

ARCHAEOLOGICAL SOLUTIONS LTD

**LAND OFF LIME AVENUE, OULTON,
SUFFOLK**

A GEOPHYSICAL SURVEY

| | |
|--|---------------------------------------|
| Authors: Sam Egan (Fieldwork & Report) | |
| NGR: TM 518 941 | Report No: 4687 |
| District: Waveney | Site Code: OUL037 |
| Approved: Claire Halpin | Project No: 5758 |
| Signed: | Date: 30 th September 2014 |

This report is confidential to the client. Archaeological Solutions Ltd accepts no responsibility or liability to any third party to whom this report, or any part of it, is made known. Any such party relies upon this report entirely at their own risk. No part of this report may be reproduced by any means without permission.

Archaeological Solutions is an independent archaeological contractor providing the services which satisfy all archaeological requirements of planning applications, including:

Desk-based assessments and environmental impact assessments
Historic building recording and appraisals
Trial trench evaluations
Geophysical surveys
Archaeological monitoring and recording
Archaeological excavations
Post excavation analysis
Promotion and outreach
Specialist analysis

ARCHAEOLOGICAL SOLUTIONS LTD

**Unit 6, Brunel Business Court, Eastern Way,
Bury St Edmunds IP32 7AJ
Tel 01284 765210**

**PI House, r/o 23 Clifton Road, Shefford SG17 5AF
Tel 01462 850483**

e-mail info@ascontracts.co.uk
www.archaeologicalsolutions.co.uk



twitter.com/ArchaeologicalS



www.facebook.com/ArchaeologicalSolutions



CONTENTS

Summary of Results

- 1 Introduction
- 2 Description of Site
- 3 Topography, Geology and Soils
- 4 Archaeological Background
- 5 Methodology
- 6 Results
- 7 Conclusion

Bibliography

APPENDIX 1 SPECIFICATION

OASIS SUMMARY SHEET

| Project details | | | |
|--|--|----------------|---------------|
| Project name | <i>Land off Lime Avenue, Oulton, Suffolk</i> | | |
| <p><i>In August and September 2014 Archaeological Solutions Limited (AS) conducted a A detailed gradiometry survey of land off Lime Avenue, Oulton, Suffolk (NGR TM 518 941). The survey was commissioned by Persimmon Homes Ltd in advance of the proposed construction of a new residential development, and it was required by the Local Planning Authority, based on advice from SCC AS-CT.</i></p> <p>West Field: <i>The survey of the western field identified four possible archaeological anomalies; however these could equally be related to modern agricultural activity.</i></p> <p>Middle Field: <i>The principal recorded anomaly forms a curve or an enclosure which may be of archaeological origin. The enclosure contains four anomalies possibly indicative of in filled discrete pits. In the same southern area of the field five anomalies may be pits of archaeological origin. A linear feature is located in the north east area of site and is oriented east-west. It may represent a former field boundary and may be of archaeological origin.</i></p> <p>East Field: <i>A linear ditch runs NE/SW across the north-eastern section of the site and may be of archaeological origin. It is close to a second ditch which may also be of archaeological origin.</i></p> <p><i>The conducive geology and presence of possible archaeological anomalies suggests that the survey has been successful. The remaining anomalies are of modern origin, relating to agricultural activity and ferrous objects.</i></p> | | | |
| Project dates (fieldwork) | <i>September 2014</i> | | |
| Previous work (Y/N/?) | <i>DBA</i> | Site Code | <i>OUL037</i> |
| P. number | <i>P5758</i> | | |
| Type of project | <i>Geophysical survey</i> | | |
| Site status | <i>none</i> | | |
| Current land use | <i>Agriculture</i> | | |
| Planned development | <i>Residential</i> | | |
| Main features (+dates) | <i>Possible enclosure</i> | | |
| Significant finds (+dates) | <i>N/a</i> | | |
| Project location | | | |
| County/ District/ Parish | <i>Suffolk</i> | <i>Waveney</i> | <i>Oulton</i> |
| HER/ SMR for area | <i>Suffolk County Council Archaeological Service Conservation Team</i> | | |
| Post code (if known) | <i>-</i> | | |
| Area of site | <i>30ha.</i> | | |
| NGR | <i>NGR TM 518 941</i> | | |
| Height AOD (max/ min) | | | |
| Project creators | | | |
| Brief issued by | <i>Suffolk County Council Archaeological Service Conservation Team (SCC AS-CT)</i> | | |
| Project supervisor/s (PO) | <i>Sam Egan</i> | | |
| Funded by | <i>Persimmon Homes Ltd</i> | | |
| Full title | <i>Land off Lime Avenue, Oulton, Suffolk. A Geophysical Survey.</i> | | |
| Authors | <i>Egan, S.,</i> | | |
| Report no. | <i>4687</i> | | |
| Date (of report) | <i>September 2014</i> | | |

LAND OFF LIME AVENUE, OULTON, SUFFOLK A GEOPHYSICAL SURVEY

SUMMARY OF RESULTS

In August and September 2014 Archaeological Solutions Limited (AS) conducted a detailed gradiometry survey of land off Lime Avenue, Oulton, Suffolk (NGR TM 518 941). The survey was commissioned by Persimmon Homes Ltd in advance of the proposed construction of a new residential development, and it was required by the Local Planning Authority, based on advice from SCC AS-CT.

West Field

The survey of the western field identified four possible archaeological anomalies; however these could equally be related to modern agricultural activity.

Middle Field

The principal recorded anomaly forms a curve or an enclosure which may be of archaeological origin. The enclosure contains four anomalies possibly indicative of in filled discrete pits. In the same southern area of the field five anomalies may be pits of archaeological origin. A linear feature is located in the north east area of site and is oriented east-west. It may represent a former field boundary and may be of archaeological origin.

East Field

A linear ditch runs NE/SW across the north-eastern section of the site and may be of archaeological origin. It is close to a second ditch which may also be of archaeological origin.

The conducive geology and presence of possible archaeological anomalies suggests that the survey has been successful. The remaining anomalies are of modern origin, relating to agricultural activity and ferrous objects.

1 INTRODUCTION

1.1 In August and September 2014 Archaeological Solutions Limited (AS) conducted a geophysical survey of land off Lime Avenue, Oulton, Suffolk (NGR TM 518 941; Figs. 1 - 2). The evaluation was commissioned by Persimmon Homes Ltd in advance of the proposed construction of a new residential development, and it was required by the Local Planning Authority, based on advice from SCC AS-CT.

1.2 The evaluation was conducted in accordance with a brief and specification issued by Suffolk County Council Archaeological Service

Conservation Team (SCC AS-CT, dated 28th March 2014), and a specification compiled by AS (dated 24th April 2014). The geophysical survey was carried out in accordance with English Heritage Geophysical Survey in Archaeological Field Evaluation, 2008, and IFA Paper 6: The use of Geophysical Techniques in Archaeological Evaluations. It also adhered to Gurney (2003) *Standards for Field Archaeology in the East of England*.

1.3 A programme of archaeological investigation comprising an archaeological field evaluation by geophysical survey and trial trenching was required, and this report describes the results of the geophysical survey.

1.4 The aim of the geophysical survey was to locate any features of possible archaeological significance so that they may be assessed prior to any development.

2 DESCRIPTION OF THE SITE

2.1 The site is located to the north of Sands Lane, Oulton, Suffolk. The survey area is approximately 30 hectares over four fields. However, three of the fields were accessible and an area of 3.2 hectares was unsurveyable due to overgrown vegetation. The survey area is generally flat with no obstructions.

3 TOPOGRAPHY, GEOLOGY AND SOILS

3.1 The underlying geology is Crag Group - Sand (British Geological Survey website). The drift geology is Happisburgh Glacigenic Formation – Sand across the majority of the surveyed area, with an area of Head – Clay, Silt, Sand and Gravel in the east (British Geological Survey website).

3.2 The overlying soils are known as Wick 3 which are typical brown earths. These consist of deep, coarse, loamy, often stoneless soils with some similar sandy soils (Soil Survey of England and Wales, Sheet 4 Eastern England England).

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 This is an area that has undergone very little systematic archaeological field investigation and there are just 16 HER points within an approximate 1km radius of the site. Prehistoric stone tools have been found in the area between 500m and 1km of the site including a Palaeolithic worked implement (OUL Misc), a Neolithic polished axe head, a late Neolithic flint artifact scatter including an adze and barbed-and-tanged arrowhead from Pound Lane to the north-east (LWT 015), and a Bronze Age hornblende granulate battleaxe from Lothingland to the south (SUF Misc). Cropmarks of at least one, and possibly three ring ditches, have been identified in Oulton parish between 500m and

1km south/south-west of the site (OUL 005). The only Roman finds are two bronze coins found during metal detecting (OUL 001).

4.2 There is only one HER point recorded within 500m of the site where an archaeological evaluation was carried out on 1.7ha of arable land off Mobbs Way between approximately 200 and 500m east of the site (OUL 011). A small assemblage of prehistoric material was recovered and two undated ditches and three possible pits were identified. A medieval or post-medieval ditch was also recorded, and the isolated post-medieval finds recovered indicated that the area had probably remained as open arable land since the medieval period.

4.3 St Michael's Church located 1km to the south-west is thought to date back to Norman times although it is not mentioned in the Domesday Survey. It was rebuilt in the 14th and 15th centuries and was restored in the 19th (OUL 004). A market is recorded at Oulton in the year 1307 (Oulton Misc). Oulton Broad is the most southerly of the manmade Norfolk Broads. A 14th century jetton and medieval finger ring were found in a garden at Oulton Broad village (LWT Misc). The cropmark of a sub-oval enclosure or moat is located over 500m west/north-west of the site (FTN 013). Post-medieval tile and other finds were made within the area of the enclosure/moat (FTN 011).

5 METHOD OF WORK

5.1 The magnetic survey was performed using a dual sensor Grad601-2 Magnetic gradiometer manufactured by Bartington instruments Ltd. The gradiometer measures differences in local magnetic anomalies compared to the difference in the general magnetic background. These machines are extremely sensitive and can detect changes as weak as 0.1 nanoTesla (nT)

5.2 Grid method and location- 30m x 30m grids were set out across the entirety of the survey area forming a network. The grids were set out with tape measures using triangulation to ensure accuracy. The grids were located using a Leica Total station. Gradiometers were carried along 1m spaced traverses through each grid square; the gradiometer was triggered to take measurements at 0.25m intervals along the traverses. A total of 3600 measurements were taken per grid square. All fieldwork methods complied with the guidelines issued by English Heritage and by the Institute for Archaeologists (EH 2008 and IfA 2011) and with the method statement for the project (Archaeological Solutions dated 24th April 2014)

5.3 The survey data was processed using Terrasurveyor LITE software. Basic processing of the data can enhance possible archaeological features and eliminate natural/modern features. The general processes are as follows:

Destripe- The destripe function removes the striping effects caused by discrepancies between different sensors and walking directions.

Destagger- The Destagger function is used to correct for displacement of anomalies caused by alternate zig-zag traverses. These displacements are often observable in gradiometer data (collected with zig-zag traverses) if sample interval is less than 1m. Destagger can operate on alternate lines or pairs of lines, in the X direction only. It can operate on all the grids, individual grids or individual lines within a grid. (Geoscan 2014)

Zero means traverse- The Zero Mean Traverse function sets the background mean of each traverse within a grid to zero. It is useful for removing striping effects in the traverse direction which can occur in gradiometer data. This also has the effect of removing grid edge discontinuities at the same time. It operates over the whole of the data set. (Geoscan 2014)

Clip -The Clip function can be used to clip, or limit, data to specified maximum and minimum values. This can improve graphical presentation and also forms a useful pre-process procedure for many other functions. It can operate over the whole of the data set, or any inclusive or exclusive block. (Geoscan 2014)

6 RESULTS

The following list of numbered anomalies refers to numerical labels on the interpretation plots (Fig. 6)

6.1 WEST FIELD

6.1.1 Possible Archaeology

1 Two positive linear anomalies. These are indicative of former cut features and may be of archaeological or modern agricultural origin.

2 Two negative linear anomalies. These are indicative of former bank or earthwork features, these may be of archaeological or agricultural origin.

6.1.2 Other Anomalies

3 Closely spaced parallel linear anomalies across the site. These are indicative of modern agricultural activity, such as ploughing.

4 A number of magnetic 'spikes' (strong focussed values with associated antipolar response) indicate ferrous metal objects. These are likely to be modern rubbish.

6.2 MIDDLE FIELD

6.2.1 Probable Archaeology

1 Positive linear anomaly, this is indicative of a former cut feature. The anomaly forms a curve which encloses an area containing four positive point readings (possible pits). The linear feature may be of archaeological origin.

2 Four possible point anomalies, these are indicative of in filled discrete cut features. The four positive points are located inside of positive linear anomaly 1. The four features may be of archaeological origin.

3 Positive linear anomaly, the feature is located in the north east area of site and is oriented east-west. The anomaly could be a former field boundary and may be of archaeological origin.

4 Five positive points scattered across the southern section of site. The positive points are indicative of discrete infilled cut features. The five points could be pits of archaeological origin.

