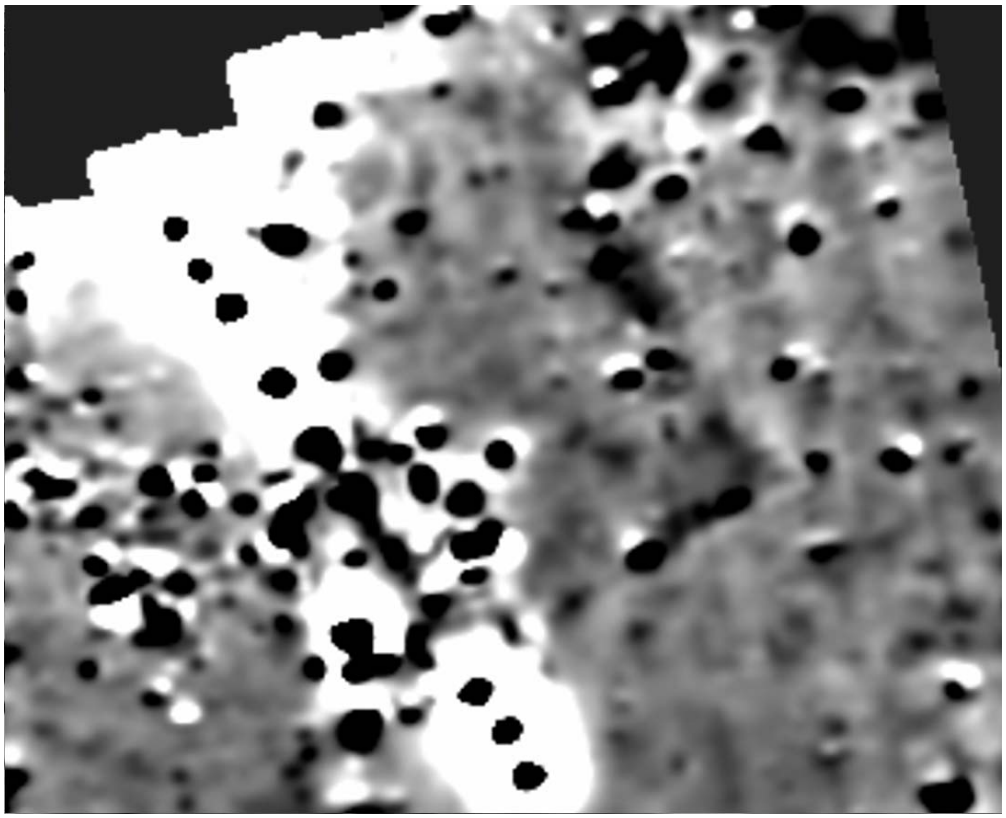

Archaeological geophysical survey at Preston Capes Northamptonshire November 2022

HER Event No: ENN110950

Report No. 22/104

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Archaeological geophysical survey at Preston Capes Northamptonshire November 2022

Report No. 22/104

Project Manager: John Walford

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Project: Preston Capes			**OASIS No: molanort1-511569**
ACTIVITY TYPE			
Project/Activity type	Geophysical survey		
Reason for investigation	Planning: between application and determination		
Development type	Other non-residential		
Planning reference ID	WND/2022/0205		
PROJECT LOCATION			
National grid ref	457700, 254750		
Site name	Preston Capes, Northamptonshire		
REVIEWERS/ ADMIN			
HER for project	Northamptonshire Historic Environment Record		
National organisation	Historic England		
WORK UNDERTAKEN			
Methodological summary	Multi-methodological: Magnetometer survey with a cart-mounted array of Bartington Grad601 fluxgate gradiometers and earth resistance survey with Geoscan RM15. Gridded survey layout: 20m grids, 1m traverses.		
Previous work?	None	Future works?	None
Dates - Start date:	22-11-22	End date:	23-11-22
GEOPHYSICS			
Geology	Whitby Mudstone Formation		
Land use (i.e. arable)	Pasture		
Survey type	Magnetometer survey	Size of survey area	*c*0.8ha
Instrumentation	Bartington Grad-01-1000L	Fluxgate – Multiple	
Resolution:	Traverse spacing / reading interval / data values		0.8m/ 0.25m / 0.1nT
Survey type	Earth resistance survey	Size of survey area	*c*0.8ha
Instrumentation	Geoscan RM15	Twin probe	
Resolution:	Traverse spacing / reading interval / data values		1m/ 1m / 0.1Ω
BIBLIOGRAPHY			
Title	Archaeological geophysical survey at Preston Capes, Northamptonshire, November 2022		
Author(s)	Chris Manktelow and John Walford		
Publisher / place / date	MOLA Northampton / Northampton / 2022		
Report number	22/104		
Report release delay?	Six months		
PEOPLE			
Organisation	MOLA		
Project manager	John Walford		
Project supervisors	Adam Meadows and Chris Manktelow		
Funding body	Graham Stanton		
KEYWORDS			
Monuments found/ date	Earthwork - medieval		
RESULTS			
Description of outcomes	Magnetometer and earth resistance surveys were conducted, identifying a few sparse features which may have been of slight archaeological interest but were too scattered and fragmentary to interpret in detail. Slight magnetic responses were detected from previously known archaeological earthworks, but these lay outside the area directly impacted by the proposed development. Some drains and other modern features were also detected.		

