

LAND NORTH SIDE OF LADY EDITH'S DRIVE,  
THROXENBY, SCARBOROUGH,  
NORTH YORKSHIRE

ARCHAEOLOGICAL FIELD EVALUATION

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## EXECUTIVE SUMMARY

Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by S Harrison Construction Ltd to undertake an archaeological field evaluation on land on the north side of Lady Edith's Drive in Throxenby, on the west side of Scarborough in North Yorkshire (NGR TA0158880 centred). This project, which followed on from an earlier desk-based assessment, involved an initial detailed walkover survey and a geophysical survey.

The work was required to provide additional information with which to assess the archaeological implications of a proposed hospital development (planning application no 02/02203/FL).

The previous desk-top assessment had established that there were three archaeological sites within the proposed development area, namely a number of former field boundaries, a possible trackway, and the remains of a modern pond; only the latter could be positively confirmed by visual inspection due to the dense vegetation which then occupied the site. The three archaeological sites were all considered to be of a local grade of importance, and the proposed development site as a whole had a low archaeological potential.

Nevertheless, there was a limited possibility for as yet undiscovered remains within the site. Previous work on the north side of Throxenby Hall had uncovered unsuspected prehistoric and other deposits, and the east side of the proposed development site may contain evidence associated with medieval crofts which fronted onto Throxenby Lane. In addition, the position of any precursor to the existing Throxenby Hall has not yet been determined. The archaeological field evaluation was therefore commissioned to help clarify these issues.

The ditches of some of the former field boundaries were identified by the non-intrusive survey work, either as a shallow ephemeral earthwork or short discontinuous geophysical anomalies. No evidence for any buried deposits associated with the medieval crofts fronting Throxenby Lane were noted, and there were no indications of any structures or features relating to the existing Throxenby Hall or its predecessors. There were also no underlying anomalies to suggest the presence of former ridge and furrow cultivation, confirming the previous conclusions that the proposed development site is likely to have always been in pasture. However, a small area of disturbed ground containing two depressions was noted in the south-east corner of the site; these earthworks did not appear to be archaeologically significant, and they might relate to the positions of former trees. A zone of increased magnetic enhancement was also recorded towards the north centre part of the site, although this is thought, on balance, to be the result of modern disturbance or dumping.

The results of the non-intrusive survey work have served to confirm the results of the previous desk-top assessment, namely that the identified archaeological sites are all of a "local" grade of importance, and that the development site as a whole has a low archaeological potential.

No further intrusive pre-development archaeological survey work is considered to be necessary on the site, but it is recommended that a targeted "recording brief" is undertaken during the initial stages of development, to allow for the appropriate recording of any archaeological features or deposits that might be associated with the identified sites.

# 1 INTRODUCTION

## **Reasons and Circumstances of the Project**

- 1.1 In August 2003, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by S Harrison Construction Ltd to undertake an archaeological field evaluation on land on the north side of Lady Edith's Drive in Throxenby, on the west side of Scarborough in North Yorkshire (NGR TA0158880 centred).
- 1.2 This evaluation followed on from an earlier desk-top assessment (Dennison 2003), and had been recommended to provide further information on the archaeological potential of a proposed hospital development which was the subject of a planning application submitted to Scarborough Borough Council (application no 02/02203/FL). The project involved an initial detailed walkover survey and a geophysical survey, which would be followed by other intrusive fieldwork as appropriate; in the event, no intrusive work was recommended (see below). The work was funded by the proposed developers of the site, S Harrison Construction Ltd.

## **Site Location and Description**

- 1.3 The proposed development site (hereafter termed the study area) covers an area of 1.62 hectare on the south-east side of Throxenby Hall, in Throxenby, which itself is located c.3km west of Scarborough town centre (at NGR TA0158880 centred) (see figure 1).
- 1.4 The site is bounded to the north by the grounds of Throxenby Hall, to the south by a road called Lady Edith's Drive, to the east by residential housing, and to the west by pasture land (see figure 2). The site lies at c.70m AOD and has a south-facing aspect. The underlying geology is middle Jurassic oolitic sandstones and shales, with the local deposits known as the Scalby Formation (Brumhead 1979, 113-114). These rocks are overlain by a glacial till, and the soils are a typical stagnogley, clay-enriched, seasonally waterlogged, slowly permeable soil of the Salop Association (Soil Survey of England and Wales 1983).

## **Summary of Previous Work**

- 1.5 The previous archaeological desk-top assessment report, produced in July 2003, provided background archaeological and historical information, an account of the historical development of the study area, details of three archaeological sites noted within it, and an assessment of the development impact and recommendations for mitigation (Dennison 2003).
- 1.6 The three sites identified within the study area comprised a number of former field boundaries (Site 1), a possible trackway (Site 2), and the remains of a pond (Site 3) (see below). However, earthwork recognition at the time of the desk-top work was severely hampered by long grass and other vegetation, and only the pond could be positively identified in the field. The desk-top assessment concluded that the three identified sites were all of a "local" grade of importance, and that the study area as a whole was of low archaeological potential (Dennison 2003, 13-14).
- 1.7 Nevertheless, there was a limited possibility for as yet undiscovered archaeological remains within the study area. Previous work on the north side of Throxenby Hall had uncovered unsuspected prehistoric and other deposits

(information provided by G Falkingham, NYCC) and the eastern side of the current study area may contain evidence associated with the backs of medieval crofts which fronted onto Throxenby Lane. In addition, the position of any precursor to the existing Throxenby Hall had not yet been determined. As a result, a programme of pre-development recording, initially comprising a detailed site visit or walkover survey and a geophysical survey, and followed by other work as appropriate, was recommended to help to clarify the potential of the proposed development site.

### **Aims and Objectives**

- 1.8 The aims of the project were to:
- enhance the existing data for the study area through a programme of non-intrusive archaeological survey, and to gather sufficient information to identify and establish the extent, nature, character, condition, quality and probable date of any archaeological and historic features within the proposed development site (the study area), as far as possible given the constraints of the new survey work;
  - consider the current development proposals, assess the implications of these proposals on any identified archaeological and historic resource, and to provide recommendations to mitigate these implications as appropriate.

### **Survey Methodologies**

- 1.9 As noted above, the requirement for the non-intrusive survey work arose from mitigation recommendations made in the previous archaeological desk-top assessment report (Dennison 2003, 14-15). The methodologies for this work were outlined in this document, and were discussed and agreed with the Client and archaeological staff at North Yorkshire County Council; no formal specifications or briefs were produced. The survey work was undertaken after the long grass and dense vegetation over the site had been cut.

#### *Detailed walkover survey*

- 1.10 A detailed walkover survey of the study area was undertaken to determine the extent of survival of any earthworks or other items of interest, to note the location, nature, extent and condition of any additional recorded and unrecorded archaeological sites, and to identify any concentrations of material which might serve as an indication of sub-surface archaeological features. The survey was made on the 9th September 2003, in warm and sunny conditions.

#### *Geophysical survey*

- 1.11 The geophysical survey was undertaken on 1st September 2003, using a fluxgate gradiometer. A 100% sample of the site was achieved, apart from small areas of remaining dense vegetation which were unable to be penetrated. The survey methodology followed established English Heritage guidelines (David 1995).

### **Reporting**

- 1.12 The results obtained from the two survey techniques have been combined into a single report and are detailed below. A written record of the earthworks has

been produced from the observations made on site, and existing descriptions contained within the earlier assessment report are also repeated here for completeness. The information arising from the geophysical survey has been extracted from the specialist sub-contractor's report (ASWYAS 2003), which also appears in an unaltered form in Appendix 1.

### **Archive**

- 1.13 An archive of material relating to the non-intrusive survey work has been prepared for deposition with the Scarborough Museum. If further archaeological investigations are carried out on the site, it is recommended that any archive from this work is combined with the existing material and deposited with the same organisation.

