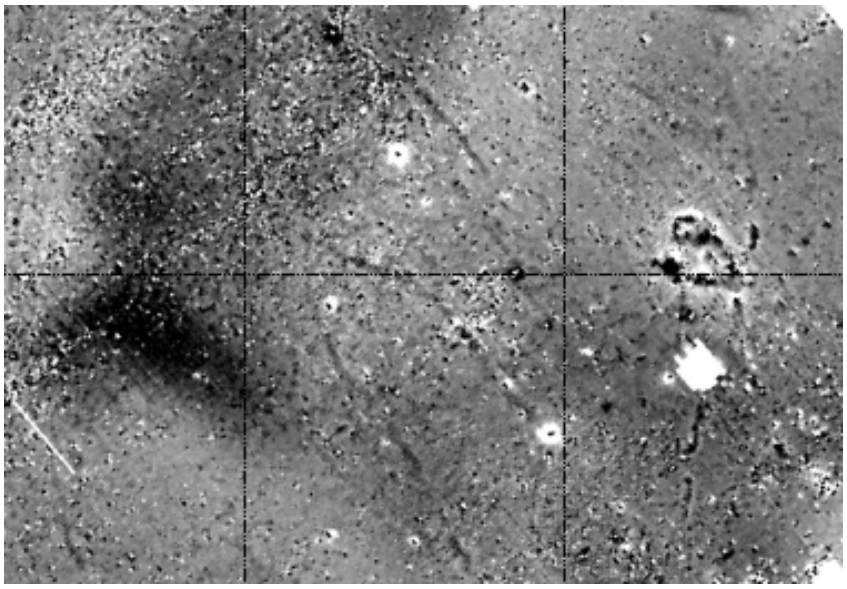

Archaeological geophysical survey of the Dallington Grange causewayed enclosure Northampton May 2014

Report No. 14/122

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Illustrator: John Walford

Project Manager: Steve Parry
NGR: SP 726 635

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1	09/06/2014	Pat Chapman	Steve Parry	Andy Chapman	Client approval

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OASIS REPORT

PROJECT DETAILS	Oasis No. molanort1-181062	
Project name	Archaeological geophysical survey of the Dallington Grange causewayed enclosure, Northampton	
Short description	MOLA was commissioned to carry out a detailed magnetometer survey of a Neolithic causewayed enclosure near Dallington Grange, Northampton. The survey successfully defined the extent of the monument and identified a few features not previously known from cropmarks. However, the clarity of the survey results was diminished by the adverse magnetic properties of the local geology.	
Project type	Geophysical survey	
Site status	None	
Previous work	Geophysical survey and trial trenching (OAU 1991, NCCAU 1993, ASUD 2006) Cropmark plotting (Northamptonshire HER).	
Current Land use	Arable	
Future work	Unknown	
Monument type/ period	Neolithic causewayed enclosure, undated ditches	
Significant finds	None	
PROJECT LOCATION		
County	Northamptonshire	
Site address	Dallington Grange, Northampton	
Study area	*c* 11ha	
OS Easting & Northing	SP 726 635	
Height OD	*c* 100m aOD	
PROJECT CREATORS		
Organisation	MOLA Northampton	
Project brief originator	Pegasus Planning	
Project design originator	MOLA Northampton	
Director/Supervisor	Ian Fisher	
Project Manager	Steve Parry	
Sponsor or funding body	Pegasus Planning	
PROJECT DATE		
Start date	6 May 2014	
End date	8 May 2014	
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BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report	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 the Dallington Grange causewayed enclosure, Northampton, May 2014.	
Serial title & volume	MOLA Northampton Reports 14/122	
Author(s)	John Walford	
Page numbers	5	
Date	9 June 2014	

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Archaeological geophysical survey of the Dallington Grange causewayed enclosure, Northampton May 2014

ABSTRACT

MOLA was commissioned to carry out a detailed magnetometer survey of a Neolithic causewayed enclosure near Dallington Grange, Northampton. The survey successfully defined the extent of the monument and identified a few features not previously known from cropmarks. However, the clarity of the survey results was diminished by the adverse magnetic properties of the local geology.

