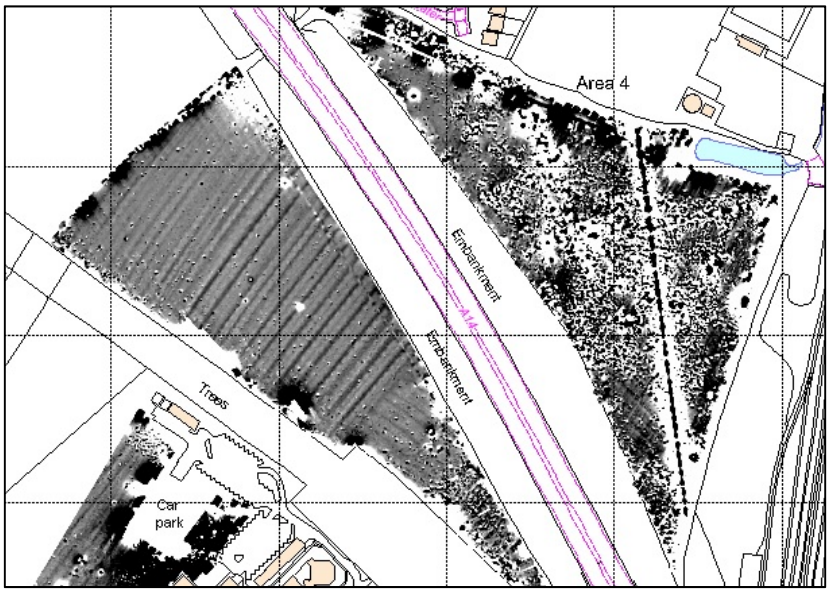

Archaeological geophysical survey in Section 6 of the A14 Huntingdon to Cambridge Road Improvement Scheme Huntingdon Cambridgeshire November 2017

Report No. 17/132

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Project Manager: John Walford
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Quality control and sign off**:**

Issue No.	Date approved:	Checked by:	Verified by:	Approved by:	Reason for Issue:
1	30/11/17	Claire Finn	Mo Muldowney	Rob Atkins	Client approval

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OASIS REPORT

PROJECT DETAILS	**Oasis No. molanort1-302387**	
Project name	Archaeological geophysical survey in Section 6 of the A14 Huntingdon to Cambridge Road Improvement Scheme, Huntingdon, Cambridgeshire	
Short description	MOLA Headland Infrastructure (MHI) instructed the MOLA Northampton geophysics team to undertake a magnetometer survey of *c*9ha of land in Section 6 of the A14 Huntingdon to Cambridge Road Improvement Scheme. The client for the work was the A14 Integrated Delivery Team. Some possible archaeological features, suggested to be broadly prehistoric or Roman in date, were detected in the southern portion of the survey area and extensive remains of medieval or early post-medieval ridge and furrow were also detected. However, the effectiveness of the survey was reduced by modern ground disturbance and dense scatters of ferrous debris. As a result of these factors some previously recorded archaeological features in the far south of the survey area proved impossible to detect.	
Project type	Geophysical survey	
Site status	None	
Previous work	Trial trench excavation (Wheeler 2008)	
Current land use	Pasture and recreational grassland	
Future work	Excavation	
Monument type/ period	Undated ditches and pits Medieval ridge and furrow	
Significant finds	None	
PROJECT LOCATION		
County	Cambridgeshire	
Site address	Huntingdon	
Study area	*c*9ha	
OS Easting & Northing	TL 230 720	
Height OD	*c*13 - 26m aOD	
PROJECT CREATORS		
Organisation	MOLA	
Project brief originator	Kasia Gdaniec, Cambridgeshire County Council	
Project design originator	MOLA	
Director/Supervisor	Adam Meadows	
Project Manager	John Walford	
Sponsor or funding body	A14 Integrated Delivery Team	
PROJECT DATE		
Start date	13 November 2017	
End date	15 November 2017	
ARCHIVES	Location	Content
Physical	N/A	
Paper	MOLA Northampton	Site survey records
Digital		Geophysical survey & GIS data
BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report	
Title	Archaeological geophysical survey in Section 6 of the A14 Huntingdon to Cambridge Road Improvement Scheme, Huntingdon, Cambridgeshire, November 2017	
Serial title & volume	MOLA Northampton report 17/132	
Author(s)	John Walford	
Page numbers	6	
Date	30 November 2017	

