

**PROPOSED SOLAR FARM AT WICK FARM
(EASTERN PLOT),
WICK ROAD, BURNHAM-ON-CROUCH
Archaeological Geophysical Survey
2014**

Report by:

A.D.H. Bartlett

**Bartlett-Clark Consultancy
25 Estate Yard, Cuckoo Lane,
North Leigh,
Oxfordshire OX29 6PW
01865 200864**

for:

**Oxford Archaeology East
15 Trafalgar Way
Bar Hill
Cambridge
CB23 8SQ**

Proposed solar farm at Wick Farm (eastern plot) Wick Road, Burnham-on-Crouch, Essex

Geophysical Survey 2014

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Abstract

This report describes a geophysical survey which has been undertaken as part of an archaeological field evaluation of the site of a proposed solar farm at Wick Farm (eastern plot) AT Burnham-on-Crouch, Essex.

The survey has detected subsurface features and disturbances which appear to relate mainly to historic field boundaries and related drainage systems. There are localised magnetic anomalies which could be consistent with the presence of debris associated with nearby ancient salt making activity in parts of the site, but this cannot be confirmed on the basis of the survey evidence alone.

1. Introduction

The survey was commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford, by Oxford Archaeology East on behalf of AAH Planning. Fieldwork for the survey was done on 11-13 November 2014.

The site is located 2km east of the village of Burnham-on-Crouch (centred approximately

at NGR TQ 968957) and is within the Maldon District Council authority. The Site comprises one large field which is currently under arable cultivation. The area within the proposed site boundary (as indicated on the location plan inset in figure 1) is 12.1ha. This was surveyed in full (with the exception of overgrown and set-aside areas near the site boundaries) giving coverage (as indicated by the blue outline) of 11.4ha.

The location and condition of the site are described in the Desk Based Assessment (DBA) prepared as part of this evaluation by Oxford Archaeology East [1]. The survey procedures were also described in the Written Scheme of Investigation for the survey [2]. The notes in the following sections are summarised in part from these documents.

2. Objectives of the Survey

The aim of the geophysical survey was to identify the extent and character of any archaeological remains capable of producing a magnetic response. 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.

3. Topography and Geology

The Site is currently one large arable field occupying reclaimed salt marsh between 2m and 4m OD, within the Dengie Peninsula.

The drift geology of the Site mainly comprises river terrace deposits, but at its southern edge the drift geology is tidal flat deposits. These glacio-fluvial deposits overlie bedrock of London Clay.

It is our experience that river terrace gravel deposits usually provide favourable ground conditions for the magnetic detection of archaeological features, although it is possible on reclaimed marshland, and particularly on the tidal flat deposits, that there could be numerous natural magnetic anomalies caused by palaeochannels, or by variations in the depth or composition of superficial silt deposits. These can usually be distinguished from archaeological features on the basis of their dimensions and (relatively amorphous) plan.

4. Archaeological Background

Previously identified archaeological findings in the vicinity of the site are indicated on the extract from a plan showing entries from the Essex Historic Environment Record (HER), which is reproduced from the DBA, and inset in figure 3.

The site is close to the medieval settlement of Burnham-on-Crouch and the Manor House of West Wick and East Wick. Evidence of archaeology from the Bronze Age and Iron Age

has been identified to the north-west of the site on the higher ground, where there are cropmarks (confirmed by excavation) of a rectilinear enclosure, and an associated linear feature (11339 on HER map). Other parallel cropmarks (18831) have been recorded to the north of the site.

Evidence for coastal salt working, which was a long-established industry from the Roman period onwards, is provided by spreads of red burnt clay deposits ('red hills'). These have been recorded by aerial photographs immediately to the north-west of the site (at 11315). An excavation here in 1976 recorded burnt clay mounds and gullies, together with some Roman briquetage and pottery. It is possible that any deposits of burnt material or briquetage associated with salt making activities will give rise to strong and distinctive magnetic anomalies. These may in some cases, however, be difficult to distinguish magnetically (except on the basis of context or surface finds) from scatters of modern rubble or debris.

