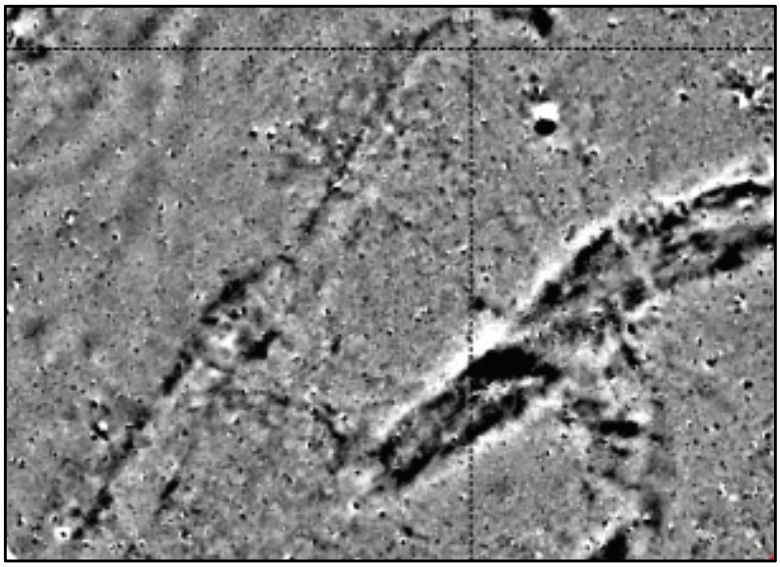

Archaeological geophysical survey of land south of Chestnut Drive, Louth, Lincolnshire
May 2016

Accession No. LCNCC:2016.66

Report No: 16/88

Authors: John Walford
Adam Meadows

Illustrator: John Walford

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Project Manager: John Walford
Accession No. LCNCC:2016.66
NGR: TF 344 879

MOLA
Bolton House
Wootton Hall Park
Northampton
NN4 8BN, 01604 809 800
www.mola.org.uk
sparry@mola.org.uk

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Quality control and sign off**:**

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1	24/05/2016	Pat Chapman	Mark Holmes	Andy Chapman	Client approval

Authors: John Walford
Adam Meadows

Illustrator: John Walford

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MOLA
Bolton House
Wootton Hall Park
Northampton
NN4 8BN
01604 809 800
www.mola.org.uk
sparry@mola.org.uk

STAFF

Project Manager:	John Walford MSc
Fieldwork:	Adam Meadows BSc
	Graham Arkley MSc
Text:	John Walford
	Adam Meadows
Illustrations:	John Walford

OASIS REPORT

PROJECT DETAILS	**Oasis No. molanort1-252816**	
Project name	Archaeological geophysical survey of land south of Chestnut Drive, Louth, Lincolnshire	
Short description	MOLA were commissioned to undertake a magnetometer survey of *c* 5ha of arable land to the south of Chestnut Drive, Louth. The survey detected anomalies relating to possible ditches, field drains, a probable Pleistocene river channel and various other geological features. Nothing of definite archaeological origin was detected.	
Project type	Geophysical survey	
Site status	None	
Previous work	None	
Current Land use	Arable	
Future work	Unknown	
Monument type/ period	Palaeochannel	
Significant finds	None	
PROJECT LOCATION		
County	Lincolnshire	
Site address	Chestnut Drive, Louth	
Study area	*c* 5ha	
OS Easting & Northing	TF 344 879	
Height OD	*c* 19m - 24m aOD	
PROJECT CREATORS		
Organisation	MOLA Northampton	
Project brief originator	Lincolnshire County Council	
Project design originator	MOLA Northampton	
Director/Supervisor	Adam Meadows	
Project Manager	John Walford	
Sponsor or funding body	Prospect Archaeology	
PROJECT DATE		
Start date	03 May 2016	
End date	05 May 2016	
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 of land south of Chestnut Drive, Louth, Lincolnshire, May 2016	
Serial title & volume	MOLA Northampton Reports 16/88	
Author(s)	Adam Meadows and John Walford	
Page numbers	4	
Date	24 May 2016	

