

A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

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Non-technical Summary

This report presents and interprets the results of resistivity and magnetometry surveys at a field centred at Ordnance Survey grid reference TL151152 in Batford, Harpenden in Hertfordshire. The surveys were conducted by research students from the University of Bristol's Department of Archaeology and Anthropology during 14th to 15th March 2015. The surveys followed a desk based assessment by CGMS Consulting which considered the archaeological potential of the site to be low to very low. Yet, a series of buildings can be seen *in situ* from 1766 until 1840 and their position in the landscape is significant, particularly in relation to a Domesday recorded mill. The buildings were demolished at some point after the Tithe Award Map in 1840 and the surveys have confirmed that their remains are still present below the ground surface. The surveys also show additional unexplained features, perhaps earlier structures of potential historic significance, which need to be investigated further. The site has the potential to confirm the origins of Batford Mill and help explain the shift in Harpenden's settlement in the late-Roman and Medieval periods. It is essential that the site is allowed a full and thorough archaeological evaluation should any development be considered and before it can proceed.

1. Introduction

1.1. Background to Survey

- 1.1.1. A series of geophysical surveys were carried out on a greenfield site centred at Ordnance Survey grid reference TL151152 on Saturday 14th and Sunday 15th March 2015 on a field in Batford, Harpenden in Hertfordshire.
- 1.1.2. Permissions were sought and granted from the farmer, Phil Holt, to survey the land.
- 1.1.3. The Greenfield site is earmarked for development by Hertfordshire County Council. It is proposed to build a new secondary school.
- 1.1.4. A desk based assessment was commissioned and was produced by CGMS Consulting (Reeves 2015). The assessment judged the possibility of finding any archaeology in the field as low to very low (Reeves 2015: 13). Yet historic maps (pre-Ordnance Survey first edition) show a series of buildings in the south west corner (Drury and Andrews 1766; 19901; Wheathampstead Tithe Map Part 1 1840). The assessment highlighted the detrimental impact that development has had on Harpenden's archaeological landscape (Reeves 2015: 15).
- 1.1.5. The survey was conducted by research students in the Department of Archaeology and Anthropology at the University of Bristol.
- 1.1.6. The surveys conducted were a resistivity and a magnetometry surveys conducted on Saturday 14th and Sunday 15th March respectively.

1.2. Historical Background

- 1.2.1. The first documentary evidence we have of Harpenden is the building of St Nicholas Church in 1217. The area around the church is the modern centre of Harpenden (Page 1971: 297).
- 1.2.2. The ancient heart of Harpenden is around the River Lea at Batford. In this area an Iron Age Chieftain burial was uncovered (HER Number 123), Prehistoric and Roman evidence was uncovered on Aldwickbury Golf Course (HER Numbers 10493 and 10539), and Glemsford Drive off Crabtree Lane (HER 1168). A significant Roman villa was uncovered at Turners Hall Farm (HER Numbers 9913 and 11441), which is about 1.5 kilometres from the site. Local knowledge attests that there are links

between the Roman Villa at Mackerye End and the ford through lines of sight and an ancient footpath.

1.2.3. Harpenden is not recorded in the Domesday Survey of 1086, it is recorded as part of Wheathampstead (Martin and Williams 2003: 375). Four mills were recorded in Wheathampstead as part of this survey, topographical and local evidence strongly suggests one these was Batford Mill.

1.2.4. The name of the field, according to the Tithe Award Map 1840, is “Bonny Boys Farm Homestead and orchard” (Wheathampstead Tithe Map Part 1 1840). This description has significance, as do many field names on tithe maps, as “homestead” derives from the Old English, *hāmstede*, meaning settlement (OED 2015).

1.3. Location and Topography

1.3.1. The site is located on the Lower Luton Road in Batford, an area that is part of the wider settlement of Harpenden in Hertfordshire (see Appendix A).

1.3.2. The site is located about 94 to 102 metres above OD. The highest point of the field is at its north west corner. Its lowest point is in its south west corner. The River Lea flows from north west to south east about 125 metres south from the site.

