Hogwood Farm, Finchampstead, Berkshire

Detailed Gradiometer Survey Report

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Summary

A detailed gradiometer survey was conducted over land at Arborfield, Reading (centred on NGR 477036 164298). The project was commissioned by Legal and General Homes with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features in support of a planning application for the development of the site for residential properties.

The site comprises several arable fields located 2.5 km north-west of Finchampstead, 6 km south-west of Wokingham, and 10 km south-east of Reading, in the county of Berkshire covering an area of 110.5 ha. The geophysical survey was undertaken between the 15 May and the 20 June 2018.

The detailed gradiometer survey has been successful in detecting anomalies thought be archaeological in in origin. This includes evidence of the Silchester to London Roman road, which is known to pass through the area. However, there is no evidence for the possible Roman villa that has been previously suggest to from cropmarks visible on aerial photographs.

To the south of the projected route of the Roman road in the centre of the site there is an area of increased magnetic response and numerous linear anomalies. This may indicate the location of possible a rectilinear enclosure, associated pit-like features and possible metal working activity. However, further investigation would be required to understand whether this is associated with Romano-British activity or an alternative date.

An additional rectilinear enclosure with several internal linear features is noted to the north-west. This may indicate further evidence of Romano-British activity in the area, although an alternative date cannot again be ruled out.

Numerous other anomalies have been interpreted as possible archaeology across the site, many of which likely pertain to ditch-like and pit features. Some of the linear anomalies likely relate to enclosures or field boundaries, while many of the pits may relate to associated activity or material extraction. Despite this, accurate interpretation of some of these features is hampered by the large area of increased magnetic response which dominates the northern portion of the site. It is thought that the majority of this relates to modern agricultural practices or other modern surface spreads.

In the south-east of the site areas of increased magnetic response which are not defined by the boundaries of the existing field have also been recorded. These responses correspond to areas of former woodland and plantation noted on historic mapping, and there are also several former field boundaries recorded in this area.

Evidence for superficial geological deposits and other agricultural activity such as ploughing and drainage have also been located in parts of the site. This corroborates the assessment of the DBA, which found the area has likely comprised agricultural land since the medieval period.

Acknowledgements

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The fieldwork was undertaken by Chris Hirst, Rok Plesnicar, Adrian Serbanescu, Jenna Jackson and Matt Tooke. Geophysical survey data was processed and interpreted by Alexander Schmidt and Chris Hirst. The report and illustrations were compiled by Alexander Schmidt. The geophysical work was quality controlled by Tom Richardson and Nicholas Crabb. The project was managed on behalf of Wessex Archaeology by Simon Woodiwiss.

Hogwood Farm, Finchampstead, Berkshire

Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

Wessex Archaeology was commissioned by Legal and General Homes to carry out a geophysical survey at Hogwood Farm, Finchampstead, Berkshire, centred on NGR 477036 164298 (**Figure 1**). The survey forms part of an ongoing programme of archaeological works being undertaken in support of a planning application (O/2014/2179 and 14/02576/OOD) for a residential development at the site.

1.2 Scope of document

1.2.1 This report presents a brief description of the methodology followed by the detailed survey results and the archaeological interpretation of the geophysical data.

1.3 The site

1.3.1 The proposed geophysical survey area is located 2.5 km north-west of Finchampstead, 6 km south-west of Wokingham, and 10 km south-east of Reading, in the county of Berkshire.

1.3.2 The survey comprises 110.5 ha of agricultural land, currently under crop and pasture. The site is bounded by the Hogwood industrial estate to the north, Park Lane to the east and south, and Reading Road (A327) to the west.

1.3.3 The site lies on a generally south-east and south-facing slope from 65 m above Ordnance Datum (aOD) at the north-western boundary to 54 m aOD at the south-eastern boundary and 50 m aOD at the southern boundary.

1.3.4 One set of over-head cables are noted traversing the site. These are located across the centre of the site on a west – east alignment and continue on a south-west to north-east alignment across the north-east of the survey area. Five pylon bases have been identified within the site.

1.3.5 The underlying geology for the majority of the site is mapped as Clay, Silt, and Sand of the London Clay Formation with an area of Sand of the Bagshot Formation recorded in the east. There are no superficial deposits recorded across the site (BGS 2018).

1.3.6 The soils anticipated to be present across most of the site are typical stagnogley soils of the 711h (Wickham 4) formation. An area of typical argillic gley soils of the 841c (Swanwick) formation are also recorded along the eastern boundary of the site (SSEW 1983).

2 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

2.1.1 The archaeological and historical background was assessed in a prior desk-based assessment (Royal HaskoningDHV 2014). This considered the recorded historic

environment resource within a 2 km study area of the proposed development. The following summary of this is not exhaustive, but details those records considered relevant to the geophysical survey. Relevant entry numbers from the National Heritage List for England (NHLE) are included with additional sources of information referenced as appropriate.

2.2 Summary of the known archaeological resource

2.2.1 There are six scheduled monuments recorded within the study area. The London to Silchester Roman road passes through the southern part of the site, and is on an east west alignment (NHLE no. 1016332). Sections of the road are scheduled, with the nearest being 500 m east of the site where a series of rectangular buildings have been identified as cropmarks (NHLE no. 1006968). The geophysical survey undertaken in advance of the current project has identified a well-defined enclosure (geophysical reference no 4 in the table below and see inset on survey drawing) and this may be associated with the Roman road which runs 400 m to the south. 1.4 km east of the site is an extant Bronze Age Bell barrow (NHLE no. 1013244). 500 m north of the site are the Arborfield Infirmary Stables, which were built in 1911-12 and formed part of the Army Remount Service Depot (NHLE no. 1006949). To the north of the stables is a moated site at Moat House in Arborfield garrison (NHLE no. 1009886). The medieval site survives as a level depression with graded banks to a height of 1 m. The final scheduled monument in the study area is the medieval Church Farm, 2 km north-east of the site (NHLE no. 1013181).

2.2.2 There are 3 Grade I, 3 Grade II*, and 55 Grade II listed buildings within the study area. One of these, the Grade II listed Hogwood Farm, lies within the site. The farmhouse dates to the 17th century with 20th century alterations (NHLE no. 1118094). Seven of the other listed buildings lie near the site boundary. These mostly relate to post-medieval cottages and farm buildings.

2.2.3 There are two registered parks and gardens in the study area. Farley Hall is registered as Grade II and located 1.5 km west of the site (NHLE no. 1000526). Warbrook House is Grade II* listed and located 2 km south of the site (NHLE no. 1000249).

2.2.4 Early prehistoric activity is limited to a small number of find spots. This includes a hand axe 1.5 km east of the site and a palaeolith 800 m to the south.

2.2.5 Bronze Age funerary activity is seen in the study area with two barrows surviving as earthworks 1.4 km to the east of the site and a cemetery recorded 1.8 km to the north. Along one boundary of the development site (just to the north of a Roman road, see below) two Bronze Age burial urns were suggested to indicate the presence of a cemetery (MOLA 2014, 11). There are also several Bronze Age find spots within the wider study area, including a palstave, dagger, and pottery. Two multi-period find spots covering the Palaeolithic through to medieval periods are recorded within the south-west and on the northern boundary of the site.

2.2.6 There is evidence for Iron Age settlement, metal-working, and cultivation within the study area. It is also suggested that these sites continued in use intermittently through the Romano-British period. This includes sites at Hogwood Shaw (immediately north of the current site), Whitehall Brick and Tile Works, Poperinghe Barracks, and Rooks Nest Farm. Cropmarks along the scheduled Roman road (Fig. 1) also indicate the location of a possible villa in the southern portion of the site. The cropmarks have been associated with an antiquarian report of quantities of Roman pottery and tile (MOLA 2014, 13). Two evaluations to the north of the site (ERM1888 and 1892) have evidence of Iron Age activity, one (EMR 1892) including iron working in the form of furnace bottoms.

2.2.7 There is limited evidence for Saxon activity in the area. The villages of Arborfield Cross and Finchampstead both have Saxon origins. Former field boundaries identified in the surrounding area are thought to be Saxon in date.