6.2.2 Other Anomalies

5 Two broadly spaced positive linears. The weak positive reading and spacing indicates the features could relate to agricultural work and are possibly plough scars from modern farming.

6 Eleven areas contained high dipolar responses which are indicative of modern waste or tip areas. Some of these areas could be spreads of magnetic material relating to the destruction of the modern farmstead. The farmstead was located in the northern part of the survey area.

7 Magnetic spikes consist of a single positive anomaly with a negative response. A strong anomaly is most likely caused by a ferrous object.

6.3 EAST FIELD

6.3.1 Probable archaeology

1 Positive linear anomaly, this is indicative of a former cut feature. The anomaly runs NE-SW across the north eastern section of the site. It is close to positive linear anomalies 2*. The feature may be of archaeological origin.

2 Positive linear anomaly, the anomalies are situated in the north-east sector of site and could be feature of archaeological origin.

6.3.2 Other anomalies

3 Magnetic disturbance from public footpath.

4 Magnetic disturbance from pylons.

5 Strong dipolar anomaly.

6 Nine areas contained high dipolar responses which are indicative of modern waste or tip areas. Some of these areas could be spreads of magnetic material relating to the construction of the modern development immediately east of site. It was noted during the survey that some areas had modern building materials visible on the field surface.

7 Magnetic spikes consist of a single positive anomaly with a negative response. A strong anomaly is most likely caused by a ferrous object.

7 CONCLUSION

West Field

7.1 The survey of the western field identified four possible archaeological anomalies; however these could equally be related to modern agricultural activity.

Middle Field

7.2 The principal recorded anomaly forms a curve or an enclosure which may be of archaeological origin. The enclosure contains four anomalies possibly indicative of in filled discrete pits. In the same southern area of the field five anomalies may be pits of archaeological origin. A linear feature is located in the north east area of site and is oriented east-west. It may represent a former field boundary and may be of archaeological origin.

East Field

7.3 A linear ditch runs NE/SW across the north-eastern section of the site and may be of archaeological origin. It is close to a second ditch which may also be of archaeological origin.

7.4 The conducive geology and presence of possible archaeological anomalies suggests that the survey has been successful. The remaining anomalies are of modern origin, relating to agricultural activity and ferrous objects.

ACKNOWLEDGEMENTS

AS would like to thank the client, Persimmon Homes for funding the work and for their assistance (in particular Mr Simon Wood).

AS also acknowledges the advice and input of Mr Matthew Brudenell of Suffolk County Council Archaeological Service Conservation Team and the Suffolk Historic Environment Record.

BIBLIOGRAPHY

British Geological Survey South Sheet, 1977. Geological Survey Ten Mile Map, South Sheet First Edition (Quaternary). Institute of Geological Sciences.

British Geological Survey, 2001. Geological Survey Ten Mile Map, South Sheet, Fourth Edition (Solid).

British Geological Society. British Geological Survey, n.d., website: (<http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps>) Geology of Britain viewer.

Soil Survey of England and Wales, 1983. Soils of England and Wales, Sheet 4 Eastern England England.

Suffolk County Council, 2014. Brief for a Geophysical Survey and Trenched Archaeological Evaluation at Land off Lime Avenue, Oulton, Suffolk

English Heritage, 2008. Geophysical Survey in Archaeological Field Evaluation.

Institute For Archaeologists. Standard and Guidance for Archaeological Geophysical Survey.

<http://www.archaeologists.net/sites/default/files/nodefiles/Geophysics2010.pdf>

APPENDIX 1 SPECIFICATION

LAND OFF LIME AVENUE, OULTON, SUFFOLK

**WRITTEN SCHEME OF INVESTIGATION FOR
AN ARCHAEOLOGICAL EVALUATION**

24th April 2014 (Revised 2nd June 2014)

Archaeological Solutions is an independent archaeological contractor providing the services which satisfy all archaeological requirements of planning applications, including:

Desk-based assessments and environmental impact assessments
Historic building recording and appraisals
Trial trench evaluations
Geophysical surveys
Archaeological monitoring and recording
Archaeological excavations
Post excavation analysis
Promotion and outreach
Specialist analysis

ARCHAEOLOGICAL SOLUTIONS LTD

**Unit 6, Brunel Business Court, Eastern Way,
Bury St Edmunds IP32 7AJ
Tel 01284 765210**

**PI House, r/o 23 Clifton Road, Shefford SG17 5AF
Tel 01462 850483**

e-mail info@ascontracts.co.uk
www.archaeologicalsolutions.co.uk



twitter.com/ArchaeologicalS



www.facebook.com/ArchaeologicalSolutions



LAND OFF LIME AVENUE, OULTON, SUFFOLK

ARCHAEOLOGICAL EVALUATION

1 INTRODUCTION

1.1 This specification has been prepared in response to a brief & specification issued by Suffolk County Council Archaeological Service Conservation Team (SCC AS-CT, dated 28th March 2014). It provides for an archaeological evaluation in advance of the proposed construction of a new residential development on land off Lime Avenue, Oulton, Suffolk (NGR TM 518 941). The evaluation is required by the LPA, on advice from SCC AS-CT.

1.2 It is understood that the programme of archaeological investigation should comprise an archaeological field evaluation by geophysical survey and trial trenching, to comply with the planning requirement of the local planning authority (on advice from SCC AS-CT).

2 COMPLIANCE

2.1 The brief has been read and understood. If AS carried out the evaluation, AS would comply with SCC AS-CT's requirements.

3 SITE & DEVELOPMENT DESCRIPTION ARCHAEOLOGICAL BACKGROUND

3.1 The site lies in an area of archaeological potential on the northern side of Lime Avenue, Oulton. It is largely greenfield/agricultural, and extends to some 35.ha.

3.2 It is proposed to construct new residential development on the site.

3.3 There has been little in the way of previous investigation in the area to characterise its archaeological potential, but it is a large greenfield site in a topographic location favourable to early activity, overlooking the River Lothing to the south and the Oulton Marshes to the north. A small area of land adjacent to Mobbs Way has been subject to an archaeological evaluation in 2010 (HER OUL 11), revealing evidence of prehistoric and medieval occupation.

3.4 The County Historic Environment Record will be consulted in order to provide the historic background data.

4 BRIEF FOR THE ARCHAEOLOGICAL EVALUATION

SPECIFICATION FOR A GEOPHYSICAL SURVEY AND TRIAL TRENCH EVALUATION

GENERAL MANAGEMENT

4.1 The principal research objectives for the evaluation as a whole include:

- To establish whether any archaeological deposit exists in the area, with particular regard to any which are of sufficient importance to merit preservation *in situ*
- To identify the date, approximate form and purpose of any archaeological deposit within the application area, together with its likely extent, localised depth and quality of preservation.
- To evaluate the likely impact of past land uses, and the possible presence of masking colluvial/alluvial deposits, along with the potential for the survival of environmental evidence
- To provide sufficient information to construct an archaeological conservation strategy dealing with preservation, the recording of archaeological deposits, working practices, timetables and orders of cost.

4.2 *Research Design*

4.2.1 The research priorities for the region are set out in Glazebrook (1997) and Brown & Glazebrook (2000) and updated by Medlycott and Brown (2008) and Medlycott (2011).

4.2.2 The key issues for the Neolithic and Bronze Age (as set out by Brown & Murphy in Brown & Glazebrook 2000, 9-13) centre on the theme of the development of farming and the attendant development and integration of monuments, fields and settlements. Medlycott & Brown (2008) and Medlycott (2011, 13) suggest that future research on the Neolithic should include synthetic and regional studies for the region; an examination of the Mesolithic/Neolithic transition through radiocarbon dates; the establishment of a chronology for Neolithic ring-ditches; improved understanding of the chronological development of pottery; the excavation and study of cropmark complexes; greater understanding of burial practices; a study of the inter-relationships of settlements; greater use of scientific methods of dating and modelling of the environmental conditions during this period; targeted programmes of sedimentological, palynological and macrofossil analyses of sediment sequences in valley bottoms, lakes or the intertidal zone; and the human impact on the natural landscape during this period. The nature of Neolithic burial in the region and the pattern of burial practice, including the relationship between settlement sites and burial, require further research. Settlement sites themselves also form part of an important research subject as there is a requirement to identify if a consensus exists on the subject of non-permanent settlement in the Neolithic (Medlycott 2011, 13). Further work on understanding the effects of plough damage on Neolithic sites is considered to be an important research subject for the region (Medlycott 2011, 13).

4.2.3 Inter-relationships between settlements and greater understanding of patterns of burial practice are important areas of research for the Bronze Age (Medlycott & Brown 2008). Medlycott (2011, 21) identifies artefact studies as of particular importance for the study of the Bronze Age in the region; the typological identification of later Bronze Age pottery linked to close radiocarbon dating, the further study of Bronze Age flintworking and the significance of hoarding and other depositional practices are all identified as being key research subjects. Artefact studies can contribute to the refinement of chronologies for the period and to an assessment of the reasons behind the marked divide in research results between the northern and southern parts of the region, which are identified by Medlycott (2011, 21) as important research areas. Like the Neolithic, sedimentological, palynological and macrofossil analyses of sediment sequences are considered to be important areas of research as are the effects of colluviation and the possibility that colluvial deposits mask some significant sites (Medlycott 2011, 21).

4.2.4 Research topics for the Iron Age set out by Bryant (in Brown & Glazebrook 2000, 14-18) include further research into chronologies, precise dating and ceramic assemblages, further research into the development of the agrarian economy (particularly with regard to field systems), research into settlement chronology and dynamics, research into processes of economic and social change during the late Iron Age and Romano-British transition (particularly with regard to the development of Aylesford/Swarling and Roman culture, and also regional differences and tribal polities in the late Iron Age and further research into oppida and ritual sites), further analysis of development of social organisation and settlement form/function in the early and middle Iron Age, further research into artefact production and distribution and the Bronze Age/Iron Age transition. Medlycott & Brown (2008) and Medlycott (2011, 29-32) build on these themes, paying particular attention to chronological and spatial development and variation and adding subjects as the Bronze Age/Iron Age transition and manufacturing and industry.

4.2.5 Research topics for the Iron Age set out by Bryant (in Brown & Glazebrook 2000, 14-18) include further research into chronologies, precise dating and ceramic assemblages, further research into the development of the agrarian economy (particularly with regard to field systems), research into settlement chronology and dynamics, research into processes of economic and social change during the late Iron Age and Romano-British transition (particularly with regard to the development of Aylesford/Swarling and Roman culture, and also regional differences and tribal polities in the late Iron Age and further research into oppida and ritual sites), further analysis of development of social organisation and settlement form/function in the early and middle Iron Age, further research into artefact production and distribution and the Bronze Age/Iron Age transition. Medlycott & Brown (2008) and Medlycott (2011, 29-32) build on these themes, paying particular attention to chronological and spatial development and variation and adding subjects as the Bronze Age/Iron Age transition and manufacturing and industry.

4.2.6 Medlycott (2011, 47) identifies regional variation and tribal distinctions as underlying themes for research in the Roman period. Research topics for the Roman period previously set out by Going & Plouviez (in Brown & Glazebrook 2000, 19-22) include analysis of early and late Roman military developments, further analysis of large and small towns, evidence of food consumption and production, further research into agricultural production, landscape research (in particular further evidence for potential woodland succession/regression and issues of relict landscapes, as well as further research into the road network and bridging points), further research into rural settlements and coastal issues. Medlycott (2011, 47-48) states that these research areas remain valid and presents updated consideration of them. To these themes Medlycott & Brown (2008) and Medlycott (2011, 47-48) add rural settlements and landscapes, the process of Romanisation in the region, the evidence for the Imperial Fen Estate, and the Roman/Saxon transition.

4.2.7 Wade (in Brown & Glazebrook 2000, 23-26) identifies research topics for the rural landscape in the Saxon and medieval periods. These include examination of population during this period (distribution and density, as well as physical structure), settlement (characterisation of form and function, creation and testing of settlement diversity models), specialisation and surplus agricultural production, assessment of craft production, detailed study of changes in land use and the impact of colonists (such as Saxons, Danes and Normans) as well as the impact of the major institutions such as the Church.

4.2.8 Medlycott (2011, 57) states that the study of the Anglo-Saxon period still requires further cooperation between historians and archaeologists. Important research issues for this period comprise: the Roman/Anglo-Saxon transitional period; settlement distribution, which suffers from problems associated with the identification of Saxon settlement sites; population modelling and demographics, which has the potential to be advanced by modern scientific methods; differences within the region in terms of settlement type and economic practice and subjects related to this such as links with the continent, trading practices and cultural influences; rural landscapes and settlements, including detailed study of the changes and developments in such settlements over time and the influence of Saxon landscape organisation and settlements on these issues in the medieval period; towns and their relationships with their hinterland; infrastructure, including river management, the identification of ports and harbours and the role of existing infrastructure in shaping the Saxon period landscape; the economy, based on palaeoenvironmental studies; ritual and religion; the effect of the Danish occupation; and artefact studies (Medlycott 2011, 57-59).

