

**ARCHAEOLOGICAL EVALUATION REPORT:  
GEOPHYSICAL SURVEY BY MAGNETOMETRY  
ON LAND WEST OF GARDEN LANE, SHERBURN IN ELMET, NORTH YORKSHIRE**

NGR: SE 4888 3312  
AAL Site Code: SHGL 17  
Planning Reference: 2017/0621/OUTM  
OASIS Reference Number: allenarc1-289599



Report prepared for Roger Lee Planning Ltd  
on behalf of Adrian Moore, Classic Developments Ltd

By  
Allen Archaeology Limited  
Report Number AAL 2017106

July 2017



Allenarchaeology



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*Cover image: View across the surveyed area from the southwest corner looking northeast*

## Executive Summary

- Allen Archaeology Ltd was commissioned by Roger Lee Planning Ltd on behalf of Adrian Moore, Classic Developments Ltd to undertake a geophysical survey using magnetometry on land west of Garden Lane, Sherburn in Elmet, North Yorkshire, prior to the determination of a planning application for a proposed residential development.
- The survey identified a number of features of archaeological interest, one positive linear feature likely to represent a former field boundary and two positive linear features possibly representing former trackways. Two linear positive features could represent ridge and furrow cultivation and one may be a former field boundary or ditch.
- The site was magnetically 'noisy', suggesting a fair amount of modern waste lies across the site. The areas that it was possible to survey within the northern part of the site were extremely magnetically noisy, representing dumps of modern waste that were clearly visible on the surface. Any potential archaeological features within the northern part of the site will be hidden by this magnetic noise, and it is possible that the location of some more ephemeral features in the other areas of the site could be masked by it.

## 1.0 Introduction

- 1.1 Allen Archaeology Ltd (AAL) was commissioned by Roger Lee Planning Ltd on behalf of Adrian Moore, Classic Developments Ltd to undertake a geophysical survey using magnetometry on land west of Garden Lane, Sherburn in Elmet, North Yorkshire, prior to the determination of a planning application for a proposed residential development.
- 1.2 The site works and reporting conform to current national guidelines as set out in '*Geophysical Survey in Archaeological Field Evaluation*' (English Heritage 2008), '*The Use of Geophysical Techniques in Archaeological Evaluations*' (Gaffney *et al.* 2002) and the Chartered Institute for Archaeologists '*Standard and guidance for archaeological geophysical survey*' (ClfA 2014).

## 2.0 Site Location and Description

- 2.1 Sherburn in Elmet is situated approximately 20km east of Leeds and 21km southwest of York in the Selby district of North Yorkshire. The site comprises a broadly rectangular shaped block of land of 2.1 hectares, located just to the west of Garden Lane, and is centred on NGR SE 4888 3312 (Figure 1).
- 2.2 The local geology comprises bedrock deposits of Brotherton Formation – Limestone, with superficial geology of lacustrine deposits of sand and gravel (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>).

## 3.0 Planning Background

- 3.1 An outline planning application was submitted in June 2017 for a '*residential development for up to 69no. dwellings with access (All other matters reserved)*' on '*Land West Of Garden Lane Sherburn In Elmet North Yorkshire*' (Planning Reference 2017/0621/OUTM). To provide further information on the potential archaeological resource within the proposed development area, the Principal Archaeologist has requested a programme of geophysical survey by magnetometry in the first instance, with a programme of evaluation trenching as appropriate.
- 3.2 The approach adopted is consistent with the recommendations of the current National Planning Policy Framework (NPPF), with the particular chapter of relevance being '*Chapter 12: Conserving and enhancing the historic environment*' (Department for Communities and Local Government 2012).

## 4.0 Archaeological and Historical Background

- 4.1 The development site lies on the western side of Sherburn-in-Elmet, which resides in the parish of Selby in an area of high archaeological potential. A summary of existing data derived from a number of sources, including the North Yorkshire Historic Environment Record (HER) database, is included below. This comprises all sites and find spots within one kilometre of the development site.
- 4.2 There is no evidence for Palaeolithic or Mesolithic archaeology within the area. The earliest known activity in the area comes from the centre of Sherburn, where an archaeological excavation revealed evidence of Neolithic activity (North Yorkshire Historic Environment Record No. MNY24520), comprising a series of ditches, a pit and an alignment of postholes (Antoni 2004).

