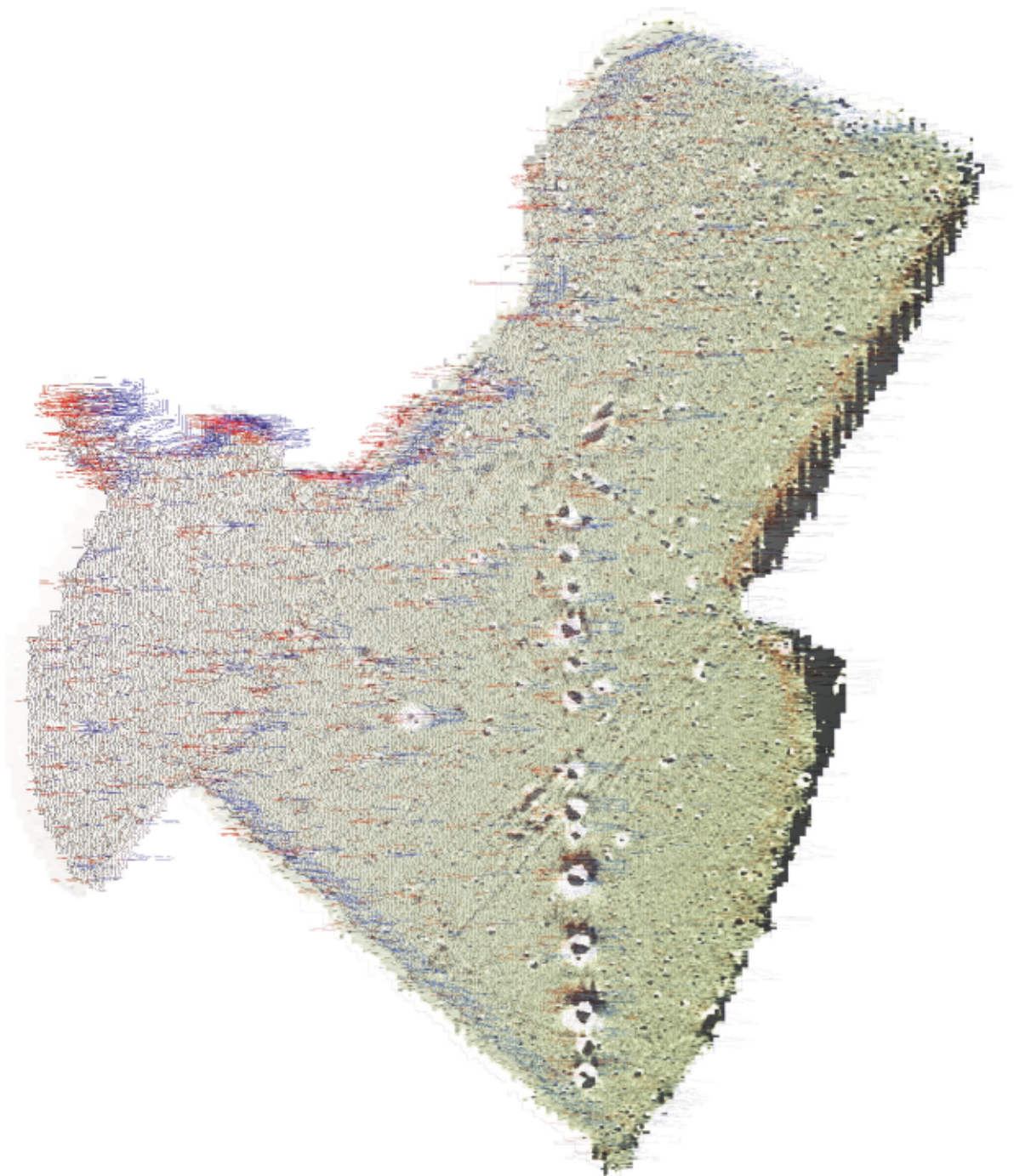




Land at Hort Bridge
Ilminster, Somerset

Detailed Gradiometer Survey Report



**LAND AT HORT BRIDGE, ILMINSTER
SOMERSET**

Detailed Gradiometer Survey Report

Prepared for:
Alchemy Properties
Building 5100
Cork Airport Business Park
Kinsale Road
Cork