2.2.8 During the medieval and post-medieval period, the site formed part of the Parish of Finchampstead. It is likely the site comprised agricultural land during this period. Evaluation to the north of the site (ERM1888) identified ditches of medieval date.

2.2.9 Early 20th century activity includes a World War II pillbox within the site and Arborford Garrison to the north. There is also evidence of clay pits associated with a brick works (understood to be operating in the 1930s and 1940s) in the surrounding area (eg Whitehall Brick and Tile Works, Sheerlands Road, to the north of the development; Pine 1998, the focus on interest was in earlier periods, though there is reference on the ADS library to building recording, no download was available).

3 METHODOLOGY

3.1 Introduction

3.1.1 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between 15 May and 20 June 2018. Field conditions at the time of the survey were generally good throughout the period of survey. An overall coverage of 86.7 ha was achieved. The survey was limited in the centre and north of the site where two small copses of woodland prevented the collection of data. In addition, the survey was limited surrounding farm buildings and trackways as well as at the periphery of several fields where encroaching hedgerows were present.

3.2 Aims and objectives

3.2.1 The aims of the survey comprise the following:

- to conduct a detailed survey covering as much of the specified area as possible, allowing for artificial obstructions;
- to clarify the presence/absence and extent of any buried archaeological remains within the site;
- to determine the general nature of the remains present.

3.3 Fieldwork methodology

3.3.1 The cart-based gradiometer system used a Leica Captivate RTK GNSS instrument, which receives corrections from a network of reference stations operated by the Ordnance Survey (OS) and Leica Geosystems. Both instruments allow positions to be determined with a precision of 0.02 m in real-time is precise to approximately 0.02 m and therefore exceed Historic England recommendations (2008).

3.3.2 The detailed gradiometer survey was undertaken using four Bartington Grad-01-1000L gradiometers spaced at 1 m intervals and mounted on a non-magnetic cart with an effective sensitivity of 0.03 n. Data were collected at a rate of 10 hz, producing intervals of 0.15 m along transects spaced 3.5 m apart, therefore exceeding Historic England guidelines.

3.4 Data processing

3.4.1 Data from the survey was subject to minimal data correction processes. These comprise a zero mean traverse function (±5 nT thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. These two steps were applied throughout the survey area, with no interpolation applied.

3.4.2 Data from the survey was subject to minimal data correction processes. These comprise a 'Destripe' function (±5 nT thresholds), applied to correct for any variation between the sensors, and an interpolation used to grid the data and discard overlaps where transects have been collected too close together.

3.4.3 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

4.1 Introduction

4.1.1 The detailed gradiometer survey has identified magnetic anomalies across the site. Results are presented as a series of greyscale plots and archaeological interpretations at a scale of 1:6500 and 1:2000 (**Figures 2** to **13**). The data are displayed at -2 nT (white) to +3 nT (black) for greyscale images (**Figures 2**, **4**, **6**, **8**, **10**, and **12**).

4.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (**Figures 3**, **5**, **7**, **9**, **11**, and **13**). Full definitions of the interpretation terms used in this report are provided in **Appendix 2**.

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

4.1.4 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be present than have been identified through geophysical survey.

4.1.5 Gradiometer survey may not detect all services present on Site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g. CAT and Genny) should be used to confirm the location of buried services before any trenches are opened on Site.

4.2 Gradiometer survey results and interpretation

4.2.1 The geophysical survey has identified several anomalies that are thought to be associated with archaeological remains. These are predominantly located in the centre and south-east of the site, and are likely the result of linear and rectilinear ditch features.

4.2.2 The first anomalies thought to be associated with archaeological remains are located to the south-east of the site at **4000** and **4001** (**Figure 9**). At this location, two weakly positive, parallel linear anomalies have been identified. The first (**4000**) is 45 m long, 2.3 m wide, and is on a west – east alignment. It is not clear whether the anomaly continues

to the east as only a weak trend can be seen in the dataset at this point. The second linear anomaly (**4001**) is on the same alignment, 22 m north of **4000**. This anomaly is weaker, but also positive, and is 61 m in length, although two notable gaps can be seen. These anomalies align to the projected route of the London to Silchester Roman Road and are therefore likely to be associated with two parallel roadside ditches. In between these, there is a very poorly defined, weak negative response may suggest that material associated with road or 'agger' may be present. However, it is not possible to clearly delineate the road itself.

4.2.3 To the east of **4000** and **4001**, a rectilinear anomaly at **4002** has been identified. This is on a broadly north – south alignment, and is perpendicular to the route of the Roman road. The anomaly is 14 m square, although there is no eastern element to the anomaly present in the data. This is indicative of a ditch feature, and may relate to a small enclosure associated with the Roman Road. There are several small discrete positive anomalies within the centre of the rectilinear. Whilst it is possible these are pit features associated with the enclosure.

4.2.4 A further positive recti-liner anomaly has been identified in the west of the survey area at **4003** (**Figure 11**). The background magnetic response in this location is notably elevated and agricultural activity has resulted in limited detectability of this feature in parts. The anomaly measures 45 m north-north-west to south-south-east by 36 m west-south-west to east-north-east. The full extent of this is not visible due to the constraints of the modern field boundary located to the west. The anomaly is indicative of a ditch feature, with a width of 1 – 2 m, which likely relates to an enclosure. Several, smaller internal anomalies are discernible within the enclosure that likely form internal divisions. Whilst the rounded rectilinear arrangement suggests a possible Iron Age / Romano-British date, the anomaly could possibly date to as late as the Medieval period. Further investigation would therefore be required to provide a confident date for the feature.

4.2.5 Towards the south-west of the site at **4004** several positive linear anomalies have been identified (**Figure 13**). These form a rectilinear shape measuring 43 m x 38 m orientated on an approximate south-west to northeast alignment. Such anomalies are indicative of ditch-like features, likely relating to an enclosure. The orthogonal layout may suggest that it could be of Romano-British origin. Given the proximity of this to the projected location of the London to Silchester Roman Road, which follows the alignment of the current field boundary to the north, such an interpretation is likely. However, it is not possible to confirm this based on these geophysical survey results alone.

4.2.6 The anomalies at **4004** are located in a large area of increased magnetic response which is characterised by a series of indistinct positive and negative anomalies. This has generally resulted in the poor definition of the rectilinear features, but may relate to numerous ferrous objects or burning. Such a dense concentration of these anomalies within, and surrounding a rectilinear enclosure, may imply this is associated with an area of metal-working, or a spread of material associated with such activity. In addition, several dipolar responses are noted at **4005**, measuring between 5 – 12 m in diameter. Further anomalies of a similar character are noted within the enclosure at **4004**, as well as to the south at **4006**. The size and nature of these could be indicative of areas burning which might be associated with the hypothesised metal-working within this areas of the site.

4.2.7 Several smaller, broadly circular anomalies are also noted to the north at **4007**. These are weakly positive and measure 1 – 4 m in diameter and may be associated with pit-like features. The weaker magnetic response of these anomalies suggests that these are

unlikely to be evidence for metal-working, but they may be associated with the enclosure at **4004**.

4.2.8 Approximately 40 m east of **4004**, there is a broad curvilinear anomaly which is variable in strength and poorly defined (**4008**). This extends on a north to south alignment and measures 106 m in length and between 7 and 10 m wide. It is generally characterised by a weakly positive magnetic response, although there are areas of weakly negative response on both the eastern and western edge of this in parts. This is interpreted as superficial geology and may be associated with a band of natural geological variation. However, the slightly linear form of this could suggest that it may relate to a very broad ditch-like feature, though this is considered unlikely.

4.2.9 At the northern and southern end of **4008** there are two amorphous areas of stronger positive response that are irregular in form. It is possible that these anomalies relate to an area of material extraction located within this area of geological variation. As such these are interpreted as possible archaeology and may be associated with features located to the west, centred on **4004**.

