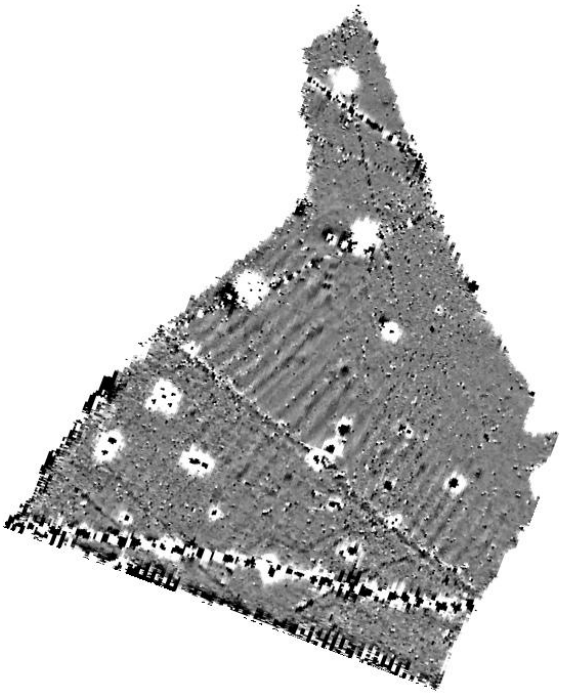
Northamptonshire Archaeology

Archaeological Geophysical Survey
Rugby Sustainable Urban Extension, Rugby
Warwickshire
June to July 2013



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Report 13/192

October 2013

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QUALITY CONTOL

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OASIS REPORT FORM

PROJECT DETAILS	**Oasis No. 162950**	
Project title	Archaeological Geophysical Survey, Rugby Sustainable Urban Extension, Rugby, Warwickshire	
Short description	Northamptonshire Archaeology were commissioned by CgMs Consulting to undertake a detailed magnetometer survey across 42ha of land situated to the east of Rugby, Warwickshire. The survey area encompassed the south-eastern part of the former Rugby Radio Station and other land immediately to its south. The survey detected an enclosure and other features of probable Iron Age or Roman date, extensive remains of the medieval open field system, and modern mast bases, services and other radio station infrastructure.	
Project type	Geophysical survey	
Previous work	Aerial photography and desk-based assessment (Dicks and Chadwick 2009), geophysical survey (Butler 2009)	
Current land use	Pasture and an orchard	
Future work	Trial trench excavation	
Monument type and period	Prehistoric/Roman enclosures and field boundaries, medieval ridge and furrow, modern radio station	
Significant finds		
PROJECT LOCATION		
County	Warwickshire	
Site address	Land east of Rugby	
Easting Northing	455298 273523	
Area (sq m/ha)	42ha	
Height aOD	105-110m aOD	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology (NA)	
Project brief originator	CgMs Consulting Ltd	
Project Design originator	Northamptonshire Archaeology	
Director/Supervisor	John Walford (NA)	
Project Manager	Mark Holmes (NA)	
Sponsor or funding body	CgMs Consulting Ltd	
PROJECT DATE		
Start date	June 2013	
End date	October 2013	
ARCHIVES	**Location (Accession no.)**	**Contents**
Physical	N/A	
Paper	NA	Site records (1 archive box)
Digital	NA	Client report PDF. Survey data
BIBLIOGRAPHY		
Title	Archaeological Geophysical Survey, Rugby Sustainable Urban Extension, Rugby, Warwickshire	
Serial title & volume	Northamptonshire Archaeology Report 13/192	
Author(s)	John Walford & Carol Simmonds	
Page numbers	19 pages text and illustrations	
Date	30/10/2013	

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ARCHAEOLOGICAL GEOPHYSICAL SURVEY
RUGBY SUSTAINABLE URBAN EXTENSION, RUGBY, WARWICKSHIRE
JUNE- JULY 2013

Abstract
Northamptonshire Archaeology were commissioned by CgMs Consulting to undertake a detailed magnetometer survey across 42ha of land situated to the east of Rugby, Warwickshire. The survey area encompassed the south-eastern part of the former Rugby Radio Station and other land immediately to its south. The survey detected an enclosure and other features of probable Iron Age or Roman date, extensive remains of the medieval open field system, and modern mast bases, services and other radio station infrastructure.

1 INTRODUCTION

A geophysical survey was undertaken by Northamptonshire Archaeology on land near Rugby, Warwickshire in June and July 2013. The survey area extended across the south-eastern part of the former Rugby Radio Station site and across agricultural land to its south and west.

The proposed survey area comprised *c* 55ha of land located immediately east of the town at NGR SP 553735. However, some areas were unsuitable for survey and part of the land had previously been subject to detailed survey, resulting in a total of *c* 42ha being surveyed in this phase of works (Fig 1). The site area was extended further westwards after the geophysical survey had been completed and consequently this area was not included in this phase of survey (Fig 2).

The work was commissioned by CgMs Consulting acting for their clients. This report follows an interim statement which was produced in August 2013 (NA 2013b) and earlier extensive geophysical surveys to the north (Butler 2009 and 2010).

