

**Archaeological geophysical survey
on land west of Bedford Road
Great Barford
Bedfordshire
March 2021**

Report No. 21/032

Author: Adam Meadows

Illustrator: Adam Meadows



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Project Manager: Adam Yates

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Geophysical survey on land west of Bedford Road, Great Barford		OASIS No: molanort1-501627	
ACTIVITY TYPE			
Project/Activity type	Geophysical survey		
Reason for investigation	Planning: Pre application		
Development type	Residential development		
PROJECT LOCATION			
National grid ref	TL 123 521		
Site name	Land west of Bedford Road, Great Barford		
REVIEWERS/ ADMIN			
HER for project	Central Bedfordshire		
National organisation	None		
WORK UNDERTAKEN			
Methodological summary	Magnetometer survey with a cart-mounted array of Bartington Grad601 fluxgate gradiometers.		
Previous work?	No	Future works?	Not known
Dates - Start date:	22nd March 2021	End date:	24th March 2021
GEOPHYSICS			
Geology	Oxford Clay Formation		
Land use (i.e. arable)	Arable and pasture		
Survey type	Magnetometry survey		
Size of survey area	c17 ha		
Instrumentation	Bartington Grad 601		
Configuration	Multiple		
Spatial resolution	Traverse spacing	0.5m	Sample interval 0.25m
Resolution (data values)	0.1nT		
BIBLIOGRAPHY			
Title	Archaeological geophysical survey on land west of Bedford Road, Great Barford, Bedfordshire, March 2021		
Author(s)	Meadows, A.		
Date of publication	2021		
Publisher	MOLA Northampton		
Place of publication	Northampton		
Report number	21/032		
Report release delay?	6 months		
PEOPLE			
Organisation	MOLA Northampton		
Project manager	Adam Yates		
Project officer/supervisor	John Walford, Adam Meadows		
Funding body	RPS Consulting Ltd		
KEYWORDS			
Monuments found/ date	Enclosures - Late prehistoric or Roman		
RESULTS			
Description of outcomes/ summary of research framework contribution	<p>The survey mapped out a concentration of archaeological remains comprising a sinuous boundary ditch or trackway with associated enclosures. These features correlate with, and expand upon, a previously recorded area of cropmarks. A small part of a separate enclosure was detected at the eastern edge of the site. Evidence of medieval ridge and furrow cultivation was also detected throughout, as were more recent field boundaries.</p> <p>The main archaeological site is morphologically similar to a number of middle to late Iron Age settlements found in the wider region and, if confirmed to be of this date, could contribute to research into late prehistoric settlement patterns and land division.</p>		
ARCHIVES			
Accession ID	None		
Paper Archive repository	None		
Digital Archive repository	ADS		
<i>No finds made during survey - no finds archive to be deposited</i>			

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ABSTRACT

MOLA (Museum of London Archaeology) was commissioned by RPS Consulting Ltd to conduct an archaeological geophysical survey on land to the west of Bedford Road, Great Barford, Bedfordshire.

The survey has mapped out a concentration of archaeological remains comprising of a potential trackway, associated enclosures, and possible residences. These features correlate with and extend from, a previously recorded area of cropmarks. Evidence for medieval ridge and furrow cultivation was also detected, alongside changing modern field divisions.

1 INTRODUCTION

MOLA (Museum of London Archaeology) was commissioned by RPS Consulting Ltd to undertake an archaeological geophysical survey across c17ha of farmland to the west of Bedford Road, Great Barford, Bedfordshire (NGR TL 123 521).

The magnetometer survey took place over three days, commencing on the 22nd March 2021, and was conducted in accordance with a Written Scheme of Investigation (Meadows 2021) and the Chartered Institute for Archaeologists and European Archaeological Council guidelines (ClfA 2014 and Schmidt *et al* 2015).

The Higgins Museum, Bedford, was informed of the work but declined to issue an accession number or accept an archive.