1.4. Geology and Pedology

1.4.1. The geology is both bedrock and superficial bedrock:

1.4.2. The bedrock is chalk, which is part of the Lewes Nodular Formation and the Seaford Chalk Formation (undifferentiated). It was formed 84 to 94 million years ago during the Cretaceous period. The past environment was dominated by warm chalk seas (BGS 2015).

1.4.3. The superficial bedrock, which only covers a small portion of the southern most part of the site, is sand and gravel. It is part of the wider Kesgrave Catchment Subgroup, which was formed three million years ago during the Quaternary period. The past environment was dominated by rivers (BGS 2015).

1.4.4. Mostly, the soil of the site is a chalky silty loam. The southern most part has a soil of sand and gravel. This type of sand and gravel soil is highly prone to flooding (NERC 2015).

1.5. Designations

1.5.1. The site is designated as being part of the green belt by St Albans District Council's Local Plan Review 1994. The field is part of the Catchment Sensitive Farming Delivery Initiative 2011-2016 for England. The field is also a Nitrate Vulnerable Zone (Magic 2015).

1.6. Survey Weather Conditions

1.6.1. The weather on the first day of the survey was cloudy in the morning with sunny intervals in the afternoon. The weather on the final day of the survey was overcast throughout the day with some rain in the early afternoon.

2. Aims and Objectives of Survey

2.1. The aims and objectives of the survey were three-fold:

2.1.1. To record any surviving remains of the buildings recorded in the historic maps of the area.

2.1.2. To investigate whether any other features of archaeological interest survived.

2.1.3. To test the conclusions of the desk based assessment.

3. Methodology

3.1. Adherence to Guidance and Regulations

3.1.1. The following guidance documents and regulations were closely followed during the completion of this survey:

3.1.1.1. Chartered Institute for Archaeologists' *Standard and guidance for archaeological geophysical survey* (ClfA 2014).

3.1.1.2. English Heritage/ Historic England's *Geophysical Survey in Archaeological Field Evaluation* (David *et al.* 2008).

3.1.1.3. The University of Bristol's *Working off-site (health and safety guidance)* (Greaves 2014).

3.1.1.3.1. In accordance with these regulations a risk assessment and a Safe System of Work Document were completed by the lead researcher and approved by the Archaeology and Anthropology Department's Health and Safety Officer.

3.2. *Extent of Survey*

3.2.1. The focus of the survey was in the south west corner of the field at Ordnance Survey grid reference TL150150 where historic maps show post medieval buildings associated with a Domesday recorded mill at Batford. To adequately cover the precinct of the buildings, two rows of three 30 by 30 metre grids were laid out.

3.2.2. If time had allowed a seventh grid, also measuring 30 by 30, would have been laid out further north to investigate if the field contained any other field systems. Unfortunately, this was not possible due to time constraints.

3.3. *Method for Gridding and Recording Survey Location*

3.3.1. Tapes and pegs were used to mark out the grids and a Garmin GPSMAP 64S GPS handheld unit was used to tie the survey into the National Grid. The GPS unit gave 10 figure grid references.

3.4. *Survey Equipment Used and Method Employed*

3.4.1. Resistivity was used to survey the buildings in the bottom row of three grids. A Geoscan RM15 unit was used. Magnetometry was used to pick up any field boundaries. All grids were surveyed using a Geoscan FM256 Fluxgate Gradiometer.

3.4.2. The sample interval along the X axis was every metre for both resistivity and magnetometry surveys. Along the Y axis, a metre traverse sample was used for the resistivity and, due to the features being surveyed, a 50cm sample was used for the magnetometry. A zig-zag traverse mode was used for both surveys.

3.5. Processing the Results

3.5.1. The resistivity results were processed in TerraSurveyor version 3.0.25.0.
The magnetometry results were processed in GeoPlot version 3.0.