2 BACKGROUND

2.1 Location and geology

The former Rugby Radio Station is situated on the eastern edge of Rugby, between the A428 and the M1, and is bisected by the A5 (Watling Street) (Fig 1). The survey area encompasses the south-eastern part of the former Rugby Radio Station site and other fields immediately to the south, around Dollman Farm. The southern boundary of the area is largely defined by the A428 Crick Road and the railway line between Northampton and Rugby, and its western boundary abuts the Oxford Canal. To the east are the warehouses and transit yards which comprise Daventry International Rail Freight Terminal (DIRFT). The average topographic profile comprises gradual slopes at a 105-100m aOD contour.

The geology of the site comprises strata of the Charmouth Mudstone Formation, overlain by glacial deposits of Hillmorton Sand at the south of the site and glacial till at the north-east (BGS 2013).

2.2 Historical and archaeological background

Rugby Radio Station and its environs have been the subject of an archaeological desk-based assessment (Dicks and Chadwick 2009) and previous phases of geophysical survey (Butler 2009 and 2010; Fig. 2). Other archaeological investigations and excavation have been undertaken to the east of the station, during the development works at DIRFT.

Within the former Rugby Radio Station site, there are very extensive and well preserved earthworks of medieval ridge and furrow, as well as modern remains of radio masts and associated infrastructure (pers obs). However, the previous geophysical surveys have identified little evidence for remains pre-dating the medieval period. The only significant archaeological sites to be identified lay beyond the southern boundary of the station in the fields numbered as 3, 4 and 12 in this report (Figs 2-3).

The excavations at DIRFT recorded evidence of Neolithic and Bronze Age activity (ditches, cremations, pottery and flint scatters) and also identified extensive Iron Age and Roman settlement. The Iron Age settlements were of considerable size and contained in excess of 150 roundhouses. Roman activity was represented by a possible cemetery, enclosures and boundary ditches. Relatively little Saxon evidence was found, amounting to only one sunken-featured building (SFB) and one inhumation located close to the A5 (Dicks and Chadwick 2009).

3 METHODOLOGY

The 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). All available parts of the survey area were covered, but Field 1 was overgrown, Fields 10, 11, 12 were unsurveyable due to the presence of a standing hay crop, and access to Fields 7 and 8 was prevented by livestock. Fields 3 and 4 were also excluded from the present survey, having been fully surveyed in 2009.

An independent system of 30m grids was established within each of the fields to be surveyed. The grids were established with a tape measure and optical square and were tied in to the Ordnance Survey National Grid by means of a Leica Systems 1200 dGPS. 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) and with the brief for geophysical survey for the project (WCC 2013).

The survey data was processed using Geoplot 3.00v software. Striping was removed using the 'Zero Mean Traverse' function, and destaggering of the data was performed as necessary. The processed data is presented in this report in the form of grey-tone plots at a scale of +/- 4nT black/white. These has been scaled, rotated and re-sampled (georectified) for display against the Ordnance Survey base mapping, and are presented along with the data collected from Fields 3, 4 and 12 in 2009 (Figs 3, 5 & 7). Interpretative overlays are shown in Figures 4, 6 & 8, and plots of the unprocessed survey data are presented in Figures 9-11.

4 SURVEY RESULTS

4.1 General comments

The geophysical survey identified archaeologically significant features in Fields 3, 4, 9, 12 and 19. These features are discussed below on a field by field basis.

Medieval ridge and furrow cultivation is evident in all but one of the fields surveyed. Broadly speaking, the S-shaped strips are aligned roughly east to west in the western part of the survey area. In the eastern part, the strips are aligned north to south. The medieval open fields are clearly subdivided by headlands.

The remnants from the felling of former radio masts and the effects of still in situ masts are evident throughout the data plots.

4.2 Field 1

Field 1 is a small and overgrown corner of land, which was unsuitable for geophysical survey.

4.3 Field 2

The data from this field is largely bland, apart from a large dipolar anomaly arising from a feed trough.

4.4 Field 3

A slight positive anomaly detected on the south-eastern boundary of Field 3 is likely to represent the south-western corner of an enclosure ditch which extends into Field 4. Further ditches are evident in the south of the field. They comprise a pair of parallel linear positive anomalies aligned south-west to north-east which lead towards the entrance to the Field 4 enclosure and interrupted positive linear anomalies orientated east to west and south-west to north-east which may reflect part of a sub-rectangular enclosure system.

The survey also detected a broad negative anomaly curving north-west to south-east through Field 3. This probably represents a geological feature in the sand and gravel substrate of the area; possibly a colluvium-filled channel. However, an archaeological origin for the feature is also possible.

4.5 Field 4

Broad linear positive anomalies were detected in the south-west of Field 4, representing a rhomboidal, ditched enclosure measuring 84m x 69m, with along a axis aligned north-east to south-west. The south-east and south-west corners of the enclosure were situated across field boundaries, although an entrance was detected on the western side.