Contents

1 INTRODUCTION **1**

2 BACKGROUND **1**

2.1 Topography and geology

2.2 Historical and archaeological background

3 METHODOLOGY **2**

4 SURVEY RESULTS **2**

5 CONCLUSION **3**

BIBLIOGRAPHY **4**

Figures

Cover Magnetometer survey results

Fig 1 Site location 1:25,000

Fig 2 Magnetometer survey results 1:2000

Fig 3 Magnetometer survey interpretation 1:2000

Fig 4 Unprocessed magnetometer data 1:2000

Archaeological geophysical survey of land south of Chestnut Drive, Louth, Lincolnshire May 2016

ABSTRACT

MOLA were commissioned to undertake a magnetometer survey of c 5ha of arable land to the south of Chestnut Drive, Louth. The survey detected anomalies relating to possible ditches, field drains, a probable Pleistocene river channel and various other geological features. Nothing of definite archaeological origin was detected.

1 INTRODUCTION

MOLA (Museum of London Archaeology) was commissioned by Prospect Archaeology to conduct a magnetometer survey on a proposed development site south of Chestnut Drive, Louth, Lincolnshire (NGR TF 344 879; Fig 1). The purpose of the survey was to investigate the presence, layout and extent of any archaeological features which may be affected by the proposed development. The survey was undertaken between the 3rd and 5th May 2016 and has been recorded with Lincolnshire County Heritage Service under accession number LCNCC:2016.66.

2 BACKGROUND

2.1 Topography and geology

The proposed development area comprises the northern half of an arable field located on the eastern edge of Louth. It is bounded to the north-west by residential properties along Chestnut Drive and is surrounded by farmland on all other sides. The surface of the field slopes down northwards into the valley of the River Ludd, dropping from *c* 24m to *c* 19m aOD.

The solid geology of the survey area is mapped as Carstone Formation sandstone, outcropping between chalk strata to the east and west. These rocks are concealed beneath Pleistocene drift, which comprises glacial till on the higher ground and river terrace deposits on the lowers slopes towards Chestnut Drive (BGS 2016).

2.2 Historical and archaeological background

The Lincolnshire Historic Environment Record (HER) holds relatively few records relating to pre-medieval activity in the vicinity of the survey area. There is one record relating to the discovery of Roman coins south of Keddington, *c* 400m east of the survey area (HER14382) and another relating to cropmarks which occur *c* 800m south of the survey and are thought potentially to relate to a prehistoric enclosure (HER46162). Most of the other records for the local area relate to remnants of ridge and furrow cultivation of medieval to early post-medieval date.

The remains of the Cistercian Louth Park Abbey, founded in 1139, lie *c* 1km east of the survey area (HER43579). An open channel, known as the Monk's Dyke, was dug as a conduit to supply water to the abbey, and this still survives as a watercourse that flows eastwards along the southern boundary of the field in which the survey area lies.

3 METHODOLOGY

The survey was undertaken with the MOLA magnetometer cart. This is a two-wheeled, lightweight structure designed to be pushed by hand. It incorporates a bank of four vertically-mounted Bartington Grad601 magnetic sensor tubes, spaced at half-meter intervals along a bar aligned crossways to the direction of travel, and also incorporates a Leica Geosystems Viva GPS antenna mounted on the central axis, 0.5m astern of the sensors. The magnetic sensors each output data at a rate of six readings per second and the GPS antenna outputs NMEA format data (GGA messages) at a rate of one position every two seconds. These various 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 pushed along straight and parallel traverses across the survey area, with 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 *c* 1.5m/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 visualization 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 median destripe function to runs of data from each sensor. The data thus de-striped was interpolated to produce a greyscale raster image (range +/-4nT) and this was output with an associated world file for geo-rectification.