- 4.3 To the north of the site, three undated ring ditches have been identified as cropmarks through aerial photography (MNY10245, MNY10146 and MNY16796). To the west are two further cropmarks (MNY10147 and MNY16785), thought to be the ploughed out remnants of barrows (Antoni 2004). Around 700m to the southeast aerial photography has also highlighted a series of irregular enclosures thought to be a field system (MNY10165), and around a kilometre to the west a similar enclosure is found (MNY10257). Finally, a series of undated trackways are visible as further cropmarks (MNY10145, MNY10166 and MNY10172).
- 4.4 In 1996 during building works close to the site, at Garden Close, two inhumations were found during archaeological monitoring (MNY23579). Both of the inhumations were interred in stone sarcophagi, and were dated to the Roman period (Johnstone and Dobney 1997). A further 12 adult and three infant burials, dated to the Late Iron Age and Romano-British periods were found during excavation on Low Street, within a double-ditched enclosure (MNY24520). The site contained pits and stone structures that were identified as having been used for grain storage, a corndryer and evidence of roundhouses (Antoni 2004). Roman coins (MNY16734) and a cross of possible Roman date (MNY16732) have also been found in the area.
- 4.5 Bede (II.14) writes of a monastery in Elmet Wood and there is also an 11<sup>th</sup> century note added to the York Gospels that an Anglo-Saxon church here had two gospel books, an antiphony, a gradual, two epistolaries, a sacramentary, a hymnal and a psalter (Lapidge 1985, 56–7). In AD 937 the royal manor of Sherburn (MNY10139) was given by King Athelstan to the Archbishop of York as a thank-offering for his victory at Brunanburgh (Kitson 1911, 196). The Domesday Book of 1086 also records that there were two churches and two priests, although Sherburn remained in the Archbishop's hands during the Romanesque period. Located 500m from the site is All Saints church. The church possesses a four-bay 12<sup>th</sup> century nave, a 13<sup>th</sup> century chancel, south chapels of 14<sup>th</sup> and 15<sup>th</sup> century date, with a vestry and organ on the north side of the chancel (Kitson 1911). In 1361 Archbishop Thoresby approved the demolition of his manor house, north of the church, resulting in the stone being transported to and reused in York Minster (Barlow 2004). The name Sherburn is thought to originate from the 9<sup>th</sup> century words *Scīr* meaning 'bright and gleaming' and *Burna*, meaning 'stream'. Elmet is an ancient district name of uncertain origins and meaning but identical to the Welsh cantref name, *Elfed* (Ekwall 1966).
- 4.6 In November 2007, Fern Archaeology undertook archaeological monitoring at 28 Low Street (MNY25214). The works comprised a series of evaluation trenches that revealed evidence for a buried soil of late medieval or post-medieval date, and a probable ditch. This ditch contained 52 sherds from a 12<sup>th</sup>–14<sup>th</sup> century northern gritty ware jug (Fern 2008). A number of 12<sup>th</sup> to 13<sup>th</sup> century Burgage plots were previously identified during excavation close by (Antoni 2004). Medieval ridge and furrow can be seen to the east of Sherburn-in-Elmet (Young 1998).
- 4.7 Located just a few hundred metres north of the development area is the site of a Civil War skirmish (MNY36019) where parliamentary forces led by Fairfax gained a small victory with cavalry at Sherburn-in-Elmet on 12<sup>th</sup> and 13<sup>th</sup> December 1642 (Newman and Roberts 2003). There are also a number of Grade II Listed Buildings in the area, namely 4 Finkle Hill, a 17<sup>th</sup> century house; 63 Kirkgate, a 16<sup>th</sup> century farmhouse, and a 17<sup>th</sup> century school (YVBSG 2009). During an archaeological evaluation at Corble's Garage, a 19<sup>th</sup> century well was recorded (Sumpter 2002). This is similar to another 19<sup>th</sup> century well at Church Hill (Atkinson 2007). A few hundred metres to the south, a 19<sup>th</sup> century corn mill is shown on the 1850 OS Map (MNY10167).
- 4.8 A field adjacent to All Saints Church contains the remains of a Halifax bomber (Serial number W7806) that on the 24<sup>th</sup> August 1943 caught fire during a training flight (MNY26838). Most of the crew bailed out, with the pilot and flight engineer remaining behind with a cadet who was

too afraid to jump. The pilot succeeded in crash landing the burning aircraft near the village church (Jefferson 2009).

## 5.0 Methodology

- 5.1 The geophysical survey consisted of a detailed gradiometer survey of the available area, totalling approximately 1.4 hectares. The survey was undertaken in a series of 30m grids across the site.
- 5.2 The fieldwork was carried out by a team of experienced geophysicists on Thursday 6<sup>th</sup> July 2017. The survey area was located using a Leica GS08 RTK NetRover GPS. This accurately 3D plotted the area of investigation and tied it into the National Grid.
- 5.3 The geophysical survey was carried out using a Bartington Grad601-2 Dual Fluxgate Gradiometer with an on-board automatic DL601 data logger. This instrument is a highly stable magnetometer which utilises two vertically aligned fluxgates, one positioned 1m above the other. This arrangement is then duplicated and separated by a 1m cross bar. The 1m vertical spacing of the fluxgates provides for deeper anomaly detection capabilities than 0.5m spaced fluxgates. The dual arrangement allows for rapid assessment of the archaeological potential of the site. Data storage from the two fluxgate pairs is automatically combined into one file and stored using the on-board data logger.
- 5.4 Data collection was undertaken in a zigzag traverse pattern, using a sample interval of 0.25m and a traverse interval of 1m.

### *Summary of Survey Parameters*

#### 5.5 Fluxgate Magnetometer

Instrument:	Bartington Grad601-2 Dual Fluxgate Gradiometer
Sample Interval:	0.25m
Traverse Interval:	1.00m
Traverse Separation:	1.00m
Traverse Method:	Zigzag
Resolution:	0.01nT
Processing Software:	3.0.32.4
Surface Conditions:	Pasture
Area Surveyed:	1.4 hectares
Date Surveyed:	Thursday 6 <sup>th</sup> July 2017
Surveyor:	Robert Evershed BSc (Hons)
Survey Assistant:	Ryan Godbold and Jedlee Chapman
Data Interpretation:	Robert Evershed BSc (Hons)

### *Data Collection and Processing*

- 5.6 The grids were marked using pre-programmed grids on the Leica GS08 Netrover A north-south alignment is preferable as the fluxgate gradiometer is set up and balanced with respect to the cardinal points. Since the data is plotted as north-south traverses there is considerable merit sampling the north-south response of a magnetic anomaly with as many data points as is possible, this is accomplished as the density collected along the traverse line is greater than that

between traverses (Aspinall *et al.* 2008). On this occasion the grids were aligned to north-northwest to south-southeast due to the orientation of the survey area.