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Archaeological geophysical survey at Preston Capes, Northamptonshire November 2022

ABSTRACT

MOLA (Museum of London Archaeology) was commissioned to undertake a geophysical survey across c0.8ha of land to the south of Preston Capes Manor, near Daventry, Northamptonshire. Magnetometer and earth resistance surveys were conducted, identifying a few sparse features which may have been of slight archaeological interest but were too scattered and fragmentary to interpret in detail. Slight magnetic responses were detected from previously known archaeological earthworks, but these lay outside the area directly impacted by the proposed development. Some drains and other modern features were also detected.

1 INTRODUCTION

MOLA (Museum of London Archaeology) was commissioned by Graham Stanton, to undertake an archaeological geophysical survey across *c*0.8ha of land to the south of Preston Capes Manor (NGR SP 5770 5475) (Fig 1). The works were required by Rachael Townend of the Northamptonshire County Archaeological Advisory Service in support of a retrospective planning application for a new access track (WND/2022/0205).

The multi-method survey took place between the 22nd and 23rd November 2022 and comprised both a magnetometer survey and earth resistance survey. The works were conducted under the methodology set out in the Written Scheme of Investigation (WSI) for the project (Manktelow 2022). The survey was also conducted in accordance with Chartered Institute for Archaeologists and European Archaeological Council guidelines (CIfA 2020 and Schmidt *et al* 2015).

2 BACKGROUND

2.1 Location, topography and geology

The survey took place at Preston Capes, approximately 6.5km south of Daventry, Northamptonshire. It covered parts of two adjoining grass fields, lying to the east of the High Street and south of Preston Capes Manor (Fig 1). These fields, and the intervening belt of trees, were crossed by the partially constructed access track which was the subject of the retrospective planning application.

The survey area lies on an east-facing slope which descends from c168m to 160m above Ordnance Datum. It is underlain by geological strata of the Whitby Mudstone Formation (BGS 2022). No geological drift deposits are recorded within the area.

The ground was wet, though not saturated, throughout the survey period due to spells of heavy rain. This did not present any problems for the survey, but will have had a general influence on the character of the resistance values recorded.

2.2 Historical and archaeological background

The Northamptonshire Historic Environment Record (NHER) has numerous entries for the survey area and its surroundings, and there are also relevant records on the Portable Antiquities Scheme (PAS) database, as summarised below:

Preston Capes Manor and adjoining features

The survey area lies within the grounds of Preston Capes Manor and contains two slight archaeological earthworks (NHER No. MNN126412 and MNN126413, indicated schematically on Fig 1), the western of which perhaps defines part of a medieval enclosure. Both of these earthworks lie in the north of the survey area, and no other archaeological features are known to lie within its boundaries.

The current manor house, standing just to the north of the survey area, is a Grade II listed building dating from the 17th century (National Heritage List England, No. 1075293). It was remodelled in the 18th century and has had several later additions.

Previous archaeological work, comprising geophysical survey, watching brief and trial trench evaluation, was carried out around the manor in the early 2000s. Several archaeological features were located, including small pits, postholes, a ditch and medieval foundations (Fisher and Soden 2004; Soden 2008). These are likely to be traces of the medieval manorial complex that pre-dated the current house. One of the foundations was for a building with an apsidal end, which may have been a chapel (MNN109621) (Soden 2008).

Other archaeological and historic features

A late Bronze Age gouge (PAS ref. NARC-5D5F57) has been found within the parish of Preston Capes, though the precise location is not in the public domain (PAS 2019a). An early Iron Age 'Sompting' type copper-alloy socketed axe (PAS ref. LANCUM-563E82) has also been found in the parish by a metal detectorist (Boughton and Cassidy 2012, PAS 2022b, NHER ref. MNN155158)).

Cropmarks located *c*500m south-west of the survey area indicate the presence of a possible prehistoric enclosure (MNN3577). There may also have been a Roman settlement site located *c*200m south-west of the survey area, near the centre of the modern village (MNN116351). Two Roman coins have been found in the vicinity of the latter site (MNN116422, MNN116423).

The remains of the scheduled Preston Capes motte and bailey castle (number 1010661; NHER 13653) lie *c*150m north-west of the survey area. The castle is recorded as being in existence from 1090 (MNN8427). It is thought that a bailey was positioned to the south-east of the motte (MNN18726).

A Cluniac priory was founded in 1090 by Hugh de Legustre and is thought to have adjoined the castle (MNN11461). The priory moved to Daventry between 1107-8 but the site remained an area of status with the manor being built in the same area during the later medieval period (MNN109621).

A windmill mound stands *c*350m south of the survey area. The windmill was presumably demolished before 1742, as it is not shown on a map of the village from that year (MNN11468).

The survey area lies close to the centre of the village of Preston Capes (MNN3571), where there are 15 listed buildings of Grade II and II* designation, including the 13th-century church of St. Peter and St. Paul (MNN109637). A considerable proportion of the fields surrounding the village show evidence of medieval to post-medieval ridge and furrow cultivation (MNN133392, MNN132373 and MNN132377).

