

# Northamptonshire Archaeology

M1 Widening, Junctions 10-13, Bedfordshire  
Cultural Heritage Surveys Stage 3

Additional Archaeological Geophysical Survey  
(Int.28)

December 2007



Adrian Butler

January 2008

Report 08/08

## Northamptonshire Archaeology

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**OASIS REPORT FORM**

PROJECT DETAILS		
Project name	M1 Widening, Junctions 10 – 13, Bedfordshire Cultural Heritage Surveys Stage 3, Additional Archaeological Geophysical Survey	
Northamptonshire Archaeology, commissioned by Scott Wilson Ltd, conducted further geophysical prospection as part of the archaeological evaluation of M1 Widening. A combined area of c 5.94 ha in seven fields was surveyed by magnetic gradiometer. Possible archaeological features, including ditches and pits were identified in four of the fields.		
Project type (eg DBA, evaluation etc)	Geophysical Survey	
Previous work (SMR numbers etc)	Fieldwalking Beds. HER: 5137/0/1 Geophysical Survey (Butler 2006)	
Current Land use	Arable / Pasture	
Future work (yes, no, unknown)	Yes	
PROJECT LOCATION		
County	Bedfordshire	
Site address (including postcode)	Junctions 10-13, M1	
Study area (sq.m or ha)	Approx 5.94 ha	
OS Easting & Northing (use grid sq. numbers)	SP960370 – TL080190	
PROJECT CREATORS		
Organisation	Scott Wilson Ltd	
Project brief originator	Scott Wilson Ltd	
Project Design originator	Scott Wilson Ltd	
Director/Supervisor	Adrian Butler for Northamptonshire Archaeology	
Project Manager	Andy Mudd for Northamptonshire Archaeology	
Sponsor or funding body	Costain-Carillion Joint Venture Ltd	
PROJECT DATE		
Start date	October 2007	
End date	January 2008	
ARCHIVES		
	Location (Accession no.)	
Physical	-	Content (eg pottery, animal bone etc)
Paper	Luton Museum	Survey notes
Digital	Luton Museum	Geophysical data, GIS mapping
BIBLIOGRAPHY		
	Unpublished client report (NA report)	
Title	M1 Widening, Junctions 10-13, Bedfordshire Cultural Heritage Surveys Stage 3, Additional Archaeological Geophysical Survey	
Serial title & volume	NA Reports 08/08	
Author(s)	Adrian Butler	
Page numbers		
Date	15/01/08	

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# M1 WIDENING, JUNCTIONS 10 – 13, BEDFORDSHIRE

## CULTURAL HERITAGE SURVEYS STAGE 3

### ADDITIONAL ARCHAEOLOGICAL GEOPHYSICAL SURVEY (INT. 28)

DECEMBER 2007

#### ABSTRACT

*Northamptonshire Archaeology, commissioned by Scott Wilson Ltd, conducted further geophysical prospection as part of the archaeological evaluation of M1 Widening Junctions 10 -13. A combined area of c 5.94 ha in seven fields was surveyed by magnetic gradiometer. Possible archaeological features, including ditches and pits were identified in four of the fields.*

## 1 INTRODUCTION

Northamptonshire Archaeology was commissioned by Scott Wilson Ltd, on behalf Costain Carillion Joint Venture (CCJV), to conduct additional geophysical surveys as part of the Stage 3 Cultural Heritage Surveys for the M1 Widening, Junctions 10-13, Bedfordshire (NGR SP 9637 – TL 0819; Fig 1; Butler 2006).

The surveys were carried out on 5.94 ha in seven fields in December 2007. The objectives were to locate and characterise potential sub-surface features within the projected road widening, as part of a programme of archaeological evaluation in accordance with a Written Scheme of Investigation (WSI) (Scott Wilson 2006). The work was undertaken to a Methods Statement prepared by Northamptonshire Archaeology continuing the work carried out in the previous surveys (NA 2006a, 2006b). The scope of works was contained in an instruction from CCJV – Compensation Event 5 (24th October 2007) - which represented a variation on the original WSI due to the inaccessibility of two of the original nine plots.

## 2 ARCHAEOLOGICAL BACKGROUND

The Stage 3 surveys follow investigations carried out 1992-1994 for a previous scheme (M1 J10 to J15), including fieldwalking, extensive geophysical survey and trial trench evaluation (Scott Wilson 2006). Following review of the existing information, the Stage 3 surveys had the objective of completing the archaeological surveys so as to inform preparation of the Environmental Statement for the current scheme.

A first phase of magnetometer survey was conducted in 2006 (Butler 2006). The additional Stage 3 surveys comprised geophysical surveys and also fieldwalking. The fieldwalking survey forms the subject of a separate report (NA 2008).

## 3 TOPOGRAPHY AND GEOLOGY

Geophysical surveys were carried out in fields next to the M1 along sections of the survey corridor which ran south from Steppingley, Bedfordshire to the south of Luton (near Caddington) (Fig 1). The specific fields surveyed were, north – south: 67, 178, 123, 40, 48, 138 and 177. Fields 45 and 114 were scheduled for survey but this was not possible due to high vegetation (45) and the presence of horses and electric fences (114).

The British Geological Survey has mapped the bedrock beneath the M1 from north to south as: Oxford Clay and Kellaways Beds, Lower Greensand, Upper Greensand and Gault, and Chalk. The drift deposits are mainly glacially derived but have too many variations as to be usefully listed

here. They have been outlined in the earlier report (Butler 2006, Section 3).

## 4 METHODOLOGY

All fieldwork was carried out in accordance with both English Heritage and the Institute of Field Archaeologists Guidelines (EH 1995 & Gaffney, Gater and Ovendon 2002), and to a specification provided by Scott Wilson Ltd (2006).

### Gradiometer Survey

All detailed magnetometer survey was undertaken using a combination of Bartington Grad601-2 dual-sensor and Geoscan FM256 single sensor fluxgate gradiometers. Intensive survey was carried out along the proposed route in seven fields using predefined 30m x 30m and 20m x 20m grid-squares. Each grid square was traversed with gradiometer at rapid walking pace in zigzag traverses spaced at 1m intervals with data recorded every 0.25m along these. Survey areas were plotted from adjacent mapped features, or where necessary, using a Leica 1200 GPS with an accuracy of up to +/- 0.05 m in relation to OS National Grid.

The data was analysed using Geoplot 3.00u software. Low (negative) magnetism is shown as white and high (positive) magnetism as black in the resultant greyscale plots. The 'Zero Mean Traverse' function was applied as a standard in order to balance each line of data to an average zero value. Other functions, such as the removal of extreme values that could bias the dataset, were carried out as necessary.

The processed data is presented here in the form of grey tone graphics highlighting the magnetic anomalies (scale +4.0nT / -4.0nT, black ~ white, Figs 2, 4, 6, 8, 10, 12 and 14). A second plotting regime - stacked trace x/y - has been included for the results of each field as Appendices 1 and 2. Interpretative plots (Figs 3, 5, 7, 9, 11, 13 and 15) have been generated from greyscales of anomalous results to aid in the discussion.

## 5 SURVEY RESULTS

The results of the gradiometer survey are presented on a field-by-field basis, from north to south (Fig 1). There is a reasonably constant background level of small intense 'dipolar' anomalies indicative of ferrous waste in the topsoil, across all the fields.

None of the fields contained obvious earthwork remains. All anomalies therefore relate to buried or ploughed-out features.

### Field 67 (Figs 2 & 3)

Grids were surveyed in the south-west corner of the field. An east-west orientated positive linear anomaly, a possible ditch, was detected in the northern half of the survey area. To the north and south of this, weakly magnetic anomalies are believed likely to represent geological formations.

### Field 178 (Figs 4 & 5)

Field 178 was surveyed in two rectangular blocks, adjacent to roads aligned north-east and north-west. Narrowly spaced magnetic banding along the axis of the western block and across the eastern block, is believed to reflect modern plough scarring. There are also curving north-west to south-east scars in the eastern block which are likely to reflect medieval ridge and furrow. However, there are two more highly magnetic linear anomalies in the northern part of the eastern block, and at least two more in the western block, which may correspond to buried ditches. Similarly, two curving positive anomalies in the western block could reflect part-detected enclosure or ring ditches. There

are other minor magnetic variations in this block with no clear pattern and of uncertain significance.

#### **Field 123 (Figs 6 & 7)**

The ‘T-shaped’ area in Field 123 was divided by waterlogged ground which rendered survey in that part impossible. Survey revealed no anomalies other than the ubiquitous ferrous debris.

#### **Field 40 (Figs 8 & 9)**

Five positive linear anomalies reflecting ditches were detected in the area; three orientated north – south, one east - west, and another east - west at the very northern corner of the survey area. No definitive interpretation can be offered for these features and they do not align with ditches identified in previous survey (Butler 2006), but they seem likely to represent boundaries which formerly sub-divided the field. Noisy data were detected in the northern half of the field, probably representing brick waste and random rubbish in the topsoil.