3.5.2. The resistivity was processed by:

- 3.5.2.1. Clip: 2.00SD.
- 3.5.2.2. Despike: Threshold: 3x3.
- 3.5.2.3. Deslope: Horizontal using Polynomial.
- 3.5.2.4. Normalize: Complete survey.
- 3.5.2.5. Periphery Match: All grids in the survey.
- 3.5.2.6. Interpolate: X and Y doubled.

3.5.3. The magnetometry results were processed by:

- 3.5.3.1. Despike: X=1, Y=1, Threshold=3.
- 3.5.3.2. High Pass Filter: X=10, Y=10, Wt=U.
- 3.5.3.3. Zero Mean Traverse: Grids=All, LMS=On.
- 3.5.3.4. Low Pass Filter: X=1, Y=1, Wt=G.
- 3.5.3.5. Interpolate: Y Expand – SinX/Y x 2.
- 3.5.3.6. Interpolate: X Expand – SinX/Y x 2.
- 3.5.3.7. Interpolate: Y Expand – Linear x 2.
- 3.5.3.8. Interpolate: X Expand – Linear x 2.

4. Results

4.1. Resistivity

The resistivity results have been colourised to better highlight the features from the survey. Thus, the features coloured red have the highest resistance with green having the lowest resistance. The order from highest to lowest resistance is: red, orange, yellow, blue and green.

There is a concentration of high resistance in the first grid to the west. This response seems to suggest building remains. When historic maps, including the Tithe Award map (Wheathampstead Tithe Map Part 1 1840), are overlaid with the results these correlate with the buildings the survey aimed to record. It is probable that the large areas of blue noise is geology, although without further investigation this is uncertain.

There are areas of unexplained high resistance to the east of the survey. Cartographic evidence from 1766 (Drury and Andrews 1766; 19901; Wheathampstead Tithe Map Part 1 1840) does not include any further features and therefore these areas may represent an unrecorded building or buildings and may be of an earlier construction than the known buildings. At the top of the survey a straight line and a return are

evident. Without further work the nature and precise date of this prominent feature cannot be determined.

4.2. Magnetometry

The magnetometry survey shows a series of post-hole like features in the first grid on the east. These features seem to correlate with features on the resistance survey and suggest the remains of a building. There are similar features toward the west but not as frequent. There are interesting hints of features in the northern part of the survey and the centre. These features could be evidence of early ploughing, or of early field systems. Evidence of early field systems is of significance and is important for the evolving understanding of Harpenden's development over time. Further work is needed to be certain.

5. Conclusions and Recommendations

The site is surrounded by others of historic importance and is one of the last remaining undeveloped riverside and Greenfield spaces in Harpenden. Moreover the field has not been extensively ploughed, which means that any archaeology should be in good condition. This is an important site archaeologically for this reason alone. However, the importance increases when cartographic evidence and geophysics results agree that there are building remains in this field. Buildings associated with a Domesday recorded mill and in a field named "homestead" increase the significance further. Moreover, both the resistivity and magnetometry results give tantalising hints of other, perhaps earlier buildings, in this field. The site has the potential to confirm the origins of Batford Mill and help explain the shift in Harpenden's settlement in the late-Roman and Medieval periods. It is essential that the site is allowed a full and thorough archaeological evaluation before any development is considered or can proceed.

6. Archive location

A copy of this report and the geophysics results has been lodged with the Hertfordshire Historic Environment Record at Hertfordshire County Council. A record of this survey has been created with the Online Access to the Index of archaeological investigations project (OASIS).