An archaeological investigation was conducted by MOLA in 2019, on land c400m north-west of the present survey area, near to the Old Rectory. A 5m wide earthwork was recorded there, along with the remains of a post-medieval pit (Jones 2019).

3 METHODOLOGY

3.1 Magnetometer survey

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 six vertically-mounted Bartington Grad-01-1000L magnetic sensor tubes, spaced at consistent 0.8m intervals along a bar aligned crossways to the direction of travel. These sensors were calibrated ('zeroed') at the start of each day's survey to minimise heading errors and offsets in their zero values.

The cart also incorporates a Leica Geosystems Viva GNSS 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 GNSS 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.

The cart was propelled along straight and parallel traverses across the survey area, with data logging being 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 typical speed of coverage was under 1.8m/s, resulting in an effective data resolution better than 0.225m x 0.80m.

The raw survey data was initially processed with MLGrad601 software, which calculated a 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 mismatches in the calibration of the individual magnetic sensors. This was removed in TerraSurveyor by applying the median de-stripe function to runs of data from each sensor.

3.2 Earth resistance survey

The earth resistance data was collected at 1m intervals, within 20m grid units, with a Geoscan Research RM15 resistance meter. The meter was deployed in twin probe configuration with a mobile probe spacing of 0.5m and the remote probes spaced a similar distance apart. Each measurement of resistance was recorded to a precision of 0.1Ω.

The network of survey grids for each field was set out manually by tape-measure and optical square. The locations of selected grid corners were recorded with a Leica Geosystems Viva GNSS antenna, enabling the grid to be tied in accurately to the Ordnance Survey National Grid.

The earth resistance data was visualised and processed using Geoplot 3.00v software. The 'despike' function was used to remove a small number of bad readings, caused by poor ground contact, and the 'edge match' function was used to compensate for biases caused by changes in the remote probe location.

3.3 Data presentation

The data from each survey is presented in this report as greyscale raster images which have been rotated and scaled to fit against base mapping of the site. The processed plot of each dataset is displayed alongside an interpretive drawing which highlights the main findings of interest.

The magnetometer data is displayed at a greyscale range of +/-8nT for the whole survey area (Fig 2), and the resistance data at ranges of 80-340Ω and 20-85Ω for the northern and southern fields respectively (Fig 4).

The data has been interpreted in a qualitative manner, based on the visual recognition of distinctive anomaly types and patterns and on a comparison of the results with observations made in the field. The interpretive drawings (Figs 3, 5 and 6) show the main anomalies of interest but, for clarity's sake, omit some minor elements including magnetic halos, the majority of small ferrous dipoles and irregular resistance patterns to which no specific significance can be attributed.

A plot of the unprocessed magnetometer data is presented at a scale of +/-10nT in Figure 7. No unprocessed plot is provided for the resistance data, as the processing was relatively light and had limited visual impact.

4 SURVEY RESULTS

4.1 Magnetometer results (Figs 2 and 3)

Two magnetic anomalies in the north-east of the survey area correspond with parts of the previously known earthworks. These are the only anomalies which can be definitely attributed to an archaeological cause (Fig 3). The few other anomalies categorised as 'possible archaeology' on Figure 3 are plain and rather equivocal in nature, lacking the diagnostic characteristics and orderly arrangement which would permit them to be interpreted with confidence.

Three of the anomalies categorised as 'possible archaeology' are small, rounded and magnetically positive. They could have a range of causes, including pits or patches of burnt soil, but also including natural pockets of iron minerals within the geological substrate. The other anomalies in this category are weakly positive linear ones. These may represent sections of ditch though some, particularly the shorter and weaker examples, may alternatively have natural causes.

There are likely to be two drains heading approximately north to south through the centre of the survey area. One is represented by a positive linear anomaly with spurs running into it obliquely, in a characteristic 'herringbone' drainage pattern. The other, which lies almost directly alongside the first, is represented by a moderately weak linear anomaly with alternate positive and negative segments. There is slight doubt about the interpretation of this second example, as it the anomaly is intermediate in size and strength between the typical magnetic response of a ceramic field drain and that of a small metal pipe.

Small but intense dipolar anomalies (magnetic anomalies with paired positive and negative components) are abundant across the data set. These typically arise from iron or steel objects, many of which will be insignificant items such as horseshoes, drink cans and similar rubbish buried in the topsoil. The three larger examples in the southern field may have more substantial causes. Such dipoles are especially abundant along the western edge of the northern field, where they merge, forming a zone of intense, incoherent magnetic noise. Such a magnetic response is often found where there has been significant dumping of rubbish, or where pieces of scrap metal are mixed into a modern layer of made ground.

Three sets of small positive anomalies lying within broad negative halos form an intermittent alignment across the middle of the northern field. The exact interpretation of this is uncertain, but the intensity of the anomalies indicates that the feature is composed of buried metal objects. The most probable causes are either the remains of a pipe or the remains of a fence-line with metal-tipped posts.

4.2 **Earth resistance results** (Figs 4 and 5)

Apart from the obvious band of disturbance on the line of the partially constructed access track, the resistance data contains only one certain, well-defined anomaly. This is a narrow low-resistance linear feature aligned north-north-west to south-south-east through the western part of the northern field. It appears somewhat narrower and more precisely straight than might be expected for an old ditch, and it is more likely that it represents a trench containing a modern drain or other utility.