1 INTRODUCTION

MOLA was commissioned by Pegasus Planning to conduct a geophysical survey of the Dallington Grange causewayed enclosure (NGR SP 726 635; Fig 1). This is a Neolithic monument located on the north-western edge of Northampton, within the Dallington Grange (King's Heath) Sustainable Urban Expansion area.

A detailed magnetometer survey was undertaken on 6th – 8th May 2014, covering a total area of approximately 11ha. The purpose of the survey was to accurately define the extent of the enclosure and to provide as much information as possible about its layout and the presence of any associated archaeological remains.

2 BACKGROUND

2.1 Topography and geology

The causewayed enclosure is located on arable land approximately 600m south-west of Dallington Grange (Fig 1), and covers part of the crest and upper slopes of a ridge at *c* 100m aOD. The geology of the area is mapped as Northamptonshire Sand and Ironstone with one small overlying patch of Lower Estuarine deposits (BGS 2014). The soils are slightly acid, free-draining loams of the Banbury Association (SSEW 1983).

At the time of the fieldwork, the site of the enclosure was covered with a developing wheat crop, which stood approximately 0.5m high. Whilst this was a hindrance to the surveyors, and caused some drag and buffeting of the instruments, it did not prevent satisfactory completion of the survey. Four mature trees presented more substantial obstructions, resulting in four small gaps in the survey data (Fig 2).

2.2 Historical and archaeological background

Causewayed enclosures are amongst the earliest large-scale archaeological monuments in England (Oswald 2011). They date to the 4th millennium BC (early Neolithic) and are often interpreted as communal meeting places. They are characterised by one or more circuits of segmented ditch enclosing an area which is typically round or oval shaped and several hectares in extent. Approximately 80 are known across the country as a whole, but the Dallington Grange enclosure is the only surviving example near Northampton. A second example formerly stood at Briar Hill,

approximately 5km south of Dallington, and was extensively excavated from 1974-78, but has since been destroyed by housing development (Bamford 1985).

The causewayed enclosure at Dallington forms one part of a large multi-period complex of archaeological remains, the evidence for which comes largely from cropmarks (Fig 1). It encompasses a smaller enclosure which has been tentatively identified as a henge (Bamford 1985, 136), overlaps with a right-angled corner of ditch which may form part of a further enclosure, and lies slightly north of a pit alignment. Three hundred metres to its south-west there is a large group of Iron Age and Roman enclosures, and more enclosures of similar date lie 300m to its north.

Several previous magnetometer surveys have investigated parts of the causewayed enclosure (OAU 1991, NCCAU 1993, ASUD 2006), but the coverage has been piecemeal and some of the early work does not meet with currently accepted survey standards. The enclosure has also been subject to very small scale trial trenching, sufficient to confirm its Neolithic date (OAU 1991).

3 METHODOLOGY

The magnetometer survey was conducted with Bartington Grad 601-2, twin sensor array, vertical component fluxgate gradiometers (Bartington and Chapman 2003). These are standard instruments for archaeological survey and can resolve magnetic variations as slight as 0.1 nanoTesla (nT).

A network of 30m grid squares was established across the entire survey area. The grid was set out with a tape measure and optical square and was tied in to the Ordnance Survey National Grid by means of a Leica Viva RTK GPS. The gradiometers were carried at a brisk but steady pace through each grid square, collecting data along 1m spaced traverse lines. Measurements were automatically triggered every 0.25m along the traverses, giving a total of 3600 measurements per square. All fieldwork methods complied with the guidelines issued by English Heritage and by the Institute for Archaeologists (EH 2008; IfA 2011).

