Playters New Solar Farm
Ellough, Suffolk

Archaeological Geophysical Survey

February 2014

Client: WYG
OA East Report No: 1597
OASIS No: oxfordar3-170735
NGR: TM 4390 8830
Playters New Solar Farm, Ellough, Suffolk

Report on Archaeological Geophysical Survey
2014

A.D.H. Bartlett

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Suffolk CC HER number: ELO 014
Playters New Solar Farm, Ellough, Suffolk
Archaeological Geophysical Survey

Summary

A geophysical survey has been undertaken as part of an archaeological evaluation of the site of a proposed solar farm at Ellough, Suffolk. The purpose of the survey was to test for evidence of any previously unrecorded archaeological features or deposits within the evaluation area.

Conditions at the site appear to be reasonably satisfactory for an investigation of this kind, but the survey has produced only minimal findings. Various land drains and cultivation effects were detected, but findings otherwise were limited to a small number of individual magnetic anomalies potentially representing silted pits or hollows. These are widely dispersed across the site, and so are likely to be of non-archaeological or natural origin. There are no groups or clusters of detectable features to suggest the presence of an archaeological site within the proposed development area.

Introduction

This geophysical survey is required in support of a planning application for a proposed solar farm at Playters New Farm, Ellough, Suffolk. It is intended to meet requirements as stated in the Written Scheme of Investigation (WSI) for the project, which was issued by WYG Planning & Environment [1]. This document specifies that a magnetometer survey is to be undertaken, following procedures as described below.

The geophysical survey was commissioned from Bartlett Clark Consultancy, Specialists in Archaeoephysics of Oxford, by Oxford Archaeology East (OA East) on behalf of WYG, and EEW Eco Energy World. Fieldwork for the survey was done on 10-14 February 2014.

The Site
Background information on site conditions is given in the WSI [1], which also specifies the survey methods. There is also a further description of survey procedures in the Proposal document submitted to OA East by Bartlett Clark Consultancy [3]. The following notes are reproduced in part from these documents.

Fields within the site have been numbered from west to east (1-3, as indicated on figures 1 and 4) for reference in this report.

Location and topography

The development site is located to the south of Beccles, Suffolk, and is centred approximately on NGR TM 43900 88300 (643900, 288300). The survey was intended to cover all surveyable ground within the site, which extends to c. 15ha.

The site is in mixed cultivation, with a meadow to the west (field 1), an arable field in the centre (field 2), and a grassed caravan site to the east (field 3). No caravans were present at the time of the survey. The ground slopes gently from an elevation of c. 30m AOD at the west to c. 22m AOD in the eastern field.

The site is on a bedrock of Norwich Crag, with superficial deposits of Lowestoft Formation, which is a chalky till also containing gravels, silts and clays. These conditions should not present any unusual difficulties for a magnetometer survey. Magnetic susceptibility readings (which were recorded across the site during the survey) were at the lower end of the commonly encountered range of values (with readings between 5 – 12 x 10⁻⁵ SI), but not exceptionally so. It is possible therefore (as is often the case on clay soils) that isolated ditches or other features lacking magnetically enhanced fill (of the kind usually found at ancient settlement or industrial sites) might not respond reliably to the survey.

Archaeological background
Previously identified archaeological findings in the vicinity of the site, and within a surrounding 3km diameter study area, are described in the DBA [2], and summarised in the WSI [1]. Some of the nearby findings are indicated on the plan (reproduced from WSI figure 2) which is inset in figure 4 of this report.

Archaeological remains of prehistoric date within the study area are limited to a few findspots of flint and pottery sherds, and there are also various findspots of Roman pottery and coins. The nearest are located at the northern edge of the study area (MSF1176, MSF13965).

No sites dating to the Early Medieval period have been identified nearby, but there is a possible medieval moat (MSF15097) in the south west of the study area, and a medieval brick kiln was discovered at Ellough Airfield to the east (MSF17139). A geophysical survey within the airfield also located possible ditches and pits, which were confirmed by excavation.