The remainder of the resistance data exhibits broad-scale variations in the measured values, with occasional sharp edges between high and low resistance zones. In broad terms, these zones will correlate to variations in the moisture content of the soil and near-surface geology, with low resistance corresponding to areas with impeded drainage or with a loose soil structure capable of holding much water, and high resistance corresponding to areas of hard, compact, stony or free-draining material with a lower capacity for water retention.

Two of the resistance zones can be tentatively attributed to recent man-made causes. The band of slightly elevated resistance around the northern and western sides of the southern field mirrors the shape of the field boundary so well that it seems likely to relate to some recent variation in cultivation regime or land use between the centre and edges of the field. There is also a broad correlation between the low resistance zones in the west of the northern field and the previously described area of magnetic noise. This might support the interpretation of the magnetic noise as indicating recently dumped material or made ground, on the grounds that such material is likely to be less firmly compacted than 'old' soil. The remaining zones of resistance cannot be interpreted in any meaningfully specific way.

5 DISCUSSION

The survey has detected only a small number of archaeological anomalies, none of which lie on the proposed line of the access track. Two correspond, in part, to previously known earthworks and the remainder, which are too slight and disjointed to interpret with high confidence, could perhaps indicate a sparse scatter of backfilled ditches and pits of indeterminate date. The survey data provides no evidence for any building foundations or other substantial or complex archaeological remains.

There is a small risk, as with any geophysical survey, that certain features will have escaped detection, perhaps being too small or slight to detect, being masked by overlying material, or producing anomalies that are indistinguishable from background noise. However, the use of two complementary techniques at Preston Capes increases the confidence that can be placed on the results, as it is often the case that a feature missed by one technique will be detected by another. This is illustrated here by the detection of a possible drain or utility trench, which is clearly apparent in the resistance data in an area where the magnetic data shows only incoherent noise.

The possible utility trench referred to above is one of several modern features identified by the survey. Other examples include drains, a possible metal pipe and, at the western edge of the site, a concentration of ferrous material that is likely to be modern rubbish, perhaps mixed into a layer of made ground.