by
Wessex Archaeology
Portway House
Old Sarum Park
Salisbury
SP4 6EB

Ref: 72010.01

August 2009

LAND AT HORT BRIDGE, ILMINSTER SOMERSET

Detailed Gradiometer Survey Report

CONTENTS

1	INTRODUCTION	1
1.1	Project background	1
1.2	Survey areas	1
2	METHODOLOGY	2
2.1	Introduction	2
3	RESULTS AND INTERPRETATION	3
3.1	Introduction	3
3.2	Detailed survey results and interpretation.....	3
4	CONCLUSION	5
4.1	Introduction	5
4.2	Conclusions.....	5
4.3	Statement of indemnity	5
5	REFERENCES	6
APPENDIX 1:	SURVEY EQUIPMENT AND DATA PROCESSING	7
APPENDIX 2:	GEOPHYSICAL INTERPRETATION	9

FIGURES

Figure 1	Site location and geophysical survey areas
Figure 2	Area A: Greyscale plot and XY trace
Figure 3	Area A: Interpretation
Figure 4	Area B: Greyscale plot and XY trace
Figure 5	Area B: Interpretation
Figure 6	Panoramas of Somerset Cattle Breeding Centre

LAND AT HORT BRIDGE, ILMINSTER

SOMERSET

Detailed Gradiometer Survey Report

Summary

Wessex Archaeology was commissioned by Alder King, on behalf of their client Alchemy Properties, to carry out an archaeological geophysical survey over land at Hort Bridge, Station Road, Ilminster. The Site is approximately centred upon OS NGR 334685 115058, and comprises two areas designated for redevelopment.

The detailed gradiometer survey was successful in detecting a number of anomalies of possible archaeological potential within the study area, along with numerous other anomalies less likely to be anthropogenic in nature. In general, the survey area exhibits a magnetic background of varying texture, reflecting the mixed use it has been subjected to over time.

A number of anomalies typical of pits are clustered near the northern extent of Area A and the northwestern extent of Area B, although it is possible that they may be pedological in origin. A complex of amorphous anomalies may represent a small enclosure in the southern part of the survey area. Several linear anomalies characteristic of field boundaries appear to define former field systems. It is probable that ridge and furrow exists in areas of the Site and, given that the ploughing trends are largely aligned with these sub-divisions, such features may not be of great antiquity.

A series of strong ferrous anomalies, regularly spaced and aligned north-south along OS easting 334700, are modern in origin. Given the proximity of the Taunton Stop Line and the presence of a Second World War pillbox within the development area, it is thought likely that these anomalies represent part of the military defences in the area.

Numerous other responses of probable pedological origin can be observed throughout the survey area and it is likely that these are associated with the River Isle immediately west of the survey areas. Other linear and curvilinear trends are evident throughout the dataset, some of which will be anthropogenic in origin.

**LAND AT HORT BRIDGE, ILMINSTER
SOMERSET**

Detailed Gradiometer Survey Report

Acknowledgements

The detailed gradiometer survey was commissioned by Alder King on behalf of their client Alchemy Properties. The assistance of Karl Scholz of Alder King and Karl McCoy of Alchemy Properties is gratefully acknowledged in this respect.

The fieldwork was directed by Cristina Serra Ruiz, assisted by Piotr Brozyna, Patrick Dresch and Simon Flaherty. Ben Urmston processed and interpreted the geophysical data and prepared this report. The geophysical work was managed and quality controlled by Paul Baggaley. Illustrations were prepared by Ken Lymer. The project was managed on behalf of Wessex Archaeology by Sue Farr.

LAND AT HORT BRIDGE, ILMINSTER

SOMERSET

Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

- 1.1.1 Wessex Archaeology was commissioned by Alder King, on behalf of their client Alchemy Properties, to carry out an archaeological geophysical survey over land at Hort Bridge, Station Road, Ilminster (**Figure 1**), hereafter referred to as 'the Site'. The Site is approximately centred upon OS NGR 334685 115058, and comprises two areas designated for redevelopment.
- 1.1.2 The aim of the project was to establish the presence/absence, extent and character of detectable archaeological remains within the survey areas.
- 1.1.3 This report presents a brief description of the methodology followed, the detailed survey results and the archaeological interpretation of the geophysical data.

