WFCH13-001

Proposed installation of a Single wind turbine at Woodlay Farm, Herodsfoot, Cornwall

Geophysical Survey
2013

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Abstract

A Magnetometer survey was undertaken over the proposed site for a wind turbine at Woodlay farm, Herodsfoot, to establish whether there are likely to be any issues regarding heritage assets which might have to be dealt with during the planning process.

The Woodlay farm site produced responses related to a small scatter of ferrous objects and three large linear anomalies and a trace response suggestive of a small right angled anomaly.

The significance of the magnetic responses has produced inconclusive results due to the background material within the study area.

Signed off by

Joe Abrams
Date…14/11/2013…….

CONTENTS

1. Introduction

This report describes a geophysical survey undertaken on a site selected for a proposed wind turbine at Woodley Farm, Herodsfoot, Cornwall

The survey was carried out by Headland Archaeology (UK) Ltd, in conjunction with Bartlett Clark Consultancy of Oxford in 2013.

The proposed area of development is within an area of farmland surrounding Woodlay Farm (NGR SX 19313 60385). The study area is currently used as open pasture land. The village of Herodsfoot lies approximately 1.5km to on the east, with the villages of Trevelmond and Lanreath located 3.5km to the north and south, respectively.

2. Objectives of the Survey

The general aim of the geophysical survey was to identify the extent and character of any archaeological remains capable of producing a magnetic response; these can include ditches, large pits, kilns, ovens etc...

3. Geological Background

The survey site is located within a transitional area of geology of the Saltash Formation, a basaltic tuff and basaltic lava. This is an Igneous bedrock formed approximately 345-407 million years ago in the Carboniferous and Devonian Period, indicating a local environment previously dominated by explosive eruptions of silica-poor magma. These rocks were formed from semi mobile to mobile and highly gaseous magma. The magma rose to the surface, where sudden pressure relief caused explosive volcanic eruptions, producing fragmentary pyroclastic material or ash spreads. (British Geological Survey website; http://www.bgs.ac.uk).

4. Archaeological Background

The proposed wind turbine site itself is not within land characterised as 'Anciently Enclosed Land', but it is surrounded by this type of landscape and woodland, which may suggest that this was former common or rough ground, which was later enclosed. The site lies within a landscape fairly densely populated by archaeological monuments.

A small multi-vallate hillfort is located at Bury Down approximately 1km to the south of the site.

Due to the large number of unrecorded barrows in the area this is one type of monument for which the survey was specifically required to establish a presence or absence.

5. Survey Procedure

The procedure used for the investigation was a recorded magnetometer survey carried out within the shaded areas on Illustration 2.

5.1 Magnetometer survey

A survey grid of 100m by 100m (1Ha) was set out and tied to the OS grid using a GPS system with Omnistar 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 were plotted at 25cm intervals along each transect. The results of the survey are presented as graphical (x-y trace) plots in Illustration 1 and as grey scale plots in Illustration 2 (1:1000 scale @ A4). Inclusion of both types of presentation allows the detected magnetic anomalies to be examined in plan and profile respectively.

The graphical (x-y) plots represent minimally pre-processed magnetometer readings, as recommended for initial presentation of survey data in the 2008 English Heritage geophysical guidelines document (English Heritage 2008). 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 reduce background noise levels.

An interpretation of the findings is shown in illustration 3. Key coding has been used in the interpretation to distinguish different interpretations and anomaly types.

6. Results

The result of the magnetometer survey within the area of proposed development identified a series of three long parallel linear anomalies and a scattering of ferrous magnetic anomalies responses and a tentative right angle anomaly.

The series of parallel magnetic responses were aligned approximately north-south and could be possibly interpreted as cultivation lines (A, B, C), although the magnetic responses were not noted to correspond with any visible evidence for ridge and furrow within the proposed development area and therefore are more likely to represent tracts of modern field drains.

Two areas of enhanced responses (D, E) were identified within the survey area. These types' of response can be caused by pits or burnt features although, given the igneous nature of the underlying geology, may in this case relate to that.