A distinct penannular positive anomaly, probably reflecting a roundhouse ring ditch, was identified within the north of the enclosure. Central to this was a discrete positive anomaly, possibly a hearth or pit. A small curving anomaly was located adjacent to the south-east. Although less magnetic than the first, a second semicircular positive anomaly with a possible concentric inner anomaly as detected to the south of the first. This may represent a second roundhouse. Numerous discrete positive anomalies, possibly reflecting pits, were identified in both the northern corner and southern half of the enclosure.

Highly magnetic area anomalies in the north and south of Field 4 indicate deposits of ferrous or other highly magnetised material.

4.6 Field 5

Parallel linear anomalies, representing ridge and furrow, are present across this field. There is one discrete positive in the eastern half of the field: this possibly represents a pit. A chain of dipolar anomalies running across the middle of the field from north to south probably represents a pipe or cable.

4.7 Field 6

A single curving linear ditch on the southern edge of Field 6 may be part of an enclosure that extends southwards out of the field. A triangular positive anomaly to the north may represent a large pit. Ridge and furrow, aligned north-east to south-west is also visible in the data.

4.8 Field 9 (orchard)

Three parallel linear anomalies on a north-west to south-east alignment probably represent ditches. Two can be seen in the north of the field, whilst the third is located further south. Parallel linear anomalies, running from north to south, represent ridge and furrow. A ferrous pipeline on the southern edge of the field was also identified. Gaps in the data indicate where the survey was obstructed by trees.

4.9 Field 12

Although Field 12 was unavailable for survey in 2013, a small sample area had been surveyed in 2009, and the data is reproduced here (Figs 7 and 8). A complex set of positive linear anomalies are present, with a majority trending from north-west to south-east. Some of the weaker of these probably represent ridge and furrow, but others are stronger and form a semi-regular pattern suggestive of enclosure ditches and associated features.

4.10 Fields 13 to 18 and field 20

These fields lie within the former Rugby Radio Station site. They contain a large number of masts, anchor blocks and associated infrastructure, which have given rise to many intense dipolar anomalies in the data. Various pipes or cables are apparent as intensely magnetic linear anomalies of alternating polarity, and two tracks in Field 20 have been detected as positive linear anomalies. Two broad swathes of magnetically disturbed data are thought to represent the places where large radio masts were felled and cut up insitu, leaving dense residual scatters of ferrous debris.

Positive linear anomalies across all of these fields represent ridge and furrow, which is well preserved and evident as very distinct earthworks. Several linear anomalies running perpendicular to the furrows probably represent former headlands.

4.11 Field 19

Several positive linear anomalies in the southern part of this field are likely to represent ditches. Two follow parallel north-west to south-east alignments across the south-western field corner, and two others are aligned north-east to south-west. Several shorter lengths of ditch are also present. It is likely that these features, and those described in Fields 9 and 12, represent elements of a single archaeological site, but the evidence is too fragmentary to allow for detailed interpretation.

5 CONCLUSION

The geophysical survey was successful in identifying prehistoric or Roman settlement in the south-western corner of the survey area as well as identifying further possible associated features in the south-eastern corner. The features comprise a probable settlement enclosure with ring ditches and pits within its boundary in Field 4, and a site with a more complex layout, including small rectangular enclosures, extending across Fields 9, 12 and 19. There may be the edge of another enclosure at the southern end of Field 6, and there are possible pits in Fields 5 and 6. The enclosures and probable field boundaries are on a similar alignment to the Roman road (Watling Street) which lies 1km to the north of Fields 4, 9 and 19.

The remains of a medieval open field system was represented by extensive positive magnetic anomalies, which largely correspond to the extensive and well preserved ridge and furrow earthworks. Given its presence in the data it would be possible to reconstruct the open field plan prior to enclosure with reference to available historic mapping.

Within the former Rugby Radio Station site, there are a large number of masts, anchor blocks, cables and associated infrastructure. These have produced a mass of high intensity magnetic anomalies, which may mask smaller features of archaeological interest.