The processed data is presented in this report a a greyscale plot (range +4nT to -4nT / black to white), rotated and scaled for display against the Ordnance Survey base mapping (Fig 2). An interpretative plot is provided as Figure 3 and a plot of the unprocessed data as Figure 4.

4 SURVEY RESULTS

The survey has detected relatively little of archaeological interest, and the data is instead dominated by anomalies of natural origin. The overall trend of these anomalies corresponds to the mapped geology, with an area of amorphous background patterning in the north-west of the survey area apparently denoting the river terrace deposits and a much smoother magnetic background across the remainder of the area corresponding to the extent of the boulder clay.

There are three minor anomalies or groups of anomalies which could arguably relate to archaeological features but none are entirely convincing and in each case a geological interpretation would be at least equally plausible. In the north-western corner of the area there is a negative linear anomaly which seems to cut across the main geological trend and could perhaps represent a stone-lined drain or a ditch with an unusually non-magnetic fill. Approximately 100m south-east of this there is a rectilinear pattern of positive linear anomalies with one anomaly branching off to the north-east. These are slightly more regular than the surrounding geological anomalies and could possibly

represent a pattern of ditches. Finally, in the far east of the survey area there is a short curving anomaly, suggestive of a ditch, associated with a few small positive anomalies which could represent pits. It should be noted that the last mentioned group of anomalies lies outside the proposed development area, the survey having been carried slightly across its boundary to ensure full coverage was achieved.

Several other positive linear anomalies occur in the data, but these are generally more irregular than those described above and seem most likely to have a geological origin. One, which crosses the survey area from south-west to north-east, seems likely to denote the edge of the boulder clay outcrop. The others, mostly trending perpendicular to this edge, cannot be attributed to any specific cause but seem too irregular to be anything other than natural in origin.

A broad, sinuous trend of magnetically positive anomalies, flanked in places by weaker negative halos, extends from south-west to north-east across the southern half of the survey area. This is very likely to mark the course of a former river channel. However, as the channel stands substantially higher than the present level of the River Ludd, it seems unlikely to date from the Holocene era and could be more plausibly attributed to one of the Pleistocene interglacial periods. How such a channel might relate to the mapped outcrop of glacial till is uncertain and beyond the scope of this report.

A positive linear anomaly runs along the southern edge of the survey data, projecting north-eastwards from a corner of the present hedgerow. It corresponds to a former field boundary depicted on late nineteenth and early twentieth-century Ordnance Survey maps. There is also a moderately intense positive anomaly running along the north-eastern edge of the survey area which may relate to a recent farm track.

Several weak and narrow positive linear anomalies occur at various places in the data. If considered individually these could be interpreted as either field drains or ditches, but their overall layout, with parallel elements converging obliquely towards a central spine, strongly favours an interpretation as field drains.

The survey data also contains scattered magnetic dipoles resulting from items of ferrous debris buried within the plough soil. This debris will probably be fairly insignificant pieces of agricultural scrap, such as horseshoes and plough fittings.

5 CONCLUSION

The survey has detected nothing of certain archaeological interest, although there are a few minor anomalies which could perhaps represent sections of ditch. Instead, the main finding of the survey is that the southern half of the survey area is crossed by what appears to be a former river channel. Because this stands substantially higher than the present level of the River Ludd it seems unlikely to be a Holocene channel and could be more plausibly attributed to one of the Pleistocene interglacial periods.