Scattered ferrous responses are not uncommon within agricultural land and can be observed across the survey area, possibly relating to general debris associated with agricultural activities.

Identified as a very negligible magnetic response in relation to the intensity of general background noise, anomaly F, appears to form small right angle feature, this may represent a possible archaeological feature, but yet again due to the nature of the background geology, its interpretation at this initial stage of analysis remains uncertain.

7. References

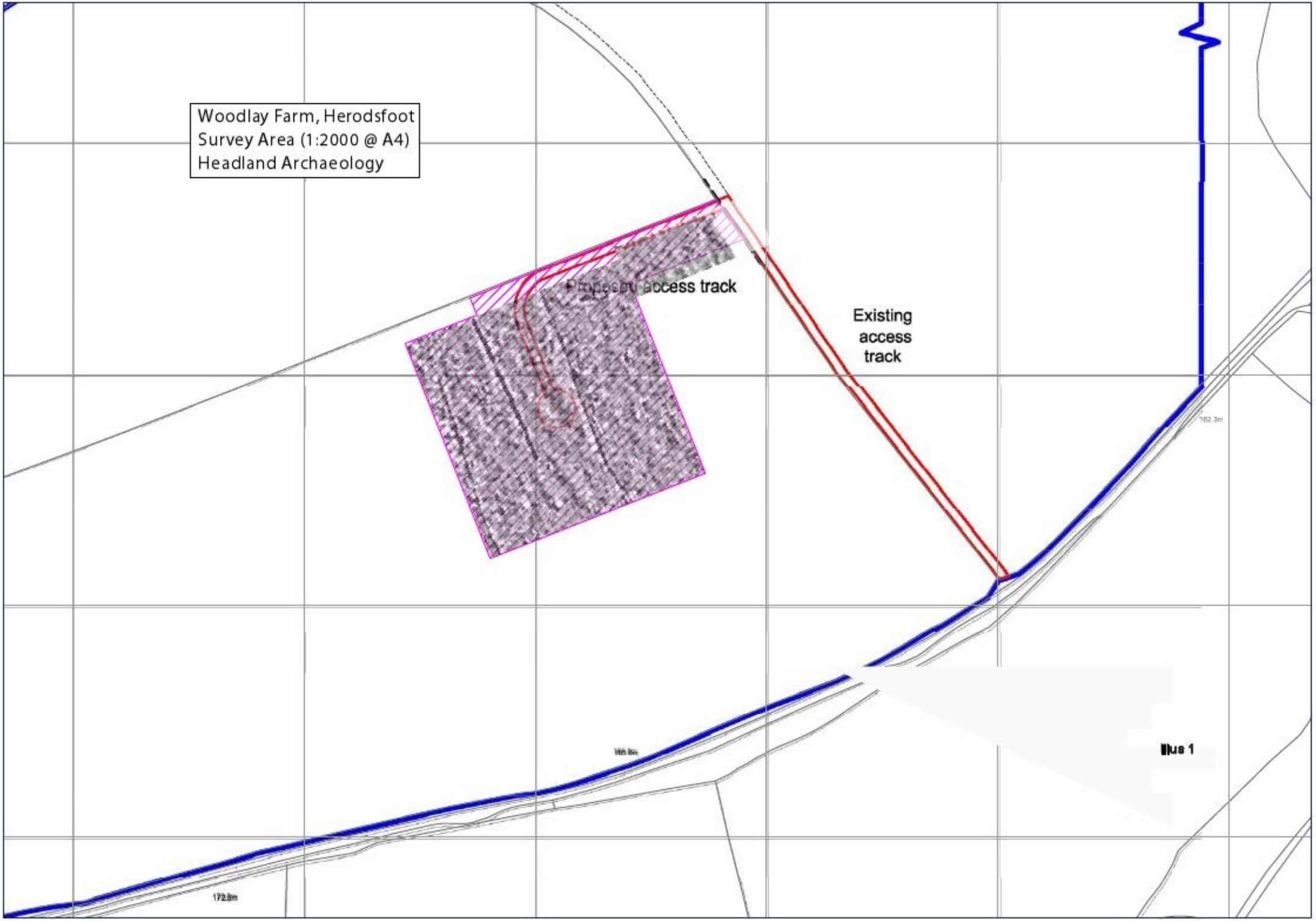
Bell, F G 1975 'Site Investigations in Areas of Mining Subsidence', Newnes-Butterwoths (Table 42; p 78).