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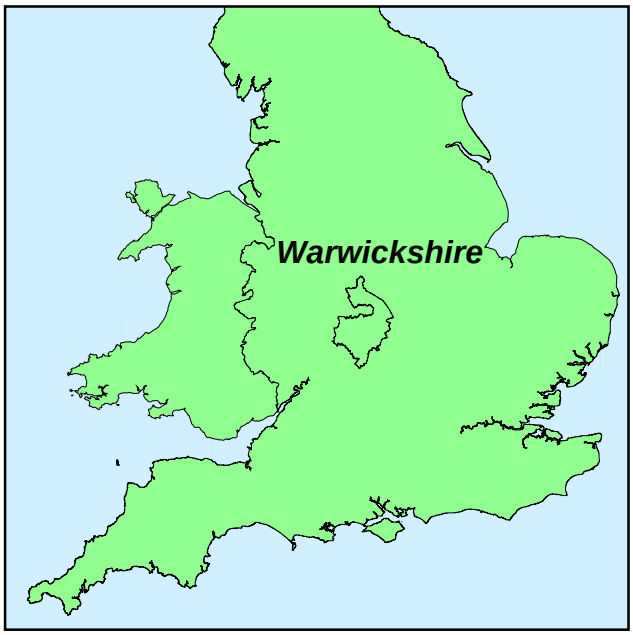
