Archaeological Services & Consultancy Ltd

GEOPHYSICAL SURVEY:
MONKSMOOR FARM
DAVENTRY
NORTHAMPTONSHIRE

on behalf of Capel House Property Trust Ltd

Alastair Hancock BSc PgDip

October 2005

ASC: 712/DMF/2

Letchworth House
Chesney Wold, Bleak Hall,
Milton Keynes MK6 1NE
Tel: 01908 608989 Fax: 01908 605700
Email: office@archaeological-services.co.uk
Website: www.archaeological-services.co.uk

Site Data

ASC project code:	DMF	*ASC Project No:*	712
County:	Northamptonshire		
Village/Town:	Daventry		
Civil Parish:	Daventry		
NGR (to6 figs):	SP 581 645 (centre)		
Present use:	Agricultural		
Planning proposal:	*c*.1000 new dwellings		
Local Planning Authority:	Northamptonshire County Council		
Date of fieldwork:	September 2005		
Client:	Capel House Property Trust Ltd c/o Kember Loudon Williams Ltd Ridgers Barn Bunny Lane Eridge Tunbridge Wells Kent TN3 9HA		
Contact name:	Bob Meek		
Telephone		*Fax:*	

Internal Quality Check

Primary Author:	A. Hancock	*Date:*	12th October 2005
Edited/Checked By:		*Date:*	
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Edited/Checked By:		*Date:*	

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Summary

Geophysical survey was undertaken on 49 hectares of land northeast of Daventry, Northamptonshire. The survey area was magnetically scanned and detailed geophysical (fluxgate gradiometer) survey of 7.5 hectares was subsequently carried out to examine defined targets.

The detailed survey defines the location of a small settlement, of probable late Iron Age or Romano-British date, which is located immediately northwest of Middlemoor Farm. Other magnetic anomalies indicate that cut and infilled features are present in the southeast of survey area although these may be contemporary with the construction of Daventry Reservoir.

1. Introduction

1.1 *General*

Archaeological Services and Consultancy Ltd (ASC) was commissioned by *Kember Loudon Williams Ltd,* on behalf of *Capel House Property Trust Ltd*, to carry out a programme of geophysical (fluxgate gradiometer) survey on a 49 hectare parcel of arable land. The survey was undertaken to aid definition of the archaeological potential of the site as part of pre-planning assessment in advance of proposed housing development. (NGR SP 581 645, site centre: Fig. 1).

This report details the results of the geophysical survey, which involved magnetic scanning of 49 hectares, and subsequent detailed survey of 7.5 hectares to determine the cause of identified magnetic anomalies and confirm negative results (Fig. 2). Fieldwork commenced on the 19th September 2005 and was completed on the 30th September. The weather was fine during the majority of the fieldwork although it was overcast with intermittent showers during the final two days. Groundcover at the time of survey was short grass and stubble. No problems were encountered during the fieldwork.

1.2 *Location & Description*

The proposal site covered a total area of *ca*. 49 Ha and is situated south of the village of Welton, which is located to the north east of the town of Daventry. Daventry Reservoir bounds the survey area at the south and the Grand Union Canal defines its northern extent. The eastern side of the site is delimited by a canalised stream which acts as the outflow of the reservoir and also defines the Norton Civil Parish boundary. The B5385 Welton Road and part of the A425 forms the western edge of the survey area. The site is internally divided into separate fields by a number of hedgerows.

1.3 *Existing Buildings & Access*

Main access to the site is via an un-metalled track off the Welton Road. The buildings of Monksmoor Farm are situated at the end of this track, *c*.250m from the western boundary and *c*.100m from the northern boundary of the site.

1.4 *Geology & Topography*

The soils of the site are mainly of the Wickham 2 Association (Soil Survey, 1983, 711f), described as slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils. The underlying geology consists of drift over Jurassic and Cretaceous clay or mudstone. Soils of the Oxpasture Association (Soil Survey, 1983, 572h) exist at the south of the site and are described as fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging. The underlying geology in this area consists of drift over Jurassic and Cretaceous clay shale. The site topography gently undulates, although a general trend of western higher ground descending to a lower eastern floodplain is evident.

