



# Fosse Green Energy

EN010154

## 6.3 Environmental Statement Appendices

Appendix 7-G: Detailed Gradiometer Survey Report

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Planning Act 2008 (as amended)

Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

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**VOLUME**

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## Planning Act 2008

### The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulation 2009 (as amended)

Fosse Green Energy

Development Consent Order 202[ ]

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### **6.3 Environmental Statement Appendices**

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#### **Appendix 7-G: Detailed Gradiometer Survey Report**

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## Summary

A detailed gradiometer survey was conducted over land at Fosse Green Energy Farm & Cable Corridor, Lincolnshire (between NGR 489132 365391 (SK 89132 65391) to 501222 358195 (TF 01222 58195). The project was commissioned by AECOM with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features in support of a planning application for the development of the site as a solar farm and cable corridor.

The site comprises arable and pasture fields located between Thorpe on the Hill and Navenby, Lincolnshire covering an area of 1,431 ha. The geophysical survey was undertaken between 24/04/2023 to 17/04/2025.

A rich agricultural and settlement landscape from the prehistoric to the post-medieval period has been detected across the site. The geophysical survey has identified new archaeological sites, as well as adding further detail to already known archaeological sites.

In the east of the site an agricultural landscape possibly from the Bronze Age to post-medieval period has been identified. Consisting of a complex multi-phase field system of ditches and pit alignments and various enclosures, it also contains a ring ditch which may point to settlement or burial activity, and areas of extraction and burning. Its position close to known Romano-British roads and settlements indicates its main development may have been during the Late Iron-Age to Romano-British period.

Less archaeology has been identified in the area between the Rivers Brant and Witham, likely due to the lower elevation and wetter conditions. However, close to the River Brant a previously recorded possible 'ladder' or 'ribbon' settlement from the Late Iron Age – early medieval period has been identified.

On the western bank of the River Witham a possible settlement and associated fields have been detected. Much of this is within an area of subsequent medieval ridge and furrow. There is a rich medieval landscape in this area and the site may be from the early medieval – medieval period. It is possibly related to the nearby scheduled monument of Hall Close (NHLE: 1021080).

South along the banks of the River Witham a likely Romano-British settlement has been detected. Roman and Romano-British finds have already been recorded in this location by the Lincolnshire HER. To the north of this a series of partial Romano-British enclosures on the same orientation have been found. Further Romano-British activity is seen to the north of the Fosse Way (A46) in the form of a likely 'ladder' or 'ribbon' settlement oriented around a former right of way. Close to the Fosse Way is a collection of ring ditches and associated enclosures. It is not clear if these form an area of settlement, burial, or agricultural enclosures however they likely date from the Bronze Age to Late Iron Age / Romano-British period.

Close to the medieval village of Morton, and Morton Manor, an area of former settlement or industrial activity has been detected, along with a field system. They are likely medieval in origin.

Evidence of the agricultural use of the site into the medieval to post-medieval period is seen in the extensive remains of former ploughing, field boundaries, ponds, and extraction across the whole site.

Variations in the underlying natural deposits are seen throughout the site. The strongest anomalies seen are of alluvium, River Terrace deposits, Ironstone, periglacial cracking in Limestone, and several former palaeochannels.

## **Acknowledgements**

Wessex Archaeology would like to thank AECOM Limited for commissioning the geophysical survey. The assistance of Iain Williamson is gratefully acknowledged in this regard.

The fieldwork was undertaken by Jo Instone-Brewer, Amy Dunn, Phoebe Baker, Jack Trueman, Zhaxi Luobu, Alice Amabilino, Micheil Halliday, Matt Lester, Cameron Lane, Bethan Healey, Philip Winder, Charlotte Gibbons. Brett Howard processed the geophysical data for 2023 – 2024, and Lydia Jones processed the geophysical data for 2024 – 2025. Lydia Jones and Brett Howard interpreted the geophysical data with assistance from various members of the Terrestrial Geophysics Team. Lydia Jones wrote the report with the assistance of Matthew Lester and prepared the illustrations. The geophysical work was quality controlled by Tom Richardson. The project was managed on behalf of Wessex Archaeology by Tom Richardson.

# Fosse Green Energy Farm & Cable Corridor, Lincolnshire

## Detailed Gradiometer Survey Report

### 1 INTRODUCTION

#### 1.1 Project background

1.1.1 Wessex Archaeology was commissioned by AECOM to carry out a geophysical survey between Thorpe on the Hill and Navenby, Lincolnshire (between NGR 489132 365391 (SK 89132 65391) to 501222 358195 (TF 01222 58195)) (**Figure 1**). The survey forms part of an ongoing programme of archaeological works being undertaken in support of a planning application for the development of the site as a solar farm and connecting cable.

#### 1.2 Scope of document

1.2.1 This report presents a brief description of the methodology followed by the detailed survey results and the archaeological interpretation of the geophysical data.

#### 1.3 The site

1.3.1 The site is located between Thorpe on the Hill in the north-west and Navenby in the south-east, 8 km south-west of Lincoln, in the county of Lincolnshire.

1.3.2 The survey comprises 1431 ha of agricultural land, currently utilised for a variety of crops and some pasture.

1.3.3 Due to the size of the site the survey area has been divided into four subsections (**Figure 1**) which are as follows:

Subsection Name	Land Parcels	National Grid Reference (centre point)
North-west	DJH_019 – 026; HG_001 – 007; HOU_008 – 016; Int_001; MMF_001 – MMF_018; RB_014 - 020	489552 364384
South-west	APV_001 – 002; CJN_008 – 010; DJH_001 – 009, 027, 028; Field 89 – 91 & 93; Int. 3 – 5i, RB_001 – 013; THT_001 - 006	490451 361910
Central	APV_003 – 005; CJN_001 - 005 & 007; CRC_001 – 006; DJH_010 - 018	492751 360823
East	CRC_001 – 050; Win_001 – 002, 008 - 009	499846 359296

#### *Subsection North-west*

1.3.4 Subsection North-west is bounded to the south by the A46 and a caravan park, to the east by further agricultural fields, to the north by woodland and fields and to the west by the village of Morton and the road leading to and from the village. The village of Thorpe on the Hill is nearby to the east.

1.3.5 The site is on an incline sloping from 30 m above Ordnance Datum (aOD) in the western edge to approximately 12 m aOD at the north-eastern edge.

1.3.6 The solid geology comprises Mudstone and Limestone of the Scunthorpe Mudstone Formation, with overlying superficial geological deposits of Sand and Gravel of the Balderton Sand and Gravel member in the west. Much of the rest of the subsection has no recorded overlaying deposits, except for a small area of Eagle Moor Sand and Gravel Member (BGS 2025).

1.3.7 The soils underlying the majority of the subsection are likely to consist of slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. In the very west and north-west of the subsection there may be some naturally wet very acid sandy and loamy soils (LandIS 2025). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

#### *Subsection South-west*

1.3.8 Subsection South-west is bounded by the A46 to the north, Haddington Lane to the north-east, the River Witham and the village of Thurlby to the east, the village of Bassingham to the south-east, further agricultural fields to the south, fishing ponds to the south-west and the village of Witham Saint Hughes to the west. Moor Lane and Stone Lane cross the subsection.

1.3.9 The subsection is on an incline sloping from 26 m aOD in the north close to the A46, down to 9 m aOD near Thurlby, and back up to 14 m aOD further south near the fishing ponds.

1.3.10 The solid geology comprises Mudstone and Limestone of the Scunthorpe Mudstone Formation. There are no recorded superficial deposits across much of the site. However, along the route of the River Witham and associated tributaries in the east of the subsection, deposits of Alluvium consisting of Clay, Silt, Sand and Gravel are recorded. A small area of Sand and Gravel of the Balderton Sand and Gravel member is recorded in the north close to Stone Lane. River Terrace deposits comprising sand and gravel are recorded surrounding Thurlby in the east of the subsection (BGS 2025).

1.3.11 The soils underlying the majority of the subsection are likely to consist of slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. Loamy and clayey floodplain soils with naturally high groundwater are recorded along the route of the River Witham and associated tributaries in the east of the subsection (LandIS 2025). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

#### *Subsection Central*

1.3.12 Subsection Central is bounded by the River Witham to the west and the River Brant to the east. Fen Land runs along the southern boundary and further agricultural fields and small areas of woodland are located along the northern boundary.

1.3.13 The subsection slopes up from 8 m aOD in the west near the River Witham to 13 m aOD in the centre close to Bassingham Road. It then slopes steadily down to 8 m at the River Brant in the east.

1.3.14 The solid geology comprises Mudstone and Limestone of the Scunthorpe Mudstone Formation in the west of the subsection close to the River Witham. Across the rest of the subsection it consists of Mudstone of the Charmouth Mudstone Formation. Superficial deposits of Alluvium consisting of Clay, Silt, Sand and Gravel are recorded along the River Witham and Brant. These deposits form a particularly broad band of Alluvium close to the River Brant. A large band of Sand and Gravel of the Balderton Sand and Gravel member is

recorded in the centre. Smaller areas of River Terrace deposits comprising sand and gravel near in the centre close to Marlborough Farm and Grocock's Farm, and Sand and Gravel of the Fulbeck Sand and Gravel Member in the south-east (BGS 2025).

1.3.15 The soils underlying the west of the subsection are recorded as loamy and clayey floodplain soils with naturally high groundwater close to the River Witham, and slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. The centre of the subsection is naturally wet very acid sandy and loamy soils along with a large area of slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. The east of the subsection is likely loamy and sandy soils with naturally high groundwater and a peaty surface, as well as loamy and clayey floodplain soils with naturally high groundwater closer to the River Brant. Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey

#### *Subsection East*

1.3.16 Subsection East is bounded to the west by the River Brant. Further agricultural fields surround the rest of the site, with the villages of Hensons Lawn, Boothby Graffoe and Navenby located nearby to the south. Various roads and tracks such as Broughton Lane, Grantham Road, High Dyke, Heath Lane and Green Man Road cross the subsection at various points.

1.3.17 The subsection climbs from 7 m aOD in the west next to the River Brant up to 84 m close to Boothby Graffoe and then slopes down to 56 m at the very eastern end.

1.3.18 The solid geology comprises Mudstone of the Charmouth Mudstone Formation in the west. Just to the west of Boothby Graffoe this changes to a thin band of Mudstone of the Whitby Mudstone Formation, and then a narrow band of Sandstone and Ironstone of the Grantham Formation and Northampton Sand Formation. Eastwards from Boothby Graffoe Limestone of the Lower Lincolnshire Limestone Member and Lincolnshire Limestone Formation are recorded.

1.3.19 The soils underlying the subsection are likely to consist of loamy and clayey floodplain soils with naturally high groundwater close to the River Brant in the east, slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils in the centre, and shallow lime-rich soils over chalk or limestone.

1.3.20 Soils derived from the majority of the discussed geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey. Whilst archaeological remains may be visible in the narrow band of sandstone and ironstone, the deposits higher iron content and so stronger magnetic field may mask or reduce the 'detectability' of archaeological deposits.

## **2 ARCHAEOLOGICAL BACKGROUND**

### **2.1 Introduction**

2.1.1 This archaeological and historical background considers the recorded historic environment resources within a 1 km study area of the proposed development. Non-designated assets are mainly considered when in the immediate vicinity of the site; however, those further afield will also be discussed where relevant. The following archaeological background is not exhaustive but discusses known heritage assets relevant to the interpretation of the geophysical survey data. It has used publicly available online heritage resources such as

the Lincolnshire Historic Environment Record (LHER) and the National Heritage List for England (NHLE). Additional sources of information are referenced, as appropriate.

## 2.2 Summary of the archaeological resource

### *Scheduled monuments*

- 2.2.1 The scheduled monument of Hall Close (NHLE: 1021080) is situated immediately east of Int.4b. It comprises the remains of a medieval and post-medieval hall complex, including a dovecote, gardens, fishponds, a churchyard, and cultivation features.
- 2.2.2 Somerton Castle (NHLE: 1005015), another scheduled monument, is located 720 m south of the centre of the site (CRC\_010). This site comprises the remains of a medieval castle, later adapted into a farmhouse with associated outbuildings and surrounding features.
- 2.2.3 A further scheduled monument, the Churchyard Cross at St Germain's Churchyard (NHLE: 1013082), lies 405 m south-east of Int.5e and is believed to date from the medieval period.

### *Listed buildings*

- 2.2.4 Numerous listed buildings lie within 1 km of the site. Five are Grade I listed, including three associated with Somerton Castle, situated 720 m south of CRC\_010. These consist of the castle itself and three outbuildings (NHLE: 1061974, 10161975, and 1360511). The remaining Grade I buildings are churches (NHLE: 1360555 and 1164829).
- 2.2.5 Three buildings are listed at Grade II\*. These include the Church of St Germain (NHLE: 1061972), a medieval parish church 430 m west of Int.5f, and Coleby Hall (NHLE: 1061979), a post-medieval country house constructed on the site of an earlier hall, 960 m north of CRC\_21. The gardens of Coleby Hall are a registered park and garden. The third Grade II\* building is the Church of St Michael and All Angels (NHLE: 1061923), located 195 m south-east of Field 89.
- 2.2.6 The remaining Grade II listed buildings are distributed among the settlements of Morton, Haddington, Thurlby, Bassingham, Aubourn, Coleby, and Boothby Graffoe.

### *Conservation areas*

- 2.2.7 Conservation areas are designated in the historic cores of Bassingham, Coleby, and Boothby Graffoe, aiming to preserve the historic character and appearance of these villages.

### *Archaeological Monuments/Sites*

#### *Prehistoric*

- 2.2.8 Evidence of prehistoric activity within the study area is limited, with a small number of findspots. Early prehistoric pottery fragments and a patinated flint blade were recovered from the western part of Int.5b at Swinderby Sewage Treatment Works, likely dating to the Neolithic or Bronze Age. A Neolithic flint tool, possibly a chisel, was found in the north-west corner of APV\_003.
- 2.2.9 Additional finds include a Neolithic stone adze 490 m east of CRC\_050 and another possible Neolithic chisel south of CJN\_007.

2.2.10 A barbed and tanged Bronze Age arrowhead was discovered near Morton within MMF\_009. Cropmarks indicating two prehistoric enclosures are situated 820 m north-east of CRC\_034.

2.2.11 A possible late Iron Age bronze coin depicting a horse was found east of Bassingham.

*Romano-British*

2.2.12 The Fosse Way, following the route of the A46, bisects the site. Another Roman road, Ermine Street (now known as High Dike), runs north – south along the eastern edge of the site, just outside CRC\_028 – 031, and Mareham Lane (A15) is 700 m to the east of CRC\_050.

2.2.13 A thin scatter of Romano-British pottery was recorded north of the Fosse Way near DJH\_026. Within Field 89, metal detecting has recovered Roman coins and brooches, alongside an Iron Age coin and Roman pottery. A bronze pin was also found 240 m north-east of Field 91.

2.2.14 A Roman coin of uncertain date was found through metal detecting east of LP\_CRC\_040.

2.2.15 A 4th century coin of Constantine II was discovered behind the Halfway House pub, 60 m west of Hou\_014, and another 4th century coin was found 100 m west of Win\_001.

2.2.16 A zoomorphic brooch, possibly late Roman in date, was recovered 240 m north of Field 93. Further Romano-British evidence was found within Bassingham, 370 m east of DJH\_006, including pits, postholes, and agricultural features such as defined field systems, ditches, and gullies.

2.2.17 A fortified Roman villa (NHLE: 1005018), located 1 km west of Norton Disney, was occupied between AD 70 and 360. The site evolved from a wooden structure into a substantial stone building surrounded by a defensive ditch.