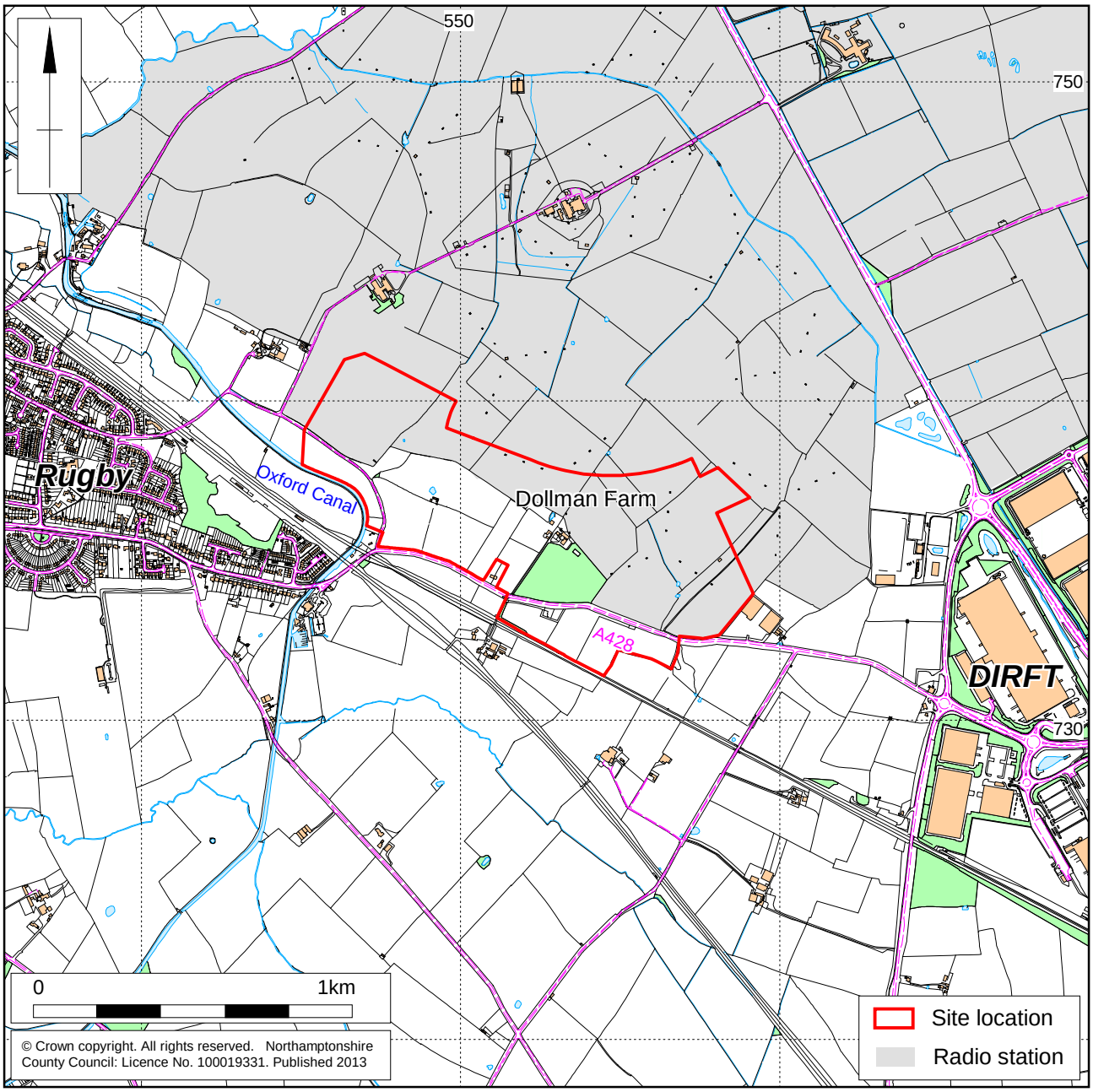
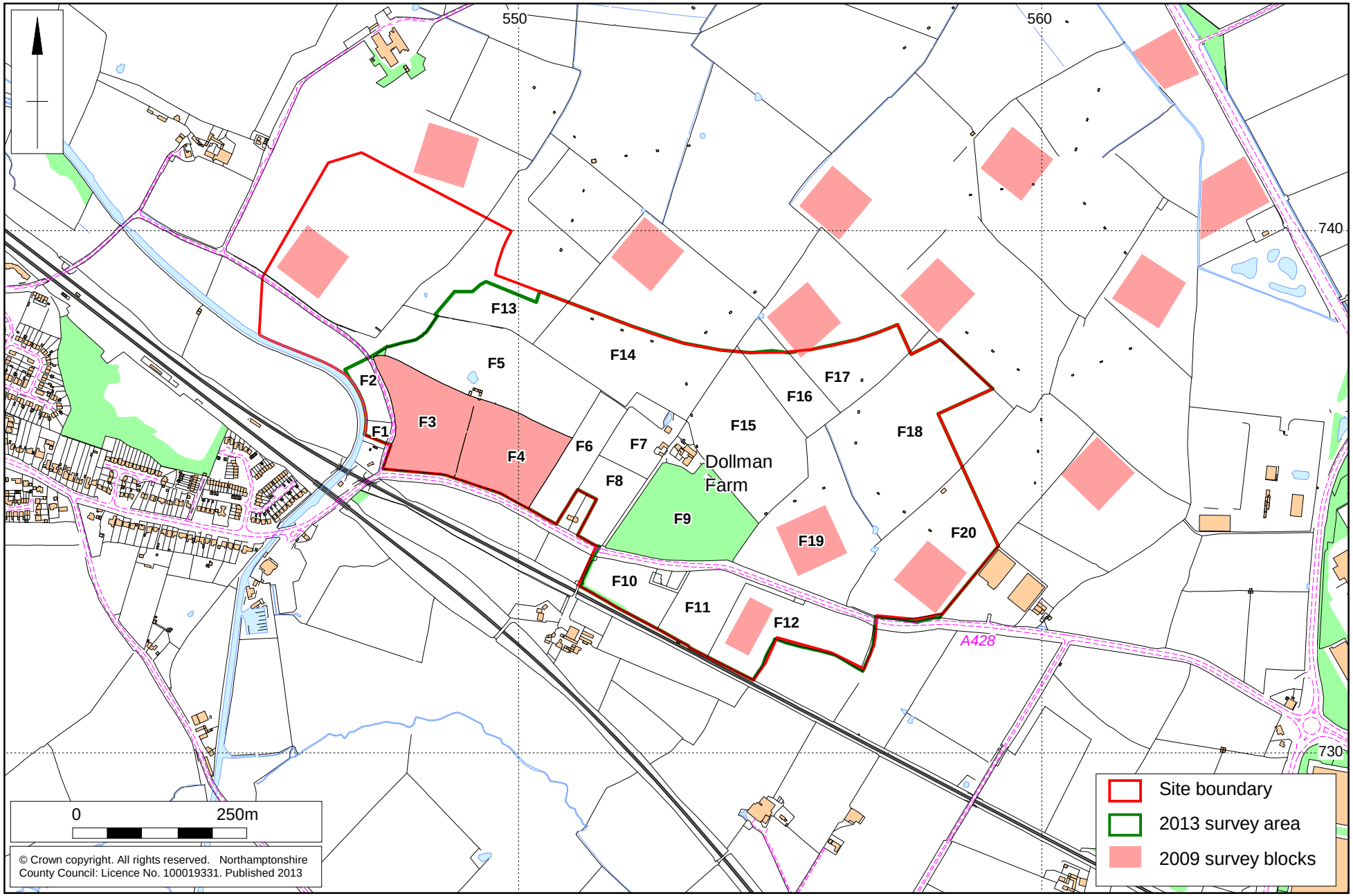