1.5 *Planning Constraints*

The majority of the site is not within a conservation area, although the Grand Union Canal Conservation Area may encroach its northern boundary, and the site does not fall within an area designated by *Daventry District Council* as an Area of Archaeological Significance. There are no listed buildings present on the site and no scheduled monuments are located within the proposal site or the immediate surrounding area.

2. Archaeological and Historical Background

The local and regional settings of archaeological sites are factors that are taken into consideration when assessing the planning implications of development proposals. The study area lies within an area of archaeological and historical interest and the site has the potential to reveal evidence of a range of periods. The following sections summarise the findings of an archaeological desk-based assessment (Rouse and Hunn, 2005).

2.1 *Early Prehistoric (before 600BC)*

No early prehistoric remains are known from the site or its immediate environs.

2.2 *Iron Age (600BC-AD43)*

No Iron Age remains have been recovered from the site. An Iron Age hillfort known as *Borough Hill* (RCHM, 1981, **3**, fig 54) lies *c*.1.5km to the south east of the site.

2.3 *Roman (AD43-c.450)*

There is no evidence of Roman activity within the proposal site. Roman remains have been identified at Borough Hill (*ibid*), and a farmstead of this period has been excavated near Middlemore Farm (Wilson, 2004), *c*.1.5km to the west of the site.

2.4 *Saxon (c.450-1066)*

No Saxon remains have been recovered from the site. Daventry was extant at the time of the Domesday Survey and was valued at £3. It is probable that the town was founded during this period.

2.5 *Medieval (1066-1500)*

2.5.1 The name '*Monksmoor'* is said to have originated from the monks of Daventry Priory, who owned the site during this period, with the '*moor'* suffix being added in reference to the quality of the land (Gover *et al*, 1975, 20).

2.5.2 Extensive traces of ridge and furrow have been recorded in the Daventry area and the site lay within open fields to the north east of the medieval centre of Daventry (Brown, 1991, fig. 16). The *Daventry Extensive Urban Survey* records the existence of a windmill and watermill at locations now subsumed by Daventry Reservoir (Ballinger *et al*, 1999, 3.1.2.5).

2.6 *Post-Medieval (1500-1900)*

2.6.1 The site remained in agricultural use throughout the post medieval period and was inclosed in 1803. The Grand Junction Canal was constructed by William Jessop between 1793 and 1815 and forms the northern boundary of the site. The stretch of the canal within the study area includes the Braunston Tunnel, opened in June 1796 (Faulkner 1993, 95).

2.6.2 Daventry Reservoir was opened in 1804 and its dam forms the southern boundary of the site. It was built to supplement the two existing reservoirs in the area; Braunston Reservoir and Drayton, or Daventry Old, Reservoir (*ibid*).

It could originally hold 362,000,000 gallons when full, has an area of almost 100 acres and is fed by four streams running down the valley (*ibid*).

2.6.3 The farm buildings on the site were in existence by the time the first Ordnance survey map was published in the 1880s. This map also shows the existence of a rifle range in the two central fields that run parallel to the eastern boundary of the site.

2.7 *Modern (1900-present)*

2.7.1 The second edition Ordnance Survey map was published in 1901 and little had changed in the layout of the site. The rifle range was no longer labelled and a sand pit has been cut into one of the central fields, although this did not affect the field boundaries.

2.7.2 OS mapping from 1927 reveals that site layout had remained largely unchanged. A hydraulic ram was installed east of the farm buildings, the sand pit first recorded on the 1901 map had been expanded slightly, and a hedgerow has been removed approximately halfway up the western boundary of the site.

2.7.3 The existing track that serves as an access road is not present on the 1952 Ordnance Survey map and must therefore be a recent addition to the farm. The sand pit and hydraulic ram were still present at this time.

2.7.4 Modern Ordnance Survey mapping shows that the site layout has been simplified in recent years and many of the field boundaries removed. The sand pit is no longer in existence and the hydraulic ram has been removed, leaving a drain in its place.