2.2.18 Navenby, 800 m to the west of Win\_009, was a small Roman town, although evidence for settlement dating back to the Neolithic period has been recorded. Various surveys and evaluations have been conducted at the town revealing amongst other things stone buildings, a metalled trackway, pits, demolition deposits, and pottery.

2.2.19 Immediately north of CRC\_027, a post-medieval quarry yielded substantial Romano-British remains, including pits containing ash and pottery (2nd – 4th century), pottery sherds, a rotary quern, a lead spindle whorl, and a hoard of Roman coins, indicating the presence of a settlement.

*Medieval*

2.2.20 During the medieval period, the landscape was divided into landholdings administered by manor complexes and ecclesiastical parishes, laying the groundwork for the post-medieval agricultural landscape still evident today.

2.2.21 Numerous villages around the site have medieval or earlier origins. Morton, north of Hou\_013, was first documented in the 13th century and retains ridge and furrow earthworks to its north-east. An earlier settlement likely existed around Morton Manor, close to MMF\_010.

2.2.22 Haddington, immediately east of Int.4a – 4c, was recorded in the Domesday Book, with ridge and furrow and possible settlement remains visible in nearby fields. Thurlby (280 m

east of Int.5f) and Boothby Graffoe (south of LP\_CRC\_025) also have medieval origins, with aerial imagery showing ridge and furrow and associated field systems. Coleby, 700 m north of CRC\_025, has Anglo-Saxon origins; aerial photographs show ridge and furrow in fields south and west of the village.

- 2.2.23 The medieval chapel of St Nicholas may have stood near Aubourn, possibly adjacent to Dovecote Lane. Aubourn also hosted a watermill within CJN\_001, in use from at least 1076 until its demolition in the 1960s.
- 2.2.24 Evidence of medieval agriculture, such as ridge and furrow, field boundaries, and hollow ways, has been identified across the site and surrounding area, particularly within RB\_013, Int 3, Field 93, Int 4, and RB\_015. Further areas of ridge and furrow have been documented in fields such as DJH\_027, THT\_001, THT\_002, and other locations surrounding DJH\_006 to DJH\_008.
- 2.2.25 Two medieval pottery fragments were found at separate locations in CRC\_011, with another recovered just outside the site in the same field to the south.
- 2.2.26 A potential medieval settlement may have existed at Marlborough Farm, 165 m north of CRC\_004.
- 2.2.27 Metal detecting within Field 89 uncovered a silver long cross penny, while another coin was found west of APV\_003. Two medieval buckles were found east of CRC\_040.
- 2.2.28 Significant finds within MMF\_001 include an Anglo-Saxon brooch, 24 pottery sherds (including green-glazed wares and shell-gritted ware potentially dating to the 9th century), and 3 jug handles. Additionally, coins, a brooch, and a possible horse harness fitting were found on a ploughed-out mound south of DJH\_006.

#### *Post-medieval*

- 2.2.29 Development during the post-medieval period appears limited. Most areas continued in agricultural use, as evidenced by surviving and demolished agricultural buildings, field boundaries, ditches, and drainage systems. Demolished farmsteads are recorded within CRC\_009 and 160 m north of CRC\_013 and various post-medieval farm buildings are present near the site. Housham Grange Farm, situated between Int.001 and Hou\_007 – 011, was one of two farms forming the hamlet of Housham.
- 2.2.30 A 2017 – 2018 geophysical survey 980 m west of Hou\_013 identified post-enclosure quarry pits, post-medieval field boundaries, drainage features, and undated linear anomalies.
- 2.2.31 A park is depicted immediately west of APV\_004 on 1880 OS maps.
- 2.2.32 An Elizabethan coin was discovered in the field west of APV\_003.
- 2.2.33 Post-medieval extraction pits are noted at Norton Bottoms Quarry. A disused quarry, marked on 1905 OS mapping, lies immediately north of CRC\_027 and was abandoned by the 1970s.

#### *Modern*

- 2.2.34 To the west of the site lies the former RAF Swinderby, operational from 1940 until its closure and sale in 1993. Near Thurlby, a World War II aircraft crash site is located; debris thought to be from an Avro Manchester was collected here. This location may fall within the eastern

extent of LP\_Int.5e and 5f. RAF Coleby Grange, 200 m north-east of LP\_Win\_002, was a fighter and satellite airfield for RAF Digby, active from 1940 until 1963.

*Undated*

2.2.35 Undated cropmarks interpreted as possible enclosures and field boundaries have been identified in the eastern part of CRC\_008. An undated linear bank and ditch are recorded immediately south of Int. 001.

### **3 METHODOLOGY**

#### **3.1 Introduction**

3.1.1 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between the 24/04/2023 to 17/04/2025. Field conditions at the time of the survey were varied with extreme wet and waterlogged periods in the autumn and winter of 2023 and into the start and end of 2024. An overall coverage of 1,011.3 ha was achieved with reductions due to areas of bird cover, high crop and vegetation, rough plough, rutted and uneven ground, and waterlogging.

3.1.2 The methods and standards employed throughout the geophysical survey conform to that set out in the Written Scheme of Investigation (WSI) (Wessex Archaeology 2023 and 2024), as well as to current best practice, and guidance outlined by the Chartered Institute for Archaeologists' (ClfA 2020) and European Archaeologiae Consilium (Schmidt *et al.* 2015).

#### **3.2 Aims and objectives**

3.2.1 The aims of the survey comprise the following:

- To determine, as far as is reasonably possible, the nature of the detectable archaeological resource within a specified area using appropriate methods and practices; and
- To inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.

3.2.2 In order to achieve the above aims, the objectives of the geophysical survey are:

- To conduct a geophysical survey covering as much of the specified area as possible, allowing for on-site obstructions;
- To clarify the presence/absence of anomalies of archaeological potential; and
- Where possible, to determine the general nature of any anomalies of archaeological potential.

#### **3.3 Fieldwork methodology**

3.3.1 The cart-based gradiometer system used a Leica Captivate RTK GNSS instrument and Carlson BRX-7, which receive corrections from a network of reference stations operated by the Ordnance Survey (OS) and for the former Leica Geosystems. Such instruments allow positions to be determined with a precision of 0.02 m in real-time and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015).

3.3.2 The survey was conducted using four or eight Sensys FGM650/3 magnetic gradiometers spaced at 1 m or 0.5 m intervals and mounted on a non-magnetic cart either hand-pushed

or ATV-towed. Data were collected with an effective sensitivity of  $\pm 8 \mu\text{T}$  over  $\pm 1000 \text{ nT}$  range at a rate of 100 Hz, producing intervals of 0.02 m along transects spaced 4 m apart.

### 3.4 Data processing

- 3.4.1 Data from the survey were subjected to minimal correction processes. These comprise a 'Destripe' function ( $\pm 5 \text{ nT}$  thresholds), applied to correct for any variation between the sensors, and an interpolation used to grid the data and discard overlaps where transects have been collected too close together.
- 3.4.2 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

## 4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

### 4.1 Introduction

- 4.1.1 The detailed gradiometer survey has identified magnetic anomalies across the site. Results are presented as a series of greyscale plots, and archaeological interpretations at a scale of 1:15,000 (**Fig. 2 – 9**) and 1:2,000 (**Fig. 10 – 151**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image.
- 4.1.2 Due to the size of the site it has been split into subsections based on geographical location within the overall Fosse Green site: *North, South-west, Central and East and West*.
- 4.1.3 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous responses, burnt or fired objects, and magnetic trends (**Fig. 11, 13, 15...151**). Full definitions of the interpretation terms used in this report are provided in **Appendix 2**.
- 4.1.4 Numerous ferrous anomalies are visible throughout the dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.
- 4.1.5 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be present than have been identified through geophysical survey.
- 4.1.6 Gradiometer survey may not detect all services present on site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g., CAT and Genny) should be used to confirm the location of buried services before any trenches are opened on site.

### 4.2 Gradiometer survey results and interpretation

#### *Subsection North-west*

##### Archaeology and possible archaeology

- 4.2.1 In the centre of subsection North-west, straddling HG\_006 – 007 a series of strong and weak interlinking positive linear, curvilinear, and discrete anomalies have been detected at **HG\_007.01 (Figure 35)**. They cover an area of 220 m north – south and 154 m east – west. The linear anomalies are up to 3 m wide. They are typical of ditched features and appear to form a series of interlinking rectilinear enclosures, some with internal sub-divisions. The series of anomalies look to be oriented along a former footpath and field boundary visible

on the 1886 (Lincolnshire LXXVII.NE) – 1953 (SK96) OS mapping, running north – south through the fields.

4.2.2 The internal enclosures are between 17 x 4 m (**a**) and 19 x 23 m (**b**), and some have further sub-divisions formed by ditch-like features (**c**). Within and surrounding these internal enclosures are many positive discrete anomalies, a clear example being at **d**. They are typical of pit features. These are 1 – 2 m in diameter and were likely pits used for storage, waste disposal, or post-holes. Various very strong anomalies are seen across **HG\_007.01**, these may be small areas of burning such as hearths, ovens, or kilns. A set of parallel linear anomalies have been detected at **e**. They are 87 m long, 1 – 2 m wide, and spaced 4 m apart. They are likely to be a trackway running alongside / entering **HG\_007.01**. At **f** two linear ditched features have been detected on a different orientation to the majority of the anomalies which indicates successive phases of use.

4.2.3 It is considered likely that **HG\_007.01** is a series of enclosures used for settlement activity. Some of the enclosures with less internal anomalies may have been used for resource or animal storage. Given the rectilinear nature of the enclosures, following a former right of way recorded on OS mapping, and with a trackway detected along one edge of the settlement, it is considered likely that this is a former 'ladder' or 'ribbon' settlement. These settlements are commonly dated to the Late Iron Age to early medieval period and are normally oriented around a trackway. Given the morphology of the settlement and proximity to the Fosse Way (A46) to the south, it is considered more likely to be from the Late Iron Age to Romano-British periods.

4.2.4 In the east of subsection North-west, 115 m north of the Fosse Way, a collection of weak positive curvilinear, linear and annular anomalies have been detected at **DJH\_023.01** (**Figure 37**). They cover an area of 100 x 71 m and are typical of ditches. Their magnetic field is particularly weak making accurate interpretation difficult. At the centre is an annular anomaly at **a**, it is 16 m in diameter and has a ditch 1 m wide. Immediately to the east are two further fragmentary annular anomalies at **b** and **c**, these are 17 m and 15 m diameter respectively. These are likely ring-ditches, forming enclosures, drip gullies for round houses, or barrows. To the immediate east of **a** are two further enclosures at **d** and **e** covering areas of 23 x 25 m and 23 x 22 m respectively. Given the weak nature of these anomalies it is impossible to determine their function, however they may have been used as animal enclosures, for settlement with associated animal enclosures, or barrows. Given their morphology it is likely they date from the Bronze Age to Late Iron Age / Romano-British periods.

4.2.5 In **DJH\_021** a series of weak positive linear and curvilinear anomalies has been detected at **DJH\_021.01** (**Figure 39**). They are between 1 – 3 m wide and cover an area of 115 x 78 m. They are oriented north-east to south-west, and approximately east – west, and are typical of ditched features. At **a** the anomalies look to form an enclosure of unknown date covering 55 x 28 m. Weaker, more fragmented anomalies are located to the immediate east of this at **b**. They do not form any recognisable morphology. **DJH\_021.001** may be the remains of an enclosure possibly used for agricultural purposes. Further investigation would be needed to determine its origin and use.

4.2.6 To the east of Morton a complex series of strong and weak positive linear, curvilinear and discrete anomalies have been detected at **MMF\_013.01** (**Figure 17**). The main area located within **MMF\_013** covers an area of 130 x 117 m. It appears to be delimited by three ditch features at **a**, **b**, and **c** to the north-west, south-west, and south-east respectively. These are between 1 – 3 m wide. It is unclear whether **c** is contemporary to **MMF\_013.01** or later, due to its very straight morphology and as it may link up with a more modern drainage

regime to the south in MMF\_015. The ditch feature at **a** is curvilinear in nature and at points consists of two parallel ditched features spaced 3 – 4 m apart. This appears to continue to the west into MMF\_009 (**MMF\_009.01**), oriented east – west towards the farmstead of Morton Manor. Given its morphology it is likely a double-ditched trackway used to access **MMF\_013.01**.

4.2.7 The anomalies within **MMF\_013.01** are fragmentary and overlapping making it difficult to accurately interpret. However, they appear to consist of various linear and curvilinear anomalies up to 27 m long and 3 m wide, oriented north-east to south-west. At points these form rectilinear enclosures covering between 5 x 5 m and 10 x 25 m with clear examples at **d** and **e**. Strong positive discrete and amorphous anomalies have been detected across **MMF\_013.01**. They are between 1 – 10 m in diameter with clear examples at **f** – **h**. It is likely these are pit features, possibly used for storage, waste disposal, or small-scale extraction either contemporary with the use of **MMF\_013.01** or later to access and reuse materials, such as stone. The smaller discrete anomalies may be former post-holes. Several stronger discrete anomalies detected across the site, a clear example being at **i**, may be evidence of burning in the form of hearths, ovens, or kilns. Given the enclosures and number of other anomalies present it is likely that this area was a former settlement, or area used for industrial activity. Former, likely medieval to post-medieval ridge and furrow is recorded to the north and possibly south of **MMF\_013.01**. The ridge and furrow to the north (**MMF\_013.02**) is on a different orientation to **MMF\_013.01** which indicates that it is from a different phase of activity. Given **MMF\_013.01** has a trackway leading from Morton Manor, and its proximity to Morton which was first recorded in the Book of Fees (1242 – 43), it is considered likely to be medieval in origin. However, an earlier date could be possible.

4.2.8 In MMF\_009 a series of weak positive linear anomalies have been detected at **MMF\_009.02** (**Figure 15**). They are oriented north-north-west to south-south-east and east-south-east to west-north-west. They are up to 2 m wide, cover an area of 200 x 70 m and are typical of ditches. It is likely that these are former field boundaries, some possibly forming enclosures. Whilst some look to be on a similar orientation to both the current road through Morton, and the post-medieval field boundaries recorded on historical OS mapping, others appear to cross the post-medieval boundaries. The surrounding ridge and furrow is on a different orientation to these field boundaries indicating they are of different phases of use. They have therefore been interpreted as likely medieval to post-medieval field boundaries related to the settlement of Morton. An earlier date is possible, however further investigation is needed to confirm their origin.

#### Possible archaeology

4.2.9 In MMF\_006 and MMF\_003 weak positive linear anomalies have been detected at **MMF\_006.01** (**Figure 11**). They are typical of ditches and are 1 – 2 m wide. At the north-eastern end they form a square enclosure at **a** covering 18 x 17 m. Leading away from the south-west corner of this enclosure a linear anomaly extends to the south-west for 75 m, and then to the south for 22 m. This crosses the field boundary between MMF\_006 and MMF\_003. The origin and use of this enclosure and ditch is unclear, but it may have formed an animal management enclosure and associated field boundary.

4.2.10 To the east of **MMF\_006.01** in MMF\_017 a weak negative sub-rectilinear anomaly has been detected at **MMF\_017.01** (**Figure 13**). It is between 2.6 m – 5 m wide, encloses an area of 53 m x 24 m and is on a south-west to north-east orientation. It has three visible sides, on the south, east, and north. A western edge is not apparent; however this may be hidden by the large number of ferrous anomalies in this area. Post-medieval field boundaries look to extend from it in the east and west on the same orientation. Based on the magnetic properties and location it is likely an old sheep or animal pen or building built out of stone and related to the post-medieval boundaries.