The survey data could not be processed in a standard way, because it did not possess a uniform magnetic background. Applying a zero-mean traverse de-striping function would have removed many of the large scale geological anomalies and produced spurious effects at the survey grid edges (as seen in ASUD 2006), so an alternative spreadsheet based de-striping routine was employed. This calculated zero-mean corrections based on sets of traverses within each grid, applied these, and then applied an approximate balancing correction to each grid as a whole. De-staggering and fine balancing of the grids was undertaken with Geoplot 3.00v software. Whilst this approach left some slight residual striping, it does not significantly detract from the appearance of the processed data.

The processed data is presented in this report as a greyscale plot (range +8nT to -8nT / black to white), rotated and scaled for display against the Ordnance Survey base mapping (Fig 2). An interpretative overlay is presented in Figure 3 and a comparison between the survey results and the cropmarks in Figure 4. Figure 5 presents the unprocessed survey data.

4 SURVEY RESULTS

The survey has detected a complicated set of linear and curvilinear anomalies standing out against a magnetically variable background. There is a tolerably good correspondence between these anomalies and the previously recorded cropmarks (Fig 4), and the perimeter of the causewayed enclosure is discernible, although not especially distinct.

The survey results demonstrate that the causewayed enclosure is sub-oval in plan, with a flattened side to the south. It has an internal area of *c* 5ha and measures *c* 270m north to south by 225m east to west, which is marginally smaller than the cropmark plot would suggest (Fig 4). A single circuit of ditch segments defines its perimeter. Only a few of these segments have produced clear magnetic anomalies, and it may be that these contain particular concentrations of burnt stone, ceramics, or other magnetic materials within their fills. The other segments have either produced very weak anomalies or remain undetected and, for this reason, the survey data does not provide a good basis for mapping the precise extents of the individual segments and their intervening causeways.

Two adjacent ditch segments on the south-eastern part of the circuit have inwardly curved terminals, a feature which may mark the principal entrance (Oswald 2011, 3). Support for this suggestion comes from the fact that these ditch segments have produced some of the strongest anomalies anywhere on the circuit, and the magnetic enhancement of entrance-ways is a commonly recognised phenomenon on ditched enclosures in general.

Within the enclosure the survey has detected a tangled set of weak curvilinear anomalies, representing ditches of unknown date. They appear to define parts of either two or three intersecting oval-shaped enclosures, but this is not certain as the anomalies are very disjointed and indistinct. No firm date or function can be attributed to the ditches. They do not convincingly represent a henge (*contra* Bamford 1985, 136) but neither do they resemble the generally rectilinear Iron Age to Roman enclosure ditches identified elsewhere in the vicinity of Dallington Grange (Fig 1).

At the northern edge of the causewayed enclosure the survey has detected a right-angled section of ditch with one straight arm *c* 50m long and one curving arm *c* 110m long. This has the appearance of an incomplete tongue-shaped enclosure. Its date and function is unknown, but it may be analogous to a similarly incomplete (and as yet undated) tongue-shaped enclosure discovered by geophysical survey to the east of Kettering (Butler 2011, fig 20). It also bears comparison with an L-shaped ditch of Middle Bronze Age date excavated at Priors Hall near Corby (Chapman and Jones 2012).

Elsewhere, the survey has identified various isolated anomalies which perhaps represent small pits and disjointed lengths of ditch. These have been highlighted as possible archaeological features on the interpretation plot, but are too undiagnostic to merit individual description. Not all of them are certainly archaeological: some may prove to be related to the geological anomalies discussed below

A few thin negative linear anomalies have been detected near to the south-eastern and north-western edges of the survey area, lying parallel to the modern field boundaries. Anomalies such as these are commonly detected on arable land, and are apparently related to the edges of modern plough headlands.

Near the eastern edge of the enclosure circuit there is a roughly triangular patch of magnetic disturbance, measuring *c* 30m long. It is composed of several amorphous

positive anomalies, mostly around 10nT to 40nT in strength, with much weaker negative halos. These would be consistent with concentrations of burnt soil, ceramics or other non-ferrous magnetic debris. They may be the result of fairly modern activity, as their location coincides with that of an indistinct feature, apparently encircled by a track, on a 1945 aerial photo of the site (Google Earth).