4.2.9 The issues identified by Ayers (in Brown & Glazebrook, 2000) and Wade (in Brown & Glazebrook, 2000) remain valid research subjects (Medlycott 2011, 70) for the medieval period. The study of landscapes is dominated by issues such as water management and land reclamation for large parts of the region, the economic development of the landscape and the region's potential to reveal information regarding field systems,

enclosures, roads and trackways. Linked to the study of the landscape are research issues such as the built environment and infrastructure; the main communication routes through the region need to be identified and synthesis needs to be carried out regarding the significance, economic and social importance of historic buildings in the region (Medlycott 2011, 70-71). Also considered to be important research subjects for the medieval period are rural settlements, towns, industry and the production and processing of food and demographic studies (Medlycott 2011, 70-71).

4.2.10 The principal research issues for the site will be to identify and characterise any early activity on this large, mainly greenfield site.

References

Brown, N & Glazebrook, J (eds), 2000, Research and Archaeology: A Framework for the Eastern Counties. 2. Research Agenda and Strategy, East Anglian Archaeology Occasional Papers 8

Glazebrook, J (eds), 1997, Research and Archaeology: A Framework for the Eastern Counties. 1. Resource Assessment, East Anglian Archaeology Occasional Papers 3

Medlycott, M & Brown, N, 2008, Revised East Anglian Archaeological Research Frameworks, www.eaareports/algaoee

Medlycott, M. (ed.) 2011, Research and Archaeology revisited: a revised framework for the East of England, ALGAO East of England Region, East Anglian Archaeology Occasional Papers 24

5 SPECIFICATION GEOPHYSICAL SURVEY TRENCHED EVALUATION

5.1 Details of Senior Project Staff

5.1.1 AS has developed a professional and well-qualified team who have undertaken numerous archaeological projects (both desk-based and field evaluations) on all types of developments, including commercial, residential, road schemes and golf courses. AS is a Registered Organisation of the IfA.

5.1.2 Profiles of key project staff are provided (Appendix 2).

A Method Statement is presented
Trial Trench Evaluation Appendix 1

5.1.3 The evaluation will conform with the guidelines set down in the brief and the Institute for Archaeologists Standard and Guidance for Archaeological Evaluations (revised 2008) and Standard and Guidance for Historic Environment Desk-Based Assessments (revised 2012) and English Heritage Geophysical Survey in Archaeological Evaluation (2008). It will also adhere to the document Standards for Field Archaeology in the East of England (Gurney 2003) and the requirements of the SCC document Requirements for a Trenched Evaluation 2011 Ver. 1.3 and Requirements for a Geophysical Survey 2011 Ver 1.1.

5.1.4 The brief requires a programme of geophysical survey followed by trial trenching. The initial geophysical survey will be carried out by Stratascan. It will comprise a detailed magnetometer survey conducted on a regular grid pattern, to include a sampling interval of 1m x 0.25m. Their method statement is attached (Appendix 3).

5.1.5 Following the geophysical survey a trial trench evaluation will be undertaken.

5.1.6 The SCC AS-CT brief requires a programme of archaeological trial trenching. A 5% sample has been allowed for, focussing on any anomalies revealed during the geophysical survey, and also to test 'blank' areas. An initial trench proposal allows for 195 trenches each 40m x 1.8m. This allows for an initial 4% sample, with a contingency for a further 1% sample, as required, to clarify any remains encountered in the initial trenches. AS is happy to review the scale/location of the trenches following comment from the client and/or SCC AS-CT. The proposed trench plan will be reviewed with SCC AS-CT in the light of the results of the geophysical survey, in order that any revealed anomalies and 'blank' areas are targeted by the trenching.

Phasing:

Two areas of the site are available for geophysical survey and trial trenching at present (shown on the attached plan as red and blue areas). The remainder of the site is currently cropped and the evaluation can only take place in these area post-harvest.

It is proposed that the red and blue areas are subject to initial geophysical survey and then trial trenching. An interim report will be prepared on conclusion of this phase of works. The remainder of the site will be subject to geophysical survey and then trial trenching post-harvest, when a final report on all the phases of investigation will be prepared.

5.1.7 The environmental strategy will adhere to the guidelines issued by English Heritage (*Environmental Archaeology; A guide to the theory and practice of methods, from sampling and recovery to post-excavation*, Centre for Archaeology Guidelines, 2011). An environmentalist will be invited to visit the site if remains of interest are found. Dr Rob Scaife will be the Environmental Coordinator for the project. The specialist will make his/her

results known to Zoe Outram who co-ordinates environmental archaeology in the region on behalf of English Heritage. It will be particularly important on this project to identify any palaeoenvironmental remains and to identify any waterlogged remains present on the site.

5.1.8 Estimate of time and resources required for each phase, to complete the trial trenching, project archive and the production of an evaluation report.

Trial Excavation

Processing, Cataloguing and Conservation of Finds

Preparation of Report and Archive c.30 Days

Staff on site: a Project Officer and Site Assistant/s (as necessary)

5.1.9 In advance of the field work AS will liaise with the County HER to fulfil their requirements for the long term deposition of the project archive. These will encompass: their collection policy, and their financial and technical requirements for long term storage. The resources include provision for the long term-deposition of the project archive.

5.1.10 Details of staff and specialist contractors are provided (Appendix 2). The project will be managed by Claire Halpin MIFA /Jon Murray MIFA.

5.1.11 AS is a member of FAME formerly the Standing Conference of Archaeological Unit Managers (SCAUM) and operates under the 'Health & Safety in Field Archaeology Manual'. A risk assessment and management strategy will be completed prior to the start of works on site.

5.1.12 AS is a member of the Council for British Archaeology and is insured under their policy for members.

6 SERVICES

6.1 The client is to advise AS of the position of any services which traverse the site.

7 SECURITY

7.1 Throughout all site works care will be taken to maintain all existing security arrangements, and to minimise disruption.

8 REINSTATEMENT

8.1 No provision has been made for reinstatement, excepting simple backfilling.

9 REPORT REQUIREMENTS

9.1 The report will include (as a minimum):

- a) the archaeological background
- b) a consideration of the aims and methods adopted in the course of the recording
- c) a detailed account of the nature, location, extent, date, significance and quality of any archaeological evidence recorded.
- d) Excavation methodology and detailed results including a suitable conclusion and discussion
- e) plans and sections of any recorded features and deposits
- f) discussion and interpretation of the evidence. An assessment of the projects significance in a regional and local context and appendices.
- g) All specialist reports or assessments
- h) A concise non-technical summary of the project results
- i) A HER summary sheet
- j) An OASIS summary sheet

9.2 Draft hard and digital PDF copies of the report will be submitted to SCC AS-CT for approval. If any revisions are required, final hard and digital PDF copies will be supplied to SCC AS-CT for deposition with the HER

9.3 The project details will be submitted to the OASIS database, and the online summary form will be appended to the project report.

9.4 A summary report will be submitted suitable for inclusion in the annual roundups of *Proceedings of the Suffolk Institute of Archaeology and History*, dependent on the results of the project.

10 ARCHIVE

10.1 The requirements for archive storage will be agreed with the County HER.

10.2 The archive will be deposited within six months of the conclusion of the fieldwork. It will be prepared in accordance with the UK Institute for Conservation's *Conservation Guideline No.2* and according to the document *Deposition of Archaeological Archives in Suffolk* (SCC AS Conservation Team, 2010). A unique event number will be obtained from the County HER Officer.

10.3 The full archive of finds and records will be made secure at all stages of the project, both on and off site. Arrangements will be made at the earliest opportunity for the archive to be accessed into the collections of Suffolk HER; with the landowner's permission in the case of any finds. It is acknowledged that it is the responsibility of the field investigation organisation to make these arrangements with the landowner and HER. The archive will be adequately catalogued, labelled and packaged for transfer and storage in accordance

with the guidelines set out in the United Kingdom Institute for Conservation's *Conservation Guidelines No.2* and the other relevant reference documents.

10.4 Archive records, with inventory, are to be deposited, as well as any donated finds from the site, at the county HER and in accordance with their requirements. The archive will be quantified, ordered, indexed, cross-referenced and checked for internal consistency. In addition to the overall site summary, it will be necessary to produce a summary of the artefactual and ecofactual data. A unique accession number will be obtained from the HER.

APPENDIX 1 METHOD STATEMENT

Method Statement for the recording of archaeological remains

The archaeological evaluation will be conducted in accordance with the project brief, and the code of the Institute of Field Archaeologists.

1 Mechanical Excavation

1.1 A mechanical excavator fitted with a wide toothless bucket will be used to remove the topsoil/overburden. The machine will be powerful enough for a clean job of work and be able to mound spoil neatly, at a safe distance from the trench edges.

1.2 The mechanical stripping will be controlled, and the mechanical excavator will only operate under the full-time supervision of an experienced archaeologist.

2 Site Location Plan

2.1 On conclusion of the mechanical excavation, a 'site location plan', based on the current Ordnance Survey 1:1250 map and indicating site north, will be prepared. This will be supplemented by an 'area plan' at 1:200 (or 1:100) which will show the location of the area(s) investigated in relationship to the development area, OS grid and site grid.

3 Manual Cleaning & Base Planning of Archaeological Features

3.1 Exposed areas will be hand-cleaned to define archaeological features sufficient to produce a base plan.

4 Full Excavation

Excavation of Stratified Sequences

The trenches will be excavated according to phase, from the most recent to the earliest, and the phasing of features will be distinguished by their stratigraphic relationships, fills and finds.

Deep features e.g. quarry holes, may incorporate stratified deposits which will be excavated by hand-dug sections and recorded.

Excavation of Buildings

Building remains are likely to comprise stake holes, post holes and slots/gullies, masonry foundations and low masonry walls. Associated features may be present e.g. hearths.

The features comprising buildings will be excavated fully and in plan/phase, to a level sufficient for the requirements of an evaluation.

Full Excavation

Industrial remains and intrinsically interesting features e.g hearths, burials will clearly merit full excavation, though will be excavated sufficient to characterise such deposits within the context of an evaluation. Discrete features associated with possible structures and/or settlement will be fully excavated, again sufficient to characterise them for the purposes of an evaluation.

Ditches

The ditches will be excavated in segments up to 2m long, and the segments will be placed to provide adequate coverage of the ditches, establish their relationships and obtain samples and finds.

5 Written Record

5.1 All archaeological deposits and artefacts encountered during the course of the excavation will be fully recorded on the appropriate context, finds and sample forms.

5.2 The site will be recorded using AS.'s excavation manual which is directly comparable to those used by other professional archaeological organisations, including English Heritage's own Central Archaeological Service.

6 Photographic Record

6.1 An adequate photographic record of the investigations will be made. It will include black and white prints and colour transparencies (on 35mm) illustrating in both detail and general context the principal features and finds discovered. It will also include 'working and promotional shots' to illustrate more generally the nature of the archaeological operations. The black and white negatives and contacts will be filed, and the colour transparencies will be mounted using appropriate cases. All photographs will be listed and indexed.

7 Drawn Record

7.1 A record of the full extent, in plan, of all archaeological deposits encountered will be drawn on A1 permatrace. The plans will be related to the site, or OS, grid and be drawn at a scale of 1:50 or 1:20, as appropriate.

In addition where appropriate, e.g. recording an inhumation, additional plans at 1:10 will be produced. The sections of all archaeological contexts will be drawn at a scale of 1:10 or, where appropriate, 1:20. The OD height of all principal strata and features will be calculated and indicated on the appropriate plans and sections.

8 Recovery of Finds

GENERAL

The principal aim is to ensure that adequate provision is made for the recovery of finds from all archaeological deposits.

The Small Finds, e.g. complete pots or metalwork, from all excavations will be 3-dimensionally recorded.

A metal detector will be used to enhance finds recovery. The metal detector survey will be conducted on conclusion of the topsoil stripping, and thereafter during the course of the excavation. The spoil tips will also be surveyed. Regular metal detector surveys of the excavation area and spoil tips will reduce the loss of finds to unscrupulous users of metal detectors (treasure hunters). All non-archaeological staff working on the site should be informed that the use of metal detectors is forbidden.

WORKED FLINT

When flint knapping debris is encountered large-scale bulk samples will be taken for sieving.

POTTERY

It is important that the excavators are aware of the importance of pottery studies and therefore the recovery of good ceramic assemblages.

The pottery assemblages are likely to provide important evidence to be able to date the structural history and development of the site.

The most important assemblages will come from 'sealed' deposits which are representative of the nature of the occupation at various dates, and indicate a range of pottery types and forms available at different periods.

'Primary' deposits are those which contain sherds contemporary with the soil fill and in simple terms this often means large sherds with unabraded edges. The sherds have usually been deposited shortly after being broken and have remained undisturbed. Such sherds are more reliable in indicating a more precise date at which the feature was 'in use'. Conversely, 'secondary' deposits are those which often have small, heavily abraded sherds lacking obvious conjoins. The sherds are derived from earlier deposits.