4.2.11 In the north-east of subsection North-west a series of weak positive interlinking linear, and strong positive discrete anomalies have been detected at **RB\_016.01** (Fig. 29 and 31). They are 10 – 100 m long, 1 – 2 m wide and typical of ditched anomalies. They are oriented north-east to south-west and north-west to south-east. This is different to the surrounding post-medieval field boundaries and cultivation trends. They are on the same orientation as the Late Iron Age to Romano-British ladder settlement (**HG\_007.01**) 600 m to the south. Several discrete anomalies, 1 – 3 m in diameter, have been detected with a clear example at **a**. These are consistent with pit features; however it is not known if they are anthropogenic, and used for waste, storage, or post-holes, or natural pitting in the underlying deposits. It is likely that **RB\_016.01** are a series of ditches that once formed field boundaries and possible enclosures. It is possible that more once existed of these features, however preservation is either poor or the contrast between the fill of the ditches and the surrounding soil is low causing them to be weak or undetectable by magnetometry. They likely date from the prehistoric – medieval periods. Further investigation would be needed to fully understand their origin.

#### Historic landscape features

4.2.12 Across subsection North-west strong amorphous anomalies have been detected of various sizes at **DJH\_021.02, 025.01, RB\_019.01, HG\_005.01**, and **MMF\_009.03** (Fig. 17, 25, 33, 35, 39). They are all former ponds as recorded on historical OS mapping.

4.2.13 In HOU\_014 the remains of a former well recorded on historical OS mapping, and by the field team at the time of survey, have been detected at **Hou\_014.01** (Figure 21).

#### Former field boundaries

4.2.14 Strong and weak positive linear anomalies have been detected across subsection North-west. They are between 1 – 3 m wide, up to 330 m long and on various orientations. They are former field boundaries recorded between the 1886 (Lincolnshire LXXVII.NE) – 1953 (SK96) OS mapping.

#### Historic cultivation

4.2.15 Weak positive linear anomalies have been detected across subsection North-west. They are of varying lengths, widths, and orientation. They are likely remnants of former cultivation from the medieval to post-medieval period. They have been detected at **MMF\_017.02, MMF\_013.02, MMF\_009.04, HG\_006.01, DJH\_024.01, DJH\_025.02**, and **DJH\_023.02** (Fig. 13, 17, 35, 37).

#### Agricultural trends and drains

4.2.16 Weak and strong positive and dipolar linear anomalies have been detected across the subsection. These are likely post-medieval to modern cultivation and drainage regimes. Some may be the remnants of earlier medieval cultivation; however, cannot be confidently interpreted as such due to weak nature or limited context.

#### Magnetic disturbance

4.2.17 Across HOU\_007 – 008, 010 – 014, 016, HG\_001 – 002, 004 – 005, Int\_001, and MMF\_017 – 018 strong magnetic responses have been detected. They are the result of the modern spreading of highly magnetic fertiliser or green waste. Due to the strong magnetic responses, any weaker archaeological anomalies present will be masked and difficult or impossible to detect.

4.2.18 Areas of strong magnetic disturbance have been detected in MMF\_009 at **MMF\_009.05 – 06** (Figure 15). There is no evidence from aerial imagery (Google Earth 2025) as to what

these are, however given the strong magnetic response it is considered likely to be post-medieval to modern magnetic waste potentially dumped to level out fields or create temporary trackways.

### Geology

4.2.19 Across the north-east of the subsection positive sinuous and amorphous bands of enhanced response have been detected. These are typical of variations in the underlying superficial deposits.

4.2.20 In MMF\_002 (**Figure 15**), close to a watercourse, positive and negative mottled and sinuous responses have been detected. These are considered likely to have been caused by either previous flooding events or the previous course of the stream, depositing enhanced material in this location. Areas of strong magnetic disturbance are recorded close by. These may also be the result of flooding and deposition of highly magnetic material, or the result of the dumping of agricultural waste or rubble intentionally in this field.

### Modern service

4.2.21 A strong dipolar linear anomaly (**HG\_002.01**) has been detected crossing the subsection east – west from MMF\_009 to HG\_002 where it then splits into two and crosses HG\_004 and HOU\_010 (**Figure 23**). This is a modern service. Further modern services have also been detected at **HOU\_016.01**, **MMF\_009.07**, **RB\_019.02**, and **RB\_020.01** (Fig. 15, 21, 27, 33).

### **Subsection South-west**

#### Archaeology and possible archaeology

4.2.22 Close to the River Witham a complex series of strong positive interlinking linear, curvilinear, and discrete anomalies have been detected at **Int.4c.01** (**Figure 91**) and **THT\_006.01** (**Figure 93**). Those in Int.4c cover an area of 200 m north-east to south-west by 170 m north-west to south-east. They are typical of ditched features and are up to 3 m wide. They form various interlinking rectilinear enclosures. Medieval ridge and furrow has also been detected at this location, and at points looks to have dragged the material from **Int.4c.01** in the direction of ploughing, an example of this is seen at **a**. Due to this, it is at points difficult to determine between the extents of **Int.4c.01**, and the spread of its material in the ridge and furrow. The clearest enclosure of **Int.4c.01** can be seen at **b**. It is 84 x 76 m with at least one internal enclosure at **c** of 47 x 56 m. Two parallel linear anomalies extend from within **b** towards the south at **d**, they are 56 m long and spaced 6 m apart. They are a double-ditched trackway. There may be further internal subdivisions within both **b** and **c** however it is not clear if these are real or caused by the ridge and furrow. Further enclosures with areas between 7 x 2 m to 49 x 55 m have been detected surrounding the enclosure at **b**, many containing subdivisions. Strong discrete anomalies have been detected throughout, a clear example being at **e**. It is not known if these are caused by pit-like features, or if they are the remnants of ploughed out ditches and associated material. The complexity and density of anomalies at **Int.4c.01** indicates possible settlement activity. However, the proximity to the River Witham and risk of flooding throws some doubt on this interpretation and it should be noted that the more complex anomalies coincide with the medieval ridge and furrow which may be causing this effect. The area of activity's southern extent at **THT\_006.02** consists of less complex linear anomalies which may represent surrounding agricultural enclosures or field ditches.

4.2.23 In the south of THT\_006, 135 m south of **Int.4c.01** a further set of interlinking anomalies has been detected at **THT\_006.01**. The anomalies are much weaker in magnetic field than **Int.4c.01** and have likely been at least partially masked by the presence of alluvium

detected as an enhanced magnetic response in this area. To the immediate south and east is a tributary of the River Witham. They cover an area of 76 x 83 m and are up to 4 m wide. They are on the same orientation as the series of enclosures at **Int.4c.01** so it is possible they are contemporary. It is possible that **Int.4c.01** and **THT\_006.01** were once connected set of enclosures, with the alluvial deposits at **THT\_006.02** masking this.

4.2.24 There is rich evidence of medieval activity in the surrounding area. Immediately to the north-west of Int.4c is the scheduled monument of Hall Close: a medieval and post-medieval hall complex south of Dovecote Lane, with dovecote, gardens, fishponds, churchyard and cultivation remains (NHLE: 1021080). The site of a medieval watermill (MLI82089) is also recorded on the opposite side of the River Witham. The settlement of Haddington (MLI83395), with its origins in the Anglo-Saxon period, is recorded 350 m north-east of Int.4c; and the settlement of Thurlby (MLI85878), first recorded in the Domesday book, is 250 m to the south of THT\_006. It may be that **Int.4c.01** and **THT\_006.01 – 02** are agricultural enclosures and possible settlement activity from the early medieval – medieval period, an earlier phase to the ridge and furrow also recorded in the fields. These could be related to the moated site and the settlement at Haddington. However, given the proximity to the Fosse Way to the west they may also be older, from the late prehistoric to Romano-British periods, and represent the continued use of this area due to the valuable resource of the River Witham and nearby routeway. Further investigation is necessary to understand these anomalies.

4.2.25 Further south in subsection South-west a collection of weak and strong positive linear anomalies have been detected in Field 89 (**Field89.01**), 100 m to the west of the River Witham (**Figure 77**). They cover an area of 176 x 96 m oriented north-east to south-west and north-west to south-east. Their eastern extent is formed by the edge of the survey area, and it is likely they continue beyond this. They are up to 3 m wide and are typical of ditched features. In the southern section of **Field89.01** the anomalies appear to form a rectilinear enclosure covering an area of 91 x 63 m at **a**. There is a gap in its south-eastern boundary of 30 m. Within this enclosure are various other linear anomalies forming further subdivisions. The largest subdivision at **b** forms a rectilinear enclosure covering 53 x 37 m within which are various linear, curvilinear, and discrete anomalies possibly forming further subdivisions and features. The eastern boundary and internal linear anomalies appear regularly fragmented which may be indicative of damage caused by ploughing. Several strong positive discrete anomalies have been detected within and around **a**, a clear example is seen at **c**. They are between 1 – 2 m in diameter. They are typical of pit features possibly used for storage, waste disposal, or post-holes. Several very strong positive anomalies have also been detected, a clear example being at **d**. These may be small areas of burning such as hearths, ovens, or kilns. Given the intensity of anomalies within **a** this may be evidence of settlement activity. Further linear and curvilinear anomalies have been detected at **e**. These likely form further enclosures however they are fragmentary and there is not enough context to confidently interpret. In this field a Roman coin and brooches were discovered by metal detector survey, and field walking identified Romano-British pottery (MLI86270). Given the morphology of the anomalies and finds from this area it is considered likely that these anomalies are settlement and associated enclosures from the Romano-British period.

4.2.26 Weak positive linear anomalies on the same orientation as **Field89.01** have been detected 630 m to the north-west in Field 93 (**Field 93.01**) (**Figure 75**). These are up to 2 m wide by 102 m long and likely ditched features. One linear anomaly, 102 m long, is oriented north-east to south-west with four connecting anomalies branching off its southern end towards the north-west. These extend to between 20 – 27 m. At the southern end the anomalies look to form an enclosure at **a** which covers an area of 16 x 9 m. At the north of **Field93.01**

a T-shaped linear anomaly has been detected. This, however, is very weak in magnetic field and it is difficult to determine if it is part of **Field93.01** or the result of cultivation activity. The anomalies at **Field93.01** may be the remains of ditched enclosures however no recognisable morphology is evident which would allow a confident interpretation. Given the regular morphology and orientation similar to **Field89.01** they may be Romano-British in origin.

4.2.27 Several weakly positive linear anomalies have been detected at **CJN\_010.01 – 02** (**Figure 49**) and **THT\_002.01** (**Figure 55**). They are between 29 – 247 m, up to 1 m wide, and oriented east – west. They are typical of ditched features and on a similar orientation to other former field boundaries. They may be former field boundaries dating from before the available historical mapping.

4.2.28 Two parallel, weak positive anomalies have been detected at **CJN\_008.01** (**Figure 57**). They are up to 114 m long, 1 m wide, spaced 8 m apart and oriented south-east to north-west. They are similar in morphology and magnetic properties to two former field boundaries in **THT\_001** and are likely to be an unmapped continuation of these boundaries.

4.2.29 In DJH\_002 close to a farm building are two positive diffuse anomalies at **DJH\_002.01** (**Figure 71**). They are 15 x 15 m and 14 x 14 m and approximately square in shape. Their magnetic signal is typical of extraction activity. The anomalies are 60 m north-west of Church Farm, a partially extant farmhouse that is recorded on historical OS mapping (Lincolnshire LXXXV.NE) and dates from the 19th century. It is therefore likely these anomalies are extraction activity related to this farmhouse from the post-medieval to modern period.

#### Historic landscape features

4.2.30 A spread of highly magnetic material has been detected in the north of DJH\_002 close to **DJH\_002.01** at **DJH\_002.02** (**Figure 71**). It is immediately to the west of Church Farm, a partially extant farmhouse that is recorded on historical OS mapping (Lincolnshire LXXXV.NE) and dates from the 19th century. It is also in close proximity to various former field boundaries from the post-medieval period. It is likely that this magnetic spread is the result of field boundary removal and building demolition at Church Farm.

4.2.31 In Int.4d an area of strong dipolar response has been detected at **Int.4d.01** (**Figure 91**). It is the same position as a weir and ford connected with Aubourn Mill (ML82089) which is on the opposite side of the river. There has been a mill on this site since at least 1076 and it was demolished in 1968. The strength of the response indicates a modern cause, such as a buried service, however in case this is related to Aubourn Mill such as an associated drain, it has been categorised as a historic landscape feature.

4.2.32 Various strong positive amorphous anomalies have been detected across the subsection at **CJN\_009.01**, **Int.4a.01 – 02**, **Int.5b.01**, **Int.5h.01**, **DJH\_007.01**, **DJH\_009.01 – 02**, **Field93.02**, **RB\_002.01**, **RB\_005.01**, **RB\_013.01**, and **THT\_003.01** (**Fig. 47, 59, 61, 65, 67, 69, 73, 75, 81, 85**). They all correspond with the location of former ponds recorded between the 1886 (Lincolnshire LXXVII.NE) – 1953 (SK96) OS mapping.

#### Former field boundaries

4.2.33 Strong and weak positive linear anomalies have been detected across subsection South-west. They are between 1 – 3 m wide, up to 874 m long and on various orientations. They are former field boundaries recorded between the 1886 (Lincolnshire LXXVII.NE) – 1953 (SK96) OS mapping.

#### Historic cultivation

4.2.34 Weak positive linear anomalies have been detected across subsection South-west at **DJH\_027.01, DJH\_028.01, Int.3.01, Int.4c.02, CJN\_010.03, CJN\_009.02, CJN\_008.01, THT\_002.02, THT\_003.01, Int.5d.01, RB\_013.02 – 03, Field93.03 – 05, RB\_007.01, DJH\_002.03 – 04, DJH\_003.01, DJH\_004.01, DJH\_007.02 – 03, DJH\_008.01 – 02, and DJH\_005.01** (Fig. 37, 47, 49, 51, 57, 59, 65, 71, 73, 75, 79, 83, 85, 87, 91). They are of varying lengths, widths, and orientation. They are likely remnants of former cultivation from the medieval to post-medieval period and associated with the surrounding villages.

4.2.35 The former cultivation seen in Int.4c at **Int.4c.02 (Figure 91)** has been detected on various orientations and looks to form several different areas or regimes of medieval ridge and furrow. This ridge and furrow is already recorded in the Lincolnshire HER (MLI83438) and is likely related to the scheduled Hall Close, a medieval and post-medieval hall complex (NHLE 1021080) immediately to the north-east.

#### Agricultural trends and drains

4.2.36 Weak and strong positive and dipolar linear anomalies have been detected across the site. These are likely post-medieval to modern cultivation and drainage regimes. Some may be the remnants of earlier medieval cultivation, however, cannot be confidently interpreted as such due to weak nature or limited context.

#### Magnetic disturbance

4.2.37 A strong magnetic linear anomaly has been detected crossing THT\_005 (**THT\_005.01**) east – west (Figure 63). It is 409 m long and up to 17 m wide. Given its magnetic signal this is likely a former trackway or infilled drainage ditch.

#### Geology

4.2.38 In the east of the subsection at **Int.4d.02 – 03** and **THT\_006.03** (Fig. 91 and 93) strong positive and negative mottled and sinuous anomalies have been detected covering an area of 495 x 200 m. At **Int.4d.02 – 03** these anomalies cover the surveyed area, whilst those at **THT\_006.03** intrude into just the east of THT\_006. The River Witham runs immediately to the east. They are considered to be variations in the underlying riverine clay and floodplain sands and gravel caused by flooding events and possible changes in the route of the River Witham.

4.2.39 An area of slightly enhanced mottled magnetic response covering an area of 210 x 90 m at **Field93.06** (Figure 71). This is likely an area of natural variation in the superficial deposits.