Features recorded from historic mapping include a building (MSF17321), a brickworks (about 1 km to the west: MSF22745), and a plot of land labelled ‘ruins’ (of unknown date or nature: MSF17322). A cropmark enclosure of unknown date (MSF15253) is recorded within the airfield, but aerial photographs from English Heritage do not show evidence for additional cropmarks or other archaeological features within the study area. An extract from a 1928 OS map (reproduced in [2]) indicates a plantation in the eastern half of field 2.

It is concluded in the DBA (section 8.0) that there is considered to be a low potential for previously unrecorded remains at the site due to limited evidence for activity within the study area.

**Survey Procedure**

The site was investigated by means of a recorded magnetometer survey. 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 at 1:2000 scale as a grey scale plot (figure 1), and as a graphical (x-y trace) plot at 1:1250 (figures 2-3). Comparison of these alternative presentations allows the detected magnetic anomalies to be examined in plan and profile respectively. An interpretation of the findings is shown superimposed on figures 2-3 (which permits the interpreted outlines to be compared with the underlying data), and is reproduced separately to provide a summary of the findings (figure 4).

The graphical plot in figures 2-3 shows the magnetometer readings after minimal pre-processing [of the kind permitted by English Heritage (2008) *Geophysical Survey in Archaeological Field Evaluation* Section 4.8]. This includes adjustment for irregularities in line spacing caused by variations in the instrument zero setting, and truncation of extreme values. Additional weak 2D low pass filtering has been applied to the grey scale plot to adjust background noise levels. No additional processing of a kind which could modify the anomaly profiles, or influence their interpretation, has been applied to the data.
The magnetometer responds to cut features such as ditches and pits when they are silted with topsoil, which usually has a higher magnetic susceptibility than the underlying natural subsoil. It also detects the thermoremanent magnetism of fired materials, notably baked clay structures such as kilns or hearths, and so responds preferentially to the presence of ancient settlement or industrial remains. It is also strongly affected by ferrous and other debris of recent origin.

Colour coding has been used in the interpretation to distinguish different effects. Magnetic anomalies which may show characteristics to be expected from features of potential archaeological interest are outlined in red. Variations in the density of background magnetic activity are indicated by the concentration of small magnetic anomalies outlined in light brown. Stronger (and perhaps recent) disturbances are outlined in grey. Possible cultivation effects are in green, and some of the more conspicuous ferrous objects (identifiable as narrow spikes in the graphical plots) are marked in light blue.

Magnetic susceptibility tests

Magnetic susceptibility readings were taken (using a Bartington MS1 meter) at c. 60m intervals across the survey area. This information provides an indication of the strength of magnetic response to be expected from the site, with conclusions as noted above.

Survey location

The survey grid was set out and tied to the OS grid using a Trimble ProXRT GPS system (with VRS correction to give accuracy of 0.1m). 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. Distances to boundaries or fixed points can also be scaled from the printed plans or AutoCAD file if required.

Results

The survey has detected a number of subsurface features and disturbances, but has not produced any findings of unambiguous archaeological significance. It is sometimes the case in magnetometer surveys on soils containing glacial gravels that the presence of naturally magnetic stones in the gravel will give rise to small magnetic anomalies which add to the background noise level of the survey. There may be some disturbances of this kind here, but the level of background magnetic activity (as indicated by small magnetic anomalies outlined in light brown) is generally low, and should not obscure the response from any archaeological features which may be present.

Findings include a sequence of parallel linear markings (visible in the grey scale plot, and marked by green broken lines in figure 4) in field 3. These are likely to be caused by cultivation, but the field is currently pasture. They could possibly indicate traces of ridge and
furrow, or could relate to more recent ploughing. A east-west pipe in the centre of field 3 (blue in figure 4) follows the line of a former boundary as shown on historic maps (and a 1966 aerial photograph).

Parallel north-south linear disturbances in field 2 are stronger than the cultivation effects, and are likely to be caused by clay land drains. They extend across the eastern half of the field (in the area previously occupied by a plantation). Drains are less clearly identifiable elsewhere in the survey, but one possible example is indicated in field 1.