HUMAN BONE

Any human remains present would not normally be excavated at the stage of an evaluation, but would be protected and preserved in situ, on advice from SCC AS-CT. Should human remains be discovered and be required to be removed, the coroner will be informed and a licence from the Ministry of Justice sought immediately; both the client and the monitoring officer will also be informed. Any excavation of human remains at the stage of an evaluation would only be carried out following advice from SCC AS-CT. Excavators would be made aware, and comply with, provisions of Section 25 of the Burial Act of 1857 and pay due attention to the requirements of Health & Safety.

ANIMAL BONE

Animal bone is one of the principal indicators of diet. As with pottery the excavators will be alert to the distinction of primary and secondary deposits. It will also be important that the bone assemblages are derived from dateable contexts.

ENVIRONMENTAL SAMPLING

The sampling will adhere to the guidelines prepared by Drs Peter Murphy and Patricia Wiltshire, and the specialist will make his/her results known to Helen Chappell who co-ordinates environmental archaeology in the region on behalf of English Heritage. The project will also accord with the recent guidelines of the English Heritage document *Environmental Archaeology, a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, Centre for Archaeology Guidelines 2011.

Provision will be made for the sampling of appropriate materials for specialist and/or scientific analysis (e.g. radiocarbon dating, environmental analysis). The location of samples will be 3-dimensionally recorded and they will also be shown on an appropriate plan. AS has its own environmental sampling

equipment (including a pump and transformer) and, if practical, provision will be made to process the soil samples during the fieldwork stage of the project.

If waterlogged remains are found advice on sampling will be obtained on site from Dr Rob Scaife. Dr Rob Scaife and AS will seek advice from the EH Regional Scientific Advisor if significant environmental remains are found.

The study of environmental archaeology seeks to understand the local and near-local environment of the site in relation to phases of human activity and as such is an important and integral part of any archaeological study. .

Environmental remains, both faunal and botanical, along with pedological and sedimentological analyses may be used to understand the environment and the impact of human activity.

There may be a potential for the recovery of a range of environmental remains (ecofacts) from which data pertaining to past environments, land use and agricultural economy should be forthcoming.

Sampling strategies on evaluations aim to determine the potential of the site for both biological remains (plants, small vertebrates) and small sized artefacts which would otherwise not be collected by hand. The number/range of samples taken will represent the range of feature types encountered, but with an aim of at least three samples from each feature type.

For plant remains, the samples taken at evaluation stage would aim to characterise:

- The range of preservation types (charred, mineral-replaced, waterlogged) and their quality
- Any differences in remains from dated/undated features
- Variation between different feature types/areas

To realise the potential of the environmental material encountered, a range of specialists from different disciplines is likely to be required. The ultimate goal will be the production of an interdisciplinary environmental study which can be of value to an understanding of, and integrated with, the archaeology.

Organic remains may allow study of the contemporary landscape (occupation/industrial/agricultural impact and land use) and also changes after the abandonment of the site.

The nature of the environmental evidence

Aspects of sampling and analysis may be divided into four broad categories; faunal remains, botanical remains, soils/sediments and radiocarbon dating measurements.

a) Faunal remains: These comprise bones of macro and microfauna, birds, molluscs and insects.

a.i) Bones: The study of the animal bone remains, in particular domestic mammals, domestic birds and marine fish will enhance understanding of the development of the settlement in terms of the local economy and also its wider influence through trade. The study of the small animal bones will provide insight into the immediate habitat of any settlement.

The areas of study covered may include all of the domestic mammal and bird species, wild and harvested mammal, birds, marine and fresh water fish in addition to the small mammals, non-harvest birds, reptiles and amphibia.

Domestic mammalian stock, domestic birds and harvest fish

The domestic animal bone will provide insight into the different phases of development of any occupation and how the population dealt with the everyday aspect of managing and utilising all aspects of the animal resource.

Small animal bones

Archaeological excavation has a wide role in understanding humans' effect on the countryside, the modifications to which have in turn affected and continue to affect their own existence. Small animals provide information about changing habitats and thereby about human impact on the local environment.

a.ii) Molluscs: Freshwater and terrestrial molluscs may be present in ditch and pit contexts which are encountered. Sampling and examination of molluscan assemblages if found will provide information on the local site environment including environment of deposition.

a.iii) Insects: If suitable waterlogged contexts (pit, pond and ditch fills) are encountered (which can potentially be expected to be encountered on the project), sampling and assessment will be carried out in conjunction with the analysis of waterlogged plant remains (primarily seeds) and molluscs. Insect data may provide information on local site environment (cleanliness etc.) as well as proxies for climate and vegetation communities.

b) Botanical remains: Sampling for seeds, wood, pollen and seeds are the essential elements which will be considered. The former are most likely to be charred but possibly also waterlogged should any wells/ponds be encountered.

b.i) Pollen analysis: Sampling and analysis of the primary fills and any stabilisation horizons in ditch and pit contexts which may provide information on the immediate vegetation environment including aspects of agriculture, food and subsistence. These data will be integrated with seed analysis.

b.ii) Seeds: It is anticipated that evidence of cultivated crops, crop processing debris and associated weed floras will be present in ditches and

pits. If waterlogged features/sediments are encountered (for example, wells/ponds) these will be sampled in relation to other environmental elements where appropriate (particularly pollen, molluscs and possibly insects).

c) Soils and Sediments: Characterisation of the range of sediments, soils and the archaeological deposits are regarded as crucial to and an integral part of all other aspects of environmental sampling. This is to afford primary information on the nature and possible origins of the material sampled. It is anticipated that a range of 'on-site' descriptions will be made and subsequent detailed description and analysis of the principal monolith and bulk samples obtained for other aspects of the environmental investigation. Where considered necessary, laboratory analyses such as loss on ignition and particle size may also be undertaken. A geoarchaeologist will be invited to visit the site as necessary to advise on sampling.

d) Radiocarbon dating: Archaeological/artifactual dating may be possible for most of the contexts examined, but radiocarbon dating should not be ruled out

Sampling strategies

Provision will be made by the environmental co-ordinator that suitable material for analysis will be obtained. Samples will be obtained which as far as possible will meet the requirements of the assessment and any subsequent analysis.

a) Soil and Sediments: Samples taken will be examined in detail in the laboratory. An overall assessment of potential will be carried out. Analysis of particle size and loss on ignition, if required would be undertaken as part of full analysis if assessment demonstrates that such studies would be of value.

b) Pollen Analysis: Contexts which require sampling may include stabilisation horizons and the primary fills of the pits and ditches, and possibly organic well/pond fills. It is anticipated that in some cases this will be carried out in conjunction with sampling for other environmental elements, such as plant macrofossils, where these are also felt to be of potential.

c) Plant Macrofossils: Principal contexts will be sampled directly from the excavation for seeds and associated plant remains. It is anticipated that primarily charred remains will be recovered, although provision for any waterlogged sequences will also be made (see below). Sampling for the former will, where possible (that is, avoiding contamination) comprise samples of an average of 40-60 litres which will be floated in the AS facilities for extraction of charred plant remains. Both the flot and residues will be kept for assessment of potential and stored for any subsequent detailed analysis. The residues will also be examined for artifactual remains and also for any faunal remains present (cf. molluscs). Where pit, ditch, well or pond sediments are found to contain waterlogged sediments, principal contexts will be sampled for seeds and insect remains. Standard 5 litre+ samples will be

taken which may be sub-sampled in the laboratory for seed remains if the material is found to be especially rich. The full sample will provide sufficient material for insect assessment and analysis.

d) Bones: Predicting exactly how much of what will be yielded by the excavation is clearly very difficult prior to excavation and it is proposed that in order to efficiently target animal bone recovery there should be a system of direct feedback from the archaeozoologist to the site staff during the excavation, allowing fine tuning of the excavation strategy to concentrate on the recovery of animal bones from features which have the highest potential. This will also allow the faunal remains to materially add to the interpretation as the excavation proceeds. Liaison with other environmental specialists will need to take place in order to produce a complete interdisciplinary study during this phase of activity. In addition, this feedback will aid effective targeting of the post-excavation analysis.

e) Insects: If contexts having potential for insect preservation are found, samples will be taken in conjunction with waterlogged plant macrofossils. Samples of 5 litres will suffice for analysis and will be sampled adjacent to waterlogged seed samples and pollen; or where insufficient context material is available provision will be made for exchange of material between specialists.

f) Molluscs: Terrestrial and freshwater molluscs. Samples will be taken from a column from suitable ditches. Pits may be sampled, based on the advice of the Environmental Consultant and / or English Heritage Regional Advisor. Provision will also be made for molluscs obtained from other sampling aspects (seeds) to be examined and/or kept for future requirements.

g) Archiving: Environmental remains obtained should be stored in conditions appropriate for analysis in the short to medium term, that is giving the ability for full analysis at a later date without any degradation of samples being analysed. The results will be maintained as an archive at AS and supplied to the EH regional co-ordinator as requested.

Waterlogged Deposits/Remains

Should waterlogged deposits (such as wells/deep ditches) be encountered, provision has been made for controlled hand excavation and sampling. Dr Rob Scaife will visit to advise of sampling as required, and AS will take monolith samples as necessary for the recovery of palaeoenvironmental information and dating evidence.

Scientific/Absolute Dating

- Samples will be obtained for potential scientific/absolute dating as appropriate (eg Carbon-14).

Provision will be made for the sampling of appropriate materials for specialist and/or scientific analysis (e.g. radiocarbon dating, environmental analysis). The location of samples will be 3-dimensionally recorded and they will also be shown on an appropriate plan. AS has its own environmental sampling equipment (including a pump and transformer) and, if practical, provision will be made to process the soil samples during the fieldwork stage of the project.

If waterlogged remains are found they will be sampled by Dr Rob Scaife. Dr Rob Scaife and AS will seek advice from the EH Regional Scientific Advisor (Helen Chappell) if significant environmental remains are found.

FINDS PROCESSING

The project director will have overall responsibility for the finds and will liaise with AS's own finds personnel and the relevant specialists. A person with particular responsibility for finds on site will be appointed for the excavation. The person will ensure that the finds are properly labelled and packaged on site for transportation to AS's field base. The finds processing will take place in tandem with the excavations and will be under the supervision of AS's Finds Officer.

The finds processing will entail first aid conservation, cleaning (if appropriate), marking (if appropriate), categorising, bagging, labelling, boxing and basic cataloguing (the compilation of a Small Finds Catalogue and quantification of bulk finds) i.e. such that the finds are ready to be made available to the specialists. The Finds Officer, having been advised by the Project Officer and relevant specialists, will select material for conservation. AS's Finds Officer, in conjunction with the Project Officer, will arrange for the specialists to view the finds for the purpose of report writing.

APPENDIX 2

ARCHAEOLOGICAL SOLUTIONS LIMITED: PROFILES OF STAFF & SPECIALISTS

DIRECTOR

Claire Halpin BA MifA

Qualifications: Archaeology & History BA Hons (1974-77).

Oxford University Dept for External Studies In-Service Course (1979-1980).

Member of Institute of Archaeologists since 1985: IFA Council member (1989-1993)

Experience: Claire has 25 years' experience in field archaeology, working with the Oxford Archaeological Unit and English Heritage's Central Excavation Unit (now the Centre for Archaeology). She has directed several major excavations (e.g. Barrow Hills, Oxfordshire, and Irthlingborough Barrow Cemetery, Northants), and is the author of many excavation reports e.g. St Ebbe's, Oxford: *Oxoniensia* 49 (1984) and 54 (1989). Claire moved into the senior management of field archaeological projects with Hertfordshire Archaeological Trust (HAT) in 1990, and she was appointed Manager of HAT in 1996. From the mid 90s HAT has enlarged its staff complement and extended its range of skills. In July 2003 HAT was wound up and Archaeological Solutions was formed. The latter maintains the same staff complement and services as before. AS undertakes the full range of archaeological services nationwide.

DIRECTOR

Tom McDonald MifA

Qualifications: Member of the IfA

Experience: Tom has twenty years' experience in field archaeology, working for the North-Eastern Archaeological Unit (1984-1985), Buckinghamshire County Museum (1985), English Heritage (Stanwick Roman villa (1985-87) and Irthlingborough barrow excavations, Northamptonshire (1987)), and the Museum of London on the Royal Mint excavations (1986-7), and as a Senior Archaeologist with the latter (1987-Dec 1990). Tom joined HAT at the start of 1991, directing several major multi-period excavations, including excavations in advance of the A41 Kings Langley and Berkhamsted bypasses, the A414 Cole Green bypass, and a substantial residential development at Thorley, Bishop's Stortford. He is the author of many excavation reports, exhibitions etc. Tom is AS's Health and Safety Officer and is responsible for site management, IT and CAD. He specialises in prehistoric and urban archaeology, and is a Lithics Specialist.

OFFICE MANAGER

Rose Flowers

Experience: Rose has a very wide range of book-keeping skills developed over many years of employment with a range of companies, principally Rosier Distribution Ltd, Harlow (now part of Securicor) where she managed eight accounts staff. She has a good working knowledge of both accounting software and Microsoft Office.

OFFICE ADMINISTRATOR

Sarah Powell

Experience: Sarah is an experienced and efficient administrative assistant with more than ten years experience of working in a variety of office environments. She is IT literate and proficient in the use of Microsoft Word, particularly Microsoft Excel. She has completed NVQ 2 & 3 in Administration and Office Skills. She recently attended and completed a course in Microsoft Excel – Advanced Level.