Historic maps show the site to have been unenclosed salt marsh in 1678, but to have been reclaimed as agricultural land by the time of a tithe map of 1850. The OS map of 1874 (inset in figure 3) shows former field boundaries within the survey area. (The red site outline as drawn on this map is located to the south of its actual position, and so appears to be offset from the survey location.)

It is concluded in the DBA that there is a low probability of finding archaeological features of Bronze Age or Iron Age date within the evaluation site because the land is at a lower elevation than the cropmark site (11339) to the north west. There is however a possibility that remains associated with the adjacent salt making activity could be present.

5. Survey Procedure

The procedure used for the investigation was a fluxgate gradiometer survey across the evaluation area. Results are presented as described below.

A survey grid was set out at the required locations, and tied to the OS grid using a GPS system with VRS correction to provide 0.1m or greater accuracy. The plans are therefore geo-referenced, and OS co-ordinates of map locations can be read from the AutoCAD version of the plans.

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 a scale plot (at 1:2000 scale) in figure 1, and as a graphical (x-y trace) plot in figure 2 (at 1:1500 at A3). Inclusion of both types of presentation allows the detected magnetic anomalies to be examined in plan and profile respectively.

The graphical (x-y) plot represents minimally pre-processed magnetometer readings, as recommended for initial presentation of survey data in the 2008 English Heritage geophysical guidelines document [3]. Adjustments are made for irregularities in line spacing caused by variations in the instrument zero setting (as is required for legibility in gradiometer data), but no further filtering or other process which could affect the anomaly profiles or influence the interpretation of the data has been applied. A weak additional 2D low pass filter has been applied to the grey scale plot to adjust background noise levels.

An interpretation of the findings is shown in figure 2, and is reproduced separately to provide a summary of the findings in figure 3. Colour coding has been used in the interpretation to distinguish different effects. The interpretation is intended to categorize most of the identifiable magnetic anomalies, but cannot reproduce the detail of the grey scale plots.

Features as marked include magnetic anomalies which may show characteristics to be expected from features of potential archaeological significance (in red and yellow), and stronger (perhaps recent) disturbances in grey. Small (and mainly natural) background magnetic anomalies are outlined in light brown. Broad irregular magnetic anomalies of a kind commonly seen in wetland soils are indicated in a light green. Some of the more conspicuous ferrous objects (identifiable as narrow spikes in the graphical plots) are outlined in light blue, and probable land drains are also marked. Former field boundaries are indicated in brown.

6. Results

The survey plots show the presence of strongly defined ditch-like linear features. These appear to relate to historic field boundaries, as is indicated by the clear correspondence between the linear disturbances (A and B in figure 3), and field boundaries as marked on the 1874 OS map (inset in figure 3). The strong and irregular response to ditches A and B suggests they have been infilled with imported modern debris.

Various additional linear features are labelled as drains in the interpretation. These probably represent infilled trenches or subsurface pipes which link with or drain into the main ditches A and B. The fact that they form a linked or intersecting pattern which respects or terminates at the 19th field boundaries suggests they form a relatively recent drainage system, and are unlikely to be ancient ditches or enclosures of the kind represented by nearby cropmarks.

The survey response is otherwise characterised (as expected) by a background of numerous broad amorphous magnetic anomalies, as outlined in light green in the interpretation. These merge with, but are often distinct from, smaller background magnetic anomalies outlined in light brown.

The magnetic anomalies as noted here are of a kind commonly seen in surveys on wetland or fenland soils, and are likely to represent variations in the depth or distribution of silt deposits. (More continuous features of this kind may sometimes indicate palaeochannels, although no clear examples are visible here.)