7. Bibliography

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Cartographic Sources

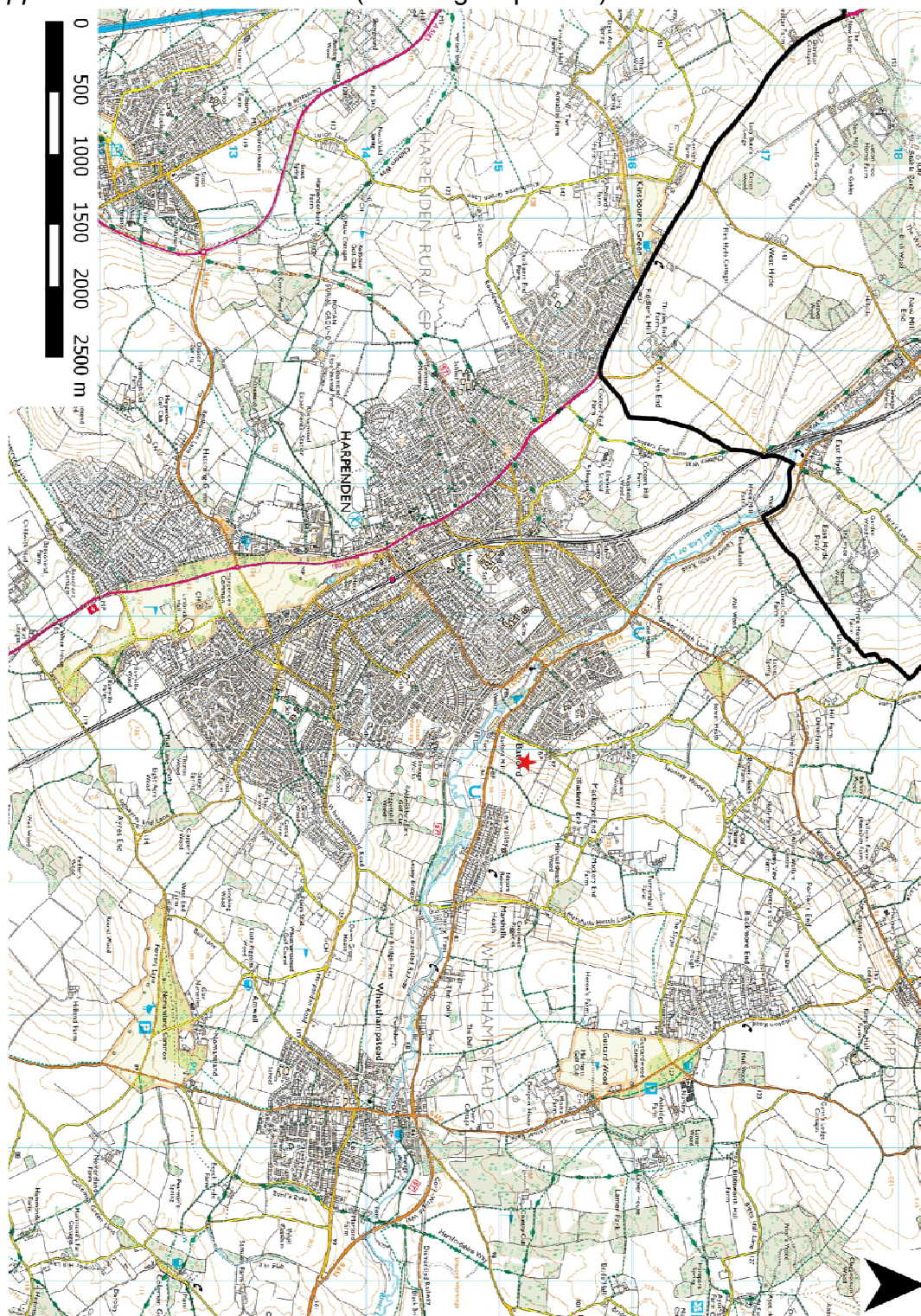
1799 Map 19901, Westminster Abbey Library and Muniments