SENIOR PROJECTS MANAGER

Jon Murray BA MifA

Qualifications: History with Landscape Archaeology BA Hons (1985-1988).

Experience: Jon has been employed by HAT (now AS) continually since 1989, attaining the position of Senior Projects Manager. Jon has conducted numerous archaeological investigations in a variety of situations, dealing with remains from all periods, throughout London and the South East, East Anglia, the South and Midlands. He is fluent in the execution of (and now project-manages) desk-based assessments/EIAs, historic building surveys (for instance the recording of the Royal Gunpowder Mills at Waltham Abbey prior to its rebirth as a visitor facility), earthwork and landscape surveys, all types of evaluations/excavations (urban and rural) and environmental archaeological investigation (working closely with Dr Rob Scaife), preparing many hundreds of archaeological reports dating back to 1992. Jon has also prepared numerous publications; in particular the nationally-important Saxon site at Gamlingay, Cambridgeshire (*Anglo-Saxon Studies in Archaeology & History*). Other projects published include Dean's Yard, Westminster (*Medieval Archaeology*), Brackley (*Northamptonshire Archaeology*), and a medieval cemetery in Haverhill he excavated in 1997 (*Proceedings of the Suffolk Institute of Archaeology*). Jon is a member of the senior management team, principally preparing specifications/tenders, co-ordinating and managing the field teams. He also has extensive experience in preparing and supporting applications for Scheduled Monument Consent/Listed Building Consent

**PROJECTS MANAGER
(FIELD & ARCHIVES)**

Martin Brook BA

Qualifications: University of Leicester BA (Hons) Archaeology (2003 -2006)

Experience: Martin worked on archaeological excavations throughout his university career in and around Leicester including two seasons excavating a medieval abbey kitchen at Abbey Park, Leicester with ULAS. He specialised in Iron Age funeral traditions and grave goods for his 3rd year dissertation advancing his skills in museum research, database use and academic correspondence. He joined AS in September 2006 as an excavator involved in projects such as Earsham Bronze Age Barrow and cremation site. From May 2007, Martin has moved across to the Post-Excavation team to become Assistant Archives Officer, and thereafter Martin has returned to fieldwork as a Supervisor before being promoted to project management in 2009

PROJECT OFFICER

Zbigniew Pozorski MA

Qualifications: University of Wroclaw, Poland, Archaeology (1995-2000, MA 2003)

Experience: Zbigniew has archaeological experience dating from 1995 when as a student he joined an academic group of excavators. He was involved in numerous archaeological projects throughout the Lower Silesia region in southwest Poland and a number of projects in old town of Wroclaw. During his university years he specialized in medieval urban archaeology. He had his own research project working on an early/high medieval stronghold in Pietrzykow. He was a member of a University team which located and excavated an unknown high medieval castle in Wierzbna, Poland. Zbigniew has worked for archaeological contractors in Poland on several projects as a supervisor where he gained experience in all types of evaluations and excavations in urban and rural areas. Recently he worked in Ireland where he completed two large long-term projects for Headland Archaeology Ltd. He joined AS in January 2008 as a Project Officer.

Zbigniew is qualified in the Construction Skills Certification Scheme (CSCS) and is a qualified in First Aid at Work (St Johns Ambulance).

SUPERVISOR**Gareth Barlow MSc**

Qualifications: University of Sheffield, MSc Environmental Archaeology & Palaeoeconomy (2002-2003)

King Alfred's College, Winchester, Archaeology BA (Hons) (1999-2002)

Experience: Gareth worked on a number of excavations in Cambridgeshire before pursuing his degree studies, and worked on many archaeological projects across the UK during his university days. Gareth joined AS in 2003 and has worked on numerous archaeological projects throughout the South East and East Anglia with AS. Gareth was promoted to Supervisor in the Summer 2007.

Gareth is qualified in the Construction Skills Certification Scheme (CSCS) and is a qualified in First Aid at Work (St Johns Ambulance).

SUPERVISOR**Stephen Quinn BSc**

Stephen Quinn joined AS as a Site Assistant 2009, and in 2012 was promoted to the role of Supervisor. After graduating in Archaeology and Palaeoecology at Queens University Belfast, he worked for several commercial archaeology units including on Neolithic settlement and burial sites and a Bronze Age henge monument in Northern Ireland; early industrial pottery productions sites in Glasgow, and urban Roman excavation in Lincoln. In 2012 Stephen has been heading AS' excavation of a Roman fenland settlement site at Soham, Cambridgeshire.

Steve is qualified in the Construction Skills Certification Scheme (CSCS) and is a qualified in First Aid at Work (St Johns Ambulance).

SUPERVISOR**Kamil Orzechowski BA, MA**

Kamil Orzechowski joined AS in 2012, as an experienced field archaeologist after spending five years in various commercial archaeology units working on large-scale construction projects including railways and pipelines. Before becoming a field archaeologist, Kamil graduated from the Institute of Ethnology and Cultural Anthropology, Adam Mickiewicz University, Poznan, Poland.

Kamil is qualified in the Construction Skills Certification Scheme (CSCS).

SUPERVISOR**Samuel Egan BSc**

Samuel Egan joined AS in 2012 as an experienced field archaeologist after working on a range of excavations in Northamptonshire including a large-scale road project, community projects, evaluation and excavation projects, and geophysical surveys. Samuel graduated from Bournemouth University with two degrees: Fdsc Field Archaeology and BSc (hons.) Field Archaeology.

Samuel is qualified in the Construction Skills Certification Scheme (CSCS) and is a qualified in First Aid at Work (Red Cross).

SUPERVISOR**Laszlo Lichtenstein MA, MSc, PhD**

Laszlo Lichtenstein joined AS in 2012 as a Supervisor, highly experienced in a range of archaeological project management, field archaeology and archaeozoology. Laszlo has extensive experience spanning Hungary, and later

Northamptonshire, including directing evaluation and excavation projects; managing project set-up including written schemes of investigation, desk-based assessments and geophysical survey; and post-excavation analysis. Laszlo completed his academic studies at University of Szeged, Hungary, including his PhD on geophysical and archaeological investigations of late Bronze Age to early Iron Age settlements in south-east Hungary, and has published numerous articles on his areas of research.

Laszlo is qualified in the Construction Skills Certification Scheme (CSCS) and is a qualified in First Aid at Work.

PROJECT OFFICER

(DESK-BASED ASSESSMENTS)

Kate Higgs MA (Oxon)

Qualifications: University of Oxford, St Hilda's College
Archaeology & Anthropology MA (Oxon) (2001-2004)

Experience: Kate has archaeological experience dating from 1999, having taken part in clearance, surveying and recording of stone circles in the Penwith area of Cornwall. During the same period, she also assisted in compiling a database of archaeological and anthropological artefacts from Papua New Guinea, which were held in Scottish museums. Kate has varied archaeological experience from her years at Oxford University, including participating in excavations at a Roman amphitheatre and an early church at Marcham/ Frilford in Oxfordshire, with the Bamburgh Castle Research Project in Northumberland, which also entailed the excavation of human remains at a Saxon cemetery, and also excavating, recording and drawing a Neolithic chambered tomb at Prissé, France. Kate has also worked in the environmental laboratory at the Museum of Natural History in Oxford, and as a finds processor for Oxford's Institute of Archaeology. Since joining AS in November 2004, Kate has researched and authored a variety of reports, concentrating on desk-based assessments in advance of archaeological work and historic building recording.

**ASSISTANT PROJECTS MANAGER
(POST-EXCAVATION)**

Andrew Newton MPhil PIFA

Qualifications: University of Bradford, MPhil (2002-04)

University of Bradford, BSc (Hons) Archaeology (1998-2002)

University of Bradford, Dip Professional Archaeological
Studies (2002)

Experience: Andrew has carried out geophysical surveys for GeoQuest Associates on sites throughout the UK and has worked as a site assistant with BUFAU. During 2001 he worked as a researcher for the Yorkshire Dales Hunter-Gatherer Research Project, a University of Bradford and Michigan State University joint research programme, and has carried out voluntary work with the curatorial staff at Beamish Museum in County Durham. Andrew is a member of the Society of Antiquaries of Newcastle-upon-Tyne and a Practitioner Member of the Institute for Archaeologists. Since joining AS in early Summer 2005, as a Project Officer writing desk-based assessments, Andrew has gained considerable experience in post-excavation work. His principal role with AS is conducting post-excavation research and authoring site reports for publication. Significant post-excavation projects Andrew has been responsible for include the Ingham Quarry Extension, Fornham St. Genevieve, Suffolk – a site with large Iron Age pit clusters arranged around a possible wetland area; the late Bronze Age to early Iron Age enclosure and early Saxon cremation cemetery at the Chalet Site, Heybridge, Essex; and, Church Street, St Neots, Cambridgeshire, an excavation which identified the continuation of the Saxon settlement previously investigated by Peter Addyman in the 1960s. Andrew also writes and co-ordinates Environmental Impact Assessments and has worked on a variety of such projects across southern and eastern England. In addition to his research responsibilities Andrew undertakes outreach and publicity work and carries out some fieldwork.

**PROJECT OFFICER
(POST-EXCAVATION)**

Antony Mustchin BSc MSc DipPAS

Qualifications: University of Bradford BSc (Hons) Bioarchaeology (1999-
2003)

University of Bradford MSc Biological Archaeology (2004- 2005)

University of Bradford Diploma in Professional Archaeological
Studies (2003)

Experience: Antony has 11 years' experience in field archaeology, gained during his higher education and in the professional sector. Commercially in the UK, Antony has worked for Archaeology South East (2003), York Archaeological Trust (2004) and Special Archaeological Services (2003). He has also undertaken a six-month professional placement as Assistant SMR Officer/ Development Control Officer with Kent County Council (2001-2002). Antony is part-way through writing up a PhD on Viking Age demographics, a long-term academic interest that has led to his gaining considerable research excavation experience across the North Atlantic. He has worked for projects and organisations including the Old Scatness & Jarlshof Environs Project, Shetland (2000-2003), the Viking Unst Project, Shetland (2006-2007), the Heart of the Atlantic Project/ Føroya Fornminnisavni, Faroe Islands (2006-2008) and City University New York/ National Museum of Denmark/ Greenland National Museum and Archives, Greenland (2006 & 2010). Shortly before joining Archaeological Solutions in November 2011, Antony spent three years working for the Independent Commission for the Location of Victims Remains, assisting in the search for and forensic recovery of "the remains of victims of paramilitary violence ("The Disappeared") who were murdered and buried in secret arising from the conflict in Northern Ireland". Antony has a broad experience of

fieldwork and post-excavation practice including specialist (archaeofauna), teaching, supervisory and directing-level posts.

**POTTERY, LITHICS AND
CBM RESEARCHER**

Andrew Peachey BA MfA

Qualifications: University of Reading BA Hons, Archaeology and History
(1998-2001)

Experience: Andrew joined AS (formerly HAT) in 2002 as a pottery researcher, and rapidly expanded into researching CBM and lithics. Andrew specialises in prehistoric and Roman pottery and has worked on numerous substantial assemblages, principally from across East Anglia but also from southern England. Recent projects have included a Neolithic site at Coxford, Norfolk, an early Bronze Age domestic site at Shropham, Norfolk, late Bronze Age material from Panshanger, Hertfordshire, middle Iron Age pit clusters at Ingham, Suffolk and an Iron Age and early Roman riverside site at Dernford, Cambridgeshire. Andrew has worked on important Roman kiln assemblages, including a Nar Valley ware production site at East Winch Norfolk, a face-pot producing kiln at Hadham, Hertfordshire and is currently researching early Roman Horningsea ware kilns at Waterbeach, Cambridgeshire. Andrew is an enthusiastic member of the Study Group for Roman Pottery, and also undertakes pottery and lithics analysis as an 'external' specialist for a range of archaeological units and local societies in the south of England.

POTTERY RESEARCHER

Peter Thompson MA

Qualifications: University of Bristol BA (Hons), Archaeology (1995-1998)
University of Bristol MA; Landscape Archaeology (1998- 1999)

Experience: As a student, Peter participated in a number of projects, including the excavation of a Cistercian monastery cemetery in Gascony and surveying an Iron Age promontory hillfort in Somerset. Peter has two years excavation experience with the Bath Archaeological Trust and Bristol and Region Archaeological Services which includes working on a medieval manor house and a post-medieval glass furnace site of national importance. Peter joined HAT (now AS) in 2002 to specialise in Iron Age, Saxon and Medieval pottery research and has also produced desk-based assessments. Pottery reports include an early Iron pit assemblage and three complete Early Anglo-Saxon accessory vessels from a cemetery in Dartford, Kent.