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Archaeological geophysical survey in Section 6 of the A14 Huntingdon to Cambridge Road Improvement Scheme, Huntingdon, Cambridgeshire November 2017

ABSTRACT

MOLA Headland Infrastructure (MHI) instructed the MOLA Northampton geophysics team to undertake a magnetometer survey of c 9ha of land in Section 6 of the A14 Huntingdon to Cambridge Road Improvement Scheme. The client for the work was the A14 Integrated Delivery Team. Some possible archaeological features, suggested to be broadly prehistoric or Roman in date, were detected in the southern portion of the survey area and extensive remains of medieval or early post-medieval ridge and furrow were also detected. However, the effectiveness of the survey was reduced by modern ground disturbance and dense scatters of ferrous debris. As a result of these factors some previously recorded archaeological features in the far south of the survey area proved impossible to detect.

1 INTRODUCTION

MOLA Headland Infrastructure (MHI) instructed the MOLA Northampton geophysics team to undertake an archaeological geophysical survey in Section 6 of the A14 Huntingdon to Cambridge Road Improvement Scheme. This work had been commissioned from MHI by the A14 Integrated Delivery Team in response to a requirement from Kasia Gdaniec, the Cambridgeshire County Council Senior Archaeologist.

The survey formed a small element of the programme of archaeological mitigation works occurring in advance of the road improvement scheme. Its purpose was to investigate the presence, character and extent of any archaeological remains on the route of a proposed new link road, this information being required to guide the planning of an upcoming archaeological excavation. The fieldwork and reporting was undertaken in accordance with English Heritage (now Historic England) and Chartered Institute for Archaeologists standards and guidance (EH 2008, CIfA 2014).

2 BACKGROUND

2.1 Topography and geology

The survey took place across three adjacent land parcels located to the south of Huntingdon, close to the A14 Huntingdon Viaduct between Views Common on the west and Mill Common on the east (Areas 2 to 4, Fig 1). These areas were approximately centred on National Grid Reference TL 230 720. Area 2 was a grass field alongside the Constabulary Headquarters west of Brampton Road and Areas 3 and 4 were pasture fields lying to the north of Area 2 on either side of the present A14. A fourth area located further south, to the west of Hinchingbrooke House, had been intended for survey but proved unsuitable due to extensive scrub cover (Area 1, Fig 1).

Area 2 lies at towards the eastern end of a ridge of relatively high ground, with gentle slopes east and south-east from a maximum elevation of *c*26m aOD. Areas 3 and 4 lie

on the north-eastern flank of the ridge, sloping down to a minimum elevation of *c*13m aOD in the north-east of Area 4.

The solid geology of the survey area comprises Oxford Clay which, to the south of the A14, is largely masked by Pleistocene drifts of boulder clay and third terrace river gravels (BGS 2017). The southern part of the survey area (Area 2) is known to have been landscaped in modern times, with some truncation of the natural geology and deposition of clayey made ground (Wheeler 2008, 1).

2.2 Historical and archaeological background

A programme of trial trench excavation was undertaken on the southern portion of Area 2 in 2008, revealing a complex of pits and ditches dating from the Neolithic period to the Iron Age (Wheeler 2008). Some residual Roman and medieval pottery was also found, but no features except a plough furrow could be attributed these periods. Other trial trench evaluations of land to the west of the area at Hinchingbrooke Hospital (Cambridgeshire HER ECB721) and to the north at Ullswater Road (Kajewski 2008) each identified a small number of undated ditches, those on the latter site having been truncated by later landscaping.

The survey area is located west of the historic core of Huntingdon and is thought to have been in predominantly agricultural use during the medieval and early post-medieval periods. Remains of ridge and furrow cultivation dating from this time survive as earthworks in Area 3 and also in a corner of ground close to the north-western corner of Area 2.