The difficulty in interpreting such findings is that most of them are clearly of natural origin, but stronger or more distinct examples may share characteristics to be expected from pits containing archaeologically derived fill. It is not impossible, therefore, that pits containing a uniformly distributed fill of burnt clay (as might be present in the vicinity of a salt-making site) could give rise to strong magnetic anomalies of the kind indicated by yellow outlines in the interpretation (as at C and D in figure 3). It is perhaps, however, more likely that these are naturally silted hollows, given that they are not clearly demarcated from others across the site, and there is no nearby increase in the level of background magnetic activity, as might be expected at an ancient industrial site.

Increased concentrations of small magnetic anomalies of a kind which could indicate scatters of burnt clay fragments are seen at locations E, F, G (with magnetic disturbances outlined in red) in figure 3. The magnetic anomalies at E are close to the salt making site 11315, but are also near to intersecting land drains, and so could perhaps indicate disturbances associated with the drains rather than salt-making. The (possibly similar) disturbances at F in the centre of the site are also near to drains and ditches.

It may be significant that there is a slight increase in the density of small background magnetic anomalies (light brown) to the west of the cluster of small disturbances outlined in red at G. This could perhaps (but not necessarily) indicate a scatter of burnt clay fragments associated with salt making in this part of the site.

7. Conclusions

The survey findings leave open the possibility that scatters of debris associated with nearby salt-making activity could be present in the northern and western parts of the site. This would be indicated, if so, either by pits containing magnetically enhanced fill as seen at C and D, or by scatters of small magnetic anomalies (perhaps indicting fragments of burnt clay debris), as at E and G. The survey has not, however, detected any dense concentrations of such disturbances as might be expected in the presence of substantial quantities of burnt clay debris.

Report by:

A. Bartlett BSc MPhil

Bartlett - Clark Consultancy
Specialists in Archaeogeophysics
25 Estate Yard
Cuckoo Lane
North Leigh
Oxfordshire
OX29 6PW 01865 200864

bcc123@ntlworld.com

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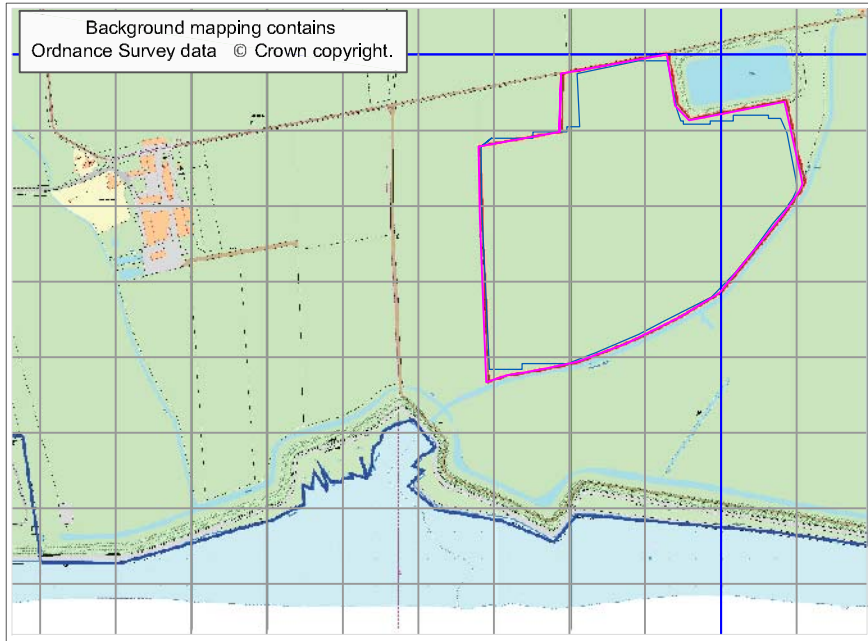
The fieldwork for this project was done by P. Heykoop and S. Mayes.

References

- [1] *Proposed solar farm at Wick Farm (eastern plot), Wick Road, Burnham-on-Crouch.* Report number 1635. Document prepared by Oxford Archaeology East (author Helen Stocks-Morgan) for AAH Planning; July 2014.