4.2.10 Roughly in the centre of the site, a positive linear anomaly has been identified at **4009** (**Figure 5**). This protrudes north-west from the south-eastern field boundary in this area and measures 46 m in length by 1.3 – 3.3 m wide. The anomaly also has an associated negative response on the eastern side, which may suggest the anomaly relates to a ditch and bank-link feature. 35 m to the north-east of this is a further strong positive linear anomaly which is situated on a parallel alignment to **4009**. This measures 21 x 5 m and turns slightly towards the south-west in the southern extent (**4010**). This may be associated a further ditch-like feature, possibly forming a small enclosure associated with the anomaly at **4009**. However, the strength of this anomaly suggests it is infilled with a magnetically enhanced material. As this is also surrounded by a wider area of increased magnetic response, it is possible that this is associated with an area of made ground, perhaps infilling a localised topographic variation. Such an interpretation is further supported by the presence of a broad linear anomaly, located directly to the south-east (**4011**) which is thought to relate to an area of superficial geology.

4.2.11 At **4011**, a weakly negative linear anomaly traverses part of the central area on a north-west to south-east alignment. This measures between 10 and 13 m wide and extends for 144 m, likely continuing beyond the survey extent to the south. On both the north-eastern and south-western edge of this response there is a corresponding weakly positive response. This is most likely associated with natural variation in the underlying geology, and probably continues further to the north-west, although this is not visible due to presence of the anomaly at **4010**.

4.2.12 Within the area enclosed by **4009** and **4010**, there are a series of weakly positive circular anomalies that measure between 1 and 3 m in diameter. These are positioned in an approximately linear arrangement, parallel with **4009**. This may suggest that they could be of archaeological origin, and may relate to an alignment of pits or post-holes (**4012**). To the west of this, an area of increased magnetic response has been identified. This contains a series of indistinct negative and positive trends and anomalies, that may have some archaeological potential. However, as no clear layout of features can be identified within this, it is not possible to provide a more confident interpretation of these features,

4.2.13 At **4013**, a further rectilinear arrangement of similarly sized pit-like anomalies has been identified. This is also located close to an area of increased magnetic response and could relate to a series of pit-like features. However, there are numerous indistinct positive

anomalies across much of this area of the site, and it is likely that many of these are associated with natural pitting in the underlying geology. As such, it is difficult to differentiate pits of a probable archaeological origin within this area and further investigation would be required to understand the exact nature of these anomalies.

4.2.14 Approximately 70 m to the south-east of **4014**, is a fragmented weakly positive linear anomaly, which is intersected by two modern services. This measures 52 m in length and is 2.5 m and is situated on a north-east to south-west alignment. It is most likely associated with a ditch like feature and is parallel with the previously mentioned area of superficial geology at **4011**. It may also relate to a continuation of **4009** which is 114 m to the north-east and follows the same alignment as this and the current field boundary to the south. As such it is probable that this relates to a former field division, although an archaeological origin cannot be ruled out. The fragmented nature may suggest that it has been heavily ploughed down by modern agricultural activity.

4.2.15 A semi-circular positive anomaly has been identified at **4015** to the north-east of the centre of the survey area (**Figure 5**). Only the north-eastern half is visible, but this measures 8 m in diameter and 1 m wide. On the northern edge of this a short, positive linear anomaly has also been identified. This is perpendicular **4009**, and measures 22 m in length and 1 – 2 m wide. It is possible the linear anomaly continues to the south-west although it is fragmented and only continues as a faint linear trend. These anomalies are most likely relate to ditch-like features of possible archaeological origin. The curvilinear anomaly may be associated with a ring ditch feature that might relate to the remains of a Bronze Age barrow or Iron Age roundhouse. However, as this is incomplete this interpretation is tentative. The north-west to south-east aligned linear anomaly to the north of this is most likely associated with a former field division of uncertain origin and may relate to the anomalies at **4009**.

4.2.16 A large portion of the site is dominated by a large area of increased background magnetic response. This is characterised by dense concentrations of indistinct positive and negative responses and is particularly prevalent throughout the north-west of the survey area. This is thought to relate to the use of a type fertiliser used modern agricultural activity. This has generally resulted in the detection of fewer other responses, although some other possible archaeological anomalies have been identified. For example, at **4016** (**Figure 7**) a weakly positive anomaly on a north – south alignment has been identified extending from the northern boundary of the field. These measures 27.7 m long and is 1.5 – 2.5 m wide and is most likely associated with a ditch-like feature of unknown date.

4.2.17 Within the same field as **4016**, two further positive linear anomalies have been identified approximately 260 m to the east (**4017**). The first is on a north-west to south-east alignment and is 52 m in length and 1.5 m wide. The second is on a north-east to south-east alignment, roughly perpendicular to **4016**. This is 21 m long and is also 1.5 m wide. These anomalies are indicative of ditch features and may relate to archaeological enclosures or land division. However, it is equally possible that they relate to field boundaries pertaining to a later period.

4.2.18 Within the northern two fields of the area there are three areas of increased magnetic response that contain a series of very poorly defined positive anomalies that may be of archaeological origin (**4018** – **4020**). These are generally formed of linear trends and weakly positive sub-circular features which might relate to possible ditch and pit-like features of uncertain origin. Unfortunately, due to the elevated level of the background magnetic response in these areas, it is not possible to offer a more specific interpretation of the survey results.

4.2.19 In the eastern part of the site, further indistinct anomalies within areas of increased magnetic response have been identified at **4021** – **4023** (**Figure 5**). These are similarly of low archaeological potential, but may be associated with pit-like features. The two more circular examples at **4021** are perhaps the most convincing of these, measuring between 4-5 m in dimeter and having a very circular form.

4.2.20 A large and slightly amorphous positive anomaly has been identified at **4024** . The anomaly is circular in form and covers a 14 m diameter area. This is indicative of a large pit feature and may relate to material extraction of an uncertain date. However, it is equally possible that it relates to a backfilled post-medieval or modern pond not visible on the available historic mapping.

4.2.21 Elsewhere within the eastern part of the site, two linear anomalies that correspond to former field boundaries visible on several historic maps dating to between 1871 – 1883 have been identified. The first is located at **4025** and is characterised by a series of weak dipolar responses and measures 96 m. It is situated on an east – west alignment and is heavily fragmented. The second is located 85 m south-east of **4025** at **4026**. This anomaly is on a north-west to south-east alignment and is weakly negative, which is suggestive of a bank-like feature. The anomaly is 2.5 m wide and protrudes from the north-west boundary for 15 m before a break of 6.5 m where there is a notable ferrous response. The anomaly then continues for a further 10 m.

4.2.22 In the south-east corner of the site several further anomalies corresponding to former field boundaries have been identified. At **4027** and **4028** two dipolar linear anomalies have been identified. **4027** protrudes from the western boundary of the field on a north-east trajectory for 134 m before meeting an area of scrub land which was not possible to survey. Extending south-west from this, a second anomaly extends to the south-east for 146 m before meeting the southern boundary of the site. These are both visible on historic mapping dating to 1876, in an area known as 'Shepperlands' Copse'. Also detailed on this map are a series of tracks and wooded areas that most likely relate to the areas of increased magnetic response and weakly positive anomalies within this eastern edge of this area (**4029** - **4034**). Many of the irregularly shaped positive anomalies within these areas are most likely associated with tree-boles or throws, however as an archaeological interpretation cannot be ruled they are identified as possible archaeology.

4.2.23 In the southern-most part of the eastern part of the site there is evidence of another field boundary (**4035**). This is situated on an approximate north-east to south-west alignment. The anomaly comprises weak dipolar responses and traverses the survey area for 108 m with a 3 m gap toward the south-western end. This is still extant on the present ground surface and visible on current aerial photographs of the area.

4.2.24 At the very south of the survey area a weak positive, sub-circular anomaly that is only discernible in fragmented segments is noted at **4036** (**Figure 13**). This anomaly is of a possible archaeological origin due to its circular form and size (15 m diameter), and could pertain to a ring ditch feature. However, as the anomaly is very poorly defined and weak it is equally possible that this anomaly could be agricultural in origin.

4.2.25 Approximately 80 m to the east of **4036**, is an 8 m wide, weakly positive anomaly. This extends for 62 m and is orientated on a north-east to south-west anomaly. It is possible that this could be associated with a very broad ditch-like feature, but it is considered more likely that it is associated with a band of superficial geology. However, further investigation would be required to establish the precise nature of this.