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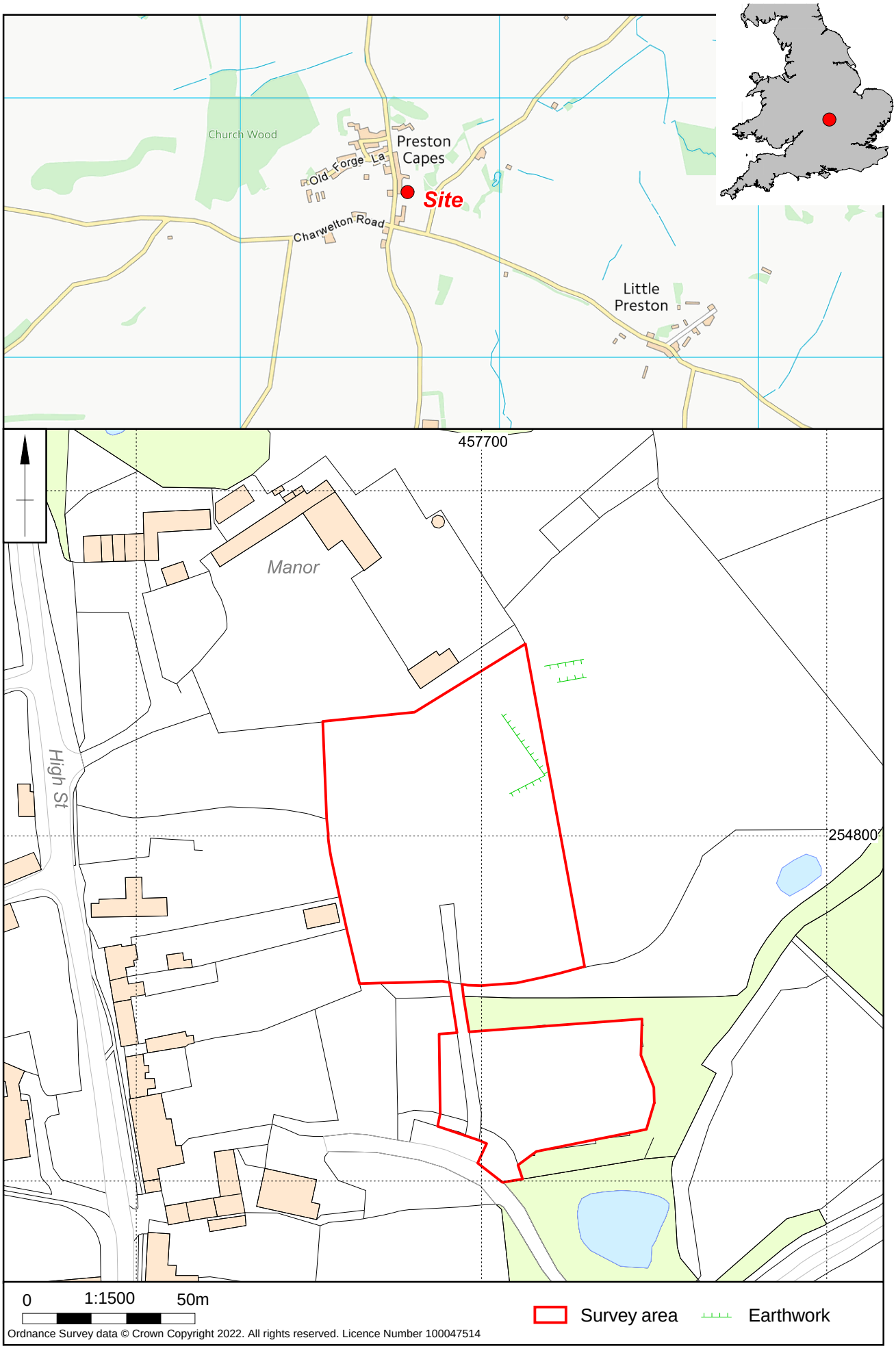
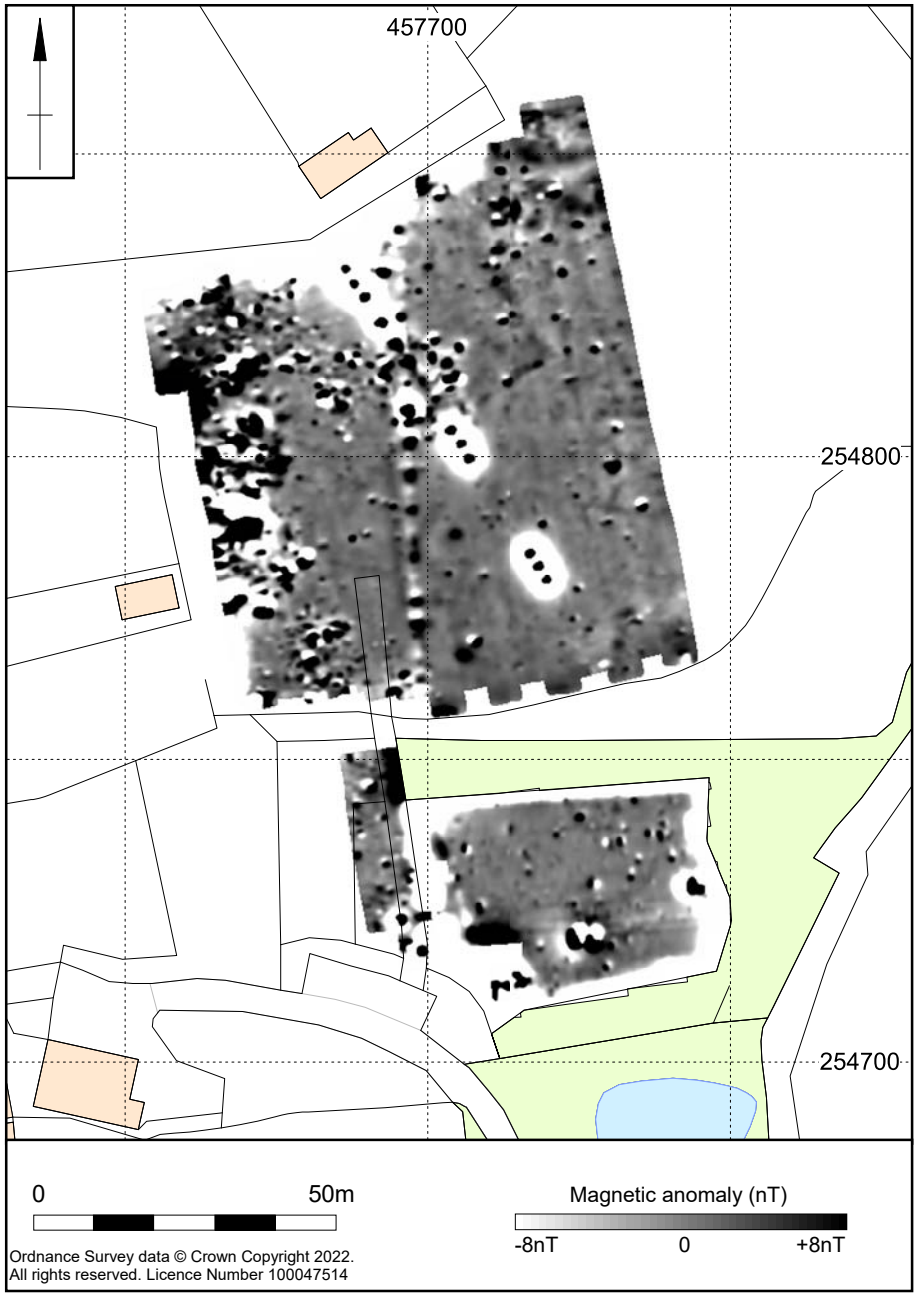
MOLA