- [2] *Written Scheme of Investigation for Archaeological Geophysical Survey 2014. Proposed Solar Farm at Wick Farm (eastern plot), Wick Road, Burnham-on-Crouch.* Document submitted to Oxford Archaeology East by Bartlett Clark Consultancy; 2 November 2014.

- [3] English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation* [online facsimile] (English Heritage: Swindon, 2008), English Heritage Research.



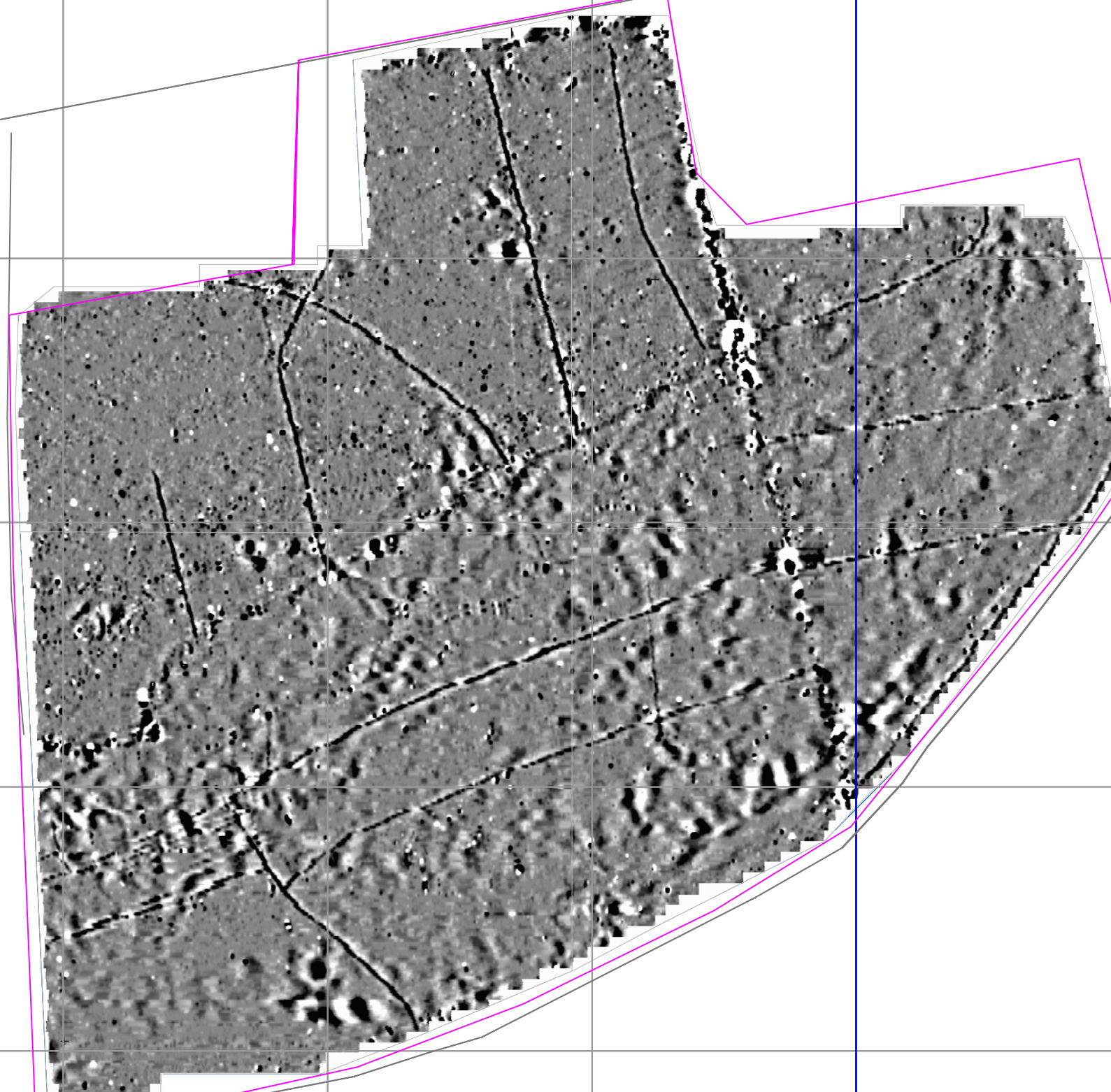
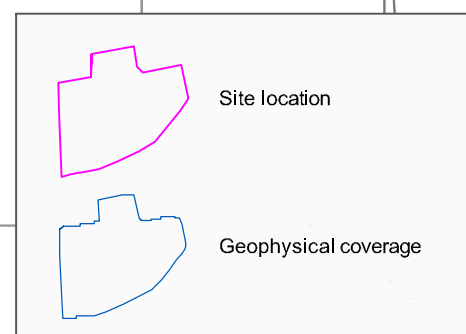
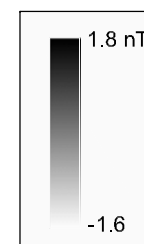
Site location