Hinchingbrooke House, which stands *c*250m south of the survey area is a post-medieval country house built on the site of a medieval nunnery. Its surrounding parkland formerly incorporated the southern half of the survey area, as is depicted on the first edition of the 6" Ordnance Survey map (1886). The other half of the survey area is depicted on the same map as a part of Views Common and is shown to have been crossed by a minor watercourse leading north from a pond. To the immediate north-west of the survey area, alongside the Great North Railway, the map depicted a brick and tile works together with a number of clay and gravel pits. Similar details are apparent on subsequent Ordnance Survey maps up until 1983, by which time the construction of the A14, Constabulary Headquarters and Hinchingbrooke Hospital had substantially changed the character of the local landscape.

3 METHODOLOGY

The survey was undertaken with a Bartington magnetometer cart. This is a two-wheeled, lightweight sensor platform designed to be pushed by hand. As operated by MOLA it incorporates a bank of six vertically-mounted Bartington Grad601 magnetic gradiometers, spaced at half-metre intervals along a bar aligned crossways to the direction of travel, and also incorporates a Leica Geosystems GS16 GPS antenna mounted on the central axis, 1.02m astern of the sensors. The magnetic sensors each output data at a rate of 8Hz (eight readings per second) and the GPS antenna outputs NMEA format data (GGA messages) at a rate of one position every second. These data streams are fed into a laptop computer where they are compiled into a single raw data file by MultiGrad601 logging software specifically designed for that purpose.

The cart was propelled along straight and parallel traverses across each of the survey areas, with data logging being manually toggled on and off at the start and end of each traverse to avoid the collection of spurious data whilst turning. Traverse ends were marked with ranging poles to aid even coverage, and the evenness of coverage was

further checked by monitoring the positional trace plotted in real time by the MultiGrad601 logging software. The average speed of coverage was up to *c*2m/s and the effective data resolution thus approximated to 0.25m x 0.50m.

The raw survey data was initially processed with MLGrad601 software, which calculated an actual UTM co-ordinate for each data point by interpolating the GPS readings and applying offset corrections based on the array geometry and calculated heading direction. This produced an output file in XYZ format which could be imported into TerraSurveyor software for data visualisation and further processing.

The raw XYZ data exhibited striping caused by slight mis-matches in the calibration of the individual magnetic sensors. This was removed in TerraSurveyor by applying the destripe function to runs of data from each sensor. A median traverse destripe with thresholds of +/-0.25 σ was applied to the data from Area 3 but it was found that a median destripe with absolute thresholds of +/-10nT produced better results when applied to the more magnetically dynamic datasets from Areas 2 and 4.

The processed data is presented in this report as greyscale raster plots rotated and scaled for display against the Ordnance Survey base mapping (Figs 2 & 3). Two display ranges have been chosen, +/-5nT to display the weaker anomalies of possible archaeological interest and +/-20nT to provide greater clarity in the areas dominated by intense ferrous anomalies. An interpretation of the data is presented in Figure 4 and plots of the unprocessed survey data in Figure 5.

4 SURVEY RESULTS

Area 1

This area was unsuitable for survey due to dense scrub cover.

Area 2

The survey has detected an intermittent positive magnetic anomaly of curvilinear form located north of the centre of Area 2. This is likely to represent a backfilled ditch, possibly defining part of an enclosure. A linear anomaly branching off its northern arm probably represents another ditch. To the north-west is a group of smaller and more fragmentary anomalies, partly obscured by a weak magnetic halo, which possibly represent further ditches. Whilst none of these features can be securely dated on geophysical evidence alone, their general appearance is consistent with a prehistoric or Roman origin.

In the same vicinity as the probable ditches, there are some small positive anomalies which could represent pits. However, such anomalies can also have a geological or pedological cause and it is rarely possible to distinguish the archaeological from the non-archaeological ones. For this reason, and erring on the side of under-interpretation (*cf* EH 2008, 49), only three of the most convincing examples have been indicated as pits on Figure 3.

The probable archaeological anomalies are crossed by a series of parallel linear anomalies, aligned north-east to south-west. These evidently relate to medieval or early post-medieval ridge and furrow, as they have similar alignments and spacings to the ridge and furrow earthworks that survive north and north-west of Area 2. There is, however, no geophysical evidence for ridge and furrow in the southern two thirds of Area 2.