## **2 THE STUDY AREA**

### **Introduction**

- 2.1 The previous archaeological desk-top assessment report provided an account of the historical development of the study area, as revealed by the historic and cartographic sources, as well as details of the three archaeological sites identified within it (Dennison 2003, 9-12). The following background information is summarised from this report, to provide a context for the non-intrusive survey work.

### **Historical Development**

- 2.2 The first detailed plan of the study area is the 1771 enclosure map, which shows the area to the south of Throxenby Hall to comprise several roughly rectangular fields, located between Throxenby Lane and the Common. The Hall and an east-west aligned building lying to the north are depicted, as well as three buildings on the east side of Throxenby Lane with plots of land extending back (east) from the road. An enclosure on the west side of the lane might also represent the boundary of former medieval plots (see below). Lady Edith's Drive does not appear to have been constructed at this time.
- 2.3 The newly enclosed fields were created by the Enclosure Award of November 1777, and the resulting field pattern is shown on a plan of 1833. This later plan shows that the field boundaries to the south of the Hall had been rationalised, although the underlying pattern remains, and that new fields had been created from the Common further to the north and west (Dennison 2003, figure 3). The schedule accompanying the 1833 plan shows that the study area lay within the Hall landholding, which covered c.85 acres; none of the associated field names are immediately significant although the field closest to the east side of Throxenby Lane was called "Garth" which might indicate the presence of former medieval enclosures.
- 2.4 The close comparison between the historic and current maps and plans allows the development of the study area to be traced. Figure 3 provides a simple map regression, as far as is possible given the constraints of the original mapping.
- 2.5 The rectangular enclosure running to the south of the Hall as depicted on the 1771 enclosure map corresponds to the west side of the present study area, while a lynchet in the pasture field to the west appears to correspond to an

angled field boundary. The western side of a second enclosure located on the Throxenby Lane frontage also extends into the east side of the study area.

- 2.6 By 1833 the western enclosure had been removed, to produce a large field named as “Hall Garths” (plot 61); the north side of this single field lies outside the study area. There has also been some sub-division of the eastern enclosure, into two plots on the road frontage, now both containing buildings (plots 58 and 59), with a larger field to the west named as “Garth” (plot 60). The larger of the two buildings depicted on the map corresponds to “Lodge Cottage”, a Grade II Listed Building of Special Architectural or Historic Interest; both these plots lie outside the study area.
- 2.7 The Ordnance Survey 1854 1st edition 6” map shows relatively little change in the study area, apart from a new north-south field boundary dividing the large single “Hall Garths” field. This boundary had again been removed by the 1890-91 edition, although the rest are retained. The 1854 map shows that there has been substantial development along the west side of Throxenby Lane, and the 1890 map shows the full extent of the gardens adjoining Throxenby Hall. Lady Edith’s Drive is first depicted on the 1890-91 map.
- 2.8 No other changes to the field boundaries are depicted on the subsequent Ordnance Survey 1895 and 1912 maps. However, by 1928 a new boundary has been introduced into the northern edge of the large “Hall Garths” field, which partly corresponds to the present northern edge of the study area; the function of this new boundary is unclear, although it appears to allow access into a new rectangular enclosure at its east end.
- 2.9 The most significant changes occur between 1928 and 1970. The range of buildings built between 1833 and 1854 along the west side of Throxenby Lane have mostly been demolished, to make way for new housing set slightly further back from the street frontage. The earlier buildings on the roadside, Lodge Cottage and The Lodge, are the older properties, and these lie towards the southern end of the row. The west side of the enclosure behind these houses has also been removed, to be replaced by another boundary on a similar alignment to the east which now represents the east side of the study area. A new tennis court has also been built within the former gardens at the Hall, leading to a rationalisation of the surrounding boundaries, and the Hall has undergone significant enlargement; this activity probably dates to the 1930s or 1940s when the Hall became a residential hotel and subsequently a reform school (Dennison 2002, 13).
- 2.10 From figure 3, it can be seen that the boundaries forming the west and south sides of the study area represent historic pre-18th century land divisions, while the majority of the northern boundary was created at the turn of the 20th century. The east side of the study area is a modern feature, created after the 1930s; the small strip of land on its east side has since been incorporated into the gardens of the houses on the lane frontage.

### **Archaeological Sites**

- 2.11 Only three archaeological sites or features were identified by the desk-top assessment within the study area (see figure 4) although, as noted above, the long grass in the field prevented positive earthwork recognition.

### *Site 1: Former field boundaries*

- 2.12 As can be seen from figure 3, a number of former field boundaries crossed the study area, but these were not all contemporary. The oldest of the boundaries lies in the western side of the area, and this forms part of an enclosure shown on the 1777 enclosure map to the south of the Hall (Site 1a). This boundary had been removed by 1833 when a larger field called "Hall Garths" had been created. A former boundary of a similar, and possibly medieval, date lies in the east part of the study area, representing the back line of an enclosure located on the west side of Throxenby Lane (Site 1b); a comparison of the historic maps shows that this boundary was removed after 1930.
- 2.13 Another north-south field boundary (Site 1c) formerly divided the study area into two approximate halves, although this feature is only depicted on the Ordnance Survey 1854 6" map. The final boundary (Site 1d) has a right-angled alignment on the south side of the former tennis court, which was created around the turn of the 20th century and which had been removed by the 1970s.
- 2.14 None of these former field boundaries were positively identified at the time of the site visit undertaken as part of the desk-top assessment, although a part of the former boundary on the east side of the study area (Site 1b) was apparent as a short section of tree line.

### *Site 2: Possible trackway, west side of study area*

- 2.15 An illustration produced by Rimington (1961, 9) shows a number of earthworks adjacent to the study area, mostly representing elements of the deserted village of Hatterboard, which were recorded from an aerial photograph taken in 1953. Included in this figure is a "trackway" which enters the study area from the north-west. The alignment of this trackway might correspond with a field boundary shown on the west side of the study area on the 1771 and 1833 maps, but not thereafter (see figure 3). It is also possible that this trackway and/or boundary corresponds with the prominent lynchet visible in the pasture field to the west of the study area. However, no sign of the trackway was visible within the study area at the time of the site visit undertaken as part of the desk-top assessment.

### *Site 3: Pond, north-east corner of study area*

- 2.16 A sub-rectangular pond, measuring c.18m by c.10m, is shown on the modern Ordnance Survey map in the north-east corner of the study area (see figure 2). It is not shown on any previous editions, and so is presumably a modern feature. The pond still survives, although is rather overgrown. Its function is unclear, and it may simply have been dug to create a wildlife habitat.

## **Conclusions**

- 2.17 The previous desk-top assessment established that the medieval and post-medieval village of Throxenby appears always to have been small, compared to most of the other neighbouring settlements, and it probably suffered some decline during the early post-medieval period. It is likely that the settlement would have been strung out along either side of the southern part of Throxenby Lane, to the south of the Moor Lane junction as far as the unnamed watercourse which forms the township boundary. A manor house is also mentioned in 1644-45, and the fact that it had five hearths in 1673 implies that it was a substantial structure. However, the existing Hall appears, from external evidence, to be late

18th or early 19th century in date but it is possible that the remains of an earlier structure lie embedded within, underneath or adjacent to the present building.

- 2.18 In the 19th century, the study area was mostly formed by a single field, called "Hall Garths" in 1833. This, and its predecessor shown on the 1771 enclosure map, was probably a paddock or enclosure associated with Hall, and it is likely to have always been in pasture. The arrangement of enclosures in and beyond the east side of the study area mirrors the situation recorded on the High Farm development site to the north (Dennison 2002) and in the deserted village of Hatterboard to the south (Rimington 1961), namely several small house plots (plots 58 and 59 on the 1833 map) located on the street frontage, with a larger enclosure (plot 60) behind them to the west (see figure 3). This pattern may be associated with a medieval "croft and toft" system, where individually-held plots of land (crofts) would have extended back from the rear of the houses (tofts) on the street frontage; these crofts would probably have had a variety of uses, but are most likely to have been small agricultural plots.