4.2.26 Within the field to the north-west, 340 m north-west of **4036**, another area of weakly positive anomalies is interpreted as pertaining to superficial geological variation (**4037**). These are much more poorly defined and are characterised by very weak positive magnetic response. However, they appear to form three parallel east-west aligned linear bands. It is possible that further deposits of this nature are present across the northern part of the site, and there is evidence for this at **4038** (**Figure 7**) and **4039** (**4039**). However, the enhanced background magnetic response may have prevented the detection of further weakly magnetic anomalies such as these.

4.2.27 Evidence for modern agricultural activity can be identified across the site as weakly positive and negative linear trends. These are closely spaced (0.5 – 1 m) and arranged in a parallel fashion, generally on a north-west to south-east, or a south-west to north-east alignment. This type of response is typically associated with modern agricultural ploughing.

4.2.28 In addition to ploughing activity, several more broadly spaced linear anomalies are noted in the dataset that are associated with drainage. For example, at **4040**, there is a series of such anomalies in a 'herringbone' pattern which are characterised by weakly dipolar magnetic values (**Figure 9**). Such a response is indicative of a material that has been burnt or fired, such as ceramic pipes or field drains. Several other, more isolated examples of these anomalies are also noted in the dataset, such as that of **4041** and **4042** to the north-east (**Figure 5**).

4.2.29 Several magnetically strong dipolar, linear anomalies traverse the site which are all indicative of modern services, such as pipes or cables. Two of these anomalies are present in the north-west of the site at **4043** and **4044** (**Figure 7**). These are both on a broadly north-west to south-east alignment. That at **4043** extends for 380 m across two fields, while that at **4029** extends 193 m. It is likely that the anomaly at **4043** extends into the north-east of the site at **4045** (**Figure 5**), where a similar response has been identified extending 400 m across three fields. This splits at the eastern end, continuing toward the east as well as heading towards a south-easterly trajectory. Several other similar anomalies have been identified across the north-east of the site at **4045** – **4050**. The largest of these are **4048** and **4049**, which extend 575 m and 595 m south-west to north-east across the site. Further services have been identified in the south-west of the site at **4051** – **4053** (**Figure 13**). The anomaly at **4051** appears to follow the route of a modern field boundary for 368 m, while that at **4052** extends north-east to south-west, with **4053** projecting east from it.

4.2.30 Three large, roughly circular areas of strongly positive magnetic response have also been identified running throughout the site (**4054** – **4056**). These anomalies correspond to pylons both within the survey area and immediately adjacent within the field boundaries.

5 DISCUSSION

5.1.1 The detailed gradiometer survey has been successful in detecting anomalies thought be archaeological in origin. This includes evidence of the Silchester to London Roman road, which is known to pass through the area. However, there is no evidence for the possible Roman villa that has been previously suggest to from cropmarks visible on aerial photographs.

5.1.2 To the south of the projected route of the Roman road in the centre of the site there is an area of increased magnetic response and numerous linear anomalies. This may indicate the location of possible a rectilinear enclosure, associated pit-like features and possible

metal working activity. However, further investigation would be required to understand whether this is associated with Romano-British activity or an alternative date.

5.1.3 An additional rectilinear enclosure with several internal linear features is noted to the north-west. This may indicate further evidence of Romano-British activity in the area, although an alternative date cannot again be ruled out.

5.1.4 Numerous other anomalies have been interpreted as possible archaeology across the site, many of which likely pertain to ditch-like and pit features. Some of the linear anomalies are likely relate to enclosures or field boundaries, while many of the pits may be attributable to associated activity or material extraction. Despite this, accurate interpretation of some of these features is hampered by the large area of increased magnetic response which dominates the northern portion of the site. It is thought that the majority of this relates to modern agricultural practices or other modern surface spreads.

5.1.5 In the south-east of the site areas of increased magnetic response which are not defined by the boundaries of the existing field have also been recorded. These responses correspond to areas of former woodland and plantation noted on historic mapping, and there are also several former field boundaries recorded in this area.

5.1.6 Evidence for superficial geological deposits and other agricultural activity such as ploughing and drainage have also been located in parts of the site. This corroborates the assessment of the DBA, which found the area has likely comprised agricultural land since the medieval period.

5.1.7 The remaining anomalies noted in the dataset are thought to be modern in origin and include services, pylon bases, and other ferrous objects.

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Old Maps (accessed June 2018) https://www.old-maps.co.uk

APPENDICES

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 an effective resolution of 0.03nT over a ±100nT 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 Viva RTK GNSS instrument and then extended using tapes. The Leica Viva system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by Historic England (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 detailed 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).

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125m intervals along traverses spaced up to 0.25m apart, resulting in a maximum of 28800 readings per 30m grid, exceeding that recommended by Historic England (English Heritage 2008) for characterisation surveys.

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 longitudinally 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 type of image is useful as it shows the full range 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 four main categories: archaeological, modern, agricultural and uncertain origin/geological.

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.

- Possible archaeology – used for features which give a response but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.

- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.

- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.

- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.

- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating bipolar (black and white) responses.

The uncertain origin/geological 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.

- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative or broad bipolar (positive and negative) anomalies.

Appendix 3: OASIS form

Project Details:

Project name		Hogwood Farm, Finchampstead, Berkshire			
Type of project		Detailed gradiometer survey (Field evaluation)			
Project description		The detailed gradiometer survey has been successful in detecting anomalies thought be archaeological in in origin. This includes evidence of the Silchester to London Roman road, which is known to pass through the area. However, there is no evidence for the possible Roman villa that has been previously suggest to from cropmarks visible on aerial photographs. To the south of the projected route of the Roman road in the centre of the site there is an area of increased magnetic response and numerous linear anomalies. This may indicate the location of possible a rectilinear enclosure, associated pit-like features and possible metal working activity. However, further investigation would be required to understand whether this is associated with Romano-British activity or an alternative date. An additional rectilinear enclosure with several internal linear features is noted to the north-west. This may indicate further evidence of Romano-British activity in the area, although an alternative date cannot again be ruled out. Numerous other anomalies have been interpreted as possible archaeology across the site, many of which likely pertain to ditch-like and pit features. Some of the linear anomalies likely relate to enclosures or field boundaries, while many of the pits may relate to associated activity or material extraction. Despite this, accurate interpretation of some of these features is hampered by the large area of increased magnetic response which dominates the northern portion of the site. It is thought that the majority of this relates to modern agricultural practices or other modern surface spreads. In the south-east of the site areas of increased magnetic response which are not defined by the boundaries of the existing field have also been recorded. These responses correspond to areas of former woodland and plantation noted on historic mapping, and there are also many former field boundaries recorded in this area. Evidence for superficial geological deposits and other agricultural activity such as ploughing and drainage have also been located in parts of the site. This corroborates the assessment of the DBA, which found the area has likely comprised agricultural land since the medieval period.			
Project dates		**Start:** 15-05-2018		**End:** 20-06-2018	
Previous work		Yes.			
Future work		Not known.			
Project Code:	206170	**HER event no.**	N/A	**OASIS form ID:**	wessexar1-3211610
		NMR no.	N/A		
		SM no.	N/A		
Planning Application Ref.		O/2014/2179 and 14/02576/OOD			
Site Status		None.			
Land use		Cultivated Lane 2 - Operations to a depth less than 0.25 m			
Monument type		N/A	**Period**	N/A	

Project Location:

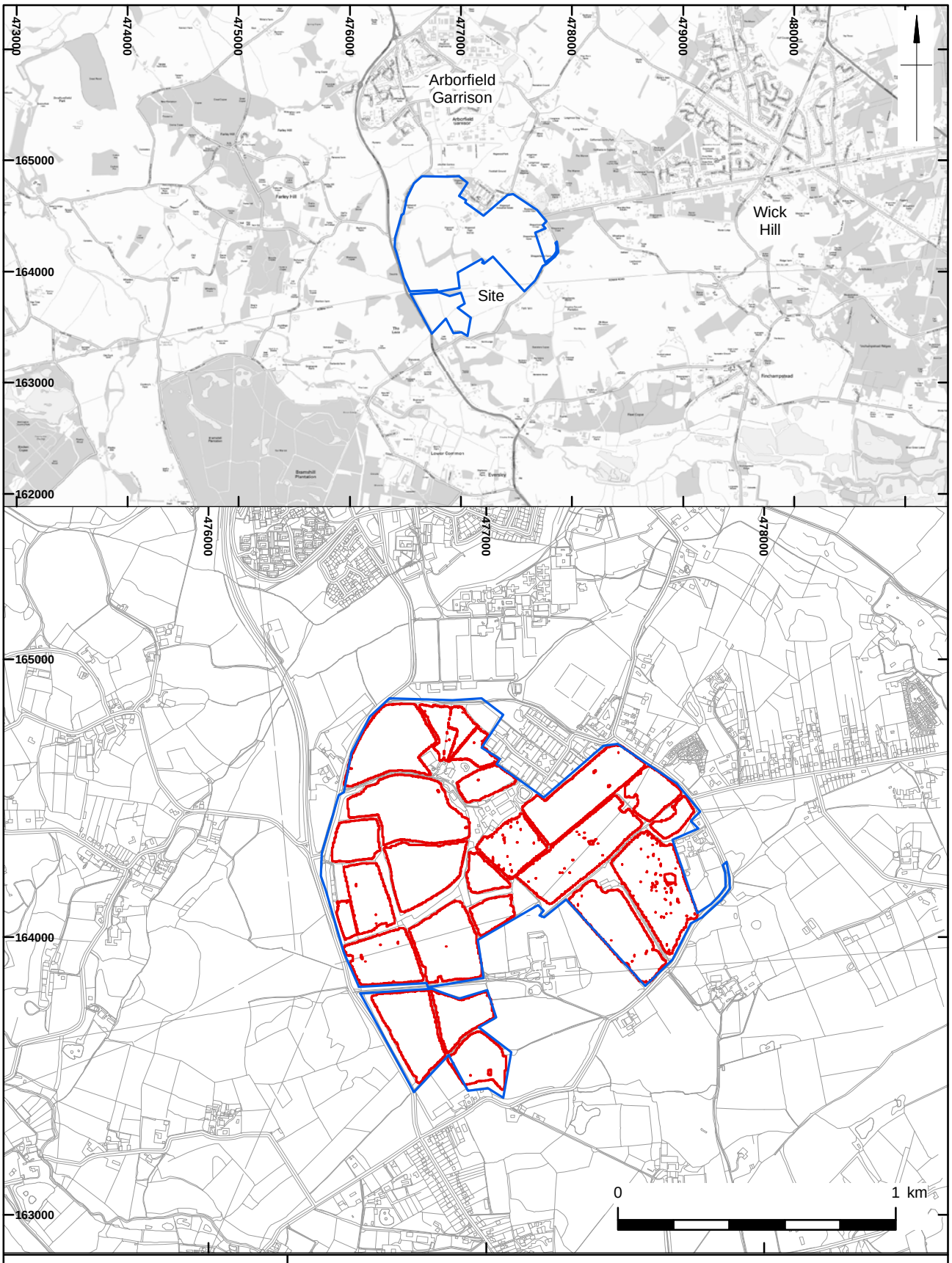
Site Address	South of Hogwood Industrial Estate, Arborfield, Berkshire			**Postcode**	RG40 4QQ
County	Berkshire	**District**	Reading	**Parish**	Reading
Study Area	110.5 ha	**Height OD**	50 – 65 m aOD	**NGR**	477036 164298

Project Creators:

Name of Organisation	Wessex Archaeology		
Project brief originator	Legal and General Homes	**Project design originator**	Wessex Archaeology
Project Manager	Simon Woodiwiss	**Project Supervisor**	Chris Hirst
Sponsor or funding body		**Type of Sponsor**	

Project Archive and Bibliography:

Physical archive	N/A	**Digital Archive**	Geophysics, survey and report	**Paper Archive**	N/A
Report title	Finchampstead Garden Village, Arborfield, Reading Detailed Gradiometer Survey Report			**Date**	2018
Author	Wessex Archaeology	**Description**	Unpublished report	**Report ref.**	206170.03



Site Boundary

Detailed Survey Extents

Coordinate system:
OSGB36 (OSTN15/OSGM15)

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Path:	X:\PROJECTS\206170\GIS\FigsMXD\Geophysics		

Site location

Figure 1

476000
476500
477000
477500
478000
164500
164000
163500

Site Boundary
Detailed Survey Extents

Coordinate system:
OSGB36 (OSTN15/OSGM15)

0 300 m

-2nT +3nT

Date:	19/06/2018	Revision Number:	0
Scale:	1:6500 at A3	Illustrator:	AJS
Path:	X:\PROJECTS\206170\GIS\FigsMXD\Geophysics		

Detailed Gradiometer Survey: Overall greyscale plot

Figure 2

476000
476500
477000
477500
478000
164500
164000
163500

Site Boundary
Detailed Survey Extents
Archaeology
Possible Archaeology
Former Field Boundary
Modern Service
Increased Magnetic Response
Geology
Ferrous
Ploughing
Trend
Field Drain

Coordinate system:
OSGB36 (OSTN15/OSGM15)

0 300 m

Date:	19/06/2018	Revision Number:	0
Scale:	1:6500 at A3	Illustrator:	AJS
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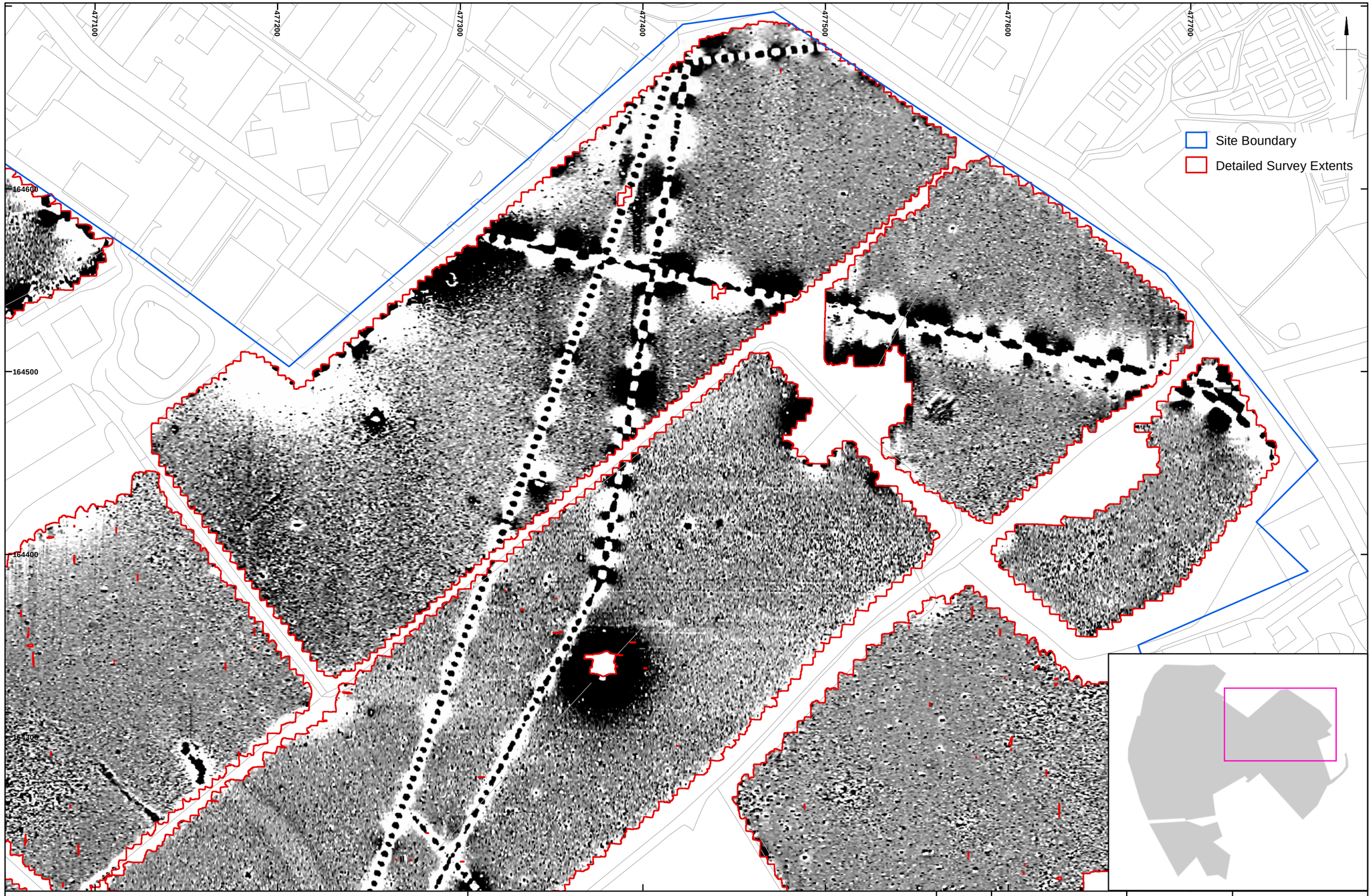
Detailed Gradiometer Survey: Overall interpretation