2 BACKGROUND

2.1 Location, geology and topography

The survey area is located on the south-western side of Great Barford, with Bedford Road and residential properties of Great Barford bordering it to the south-east and north-east respectively. The land to the north and west is in agricultural use.

Four agricultural fields are included within the survey area. At the time of the survey two were in use as sheep pasture while the other larger fields comprised arable land, which had been recently drilled and rolled. The arable fields were separated by a grass topped bank with the remainder separated by fence lined hedgerows.

The survey area is positioned on a gentle north-east facing slope, falling from c36m above Ordnance Datum (aOD) in the south-west to c25m aOD in the north-east.

The solid geology of the site comprises Peterborough Member Mudstone, a part of the Oxford Clay Formation. This is mostly overlain by a superficial deposit of Oadby Member Diamicton, with a small area of river terrace deposits recorded in the south-west (BSG 2021). The soils are recorded as loamy clay, rich in lime with 'slightly impeded' drainage (Landis 2021).

2.2 Historical and archaeological background

No prior archaeological works are known to have taken place within the proposed survey area. However, MOLA has undertaken archaeological works in a field located c300m to the east. A geophysical survey identified ridge and furrow cultivation (Meadows 2015) and this was confirmed through trial trench evaluation (Jones 2016) but no other archaeological remains were encountered.

Two probable prehistoric or Roman cropmark sites lie within the southernmost part of the survey area, one being a large double-ditched enclosure (Bedford Historic Environment Record No. MBB22012), and the other a trackway with several small enclosures alongside it (MBB22011). Further cropmarks suggest a prehistoric barrow cemetery lies c100m south of the survey area (MBD600).

There is no evidence for Anglo-Saxon activity within the survey area, but a small excavation at Peashill, c400m to the north revealed ditches, postholes and other features associated with 8th to 9th-century pottery (13358, EBB433).

The village of Great Barford is recorded in the Domesday Book of 1086. Historically, it comprised two separate parts, the main village to the east of the survey area, extending down to the River Ouse, and the smaller 'Green End' to the north of the survey area (Ordnance Survey, Old Series, Sheet 52SW). There is no evidence of medieval or later settlement within the survey area itself.

3 METHODOLOGY

The magnetometer survey was undertaken with a Bartington magnetometer cart. This is a two-wheeled, lightweight sensor platform designed to be pushed by hand. It incorporates a bank of eight vertically-mounted Bartington Grad-01-1000L magnetic sensor tubes, spaced at half-metre intervals along a bar aligned crossways to the direction of travel.

The cart incorporates a Leica Geosystems Viva GPS antenna mounted on the central axis, 1.02m astern of the sensors. The magnetic sensors each output data at a rate of eight readings per second and the GPS antenna outputs NMEA format data (GGA messages) at a rate of one position per second. These data streams 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 the survey area, 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 c1.8m/s, with an effective data resolution thus approximated to better than 0.225m 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 minor striping caused by slight mis-matches in the calibration of the individual magnetic sensors (Fig 6 and 7). This was removed in TerraSurveyor by applying the median de-stripe function to runs of data from each sensor. No other processing was required.

The survey data is presented in this report as greyscale raster images which have been rotated and scaled to fit against Ordnance Survey base-mapping. The processed data are presented at a scale of $\pm 4\text{nT}$ (Fig 2 and 3), and an interpretive overlay is presented over the data at the same scale (Fig 4 and 5). A minimally processed data plot is presented at a scale of $\pm 10\text{nT}$ (Fig 6 and 7) as a comparison to the processed data.

4 SURVEY RESULTS

The survey data contains a concentration of anomalies of archaeological origin, in the southern part of the site. These represent several ditched enclosures arrayed along a sinuous boundary ditch or trackway aligned north-east to south-west, roughly parallel with the modern Bedford Road. The boundary extends beyond the edges of the survey area at both ends, and is evidently just a part of a more extensive site. The strength of the magnetic responses appears to weaken towards the north-east; this may represent a broad-scale variation in the magnetism of the natural geology and soils.