### **3 RESULTS OF NON-INTRUSIVE SURVEY WORK**

#### **Detailed Walkover Survey**

- 3.1 Although the long grass and other vegetation within the study area had been cut prior to the detailed walkover survey being undertaken, most of the former field boundaries noted by the previous desk-top assessment were not visible as earthworks (Site 1). However, a very slight and spread ditch, measuring c.5m across and c.0.2m deep, could just be seen running north-south through the eastern part of the field, and this appears to correspond to the potentially medieval boundary which had been removed after 1930 (Site 1b on figure 4).
- 3.2 There was also no evidence for the possible trackway (Site 2) which had been noted from other sources. The lynchet in the adjoining field to the west has a more east-west alignment than the trackway as depicted by Rimington (1961, 9), and the two do not appear to be connected.
- 3.3 The modern pond (Site 3), as previously reported, lies in the north-east corner of the study area. It was heavily overgrown, and no new information was collected, over and above that recorded by the earlier desk-top assessment.
- 3.4 However, the detailed walkover survey did reveal two shallow sub-circular depressions located towards the south-east corner of the site (Site 4 on figure 4). These both measured c.2m in diameter and c.0.3m deep, and they coincided with a slightly larger area of disturbed ground. It was unclear what these depressions were, but they could represent the position of former trees; they did not appear to be archaeologically significant earthworks.

#### **Geophysical Survey**

- 3.5 As noted above, the unaltered specialist geophysical survey report is included as Appendix 1 to this document. This appendix includes several depictions of the geophysical survey data, while the interpretation of the results is also reproduced here as figure 5.
- 3.6 In summary, the survey revealed numerous "iron spike"-type responses across all parts of the study area, which probably reflect ferrous debris and other rubbish contained within the topsoil or subsoil which may result from manuring and/or fly-

tipping. However, a number of other short, discontinuous linear anomalies may represent some of the former field boundaries recorded by the desk-top assessment; geophysical anomalies B, C and D on figure 5 may relate to boundaries 1d, 1c and 1b respectively. A fourth anomaly (E on figure 5) is considered to be a modern feature.

- 3.7 The geophysical survey also recorded an area of increased magnetic enhancement towards the north centre part of the study area (A on figure 5). The interpretation of this feature is unclear, and it may have an archaeological origin although in the absence of any other information, it is more likely to be the result of modern ground disturbance or localised debris/dumping. No obvious surface features were visible in this area at the time of the detailed walkover survey.

### **Conclusions**

- 3.8 The combined results of the non-intrusive archaeological survey work have helped to clarify some of the conclusions presented in the previous desk-top assessment report. No obvious earthwork features were identified within the study area by the detailed walkover survey, and the geophysical survey did not detect any significant buried remains.
- 3.9 The ditches of some of the former field boundaries were identified, either as a shallow ephemeral earthwork or short discontinuous geophysical anomalies. This implies that the banks forming part of the boundaries had been physically removed in the past, rather than having been simply abandoned, or that the field had been ploughed and/or levelled in more recent times. No evidence for any buried deposits associated with the back ends of the presumed medieval crofts fronting Throxenby Lane were noted in the east part of the study area, and there were no indications of any structures or features relating to the existing Throxenby Hall or its predecessors. More interestingly, there were no underlying anomalies to suggest the presence of former ridge and furrow cultivation, confirming the previous conclusions that the study area is likely to have always been in pasture. The one area of possible archaeological interest is represented by a zone of increased magnetic enhancement towards the north centre part of the study area, although this too is thought, on balance, to be the result of modern disturbance or dumping.
- 3.10 Overall, the results of the non-intrusive survey work have served to confirm the results of the previous desk-top assessment, namely that the identified archaeological sites are all of a “local” grade of importance, and that the development site as a whole has a low archaeological potential.

## **4 ASSESSMENT OF DEVELOPMENT IMPACT AND RECOMMENDATIONS FOR MITIGATION**

### **Introduction**

- 4.1 For archaeological sites and monuments, the main impacts arising from development may be summarised as:
- possible disturbance and/or destruction of above or below-ground archaeological deposits from works associated with the proposals, whether from actual construction or secondary works such as landscaping, site compounds and borrow pits etc;

- possible demolition or loss of parts of buildings or other structures;
- severance from other linked features such as field systems, agricultural complexes and landscapes;
- changes in the original landscape;
- increased visual intrusion and increases in noise, vibration and disturbance;
- loss of amenity.

4.2 Possible mitigation measures to offset development impact can be summarised as:

- locate any disturbance away from archaeological remains and their settings;
- undertake appropriate recording works and other investigations in advance of construction;
- undertake appropriate recording works and other investigations during construction.

4.3 Such measures depend on the importance of the site and in practice a combination of measures is often used.

### **Summary of Development Proposals**

4.4 Full details of the development proposals are contained with the detailed planning permission (application no 02/02203/FL), which is currently under consideration by Scarborough District Council.

4.5 In summary, the proposals involve the construction of a new hospital within the study area. The main structures will be located in the eastern two thirds of the site, with landscaped grounds to the west and parking to the south. Access into the site will be off Lady Edith's Drive, near the south-east corner of the site. The nature of the development and the natural topography of the site means that existing ground levels will be significantly modified throughout the study area.

### **Impact of Development**

4.6 It can be assumed that the proposed changes in ground levels required for the development mean that there will be no opportunity for the preservation *in situ* of any below ground archaeological deposits within the site. As a result, any archaeological deposits or earthworks that might currently exist will be destroyed by the current development proposals.

### **Recommendations for Mitigation**

4.7 It was recommended in the previous desk-top assessment report that several stages of archaeological work would be required to ensure that any identified archaeological remains within the proposed development site were afforded an adequate and appropriate level of recording prior to their destruction (preservation by record). Such work should comprise a pre-development field

evaluation (Stage 1 pre-development recording), followed by other works as appropriate (Dennison 2003, 14-15).

- 4.8 The detailed walkover and geophysical surveys discussed above comprise the non-intrusive part of the Stage 1 pre-development recording. This work would normally be followed by limited trial trenching or sample excavation, to confirm any results. However, the nature of the results obtained to date, and the overall potential of the study area as determined by the previous research, suggest that this work will not be required. It is therefore recommended that no further pre-development intrusive archaeological recording work is undertaken on this site.
- 4.9 However, a few sites of local importance have been identified, namely evidence for some earlier field boundaries, some ephemeral earthworks in the south-east corner of the site, and an area of increased magnetic enhancement towards the north centre part of the site. These features, particularly the former field boundaries, will contain a limited amount of archaeological information, which will be destroyed by the current development proposals.
- 4.10 It is therefore recommended that a targeted "recording brief" is undertaken during the initial stages of development, when the topsoil is being stripped, so that any features or deposits that might be associated with the identified sites can be afforded an appropriate level of investigation. The parameters and methodology for this work would need to be discussed and approved by North Yorkshire County Council archaeological staff and the Local Planning Authority, through the production of method statements or specifications, but it is envisaged that the work would involve the recording and selective excavation of any archaeological features or deposits revealed by a careful topsoil strip.
- 4.11 Archaeological watching briefs are now a standard mitigation procedure used in areas of low but otherwise unconfirmed archaeological potential. The work involves the monitoring and inspection of topsoil strips and shallow ground excavations, and time needs to be allowed by the developer for the adequate identification, investigation and recording of any archaeological material that might be uncovered. The level of recording required will depend on what deposits are actually revealed - it may be sufficient just to plan and/or partially section relatively minor features (such as former field or other boundaries), but more complex and/or significant discoveries (such as building platforms, structural remains, and/or pits) may need more detailed partial or complete excavation. Much depends on the level of liaison and cooperation between the building and archaeological contractors, but development programmes should not be unduly inconvenienced by a watching brief.
- 4.12 On completion of the watching brief, a report should be produced and disseminated to the appropriate authorities. Depending on the type and quality of any finds, appropriate post-excavation work, such as the dating of pottery and the processing of environmental samples, may also need to be carried out.
- 4.13 Finally, an ordered project archive, incorporating both the above non-intrusive survey work and the watching brief work, should be prepared and deposited with a registered museum. Depending on the level of results, further publication in an appropriate journal such as the *Transactions of the Scarborough Archaeological Journal* may be required.