1.2 Survey areas

- 1.2.1 The Site falls within an overall planning area of 16.9ha, located approximately 1km north-northwest of Ilminster, Somerset, and 500m south-east of the junction of the A303 and the A358 (**Figure 1**). The B3168 from the A303 to Ilminster bisects the survey areas. The landscape of the area is characterised by small to medium sized arable and pasture fields enclosed by hedgerows, with the River Isle forming the western boundary of the Site. The former Somerset Cattle Breeding Centre lies between the two survey areas.
- 1.2.2 The topography of the Site consists of a gently sloping valley bottom at c. 33m AOD, rising south and west to a maximum elevation of 110m AOD at Herne Hill.
- 1.2.3 Detailed gradiometer survey was conducted in two areas, totalling 11.5ha, with Area A (4.4ha) lying to the north of the B3168 and Area B (7.1ha) to the south. A portion of the development area was not suitable for geophysical survey due to dense undergrowth and other obstructions. The site of the Somerset Cattle Breeding Centre was covered with concrete plinths and the foundations of former buildings; the magnetic responses from such structures will have masked any weaker archaeological anomalies that may be present.
- 1.2.4 At the time of survey, the Site was covered in mixed vegetation and had been cleared recently; the majority of the Site was consequently under mown grasses. Some of the large shrubs had only been flattened, although they did not prevent geophysical survey.

- 1.2.5 The soils underlying the Site are predominantly the pelo-alluvial gley soils of the 813b (Fladbury 1) association. Given the varied superficial geology of the region, it is possible that there are components of nearby typical stagnogleys of the 711f (Wickham 2) association and the stagnogleyic argillic brown earths of the 572i (Curtisden) association. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of archaeological remains through survey with the Bartington Grad 601-2 gradiometer.

2 METHODOLOGY

2.1 Introduction

- 2.1.1 A geophysical specification was prepared by Wessex Archaeology to investigate the Site. The methodology consisted of detailed gradiometer survey conducted using Bartington Grad 601-2 dual gradiometer systems. The survey was conducted in accordance with English Heritage guidelines *Geophysical Survey in Archaeological Field Evaluation* (2008).
- 2.1.2 The geophysical survey was conducted by Wessex Archaeology's in-house geophysics team from 3rd to 7th August 2009.
- 2.1.3 Individual survey grid nodes were established at 20m x 20m intervals using a Leica 1200 RTK GPS system, which is precise to within 0.05m and therefore exceeds English Heritage recommendations.
- 2.1.4 The detailed gradiometer survey was conducted using Bartington Grad 601-2 gradiometer systems over 20m x 20m grids with a sample interval of 0.25m along transects spaced 1m apart. Data were collected in the zig-zag manner.
- 2.1.5 Data from the survey was subject to limited data correction processes. This included a zero mean traverse function ($\pm 5nT$ thresholds) applied to correct for any variation between the two Bartington sensors used, and also a de-step function to account for variations in traverse position due to the zig-zag data collection method. These two steps were applied to all survey areas, with no further data filtering or interpolation.
- 2.1.6 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

3 RESULTS AND INTERPRETATION

3.1 Introduction

3.1.1 The geophysical survey identified a number of anomalies of possible archaeological origin. Results are presented as a series of greyscale, XY trace plots and interpretation diagrams over the Site at a scale of 1:2000 (**Figures 2 to 5**).

3.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ploughing trends, ferrous/burnt or fired objects, areas of general increased magnetic response and modern services. Full definitions of the interpretation terms used in this report are provided in **Appendix 2**.

3.1.3 Numerous ferrous anomalies are visible throughout the detailed survey dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.

3.2 Detailed survey results and interpretation

3.2.1 Towards the northern extent of Area A, anomalies **4000** may represent a number of amorphous pits. Given their irregularity of form and proximity to other more amorphous anomalies, it is possible that they are not anthropogenic in origin. Linear anomalies **4001** represent former field boundaries and largely comprise ferrous responses, which appear to extend to the extant perimeter of the Site. The line of the former field system is clearest to the southeast, where the intersection with the current property boundary indicates continuity of use; in each of the other directions, the course of the boundaries are denoted by faint trends and isolated ferrous anomalies.