The data contains several very loosely defined zones of 'magnetic noise' (clusters of small dipoles and data spikes). These indicate scatters of ferrous debris, shattered ironstone or other magnetic materials within the ploughsoil. The specific cause of their distribution is unknown, but it is possible that they represent rubbish or hardcore associated with the motocross tracks which formerly extended across the western half of the survey area. The data also contains a few larger dipolar anomalies which represent more substantial pieces of ferrous debris scattered randomly across the survey area.

The broad-scale variations in the background magnetic field, which give the data a 'cloudy' appearance, are presumed to arise from the underlying ironstone geology. A geological cause is also likely for the series of broad, slightly crooked linear anomalies pass through the northern part of the survey area on near-parallel headings. Comparison with the cropmark plot (Fig 1) and with aerial photographs (Google Earth) shows that they represent part of an extensive swarm of probable geological fissures. A similarly broad but less distinct anomaly in the south of the survey area may have the same cause.

5 CONCLUSION

Magnetometer survey of the Dallington Grange causewayed enclosure has broadly confirmed the plan of the site as determined from cropmarks. However, there are discrepancies of around 10m between the positions of certain features on the cropmark plot and the positions of same features as indicated by the survey (Fig 4). Where such discrepancies occur the survey results should be treated as the more accurate source of information, because cropmark plotting is commonly prone to errors, especially in open areas with sloping ground and little topographic control.

Although the survey results are spatially accurate, they are not clear in every detail. Many of the archaeological anomalies are weak and poorly defined (perhaps due to iron depletion of the free-draining acidic topsoil) and they do not always contrast well against the broad scale background variations arising from the underlying ironstone. Thus it should not be assumed that the survey results provide a comprehensive depiction of every archaeological feature present.