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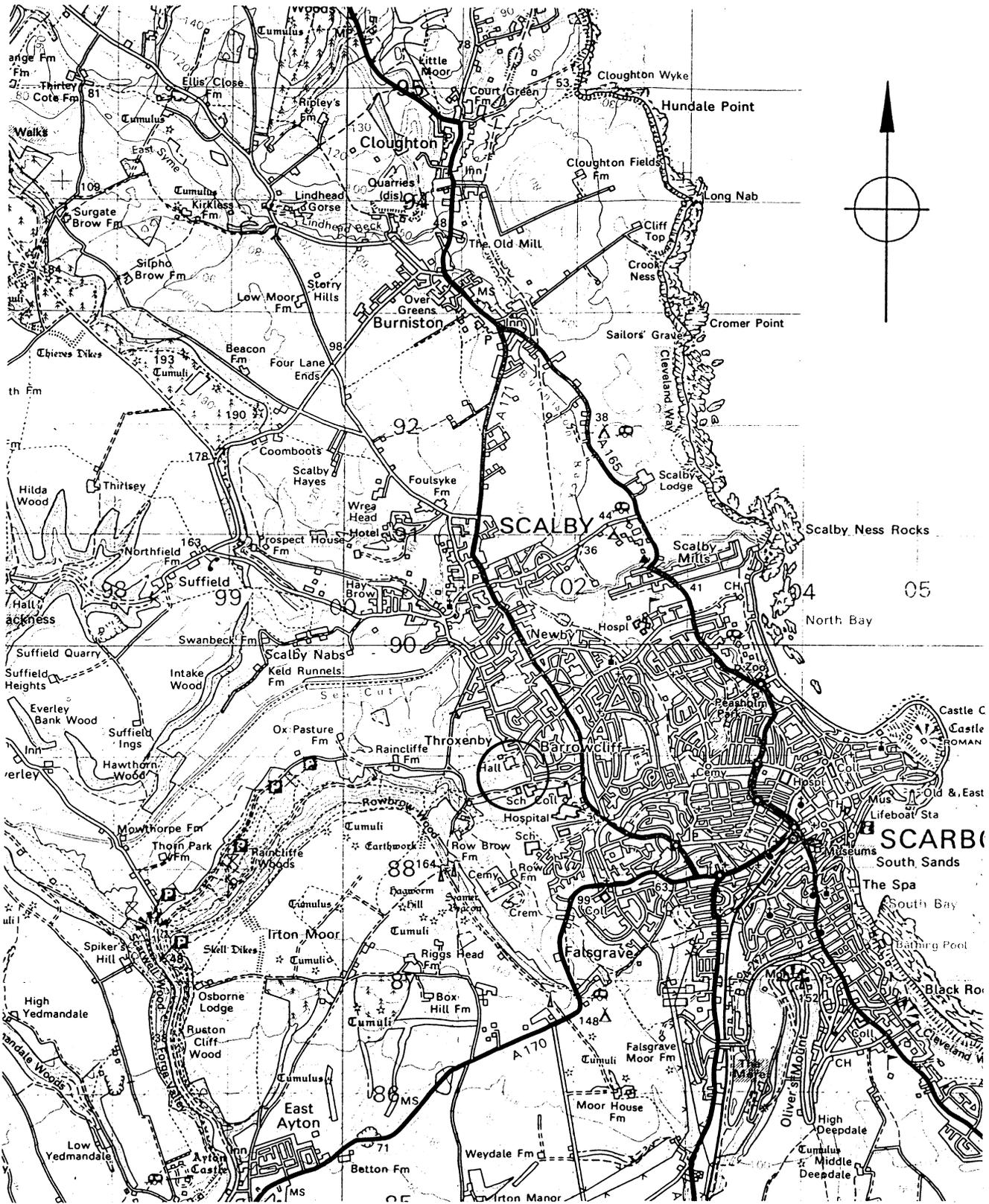
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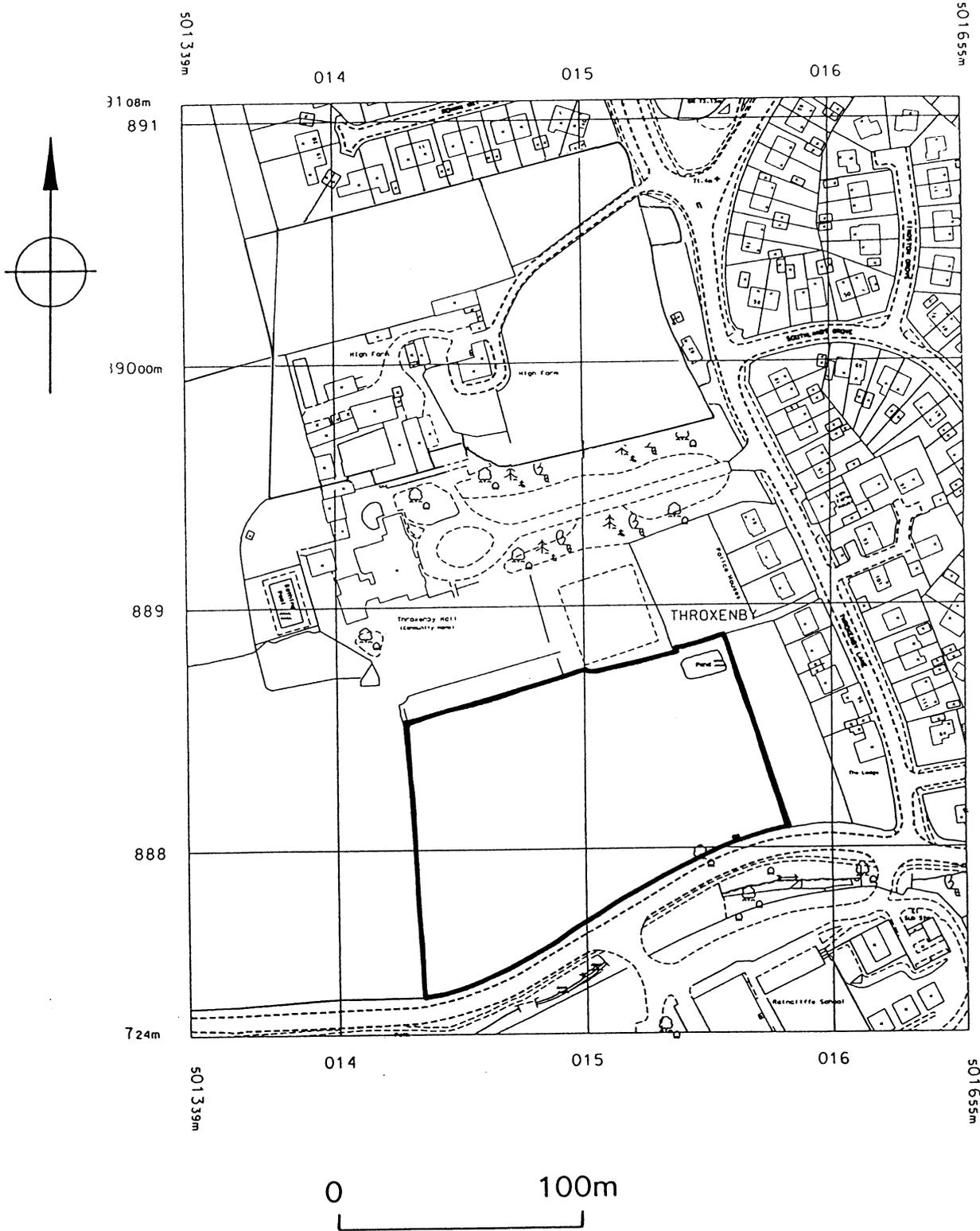
## 6 ACKNOWLEDGEMENTS

- 6.1 The programme of non-intrusive survey work was initiated by S Harrison Construction Ltd, and was funded by them. The geophysical survey was undertaken by Archaeological Services WYAS of Leeds, as a sub-contractor to Ed Dennison Archaeological Services Ltd. This report was produced by Ed Dennison of EDAS, and thanks are due to Mr Chris Hale and Mr Ian Tulloch of S Harrison Construction Ltd for their co-operation during the project.



