STRATASCAN

Geophysical Survey Report

Kit's Coty Farm, Kent

for

Fraggle Poultry

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J1903

H Heard

REGISTERED ORGANISATION IFA

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1 SUMMARY OF RESULTS

A detailed magnetometry survey was carried out over 3.5 ha at Kit's Coty Farm, Kent. The survey located a number of geophysical anomalies pertaining to agricultural activity and possible geological or natural soil variations, no anomalies are characteristically archaeological in origin.

2 INTRODUCTION

2.1 Background synopsis

Stratascan were commissioned by Fraggle Poulty to undertake a geophysical survey of an area outlined for development as free-range hen houses. This survey forms part of an archaeological investigation prior to any development.

2.2 Site location

The site is located at Kit's Coty Farm, 3km north of Maidstone, Kent at OS ref. TQ742610.

2.3 Description of site

The survey area is approximately 3.5 hectares in size; the present land is agricultural. The topography gently slopes down to the west. The underlying geology is solid chalk and Quaternary clay with flint (British Geological Survey South Sheet, Third Edition Solid, 1979; First Edition Quaternary, 1977). The overlying soils are known as Coombe 2 soils, which are chalky drift and chalk soils. These consist of well-drained calcareous fine silty soils over chalk or chalk rubble (Soil Survey of England and Wales, Sheet 6 South East England).

2.4 Site history and archaeological potential

No specific details were available to Stratascan, although the site is located close to a small number of prehistoric monuments. Kit's Coty chambered tomb being situated approximately 0.5km towards the south east.

Photo 1: looking south-westerly over survey area

Photo 2: Looking north-westerly over survey area

2.5 Survey objectives

The objective of the survey was to locate any features of possible archaeological significance in order that they may be assessed prior to development.

2.6 Survey methods

Detailed magnetometry was used as an efficient and effective method of locating archaeological anomalies. More information regarding this technique is included in the Methodology section below.

3 METHODOLOGY

3.1 Date of fieldwork

The fieldwork was carried out over 3 days from 2/8/04 - 4/8/04. Weather conditions during the survey were hot and dry.

3.2 Grid locations

The location of the survey grids has been plotted in Figure 2 together with the referencing information.

3.3 Description of techniques and equipment configurations

Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTesla (nT) in an overall field strength of 48,000nT, can be accurately detected using an appropriate instrument.

The mapping of the anomaly in a systematic manner will allow an estimate of the type of material present beneath the surface. Strong magnetic anomalies will be generated by buried iron-based objects or by kilns or hearths (thermoremnant features). More subtle anomalies such as pits and ditches can be seen if they contain more humic material which is normally rich in magnetic iron oxides when compared with the subsoil.

To illustrate this point, the cutting and subsequent silting or backfilling of a ditch may result in a larger volume of weakly magnetic material being accumulated in the trench compared to the undisturbed subsoil. A weak magnetic anomaly should therefore appear in plan along the line of the ditch.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd.. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame. Each sensor has a 1m separation between the sensing elements giving a strong response to deep anomalies.

3.4 Sampling interval, depth of scan, resolution and data capture

3.4.1 Sampling interval

Readings were taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid.

3.4.2 Depth of scan and resolution

The Grad601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. The collection of data at 0.25m centres provides an appropriate methodology balancing cost and time with resolution.

3.4.3 Data capture

The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each job, data is transferred to the office for processing and presentation.

3.5 Processing, presentation of results and interpretation

3.5.1 Processing

Processing is performed using specialist software known as *Geoplot 3.* This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves 'flattening' the background levels with respect to adjacent traverses and adjacent grids. 'Despiking' is also performed to remove the anomalies resulting from small iron objects often found on agricultural land. Once the basic processing has flattened the background it is then possible to carry out further processing which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following schedule shows the basic processing carried out on all processed gradiometer data used in this report:

1. *Despike* (useful for display and allows further processing functions to be carried out more effectively by removing extreme data values)

   Geoplot parameters:
   X radius = 1, y radius = 1, threshold = 3 std. dev.
   Spike replacement = mean

2. *Zero mean grid* (sets the background mean of each grid to zero and is useful for removing grid edge discontinuities)

   Geoplot parameters:
   Threshold = 0.25 std. dev.

3. *Zero mean traverse* (sets the background mean of each traverse within a grid to zero and is useful for removing striping effects)

   Geoplot parameters:
   Least mean square fit = off

3.5.2 Presentation of results and interpretation

The presentation of the data for each site involves a print-out of the raw data both as greyscale (Figure 3) and trace plots (Figure 4 and 5), together with a greyscale plot of the processed data (Figure 6). Magnetic anomalies have been identified and plotted onto the 'Abstraction and Interpretation of Anomalies' drawing for the site (Figure 7).

4 RESULTS

See Figures 3 – 7.

4.1 The detailed magnetometry survey located a number of geophysical anomalies across the site. These can be generally classified as positive linear anomalies associated with agricultural activity, positive linear anomalies of possible geological or pedological (soil) origin, a negative linear anomaly caused by a track way and finally, strong discrete positive anomalies with negative returns caused by near surface ferrous objects.

4.2 The present track running northeast to southwest across the centre of the survey area appears as a negative linear response with two large discrete positive anomalies with negative returns situated along its length likely to indicate near surface ferrous objects.

4.3 A spread of strong discrete positive anomalies with negative returns has been identified north of the track running approximately parallel with it. This is likely to represent near surface ferrous objects.

4.4 A number of discrete positive linear anomalies running parallel to each other have been identified in the southwest corner of the survey, these are likely to be caused by agricultural activity. Similar features have been identified north of the track way, running approximately parallel to the track.

4.5 Three areas of positive linear anomalies have been identified across the site, an area in the north of the survey, and two linear areas south of the track. These anomalies are possibly caused by local geology or soil variation; aerial photographs of the area appear to support this.

5 CONCLUSION

The detailed magnetometry survey located a number of geophysical anomalies across the site. Linear anomalies likely to be caused by agricultural activity have been identified north and south of the survey area. A number of possible ferrous objects have been identified across the survey area with a concentrated spread north of the track. An area of positive linear anomalies to the north of the site and two linear shaped areas to the south of the site have been identified, the origin of these anomalies is uncertain but maybe associated with geological or soil variation.