Scale 1:20,000

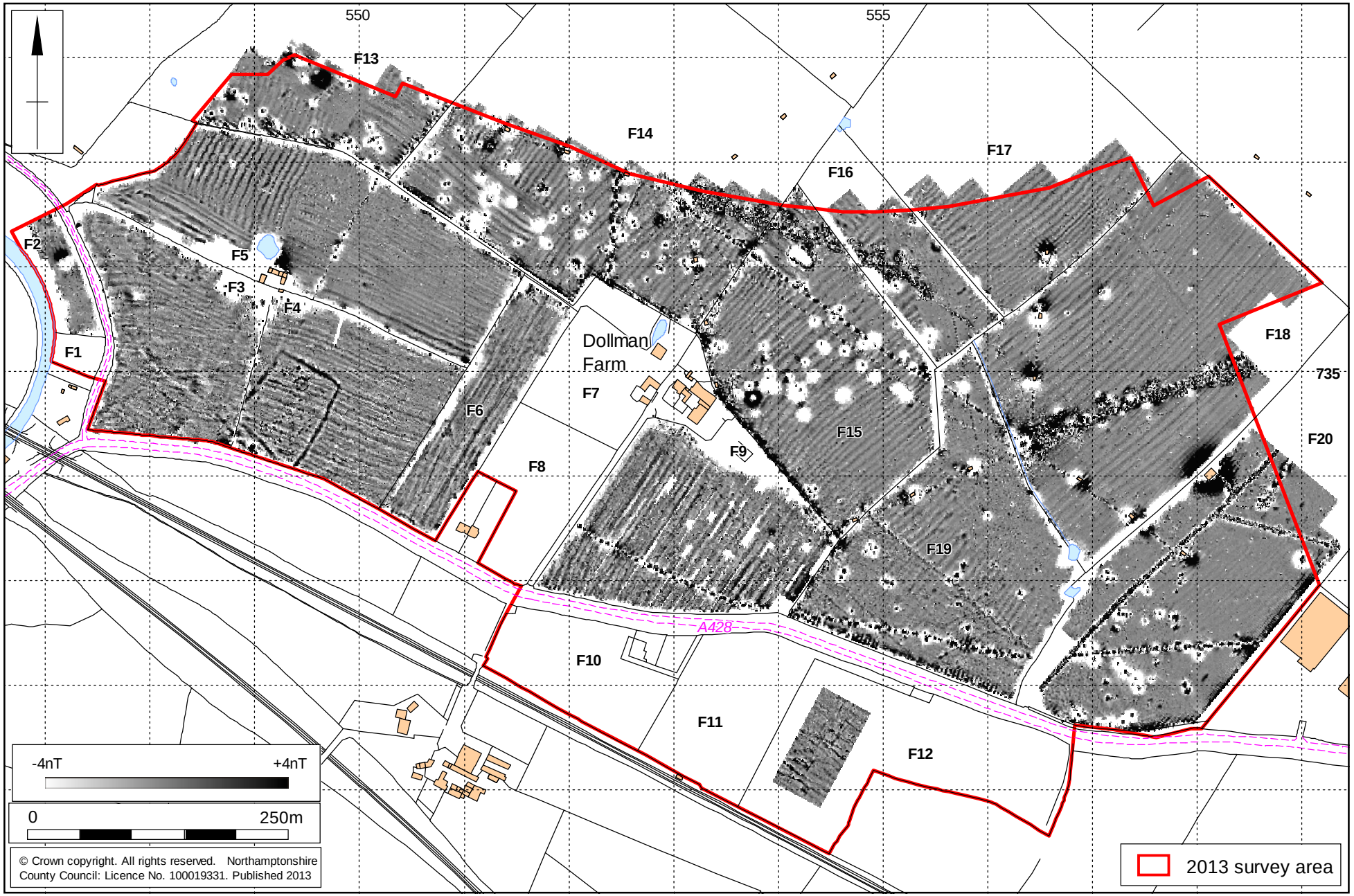
Site location Fig 1

Scale 1:7,500 (A4)



2009 and 2013 survey areas

Fig 2



Scale 1:5,000 (A4)

Magnetometer survey results Fig 3

Scale 1:5,000 (A4)

Magnetometer survey interpretation Fig 4

Scale 1:2,500 (A4)

Magnetometer survey results, Fields 3 and 4

Fig 5

Scale 1:2,500 (A4)

Magnetometer survey interpretation, Fields 3 and 4

Fig 6

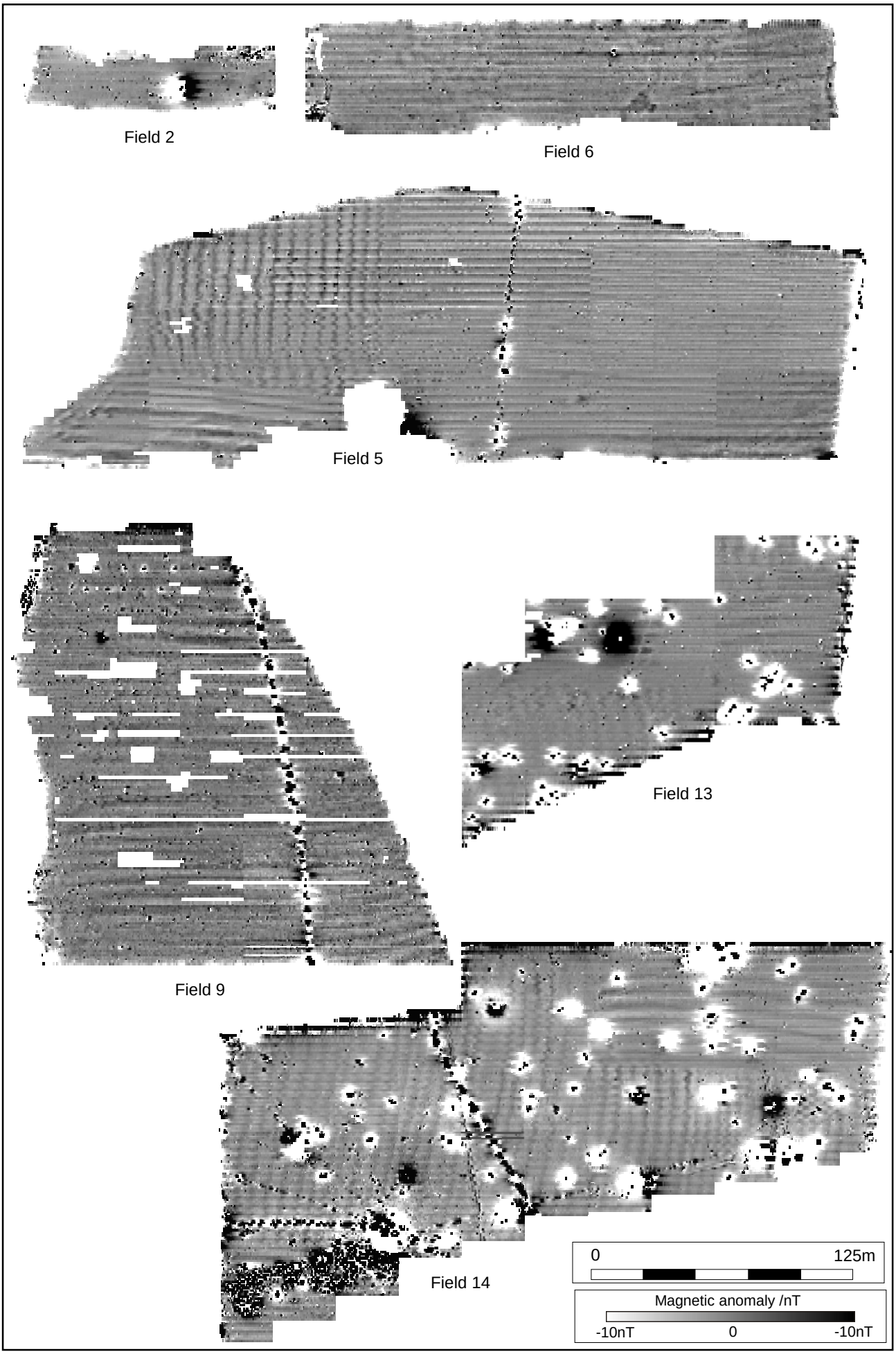
Scale 1:5,000 (A4)