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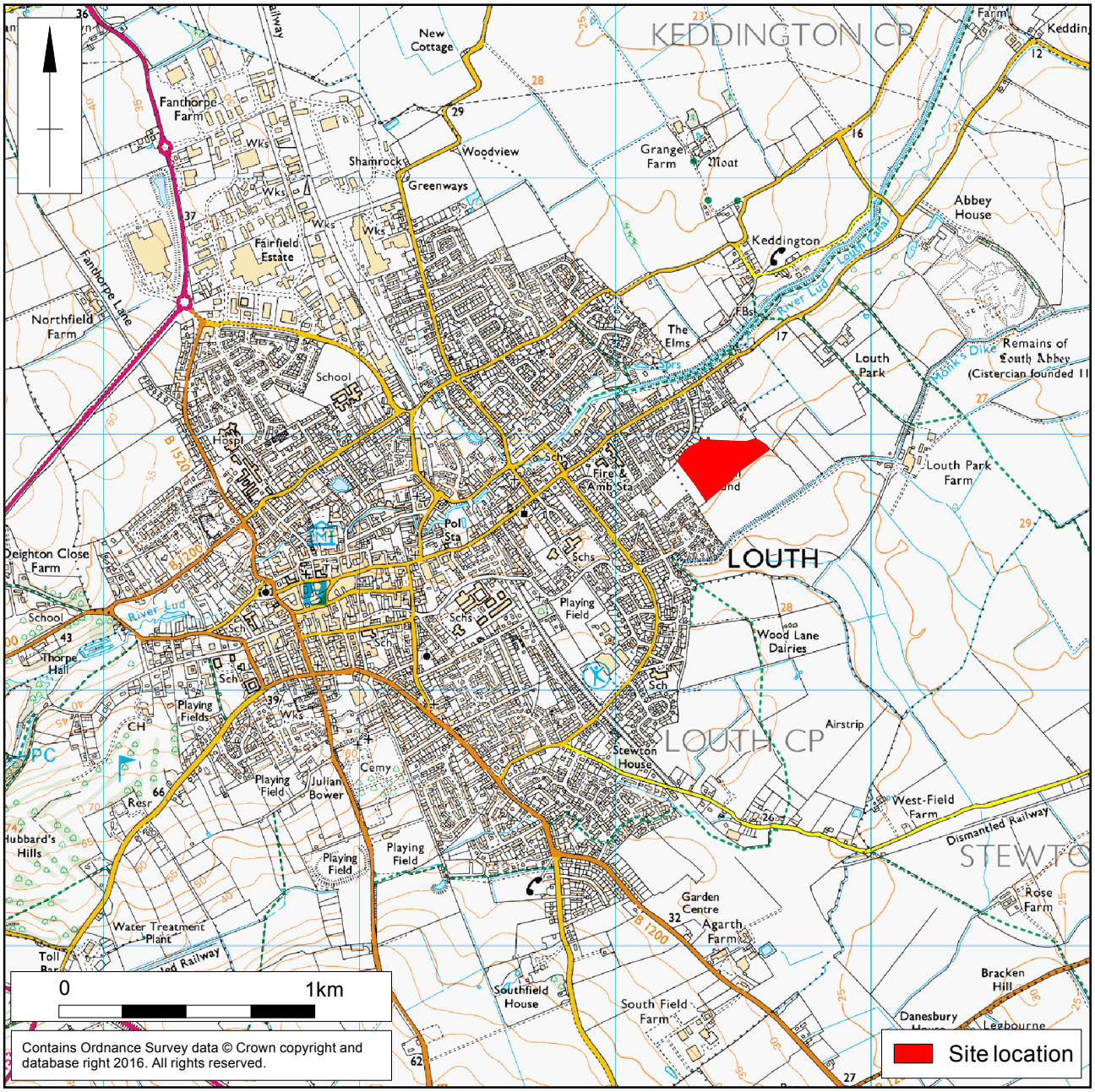