#### **Field 48 (Figs 10 & 11)**

Highly positive and negative data were gathered along the south of this ‘T-shaped’ area, in response to the ferrous content of field boundaries. Otherwise, several larger ferrous anomalies were identified amongst the generally noisy magnetic background to this field.

#### **Field 138 (Figs 12 & 13)**

Two areas were surveyed in Field 138. The southern block was found to contain an area of thermoremanent (fired material) noise likely to represent material cast off a boundary track directly to the south. Two discrete positive magnetic anomalies were detected in the north-east of that block. It would appear that these reflect a pair of pits, with possibly some of the magnetic fills distributed around through ploughing. Survey of the northern block of Field 138 located an area of weakly enhanced textured magnetic data, possibly caused by geological fluctuation. Two adjacent positive anomalies likely to indicate large pits were identified within this.

#### **Field 177 (Figs 14 & 15)**

No significant anomalies were detected other than random ferrous debris. Slight variations in the background texture probably reflect geological changes.

## **6 CONCLUSIONS**

Additional gradiometer prospection along the M1 between Steppingley and Caddington identified possible archaeological remains in four of the seven fields.

In Field 178 several linear ditches and possible parts of penannular or curving ditches were detected. If the identification of the curving ditches is correct, they may indicate later prehistoric or Roman period occupation on the western side of the field, but the identification is tentative.

Survey of Field 40 revealed five ditches. These are widely separated and may represent former field boundaries, although it is possible that one or more are of greater archaeological significance.

Prospection of Field 138 located two pairs of pits. These are of unknown date and significance. A single ditch was also identified in Field 67.

The potential archaeological features that have been located add to the number identified in the

previous geophysical surveys (Butler 2006). In common with the previous survey, no clear groups of features suggesting complex settlement sites have been found. However, archaeological sites comprising mainly small pits and postholes would not be clearly detected or recognised by this method of survey.

## 7 REPORTING AND ARCHIVE

A brief summary of the results will be offered for inclusion in the journal *Bedfordshire Archaeology* and will be entered into the on-line OASIS database for reference.

The archive, which comprises the digital geophysical and GIS data, will be produced following Archaeology Data Service good practice (Schmidt 2002) and stored in accordance with English Heritage management guidelines.

The archive is held by Northamptonshire Archaeology. The survey area lies within the collecting zone of Luton Museum, who have expressed an interest in accepting the archive for long-term storage.

## BIBLIOGRAPHY

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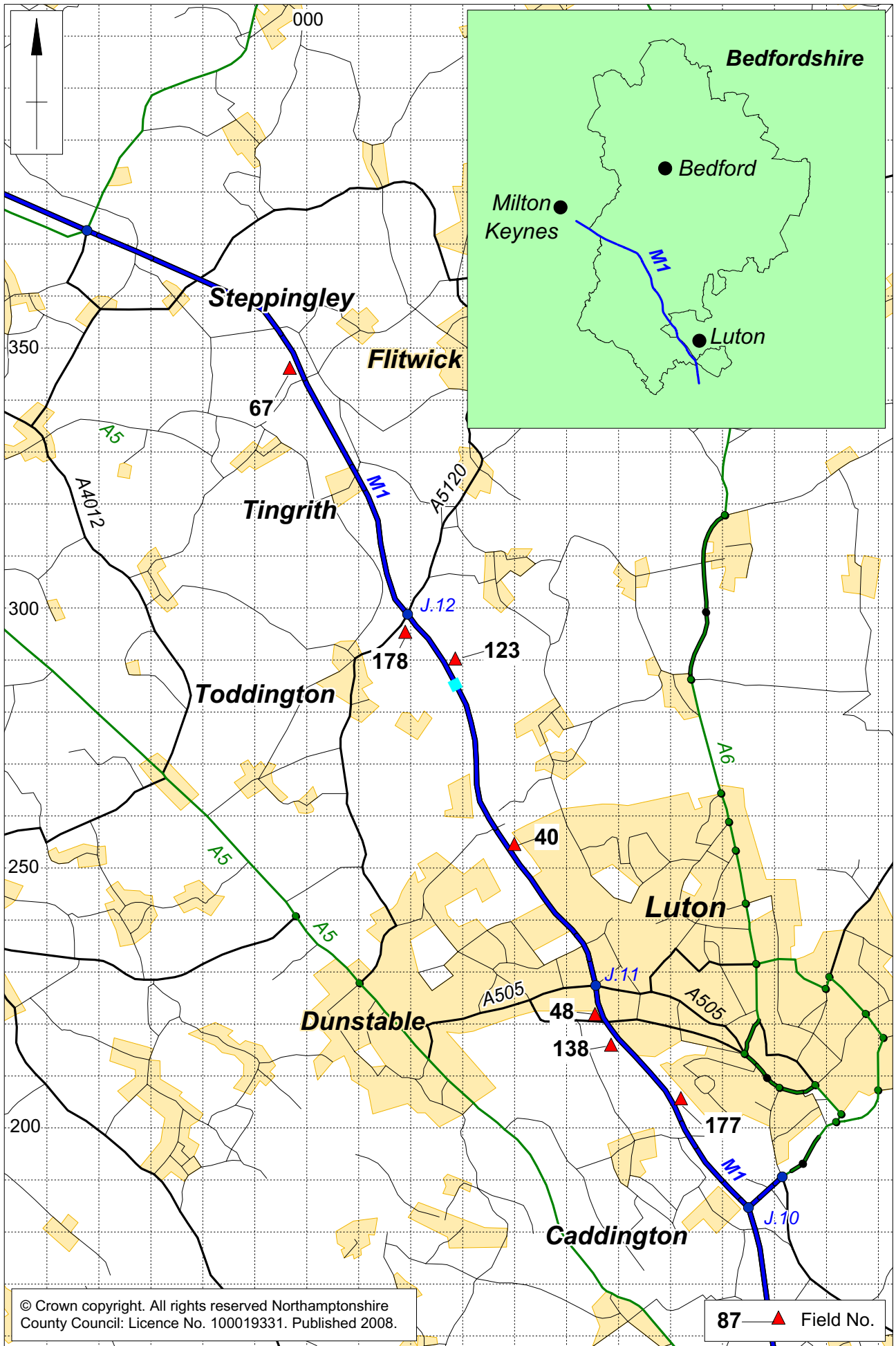
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NA 2008 *M1 Widening Junctions 10 – 13, Bedfordshire. Cultural Heritage Surveys Stage 3: Additional Archaeological Fieldwalking Survey (Int. 29), November 2007*, Northamptonshire Archaeology Report **08/24**