#### Modern service

4.2.40 A strong dipolar linear anomaly (**DJH\_008.03**) (Fig. 83 and 85) has been detected crossing DJH\_008 and DJH\_007 for 1.2 km. At its far western end it appears to be fragmentary. A similar anomaly has been detected crossing DJH\_004 – 006 for 850 m (**DJH\_005.02**) (Figure 81). These are typical of modern services.

4.2.41 Smaller modern services have been detected at **DJH\_009.03, THT\_001.01, and Int.5b.02** (Fig. 55, 65, 81).

#### **Subsection Central**

##### Archaeology and Possible archaeology

4.2.42 In CJN\_004 a weak linear and curvilinear fragmented positive anomaly has been detected at **CJN\_004.01**, 1 km from the River Witham on the surrounding River Terrace deposits (Figure 99). It consists of a linear anomaly at a which extends for 67 m north-east to south-

west. It is up to 2 m wide and consistent with a ditch-like feature. This anomaly curves at its north-eastern end forming a semi-annular anomaly at **b** which encloses a space of 15 x 17 m. At its south-western end it turns to the north-east for 20 m and then curves forming a C-shaped anomaly at **c**, which is 11 m in diameter. These anomalies may form the remains of a ditch and associated ditched enclosures at **b** and **c**, however given its fragmentary nature and lack of recognisable morphology no definitive interpretation of its use or origin can be provided. Further investigation would be needed to understand this anomaly.

4.2.43 Further weak positive linear anomalies have been detected on the River Terrace deposits 260 m to the east of **CJN\_004.01** at **CJN\_007.01** (**Figure 99**). They are up to 3 m wide and cover an area of 106 x 55 m. They are located on the eastern boundary of the field and may continue beyond it. These anomalies are typical of ditched features. They may represent former ditched enclosures or field boundaries. While similar to the anomalies at **CJN\_004.01** the lack of definitive morphology means no further interpretation can be determined.

4.2.44 In the far east of subsection Central a strong positive linear has been detected on the alluvium immediately west of the River Brent at **DJH\_017.01** (**Figure 117**). It is typical of a ditched feature. It sits within an area of strong enhanced deposits likely deposited during flooding events. It is 205 m long, up to 4 m wide, and is L-shaped. The longer ditch is oriented north-west to south-east and leads towards the River Brent. Given its location it may be the remnants of a former drainage channel leading into the river. Natural palaeochannels have been detected to the north-west and west. The right-angled morphology at its northern end indicates it may be man-made, however there is the possibility it is a natural channel altered by human activity.

#### Historic Landscape Features

4.2.45 Spreads of highly magnetic material have been detected at **CJN\_002.01** and **DJH\_010.01** (**Fig. 95 and 103**). They are in the same location as former agricultural buildings recorded on the 1886 (Lincolnshire LXXVII.NE) OS map and are likely the remnants of rubble and foundations of these buildings.

4.2.46 At **CJN\_002.02** an area of highly magnetic responses covering 55 x 29 m has been detected (**Figure 93**). This is the location of a former gravel pit recorded on the 1886 (Lincolnshire LXXVII.NE) OS map. The magnetic signal indicates the pit was filled with highly magnetic rubble after it was abandoned.

4.2.47 Amorphous anomalies have been detected across the subsection at **DJH\_011.01** and **DJH\_012.01** (**Figure 105**). They correspond with the location of former ponds recorded between the 1886 (Lincolnshire LXXVII.NE) – 1953 (SK96) OS mapping. Given its strong dipolar magnetic field the former pond at **DJH\_012.01** has likely been infilled with highly magnetic material.

#### Former field boundaries

4.2.48 Strong and weak positive linear anomalies have been detected across subsection Central. They are between 1 – 3 m wide, up to 168 m long, and on various orientations. They are former field boundaries recorded between the 1886 (Lincolnshire LXXVII.NE) – 1953 (SK96) OS mapping.

#### Historic cultivation

4.2.49 Weak positive linear anomalies have been detected in the east of subsection Central at **CJN\_002.03 – 04** and **CJN\_007.02** (**Fig. 93, 97, 99**). They are of varying lengths, widths,

and orientation. They are likely remnants of former cultivation from the medieval to post-medieval period and associated with the surrounding villages.

#### Agricultural trends and Drains

4.2.50 Weak and strong positive and dipolar linear anomalies have been detected across the site. These are likely post-medieval to modern cultivation and drainage regimes. Some may be the remnants of earlier medieval cultivation, however, cannot be confidently interpreted as such due to weak nature or limited context.

#### Geology and Geomorphology

4.2.51 Various strength amorphous and sinuous anomalies have been detected across the section which represent changes in the underlying superficial deposits. In the west of the subsection at **CJN\_001.01** these are likely related to the alluvial deposits close to the River Witham (**Figure 91**). At **CJN\_003.01** and **CJN\_007.03 – 04** sinuous anomalies have been detected which may be due to the movement of water across the sands and gravels of the River Terrace deposits (**Fig. 97, 99, 101**).

4.2.52 A broad band of strong mottled anomalies has been detected running roughly north-east to south-west across APV\_003 – 005 and DJH\_010 (**APV\_003.01**, **APV\_004.01**, and **DJH\_010.02 – 03**) (**Fig. 101, 103**). This band coincides with the interface between the recorded sands and gravels of the River Terrace deposits to the west and the claystone and mudstone to the east. Further to the east similar mottled anomalies on a smaller scale have been detected at **CRC\_003.01 – 02** at another interface between Mudstone and Claystone and sands and gravels (**Figure 107**).

4.2.53 In the east of the subsection, close to the River Brent on its alluvial deposits, strong sinuous anomalies have been detected crossing DJH\_016 – 018 at **DJH\_018.01**, **DJH\_016.01**, and **DJH\_017.02** (**Fig. 115 and 117**). They are the former channels of the River Brent or associated tributaries. Surrounding the channels are strong discrete positive and dipolar anomalies which increase in density and strength close to the River Brent. This is likely pitting and deposited highly magnetic waste caused by past flooding events.

#### Modern service

4.2.54 Strong dipolar anomalies have been detected at **CJN\_002.05 – 06**, **CJN\_003.02**, **CJN\_004.02 – 03**, and **CJN\_007.05** (**Fig. 95, 97, 99**). These are typical of modern services.

### ***Subsection East***

#### Archaeology and Possible archaeology

4.2.55 Close to the River Brent and bounded to the east by Broughton Lane is a series of positive linear and curvilinear anomalies at **CRC\_008.01** (**Figure 119**). They are up to 2 m wide, cover an area of 198 m north-east to south-west by 54 m west-north-west to east-south-east and are typical of ditched features. In aerial imagery (Google Earth 2024) from 2005 these anomalies are visible as cropmarks and continue to the south of the current survey extent. They are recorded in the Lincolnshire HER as a series of undated maculae and possible enclosures (MLI91080). The anomalies appear to form several enclosures, a clear example is seen at **a**, containing subdivisions and internal features. Several strong discrete anomalies have been detected, examples at **b** and **c**, which may represent pits and areas of burning. Immediately to the west however is an area of natural pitting and enhanced magnetic spread caused by the River Brent, and it is possible that these discrete anomalies represent naturally created and deposited features rather than anthropogenic ones. The anomalies at **CRC\_008.01** may represent evidence of former settlement activity, however it is also possible they were for animal management purposes. Given their position along a

current road, and so possibly former routeway, they may represent a former 'ladder' or 'ribbon' settlement. These settlements are commonly dated to the Late Iron Age – early medieval period and are normally oriented around a trackway. The location on the edge of the River Terrace gravel and sands indicates the location was chosen to use the resource of the River Brent, but was located on slightly higher, better draining sands and gravels, less likely to flood than the lower ground immediately to its west.

4.2.56 On the relatively higher land at the eastern end of the subsection, to the south-west of Coleby, a series of interlinking linear and several annular anomalies have been detected at **CRC\_022.01 (Figure 129)**. They are up to 2 m wide, cover an area of 61 x 70 m and are oriented north-north-west to south-south-east. They are typical of ditched features. The anomalies look to form one rectilinear anomaly at **a** which encloses an area of 38 x 34 m. The ditch that forms this enclosure continues to the north, possibly forming a further curvilinear enclosure with a diameter of 9 m at **b**. Three curvilinear anomalies are located at **c – e**. That at **c** forms a annular anomaly with a diameter of 5 m. Those at **d** and **e** have gaps in their north-eastern and northern boundaries and have diameters between 9 – 13 m. The gaps may be caused by poor preservation or may have originally been built like this. These annular anomalies are the remnants of ring-ditches. They may have been the drip gullies for round houses, the ditches forming circular enclosures, or be the surrounding ditch of barrows. Strongly positive discrete anomalies have been detected throughout **CRC\_022.01**, with a clear example at **f**. They are typical of pit features and may have been used for storage, waste disposal, or post-holes. Given the morphology of the anomalies and proximity of a probable Roman settlement site (MLI82135) recorded in the Lincolnshire HER, it is likely the anomalies are the remains of Late Iron Age to Romano-British enclosures used for agricultural purposes. There is not enough evidence to suggest settlement.

4.2.57 To the immediate west of **CRC\_022.01** are several weaker positive linear anomalies at **g**. They are up to 2 m wide and 36 – 61 m long. They are on the same orientation as the rest of the anomalies (north-west to south-east) and may be associated ditches. However, they are also on the same orientation as surrounding modern and post-medieval field boundaries and may therefore be of a later date.

4.2.58 In CRC\_025 a weak diffuse linear anomaly has been detected at **CRC\_025.01 (Figure 129)**. It is 190 m long, up to 5 m wide, and oriented north-north-west to south-south-east. It is more similar in magnetic response to a natural feature; however it is particularly straight indicating an anthropomorphic origin. It may be the remains of a former field boundary or drainage channel of uncertain date.

4.2.59 From CRC\_027 eastwards the parent geology changes to Limestone and various archaeological features are seen across the better draining soils of this area. It is worth noting whilst discussing these anomalies that from this point eastwards, strong responses typical of periglacial cracking have been detected in the data. This has made some of the following archaeology difficult to accurately define.

4.2.60 Across CRC\_027 – 029, 031, and Win\_001 are various interlinking linear and discrete positive anomalies. They are up to 330 m long and mainly oriented south-west to north-east and north-west to south-east. Some are oriented east – west. They cover an area of 1.3 km x 470 m.

4.2.61 Linear alignments of strong positive discrete anomalies are seen within CRC\_027 – 029 (**Fig. 131, 133, 135**). They consist of discrete anomalies 1 – 2.5 m in diameter and spaced 1 m apart. At **CRC\_027.01** they stetch south-west to north-east for 170 m and then appear

to turn north-west and run for 30 m and then 74 m. At **CRC\_028.01** they stretch east – west for 333 m and whilst it is impossible to say due to the presence of the A607, they may at one point have connected with **CRC\_027.01** in the west. Other stretches of these discrete anomalies have been detected at **CRC\_027.02** which runs north – south for 75 m, **CRC\_028.02** which is oriented north-west to south-east and 40 m long, **CRC\_029.01** which travels south-west to north-east for 37 m, and **CRC\_029.02** which traverses the field south-east to north-west for 179 m. These anomalies are typical of pit alignments. Pit alignments are boundaries consisting of regularly spaced pit features. Pit alignments were generally constructed from the Bronze Age up until the Middle Iron Age, however earlier and later examples have been identified from the Neolithic and Roman periods. They are generally thought to have been a way of dividing up the landscape.

4.2.62 Several positive interlinking linear anomalies have been detected across CRC\_027 – 029, 031, and Win\_001. They are up to 330 m long, 1 – 3 wide, and mainly oriented south-west to north-east and north-west to south-east. They are typical of ditched features. Clear examples are seen at **CRC\_029.03** (**Figure 133**), **CRC\_027.03** (**Figure 131**), **CRC\_031.01** (**Figure 135**), and **Win\_001.01** (**Figure 137**). They are likely to be ditched boundary features dividing up the landscape. It is worth noting that they mirror some of the surrounding current field boundaries that are recorded on OS mapping (LXXXVI.NW 1887 to the SK95 1960 OS mapping). Whilst at points the pit alignments appear to cross the linear ditches, in other instances they may join with them and so could possibly be contemporary i.e. **CRC\_029.02** and **CRC\_029.03**, however without excavation this is impossible to state definitively. In CRC\_027 the linear anomalies divide the area into smaller areas forming a coaxial field system covering an area of 292 x 391 m. However, it is difficult to determine the size of the individual fields given the missing data along the line of the overhead line (OHL), the modern service, and the survey extents. A nearly complete rectilinear enclosure on the same orientation has been detected at **CRC\_027.04** enclosing an area of 60 x 46 m (**Figure 131**). The linear anomalies on the same orientation in CRC\_031 (**CRC\_031.02**) are weaker than those in CRC\_028 – 029 meaning their extent and function is less clear. It is considered likely that these ditched boundary features are late prehistoric to Romano-British, although medieval is also possible.

4.2.63 A large rectilinear enclosure has been detected at **CRC\_029.04** which covers 131 x 128 m (**Figure 133**). It appears to contain internal ditched subdivisions, with clear examples at **a** and **b**. This enclosure is on a slightly different orientation, south-west to north-east by north-north-west to south-south-east. This differing orientation may represent a different phase of activity. The size of the enclosure and lack of distinctive internal features indicates it was not used for settlement but was likely for agricultural purposes. Further, smaller enclosures on a similar orientation have been detected at **CRC\_028.03** and **CRC\_029.05** (**Figure 135**). Here there are at least three enclosures, which are between 39 x 26 m and 27 x 51 m. These enclosures are grouped closely together and contain internal strong positive discrete anomalies 1 – 3 m in diameter. These may be pits for storage, waste-disposal, or post holes; however, given the variations in the underlying deposits, they may also be natural pitting. To the immediate west of **CRC\_028.03** at **a** are further fragmentary linear and curvilinear anomalies which may be the remains of poorly preserved ditches forming further enclosures. Further weak linear anomalies have been detected in the immediate vicinity however it is unclear if these are naturally occurring or more ditches associated with these enclosures. It is unclear what purpose these enclosures had; however they may have been agricultural or possibly a settlement function. A series of strong discrete anomalies has been detected 45 m to the west of **CRC\_028.03** at **b**. They are 2 – 4 m in diameter, form a semi-annular shape and are close to the eastern end of the pit alignment at **CRC\_028.01**. These may represent pits, possibly for waste or storage, and possibly burning activity, related to the enclosures.

4.2.64 In CRC\_028, 63 m north of the pit alignment at **CRC\_028.01**, is a weak positive annular anomaly at **CRC\_028.04 (Figure 133)**. It is 1 m wide and 17 m in diameter. It is typical of a ring ditch and, given its size, may be the remnants of a round house drip gully, barrow, or enclosure from the Bronze Age to Romano-British period. The ring ditch is within an area of periglacial cracking which appears as strong anomalies. It is therefore unclear whether the pit-like anomalies detected within it are archaeological or geological. Immediately to the south-west of **CRC\_028.04** is a curved rectilinear anomaly at **a**. It is 1 m wide and encloses an area of 12 x 16 m. This may be a related enclosure, however given the strong background responses it has the potential to be geological in origin.

4.2.65 In the west of CRC\_027, close to a pit alignment (**CRC\_027.02**) and an enclosure (**CRC\_027.04**) are several strong positive anomalies at **CRC\_027.05 – 06 (Figure 131)**. They are mainly sub-rectangular or circular in morphology with diffuse edges. The sub-rectilinear are all oriented north-west to south-east. They are between 4 x 3 m and 10 x 5 m. They are typical of pit-like features, specifically extraction pits. It is not possible to date these pits as extraction is evident up until the modern period in this area. Given their size they are likely small scale extraction which could be from the prehistoric to post-medieval period.