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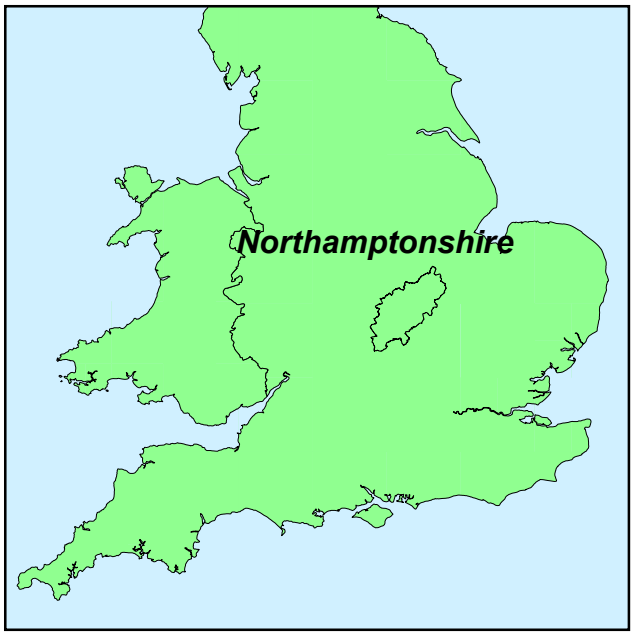
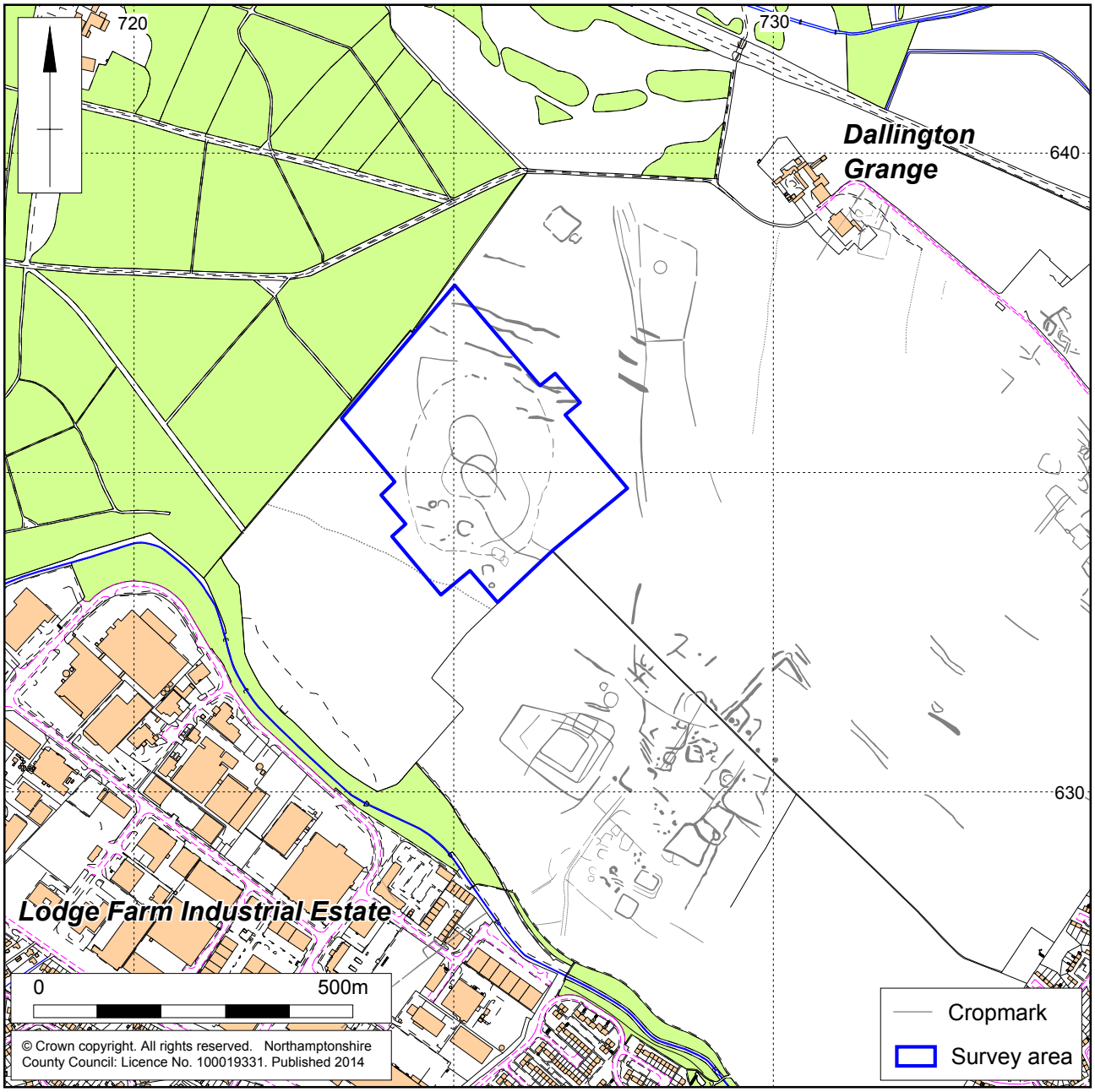
MOLA
9 June 2014