- 5.7 The data collected from the geophysical survey has been analysed using Terrasurveyor 3.0.32.4. The resulting data set plots are presented with positive nT/m values and high resistance as black and negative nT/m values and low resistance as white.

The data sets have been subjected to processing using the following filters:

- De-stripping
  - Clipping
  - De-staggering
- 5.8 The de-stripe process is used to equalise underlying differences between grids or traverses. Differences are most often caused by directional effects inherent to magnetic surveying instruments: instrument drift, instrument orientation (for example off-axis surveying or heading errors) and delays between surveying adjacent grids. However, the de-stripe process is used with care as it can sometimes have an adverse effect on linear features that run parallel to the orientation of the process.
- 5.9 The clipping process is used to remove extreme data point values which can mask fine detail in the data set. Excluding these values allows the details to show through.
- 5.10 The de-staggering process compensates for data correction errors caused by the operator commencing the recording of each traverse too soon or too late. It shifts each traverse forward or backwards by a specified number of intervals.
- 5.11 Plots of the data are presented in processed linear greyscale (smoothed) with any corrections to the measured values or filtering processes noted, and as separate simplified graphical interpretations of the main anomalies detected.

## 6.0 Results

### ***Geophysical Survey***

- 6.1 For the purposes of interpreting the anomalies, the survey data has been processed to the values of -3 to 3 nT/m (Figure 3). This enhances faint anomalies that may otherwise not be noted in the data, with a number of anomalies identified across the data set, and these are discussed in turn and noted as single or double digit numbers in square brackets.
- 6.2 Part of the northern half of the site was not suitable for surveying as there were large piles of modern rubbish, vehicles, buildings and greenhouses.



*Plate 1: View of the northern part of the site*

- 6.3 Along the northern edge of the surveyed area there is a large amount of magnetic noise [1], -100 to 100 nT/m. This is likely to represent dumps of modern waste, clearly visible across the area.
- 6.4 Along the eastern edge of the site there are areas of magnetic noise [2] and [3], -20 to 20 nT/m and -40 to 40 nT/m. The results are likely a combination of metal fencing (made of chicken wire) and a build-up of modern waste along the field edge.
- 6.5 The area of magnetic noise along the southern edge of the field [4], -10 to 10 nT/m, represents a metal and wooden fence.
- 6.6 Within the large area of magnetic noise at the northern edge of the survey area is a linear feature [5], -100 to 100 nT/m, which represents the remains of a metal fence dividing the cut grass area from the northern part of the site.
- 6.7 Within the small area of magnetic noise [6] there are varying readings from -10 to 30 nT/m up to -100 to 100 nT/m. This is a grassed area flanked by a greenhouse on the western edge and an overgrown area on the east. The results could represent a combination of the greenhouse and modern waste, but may represent the buried remains of a former building seen on historic mapping in this location.
- 6.8 The long slightly curvilinear positive feature aligned roughly northeast to southwest [7], 3 to 5 nT/m, likely represents a former field boundary identified on an 1850 OS map.
- 6.9 There are a few short positive linear features towards the eastern edge of the site, [8], 3 to 4 nT/m, that appear to run parallel with [7]. These could represent former ditches, but perhaps more likely represent former cultivation trends such as ridge and furrow agriculture.
- 6.10 The long linear positive feature [9] aligned just off north to south, 4 to 8 nT/m, could represent a former field boundary, a ditch, path or track, this does not appear on any historic mapping
- 6.11 The short linear positive feature [10], 4 to 5 nT/m, likely represents a continuation of [9].



- 6.12 The positive linear feature [11], 5 to 10 nT/m, along with [12] and [13], 4 nT/m and 2 nT/m respectively, may well represent former tracks seen on historic OS maps between 1891 and 1958. They could also represent ditches, and it is possible that [12] and [13] may relate to [9].
- 6.13 There are a few potential positive curvilinear/linear positive features, [14], [15] and [16], 4 to 5 nT/m, 2 nT/m and 4 nT/m respectively, which could represent archaeological features such as ditches. However they could relate to natural geological features or to modern cultivation.
- 6.14 The negative linear feature [17], -6 to -10 nT/m, represents a disturbed area of ground extending from one of the fenced off areas and is most likely a former boundary ditch or modern drain.
- 6.15 The amorphous positive features [18], [19] and [20], 5 to 6 nT/m, 10 nT/m, and 4 nT/m respectively, are likely to represent pits, soil-filled hollows or former ponds.
- 6.16 Scattered randomly throughout the site are a number of strong and weak dipolar responses, examples of which are highlighted as [21]. The characteristic dipolar response of pairs of positive and negative 'spikes' suggest near-surface ferrous metal or other highly fired material in the ploughsoil.