4.2.66 Further possible extraction has been detected in the form of strong positive amorphous linear anomalies in between **CRC\_027.05 – 06** at **CRC\_027.07 (Figure 131)**. They cover an area of 35 x 50 m. The signal of these anomalies is also typical of extraction, similarly it is not possible to date these pits but may be from the prehistoric to post-medieval period.

4.2.67 To the south of the anomalies discussed above is the village of Navenby which was a small Roman town (MLI60537), although evidence for settlement dating back to the Neolithic period has been recorded. Evidence of earlier prehistoric activity has been found at Navenby including settlement activity from the Iron Age (MLI60557). Occupation evidence from Navenby after the Roman period is present further to the west of the Roman town and comes from the middle Saxon period (MLI60581) and a small manor is recorded in Navenby by the time of Domesday Book. The Roman roads of Ermine Street (High Dyke) and Mareham Lane (A15) are also nearby. To the north of the site, south of the village of Coleby, a probable Roman settlement site (MLI82135) is recorded, identified by large numbers of Romano-British finds. The village itself originates in the medieval period, as does the village of Boothby Graffoe immediately south of the site.

4.2.68 Given the nearby known sites it is considered likely that the archaeology detected across CRC\_027 – 029, 031, and Win\_001 represents a multi-phase field system consisting of both ditched and pit alignment boundaries and several rectilinear enclosures. It is likely most of this was agricultural in nature. The ring ditch may represent settlement or burial activity; however it may equally have been an animal enclosure. Evidence of burning and extraction has also been detected. It is most likely that these features date from the Iron Age to Romano-British periods, however the ring ditch and coaxial field system may possibly date from the Bronze Age, and some of the linear ditches and possible extraction may date as late as the post-medieval period. Further investigation would be needed to fully understand this landscape.

4.2.69 In the west of CRC\_029 next to Grantham Road a series of strong positive circular anomalies have been detected at **CRC\_029.06 (Figure 133)**. They are up to 11 m in diameter. In satellite imagery (Google Earth 2025) from 2012 a series of these features are seen in cropmarks running up both the west and eastern extent of this field boundary. It is not clear what these anomalies are, they may be previous extraction activity or a more modern practice.

4.2.70 A series of strong positive linear and partial rectilinear anomalies have been detected at **CRC\_036.01 (Figure 137)**. They cover an area of 91 x 84 m. Given their position on the edge of the survey extent it is likely they continue to the west. Their morphology indicates partial ditched enclosures. There is not enough context to determine an origin, however given their location between two Roman roads and the nearby settlements with prehistoric, Romano-British, and early medieval origins, it is likely they are from the prehistoric – medieval periods.

4.2.71 In the east of the subsection in CRC\_040 a weak positive rectilinear anomaly has been detected at **CRC\_040.01 (Figure 143)**. Its south-eastern side is not visible due to a modern service which crosses this location. It is 30 x 30 m, and its enclosing ditch is 1 m wide. It is within an area of periglacial cracking which has caused a grid-like effect in the data. Whilst the enclosure is a similar size to these natural rectilinear features, it is on a different orientation and so it is most likely archaeological in origin. Again there is not enough context to determine a use or origin, however given its morphology and location between two Roman roads and the nearby settlements with prehistoric, Romano-British and early medieval origins, it is likely later prehistoric to Romano-British.

4.2.72 A linear series of strong positive discrete anomalies has been detected at **Win\_009.01 (Figure 145)**. They are up to 2 m in diameter and continue north-west to south-east for 151 m. Given the strong peri-glacial natural variation in this area it is at points difficult to determine the extent of this activity. The anomalies also appear to cross the location of a former palaeochannel. These anomalies are typical of a pit alignment. As previously discussed pit alignments are boundaries consisting of regularly spaced pit features, generally thought to be a way of dividing up the landscape. They were generally constructed from the Bronze Age up until the Middle Iron Age, however earlier and later examples have been identified from the Neolithic and Roman periods.

4.2.73 Across the eastern end of the subsection weak and strong positive amorphous and rectilinear anomalies with diffuse edges have been detected at **CRC\_035.02 – 03, CRC\_040.02 – 06, CRC\_044.01, CRC\_047.01 – 02, CRC\_049.03 – 04, and CRC\_050.01 – 03 (Fig. 139, 143, 147, 149, 151)**. They cover areas between 8 x 8 m to 30 x 11 m. Due to their morphology and magnetic properties, it is likely that these are examples of extraction. Whilst these areas of extraction are previously unrecorded on mapping, other quarries are recorded in the wider landscape in the Lincolnshire LXXXVI.NW 1887 to the SK95 1960 OS mapping. Further investigation would be necessary to understand their origin but they are likely from the Romano-British to post-medieval periods.

4.2.74 A series of weak linear and curvilinear interlinking anomalies has been detected at **CRC\_046.01**, 120 m to the south of the pit alignment at **Win\_009.01 (Figure 151)**. They are 1 – 2 m wide and cover an area of 190 x 290 m. Similar anomalies are also seen at **CRC\_049.02 (Figure 149)**. They are oriented north-west to south-east and north-east to south-west. They are on the same orientation as the peri-glacial cracking seen in surrounding fields. While it is likely these are associated with the peri-glacial cracking, they have more regular coaxial elements that mean an archaeological origin cannot be discounted.

4.2.75 Across this south-eastern section of subsection East are various weak and strong positive linear and curvilinear anomalies. They are generally 1 – 2 m wide, and up to 257 m long. Some, given their alignment with surrounding field boundaries, are likely former field boundaries (**CRC\_034.01, 035.01, 036.01**) (**Figure 139 and 141**). The anomalies at **CRC\_049.01 (Figure 149)** are former ditches however their purpose and origin is unclear from the data alone. They may represent former boundary ditches from the prehistoric – medieval periods.

### Historic Landscape Features

4.2.76 Strong magnetic disturbance surrounded by an enhanced magnetic spread has been detected at **CRC\_009.01 (Figure 121)**. This is the remains of a now demolished farmstead recorded on the Lincolnshire LXXXVI.NW 1887 to the SK95 1960 OS mapping. The demolished remains of small agricultural building have been detected to the east at **CRC\_010.01 (Figure 123)**.

4.2.77 Strong magnetic disturbance at the location of a former sand pit recorded in the Lincolnshire LXXXVI.NW 1887 to the SK95 1960 OS mapping has been detected at **CRC\_010.02 (Figure 121)**. Further areas of strong magnetic disturbance have been detected at **CRC\_024.01** and **25.02 (Figure 129)** which are the remains of infilled former ponds, also recorded on the aforementioned OS mapping.

4.2.78 A weak positive linear anomaly, surrounded by an area of enhanced magnetic background, has been detected running east – west across CRC\_046 – 047 at **CRC\_046.02 (Figure 151)**. It is 237 m long and 1 – 3 m wide. It is the location of a former footpath as recorded in the OS Lincolnshire LXXXVI.NW 1887 mapping.

### Former field boundaries

4.2.79 Strong and weak positive linear anomalies have been detected across subsection East. They are between 1 – 3 m wide, up to 217 m long, and on various orientations. They are former field boundaries recorded between the Lincolnshire LXXXVI.NW 1887 – the SK95 1960 OS mapping. Those at **CRC\_025.03** are particularly strong in magnetic properties due to their location on a narrow band of Ironstone (**Figure 129**).

### Historic cultivation

4.2.80 Weak positive linear anomalies have been detected at the western and eastern ends of subsection East at **CRC\_014.01 (Figure 125)** and **CRC\_050.04 (Figure 149)**. They are of varying lengths, widths, and orientation. They are likely remnants of former cultivation from the medieval to post-medieval period and associated with the surrounding villages.

### Agricultural trends and Drains

4.2.81 Weak and strong positive and dipolar linear anomalies have been detected across the subsection. These are likely post-medieval to modern cultivation and drainage regimes. Some may be the remnants of earlier medieval cultivation, however, cannot be confidently interpreted as such due to weak nature or limited context.

### Geology and Geomorphology

4.2.82 In the west of subsection East at **CRC\_008.02 (Figure 119)** strong positive discrete anomalies likely represent natural pitting in the underlying bedrock of Mudstone and infilling with overlying alluvium sand and gravel. An area of weak mottling in **CRC\_009.02 (Figure 121)** is typical of natural variations in sand and gravel deposits.

4.2.83 Across CRC\_018 – 020 and CRC\_022 – 023 weak sinuous and amorphous anomalies reflect variations in the underlying superficial deposits by the movement of water. A clear example is seen at **CRC\_022.02 (Figure 127)**.

4.2.84 A strong amorphous area of increased magnetic field has been detected at **CRC\_025.04 (Figure 129)**. The strongest field surrounds two former field boundaries. This effect is considered likely to have been caused by a narrow band of Sandstone and Ironstone recorded close to this location.

4.2.85 From CRC\_028 – 029 eastwards the underlying geology is Limestone. This is reflected in the data by various strong positive anomalies. These anomalies are seen across this subsection, with particularly clear examples seen at **CRC\_028.05 (Figure 133)** as an area of honeycomb-like lattice and at **CRC\_040.07 (Figure 147)** as a regular grid-like pattern. These anomalies represent peri-glacial cracks in the underlying Limestone formed by water ingress which then froze, thawed, and refroze repeatedly. The resulting cracks have since filled with soil which has higher magnetic properties than the bedrock. It should be noted that due to its well-draining properties and higher elevation (compared to the rest of the site) much of the archaeology is found on this geology. The strong geological responses however have made interpretation of the archaeology at points difficult. In areas such as **CRC\_046.01 (Figure 151)** it is not possible without further investigation to understand if anomalies are archaeological or geological in origin.

4.2.86 Strong broad sinuous bands have been detected running across CRC\_034 – 035 at **CRC\_035.04 (Figure 139)**, and Win\_009 and CRC\_044 at **Win\_009.02** and **CRC\_044.02 (Fig. 145 and 147)**. These are former palaeochannels caused by former watercourses. Further weaker sinuous anomalies are seen close to these palaeochannels which may also be previous watercourses or natural drainage. Clear examples are at **CRC\_044.03 (Figure 147)** and **CRC\_047.03 (Figure 151)**.

#### Magnetic disturbance

4.2.87 Across CRC\_036 and Win\_002 areas of stronger magnetic responses have been detected. These may be the result of the modern spreading of highly magnetic fertiliser. Due to the strong magnetic responses, any weaker archaeological anomalies present may be masked and difficult to detect.

#### Modern service

4.2.88 Strong dipolar anomalies have been detected at **CRC\_027.08, 029.07, Win\_002.01, CRC\_034.02, CRC\_040.08, Win\_009.03 – 04**, and **CRC\_046.03 (Fig. 131, 135, 137, 139, 145, 147, 151)**. These are typical of modern services.

## 5 DISCUSSION

5.1.1 A rich agricultural and settlement landscape from the prehistoric to post-medieval period has been identified across the site. The geophysical survey has confirmed the presence of already known heritage assets as well as identifying new archaeological sites.

5.1.2 In the east of the site, on higher land and better draining geology, is the densest area of archaeology. Here, a primarily agricultural landscape possibly from the Bronze Age to post-medieval period has been identified. It consists of a complex multi-phase field system comprising both ditched and pit alignment boundaries, and several rectilinear enclosures. Various areas of small-scale extraction and burning point to small scale industrial activity. One ring ditch has been found which, whilst in this landscape is likely an animal enclosure, has the possibility to have been either for a settlement or burial purpose. The nearby Roman roads of Ermine Street (High Dyke) and Mareham Lane (A15), and Romano-British town of Navenby, indicate that this landscape was likely heavily in use in the Romano-British period. It is worth noting that in this area of the site the underlying periglacial geology is seen strongly in the data and has at points made distinguishing the extent of the archaeology difficult.

5.1.3 Further west towards the River Brant and then onwards up to the River Witham, less archaeology has been detected. This is unsurprising given the lower elevation and wetter conditions. However, close to the River Brant on the edge of the River Terrace gravel and

sands a possible 'ladder' or 'ribbon' settlement from the Late Iron Age – early medieval period has been identified. This possible settlement was already recorded in the Lincolnshire HER; however the geophysical survey has likely added more internal detail.

5.1.4 On the western bank of the River Witham, close to Haddington, a possible settlement and associated fields have been detected. Much of this is within an area of subsequent medieval ridge and furrow which has dragged the material of the earlier 'settlement' and made defining this site difficult. There is a rich medieval landscape in this area and the site may be from the early medieval – medieval period, an earlier phase to the ridge and furrow also recorded in the fields. It is possibly related to the nearby scheduled monument of Hall Close (NHLE: 1021080).

5.1.5 Further south along the banks of the River Witham a likely Romano-British settlement has been detected consisting of enclosures, pits, and areas of burning. It is likely larger than that detected, possibly continuing further to the east of the survey area. Roman and Romano-British finds have already been recorded in this location by the Lincolnshire HER. To the north of this a series of partial Romano-British enclosures on the same orientation have been found.

5.1.6 Further Romano-British activity is seen to the north of the Fosse Way (A46). A likely former 'ladder' or 'ribbon' settlement oriented around a former right of way has been found in the north-west of the site which is likely from the Late Iron Age to Romano-British period. Close to the Fosse Way in this area is a collection of ring ditches and associated enclosures. It is not clear if these form an area of settlement, burial, or agricultural enclosures however they likely date from the Bronze Age to Late Iron Age / Romano-British period. Further undated agricultural enclosures are seen in this area close to the Fosse Way.

5.1.7 Close to the medieval village of Morton, and Morton Manor, an area of former settlement or industrial activity has been detected, along with a field system. They are likely medieval in origin.

5.1.8 Further evidence of the agricultural use of the site into the medieval to post-medieval period is seen in the extensive remains of former ploughing, field boundaries, ponds, and extraction across the whole site. More recent use of the land is seen in the numerous field drains, spreading of green waste, and various modern services.

5.1.9 Variations in the underlying natural deposits are seen throughout the site. Given the size of the site they are varied, but the strongest anomalies seen have been of alluvium, River Terrace deposits, Ironstone, periglacial cracking in Limestone, and several former palaeochannels. In several cases, such as the alluvium close to the River Witham near Haddington, and the periglacial deposits in the east of the site, the natural deposits appear to at least partially mask or make determining the extent of the archaeology difficult.

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Schmidt, A, Linford, P, Linford, N, David, A, Gaffney, C, Sarris, A and Fassbinder, J. 2015  
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## Online Resources

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Soilscapes, Cranfield University. <http://www.landis.org.uk/soilscapes/> (accessed April 2025)

## APPENDICES

### Appendix 1 Survey equipment and data processing

#### Survey methods and equipment

The magnetic data for this project were acquired using a non-magnetic hand-pushed or ATV-towed cart fitted with four or eight SenSys FGM650/3 magnetic gradiometers. The instrument has four or eight sensor assemblies fixed horizontally at 1 m or 0.5 m apart allowing four or eight traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 0.6 m separation and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of  $\pm 8 \mu\text{T}$  over  $\pm 1000 \text{nT}$  range. All of the data were then relayed to a CS35 tablet, running the MONMX program, which is used to record the survey data from the array of FMG650/3 probes at a rate of 20 Hz. The program also received measurements from a GPS system, which was fixed to the cart at a measured distance from the sensors, providing real time locational data for each data point.

The cart-based system relied upon accurate GPS location data which is collected using a Carlson BRX-7 RTK system. This received corrections from a network of reference stations operated by the Ordnance Survey (OS), allowing positions to be determined with a precision of 0.02 m in real-time and therefore exceed the level of accuracy recommended by European Archaeologiae Consilium (Schmidt *et al.* 2015).