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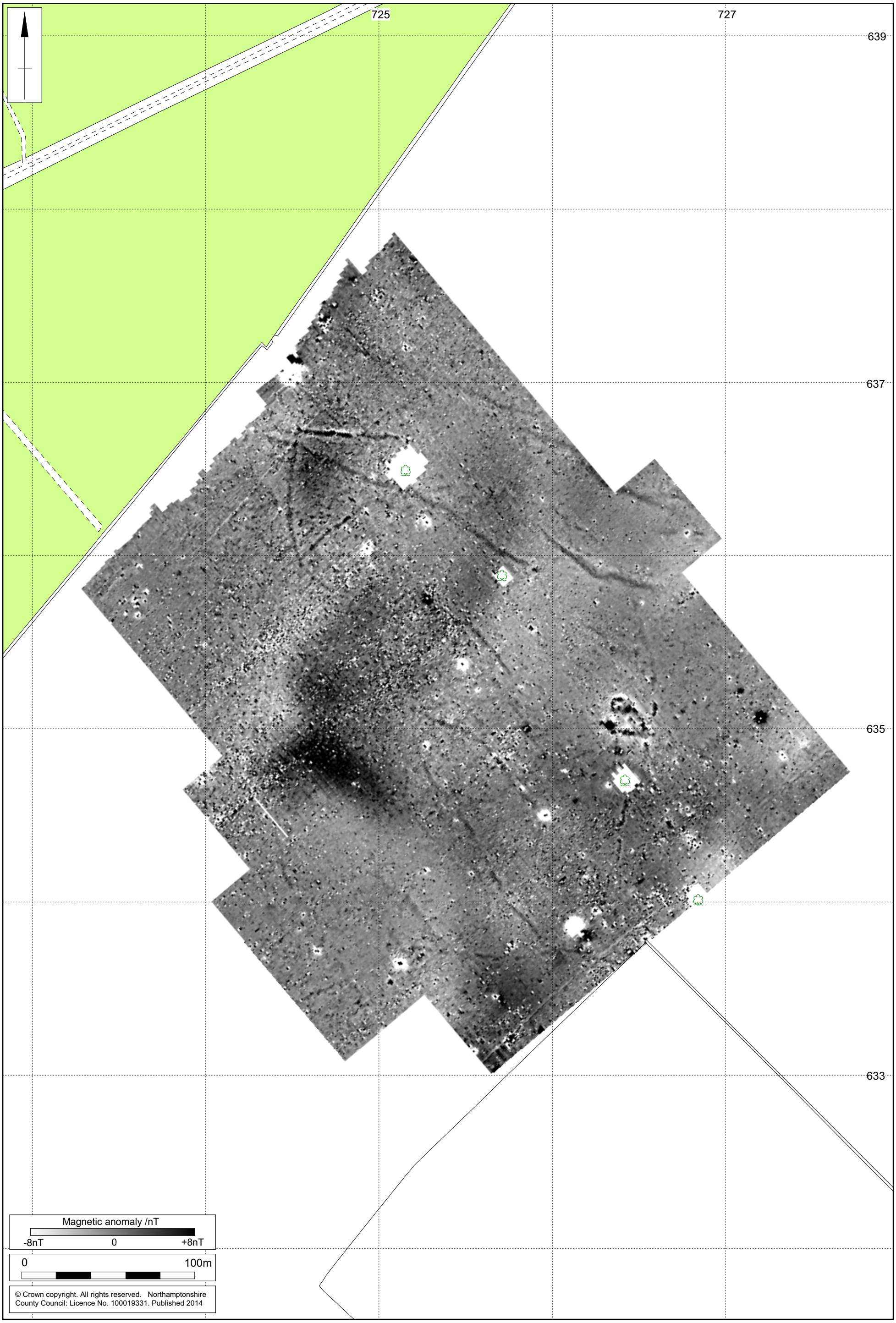
Site location Fig 1



Scale 1:2000

Magnetometer survey results Fig 2

725

727

639

637

635

633

Causewayed enclosure ditch

Other archaeological feature?

Burnt soil / ceramic debris?