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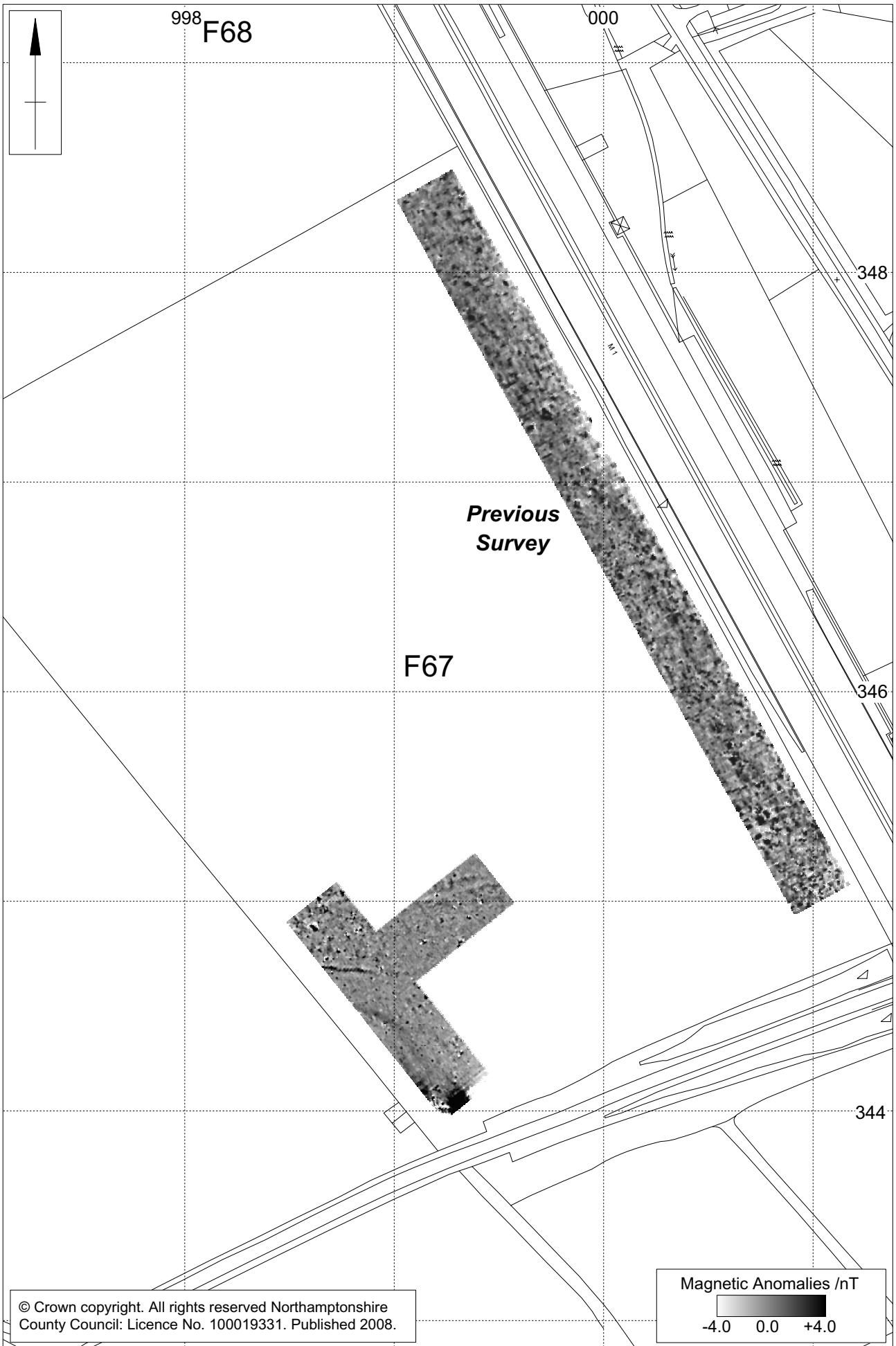
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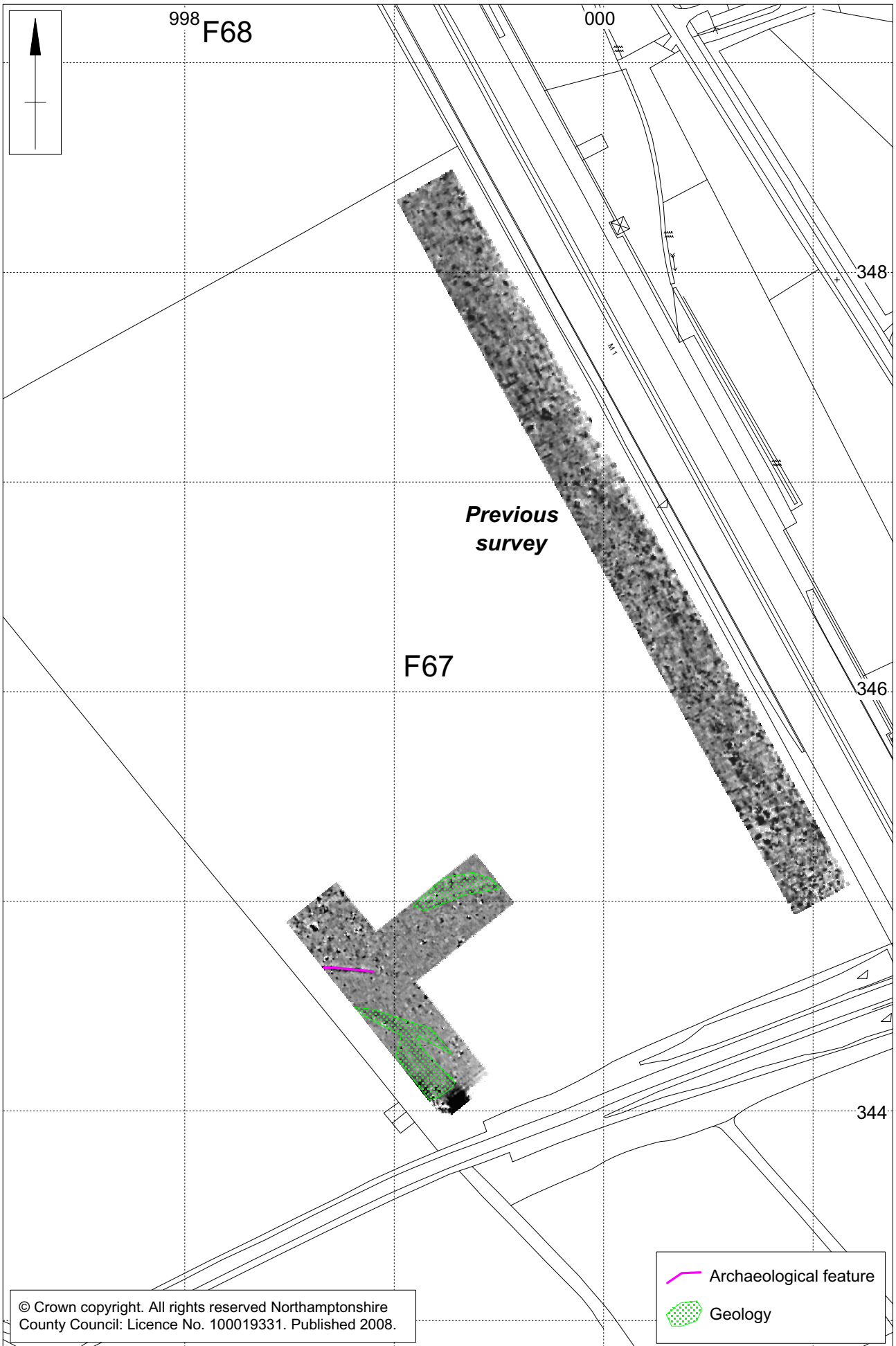
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Areas of geophysical survey Fig 1



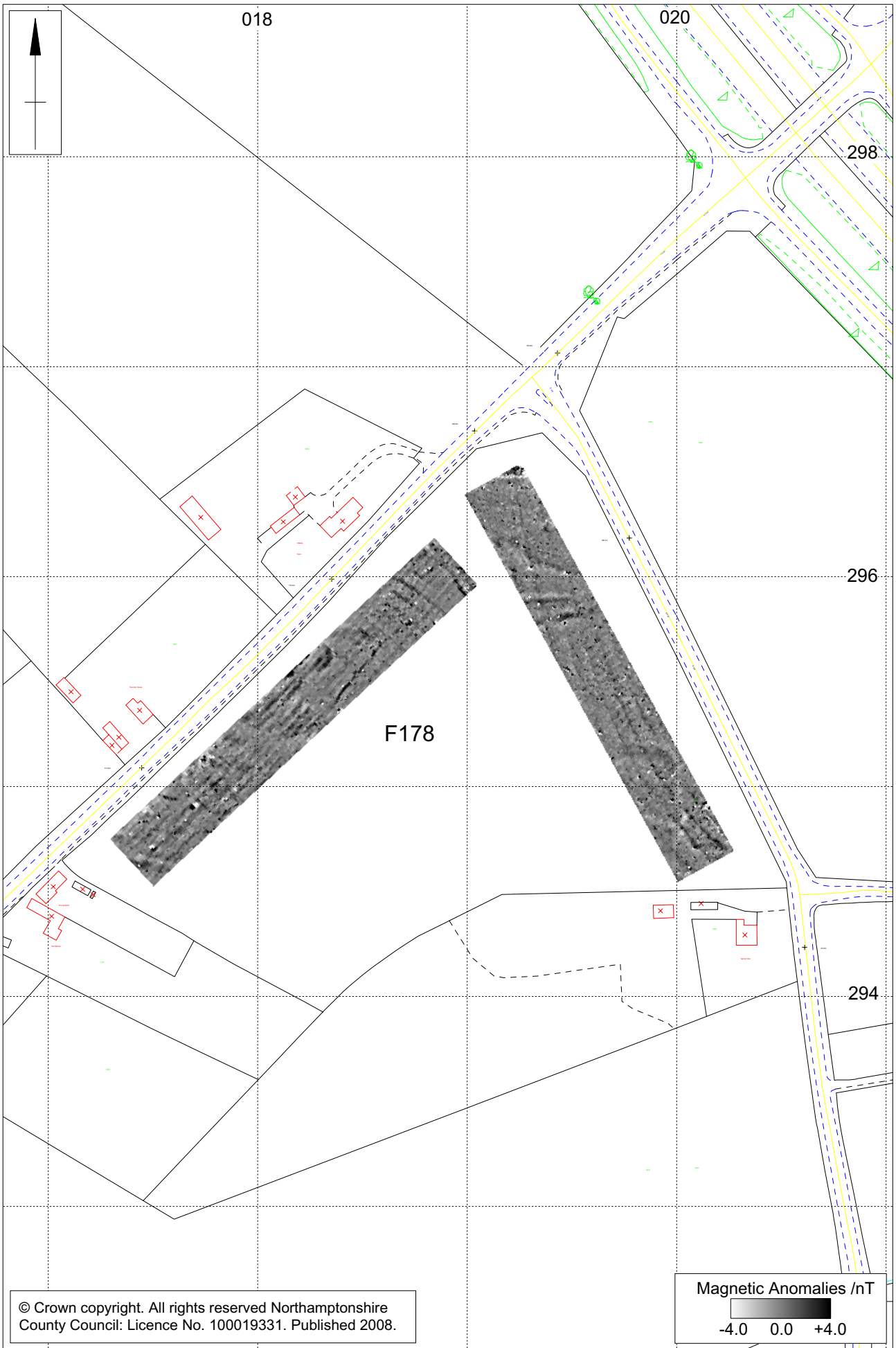
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Field 67 Survey Results Fig 2