#### Post-processing

The magnetic data collected during the detail survey were downloaded from the cart system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

The cart-based system generally requires a lesser amount of post-processing than the handheld Bartington Grad 601-2 fluxgate gradiometer instrument. This is largely because mounting the gradiometers on the cart reduces the occurrence of operator error, caused by inconsistent walking speeds and deviation in traverse position due to varying ground cover and topography.

Typical data and image processing steps may include:

- Destripe – Applying a smooth function to remove differences caused by directional effects inherent in the magnetometer;
- Despike – Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data).

Typical displays of the data used during processing and analysis:

- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.

## Appendix 2 Geophysical interpretation

The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural, and uncertain origin/geological.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Possible archaeology – used for features which give a response, but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.
- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.
- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.
- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.
- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating bipolar (black and white) responses.

The uncertain origin/geological category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative, or broad bipolar (positive and negative) anomalies.

## Appendix 3 OASIS form

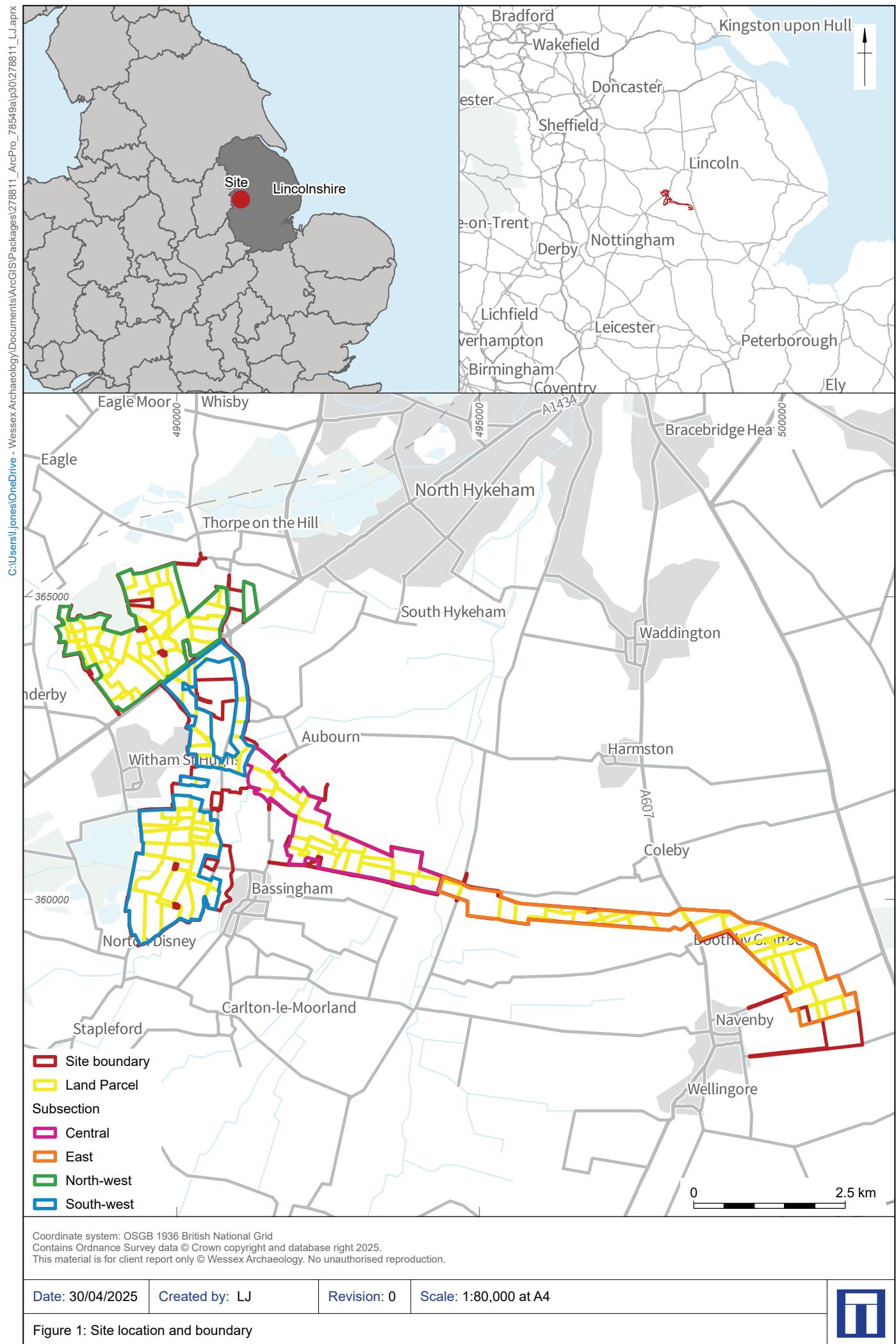
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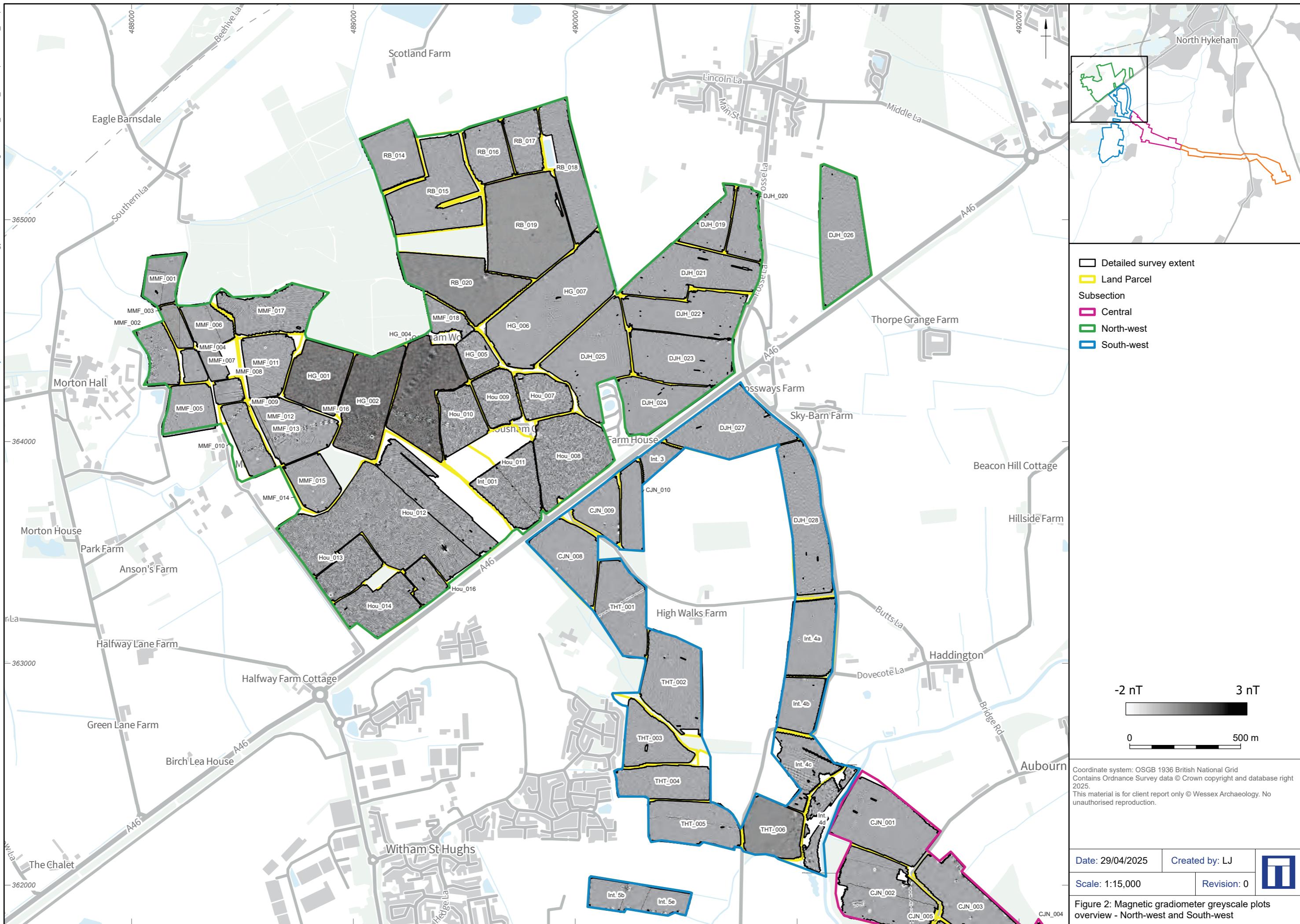
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Sitename	Fosse Green Energy Farm and Cable Corridor
Sitecode	278810 278811
Project Identifier(s)	278810 , 278811
Activity type	Geophysical Survey, MAGNETOMETRY SURVEY
Planning Id	
Reason For Investigation	Planning requirement
Organisation Responsible for work	Wessex Archaeology
Project Dates	24-Apr-2023 - 17-Apr-2025
Location	Fosse Green Energy Farm and Cable Corridor NGR : SK 94911 60033 LL : 53.12902226901687, -0.58297108750408 12 Fig : 494911,360033
Administrative Areas	Country : England County/Local Authority : Lincolnshire Local Authority District : North Kesteven Parish : Coleby
Project Methodology	The cart-based gradiometer system used a Leica Captivate RTK GNSS instrument and Carlson BRX-7, which receive corrections from a network of reference stations operated by the Ordnance Survey (OS) and for the former Leica Geosystems. Such instruments allow positions to be determined with a precision of 0.02 m in real-time and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt et al. 2015). The survey was conducted using four or eight Sensys FGM650/3 magnetic gradiometers spaced at 1 m or 0.5 m intervals and mounted on a non-magnetic cart either hand-pushed or ATV-towed. Data were collected with an effective sensitivity of $\pm 8 \mu\text{T}$ over $\pm 1000 \text{nT}$ range at a rate of 100 Hz, producing intervals of 0.02 m along transects spaced 4 m apart.