Drury and Andrews Map 1766, Hertfordshire Record Office

Wheathampstead Tithe Map Part 1 1840, Hertfordshire Record Office

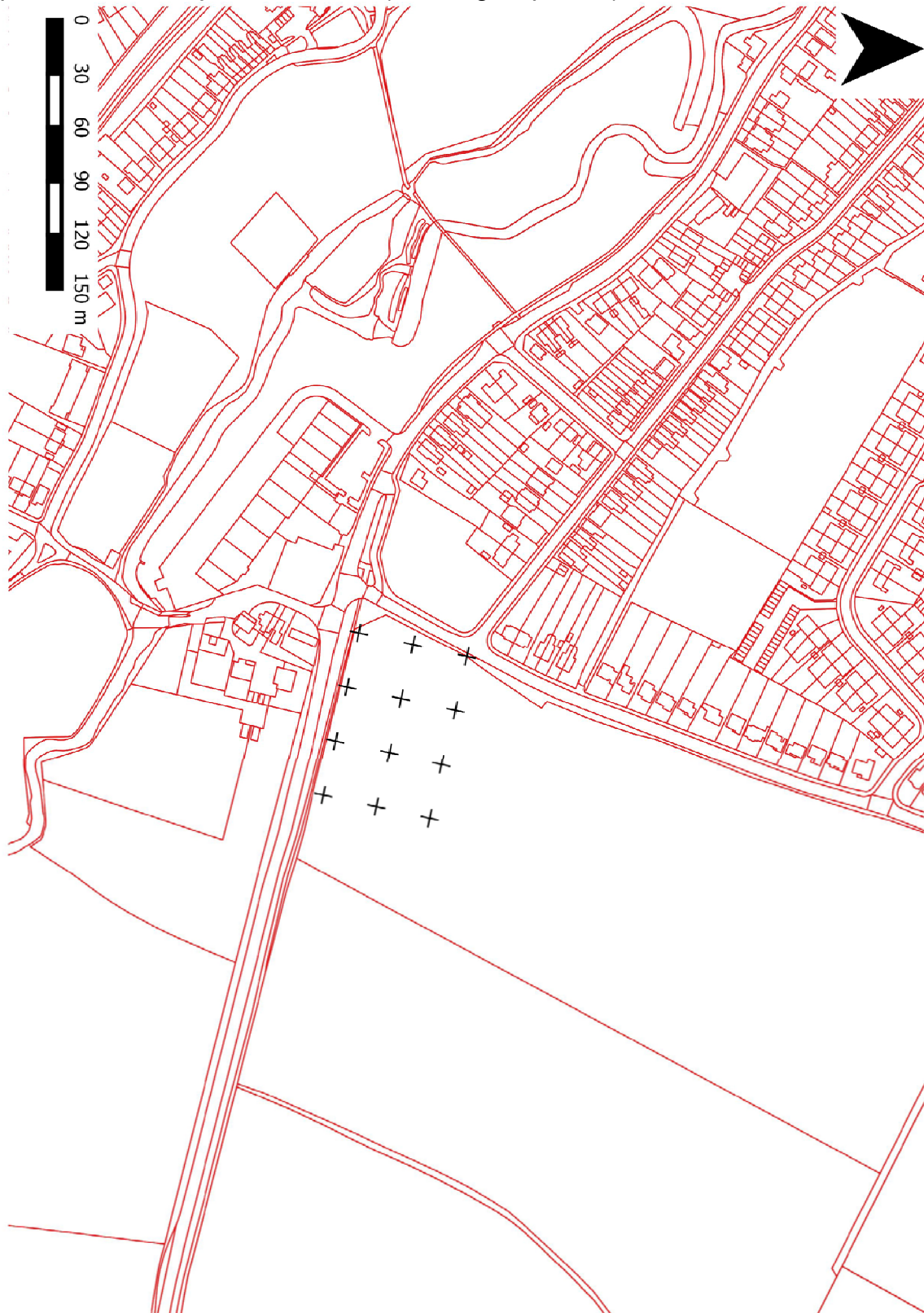
8. Appendices

Appendix A – Location of site (after Digimap 2015)