The survey data contains some weak magnetic anomalies which correlate with the backfilled trenches of the 2008 excavation (Wheeler 2008, fig 1). The clearest are two broad negative linear anomalies at the western edge of the area which correspond to parts of trenches 7 and 12; between these lies a less distinct negative anomaly corresponding to trench 11. To the south-east, trenches 6 and 14 are represented by weak, narrow positive linear anomalies aligned almost north-south.

Whilst the former excavation trenches have been detected the survey data provides no evidence for the prehistoric ditches and pits they were reported to contain. The failure to detect either this archaeology or any trace of ridge and furrow in the southern part of Area 2 is most likely due to their masking beneath the made ground reported by Wheeler 2008.

Three broad, weakly positive linear anomalies are present in the south-west of Area 2. Their cause is uncertain, but it is tentatively suggested that they could relate to bulldozer scars or other features associated with the landscaping of the area.

A number of weak negative linear anomalies, some of them very subtle, are present across Area 2. It is most likely that these relate to modern drains or service trenches. The clearest, which follows a curving course through the south of the area, runs towards a massive ferrous dipole which perhaps indicates a large piece of buried infrastructure. Further buried services are probably indicated by the chains of ferrous dipoles which cross the south-eastern corner of the area and project into the area from midway along its eastern edge, although it would also be possible that these represent the buried remains of former fencelines.

Ferrous dipoles of various sizes and forms are widespread across the survey area. Whist the majority of these are likely to relate to insignificant pieces of debris buried in the topsoil and made ground there is a group of large dipoles in the northern part of the area, including three evenly spaced ones of similar form, which seems more likely to relate to structural footings or buried infrastructure. There is also a sinuous band of densely clustered ferrous dipoles which runs north from the south-eastern corner of the area, probably representing a concentration of ferrous debris amongst the hardcore of a former track. The rectangular concentration of dipoles at the north-western corner of the area may similarly represent a recent hardcore surface.

Area 3

The data from this area shows no likely archaeological anomalies other than those relating to medieval or early post-medieval ridge and furrow. The furrows run from north-east to south-west across the majority of the area, with a separate set on a perpendicular alignment in the south-east.

A weak linear anomaly of alternating polarity runs close to the north-eastern edge of Area 3, perpendicular to the ridge and furrow. This probably represents a modern service trench. Another alternating linear anomaly occurs in the north-west of the area. This is clearly associated with the modern footpath that runs on the same line, though it is uncertain whether the anomaly relates to an element of the path itself (eg metal edging) or to a buried service running alongside it.

Small but intense dipolar anomalies of ferrous origin are widespread across Area 3, with concentrations occurring towards the field corners. The largest zone of such debris occurs in the south-eastern corner of the field, in association with some parallel linear anomalies of variable character and uncertain, though probably recent, origin.

Area 4

The data from this area is very disturbed, being dominated by intense magnetic anomalies of ferrous origin. The only possible archaeological anomalies that can be discerned are three parallel linear anomalies near the southern end of the field which could relate to medieval or early post-medieval ridge and furrow.

The most likely cause of the magnetic disturbance is residual debris (ferrous material and hardcore) from the construction of the A14 embankment and viaduct. However, another possible source of such debris could be the historic brick and tile works which stood just to the west of Area 4 (see Section 2.2, above). Towards the north-west of the largest zone of disturbance there is one cluster of particularly large, irregular anomalies which resemble the typical magnetic response from a backfilled pond or quarry pit; this is particularly apparent on Figure 3.

An intense positive linear anomaly with a negative halo runs northwards from near the southern corner of the field. This represents a modern pipeline. A slighter and more sinuous linear anomaly of alternating polarity lies towards the middle of the northern edge of the field, and this very probably represents another pipe or cable.

A modern footpath which runs close to the northern edge of this survey area has produced a positive linear anomaly along part of its length. Lampposts are regularly spaced along this path and have given rise to a row of large positive magnetic halos.

5 CONCLUSION

The survey has produced mixed results. It has identified a group of probable archaeological features in the southern portion of the survey area (Area 2) but failed to detect other features that had been recorded when trial trenches were excavated on part of the same field (Wheeler 2008). This variable response may be due to variations in the depth of modern made ground across the field. The fact the trenches themselves have been detected does not contradict this suggestion, as the trenches were cut from the modern ground level so would not be masked in the same way that features buried beneath made ground would be.