## **7.0 Discussion and Conclusions**

- 7.1 The survey identified a number of features of potential archaeological interest, one positive linear feature likely representing a former field boundary and a couple of positive linear features possibly representing former trackways. There are two linear positive features that could represent ridge and furrow cultivation and one that may be a former field boundary or ditch. A number of these linear anomalies were identified on historic mapping.
- 7.2 The entire site was fairly magnetically 'noisy', suggesting modern waste lies within or below the modern topsoil. The areas that it was possible to survey within the northern part of the site were extremely magnetically noisy, representing dumps of modern waste that were clearly visible on the surface. Any potential archaeological features within the northern part of the site will be hidden by magnetic noise, and it is possible that some ephemeral features in the rest of the site could also be masked by it.

## **8.0 Effectiveness of Methodology**

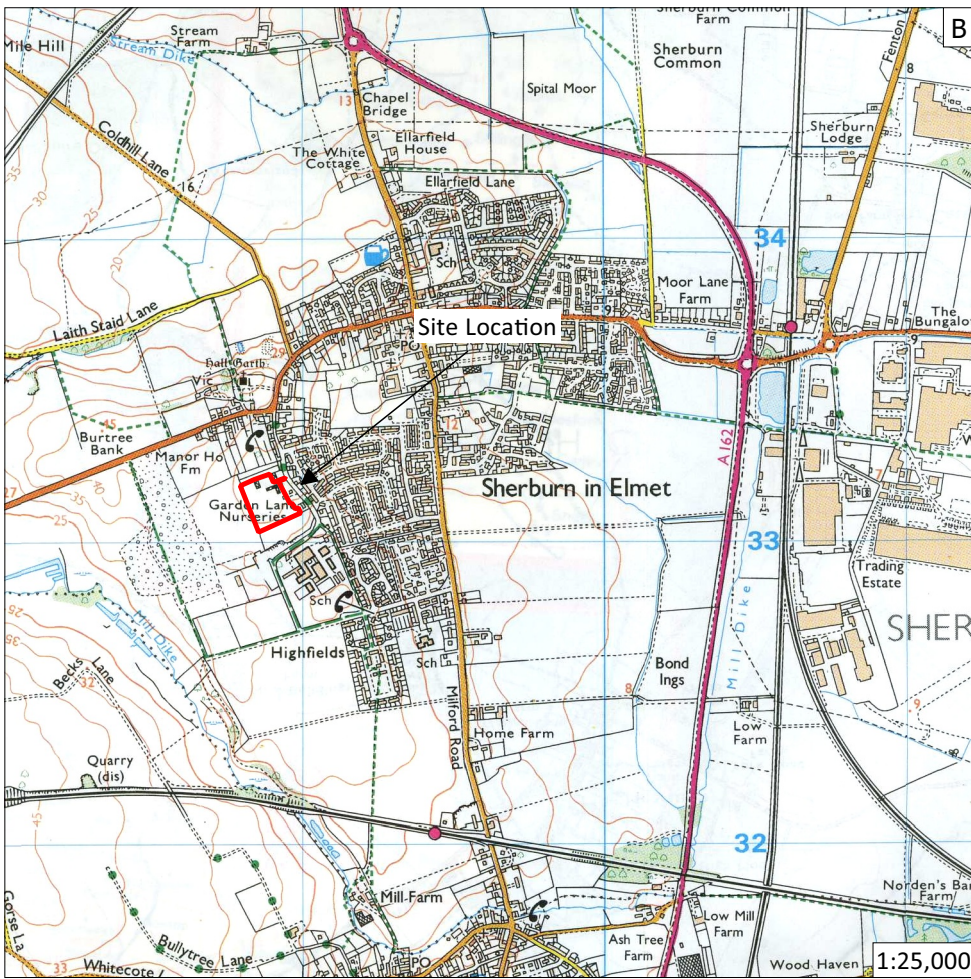
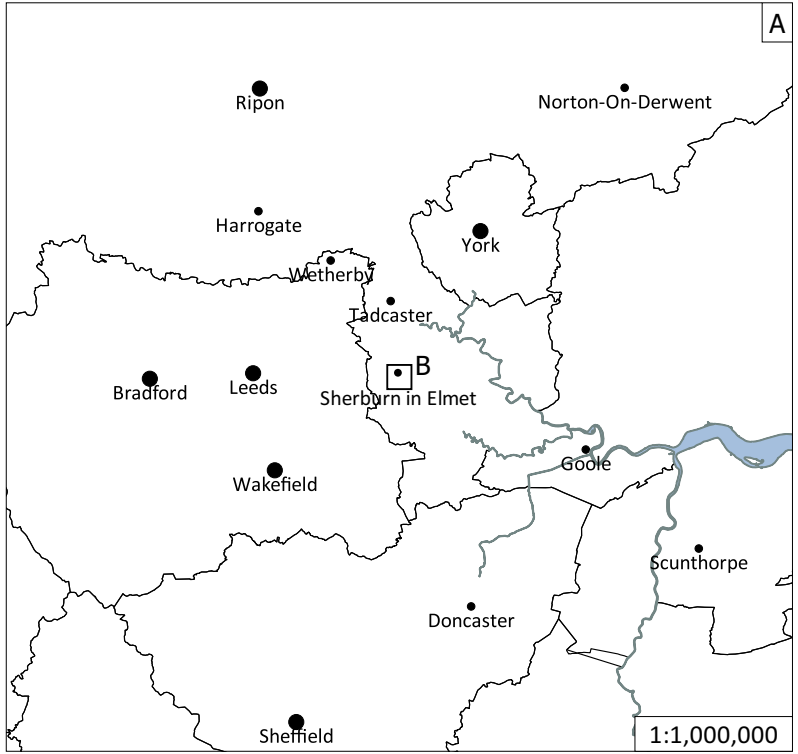
- 8.1 The non-intrusive survey methodology employed was particularly appropriate to the scale and nature of the site to be surveyed. Magnetometry was the technique best suited to the identification of possible archaeological remains on the site.