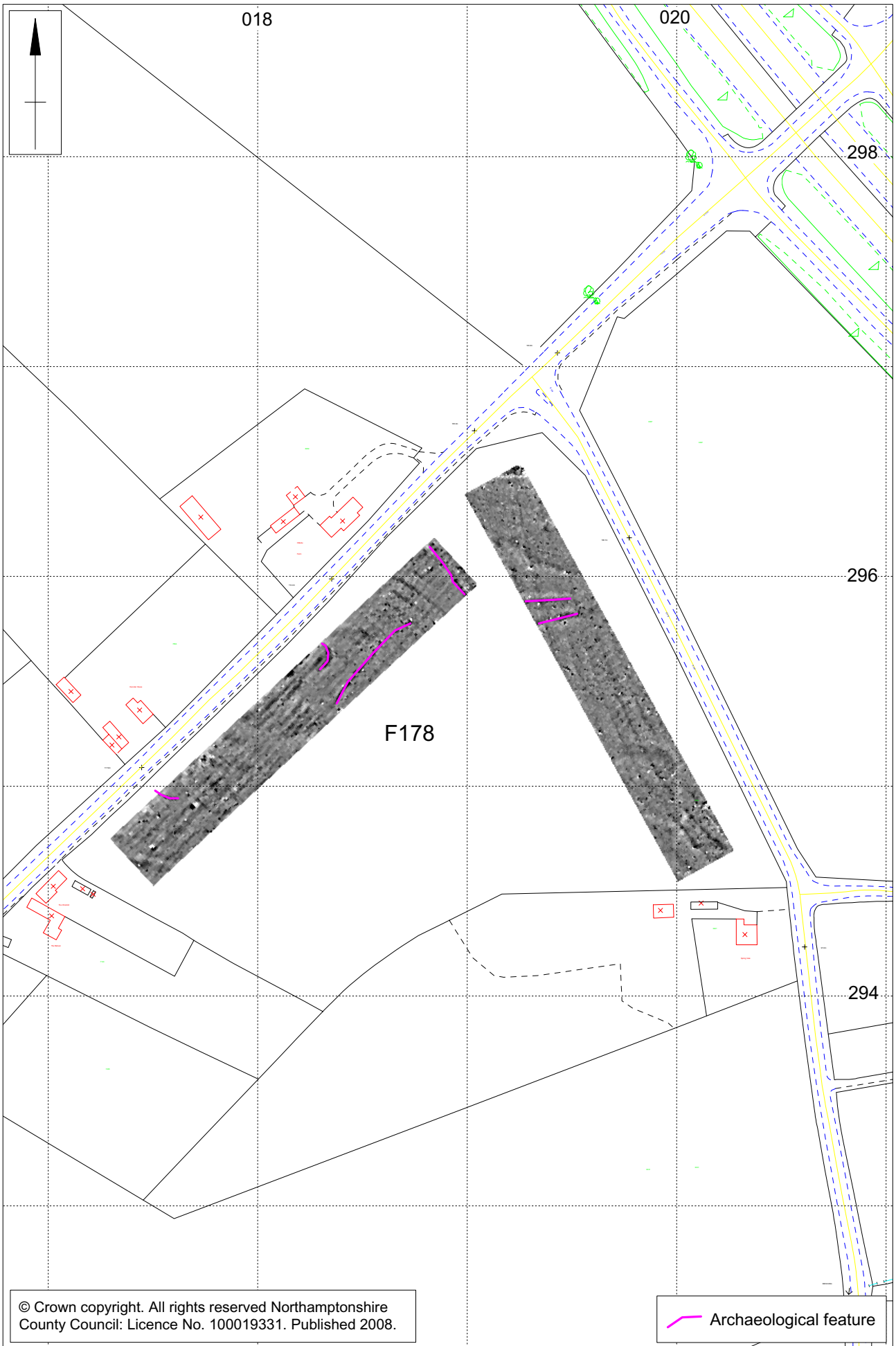
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Field 67 Survey Interpretation Fig 3



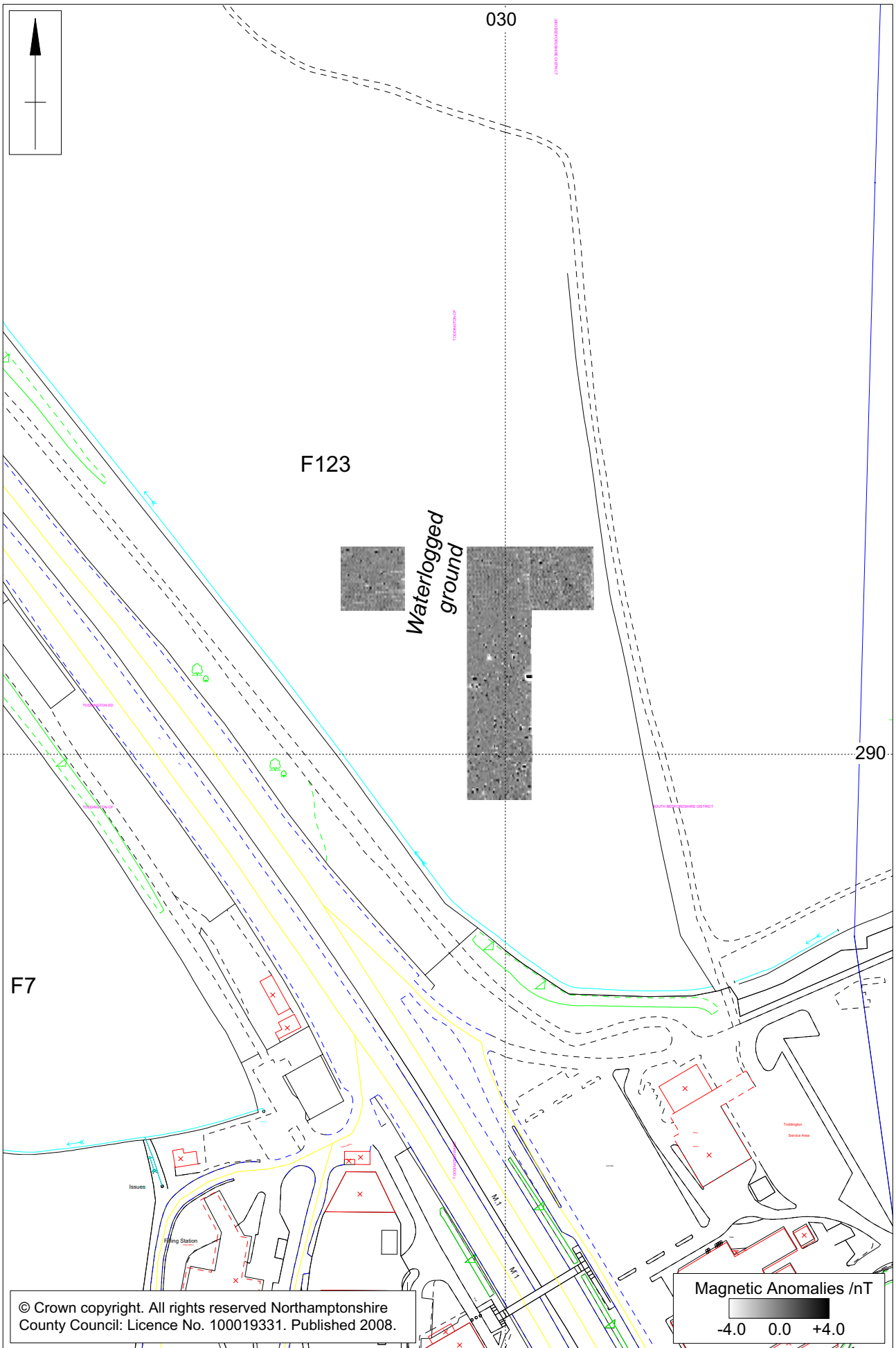
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Field 178 Survey Results Fig 4