2.8 *Comment*

The summarised evidence indicates that the proposed development area has unknown potential for discovery of prehistoric human activity. The proximity of the hillfort and Romano-British sites suggests that the probability of discovery of Iron Age and Romano-British archaeology may be regarded as moderate. It is likely that the majority of the area remained in agricultural use during the medieval and post medieval periods and this suggests that the archaeological potential for these periods may be regarded as limited.

3. Aims, Methodology and Report Presentation

3.1 The detailed aims and methods of the geophysical survey were set out in the project design (Hancock, 2005). In summary; the objectives of the survey were to determine the location and character of any geophysical anomalies caused by archaeological features thus enabling effective management of the archaeological resource and/or effective mitigation of development impact .

3.2 The survey, report and archive format follow the recommendations outlined in English Heritage guidelines (David 1995) and AHDS guidelines (Schmidt, 2001) as a minimum standard. All figures reproduced from Ordnance Survey mapping are done so with the permission of the controller of Her Majesty's Stationery Office, © Crown copyright.

3.3 A general site location plan incorporating the 1:25000 Ordnance Survey mapping is presented in Figure 1. Figure 2 is a site location plan (1:5000) showing the boundaries of the survey area plus the location of the detailed survey blocks. The processed greyscale gradiometer data and accompanying interpretations are presented in Figures 3 to 16 at a scale of 1:1000. XY trace plots (1:500) of the unprocessed "raw" gradiometer data are presented in Appendix 4.

3.4 Comprehensive technical details on the underlying principles of magnetic survey, the equipment used and general geophysical survey methodology are given in Appendix 1. Details on data processing and display are also given in Appendix 1. Survey location information is provided in Appendix 2 and the composition of the archive is described in Appendix 3.

The figures in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of ASC staff.

4. Magnetic Scanning

4.1 The survey area was magnetically scanned using Geoscan FM36 and Bartington Grad 601-1 fluxgate-gradiometers during the week commencing 12th September. Adjacent fields were scanned along transects spaced 12m apart in opposing directions in order to minimise the possibility of missing extensive linear magnetic anomalies.

4.2 "Iron spike' responses (Appendix I) were identified distributed across all of the survey area. These are indicative of ferrous material in the topsoil or subsoil and, although archaeological artefacts may cause them, they are more often caused by modern material. Unless there is strong supporting evidence to the contrary, for example if they are located close to areas of archaeological activity, they are assumed to be non-archaeological in origin.

4.3 The location of a number of modern ferrous pipelines was noted while scanning the northern half of the survey area (Fig 2).

4.4 A *c.*5m wide area of negative magnetic background was observed lying adjacent to, and running parallel with the canal. The negative readings suggest a change in the underlying geology or, more probably, that dumping of material may have occurred during construction of the canal.

4.4 The magnetic background fluctuated by ±4nT across the site although the fluctuation was most marked on the floodplain at the sites eastern margin and over a former sand extraction pit located between detailed survey blocks 11 and 16.

4.6 The majority of the survey area was devoid of magnetic anomalies suggesting the presence of subsurface archaeological features although anomalies of this type were observed northwest of Monksmoor Farm and in the southwestern corner of the site. Detailed survey blocks were located over identified targets and in "blank" areas to test scanning results.

5. Detailed Survey: Results and Discussion

Detailed magnetometer survey was undertaken in seventeen blocks (Fig. 2). Isolated dipolar anomalies ("iron spikes" – Appendix 1) are evident in all survey blocks. These "iron spike" anomalies are usually indicative of ferrous objects or other magnetic material in the topsoil/subsoil and are often caused by modern cultural debris. Archaeological artefacts may cause them and significant clusters associated with other substantiating evidence may be included in the following discussion.

5.1 Blocks 1, 2 and 3 (Figs 3-4)

Block 1 was positioned to test negative scanning results. Block 2 was located over possible archaeological magnetic anomalies and Block 3 was a supplementary block surveyed after it was determined that the anomalies in Block 2 were caused by archaeological features.

Block 1 areas of strongly dipolar magnetic disturbance at the western and northern margins of the block are caused by proximity to modern subsurface ferrous pipelines. Parallel north-south aligned weakly positive linear trends result from the presence of ploughed out ridge and furrow. A single discrete area of magnetic enhancement probably originates from relatively modern activity although an archaeological origin is not discounted.