Magnetometer survey results, Fields 9, 12 & 19 Fig 7

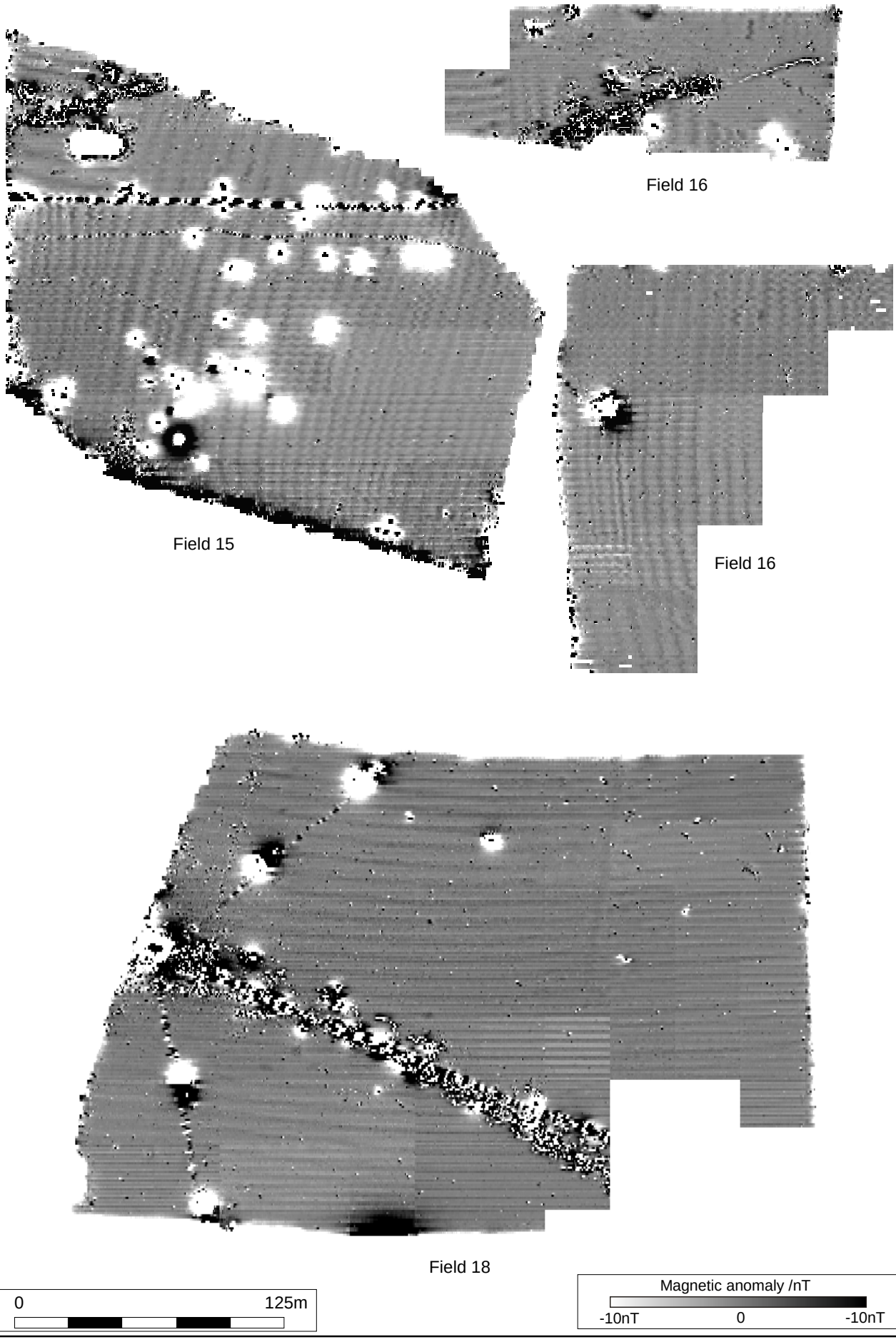
552
F7
F8
F9
555
F15
735
F18
F19
F10
A428
F11
F12
-4nT
+4nT
0
100m