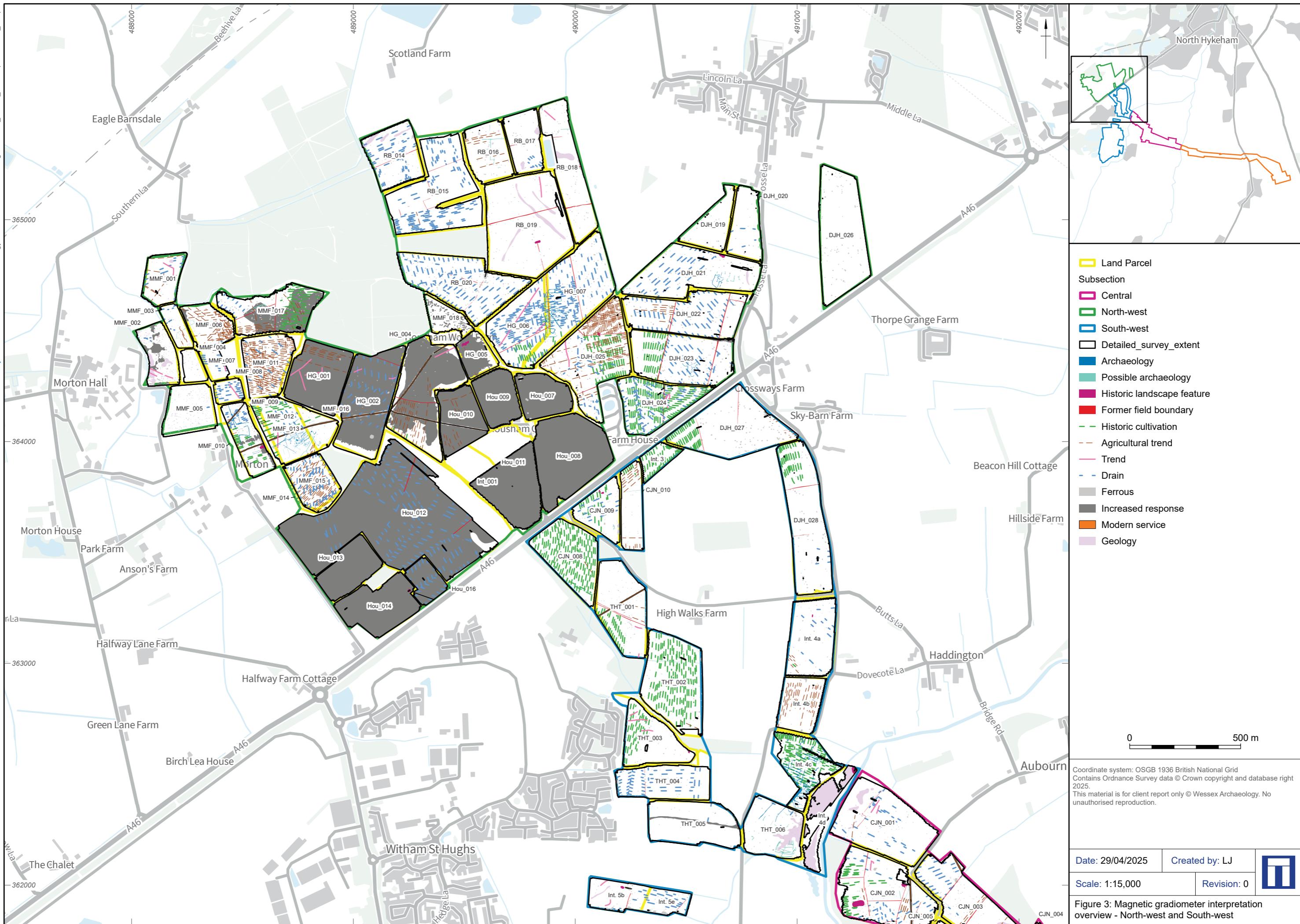
Project Results	<p>A rich agricultural and settlement landscape from the prehistoric to post-medieval period has been identified across the site. The geophysical survey has confirmed the presence of already known heritage assets as well as identifying new archaeological sites.</p> <p>In the east of the site, on higher land and better draining geology, is the densest area of archaeology. Here, a primarily agricultural landscape possibly from the Bronze Age to post-medieval period has been identified. It consists of a complex multi-phase field system comprising both ditched and pit alignment boundaries, and several rectilinear enclosures. Various areas of small-scale extraction and burning point to small scale industrial activity. One ring ditch has been found which, whilst in this landscape is likely an animal enclosure, has the possibility to have been either for a settlement or burial purpose. The nearby Roman roads of Ermine Street (High Dyke) and Mareham Lane (A15), and Romano-British town of Navenby, indicate that this landscape was likely heavily in use in the Romano-British period. It is worth noting that in this area of the site the underlying periglacial geology is seen strongly in the data and has at points made distinguishing the extent of the archaeology difficult.</p> <p>Further west towards the River Brant and then onwards up to the River Witham, less archaeology has been detected. This is unsurprising given the lower elevation and wetter conditions. However, close to the River Brant on the edge of the River Terrace gravel and sands a possible 'ladder' or 'ribbon' settlement from the Late Iron Age – early medieval period has been identified. This possible settlement was already recorded in the Lincolnshire HER; however the geophysical survey has likely added more internal detail.</p> <p>On the western bank of the River Witham, close to Haddington, a possible settlement and associated fields have been detected. Much of this is within an area of subsequent medieval ridge and furrow which has dragged the material of the earlier 'settlement' and made defining this site difficult. There is a rich medieval landscape in this area and the site may be from the early medieval – medieval period, an earlier phase to the ridge and furrow also recorded in the fields. It is possibly related to the nearby scheduled monument of Hall Close (NHLE: 1021080).</p> <p>Further south along the banks of the River Witham a likely Romano-British settlement has been detected consisting of enclosures, pits, and areas of burning. It is likely larger than that detected, possibly continuing further to the east of the survey area. Roman and Romano-British finds have already been recorded in this location by the Lincolnshire HER. To the north of this a series of partial Romano-British enclosures on the same orientation have been found.</p> <p>Further Romano-British activity is seen to the north of the Fosse Way (A46). A likely former 'ladder' or 'ribbon' settlement oriented around a former right of way has been found in the north-west of the site which is likely from the Late Iron Age to Romano-British period. Close to the Fosse Way in this area is a collection of ring ditches and associated enclosures. It is not clear if these form an area of settlement, burial, or agricultural enclosures however they likely date from the Bronze Age to Late Iron Age / Romano-British period. Further undated agricultural enclosures are seen in this area close to the Fosse Way.</p> <p>Close to the medieval village of Morton, and Morton Manor, an area of former settlement or industrial activity has been detected, along with a field system. They are likely medieval in origin.</p> <p>Further evidence of the agricultural use of the site into the medieval to post-medieval period is seen in the extensive remains of former ploughing, field boundaries, ponds, and extraction across the whole site. More recent use of the land is seen in the numerous field drains, spreading of green waste, and various modern services.</p> <p>Variations in the underlying natural deposits are seen throughout the</p>
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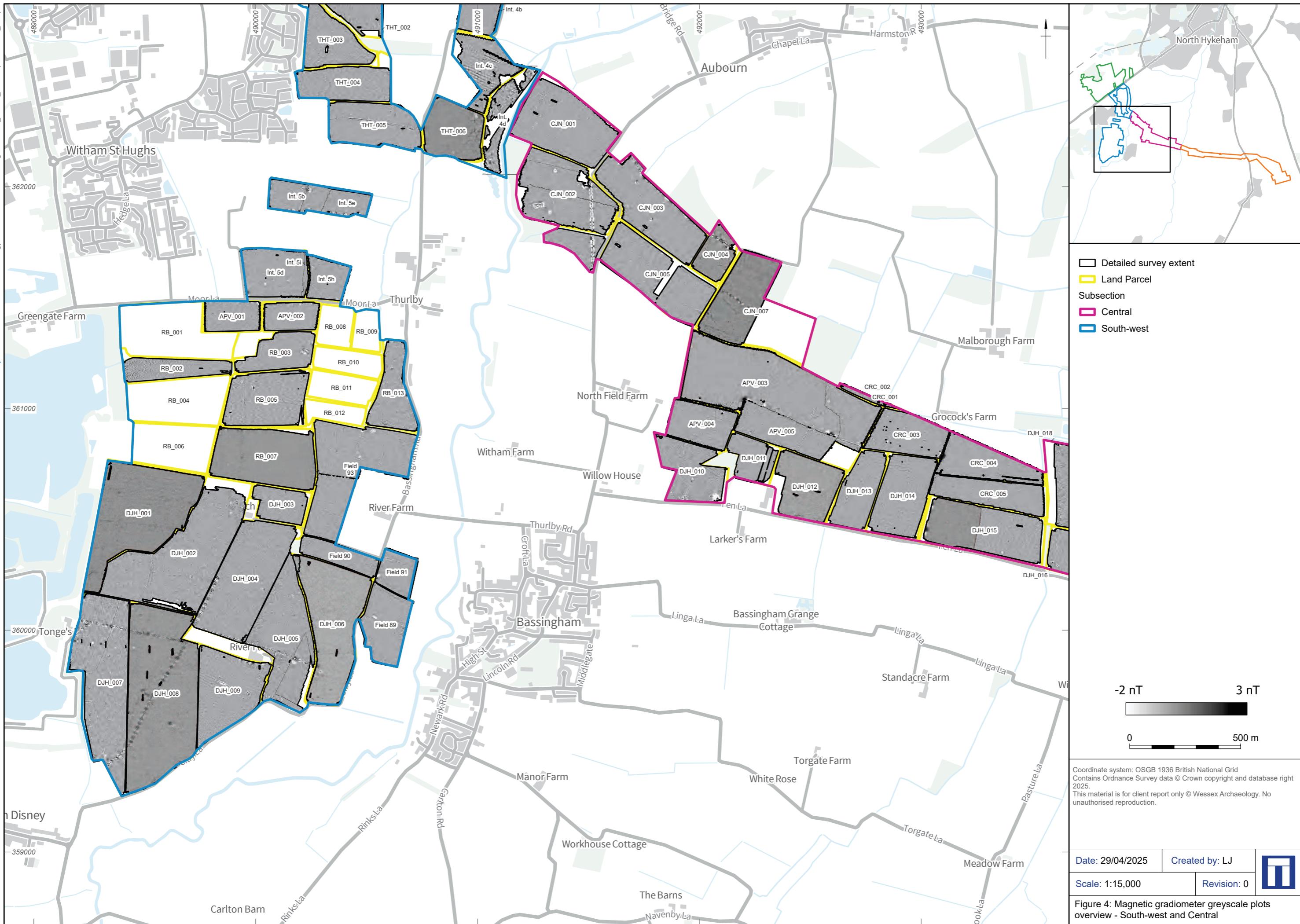
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Person Responsible for work	
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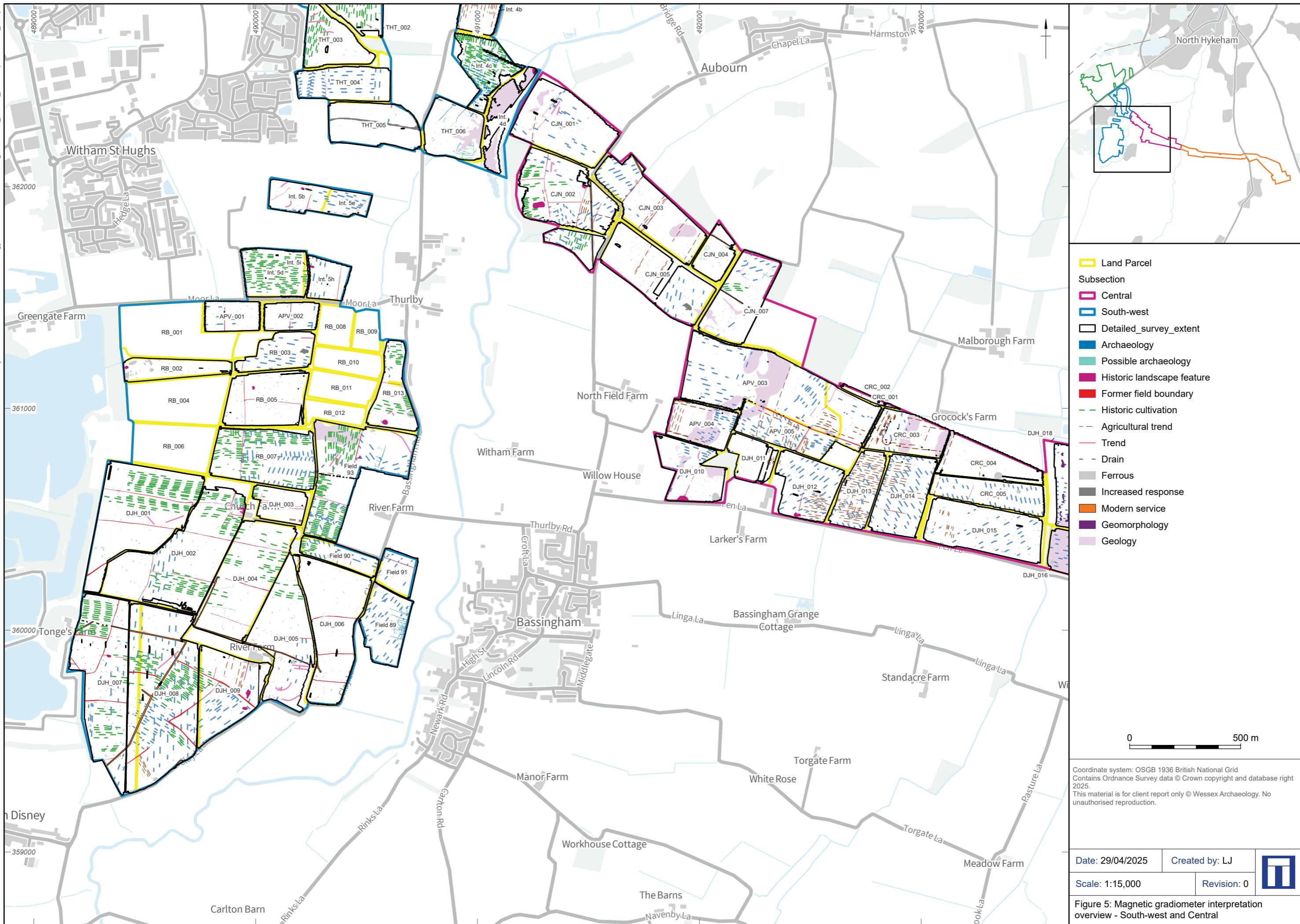
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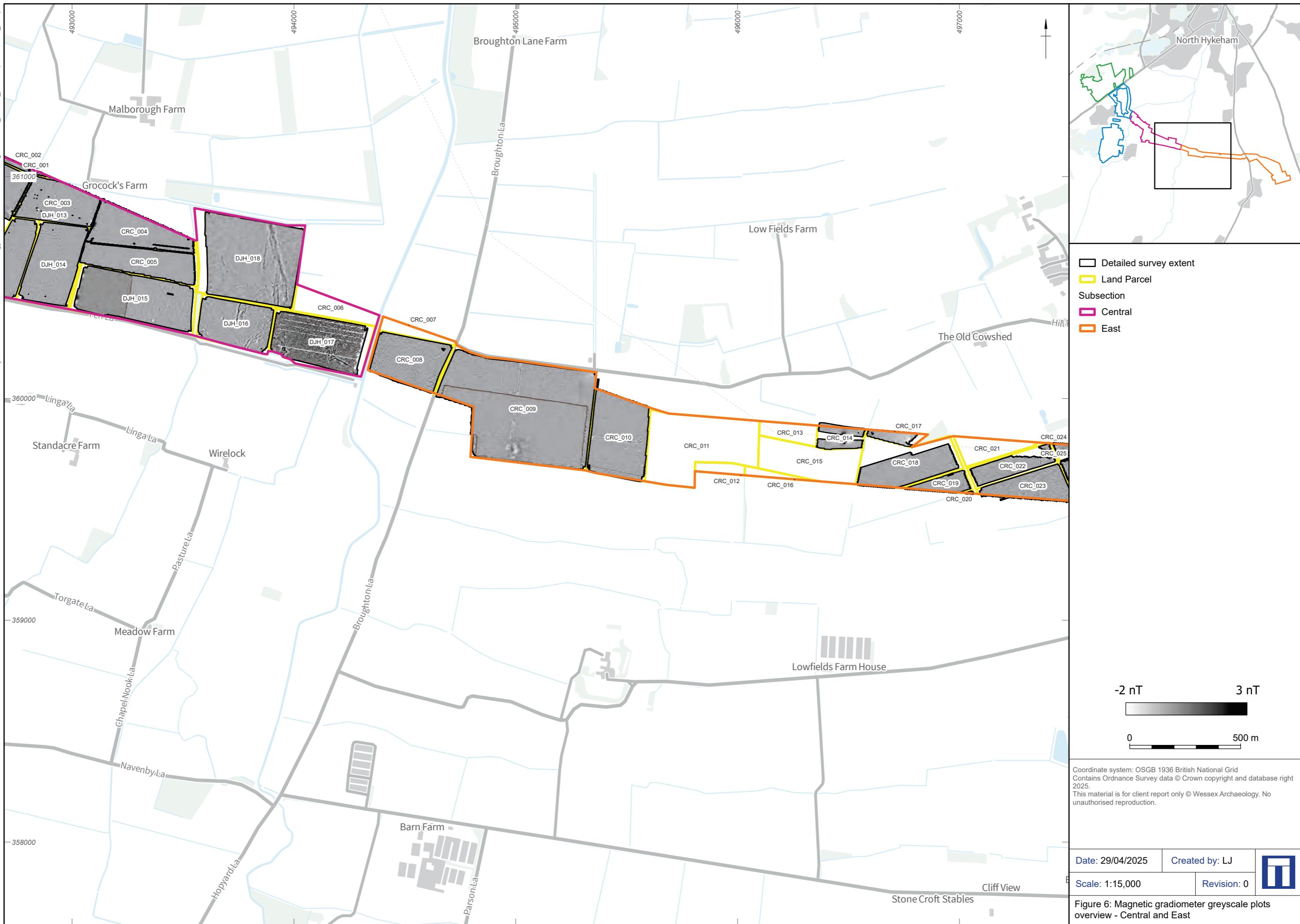