Figure 3



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-2nT +3nT

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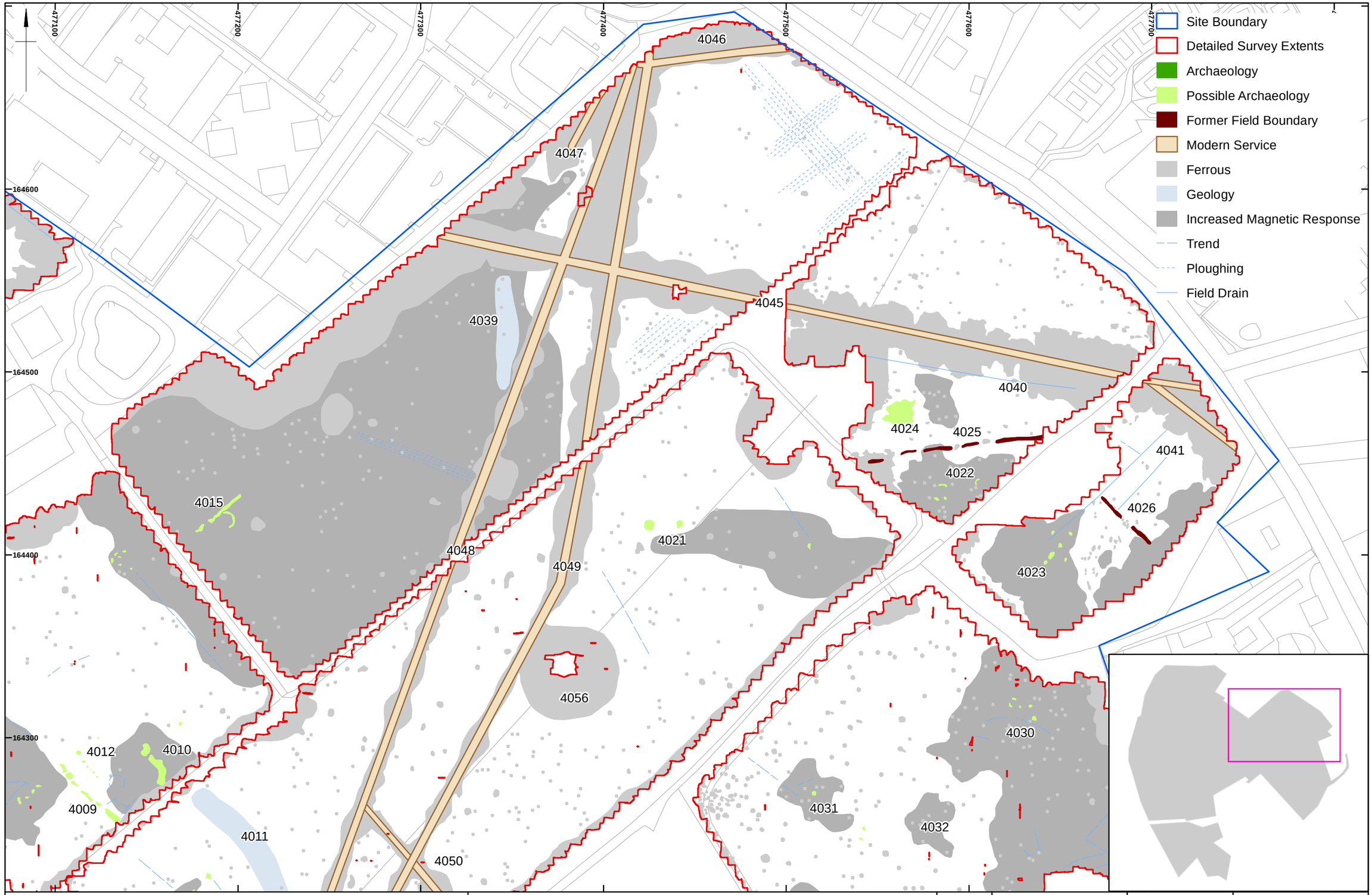
Detailed Gradiometer Survey: Greyscale plot (north-east)

Figure 4



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Detailed Gradiometer Survey:Interpretation (north-east)

Figure 5

476500
476600
476700
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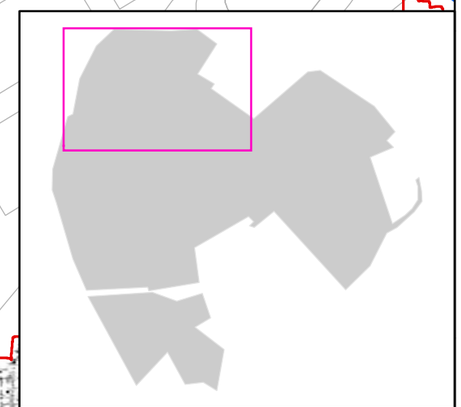
476900
477000
477100
164800
164700
164600
164500
164400

Site Boundary
Detailed Survey Extents



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Path:	X:\PROJECTS\206170\GIS\FigsMXD\Geophysics		

Detailed Gradiometer Survey: Greyscale plot (north-west)

Figure 6

476500
476600
476700
476800
476900
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477100
164800
164700
164600
164500
164400
4044
4043
4019
4020
4018
4017
4016
4038
Site Boundary
Detailed Survey Extents
Archaeology
Possible Archaeology
Former Field Boundary
Modern Service
Increased Magnetic Response
Ferrous
Geology
Trend
Ploughing
Field Drain

Coordinate system:
OSGB36 (OSTN15/OSGM15)
0
100 m

Date:	19/06/2018	Revision Number:	0
Scale:	1:2000 at A3	Illustrator:	AJS
Path:	X:\PROJECTS\206170\GIS\FigsMXD\Geophysics		

Detailed Gradiometer Survey: Interpretation (north-west)

Figure 7

Coordinate system:
OSGB36 (OSTN15/OSGM15)