Block 2 a north south aligned dipolar linear anomaly, slightly offset from the centre of the block, locates a ferrous pipeline. Two large areas of magnetic disturbance are visible at the southwest of the block, these are caused by the footing material of a wooden post of an overhead powerline and proximity to the route of a ferrous pipeline. Magnetic anomalies suggesting the presence of archaeological features are absent.

Block 3 six curvilinear magnetic anomalies (A) identify four roundhouses and two small stock enclosures. Discrete areas of magnetic enhancement located in the same area may be caused by archaeological features, although proximity to the modern farm buildings suggests that some or all could be caused by modern agricultural activity. The tentatively identified weak positive trend (B) appears to respect the position of one of the roundhouses and may locate a shallow ditch temporally associated with the structures. However, the weakness of this magnetic anomalies could suggest that it results from more ephemeral modern agricultural activity.

The tentatively identified positive linear trend and areas of magnetic enhancement identified at C could be caused by archaeological features although their character and proximity to a ferrous pipeline slightly north of the block suggests that a modern origin is equally probable.

5.2 Blocks 4, 5 and 6 (Figs 5-6)

Blocks 4 and 5 were located to test negative scanning results. Block 6 was a supplementary block positioned to determine whether archaeological features identified in Block 2 extended to the south.

Block 4 magnetic disturbance present on the western boundary of the block is caused by accumulation of modern ferrous detritus in the adjacent field boundary or by proximity of the block to a subsurface ferrous pipe. Parallel north-south aligned positive linear trends are caused by ploughed out ridge and furrow

Block 5 a large area of dipolar magnetic disturbance lies next to the eastern boundary of the block and defines the location of a subsurface ferrous pipe. Parallel north-south aligned weakly positive linear trends result from ploughed out ridge and furrow. Areas of weak magnetic enhancement are identified in the southern half of the block. An archaeological origin for these anomalies is not discounted although their character and the presence of pipelines a few metres south and east of the block suggests that more probable origins are modern intrusive activity or geological variability

Block 6 magnetic disturbance along the western boundary of the block is caused by accumulation of ferrous detritus and the use of ferrous material in the adjacent field boundary. The area of magnetic disturbance at the northeast of the block is caused by the modern barn located a few metres east. Two discrete areas of magnetic disturbance result from the presence of modern ferrous detritus. No archaeological anomalies are identified.

5.3 Blocks 7 and 8 (Figs 7-8)

The blocks were surveyed to test negative scanning results.

Block 7 a discrete area of magnetic enhancement is identified which could identify the location of an archaeological feature although the form of the anomaly, its isolation, its position close to the farm buildings and the field entrance indicates that modern agricultural practice, modern intrusive activity, or geological variability are more probable explanations. A discrete area of magnetic disturbance close to the aforementioned anomaly defines the position of a piece of modern ferrous detritus.

Block 8 discrete areas of dipolar magnetic disturbance locate pieces of modern ferrous detritus. Anomalies suggesting the presence of archaeological features are not identified.

5.4 Blocks 9 and 10 (Figs 9-10)

The blocks were located over areas of magnetic variability on the floodplain at the east of the survey area.

Both blocks contain spatially expansive discrete areas of magnetic enhancement which probably define areas of geological variability and/or the position of a palaeochannel. An archaeological origin for some of these anomalies cannot be discounted but is deemed unlikely

5.5 Blocks 11 and 12 (Figs 11-12)

Bock 11 was randomly located to test a negative area noted during scanning. Block 12 was positioned aver a disturbed magnetic background

Block 11 other than ferrous "spikes" no anomalies are identified and the negative results of scanning are confirmed.

Block 12 areas of magnetic enhancement likely identify modern agricultural practice, modern intrusive activity, or geological variability. An archaeological origin for some of these anomalies is not discounted but is deemed unlikely

5.6 Blocks 13, 14 and 15 (Figs 13-14)

Block 13 was randomly positioned to test negative scanning result. Blocks 14 and 15 were located over targets identified during scanning.