3.2.2 Ferrous anomalies **4002** are similar in character to responses over modern services. The individual anomalies lack definition, however, and it is possible that they are the product of features such as isolated footings or inspection chambers; a broadly rectangular region of ferrous disturbance to the north is likely to be the result of an area of hard-standing. It is notable that the south-western field in Area A has an elevated magnetic background, and parts of the north-eastern and south-eastern fields exhibit similar enhancement; it is thought that this difference in texture is due to relatively recent land use strategies.

3.2.3 In Area B, anomalies **4003** are similar in character to **4000**, although they are somewhat better defined and more densely packed; it is possible that they represent a former enclosure. Linear anomalies **4004** and **4005** indicate the course of a former boundary aligned north-east to south-west, with a curvilinear spur extending south-eastwards towards the southernmost extent of the Site. Linear anomaly **4006** is probably of similar provenance, and a series of linear responses and ferrous anomalies north of **4003** may indicate a return towards the southeast. It is not possible to ascertain any relative dating for these anomalies; given that they appear to respect extant boundaries, it is not thought that they are of great antiquity.

- 3.2.4 Amorphous anomalies **4007** are of possible archaeological interest, although other nearby responses suggest that they may be geological in origin; the River Isle lies immediately to the west and it is conceivable that they are alluvial in origin.
- 3.2.5 A series of ferrous anomalies **4008** are characteristic of modern intrusion, and it is likely that they represent the foundations of former structures. However, the Defence of Britain Project (DoB 2002) provides information concerning Second World War military defences in the area; a known pillbox lies at the northeastern corner of the Somerset Cattle Breeding Centre (OS NGR SO 007384) and the Taunton Stop Line, a system of anti-tank and anti-personnel defences, passes through this area. Given that the anomalies are regularly spaced approximately 25m apart and are located north-south along OS easting 334700, they may indicate the former alignment of part of the Taunton Stop Line.
- 3.2.6 Elsewhere, numerous linear trends are indicative of ploughing strategies. Given the breadth and regular distribution of these responses, it is likely that at least some are due to ridge and furrow. These ploughing trends are observed most clearly when coincident with regions of increased magnetic response, although no stratigraphic relationship is clear; the majority appear to be aligned NNE-SSW, indicating concurrency of use.
- 3.2.7 Numerous weak amorphous responses are evident throughout the survey area and are characteristic of pedological changes; it is possible that they are alluvial in origin, given the proximity of the river to the west. Some of these anomalies are better defined and have been tentatively assigned as being of possible archaeological interest. Other weak trends may be anthropogenic in nature, although their weak contrast with the magnetic background prevents more definite interpretation; a multitude of such responses can be discerned within the background magnetic field, although it is unclear how many of these are the result of chance alignments.
- 3.2.8 Whilst the majority of the ferrous anomalies are not considered to be archaeological in origin, it is likely that their responses will have masked weaker signals from archaeological deposits in the vicinity. Some of these ferrous anomalies are aligned and are occasionally coincident with minor changes in the texture of the magnetic background; it is likely that such anomalies indicate the line of former field divisions.

4 CONCLUSION

4.1 Introduction

4.1.1 The detailed gradiometer survey has been successful in detecting a number of anomalies of possible archaeological potential within the study area and can therefore be considered to have successfully fulfilled the aims of the survey.

4.2 Conclusions

4.2.1 Several amorphous anomalies near the northern extent of Area A and the northwestern extent of Area B are typical of pits, although they lack regular form; it is therefore conceivable that they may be geological in origin. It is also possible that a small enclosure has been located in the southern part of the survey area. A number of linear anomalies are characteristic of field boundaries and indicate former field systems, although it is not possible to ascribe a date to them from this survey alone. Within these sub-divisions, the remnants of former ploughing strategies can be seen and it is probable that some are the result of ridge and furrow.

4.2.2 A series of ferrous anomalies aligned north-south along OS easting 334700 exhibit coherent responses and each is of similar form. Given the proximity of the Taunton Stop Line, part of the Second World War defence network, it is thought likely that these anomalies represent the remnants of former military installations.