Most of the enclosures are grouped towards the southern end of the survey area (Figs 2 and 4). One sub-rectangular enclosure, measuring c20m by 25m, has a very broad ditch, probably at least 3m across. To its west, on the opposite side of the sinuous boundary, is a larger complex of conjoined and overlapping enclosures, covering an area of at least 90m by 35m and exhibiting a variety of rectilinear and curvilinear forms. The northern and western edges of this complex are poorly resolved and it may be a little more extensive than the data plot would suggest

North of the broad-ditched enclosure there is one very small, C-shaped enclosure or roundhouse gully, c10m across, which intersects the sinuous boundary. Several other lengths of ditch have been detected and may comprise fragments of other enclosures or fields, but they are too disjointed to establish any meaningful plan.

A solitary corner of an enclosure is present in the north-western corner of the large southern field. Entering the survey area from an unsurveyed northern field, it turns to the south-east, running in parallel with the modern field boundary and gradually weakening in its magnetic signature before turning back towards the north-east.

Evidence of ridge and furrow cultivation was recorded across much of the survey area. It is marked by long, magnetically positive, linear anomalies which are evenly spaced and broadly parallel. Two alignments are present within the results, the north-western portion following a broadly north-east to south-west alignment and the south-eastern following a north-west to south-east alignment. An area of overlap appears to exist in the central area of the results, though not extending through to the opposing side of the respective fields.

A concentration of ferrous dipoles arranged in a diffuse line was recorded bisecting the southernmost field (Figs 2 and 4). Orientated north-west to south-east, it projects from a short section of concrete track leading from Bedford Road. This correlates with a field boundary depicted on Ordnance Survey County Series mapping from 1884 to the 1976 Ordnance Survey Plan. A second, broadly linear concentration of ferrous anomalies is present, projecting south-westwards from the tip of the extant concrete track. This represents the remains of a field boundary depicted across all available historic maps up until its removal by 2019, as depicted in satellite imagery.

The remains of a trackway that is recorded on all readily available historic Ordnance Survey mapping has also been detected bisecting the northernmost field. This diffuse linear concentration of ferrous anomalies extends in a north-west to south-east

orientation. It can be projected along the eastern edge of the survey area, aligning with an existing farm track leading from Bedford Road.

A star-shaped magnetic anomaly has been detected within the northern field and may be the result of a historic lightning strike (Figs 3 and 5). However, mapping from the mid-20th century marks this field as being allotments, so this anomaly may prove to be more mundane and relate to discarded garden equipment or a bonfire site.

Many small, discrete magnetic dipoles are present within the survey data. These are indicative of scattered ferrous material, likely agricultural in nature, buried within in the topsoil. Larger ferrous anomalies in the form of a magnetic 'halo' are often found towards the edges of the survey data, originating from metal fencing or structures positioned close to the survey area. The most conspicuous of these halos in the northern half of the survey area, are due to adjacent barns.

5 CONCLUSION

The survey has detected a concentration of archaeological remains that broadly correspond with known cropmarks in the area. The remains comprise a series of ditched enclosures arranged intermittently along a long, sinuous boundary ditch or trackway, and include one group of overlapping curvilinear enclosure ditches, which probably marks an area prolonged or repeated occupation. Similarly arranged sites, with small enclosures strung along a sinuous boundary, are relatively common in the wider region and on excavation often prove to date from the middle and late Iron Age through to the Roman period. Several examples have, for instance, been found during ongoing archaeological works on the A428 'Black Cat to Caxton Gibbet' road scheme to the north-east of Great Barford and have been informally termed 'strings' or 'string systems' (Finn *et al* 2020).

Further archaeological remains have been detected at the eastern edge of the survey area where a small section of enclosure ditch hints at the presence of a site extending into an unsurveyed field to the north. The rest of the survey data provides evidence of medieval to early post-medieval ridge and furrow cultivation and to the changing pattern of post-medieval and modern field divisions.