## **9.0 Acknowledgements**

- 9.1 Allen Archaeology Limited would like to thank Roger Lee Planning Ltd on behalf of Adrian Moore, Classic Developments Ltd for this commission.

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**Figure 1:** Site location outlined in red

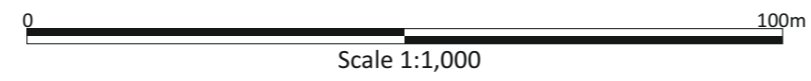
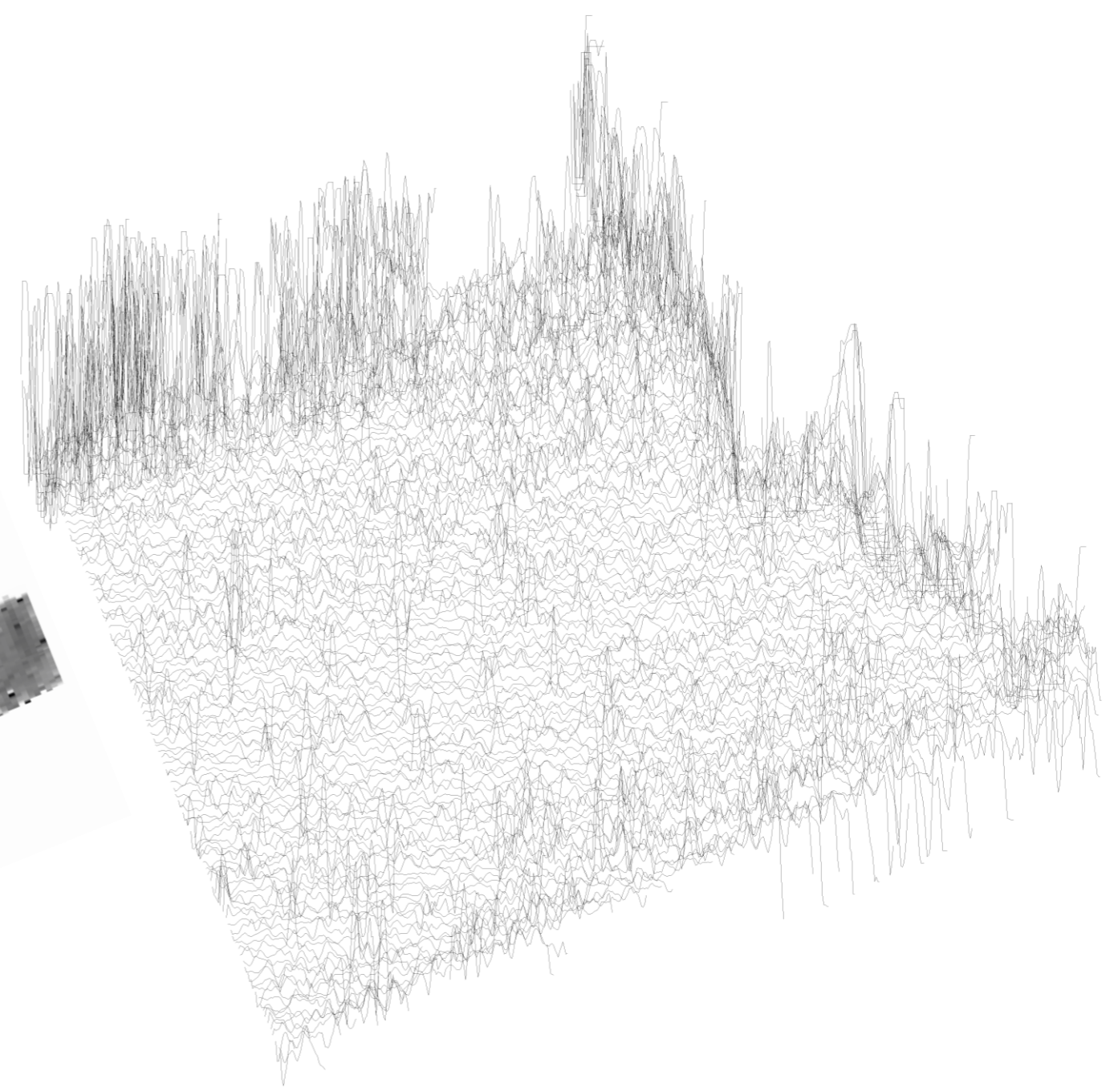
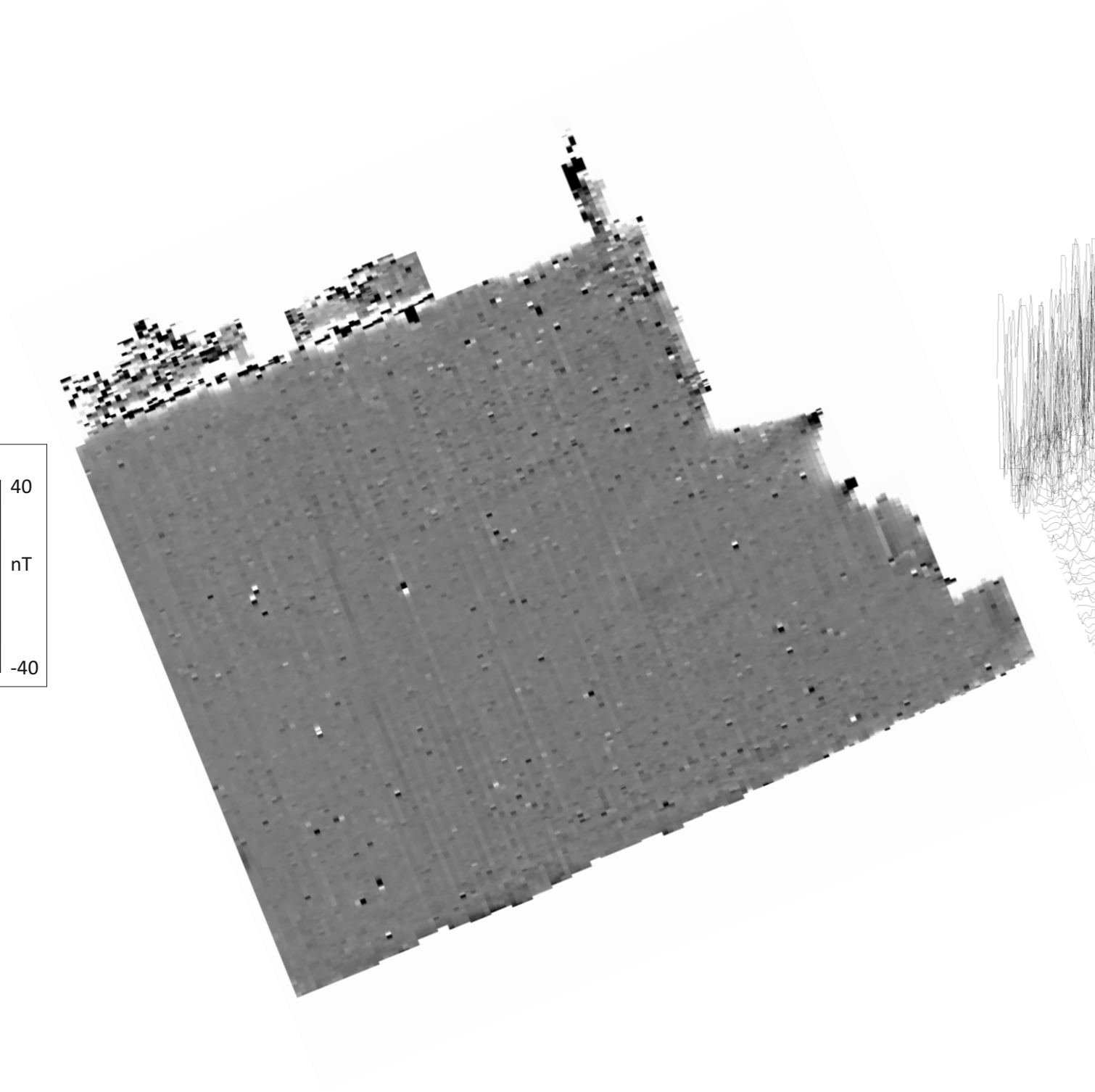
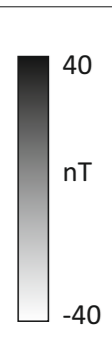
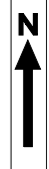
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Site Code	SHGL 17
Scale	1:10,000,000 1:1,000,000 1:25,000 @ A4
Drawn by	R Evershed
Date	07/07/17