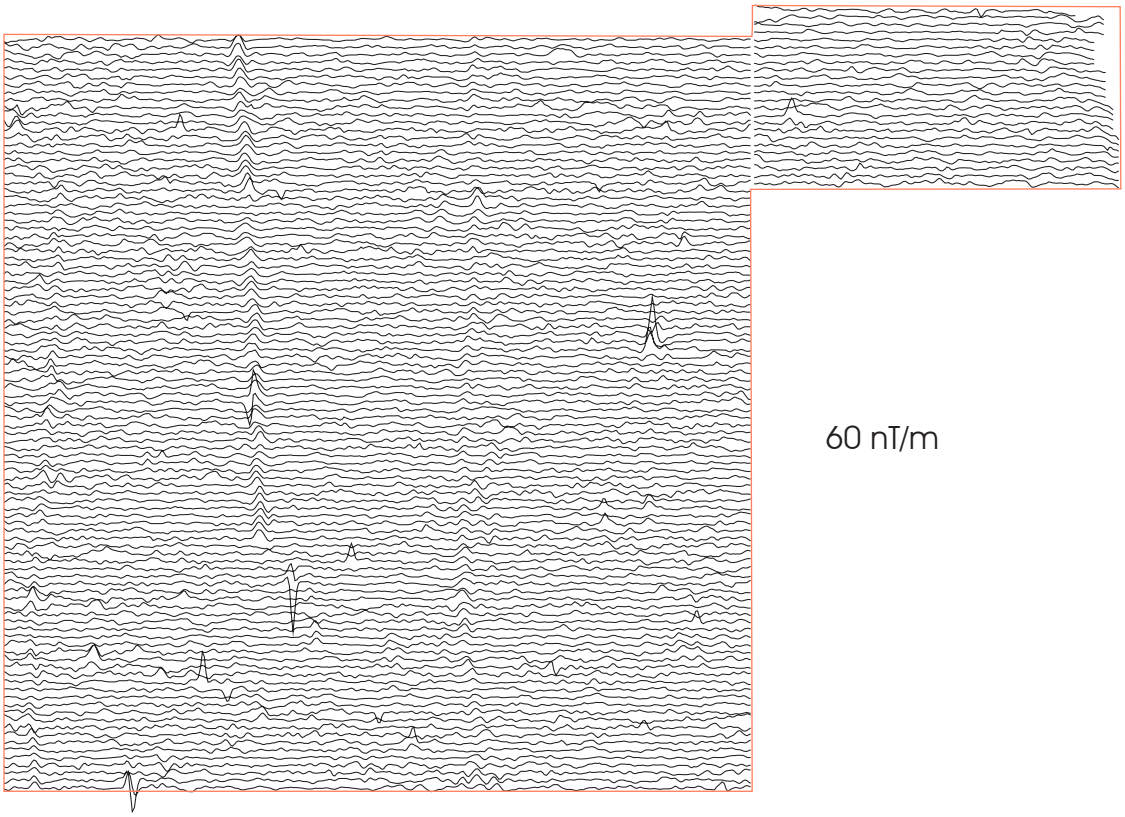
English Heritage 2008a *Geophysical Survey in Archaeological Field Evaluation* [online facsimile] (English Heritage: Swindon, 2008), English Heritage Research

English Heritage 2008b *Professional Services Guideline no. 1, 2nd edn* English Heritage Research.