0 100 m

-2nT +3nT

Date:	19/06/2018	Revision Number:	0
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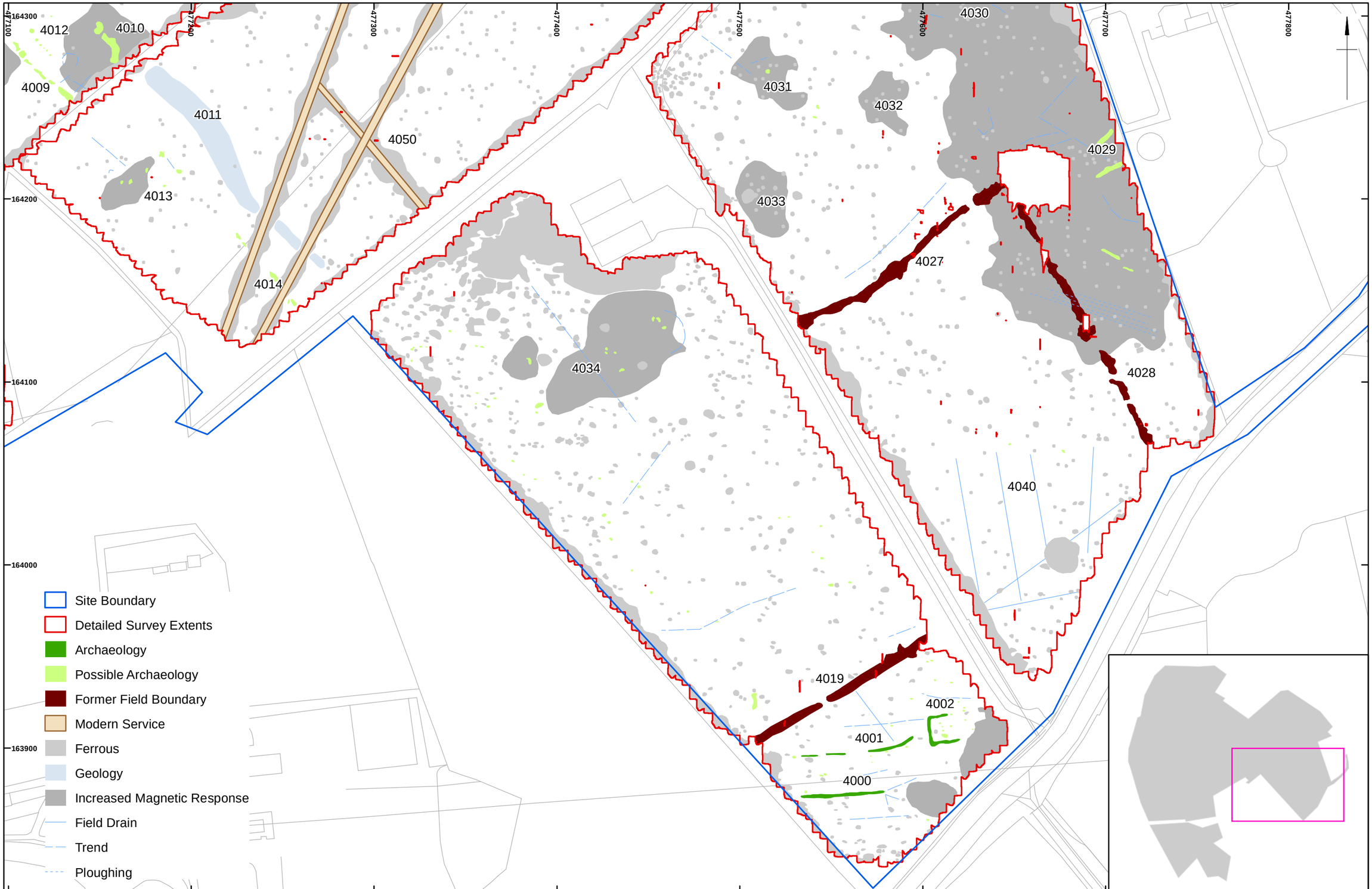
Detailed Gradiometer Survey: Greyscale plot (south-east)

Figure 8



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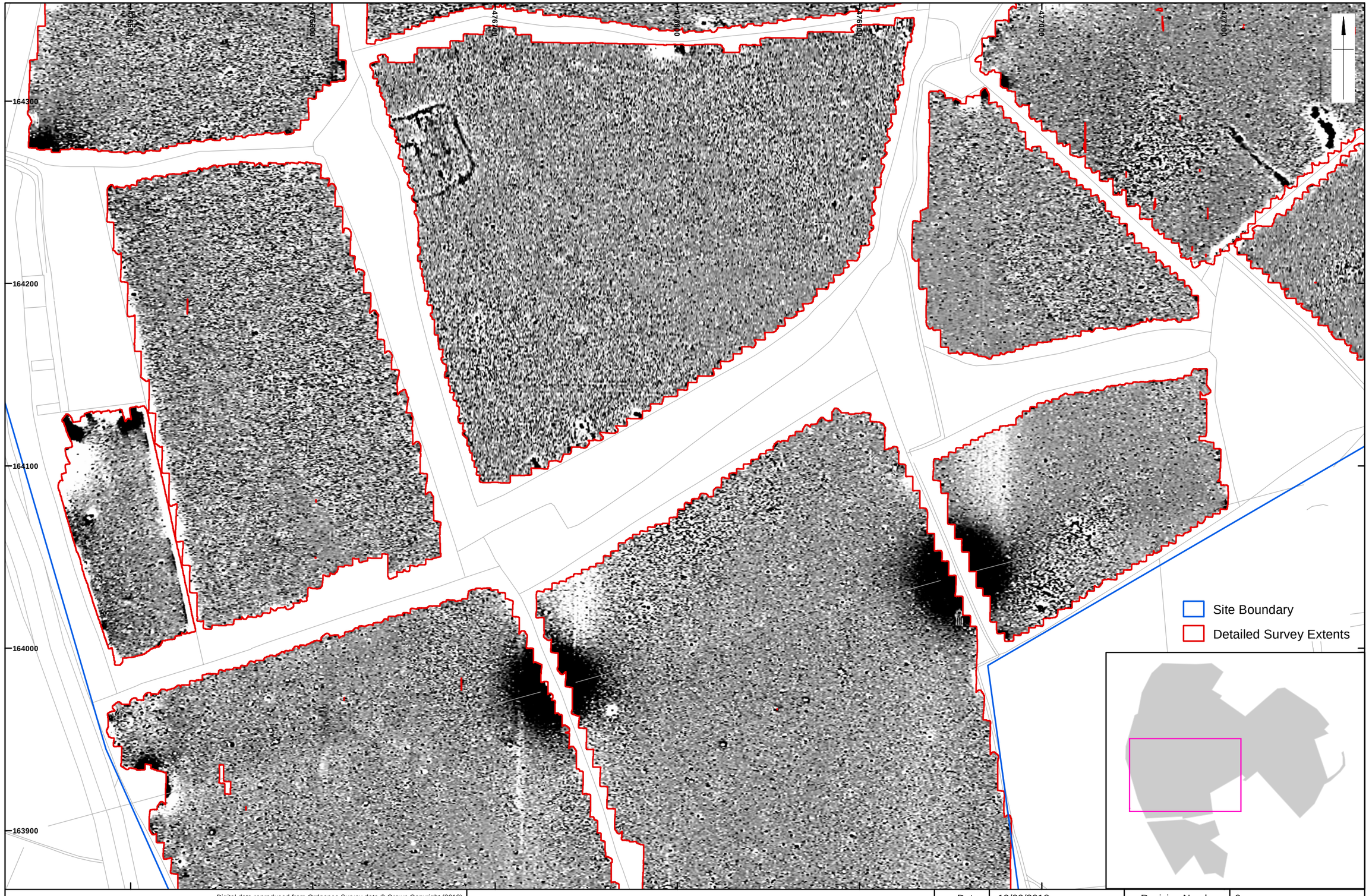
Detailed Gradiometer Survey: Interpretation (south-east)