1:10000



597000E

195800N











WICK FARM
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Figure 1: Magnetometer survey
(grey scale plot)

0 Scale 1:2000 @ A3 100m

Surveyed by: Bartlett-Clark Consultancy 01865 200864
for: Oxford Archaeology East



-  magnetic anomalies
(possibly archaeological ?)
-  archaeological or natural ?
-  recent magnetic disturbances ?
-  former ditches ?
-  broad / weak magnetic anomalies
(wetland / natural ?)
-  drains
-  strong (ferrous)
magnetic anomalies
-  small background magnetic anomalies
(mainly natural ?)

45nT

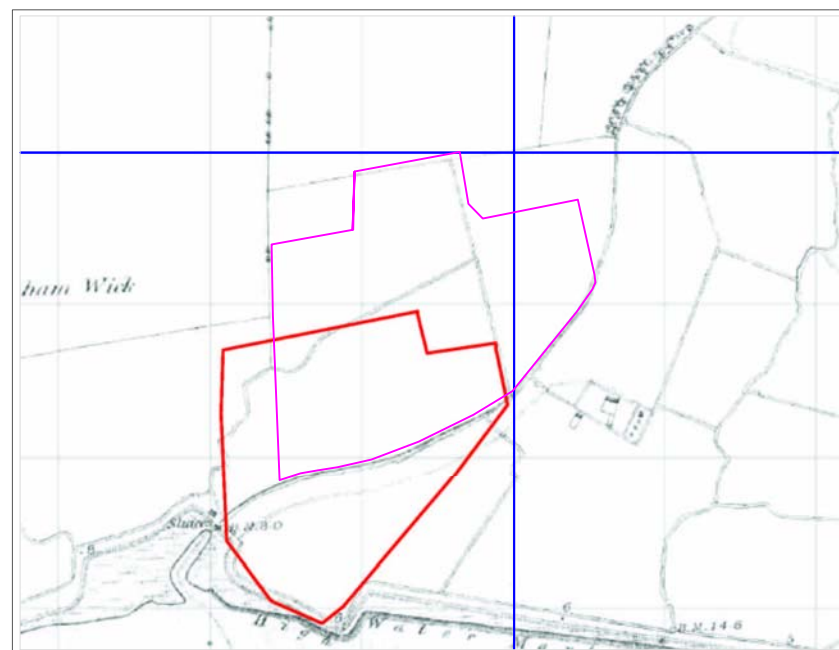
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WICK FARM
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Figure 2: Magnetometer survey
(with interpretation)