Various strong magnetic disturbances (grey) along the northern boundary of fields 2 and 3 may be caused by fences, or by magnetic interference from the adjacent industrial site to the north. Items of ferrous debris (as indicated by narrow spikes in the graphical plots 2 and 3, and outlined in blue) appear to be uniformly distributed across the site, with no concentrations of a kind which could relate to variations in land use or activity within the survey area.

The remaining findings are a few individual magnetic anomalies (outlined in red) which could indicate silted pits or hollows. These features (corresponding to magnetic anomalies with rounded profiles as seen in the graphical plots 2 and 3) could in a suitable context be interpreted as features of potential archaeological origin, but here they are widely dispersed and isolated, and so are unlikely to be of archaeological interest.

The features labelled A, D and E in figure 4 are relatively broad and weak, and so could indicate earth-filled hollows 3-4m in width. The stronger example at B could be either a ferrous object at some depth, or a pit (with responsive fill) about 2m in width. The magnetic anomalies at C could perhaps indicate a short linear feature entering the site from the north, but the evidence is uncertain. Other (unlabelled) features as marked in red are less clearly distinguishable from the general level of background activity.

**Conclusions**

The survey has produced findings which are consistent with the limited archaeological expectations for the site as stated in the DBA [2].

Features detected by the survey include probable cultivation effects which may indicate traces of ridge and furrow in field 3, and land drains in field 2. The detection of the cultivation markings suggests that soil conditions at the site are at least reasonably responsive to magnetic surveying, and that any more substantial or concentrated archaeological features should therefore be detectable (if any are present).

The only other findings of potential archaeological relevance are isolated pit-like features (including examples labelled A – E in figure 4). There are no clusters or concentrations of such features to suggest the presence of an archaeological site.
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The fieldwork for this survey was done by C. Oatley and P. Heykoop.

References


APPENDIX E. OASIS REPORT FORM
All fields are required unless they are not applicable.

Project Details
OASIS Number: oxfordar3-170735
Project Name: Players New Solar Farm, Ellough, Suffolk. Geophysical Survey
Project Dates (fieldwork): Start 10-02-2014, Finish 14-02-2014
Previous Work (by OA East): No

Project Reference Codes
Site Code: XSFPE14
HER No.: ELO 014
Planning App. No.: 
Related HER/OASIS No.: 

Type of Project/Techniques Used
Prompt: Direction from Local Planning Authority - PPS 5
Development Type: Other

Please select all techniques used:
- [ ] Aerial Photography - interpretation
- [ ] Aerial Photography - new
- [ ] Annotated Sketch
- [ ] Augering
- [ ] Dendrochronological Survey
- [ ] Documentary Search
- [ ] Environmental Sampling
- [ ] Fieldwalking
- [x] Geophysical Survey
- [ ] Grab-Sampling
- [ ] Gravity-Core
- [ ] Laser Scanning
- [ ] Measured Survey
- [ ] Metal Detectors
- [ ] Photographic Survey
- [ ] Photogrammetric Survey
- [ ] Phosphate Survey
- [ ] Rectified Photography
- [ ] Remote Operated Vehicle Survey
- [ ] Sample Trenches
- [ ] Survey/Recording Of Fabric/Structure
- [ ] Targeted Trenches
- [ ] Test Pits
- [ ] Topographic Survey
- [ ] Vibro-core
- [ ] Visual Inspection (Initial Site Visit)

Monument Types/Significant Finds & Their Periods
List feature types using the NMR Monument Type Thesaurus and significant finds using the MDA Object type Thesaurus together with their respective periods. If no features/finds were found, please state "none".

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**Project Originators**

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**Digital Media**

- Database
- GIS
- Geophysics
- Images
- Illustrations
- Moving Image
- Spreadsheets
- Survey
- Text
- Virtual Reality

**Paper Media**

- Aerial Photos
- Context Sheet
- Correspondence
- Diary
- Drawing
- Manuscript
- Map
- Matrices
- Microfilm
- Misc.
- Research/Notes
- Photos
- Plans
- Report
- Sections
- Survey