PROJECT OFFICER**(OSTEOARCHAEOLOGY)****Julia Cussans PhD***Qualifications:* University of Bradford, PhD (2002-2010)

University of Bradford, BSc (Hons) Bioarchaeology (1997-2001)

University of Bradford, Dip. Professional Archaeological Studies (2001)

Experience: Julia has c. 12 years of archaeozoological experience. Whilst undertaking her part time PhD she also worked as a specialist on a variety of projects in northern Britain including Old Scatness (Shetland), Broxmouth Iron Age Hillfort and Binchester Roman Fort. Additionally Julia has extensive field experience and has held lead roles in excavations in Shetland and the Faroe Islands including, Old Scatness, a large multi-period settlement centred on an Iron Age Broch; the Viking Unst Project, an examination of Viking and Norse houses on Britain's most northerly isle; the Laggan Tormore Pipeline (Firths Voe), a Neolithic house site in Shetland; the Heart of the Atlantic Project, an examination of Viking settlement in the Faroes and Við Kirkjugarð, an early Viking site on Sanday, Faroe Islands. Early on in her career Julia also excavated at Sedgeford, Norfolk as part of SHARP and in Pompeii, Italy as part of the Anglo-American Project in Pompeii. Since joining AS in October 2011 Julia has worked on animal bone assemblages from Beck Row, a Roman villa site at Mildenhall, Suffolk and Sawtry, an Iron Age, fen edge site in Cambridgeshire. Julia is a full and active member of the International Council for Archaeozoology, the Professional Zooarchaeology Group and the Association for Environmental Archaeology.

ENVIRONMENTAL ARCHAEOLOGIST**Dr John Summers***Qualifications:* 2006-2010: PhD "The Architecture of Food" (University of Bradford)

2005-2006: MSc Biological Archaeology (University of Bradford)

2001-2005: BSc Hons. Bioarchaeology (University of Bradford)

Experience: John is an archaeobotanist with a primary specialism in the analysis of carbonised plant macrofossils and charcoal. Prior to joining Archaeological Solutions, John worked primarily in Atlantic Scotland. His research interests involve using archaeobotanical data in combination with other archaeological and palaeoeconomic information to address cultural and economic research questions. John has made contributions to a number of large research projects in Atlantic Scotland, including the Old Scatness and Jarlshof Environs Project (University of Bradford), the Viking Unst Project (University of Bradford) and publication work for Bornais Mound 1 and Mound 2 (Cardiff University). He has also worked with plant remains from Thruxton Roman Villa, Hampshire, as part of the Danebury Roman Environs Project (Oxford University/ English Heritage). John's role at AS is to analyse and report on assemblages of plant macro-remains from environmental samples and provide support and advice regarding environmental sampling regimes and sample processing. John is a member of the Association for Environmental Archaeology.

SENIOR GRAPHICS OFFICER**Kathren Henry**

Experience: Kathren has twenty-five years experience in archaeology, working as a planning supervisor on sites from prehistoric to late medieval date, including urban sites in London and rural sites in France/Italy, working for the Greater Manchester Archaeological Unit, Passmore Edwards Museum, DGLA and Central Excavation Unit of English Heritage (at Stanwick and Irthlingborough, Northamptonshire). She has worked with AS (formerly HAT) since 1992, becoming Senior Graphics Officer. Kathren is AS's principal photographer, specializing in historic building survey, and she manages AS's photographic equipment and dark room. She is in charge of AS's Graphics Department, managing computerised artwork and report production. Kathren is also the principal historic building surveyor/illustrator, producing on-site and off-site plans, elevations and sections.

HISTORIC BUILDING RECORDING

Tansy Collins BSc

Qualifications: University of Sheffield, Archaeological Sciences BSc (Hons) (1999-2002)

Experience: Tansy's archaeological experience has been gained on diverse sites throughout England, Ireland, Scotland and Wales. Tansy joined AS in 2004 where she developed skills in graphics, backed by her grasp of archaeological interpretation and on-site experience, to produce hand drawn illustrations of pottery, and digital illustrations using a variety of packages such as AutoCAD, Corel Draw and Adobe Illustrator. She joined the historic buildings team in 2005 in order to carry out both drawn and photographic surveys of historic buildings before combining these skills with authoring historic building reports in 2006. Since then Tansy has authored numerous such reports for a wide range of building types; from vernacular to domestic architecture, both timber-framed and brick built with date ranges varying from the medieval period to the 20th century. These projects include a number of regionally and nationally significant buildings, for example a previously unrecognised medieval aisled barn belonging to a small group of nationally important agricultural buildings, one of the earliest surviving domestic timber-framed houses in Hertfordshire, and a Cambridgeshire house retaining formerly hidden 17th century decorative paint schemes. Larger projects include The King Edward VII Sanatorium in Sussex, RAF Bentley Priory in London as well as the Grade I Listed Balls Park mansion in Hertfordshire.

HISTORIC BUILDING RECORDING

Lisa Smith BA

Qualifications: University of York, BA Archaeology (1998-2001)

Experience: Lisa has nine years archaeological experience undertaken mainly in the north of England previously working as a senior site assistant for Field Archaeology Specialists in York on both rural and urban sites as well as Castle Sinclair Girmigoe and Tarbat in Scotland. Prior to working for FAS Lisa was involved in various excavation projects for Oxford Archaeology North and Archaeological Services, University of Durham. Lisa joined AS as a supervisor in January 2008 and in November 2009 transferred to historic building recording and has since worked on a variety of buildings dating from the medieval period onwards, working closely with external consultant Dr Lee Prosser.

GRAPHICS OFFICER

Rosanna Price BSc

Qualifications: University of Kent, Medical Anthropology BSc (Hons) (2005 - 2008)

Experience: Rosanna's interests have always revolved around art and human history, and she has combined these throughout her work and education. During her degree she specialised in Osteoarchaeology and Palaeopathology, and personally instigated the University's photographic database of human remains. This experience gained her the post of Osteoarchaeologist at Kent Osteological Research and Analysis in early 2009, where she worked on a number of human bone collections including the Thanet Earth Skeletons. In January 2010 she joined AS as a Finds and Archives assistant, and by the summer had achieved a new role as graphics officer. In her current position Rosanna uses a range of computer programmes, such as AutoCAD, Adobe Illustrator and CorelDraw to produce digital figures and finds illustrations. These accompany a wide range of archaeological reports, from desk-based assessments and interim reports through to publication standard.

GRAPHICS OFFICER

Charlotte Davies MPhil

Qualifications: University of Exeter, Archaeology BA (Hons) (2004-2007)
Surrey Institute of Art & Design, BTEC Foundation Diploma in Art & Design (2003-2004)
University of Cambridge, Archaeology (Heritage & Museum Studies) MPhil (2010-2011).

Experience: Charlotte has always had a passionate interest in art and archaeology, and has combined these interests in her higher education. Charlotte worked on archaeological excavations in South Dakota, USA, before joining AS in 2007 as part of the graphics team. Charlotte's role within AS comprises the production of a wide range of high quality figures and illustrations for reports, from desk-based assessments and interim reports through to publication. Charlotte became a member of the Association of Archaeological Illustrators and Surveyors in 2009 (this subsequently became incorporated into the Institute for Archaeologists), and in 2010 undertook a masters degree in archaeology at the University of Cambridge.

FINDS AND ARCHIVE ASSISTANT

Adam Leigh

Experience: Adam joined AS in January 2012. In his time with the company he has helped process hundreds of finds from a variety of sites going on to concord them. Adam has helped prepare a large number of sites for deposition with museums making sure that the finds are prepared in strict accordance with the guidelines and requirements laid out by the receiving museum.

ASSISTANT ARCHIVES OFFICER

Karen Cleary

Experience: Karen started her administrative career as Youth Training Administrator for a training company (TSMA Ltd) in 1993, where she provided administrative support for NVQ Assessors' of trainees and apprentices on the youth training scheme and in work placements they'd helped set up. Amongst her administrative duties she was principally in charge of preparing the Training Credits Claims and sending off for government funding. She gained NVQ's Level's 2 and 3 in Administration whilst working in this role. Karen started out with AS as Office Assistant in February 2009 and within a few months was promoted to Archives Assistant. Principally her role involves the preparation of Archaeological archives for long term deposition with museums. She has developed a good understanding of the preparation process and follows each individual museum's guidelines closely. She has a good working knowledge of Microsoft Office and is competent with *FileZilla*- Digital File Transfer software and *Fastsum*-Checksum Creation software.

ARCHAEOLOGICAL SOLUTIONS: PRINCIPAL SPECIALISTS

| | |
|------------------------------|---|
| GEOPHYSICAL SURVEYS | Stratascan Ltd |
| AIR PHOTOGRAPHIC ASSESSMENTS | Air Photo Services |
| PHOTOGRAPHIC SURVEYS | Ms K Henry |
| PREHISTORIC POTTERY | Mr A Peachey |
| ROMAN POTTERY | Mr A Peachey |
| SAXON & MEDIEVAL POTTERY | Mr P Thompson |
| POST-MEDIEVAL POTTERY | Mr P Thompson |
| FLINT | Mr A Peachey |
| GLASS | H Cool |
| COINS | British Museum, Dept of Coins & Medals |
| METALWORK & LEATHER | Ms Q Mould, Ms N Crummy |
| SLAG | Ms J Cowgill |
| ANIMAL BONE | Dr J Cussans |
| HUMAN BONE: | Ms J Curl |
| ENVIRONMENTAL CO-ORDINATOR | Dr R Scaife |
| POLLEN AND SEEDS: | Dr R Scaife |
| CHARCOAL/WOOD | Dr J Summers |
| SOIL MICROMORPHOLOGY | Dr R MacPhail, Dr C French |
| CARBON-14 DATING: | English Heritage Ancient Monuments Laboratory (for advice). |
| CONSERVATION | University of Leicester |

APPENDIX 3

GEOPHYSICAL SURVEY METHOD STATEMENT

1. Site location

Land off Lime Avenue, Oulton, Suffolk

2

Detailed magnetic survey

Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.2 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. 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.

3. Methodology for the collection of the data

Detailed magnetic survey

The detailed magnetic survey will be carried out using a Bartington Grad 601-2. The instrument consists of two fluxgates mounted 1m vertically apart, and very accurately aligned to nullify the effects of the earth's magnetic field. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background.

Readings will be taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid. Data collection requires a temporary grid to be established across the survey area using wooden pegs at 30m intervals.

The Grad 601-2 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.

One grid will be selected and surveyed twice to demonstrate the repeatability of the technique. A reasonable time delay will be left before the re-survey.

4. *Processing, analysis, presentation and interpretation of the data*

Processing of the data will be carried out using specialist software – either *Geoplot 3* or *ArchaeoSurveyor*. 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.

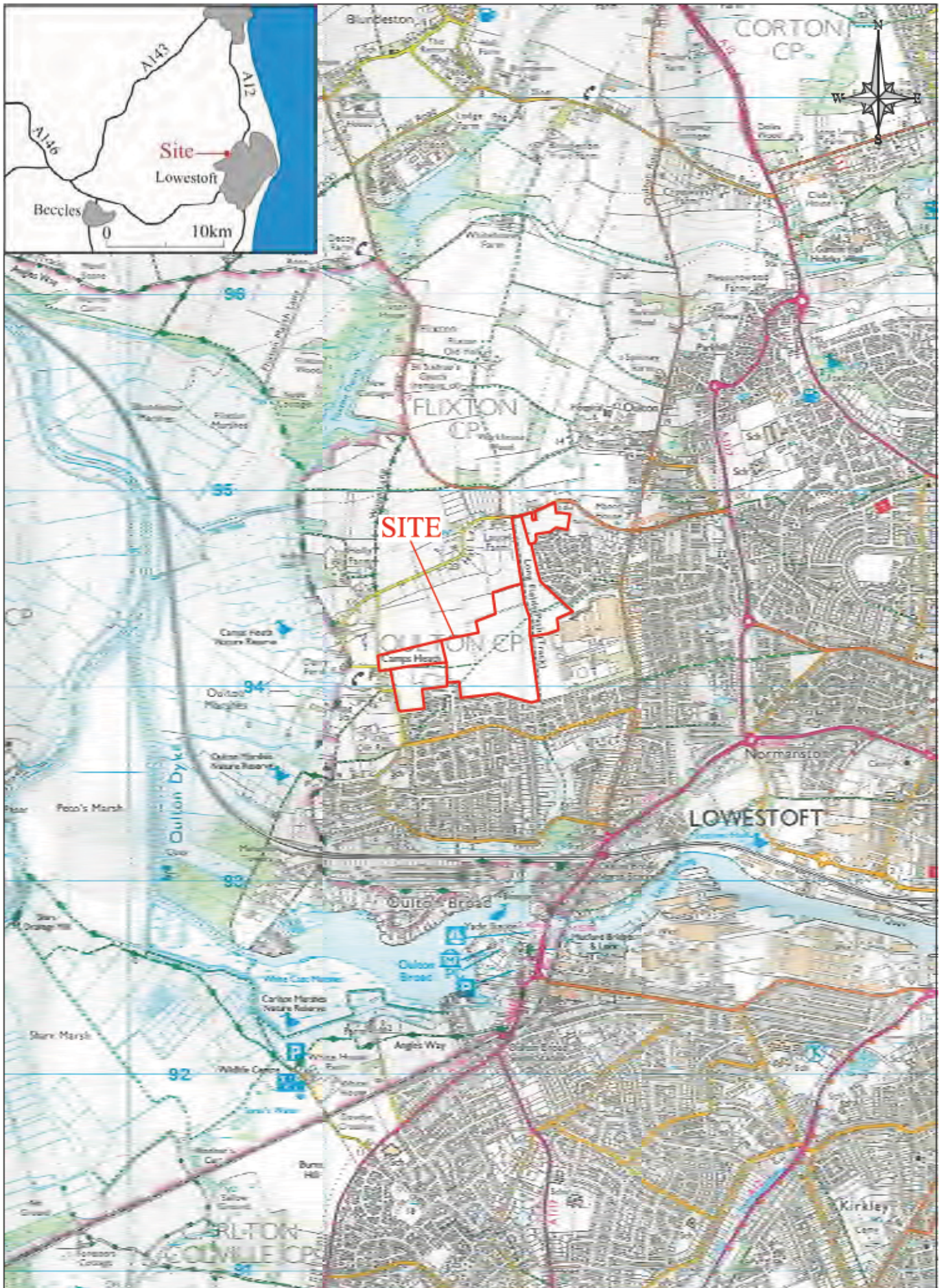
The presentation of the data for the survey will be a print-out of the raw data both as grey scale and trace plots together with a grey scale plot of the processed data. Magnetic anomalies will be identified and plotted onto the 'Abstraction and Interpretation of Anomalies' drawing for the site.