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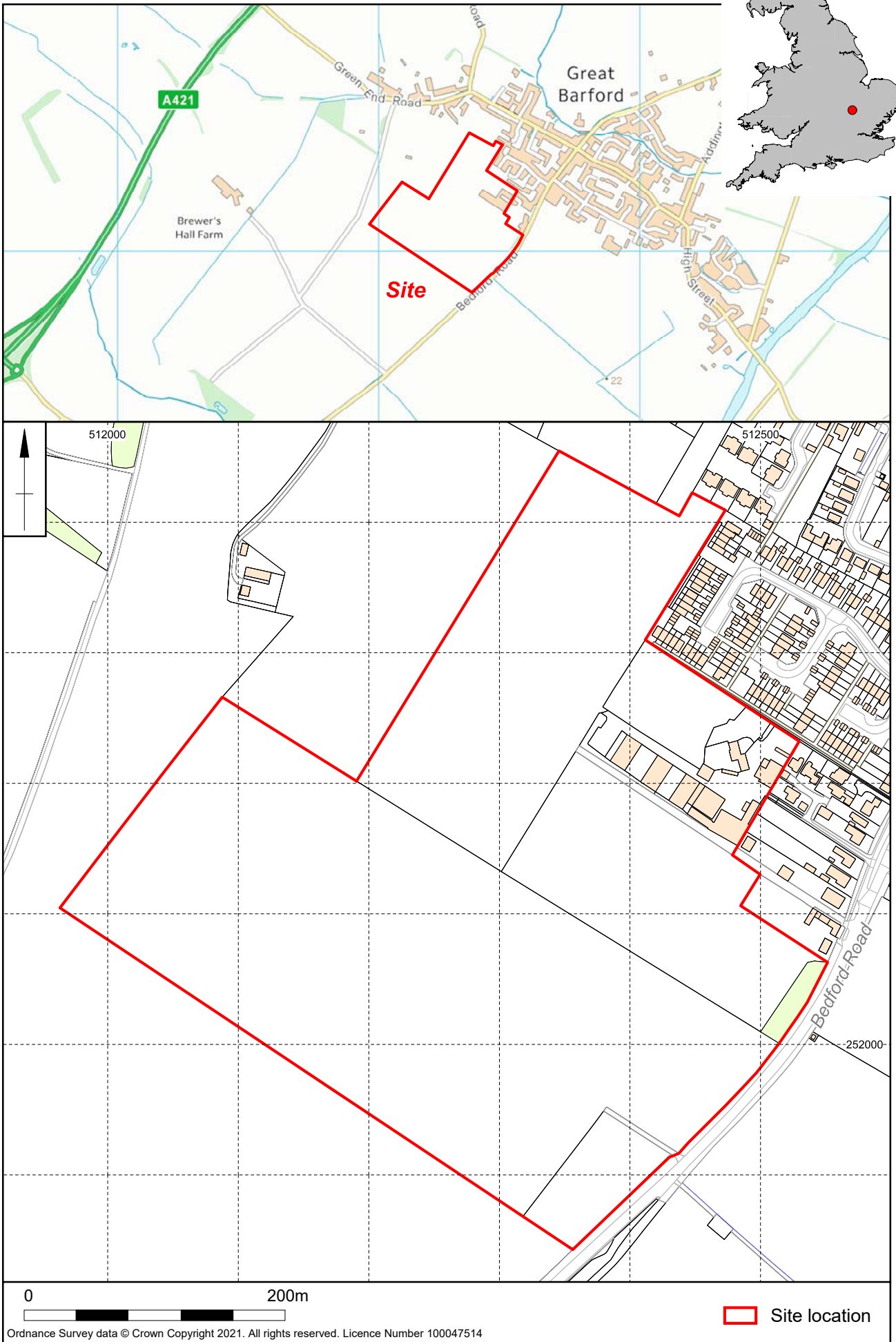