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Raw data (clipped to +/- 40 nT)

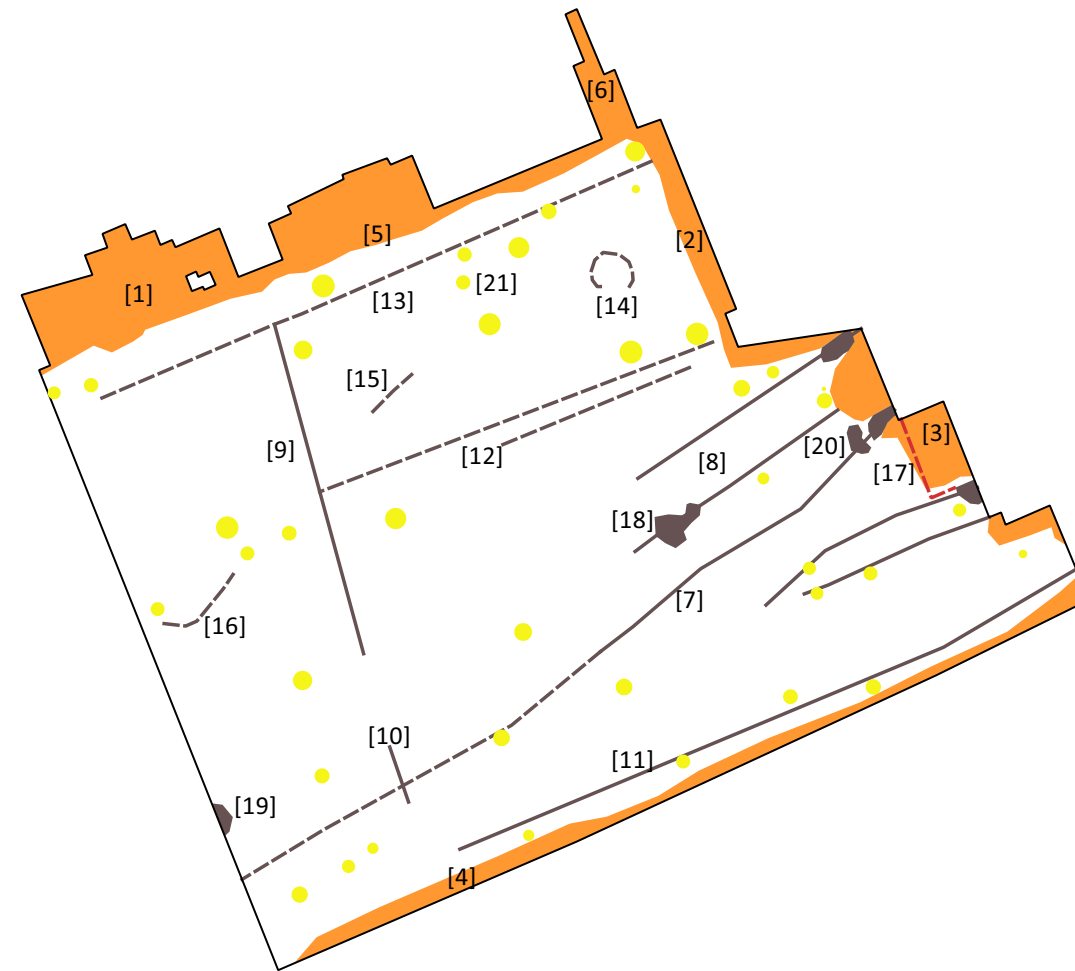
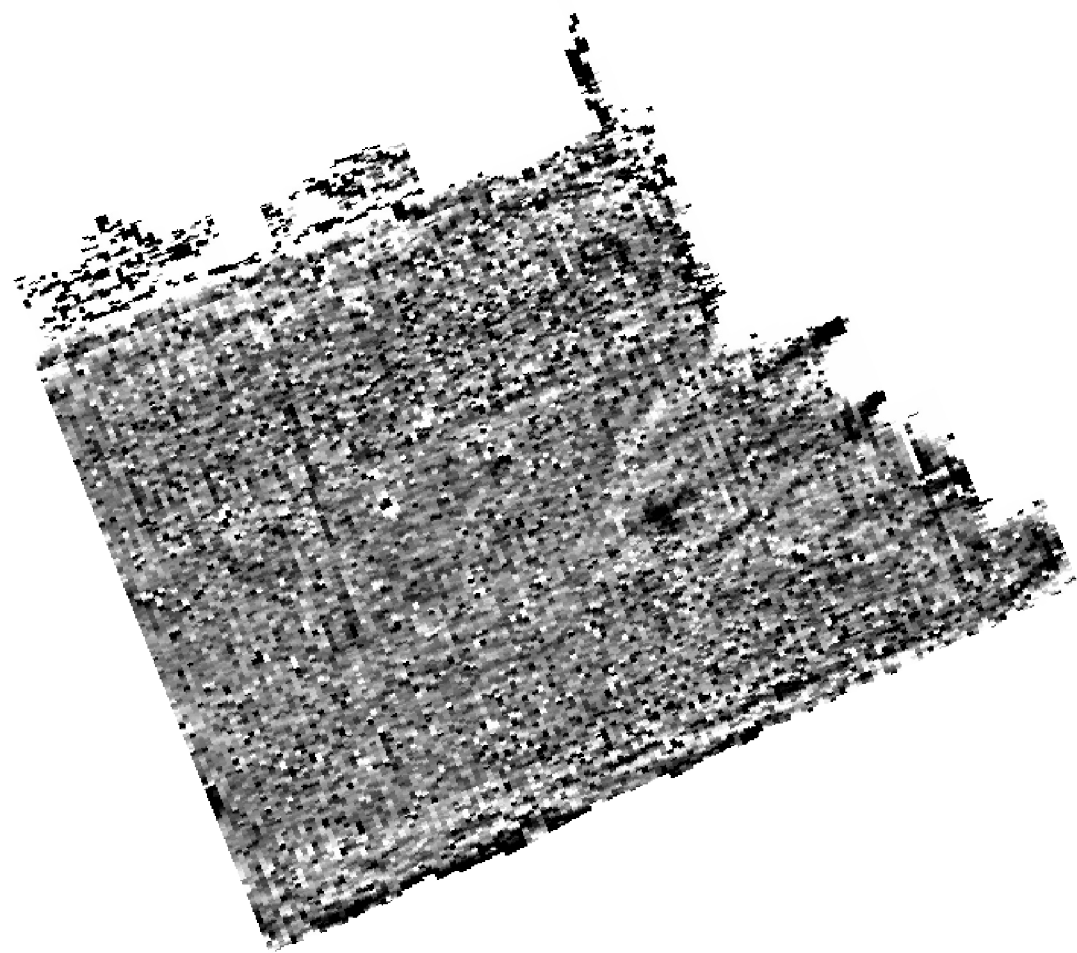
Trace Plot (ZMT and clipped to +/- 25nT)