Scale 1:5,000 (A4)

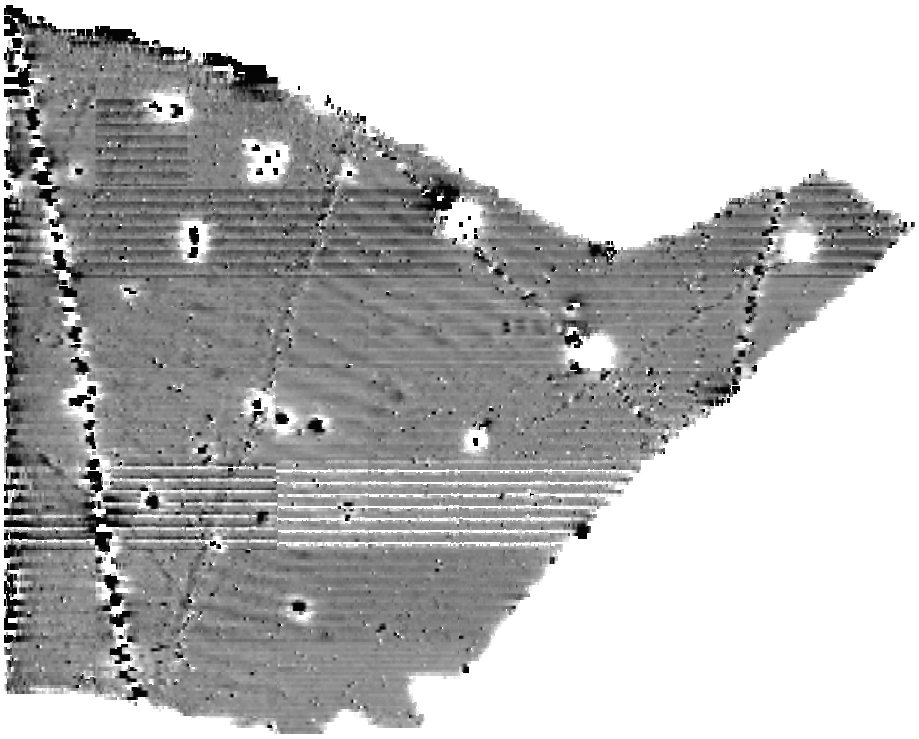
Magnetometer survey intrepretation, Fields 9, 12 & 19 Fig 8



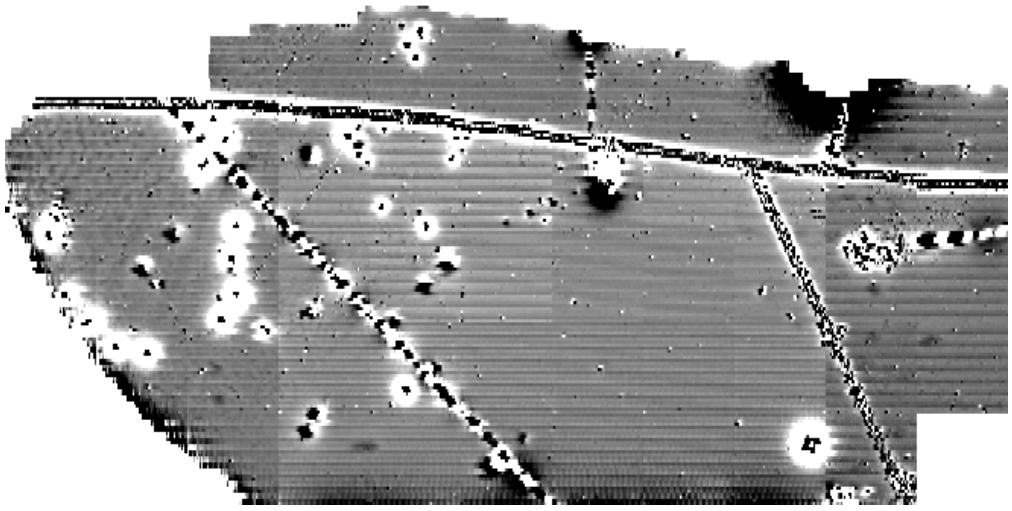
1:2500 Unprocessed magnetometer data, Fields 2 - 14 Fig 9



1:2500 Unprocessed magnetometer data, Fields 15 - 18 Fig 10



Field 19



Field 20

0 125m

Magnetic anomaly /nT

-10nT 0 -10nT

1:2500

Unprocessed magnetometer data, Fields 19 - 20 Fig 11

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