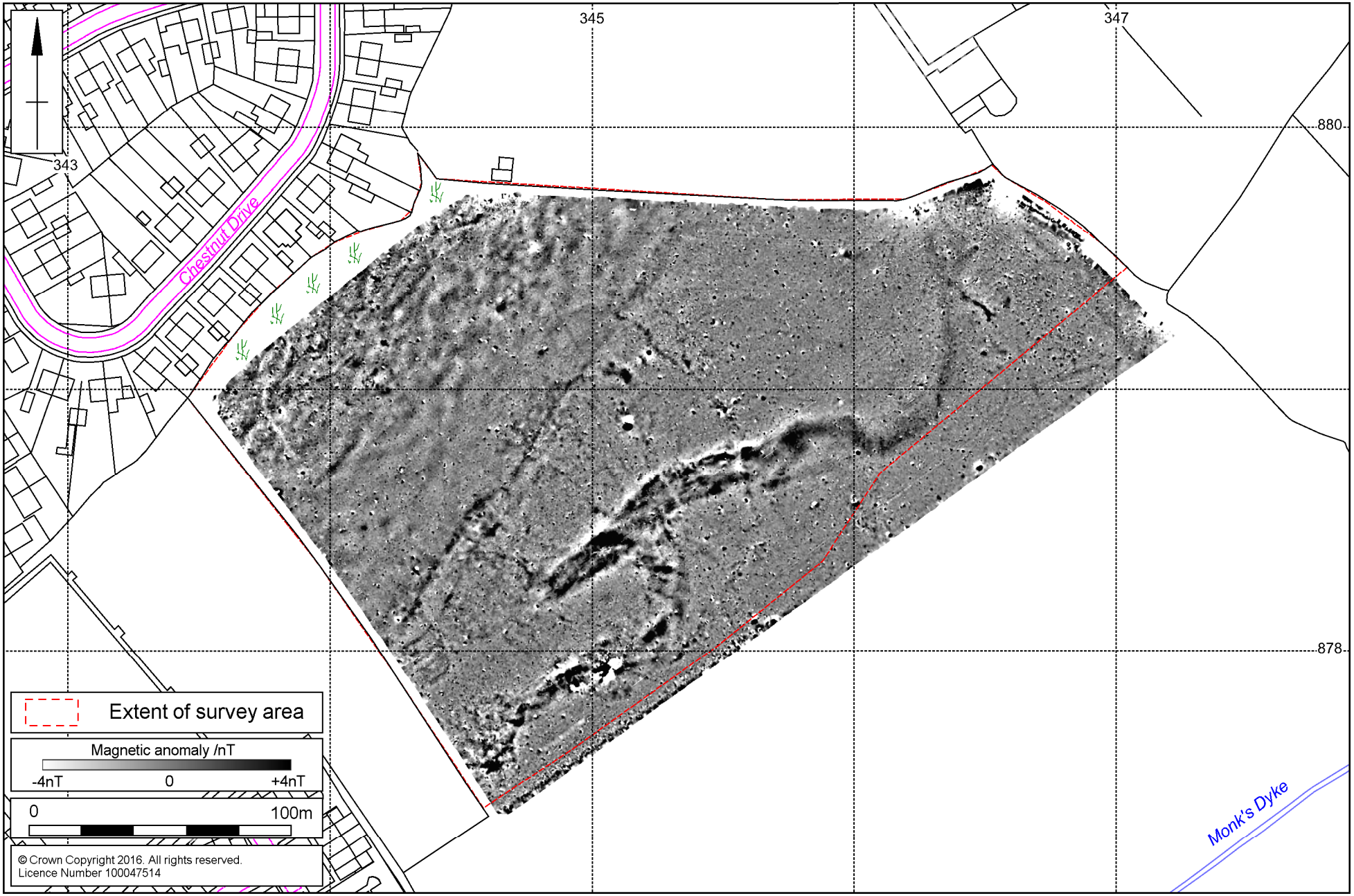
MOLA
24 May 2016