5. Reporting

The report for the survey will comprise a written section describing the background to the survey, the methodologies used and a discussion of the results. The text will be illustrated using plots of the results using CAD to overlay the results and interpretations over the base mapping. The format for these drawings will either be A3 or A1 depending on the size and configuration of the survey areas. It will include an appendix showing the results of the control grid surveyed twice.

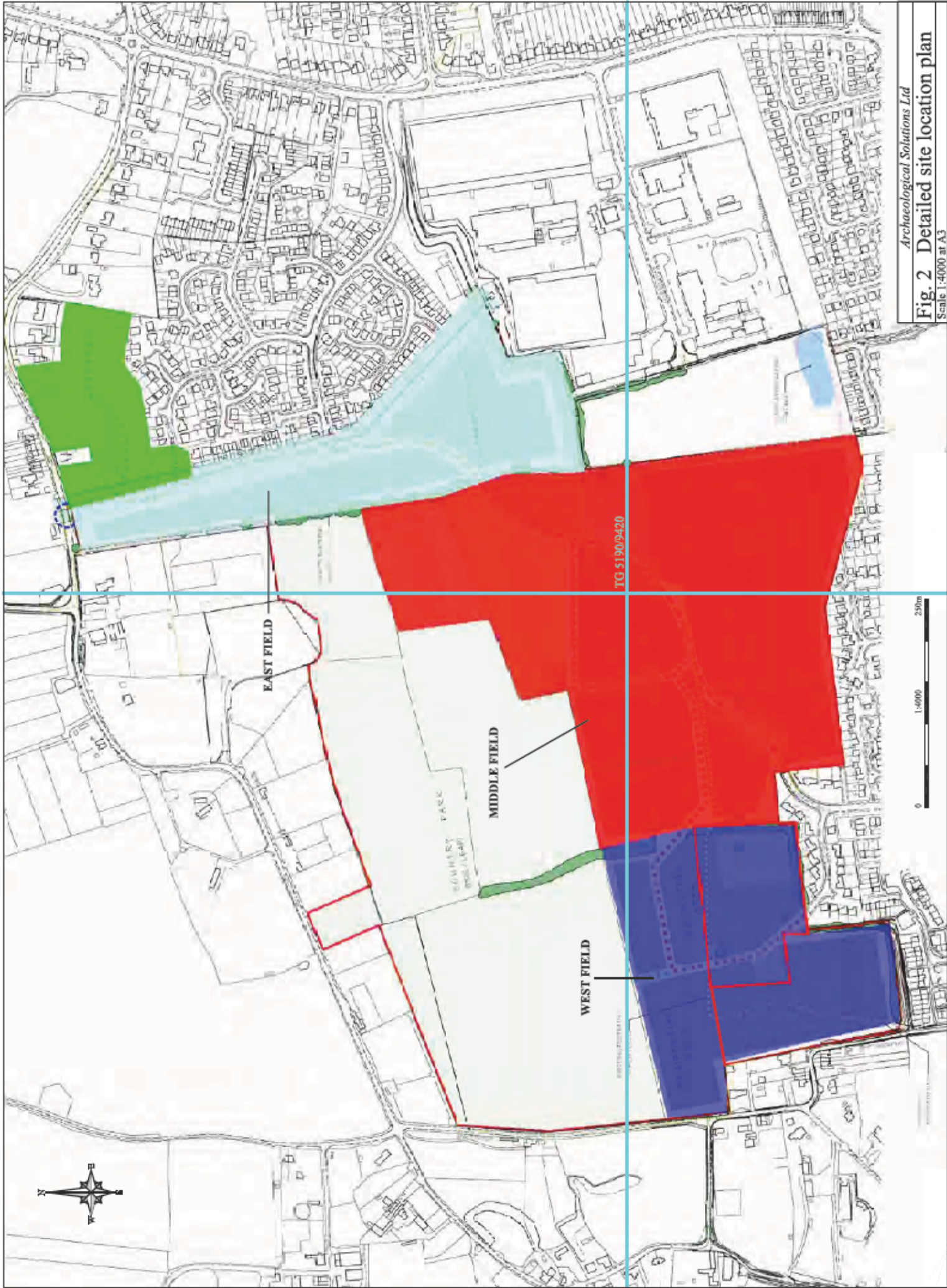
6. Standards and Guidance

All site work and reporting will be carried out in accordance with English Heritage Geophysical Survey in Archaeological Field Evaluation, 2008, and IFA Paper 6: The use of Geophysical Techniques in Archaeological Evaluations.

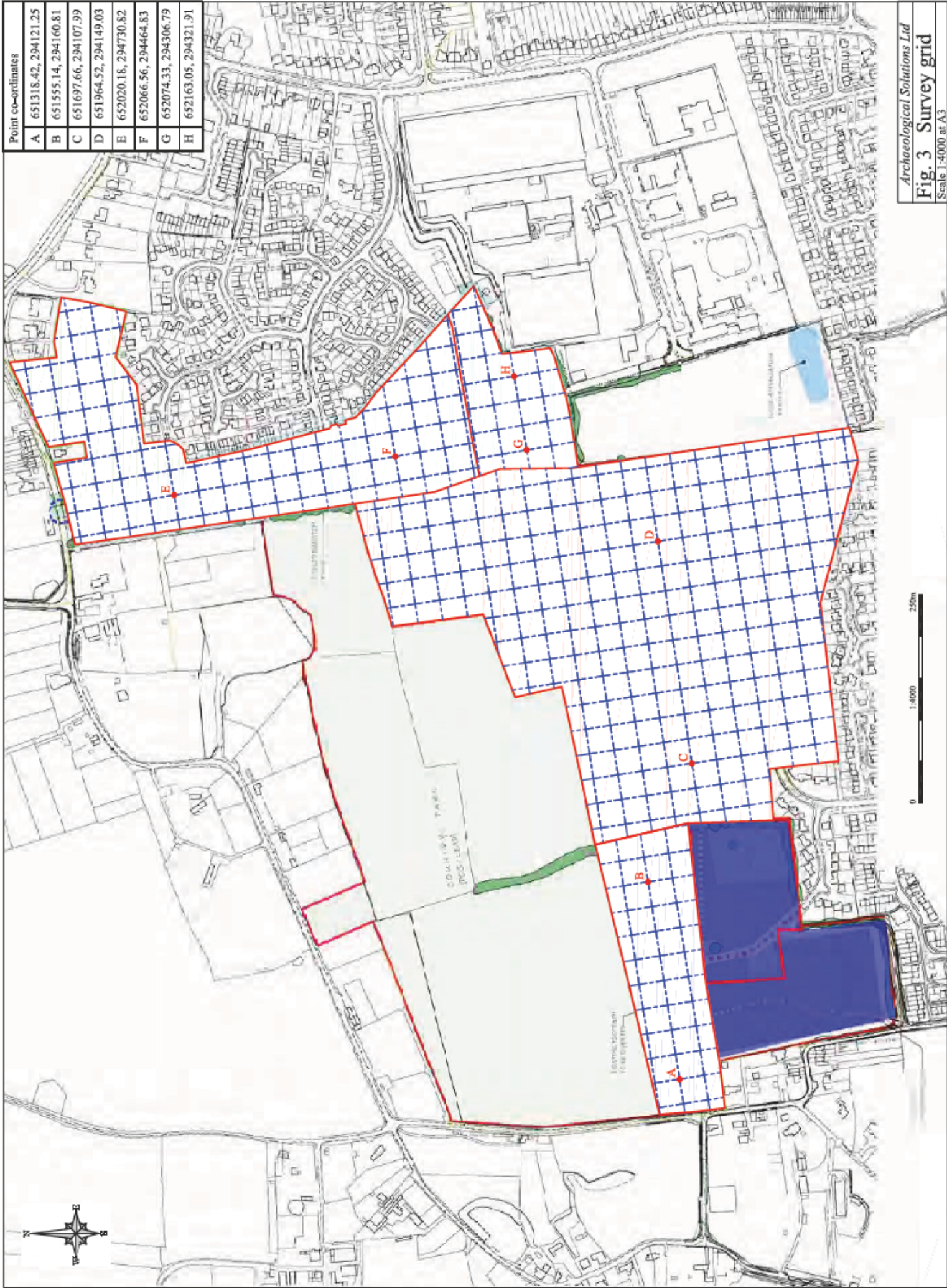


Reproduced from the 2002 Ordnance Survey 1:25000 map with the permission of Her Majesty's Stationery Office. Crown copyright Archaeological Solutions Ltd. Licence No. 100036680

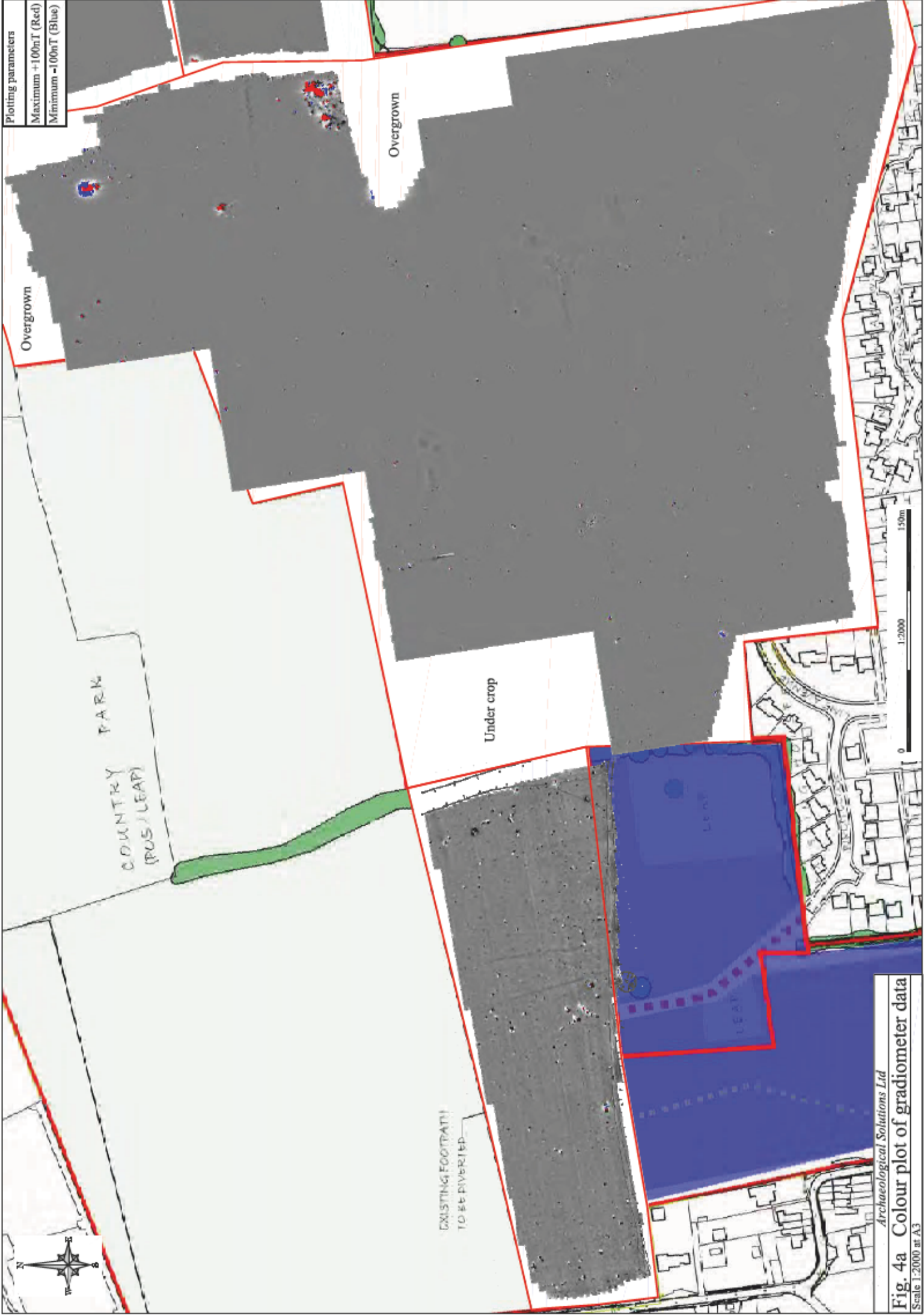
Archaeological Solutions Ltd
Fig. 1 Site location plan
 Scale 1:25000 at A4