Gaffney, C, Gater, J & Ovenden, S 2002 'The Use of Geophysical Techniques in Archaeological Evaluations', *Institute of Field Archaeologists Paper,* no. 6 [online paper] (published online June 2002) <http://www.archaeologists.net/sites/default/files/node-files/ifa_paper_6.pdf> accessed July 2013.

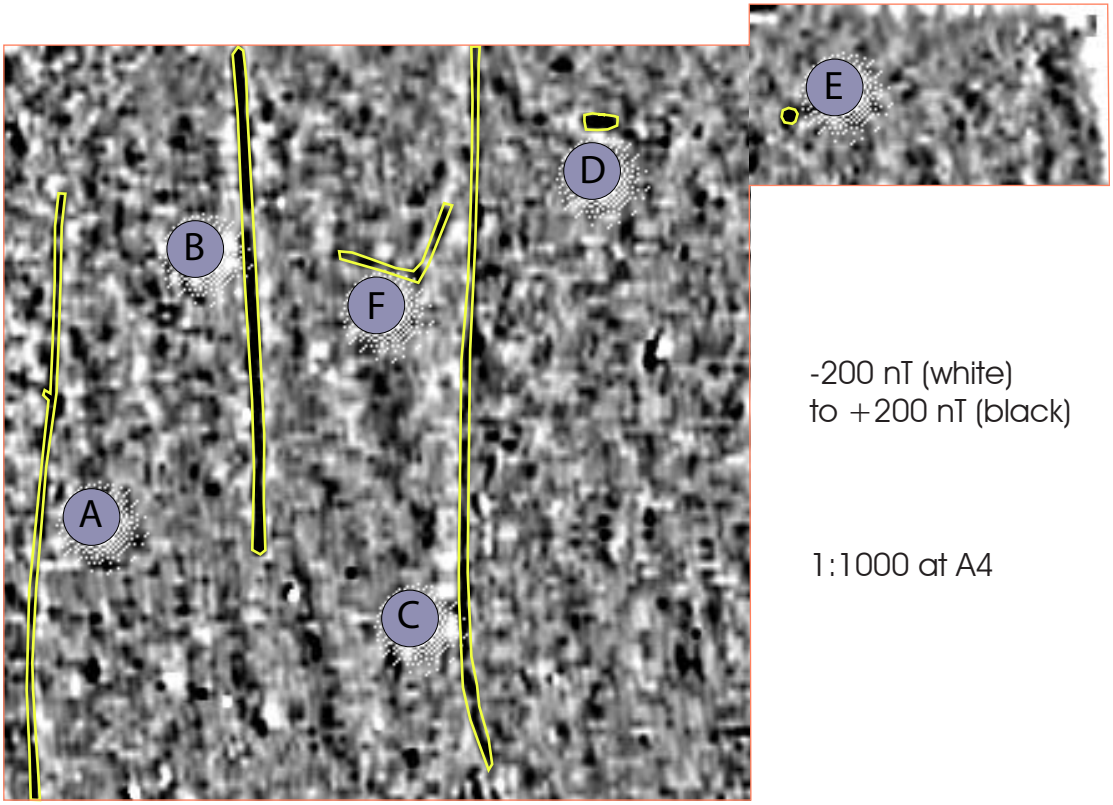
Schmidt, A & Ernenwein, E 2011 *Guide to Good Practice: Geophysical Data in Archaeology, 2nd edn* [online facsimile] Guides to Good Practice <http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_Toc#section-Geophysics_Toc-Guide To Good PracticeGeophysicalDataInArchaeology> accessed July 2013.


Woodlay Farm, Herodsfoot
Survey Area (1:2000 @ A4)
Headland Archaeology
Existing
access
track



60 nT/m

Fig 3



-200 nT (white)
to +200 nT (black)

1:1000 at A4

Fig 4

Woodlay Farm, Herodsfoot
Survey Area (1:1000 @ A4)
Headland Archaeology

Illus 2 & 3