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Drawn by	R Evershed
Date	07/07/17

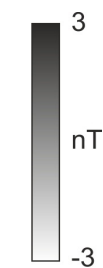
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**Figure 2:** Greyscale raw data and processed trace plot



**Key**

- Positive anomaly
- Negative anomaly
- Dipolar anomaly
- Magnetic noise
- Survey boundary



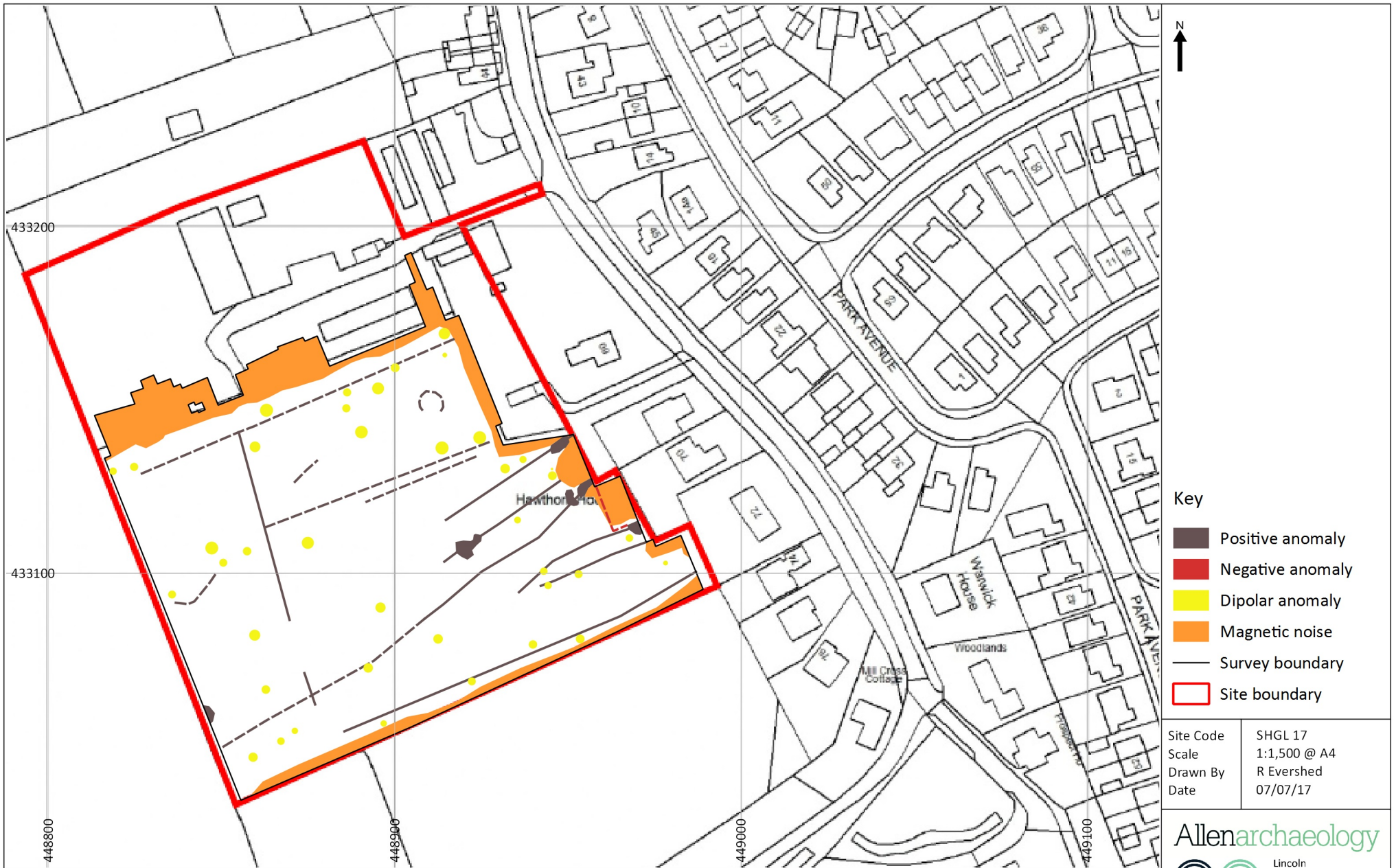
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Drawn	07/07/17

**Figure 4:** Processed greyscale plot and interpretation



Figure 4: Processed greyscale location

0 10 20 30 40 50 m



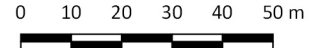
- Key**
- Positive anomaly
  - Negative anomaly
  - Dipolar anomaly
  - Magnetic noise
  - Survey boundary
  - Site boundary

Site Code	SHGL 17
Scale	1:1,500 @ A4
Drawn By	R Evershed
Date	07/07/17

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**Figure 4:** Geophysical interpretation location



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