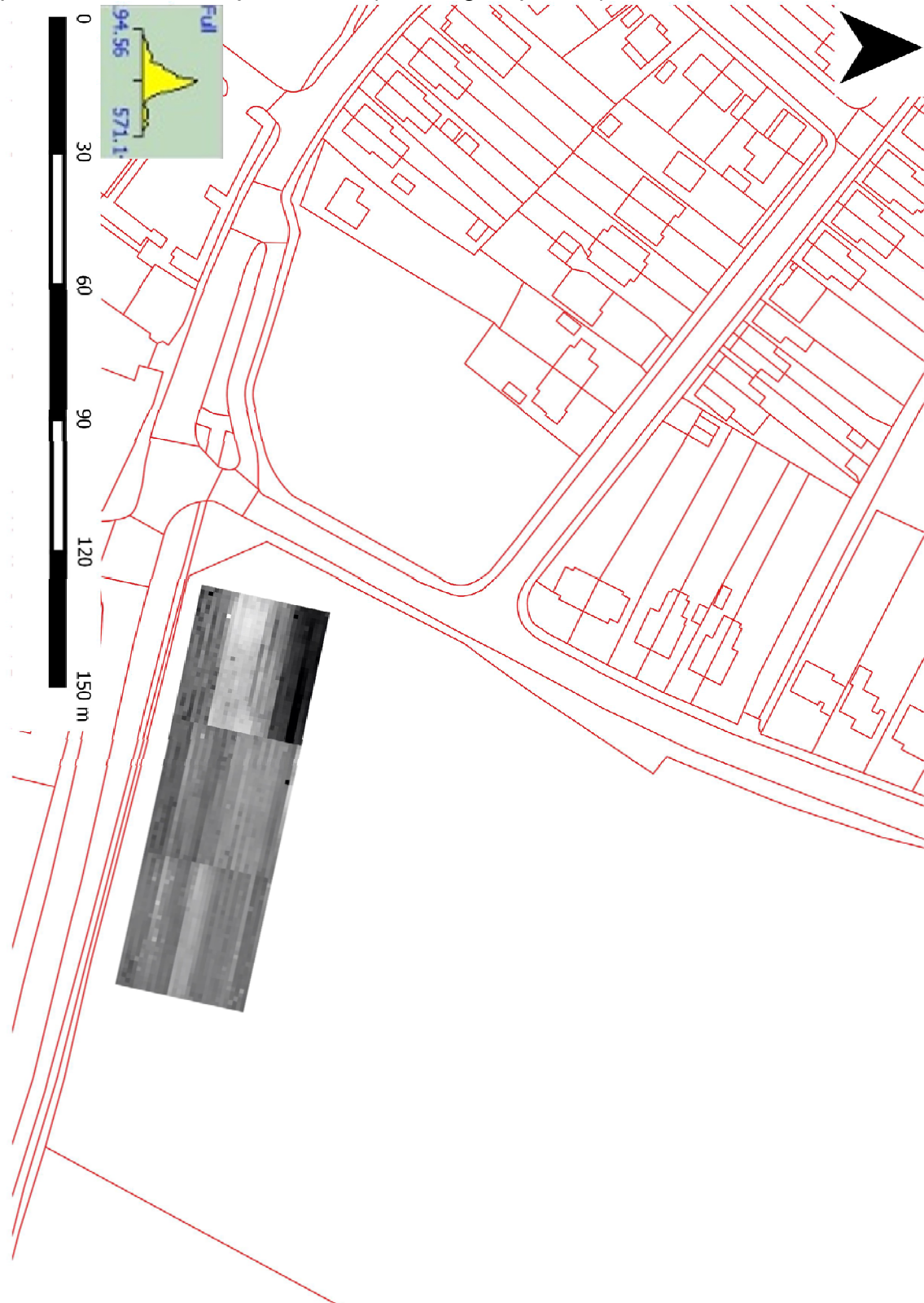
A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

Appendix B – Survey Grid Location (after Digimap 2015)