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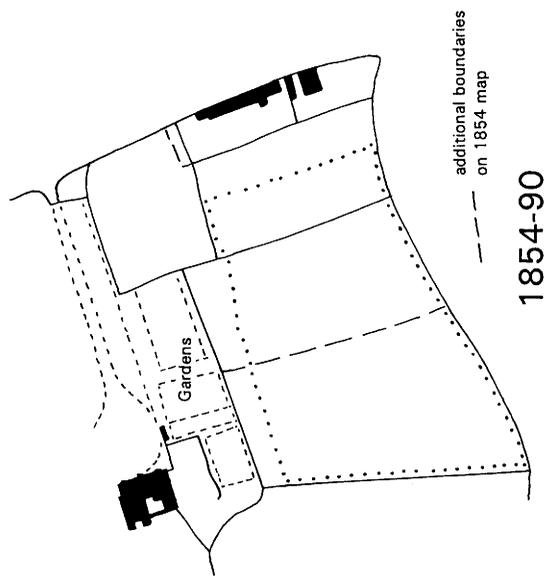
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	DATE		TITLE	
	SEPT 2003		GENERAL LOCATION	1



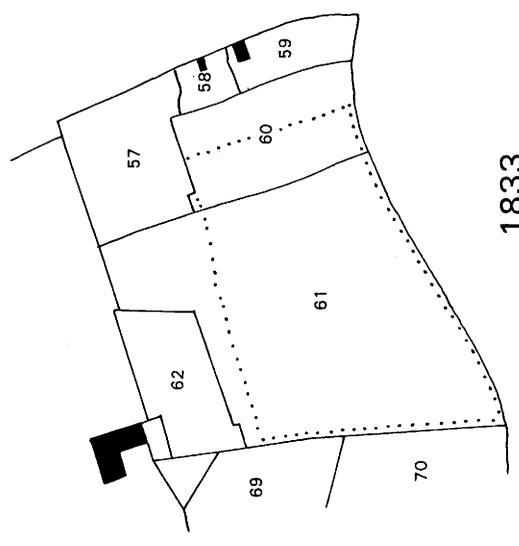
— Site boundary

PROJECT LADY EDITH'S DRIVE, THROXENBY	
TITLE DETAILED SITE PLAN	
SCALE AS SHOWN	DATE SEPT 2003
EDAS	FIGURE 2

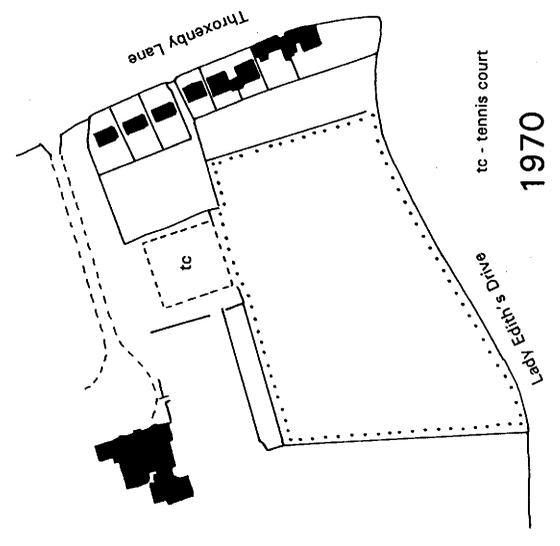
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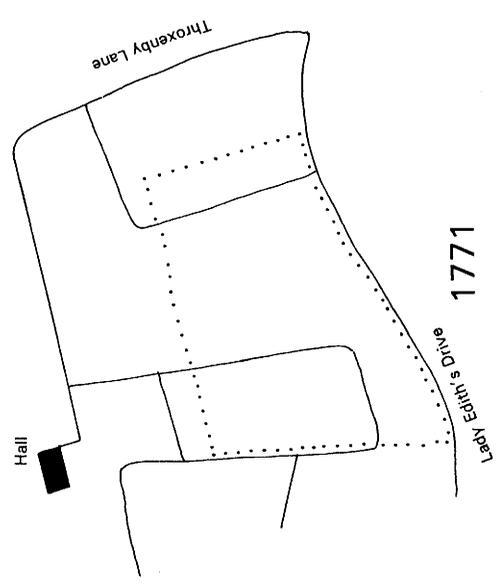
1854-90