Figure 9



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Date:	19/06/2018	Revision Number:	0
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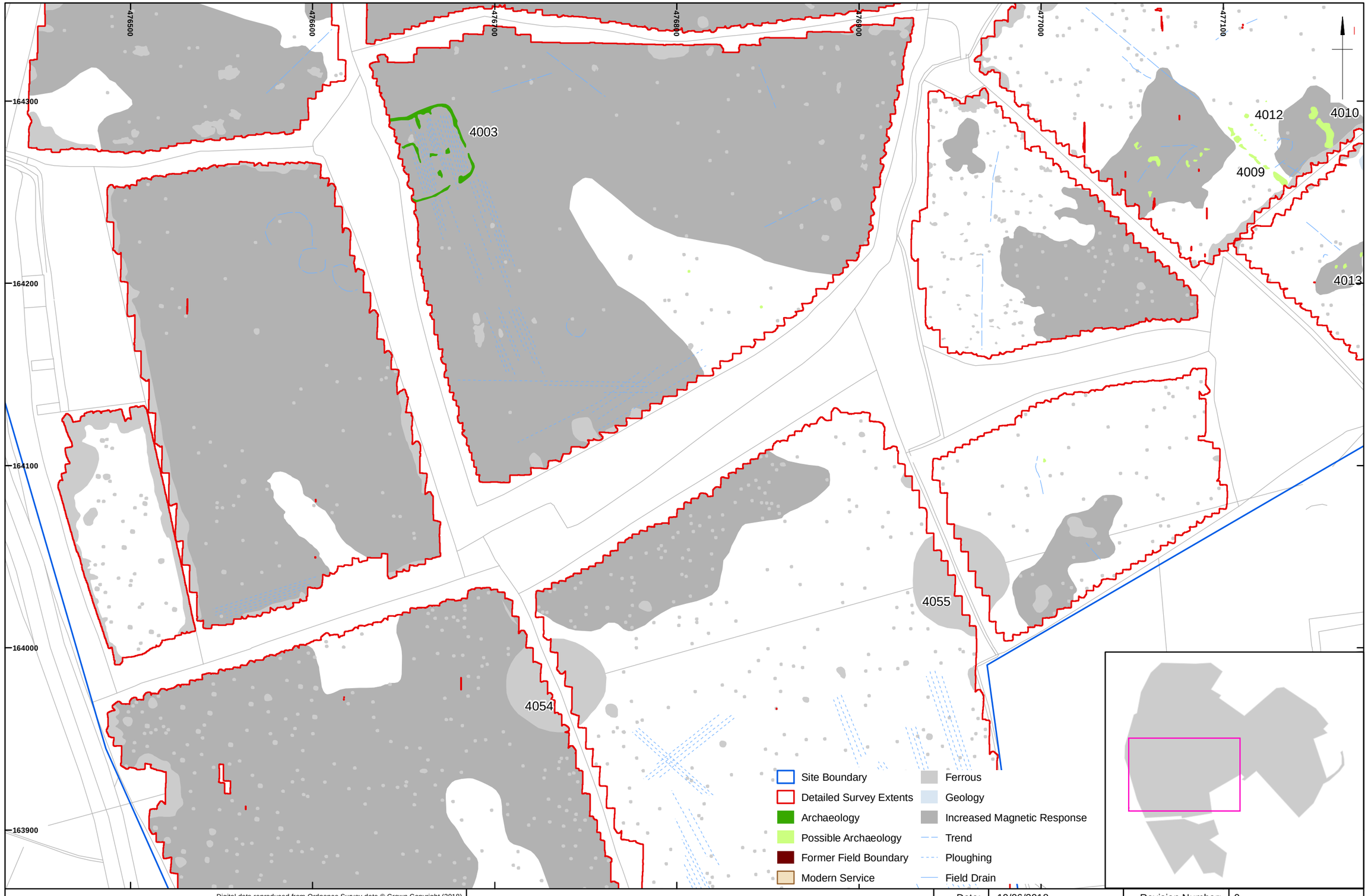
Path:	X:\PROJECTS\206170\GIS\FigsMXD\Geophysics		

Detailed Gradiometer Survey: Greyscale plot (west)

Figure 10



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Date:	19/06/2018	Revision Number:	0
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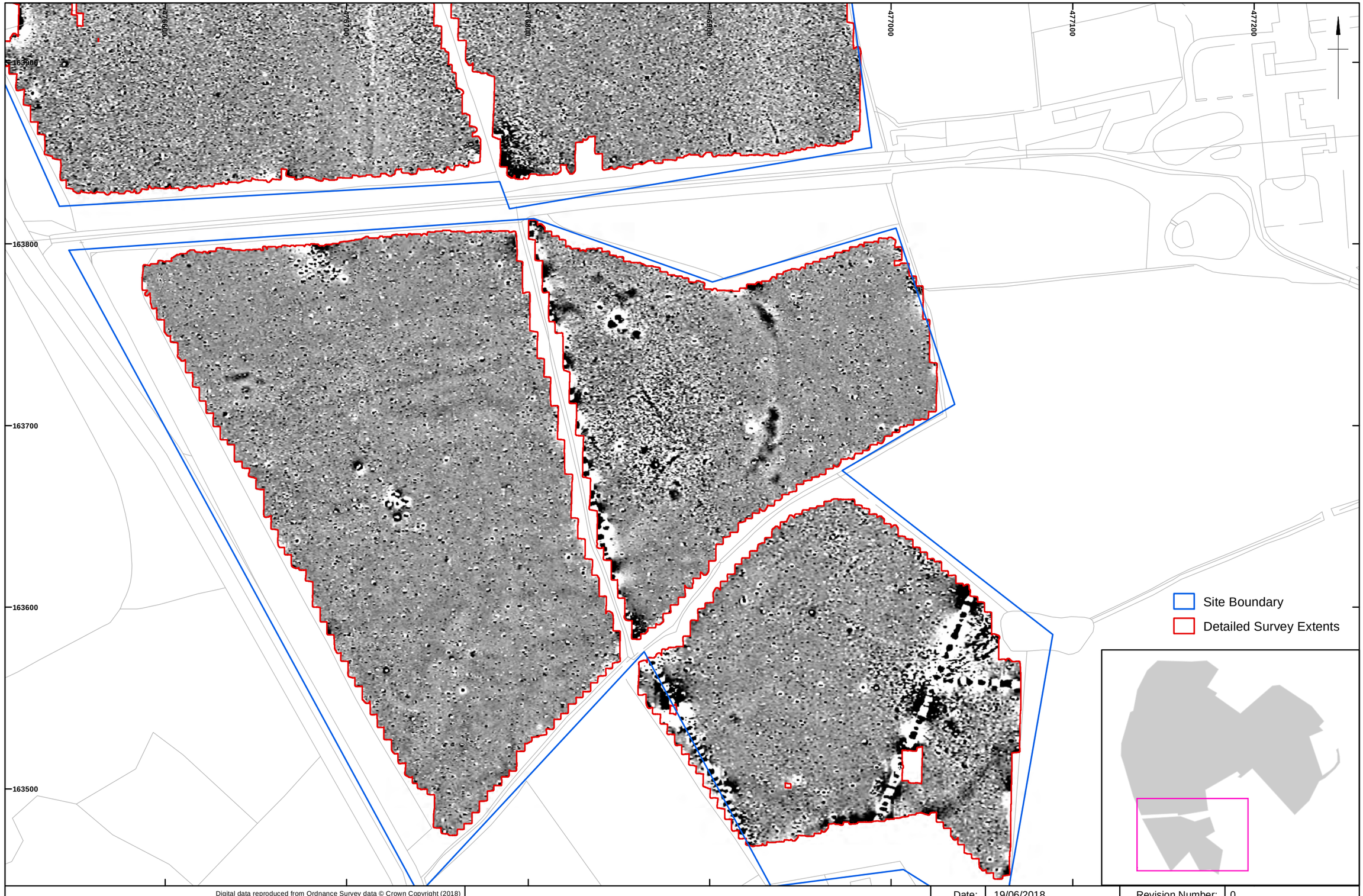
Detailed Gradiometer Survey: Interpretation (west)

Figure 11



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0 100 m

-2nT +3nT

Date:	19/06/2018	Revision Number:	0
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Detailed Gradiometer Survey: Greyscale plot (south-west)

Figure 12

476600
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477200
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163500
4007
4005
4008
4038
4004
4006
4051
4052
4053
4036
4037
Site Boundary
Detailed Survey Extents
Archaeology
Possible Archaeology
Former Field Boundary
Increased Magnetic Response
Modern Service
Geology
Ferrous
Trend
Ploughing
Field Drain

Coordinate system:
OSGB36 (OSTN15/OSGM15)
0
100 m
-2nT
+3nT

Date:	19/06/2018	Revision Number:	0
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Path:	X:\PROJECTS\206170\GIS\FigsMXD\Geophysics		

Detailed Gradiometer Survey: Interpretation (south-west)

Figure 13

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