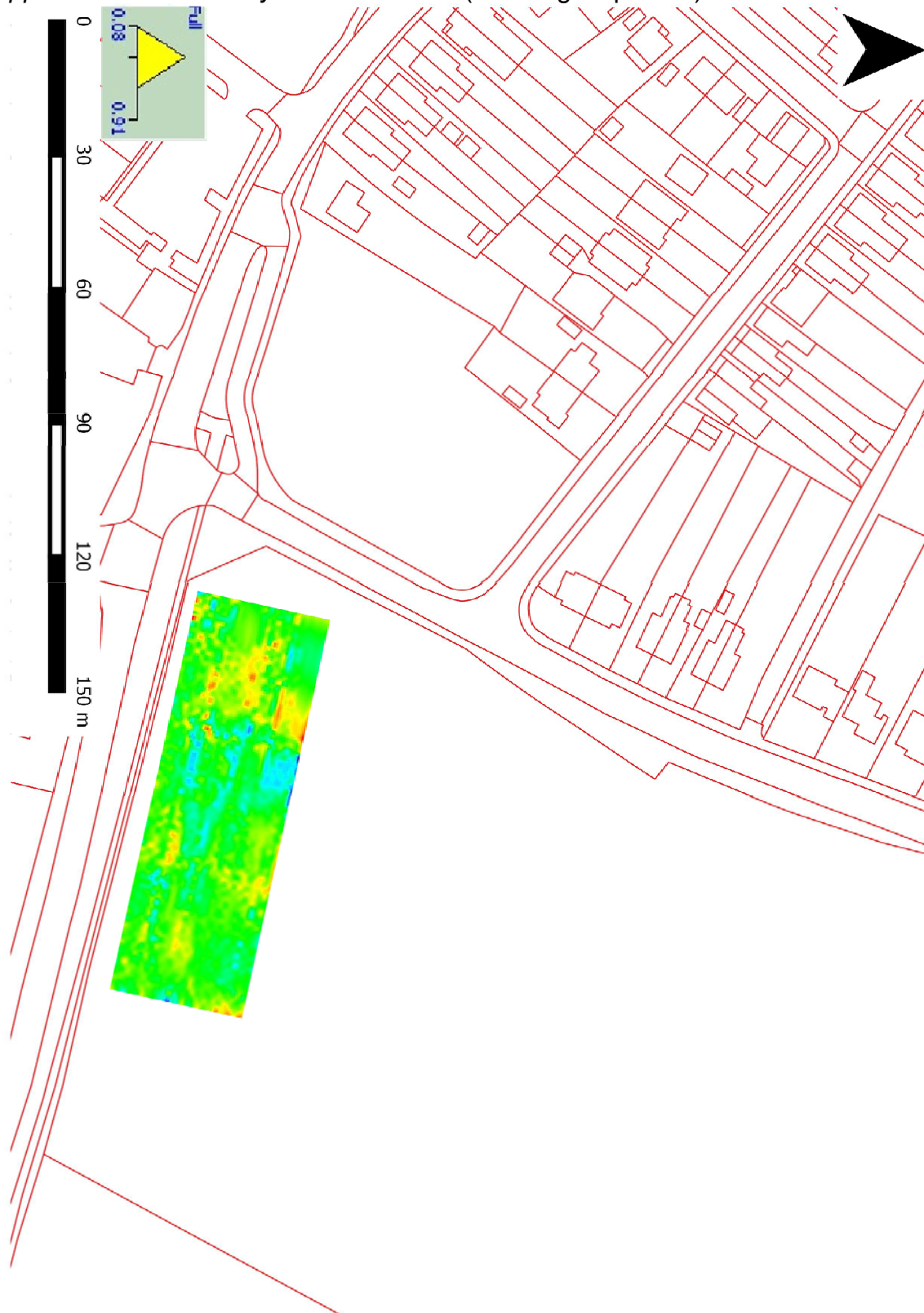
A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

Appendix C – Resistivity Raw Plot (after Digimap 2015)