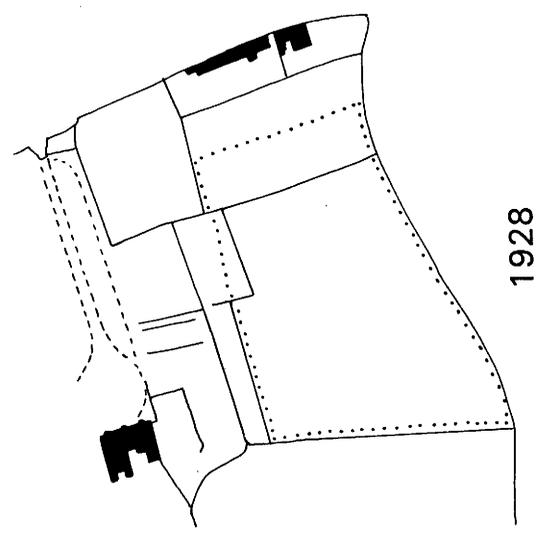
1833



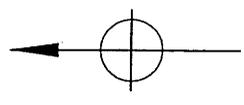
1970



1771



1928

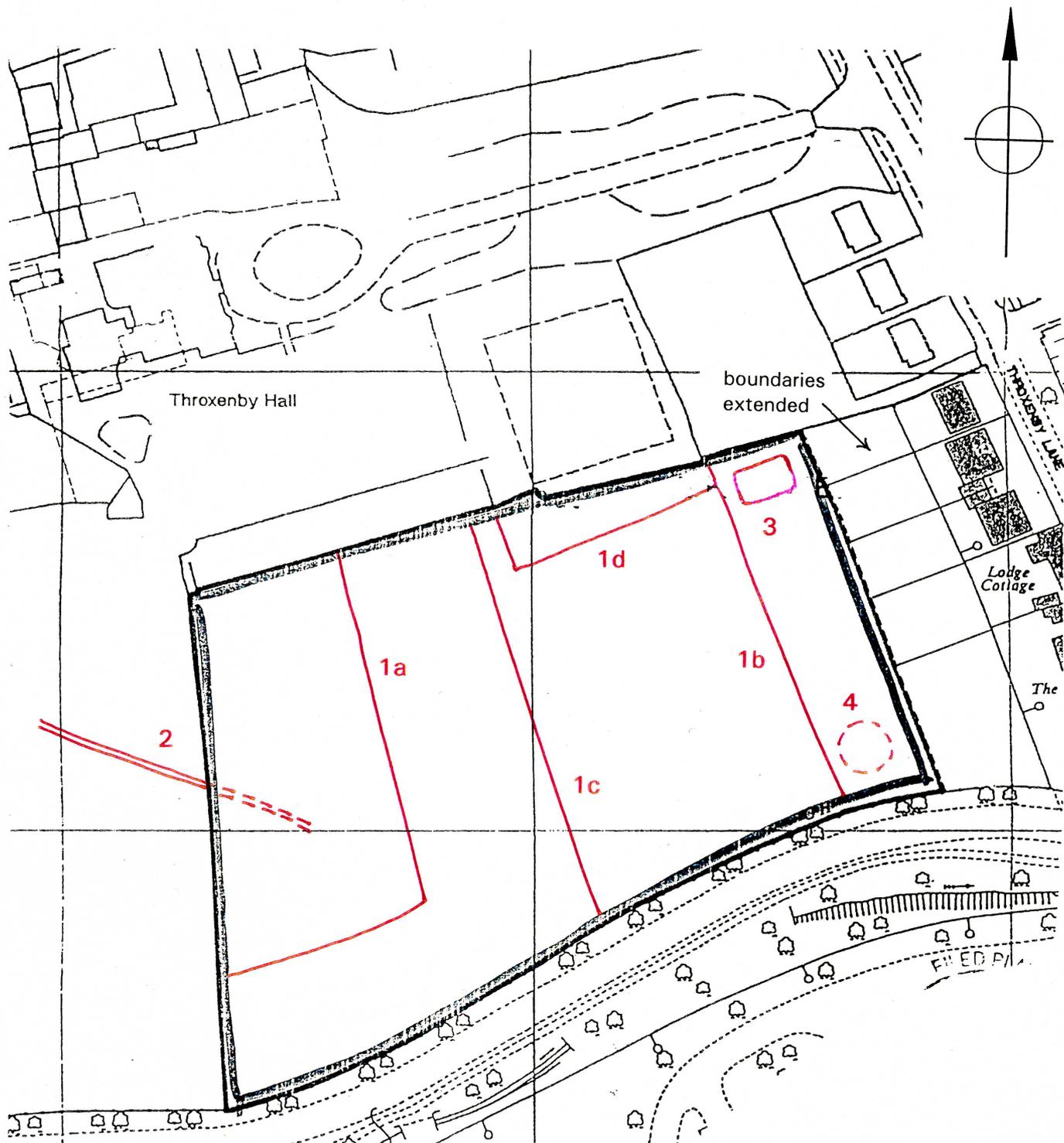


..... site boundary

Field names on 1833 map

- 57 - Croft
- 58 - Cottage & Yard
- 59 - Cottage & Garden
- 60 - Garth
- 61 - Hall Garths
- 62 - Gardens
- 69 - Calf Close
- 70 - Swang Close

PROJECT		LADY EDITH'S DRIVE, THROXENBY	
TITLE		MAP REGRESSION	
SCALE	AS SHOWN	DATE	SEPT 2003
EDAS		FIGURE	3



- Site 1: Former field boundaries
- Site 2: Possible trackway
- Site 3: Pond
- Site 4: Disturbed earthworks

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PROJECT		LADY EDITH'S DRIVE, THROXENBY	
TITLE		ARCHAEOLOGICAL SITES	
SCALE	DATE	AS SHOWN	SEPT 2003
EDAS		FIGURE	4

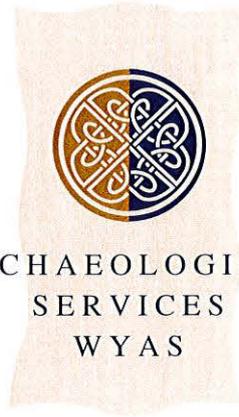


Fig.4. Interpretation of gradiometer data

## **APPENDIX 1**

*Library Copy.*

*Book No. 4898*



ARCHAEOLOGICAL  
SERVICES  
WYAS

**Land north side of Lady Erith's Drive  
Throxenby  
Scarborough  
North Yorkshire**

*Geophysical Survey*

*September 2003*

*Report No. 1159*

CLIENT  
EDAS Ltd

**Land north side of Lady Edith's Drive,  
Throxenby,  
Scarborough,  
North Yorkshire**

**Geophysical Survey**

**Contents**

1. Introduction and Archaeological Background
2. Methodology and Presentation
3. Results and Discussion
4. Conclusions

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Appendices

***Summary***

*A geophysical (fluxgate gradiometer) survey was carried out at the site of a proposed hospital development on the western periphery of Scarborough, adjacent to Throxenby Hall. Various linear and non-linear anomalies have been identified across the whole of the site. However, it is considered probable that these anomalies are due to relatively modern field boundaries or are caused by recent ground disturbance.*

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Archaeological Services WYAS

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## **1. Introduction and Archaeological Background**

- 1.1 Archaeological Services WYAS was commissioned by Ed Dennison Archaeological Services Ltd (hereafter EDAS) to carry out a geophysical (fluxgate gradiometer) survey at the proposed site of a hospital development on the western periphery of Scarborough, adjacent to Throxenby Hall (see Fig 1). The site, centred at NGR TA 0150 8880, covers approximately 1.6 hectares.
- 1.2 The evaluation area comprised a single trapezoidal shaped field, measuring approximately 125m by 100m, that was delimited by a road (Lady Edith's Drive) to the south, housing to the east, and hedges to the west and north. At the time of survey (September 1<sup>st</sup> 2003) the site was uncultivated pasture and had been recently mown to facilitate the survey. No problems were encountered during the survey although a pond in the north-east corner of the site and other smaller areas of dense vegetation, that had not been cleared, slightly reduced the overall survey area.
- 1.3 Topographically the evaluation area sloped down from north, at about 70m Above Ordnance Datum, to south, at about 65m AOD. The solid geology comprises Great and Inferior Oolite. The soils are classified in the Wickham 2 soil association being characterised as slowly permeable, seasonally waterlogged, fine loamy clay based soils.
- 1.4 Prior to the geophysical survey an archaeological assessment was undertaken (Dennison 2003) that concluded '*that the development site has a low or limited archaeological potential*'. This conclusion was based on documentary research and map regression analysis that established that the medieval and post-medieval settlements at Throxenby were always small and that most, if not all, of the study area is likely to have been under an agricultural regime during this period. More recently the site was sub-divided into smaller fields that were probably under permanent pasture.

## **2. Methodology and Presentation**

- 2.1 As the evaluation area was relatively small it was proposed that detailed magnetic survey be undertaken over the whole of the site in order to establish the presence, extent and character of any magnetic anomalies within the proposed development area.
- 2.2 A general site location plan incorporating the 1:50000 Ordnance Survey mapping is shown in Figure 1. Figure 2 is a site location plan showing the greyscale gradiometer data superimposed onto a scanned copy of an Ordnance Survey base map supplied by the client. The unprocessed data is displayed in greyscale format, at a scale of 1:500, in Figure 3 with an interpretation of the anomalies at the same scale in Figure 4. Figure 5 is an X-Y trace plot of the unprocessed ('raw') data. Details on data processing and display are given in Appendix 1 and the survey location information is presented in Appendix 2. The composition of the archive comprises Appendix 3.
- 2.3 The survey methodology and report presentation use the recommendations outlined in the English Heritage Guidelines (David 1995) as a minimum standard. All figures reproduced from Ordnance Survey mapping are done so

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*The interpretative figure should not be looked at in isolation but in conjunction with the relevant discussion section and with the information contained in the Appendices.*

### **3. Results and Discussion**

- 3.1 The most obvious characteristic of the data set is that there are numerous 'iron spike' responses (see Appendix 1) across all parts of the site as well as larger areas of magnetic disturbance and other areas where the magnetic background has been enhanced. The individual dipolar, 'iron spike', responses (see Appendix 1) are indicative of ferrous objects or other magnetic material in the topsoil or subsoil and, although archaeological artefacts may cause them, they are more often caused by modern cultural debris that has been introduced into the topsoil as a consequence of manuring or fly tipping.
- 3.2 The areas of magnetic enhancement, particularly the cluster identified as Anomaly **A**, are more likely to have an archaeological origin. However, without any supporting information it is considered more likely that these anomalies are due to modern ground disturbance and/or the presence of recent cultural material.
- 3.3 Several short, discontinuous, linear anomalies have also been identified most of which probably correlate with the location of former (recent) field boundaries (see Dennison 2003 – Figure 5). These include the linear dipolar anomaly (**B**) and the discontinuous anomalies **C** and **D**. A fourth such anomaly, **E**, is also thought to have a modern origin.