Agricultural feature

Geological feature

Ferrous object

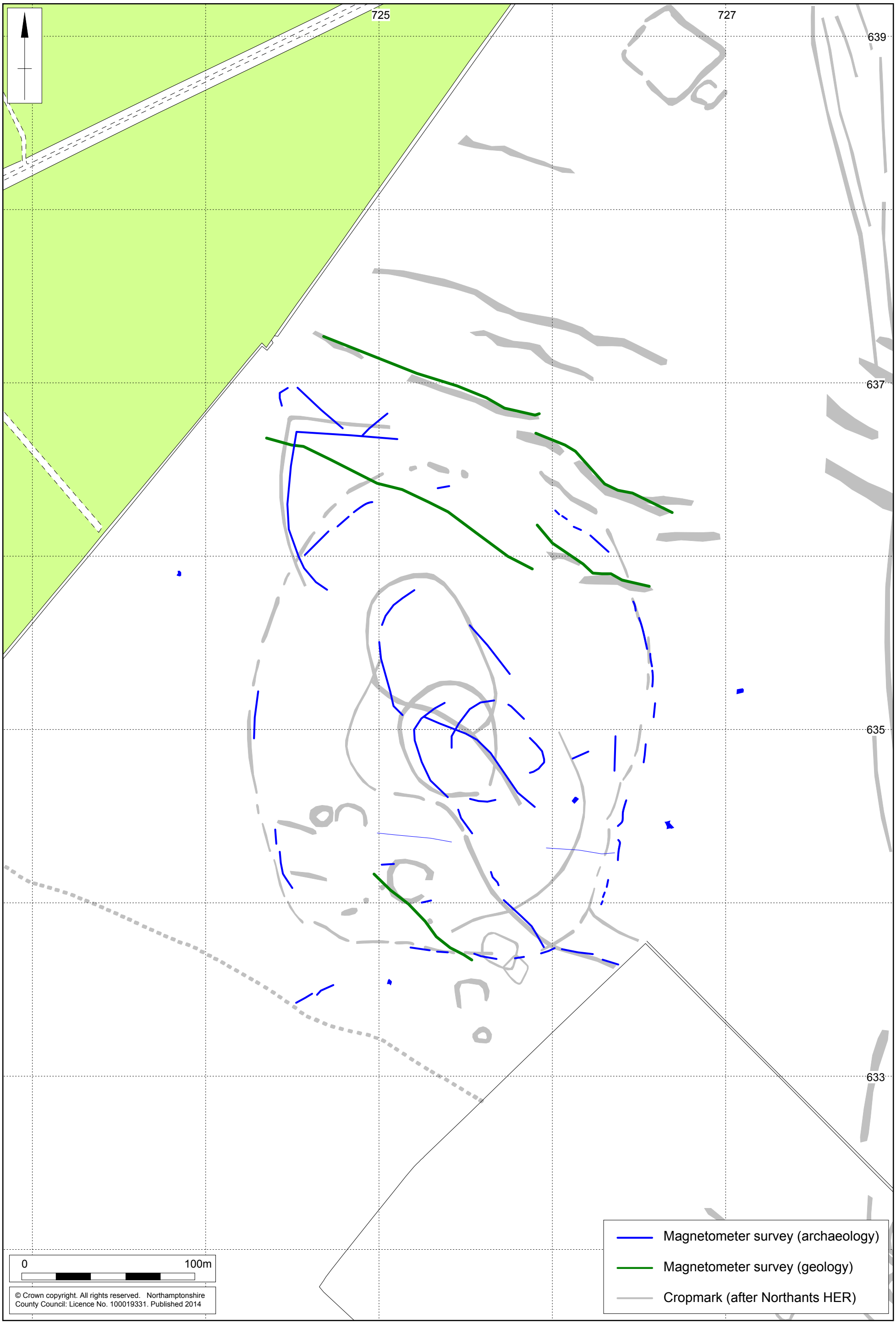
Magnetic anomaly /nT

-8nT 0 +8nT

0 100m

Scale 1:2000

Magnetometer survey interpretation Fig 3



Scale 1:2000

Comparison of survey results and cropmarks Fig 4

725

727

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Magnetic anomaly /nT

-8nT 0 +8nT

0 100m

Scale 1:2000

Unprocessed magnetometer data Fig 5

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