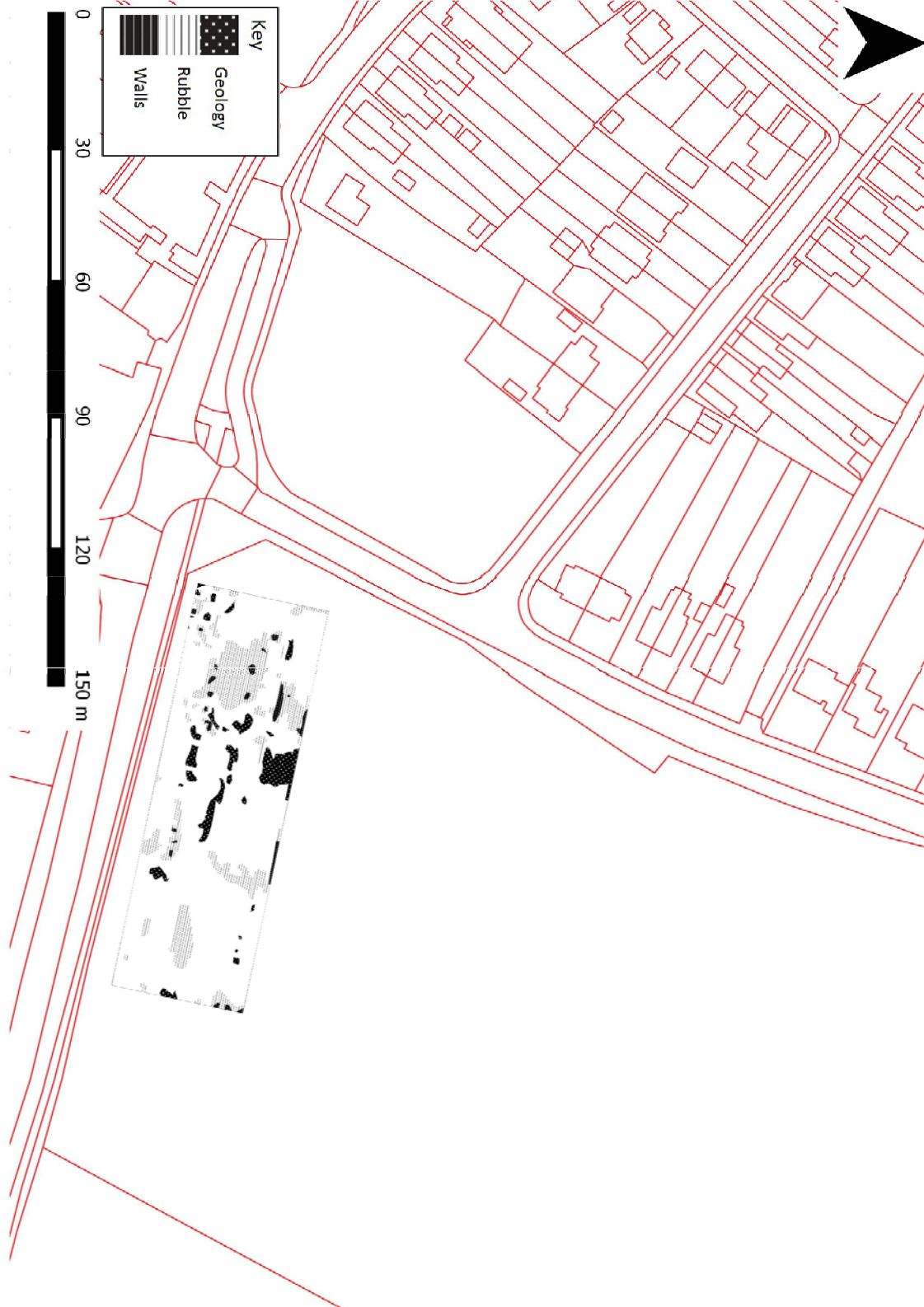
A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

Appendix D – Resistivity Processed Plot (after Digimap 2015)



A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

Appendix E – Resistivity Interpretation Plot (after Digimap 2015)



A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

Appendix F – Magnetometry Raw Plot (after Digimap 2015)



A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

Appendix G – Magnetometry Processed Plot (after Digimap 2015)



A Resistivity and Magnetometry Survey of a Field at TL151152 in Batford, Harpenden, Hertfordshire

Appendix H - Magnetometry Interpretation Plot (after Digimap 2015)