### **4. Conclusions**

- 4.1 Although several linear and non-linear magnetic anomalies have been identified it is not thought that any of these anomalies are likely to have an archaeological origin. However, an archaeological origin for any of these anomalies, particularly the areas of magnetic enhancement, cannot be completely dismissed.

*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.*

## ***Bibliography***

David, A. 1995. *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines* No. 1. English Heritage.

Dennison, E. 2003. *Land north side of Lady Edith's Drive, Throxenby, Scarborough, North Yorkshire*. Unpubl. EDAS Report 2003/208.R01

## ***Acknowledgements***

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### **Report**

A. Webb

### **Graphics**

A. Hancock

## ***Figures***

Figure 1 Site location (1:50000)

Figure 2 Site location showing greyscale gradiometer data (1:2500)

Figure 3 Greyscale plot of gradiometer data (1:500)

Figure 4 Interpretation of gradiometer data (1:500)

Figure 5 XY trace plot of gradiometer data (1:500)

## ***Appendices***

***Appendix 1*** Magnetic Survey: Technical Information

***Appendix 2*** Survey Location Information

***Appendix 3*** Geophysical Archive

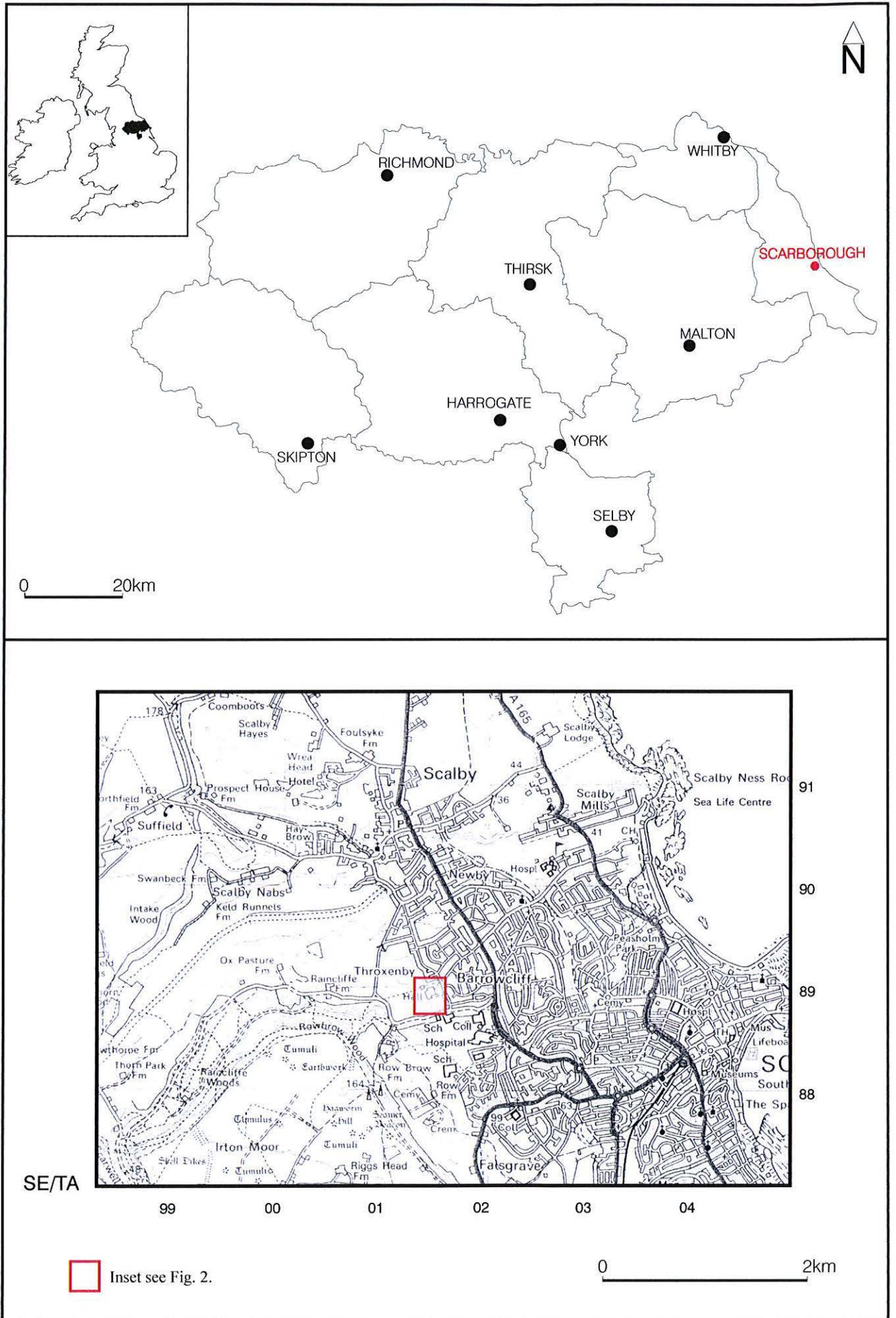


Fig. 1. Site location

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	SITE LIMITS
	ASWYAS REFERENCE POINTS