Block 13 discrete areas of magnetic disturbance identify the locations of pieces of modern ferrous detritus. A discrete area of magnetic enhancement may identify the position of a cut and infilled pit although its form and isolation indicate that modern agricultural practice, modern intrusive activity, or geological variability are more probable explanations

Block 14 contains magnetic anomalies caused by cut and infilled features. Anomaly C is intermittent and tentatively identified in some places, yet it may define the boundary ditch of a small sub-square enclosure. Anomaly D appears to denote the position of an irregular boundary ditch; a positive linear trend (Anomaly E) may form a continuation of this feature. Discrete areas of magnetic enhancement surrounding these anomalies could be caused by cut and infilled discrete features temporally associated with C and D.

A weak positive linear trend (F) is tentatively identified, although it is unclear whether it defines the position of a shallow or ploughed out cut and infilled feature contemporary with C and D, or is caused by more ephemeral agricultural activity. The positive and negative magnetic anomalies identified at G could be evidence of an infilled natural drainage feature although they could also result from the presence of ditches flanking a metalled or compacted surface.

Block 15 the southeastern part of the block contains a concentration of areas of magnetic enhancement which suggest that relatively modern intrusive activity has occurred, or that a concentration of more magnetically susceptible material is present within the drift geology. A discrete area of magnetic disturbance, which locates a piece of ferrous detritus, is identified at the end of a linear area of negative magnetic data of unknown origin. Two further areas of negative magnetic data are also noted. A definitive interpretation of the discussed anomalies is impossible although activity associated with construction of the nearby dam is suggested.

5.7 Blocks 16 and 17 (Figs 13-14)

Block 16 was positioned over areas of magnetic enhancement noted during scanning and Block 17 was randomly located to test negative scanning results.

Block 16 an area of magnetic disturbance at the northeastern corner of the block is caused by proximity to a subsurface ferrous pipeline. Discrete areas of magnetic enhancement are present toward the northwest of the block. A definitive interpretation

of the origin of these anomalies is difficult. They do not form any distinctive pattern and are located near the position of a disused sand extraction pit, facts that indicate that they are caused by relatively modern intrusive activity or geological variability. However, an archaeological origin cannot be discounted.

Block 17 discrete areas of magnetic disturbance east of the centre of the block are caused by pieces of modern ferrous detritus. Discrete areas of magnetic enhancement are evident distributed throughout the survey block; there is no distinctive patterning to these anomalies and it is thought probable that all result from geological variability or agricultural activity.

6. Conclusions

6.1 At least four modern ferrous pipelines were identified crossing the northern half of the survey area.

6.2 An area of negative magnetic background adjacent to and running parallel with the northern boundary of the survey area indicates that natural material with a lower magnetic susceptibility may have been dumped at this location, probably at the time of construction of the Grand Union Canal.

6.3 Magnetic anomalies located at the east of the survey area probably identify areas of enhancement resulting from geomorphological processes. These areas of variability may originate from the presence of igneous or metamorphic erratics within the underlying drift geology and/or deposition of material by a meandering river channel that has migrated across the floodplain during the Holocene.

6.3 The characteristic signature of ploughed out ridge and furrow is identified in detailed survey blocks located in the northwest of the survey area.

6.4 Cut and infilled features of uncertain date have been identified in survey Block 14 at the southwest of the survey area. The features could be archaeological although their form and location next to the B3585, Welton Road and close to the dam of Daventry Reservoir may indicate that they are contemporary with construction of the dam.

6.5 Curvilinear magnetic anomalies in survey Block 3 identify four roundhouses and two small stock enclosures located immediately northwest of the 19th century buildings of Monksmoor Farm. Extension of the survey block to determine the position of a contemporary enclosure ditch failed to find such a feature. Other detailed survey blocks immediately west and south were devoid of archaeological anomalies. The summarised evidence suggests that a small unenclosed settlement of late IA early RB date existed at this location.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

7. References

Standards & Specifications

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8. Acknowledgements

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Fieldwork
A Hancock BSc PgDip
N Crank BSc AIFA
N. Wilson HND AIFA

Report
A. Hancock

Graphics
A. Hancock

Figures (overleaf)

Appendix 1: Magnetic Survey: Technical Information

1. Magnetic Susceptibility and Soil Magnetism

1.1 Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed ***magnetic susceptibility***. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms. These effects are often observable by measuring the magnetic susceptibility of the topsoil, which can enable identification of areas where human occupation or settlement has occurred by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently fills features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

1.2 In general, it is a contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of the surrounding matrix, i.e topsoils, subsoils and rocks, into which these features have been cut that causes the most recognisable archaeological responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. Less magnetic material such as masonry or plastic service pipes that intrude into the topsoil may give a negative magnetic response relative to the background level.