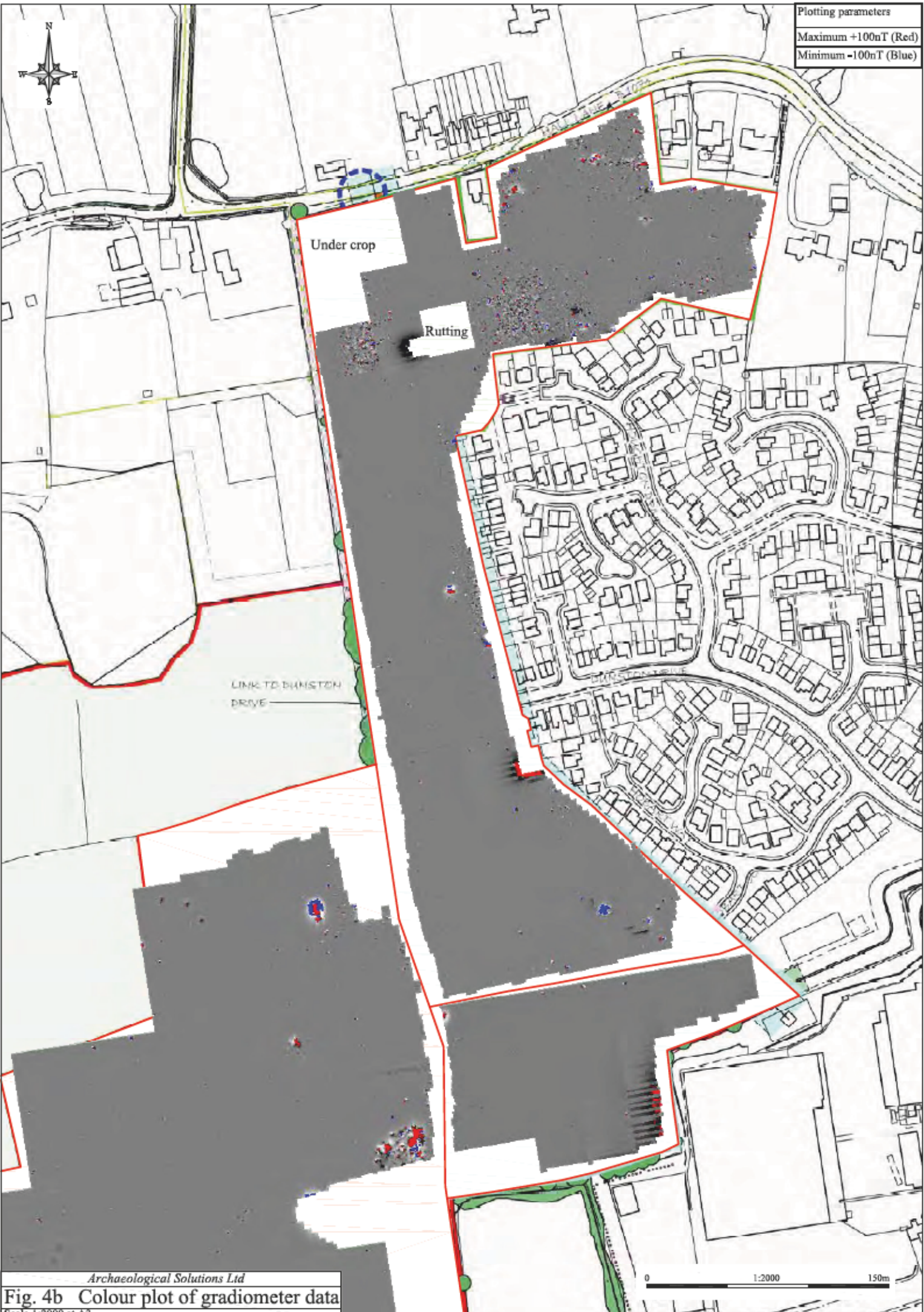


| Point co-ordinates | |
|--------------------|----------------------|
| A | 651318.42, 294121.25 |
| B | 651555.14, 294160.81 |
| C | 651697.66, 294107.99 |
| D | 651964.52, 294149.03 |
| E | 652020.18, 294730.82 |
| F | 652066.56, 294464.83 |
| G | 652074.33, 294306.79 |
| H | 652163.05, 294321.91 |



Archaeological Solutions Ltd
Fig. 3 Survey grid
 Scale 1:4000 at A3





Plotting parameters
 Maximum +100nT (Red)
 Minimum -100nT (Blue)

Under crop

Rutting

LINK TO BUNSTON
 DRIVE

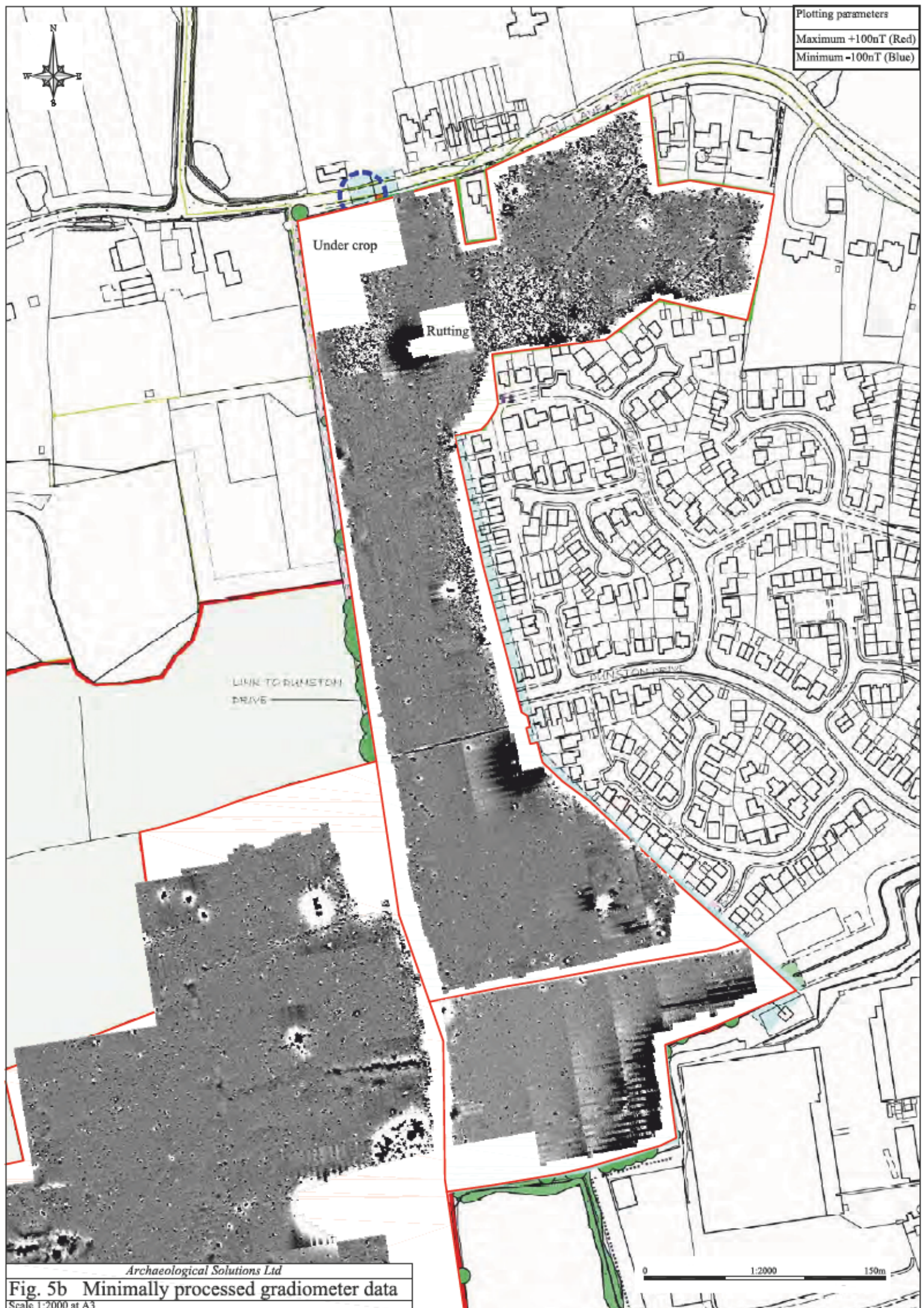
Archaeological Solutions Ltd

Fig. 4b Colour plot of gradiometer data

Scale 1:2000 at A3

0 1:2000 150m

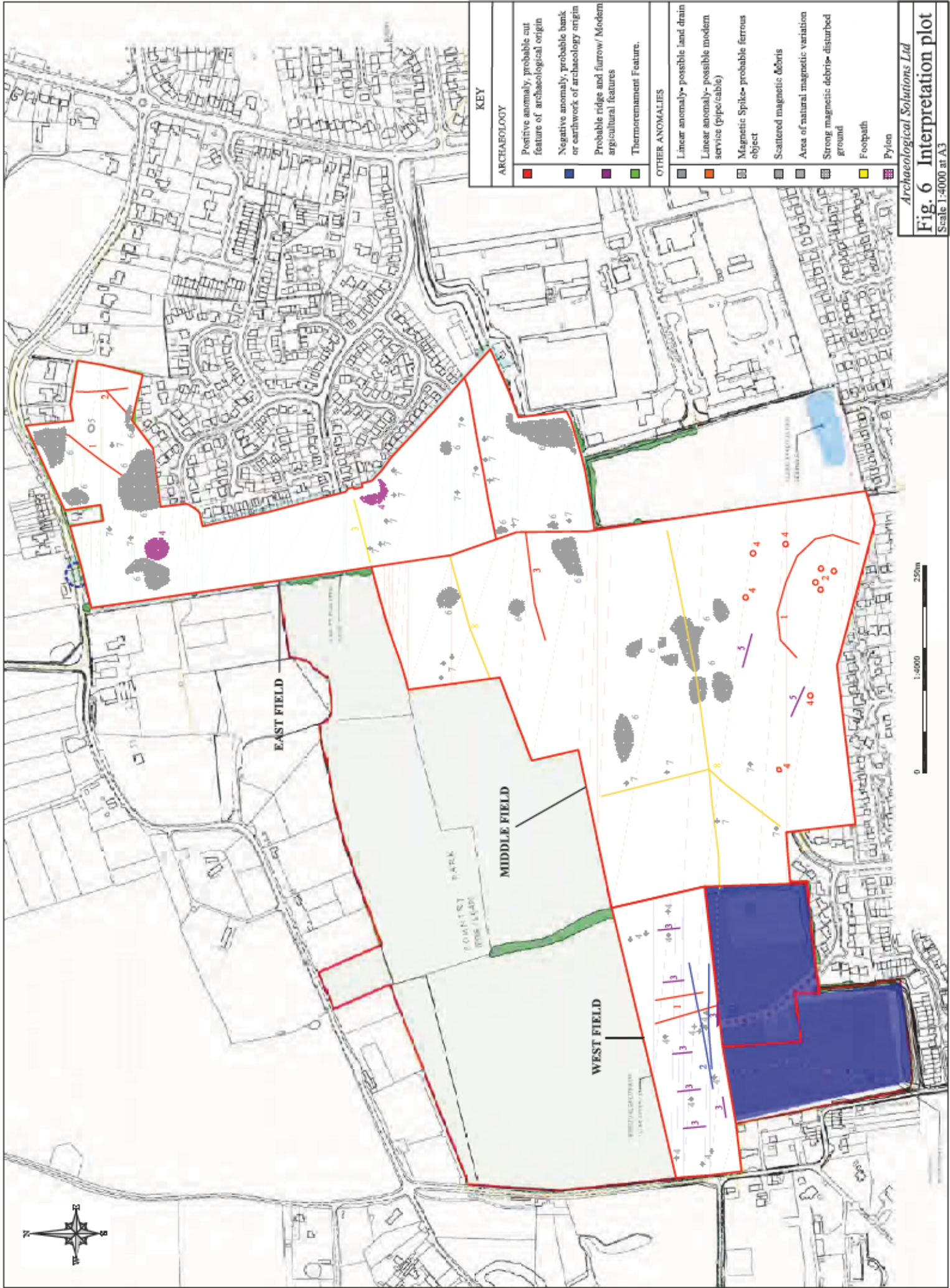




Archaeological Solutions Ltd

Fig. 5b Minimally processed gradiometer data

Scale 1:2000 at A3



Archaeological Solutions Ltd
Fig. 6 Interpretation plot
 Scale 1:4000 at A3