The data from the central and northern portions of the survey area (Areas 3 and 4 respectively) contains no archaeological anomalies other than those relating to medieval or early post-medieval ridge and furrow. However, Area 4 shows evidence for dense spreads of modern ferrous debris which would have served to mask any archaeology which may survive in that area. In contrast, there is minimal evidence for modern debris or ground disturbance in Area 3. Indeed the survival of ridge and furrow earthworks in that area is good evidence that the area has not been heavily disturbed in recent centuries.

BIBLIOGRAPHY

BGS 2017 *Geology of Britain Viewer*, http://mapapps.bgs.ac.uk/geologyofbritain, British Geological Survey, consulted November 2017

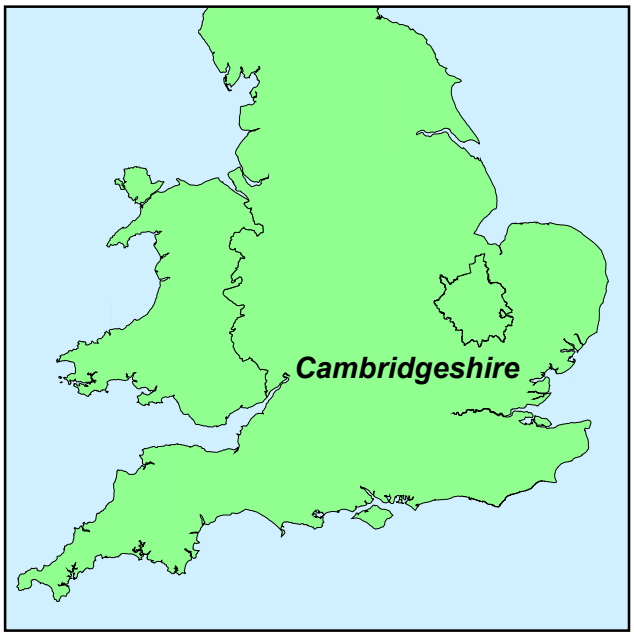
CIfA 2014 *Standard and Guidance for Archaeological Geophysical Survey*, Chartered Institute for Archaeologists

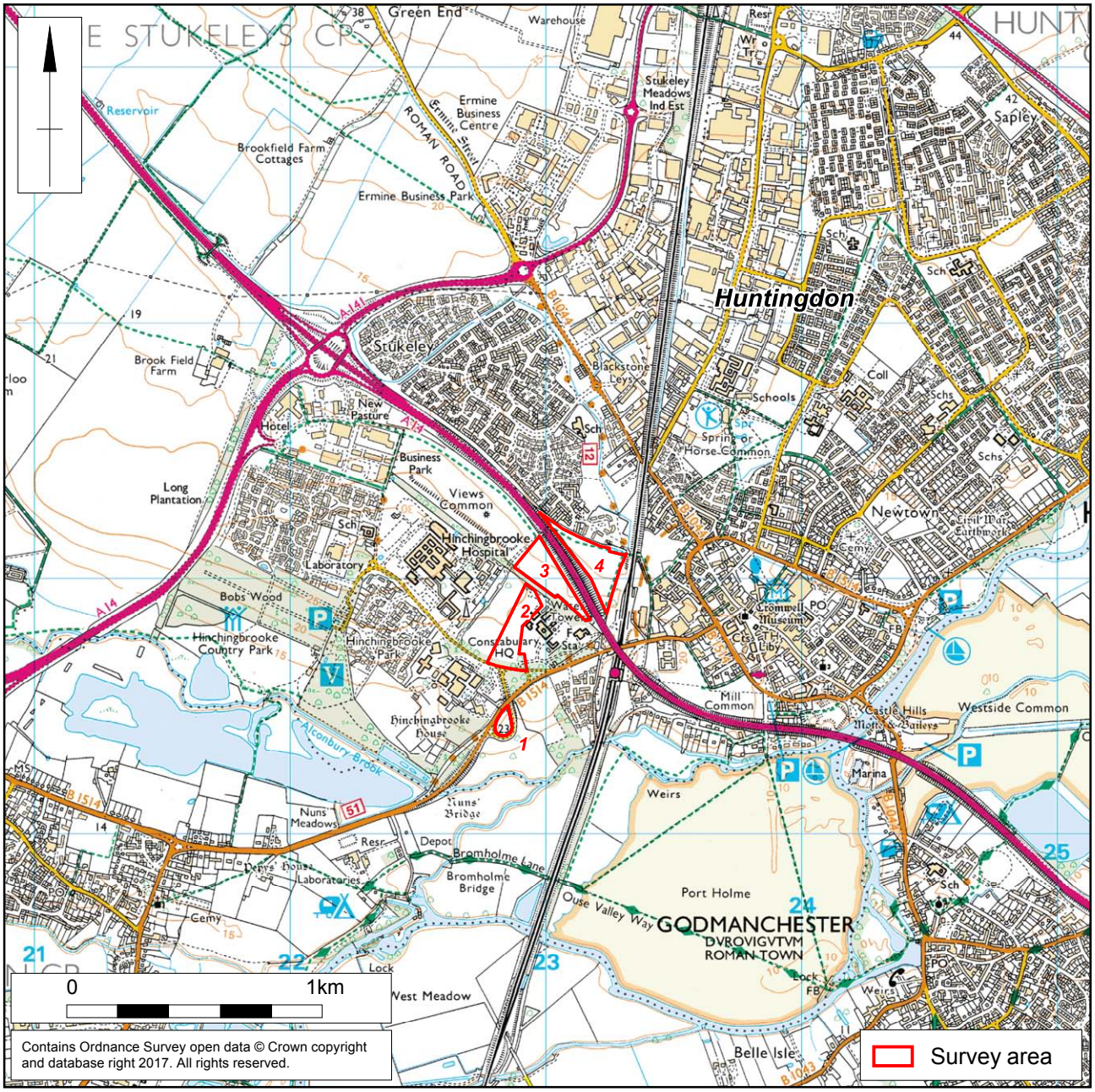
EH 2008 *Geophysical Survey in Archaeological Field Evaluation*, English Heritage