December 2022

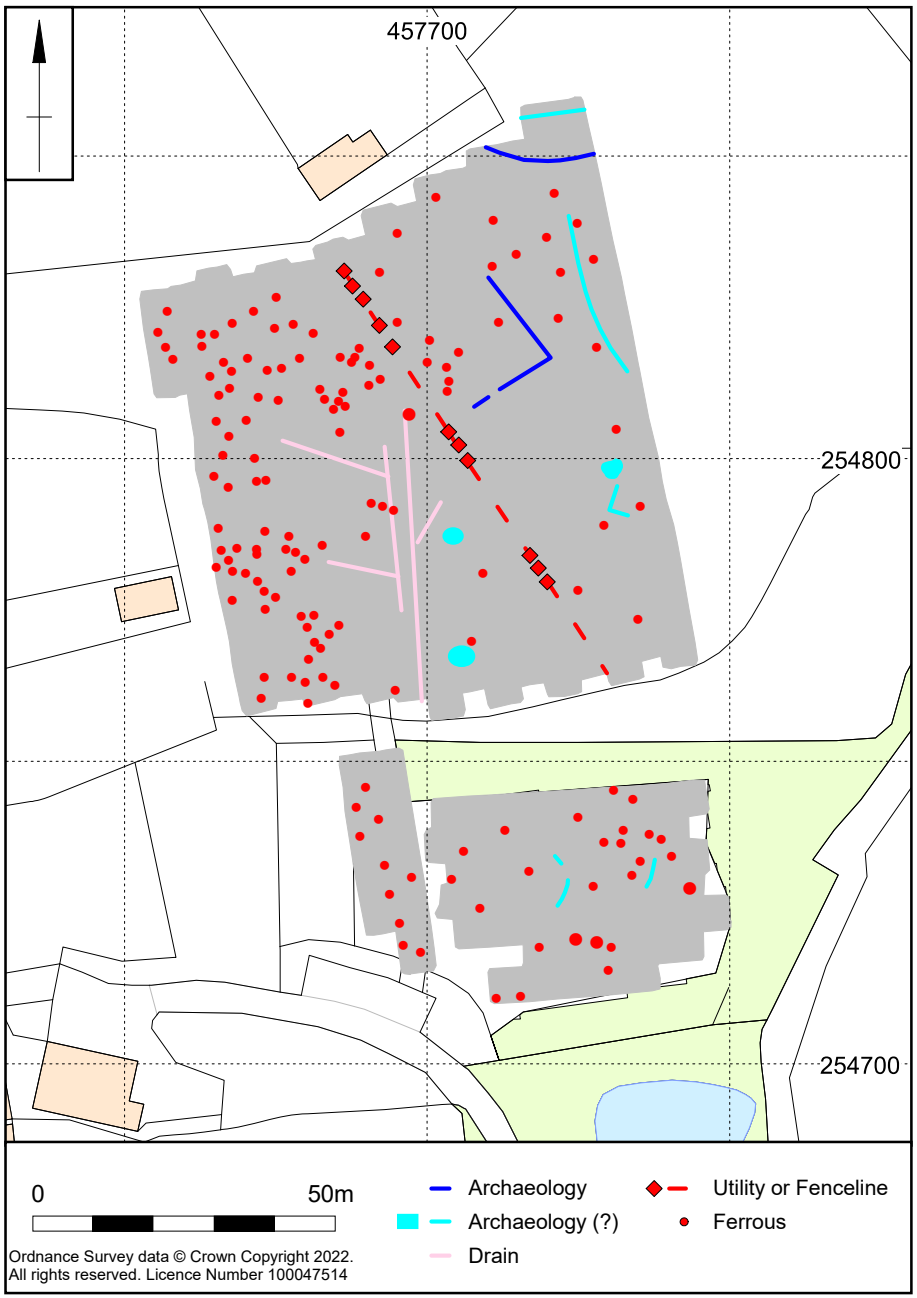


Scale 1:1500 (A4)