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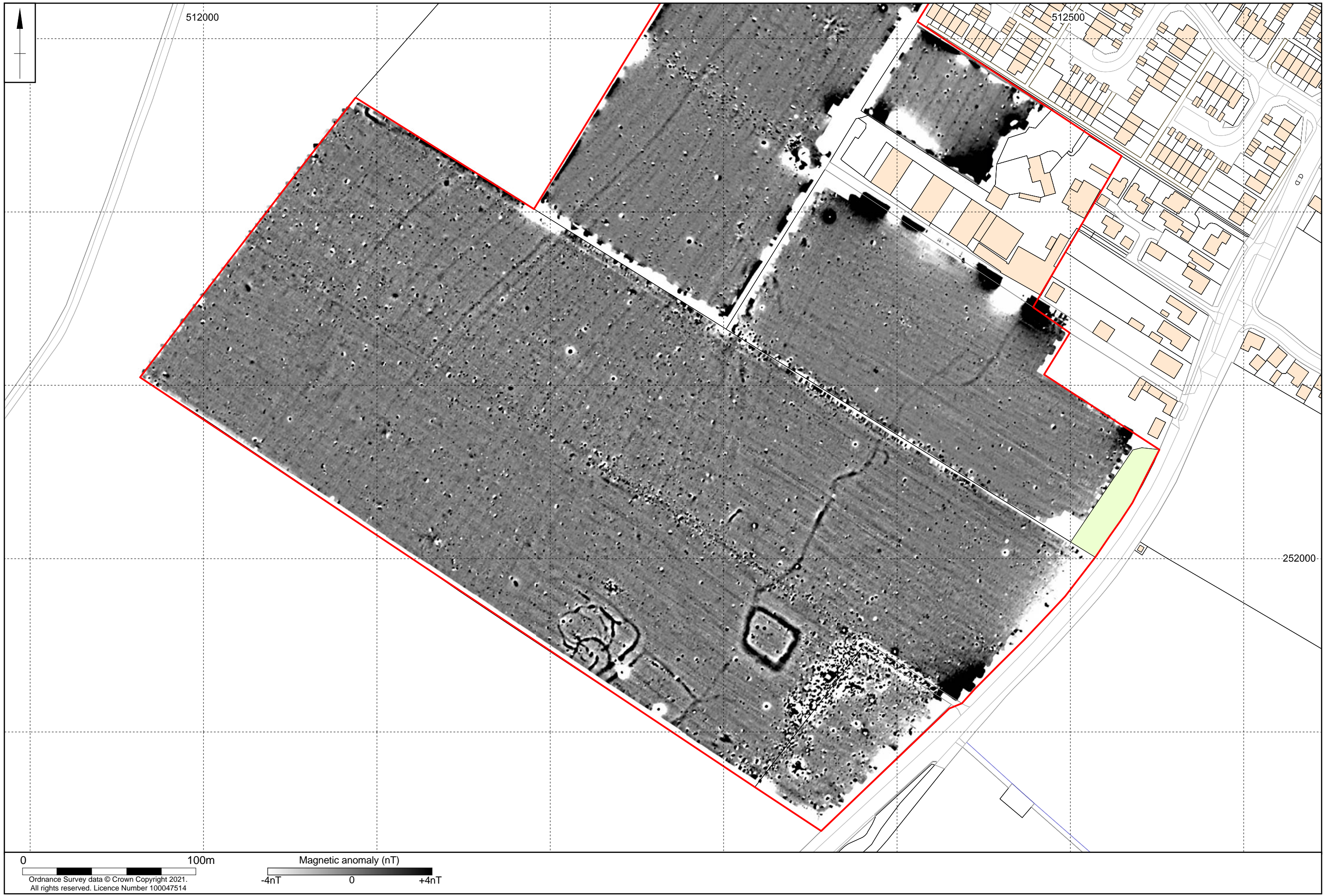
MOLA