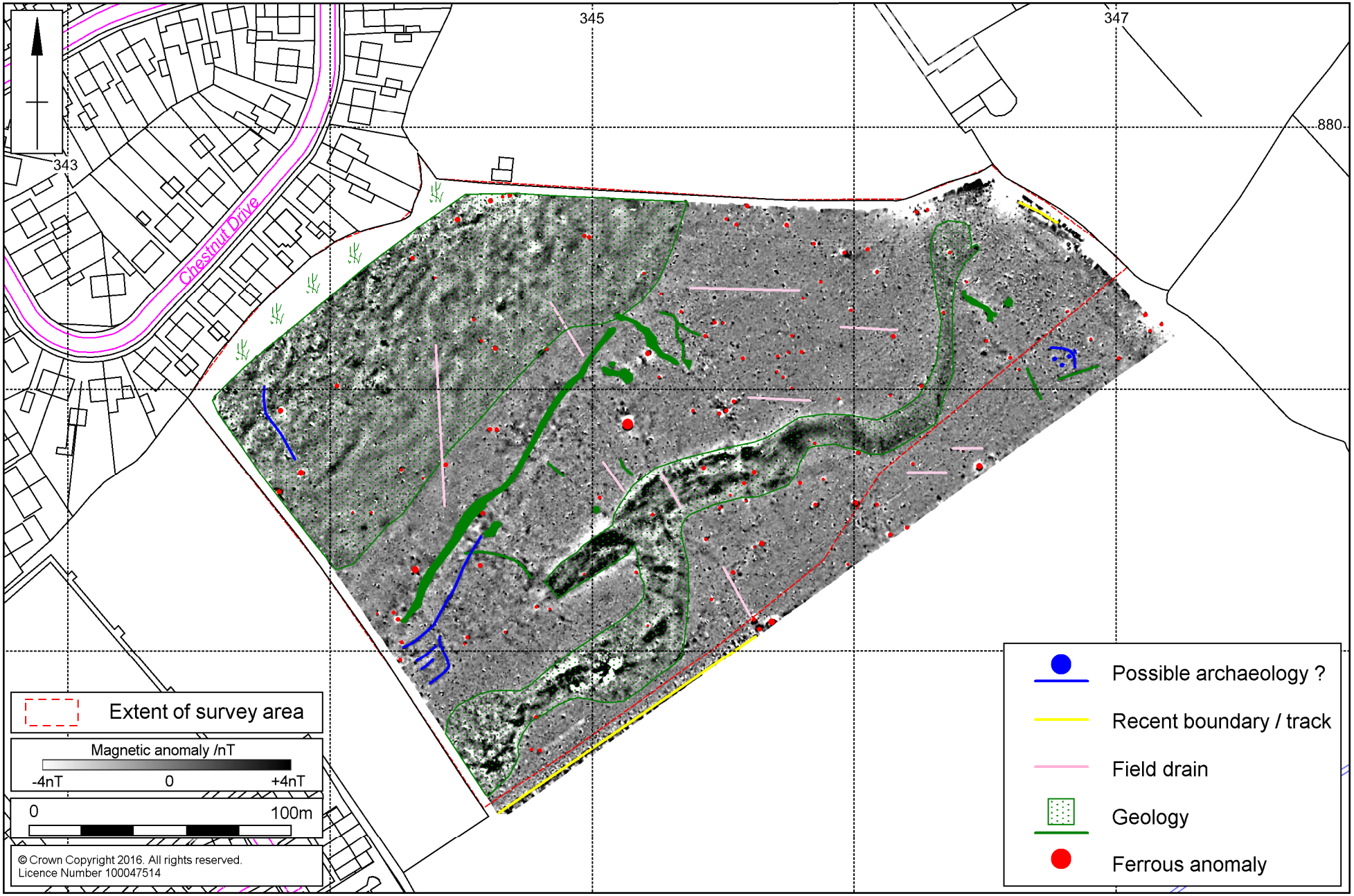
Scale 1:25,000

Site Location Fig 1



Scale 1:2000 (A4)

Magnetometer survey results Fig 2



Scale 1:2000 (A4)

Magnetometer survey interpretation Fig 3

Scale 1:2000 (A4)

Unprocessed magnetometer data Fig 4

MOLA
Bolton House
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Northampton
NN4 8BN
01604 809 800
www.mola.org.uk
sparry@mola.org.uk