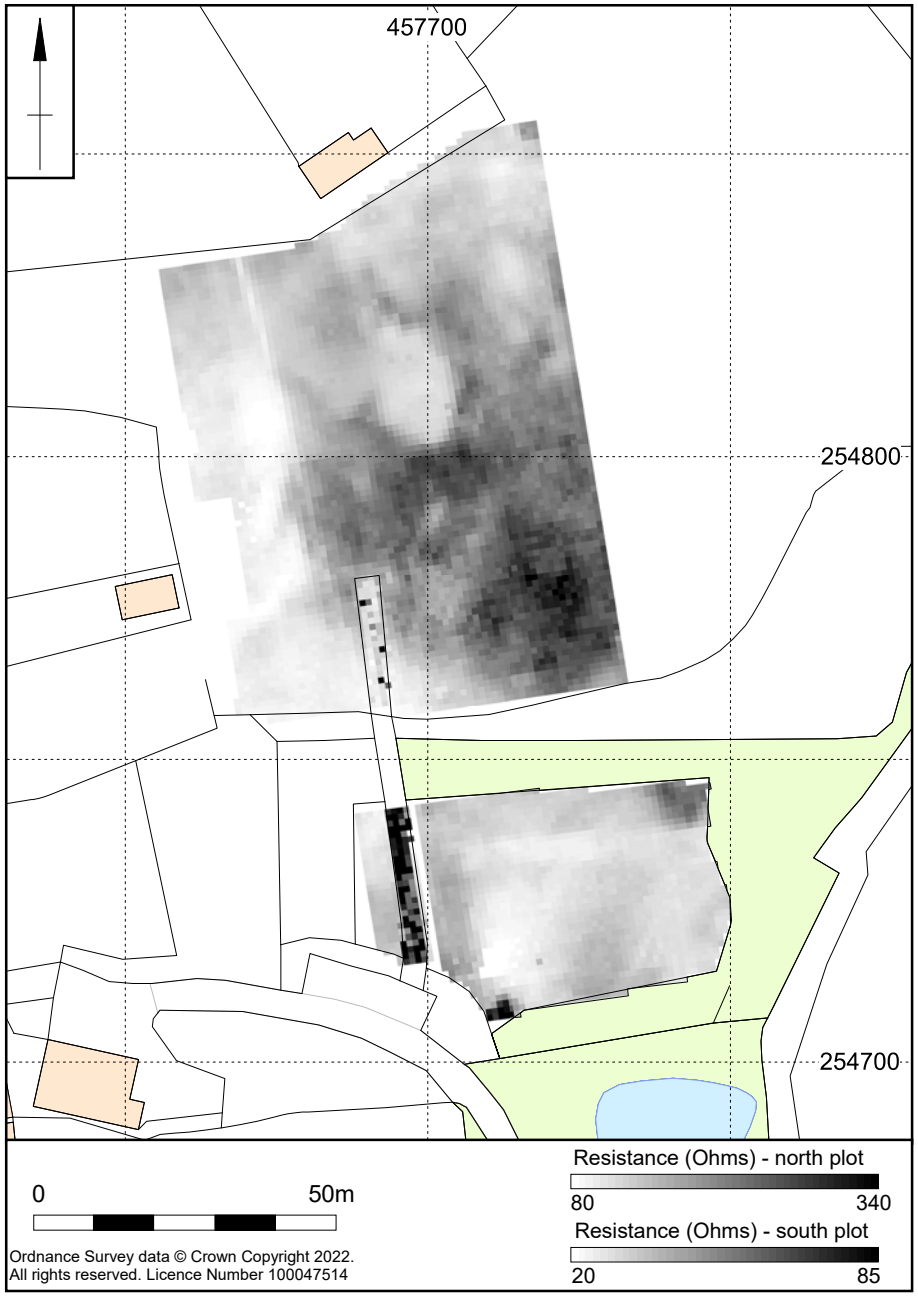
Site location Fig 1



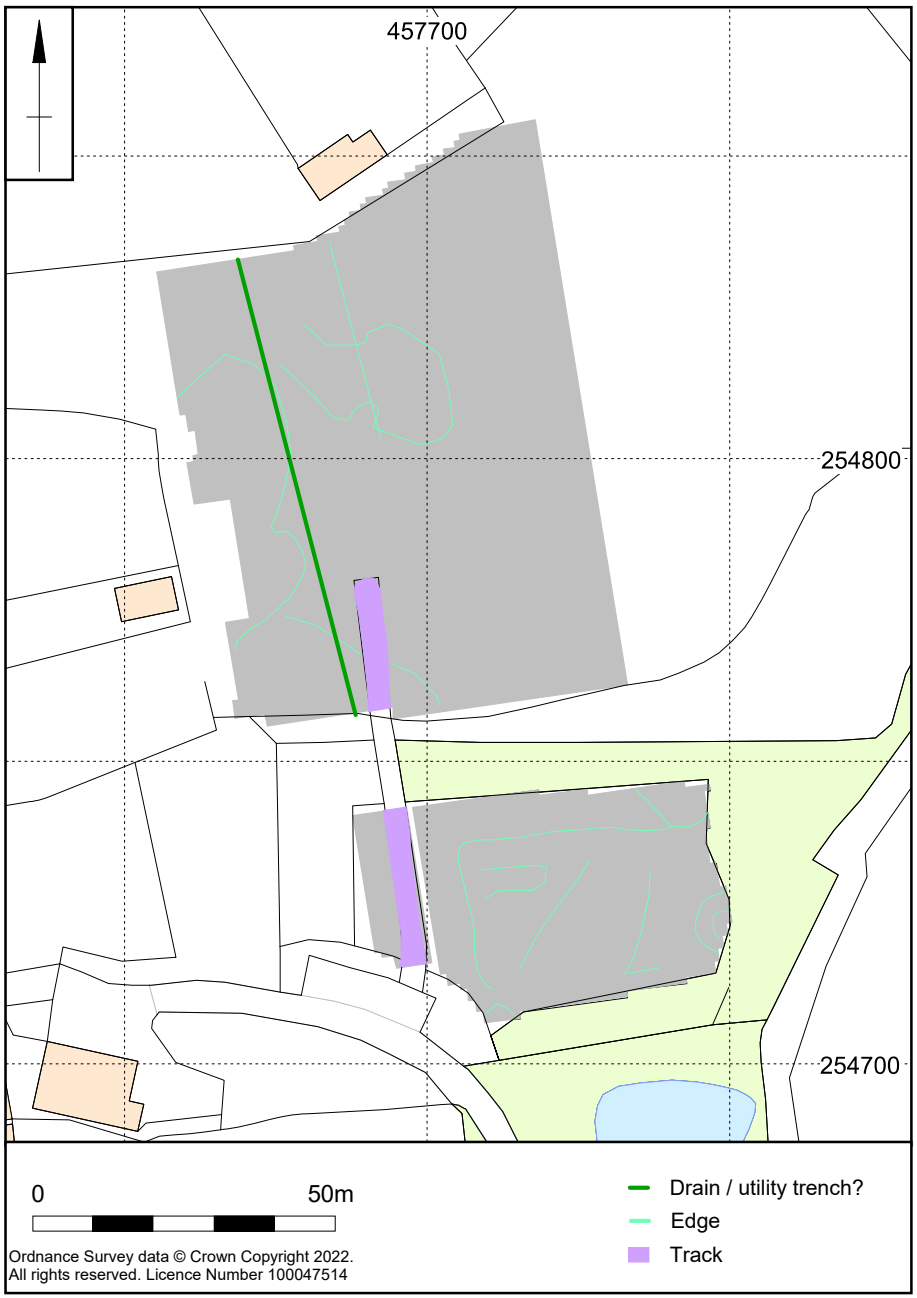
Scale 1:1250 (A4) Magnetometer survey results Fig 2