4.2.3 Numerous responses of probable geological origin can be observed throughout the Site and it is likely that these are associated with the River Isle immediately west of the survey areas. Various linear and curvilinear trends are evident throughout the dataset. Whilst some of these will be anthropogenic in origin, it is uncertain which are simply chance alignments. The likelihood that they are the result of tangible features is greatest where they respect extant boundaries or other geophysical anomalies.

4.3 Statement of indemnity

4.3.1 The results and subsequent interpretation of geophysical surveys should not be treated as an absolute representation of the underlying features. It is normally only possible to prove the nature of anomalies through intrusive means, such as trial excavations.

5 REFERENCES

Defence of Britain Project, 2002. <http://www.britarch.ac.uk/cba/projects/dob/>. Visited 14/08/2009.

English Heritage, 2008. *Geophysical Survey in Archaeological Field Evaluation*. Research and Professional Service Guideline No 1, 2nd edition.

SSEW, 1983. *Soil Survey of England and Wales Sheet 5: Soils of South West England*. Ordnance Survey, Southampton.

APPENDIX 1: SURVEY EQUIPMENT AND DATA PROCESSING

Survey Methods and Equipment

The magnetic data for this project was acquired using a Bartington 601-2 dual magnetic gradiometer system. This instrument has two sensor assemblies fixed horizontally 1m apart allowing two traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation, and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have a resolution of 0.1nT over a ± 3000 nT range, and measurements from each sensor are logged at intervals of 0.25m. All of the data are stored on an integrated data logger for subsequent post-processing and analysis.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20m or 30m site grid, which is achieved using a Leica 1200 RTK GPS system and then extended using tapes. The Leica 1200 RTK GPS system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined to an accuracy of 1-2cm in real-time and therefore exceed the level of accuracy recommended by English Heritage (2008) for geophysical surveys.

Scanning surveys consist of recording data at 0.25m intervals along transects spaced 10m apart, acquiring a minimum of 80 data points per transect. Due to the relatively coarse transect interval, scanning surveys should only be expected to detect extended regions of archaeological anomalies, when there is a greater likelihood of distinguishing such responses from the background magnetic field.

The detail surveys consist of 20m x 20m or 30m x 30m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20m or 30m grid respectively, and are the recommended methodologies for archaeological surveys of this type (English Heritage, 2008).

Post-Processing

The magnetic data collected during the detail survey are downloaded from the Bartington system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

As the scanning data are not as closely distributed as with detailed survey, they are georeferenced using the GPS information and interpolated to highlight similar anomalies in adjacent transects. Directional trends may be removed before interpolation to produce more easily understood images.

Typical data and image processing steps may include:

- Destripe – Applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;
- Destagger – Shifting each traverse forward or backward by a number of readings. This corrects for operator errors and is used to enhance linear features;
- Despike – Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data)

Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This image can include a hidden line algorithm to remove certain lines and enhance the image. This type of image is useful as it shows the full range and shape of individual anomalies.
- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.

APPENDIX 2: GEOPHYSICAL INTERPRETATION

The interpretation methodology used by Wessex Archaeology separates the anomalies into two main categories: archaeological and unidentified responses.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