Scale 1:2500 @ A4P

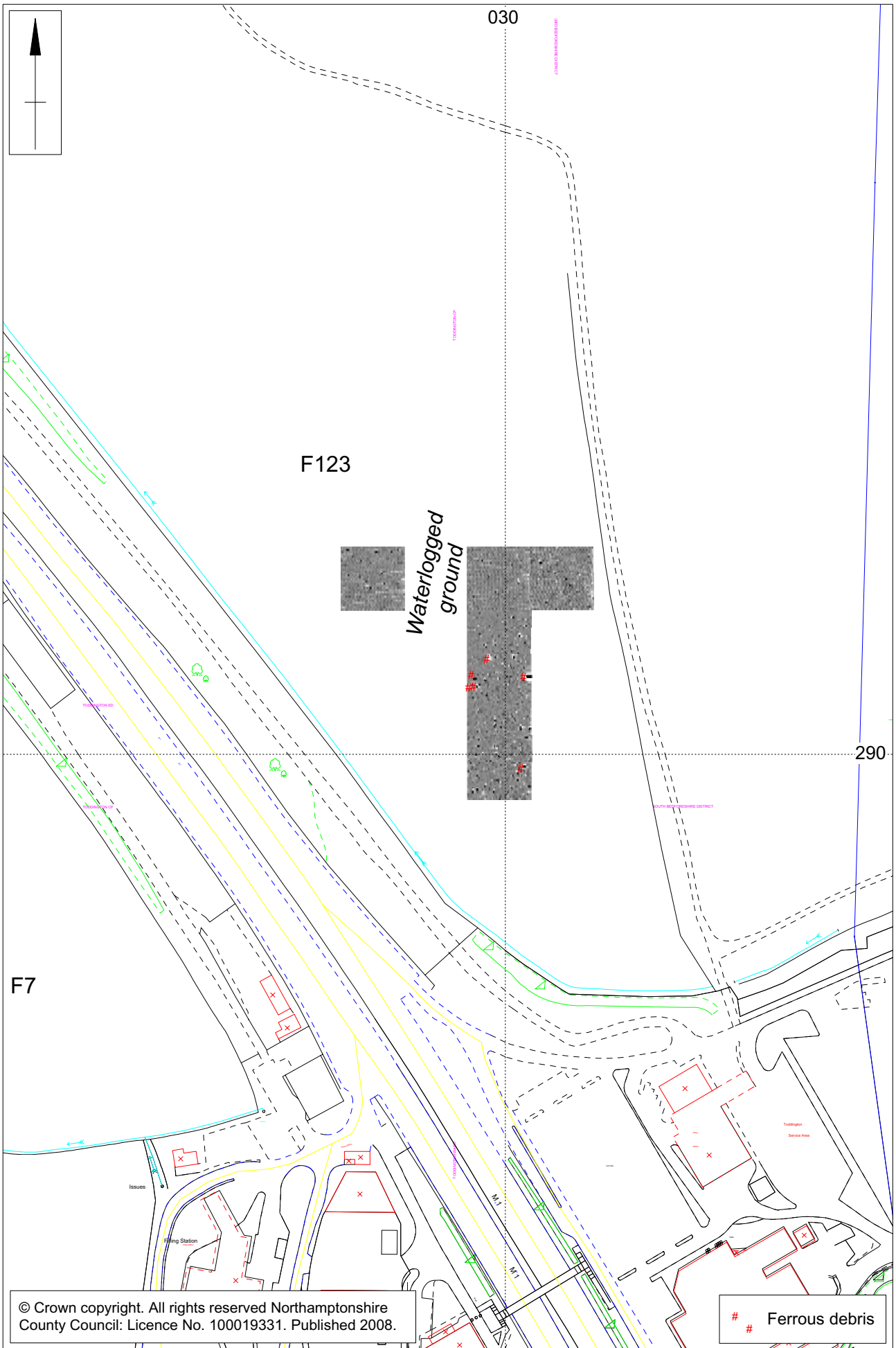
Field 178 Survey Interpretation Fig 5



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Scale 1:2500 @ A4P

Field 123 Survey Results Fig 6

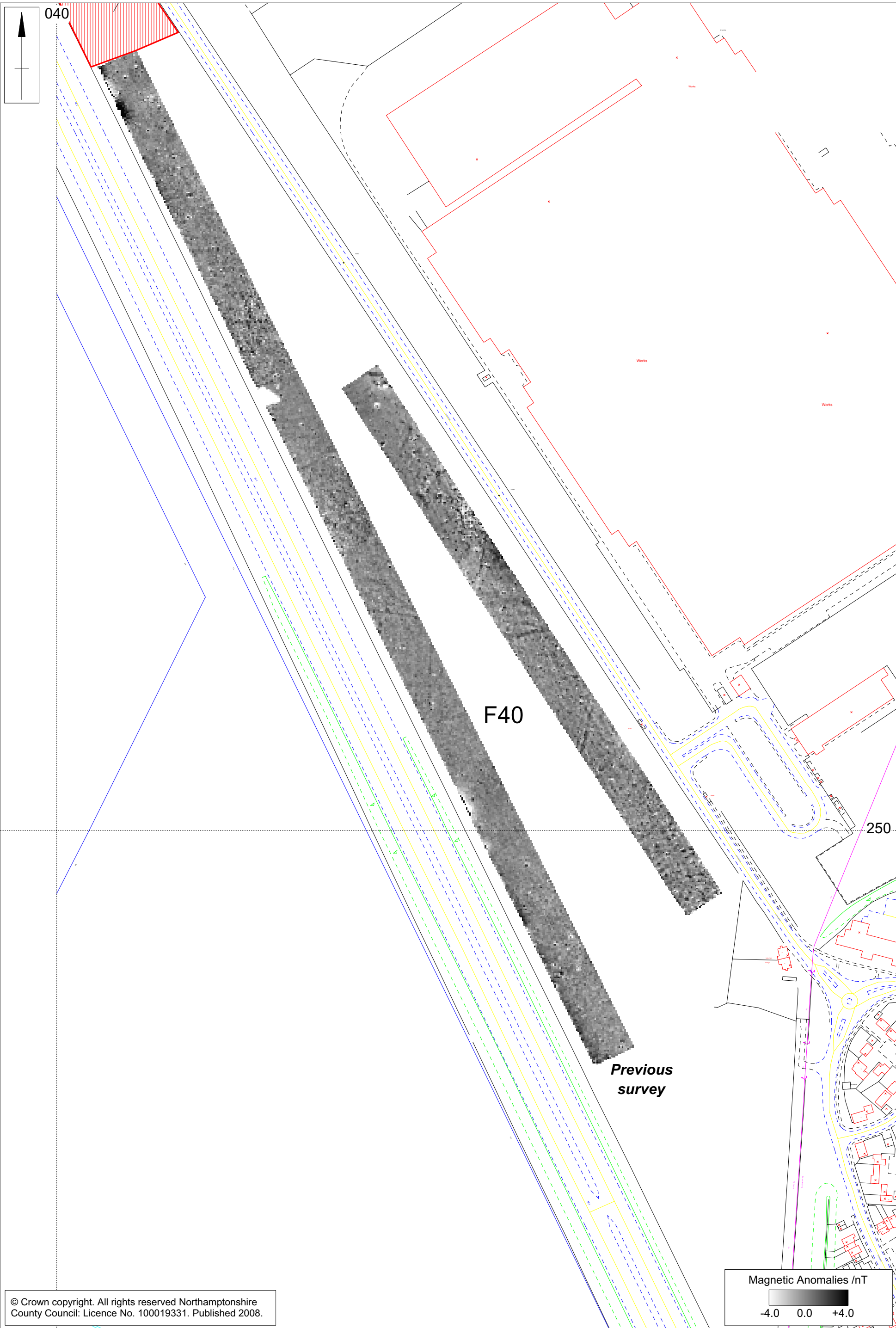


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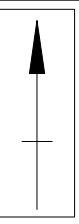
# Ferrous debris