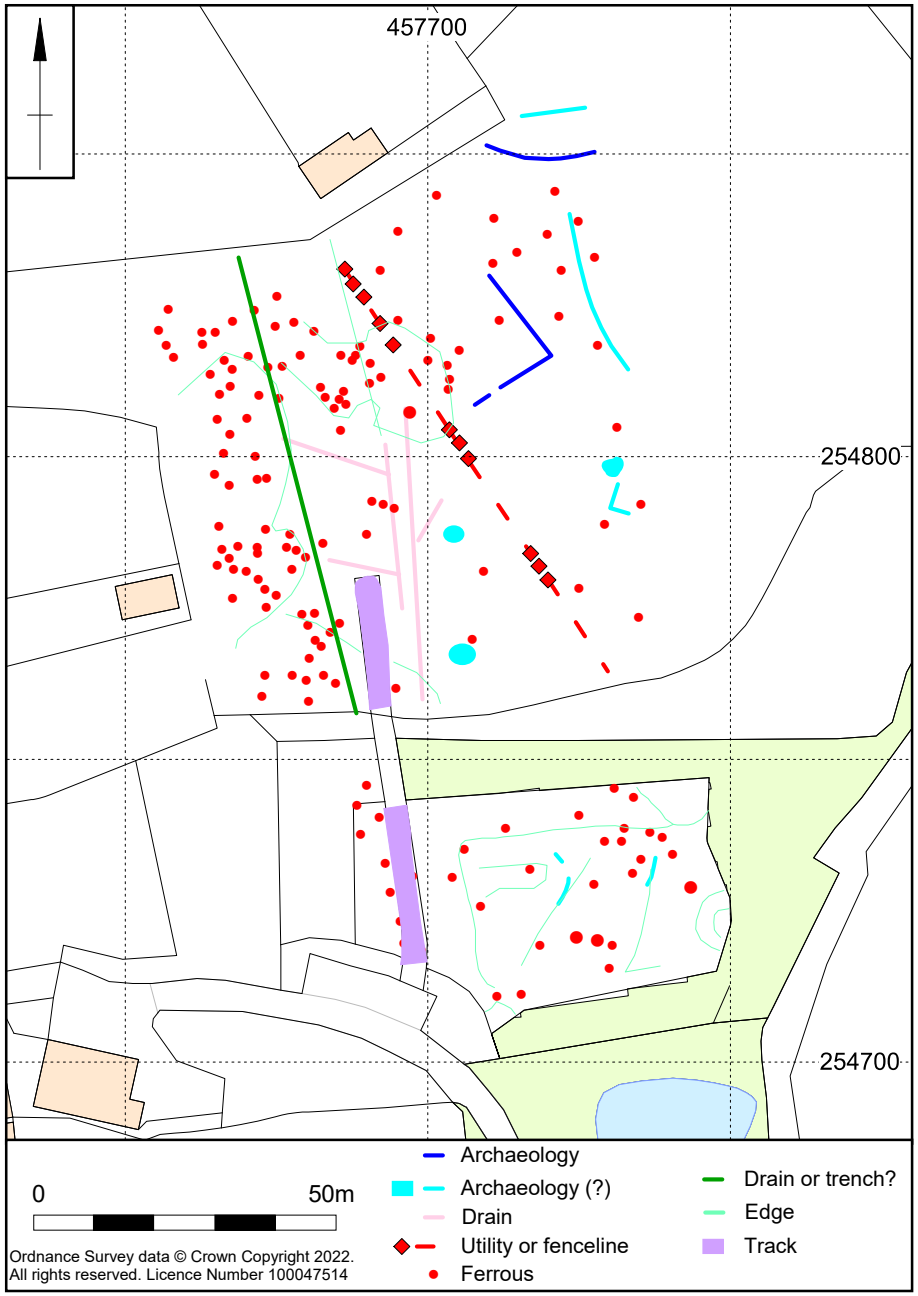
Scale 1:1250 (A4) Magnetometer survey interpretation Fig 3



Scale 1:1250 (A4) Earth resistance survey results Fig 4



Scale 1:1250 (A4) Earth resistance survey interpretation Fig 5



Scale 1:1250 (A4) Combined survey interpretation Fig 6

Scale 1:1250 (A4) Unprocessed magnetometer data Fig 7

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