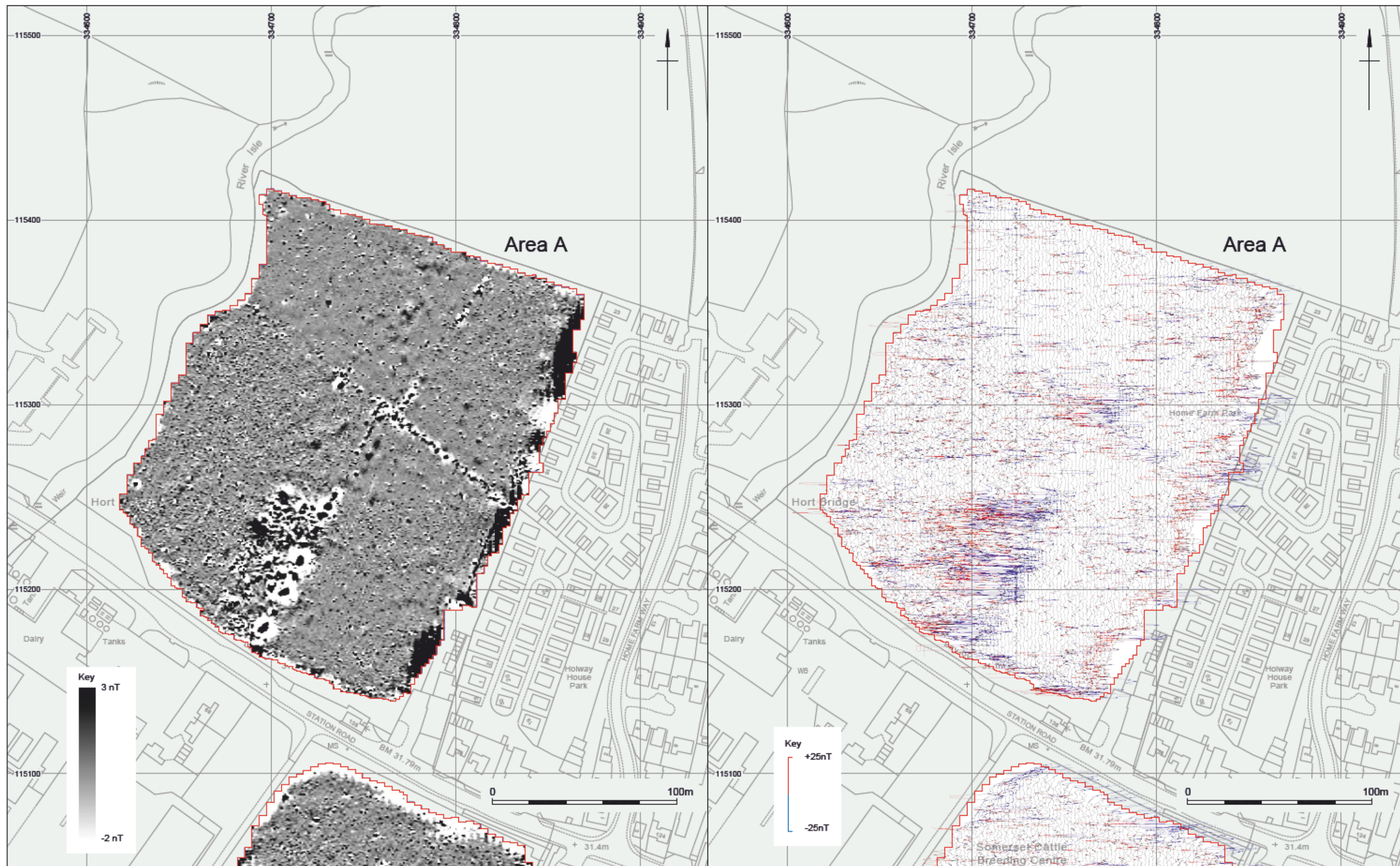
- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Probable archaeology – used for features which give a clear response but which form incomplete patterns.
- Possible archaeology – used for features which give a response but which form no discernable pattern or trend.

The unidentified category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature.

This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.

Finally, services such as water pipes are marked where they have been identified.



Date:	13/08/09	Revision Number:	0
Scale:	1:2000	Illustrator:	KL
Path:	Y:\PROJECTS\72010\Drawing Office\Report Figs\geophys report\09_08_12\72010_geophys_f2.dwg		

Area A: Greyscale plot and XY trace

Figure 2



Digital map data supplied by the Client.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date: 13/08/09