20th April 2021



Scale 1:4000

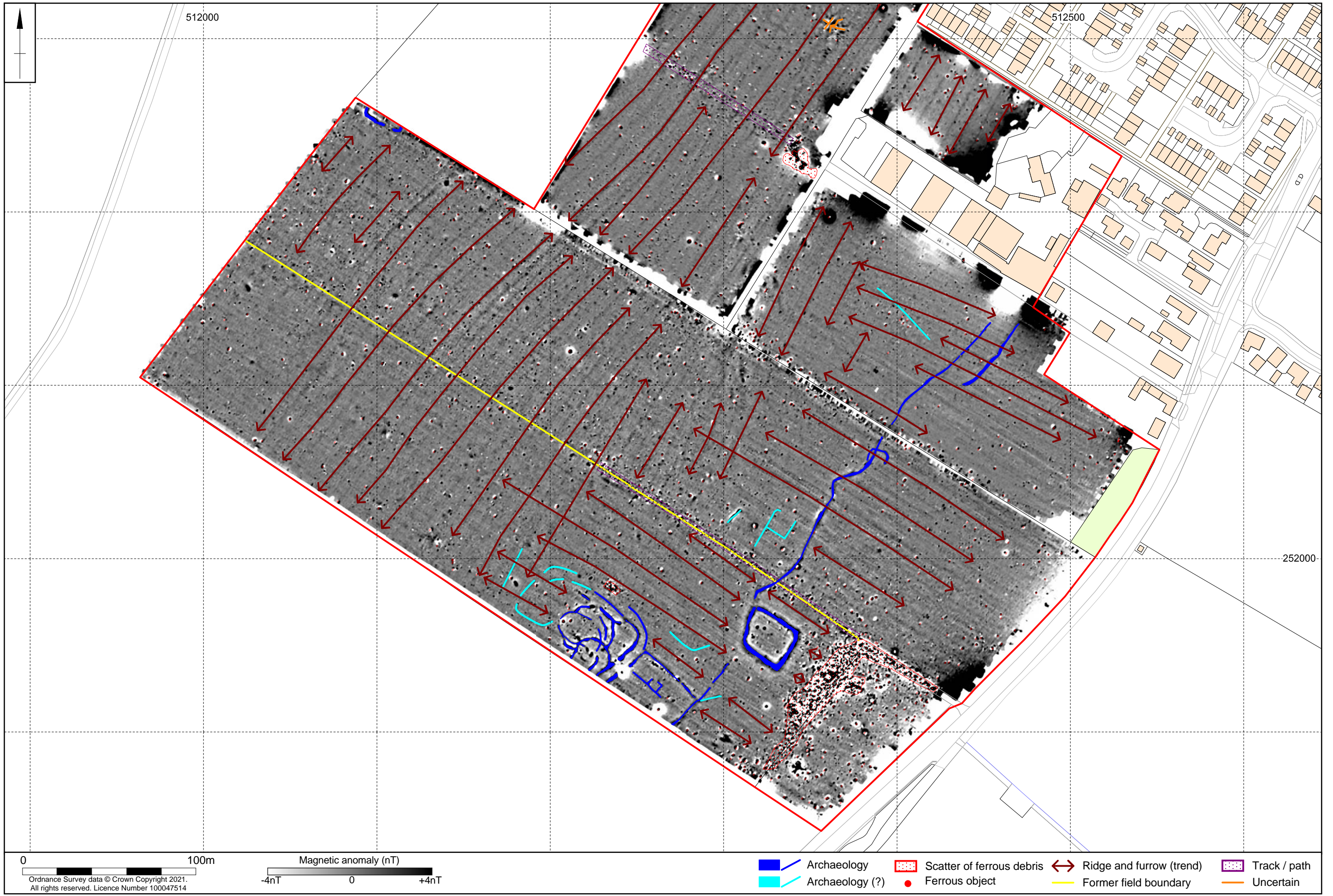
Site location Fig 1