Scale 1:2500 @ A4P

Field 123 Survey Interpretation Fig 7







040

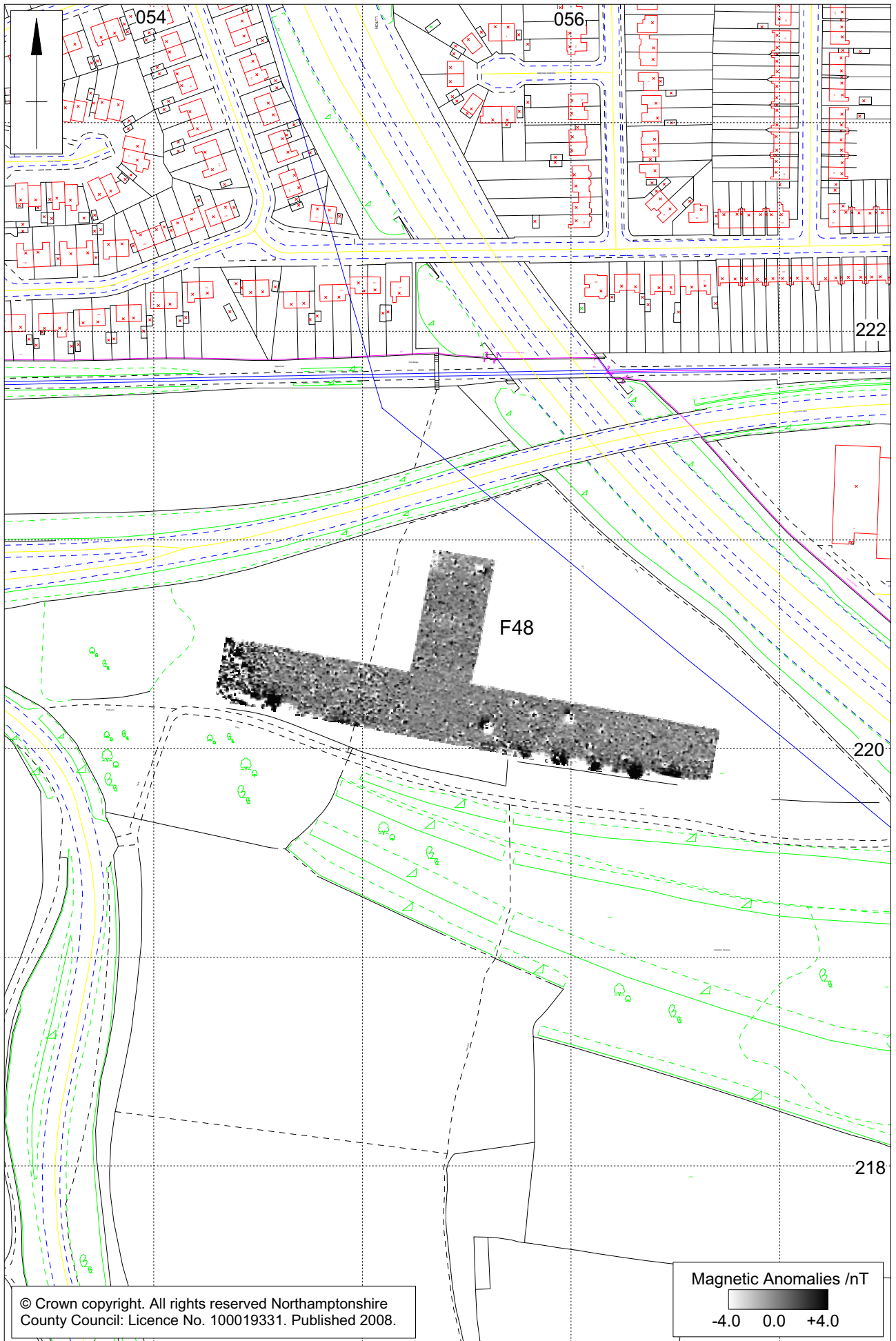


F40

Previous survey

250

- Archaeological feature
- Magnetic Noise

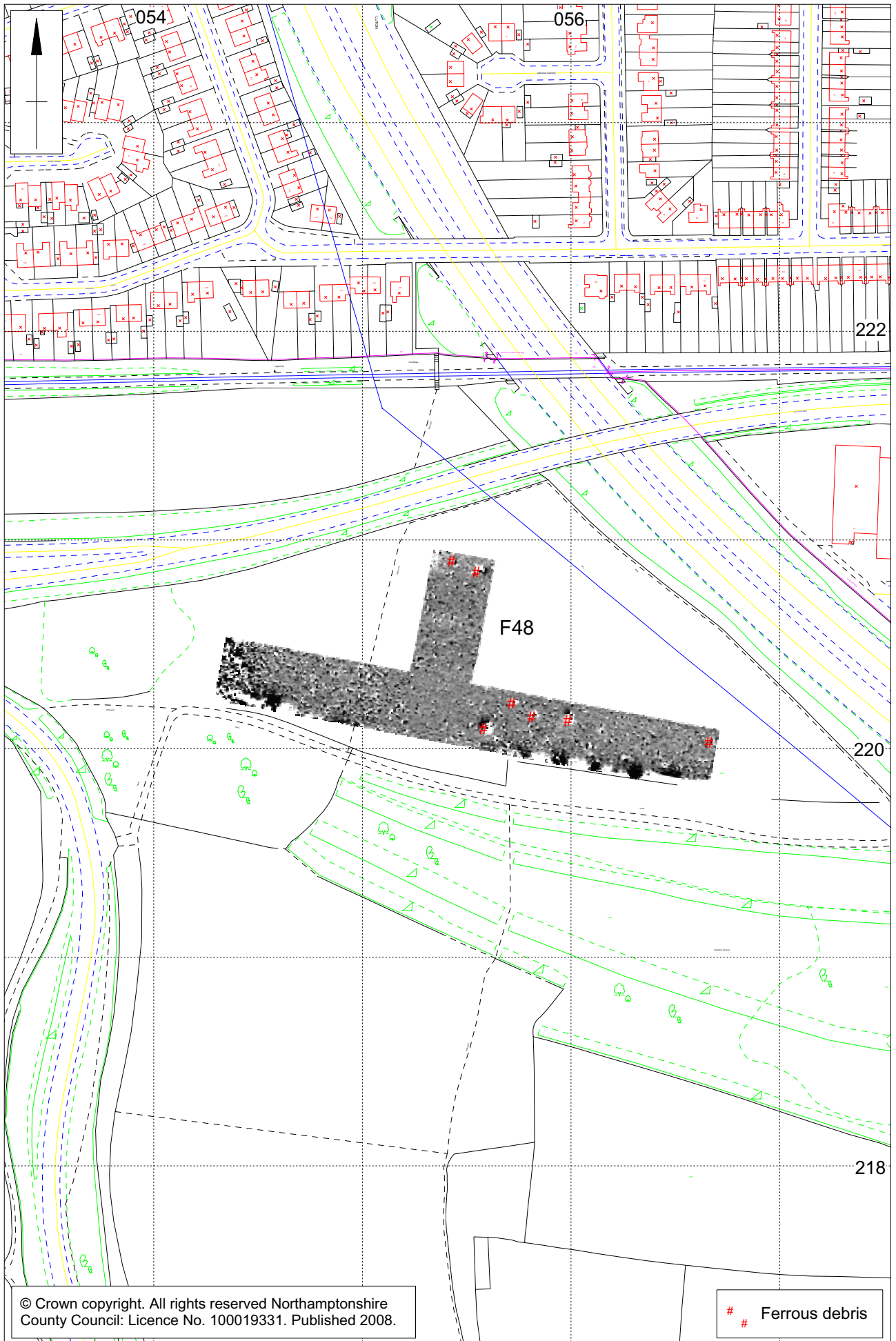


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Magnetic Anomalies /nT  
 -4.0 0.0 +4.0

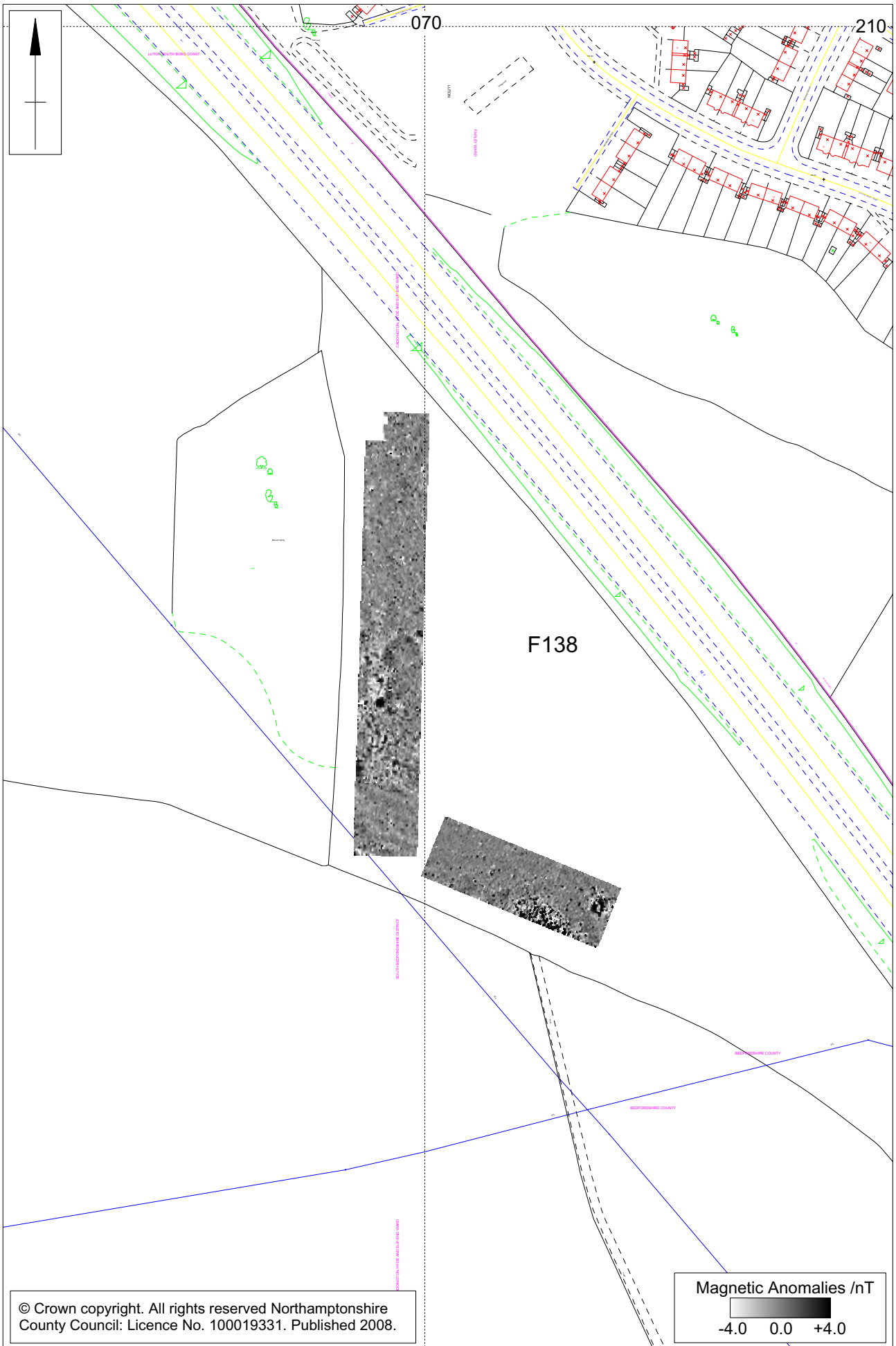
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Field 48 Survey Results Fig 10