Revision Number: 0

Scale: 1:2000

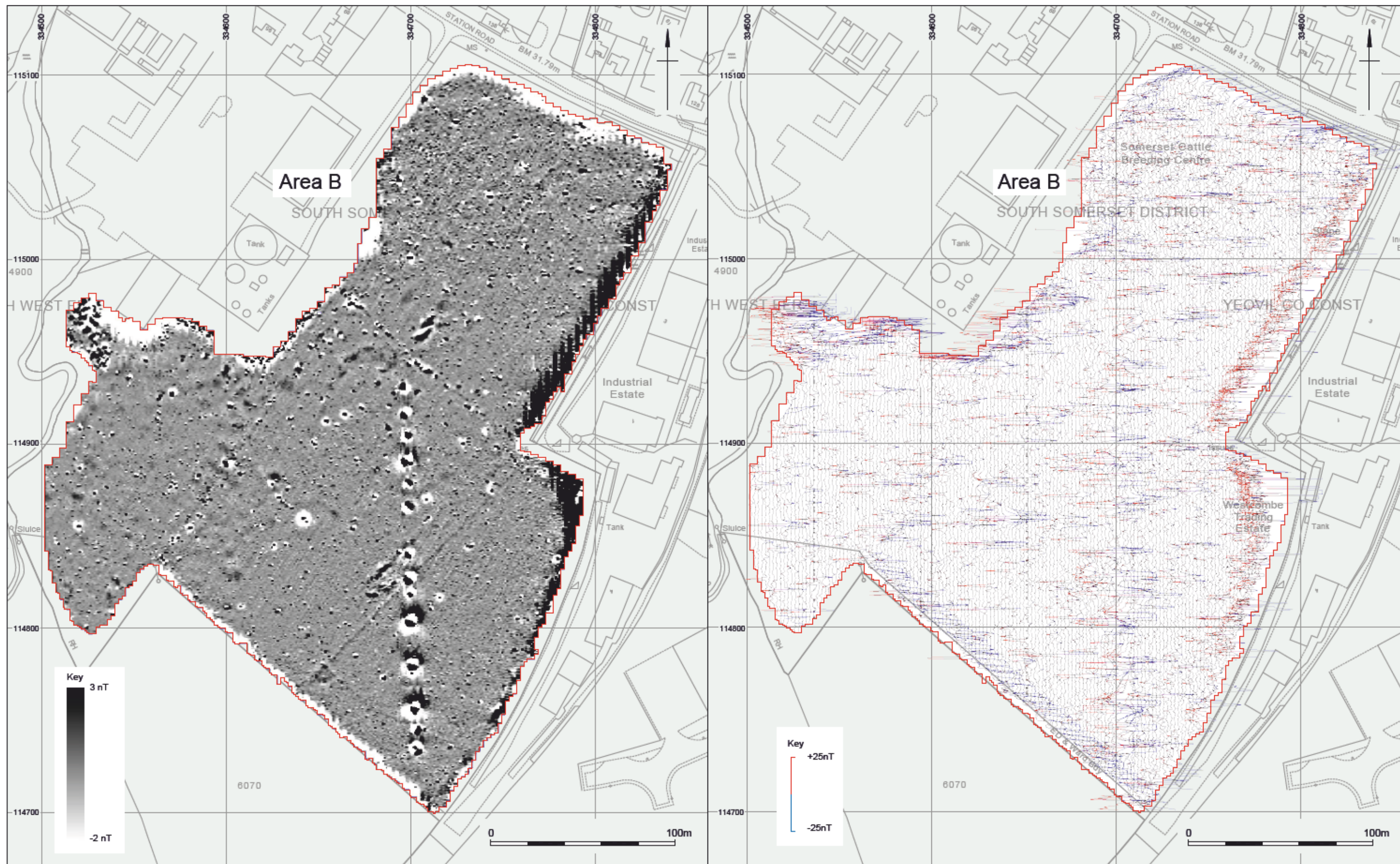
Illustrator: KL

Path: Y:\PROJECTS\72010\Drawing Office\Report Figs\geophys report\09_08_12\72010_geophys_f2.dwg