1.3 An alternative method of enhancement to the magnetic properties of soil or archaeological features is through sustained heating. This can lead to the detection of features such as hearths, kilns or burnt areas through thermoremanent magnetism.

2. Types of Magnetic Anomaly

2.1 In the majority of instances anomalies are termed ***'positive'***. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as ***'negative'*** anomalies that, conversely, means that the response is negative relative to the mean magnetic background. Such negative anomalies are often very faint and are commonly caused by modern, non-ferrous, features such as plastic water pipes. Infilled natural features may also appear as negative anomalies on some geologies.

2.2 Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

2.3 It should be noted that anomalies that are interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

2.4 The types of response mentioned above can be divided into five main categories which are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. This type of anomaly is characterised by very strong, 'spiky' variations in the magnetic background. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. An agricultural origin, either ploughing or land drains is a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an X–Y trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic of an area of magnetic disturbance or of an 'iron spike' (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post holes or by kilns, with the latter often being characterised by a strong, positive double peak response. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

3. Methodology

3.1 Gradiometer Survey

There are two main methods of using the fluxgate gradiometer for commercial evaluations. The first of these is referred to as ***scanning*** and requires the operator to visually identify anomalous responses on the instrument display panel whilst covering the site in widely spaced traverses, typically 10-15m apart. The instrument logger is not used and there is therefore no data collection. Once anomalous responses are identified they are marked in the field with bamboo canes and approximately located on a base plan. This method is usually employed as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be subject to detailed survey. In favourable circumstances scanning may be used to map out the full extent of features located during a detailed survey.

The second method is referred to as ***detailed survey*** and employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0.5m intervals, on zig-zag traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation.

The Geoscan FM36 fluxgate gradiometer and ST1 sample trigger were used for the detailed gradiometer survey. Readings were taken, on the 0.1nT range, at 0.5m intervals on zig-zag traverses 1m apart within 20m by 20m square grids.

3.2 Data Processing and Presentation

The detailed gradiometer data has been presented in this report in X-Y trace and greyscale formats. The former option shows the 'raw' data with no processing other than grid biasing whilst in the latter the data has been selectively filtered to remove spurious errors such as striping effects and edge discontinuities caused by instrument drift and inconsistencies in survey technique caused by poor field conditions.

An X-Y plot presents the data logged on each traverse as a single line with each successive traverse incremented on the Y-axis to produce a 'stacked' plot. A hidden line algorithm has been employed to block out lines behind major 'spikes' and the data has been clipped at 5nT. The main advantage of this display option is that the full range of data can be viewed, dependent on the clip, so that the 'shape' of individual anomalies can be discerned and potentially archaeological anomalies differentiated from 'iron spikes'. Geoplot v3 was used to create the X-Y trace plots.

Geoplot v3 was used to process the data and produce the greyscale images and XY trace plots. All greyscale plots are displayed using a linear incremental scale.

Appendix 2: Survey Location Information

1. The survey blocks were established using a Trimble TS315 total station theodolite. Survey block points at 60m intervals were set out with the total station theodolite and points at 20m intervals were set out as required using 100m tapes.

2. The survey grids were "tied in" using a GPS capable of real time accuracy of < 3m. and superimposed onto an Ordnance Survey digital map base.

ASC Ltd cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party or for the removal of any of the survey reference points.

Appendix 3: Geophysical Archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data; plot meshes and composites, report text (Word 2000), and graphics files (CorelDraw12 and AutoCAD 2000) files.
- a full copy of the report

At present the archive is held by ASC Ltd although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (*i.e*. available for consultation in the relevant Sites and Monument Record Office).

Appendix 4: XY Trace Plots of Raw Gradiometer Data (1:500)