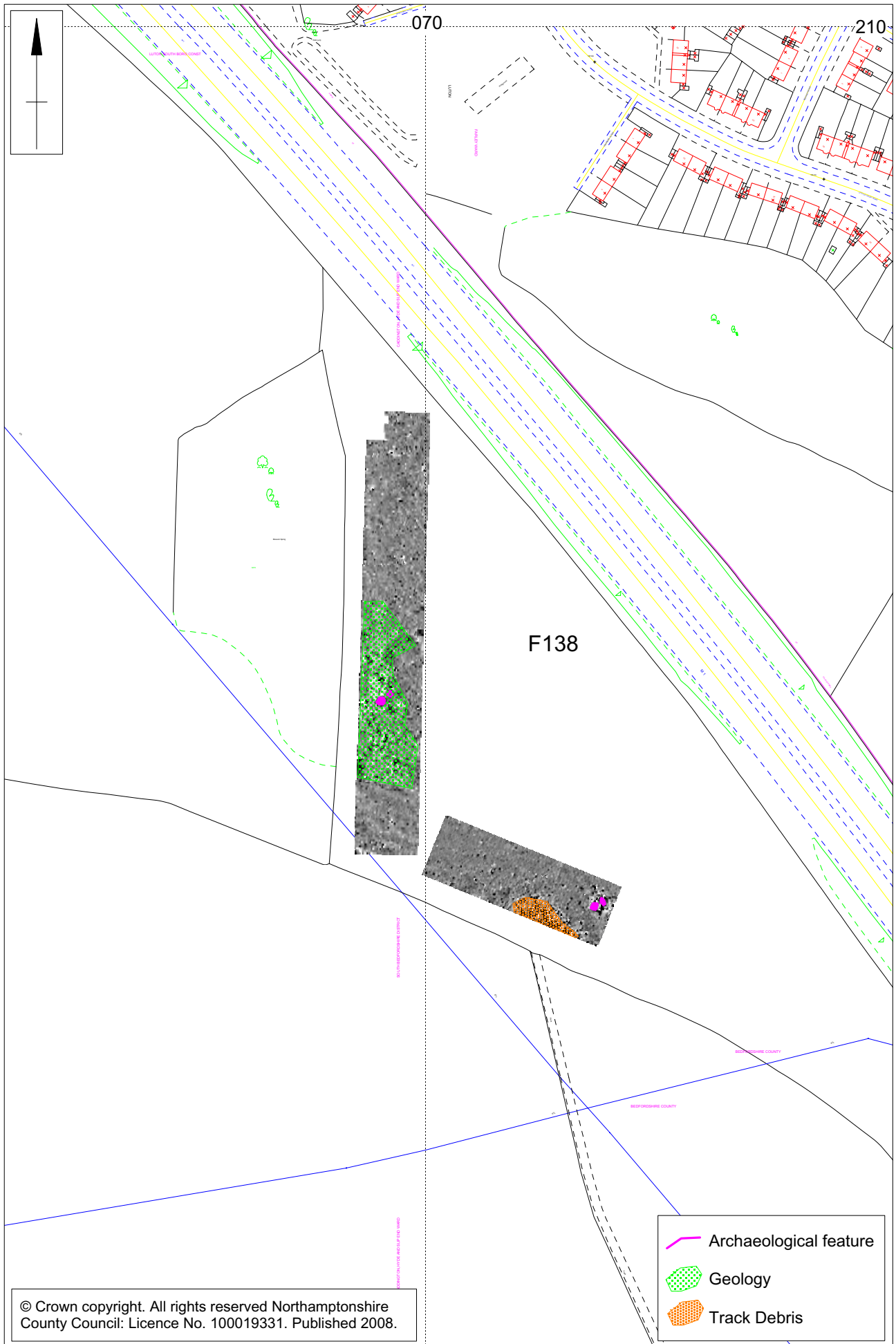
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Field 48 Survey Interpretation Fig 11



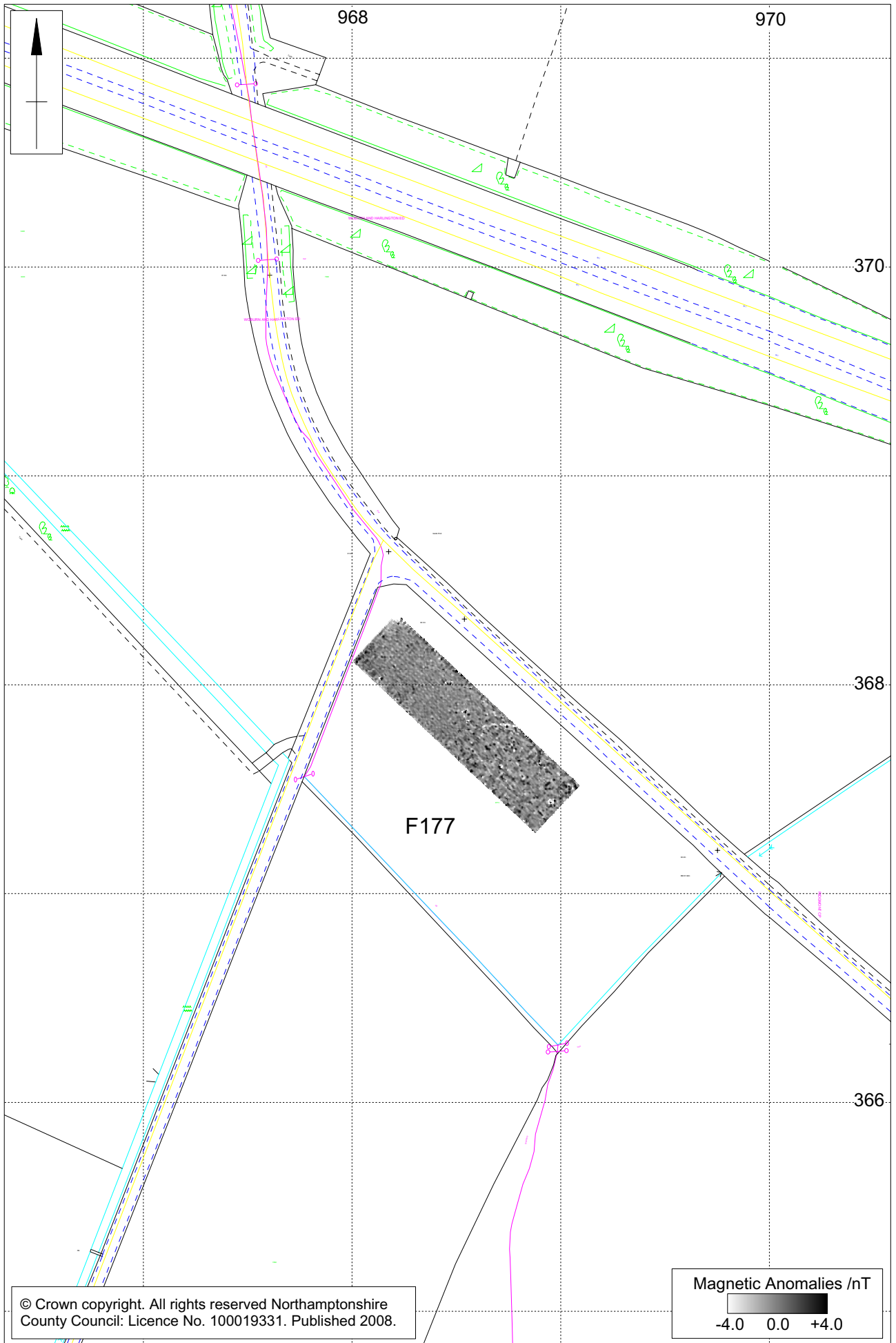
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Field 138 Survey Results Fig 12