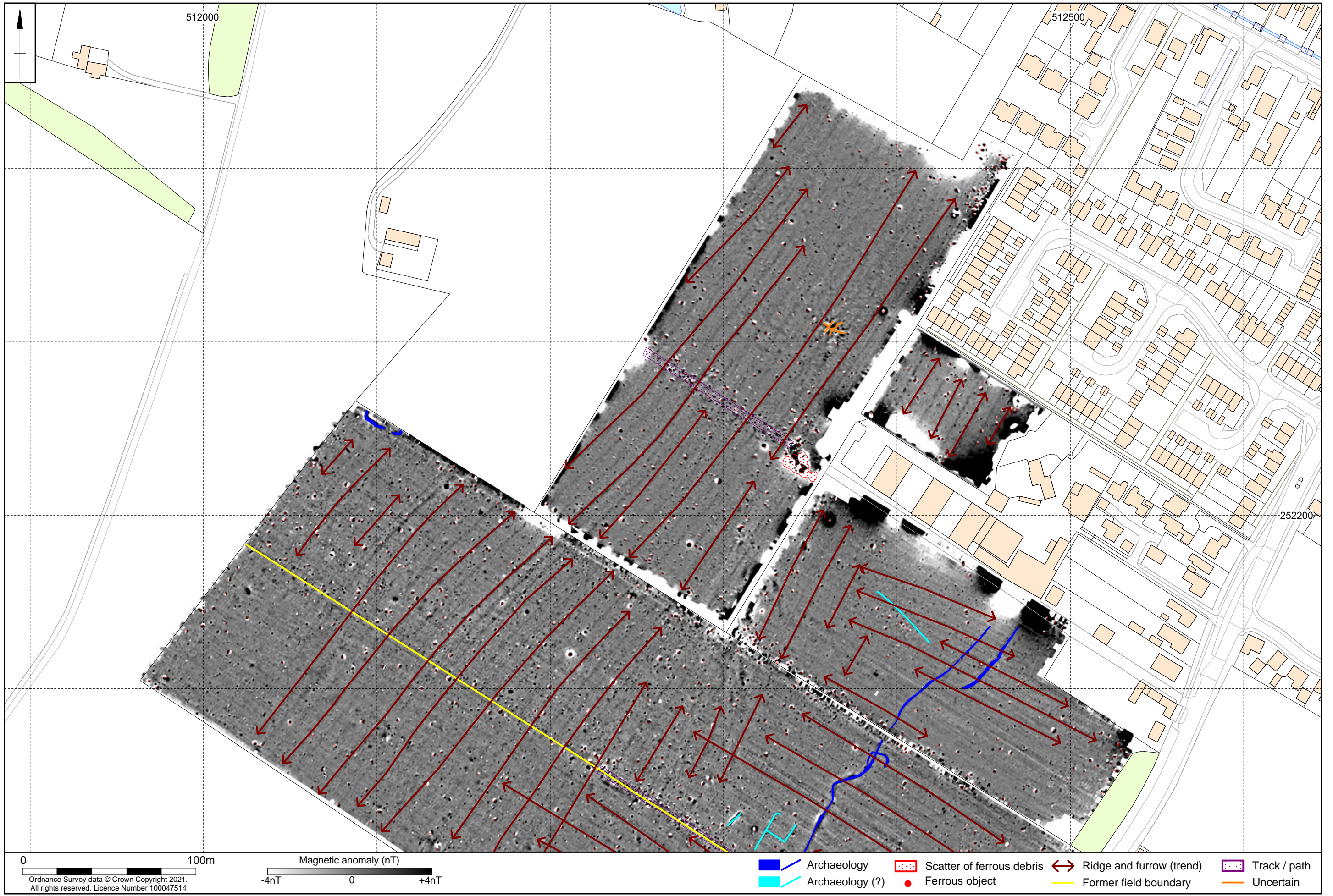
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Magnetometer survey results - North Fig 3