Kajewski, P, 2008 *Archaeological evaluation at Ullswater Road, Huntingdon, Cambridgeshire, ECB2833*, Northamptonshire Archaeology report, **08/22**

Wheeler, D, 2008 *Prehistoric activity at Hinchingbrooke Sports Ground, Huntingdonshire Regional College (Land adjacent to Hinchingbrooke Constabulary): An archaeological evaluation*, CAM ARC report, **996**

MOLA
30th November 2017





Scale 1:25,000

Site location Fig 1

227
230
233
721
718
Area 3
Area 4
Area 2
Lowestwater
Embankment
A14
Embankment
Trees
Car park
Trees
Ferrars Road
Edison Bell Way
Hunchingbrooke Park Road
B1514
Magnetic anomaly /nT
-5nT 0 +5nT
0 100m
Approx. extent of development

Scale 1:2500

Magnetometer survey results (+/-5nT) Fig 2

227
230
233
721
718
Area 3
Area 4
Area 2
Embankment
Embankment
A14
Trees
Car park
Trees
Lowestwater
Ferrars Road
Edison Bell Way
Hinchingbrooke Park Road
B1514
Magnetic anomaly /nT
-20nT 0 +20nT
0 100m
Approx. extent of development

Scale 1:2500

Magnetometer survey results (+/-20nT) Fig 3

227
230
233
721
718
Area 3
Area 4
Area 2
Trees
Trees
Car park
Embankment
Embankment
A414
Lowewater
Ferrars Road
Edison Bell Way
Hutchingbrooke Park Road
B1514
7
11
12
6
14
Magnetic anomaly /nT
-20nT
0
+20nT
0
100m

Archaeology?
Archaeological trench*
Ridge and furrow
Pipe / drain / service trench
Modern footpath
Lampost
Ferrous object (single)
Ferrous objects (cluster)
*Trench numbers as per Wheeler 2008
Scale 1:2500
Magnetometer survey interpretation Fig 4

227
230
233
721
718
Area 3
Area 4
Area 2
Lowes Water
Embankment
A14
Embankment
Trees
Car park
Trees
Ferrars Road
Edison Bell Way
Hinchingbrooke Park Road
B1514
Magnetic anomaly /nT
-10nT 0 +10nT
0 100m
Approx. extent of development

Scale 1:2500

Unprocessed magnetometer data Fig 5

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