. Such features were detected both in 2010 and in the present survey (mainly in field 21).

Findings from the 2010 survey include a number of clearly defined ditched enclosures and associated features probably representing Iron Age and Roman settlement features. One purpose of the present survey was to test for additional findings of this kind.

Survey Procedure

The three fields covered by the present survey amount in total to c. 13.2 ha. It was specified in the brief that the previously unsurveyed area in field 5 was to be surveyed in full, and that fields 12 and 21 were be subject to 50% sampled coverage arranged as alternate 10m wide strips. The specified coverage amounts in total to c. 8.45ha.

The methods used for the survey were recorded magnetometer surveying, supplemented by background magnetic susceptibility testing.

Magnetometer survey

The magnetometer readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and are plotted at 25cm intervals along each transect. The results of the survey are presented as grey scale plots (illustrations 2-3), and as graphical (x-y trace) plots at 1:1250 scale in illustrations 4-6. Inclusion of these alternative presentations allows the detected magnetic anomalies to be examined in plan and profile respectively. Grey scale plots reproduced from the 2010 GSB survey report have been included (for comparison and completeness) alongside the present survey plots in illustrations 2-3.

The graphical survey plot shows the magnetometer readings after minimal pre-processing based on adjustment for irregularities in line spacing caused by variations in the instrument zero setting. Additional 2D low pass filtering has been applied to the grey scale plot to reduce background noise levels.

An interpretation of the findings is shown superimposed on illustrations 4-6 (which permits the interpreted outlines to be compared with the underlying data), and is reproduced separately to provide a summary of the findings (illustrations 7-8). Colour coding has been used in the interpretation to distinguish different effects. Features are indicated by coloured outlines, shading, or broken lines.

For consistency we have tried to follow the colour coding and anomaly classification system used in the 2010 report. Features of probable and possible archaeological interest are shown in shades of purple / pink, and recent or non-archaeological disturbances in light brown. Small, and other perhaps mainly natural background disturbances are in green.

Magnetic susceptibility tests

The magnetometer survey was supplemented by a background magnetic susceptibility survey based on readings taken at 50m intervals with a Bartington MS2 meter. Susceptibility readings can (sometimes) be used to provide a broad indication of previously occupied or disturbed areas in which burning associated with past human occupation has enhanced the magnetic susceptibility of the topsoil, although the readings are usually affected also by non-archaeological factors, including geology and land use. A background survey of the kind done here is undertaken to test the (largely) geologically determined magnetic properties of the soil. This information provides an indication of the strength of magnetic response to be expected from the site, and can be of help when interpreting the magnetometer survey. Susceptibility readings are shown on a plot inset in illustration 7.

Survey location

The survey grid was set out and tied to the OS grid using a differential GPS system. The plans are therefore geo-referenced, and OS co-ordinates of map locations can be read from the AutoCAD version of the plans which can be supplied with this report.

Results

The survey findings are described for the three fields in turn.

Field 5

The most extensive and distinct archaeological findings in the 2010 survey were in the field immediately to the north of field 5 (as seen in the grey scale plots in illustration 2). The present survey has shown that this group of enclosures continues to the south, and links with features seen in the southern part of field 5 in the previous survey. Findings include a group of variously shaped ditched enclosures. Towards the north of the field these appear to be superimposed on a trackway, suggesting there could be more than one period of activity. The strength of some of the magnetic anomalies within the enclosures (as seen particularly in the graphical plot, illustration 4) would be consistent with the presence of kilns or hearths, suggesting there could have been industrial activity at the site. Elsewhere in the field there are a few more isolated pit-like features, some of which could be of archaeological origin. A linear feature (indicated as of uncertain origin) at the east of the field continues into the 2010 survey. It aligns with the present field boundary, and could perhaps be a cultivation headland or drain.

Field 12

The main finding here is a further group of ditched enclosures similar to, but less extensive than, those in in field 5. These again represent a continuation of similar findings in the field to the north in 2010. There are fewer strong magnetic anomalies to suggest industrial feature here than in field 5 (although there could be at least one). Elsewhere in field12 there may be some isolated and uncertain silted pits, but findings otherwise are limited to natural background variations.

Field 21

Potential archaeological findings here are limited to some isolated possible pit-like features, mainly towards the south of the field. Other disturbances near to the road to the south appear to be recent.

There are broad natural magnetic anomalies, of the kind mentioned previously, and which are typically found in marshland, to the north of the field. An extensive area of similar magnetic activity was seen in adjacent fields in 2010.

Conclusions

The survey has identified two areas of clearly defined archaeological features. These are in in field 5, and towards the east of field 12. In each case the findings represent a continuation of similar features seen nearby in the 2010 survey, and are likely to represent settlement or industrial sites of late prehistoric or Roman date, as previously identified. Relevant findings in the western part of field 12 and in field 21 are limited to scattered individual pit-like features of uncertain significance.

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The fieldwork for this project was done by P. Cottrell and N. Paveley.