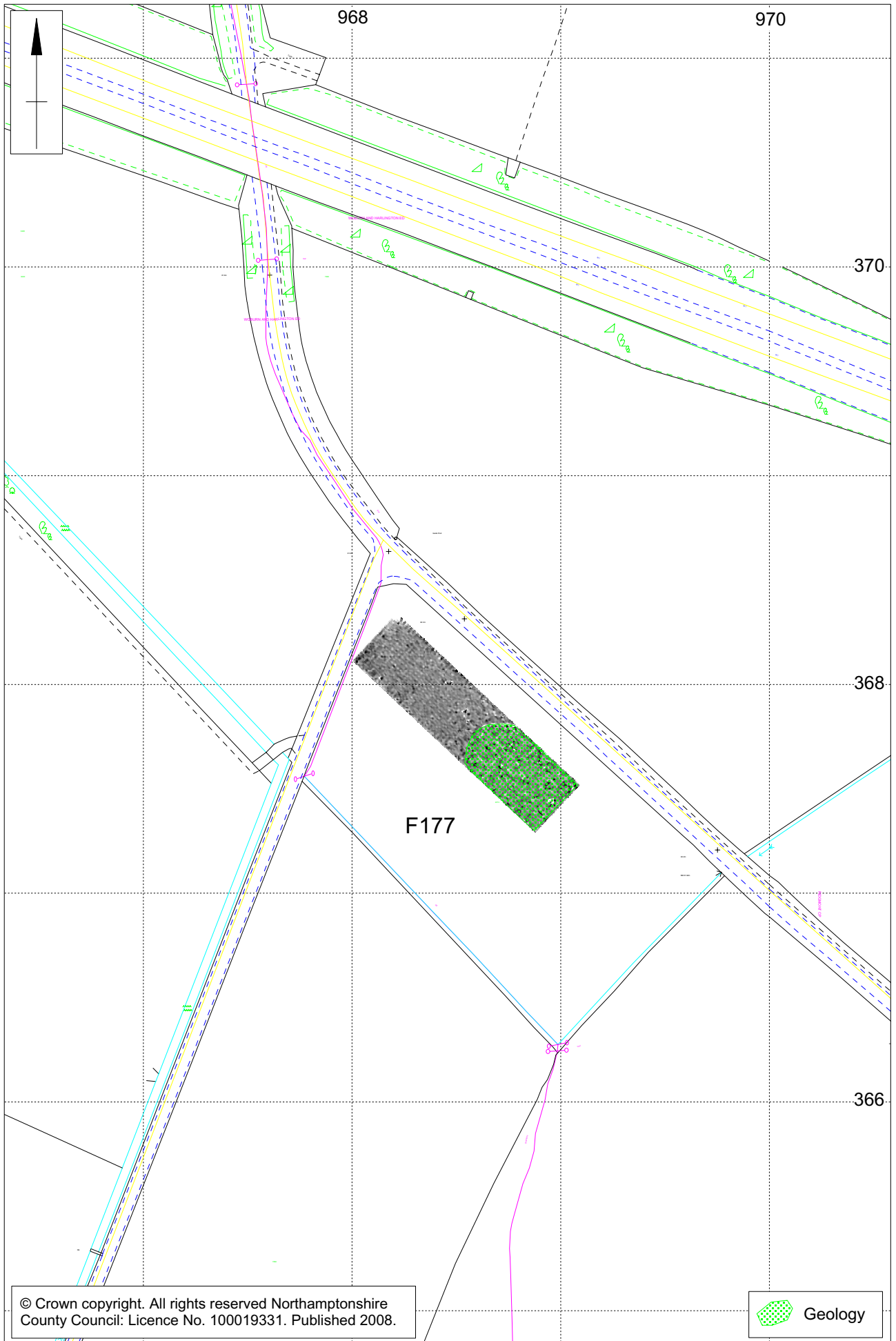
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Field 138 Survey Interpretation Fig 13



Scale 1:2500 @ A4P

Field 177 Survey Results Fig14

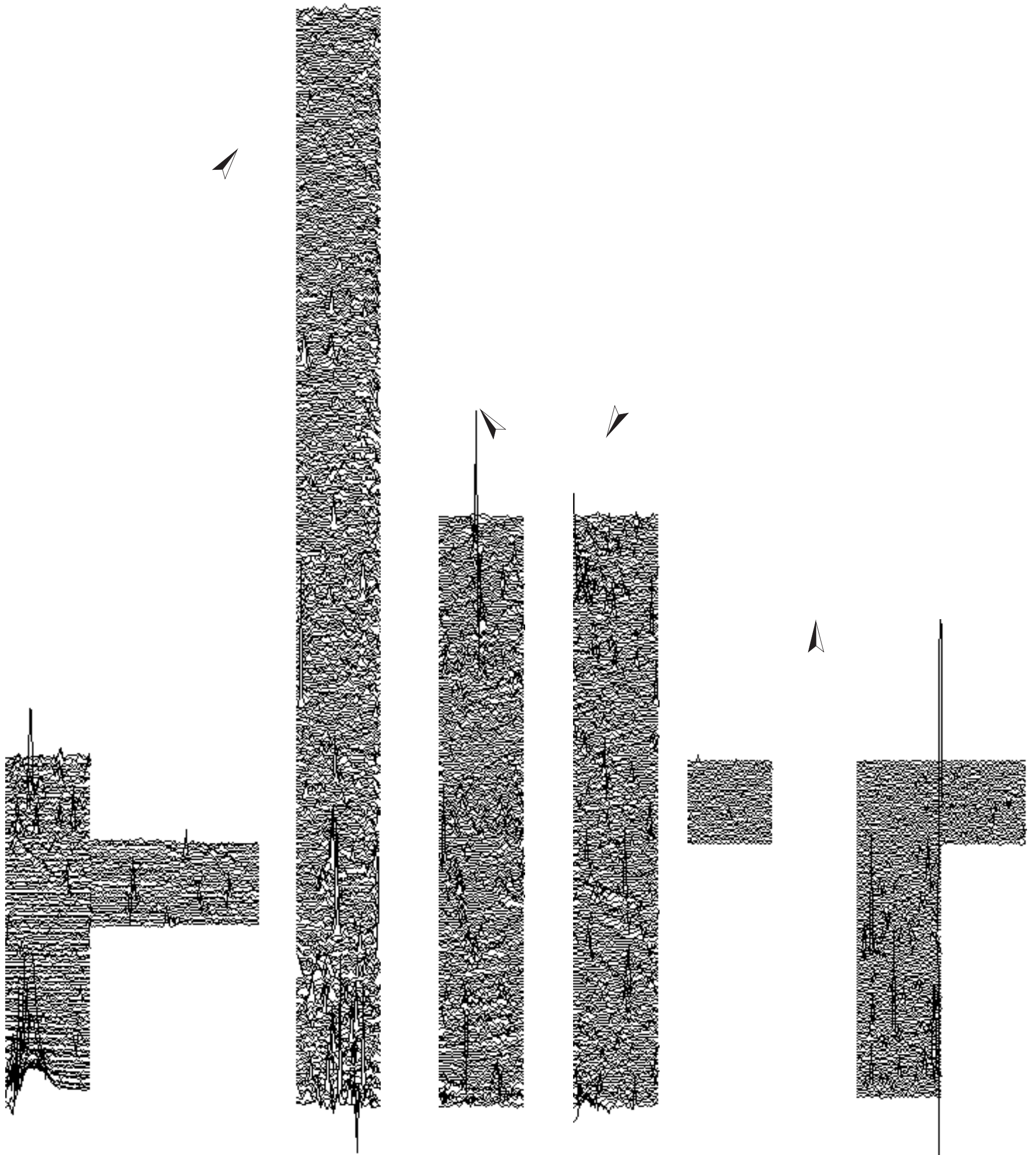


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 Geology

Scale 1:2500 @ A4P

Field 177 Survey Interpretation Fig15



F67

F178w

F178e

F123

0 30m

20nT





F40



F48

0 30m

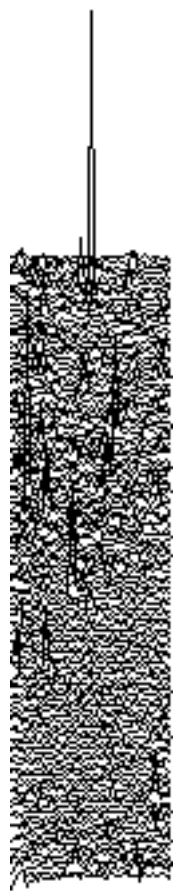


F138e

20nT



F138w



F177