Area A: Interpretation

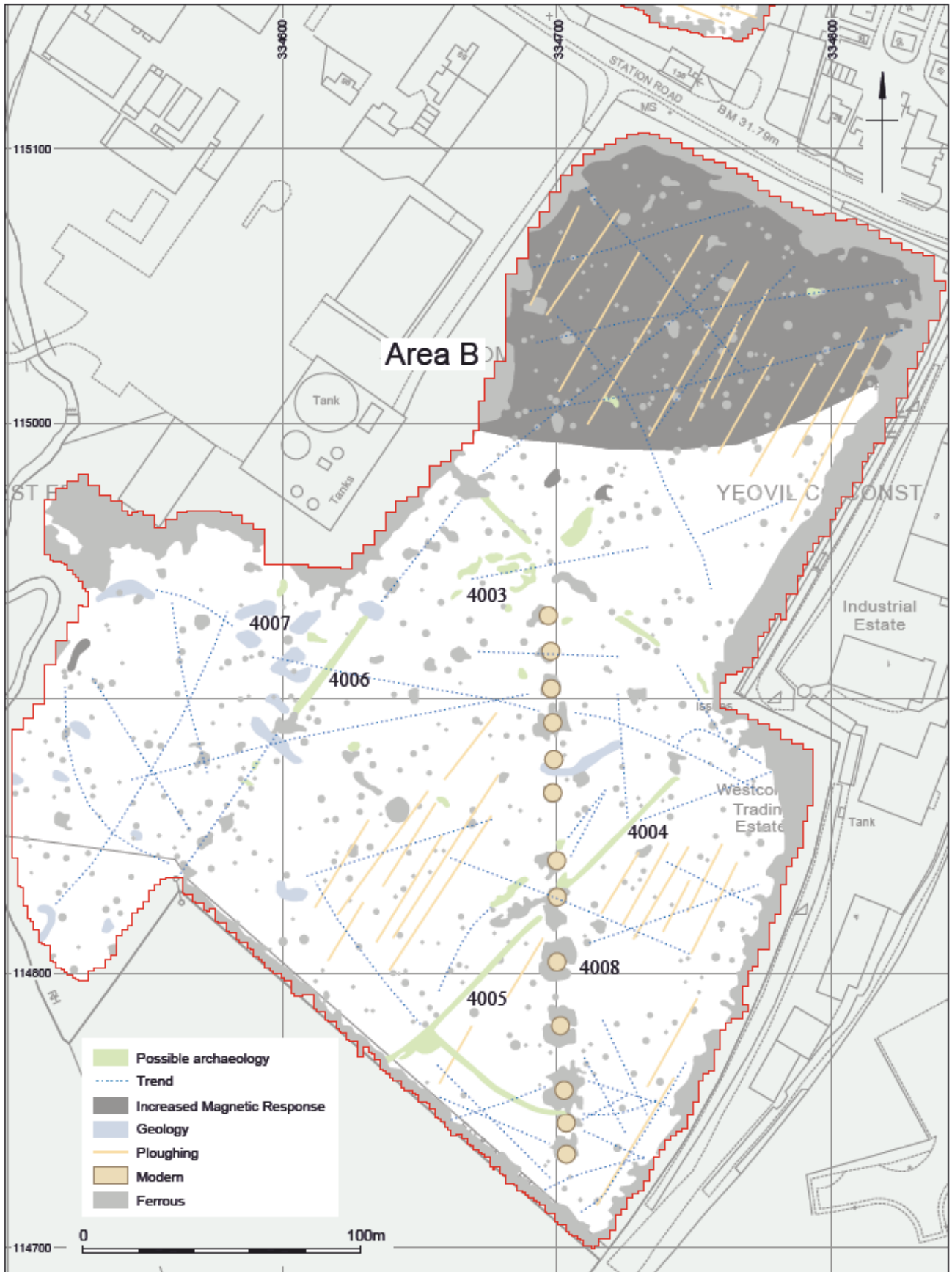
Figure 3



Date:	12/08/09	Revision Number:	0
Scale:	1:2000	Illustrator:	KL
Path:	Y:\PROJECTS\72010\Drawing Office\Report Figs\geophys report\09_08_12\72010_geophys_f2.dwg		

Area B: Greyscale plot and XY trace

Figure 4



Digital map data supplied by the Client.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date: 13/08/09

Revision Number: 0

Scale: 1:2000

Illustrator: KL

Path: Y:\PROJECTS\72010\Drawing Office\Report Figs\geophys report\09_08_12\72010_geophys_f2.dwg



Area B: Interpretation

Figure 5



Plate 1: Panorama view near former dairy (looking north at centre of image)



Plate 2: Panorama view near southwestern corner (looking south at centre of image)



WESSEX ARCHAEOLOGY LIMITED.

Registered Head Office: Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB.

Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk www.wessexarch.co.uk

Maidstone Office: The Malthouse, The Oast, Weaving Street, Maidstone, Kent ME14 5JN.

Tel: 01622 739381 info@wessexarch.co.uk www.wessexarch.co.uk