Fig.2. Site location showing greyscale gradiometer data

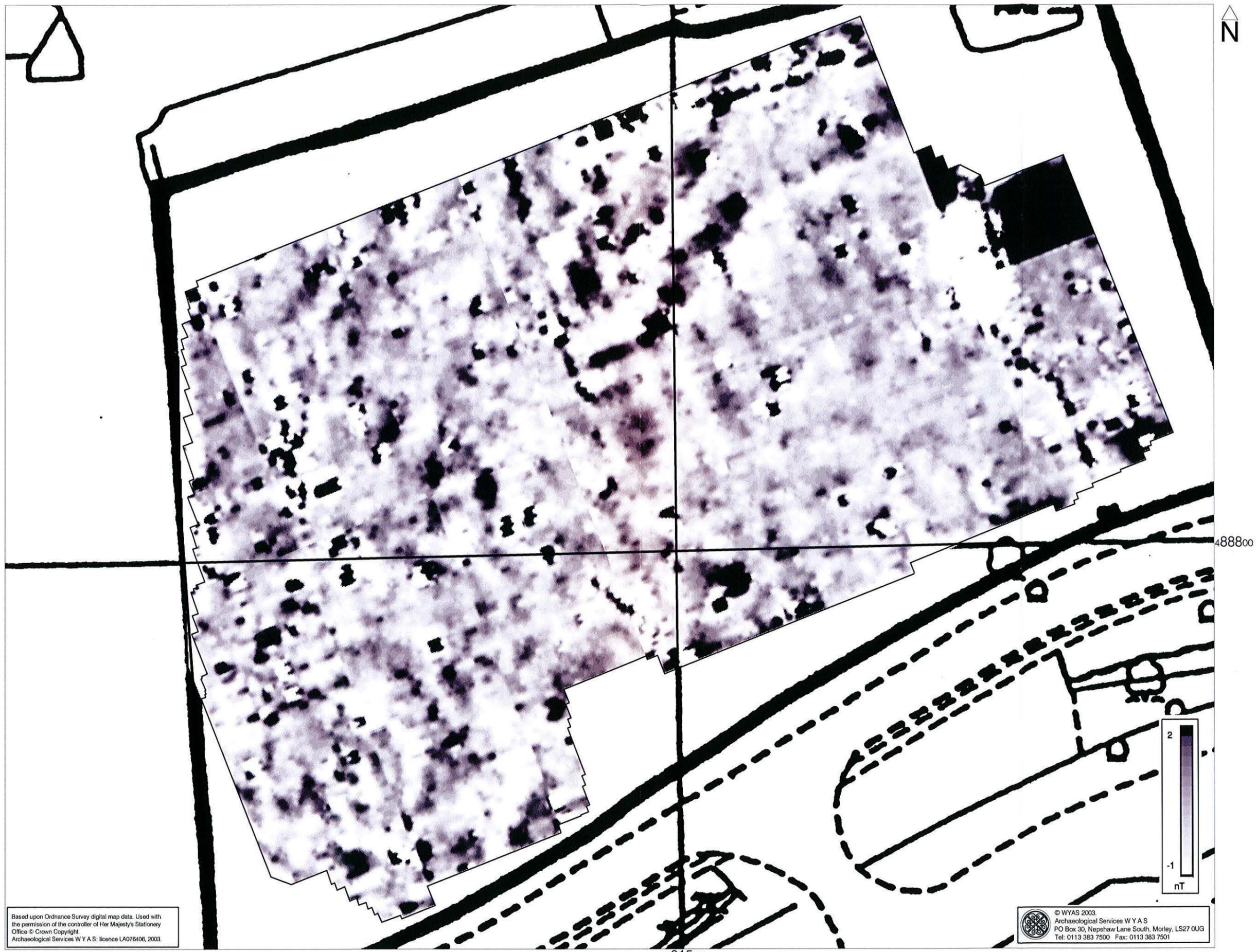


Fig.3. Greyscale plot of gradiometer data



Fig.4. Interpretation of gradiometer data

0 25m

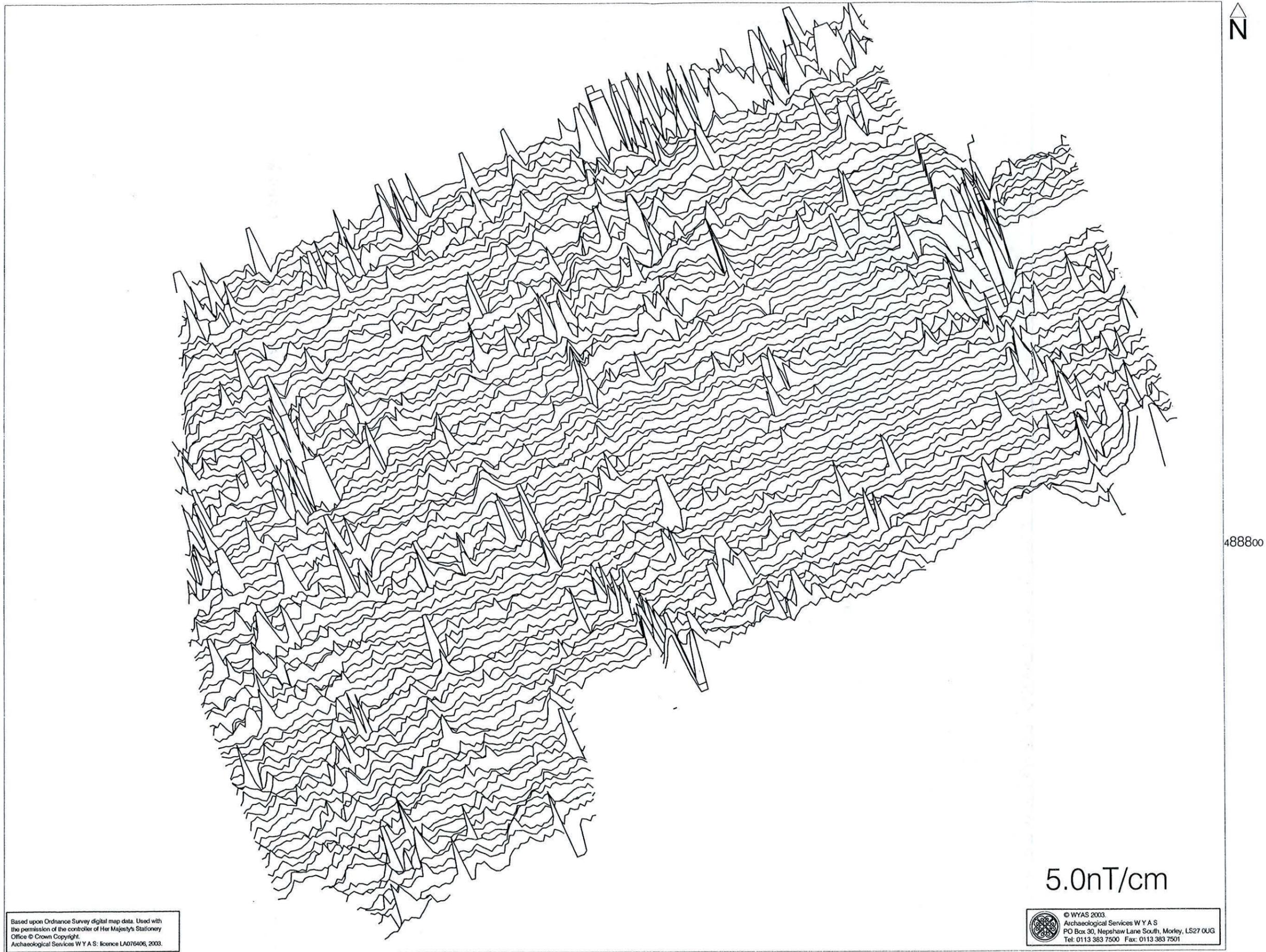


Fig. 5. XY trace plot of gradiometer data

## **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 haemetite. 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 so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill 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 the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable 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 the 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 intrudes into the topsoil may give a negative magnetic response relative to the background level.
- 1.3 The magnetic susceptibility of the soil may also be enhanced significantly by heating. This can lead to the detection of features such as hearths, kilns or burnt areas.

#### **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 which, 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 may 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 Magnetic Susceptibility Survey**

- 3.1.1. There are two methods of measuring the magnetic susceptibility of a soil sample. The first involves the measurement of a given volume of soil, which will include any air and moisture that lies within the sample, and is termed volume specific susceptibility. This method results in a bulk value that is not necessarily fully representative of the constituent components of the sample. The second technique overcomes this potential problem by taking into account both the volume and mass of a sample and is termed mass specific susceptibility. However, mass specific readings cannot be taken in the field

where the bulk properties of a soil are usually unknown and so volume specific readings must be taken. Whilst these values are not fully representative they do allow general comparisons across a site and give a broad indication of susceptibility changes. This is usually enough to assess the susceptibility of a site and evaluate whether enhancement has occurred.

### 3.2 Gradiometer Survey

- 3.2.1. 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.
- 3.2.2. 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.
- 3.2.3. 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. The instrument was facing north for improved data collection and was checked for electronic and mechanical drift at a common point after every three grids and calibrated as necessary. The drift from zero was not logged.
- 3.2.4. The detailed gradiometer data has been presented in this report in X-Y trace and greyscale formats with neither data set having been processed.
- 3.2.5. 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 10nT. 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'. In-house software (XY3) was used to create the X-Y trace plots.
- 3.2.6. In-house software (Geocon 9) was used to interpolate the gradiometer data so that 1600 readings were obtained for each 20m by 20m grid. Contors software (University of Bradford) was used to produce the greyscale images. All gradiometer greyscale plots are displayed in the range -1nT to 2nT, unless otherwise stated, using a linear incremental scale.

## **Appendix 2**

### **Survey Location Information**

The site grid was laid out using a Geodimeter 600s total station theodolite and tied in to field boundaries and three semi-permanent survey markers (see Fig. 2 – A, B and C) that were left on site. The survey data were then superimposed onto a scanned Ordnance Survey map base supplied by the client using common field boundaries and other fixed points. Overall there was a good correlation between the local survey and the digital map base and it is estimated that the average 'best fit' error is better than  $\pm 1.5\text{m}$ . However, it should be noted that Ordnance Survey co-ordinates for 1:2500 map data have an error of  $\pm 1.9\text{m}$  at 95% confidence. This potential error must be considered if co-ordinates are measured off for relocation purposes. Local grid co-ordinates can be supplied if required.

*Archaeological Services WYAS 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, report text (Word 2000), and graphics files (CorelDraw6 and AutoCAD 2000) files.
- a full copy of the report

At present the archive is held by Archaeological Services WYAS 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).