0 Scale 1:1500 @ A3 100m



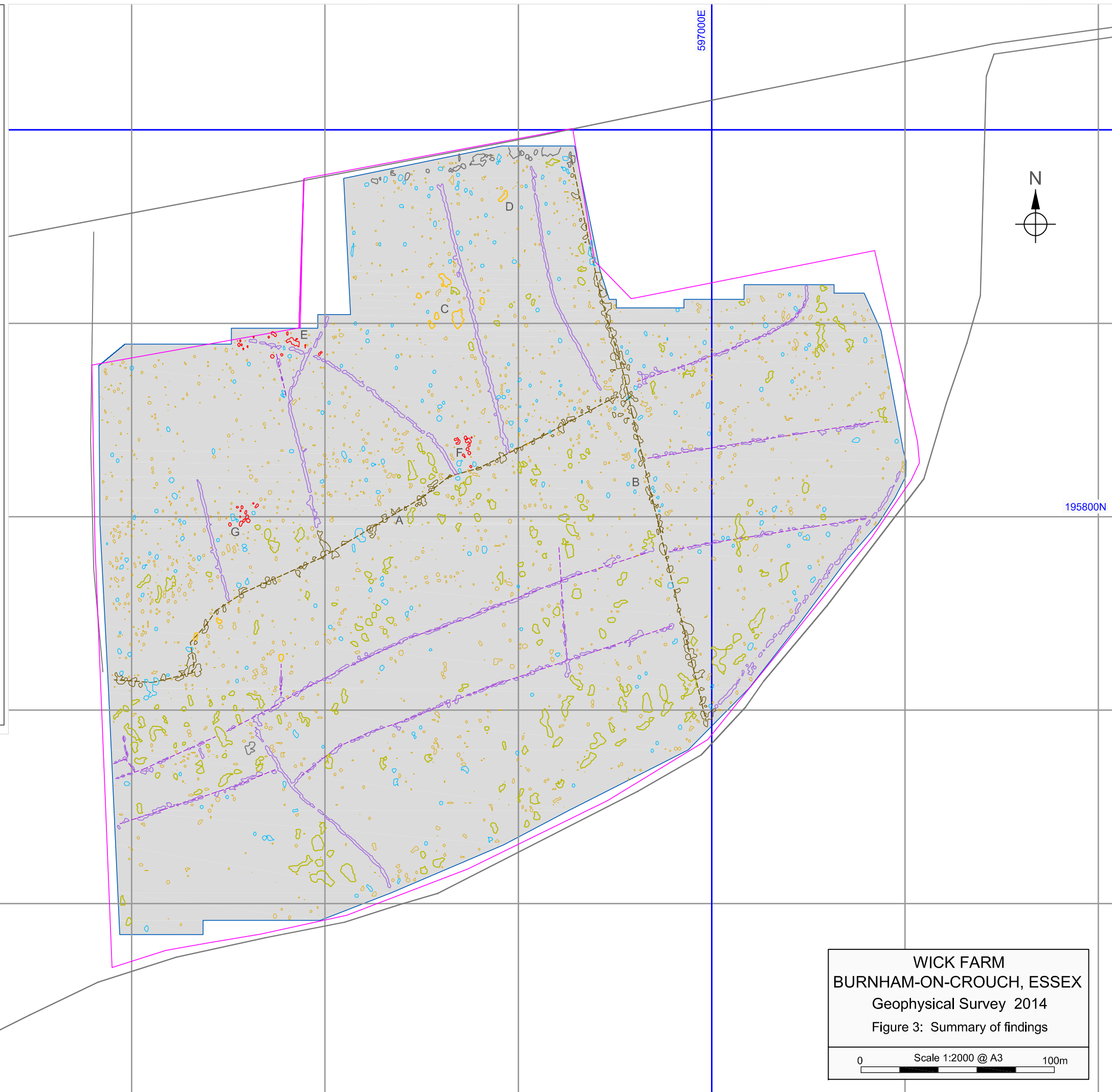
HER Data (from DBA figure 2) 1:12500



OS map 1874 (from DBA figure 5) 1:10000

-  magnetic anomalies (possibly archaeological ?)
-  archaeological or natural ?
-  recent magnetic disturbances ?
-  former ditches ?
-  broad / weak magnetic anomalies (wetland / natural ?)
-  drains
-  strong (ferrous) magnetic anomalies
-  small background magnetic anomalies (mainly natural ?)

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Figure 3: Summary of findings

0 Scale 1:2000 @ A3 100m