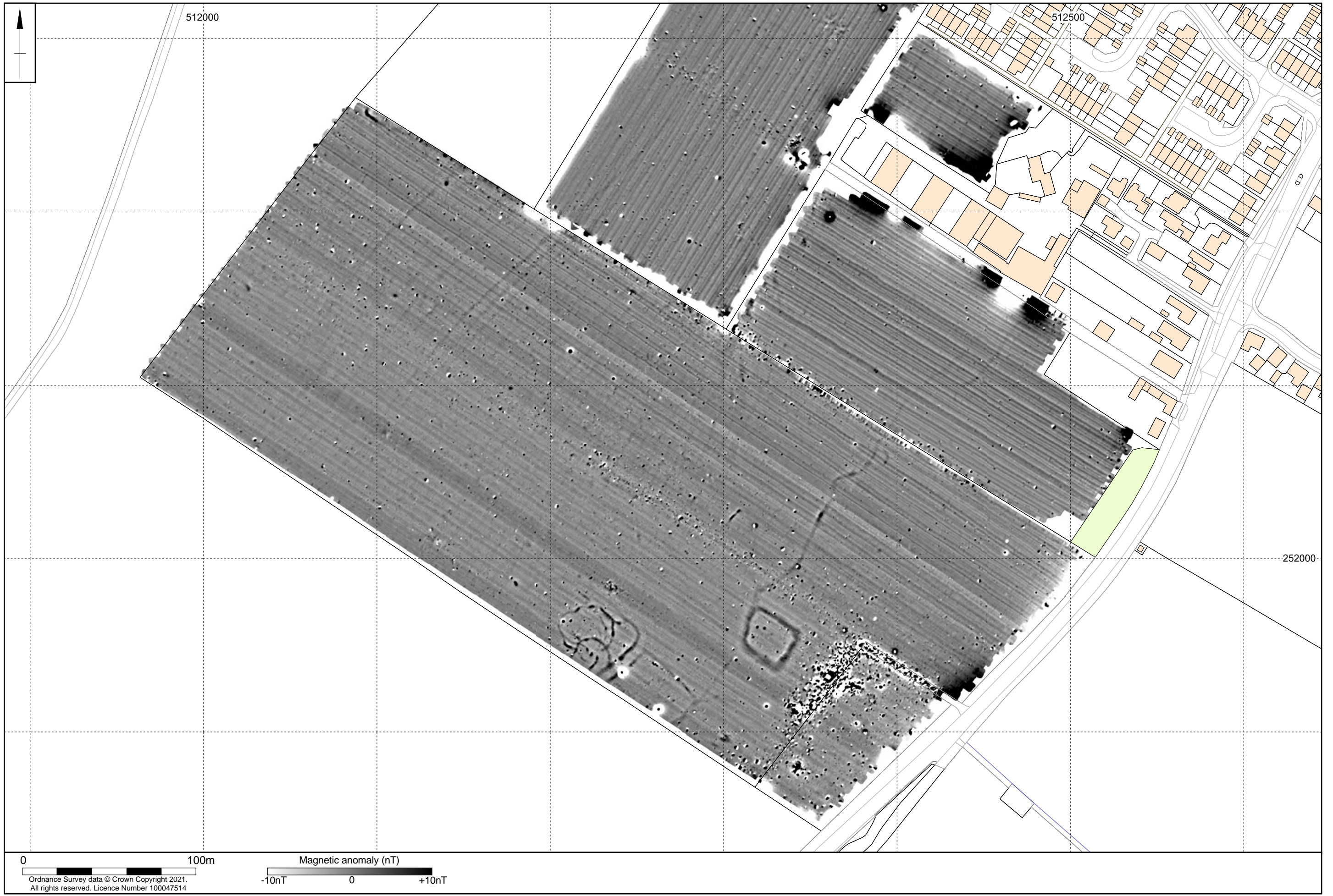
Scale 1:2000 (A3)

Magnetometer survey interpretation - South Fig 4



Scale 1:2000 (A3)

Magnetometer survey interpretation - North Fig 5



Scale 1:2000 (A3)

Unprocessed magnetometer data - South Fig 6



Scale 1:2000 (A3)

Unprocessed magnetometer data - North Fig 7



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