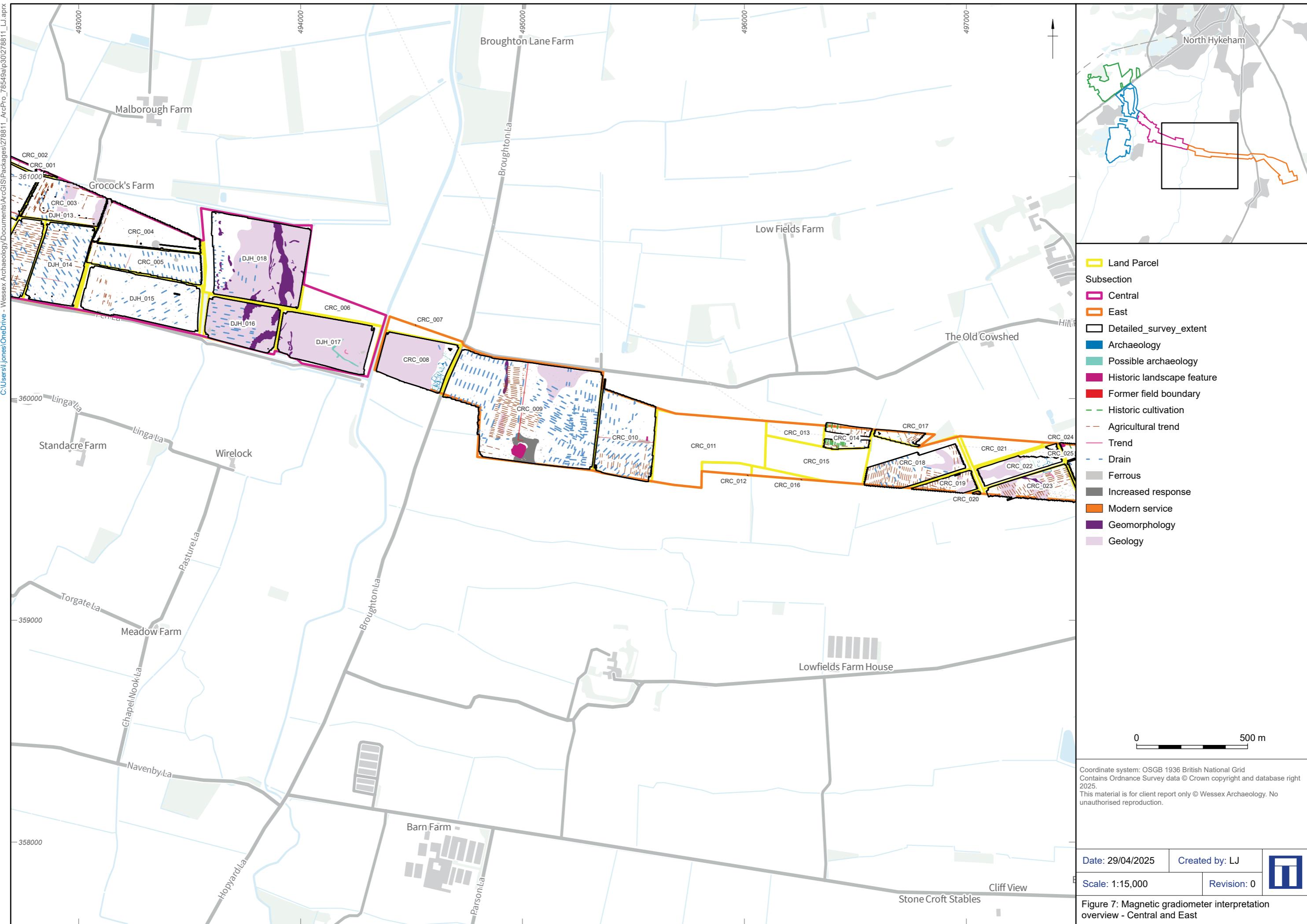


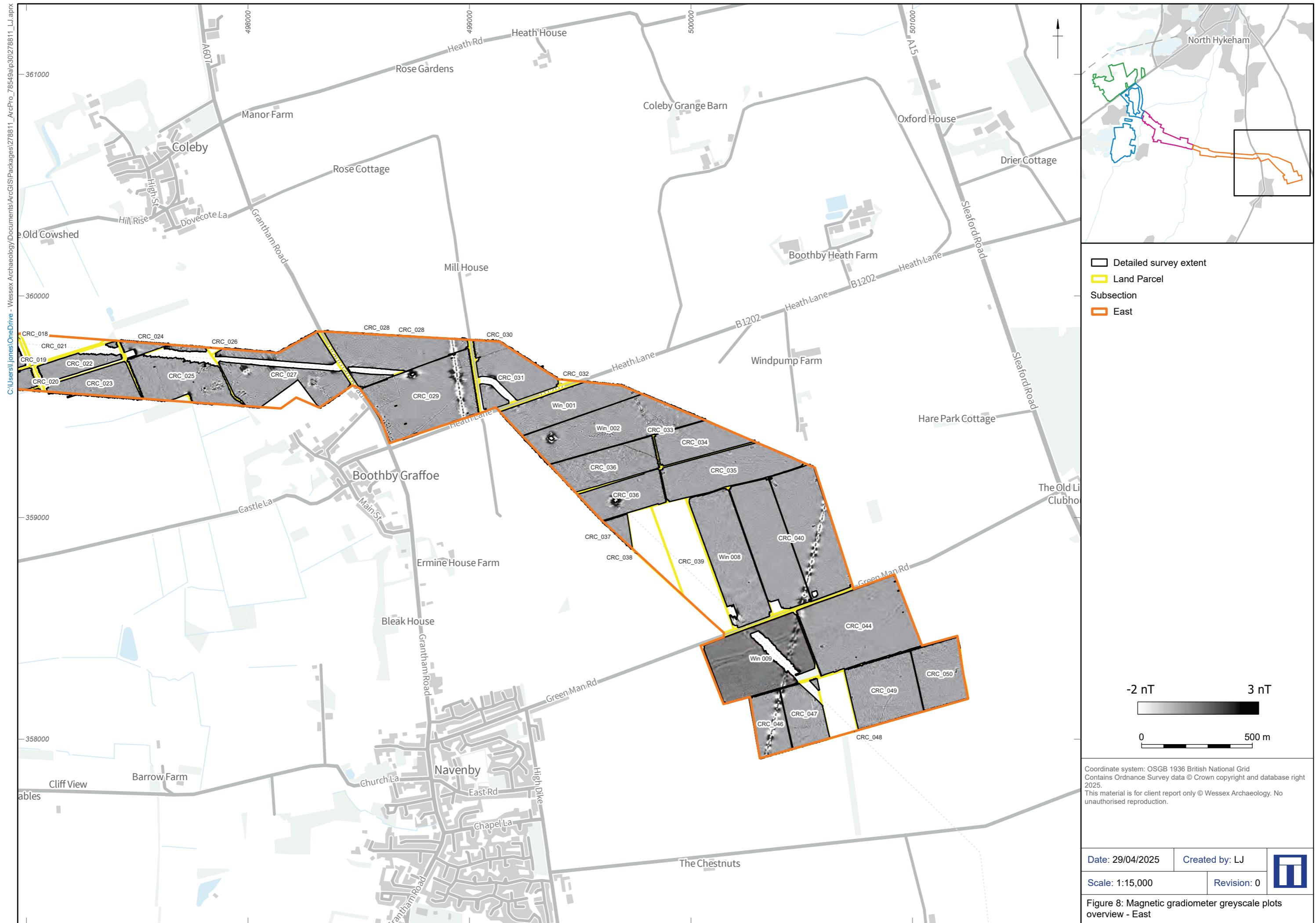


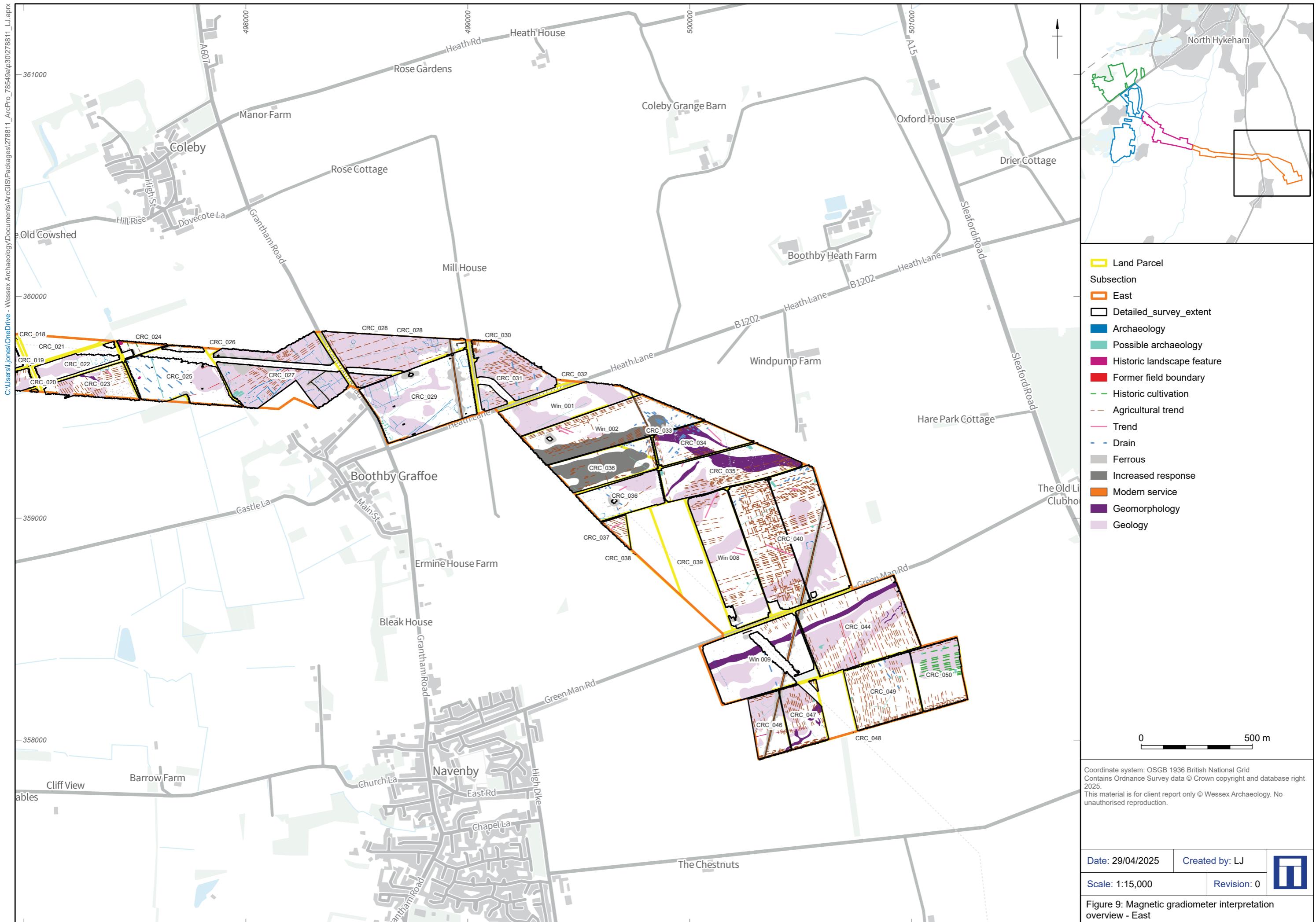




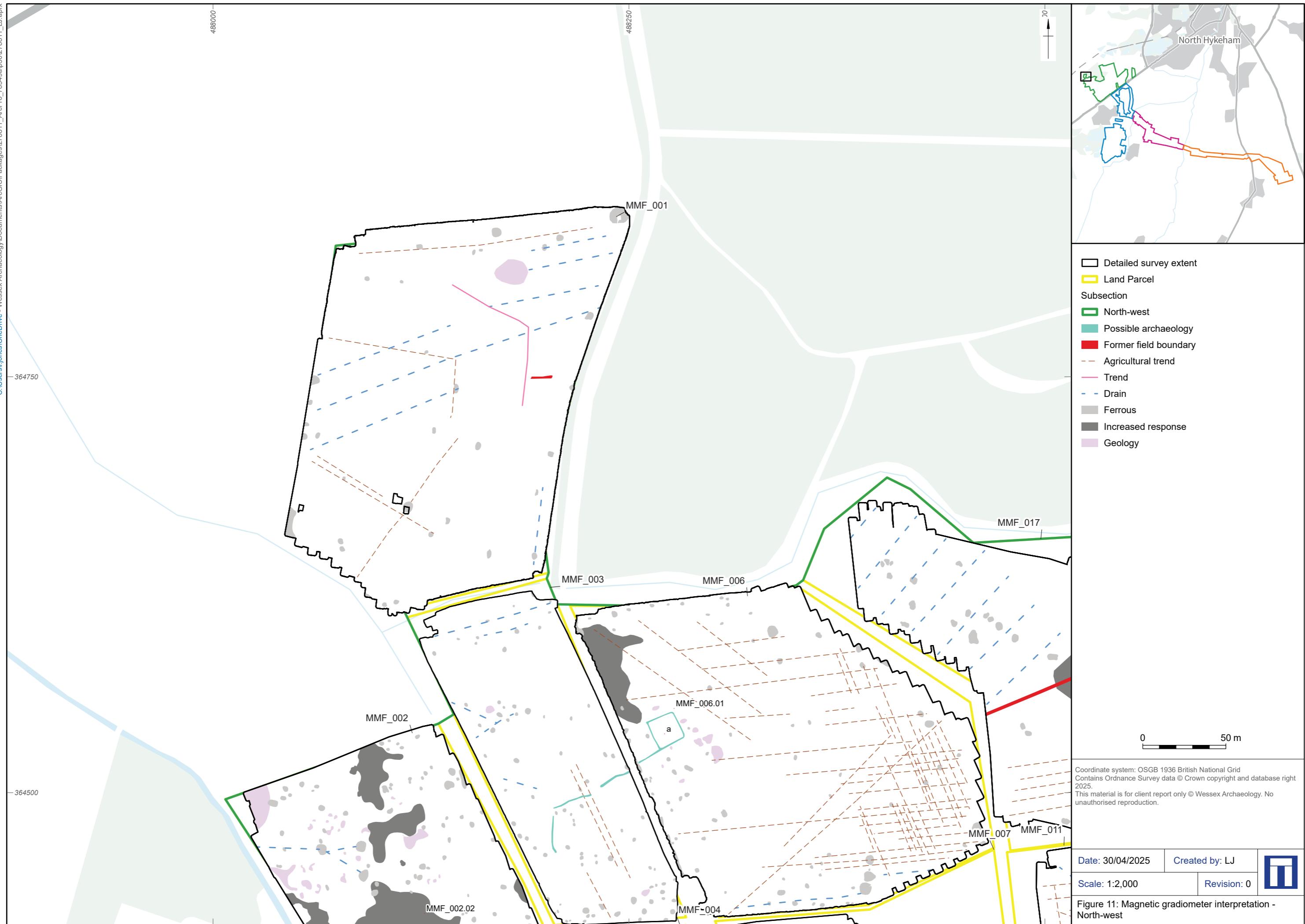




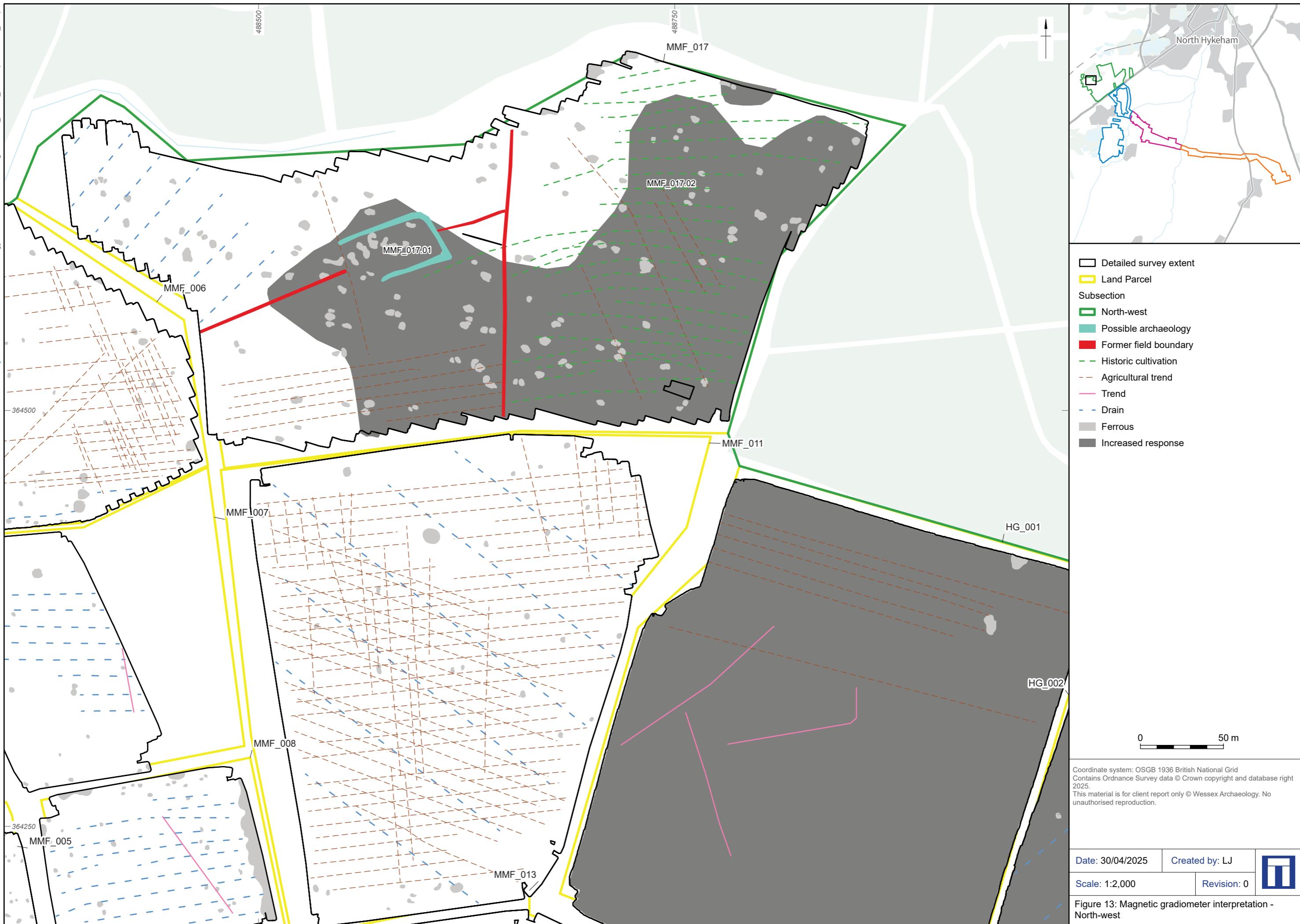


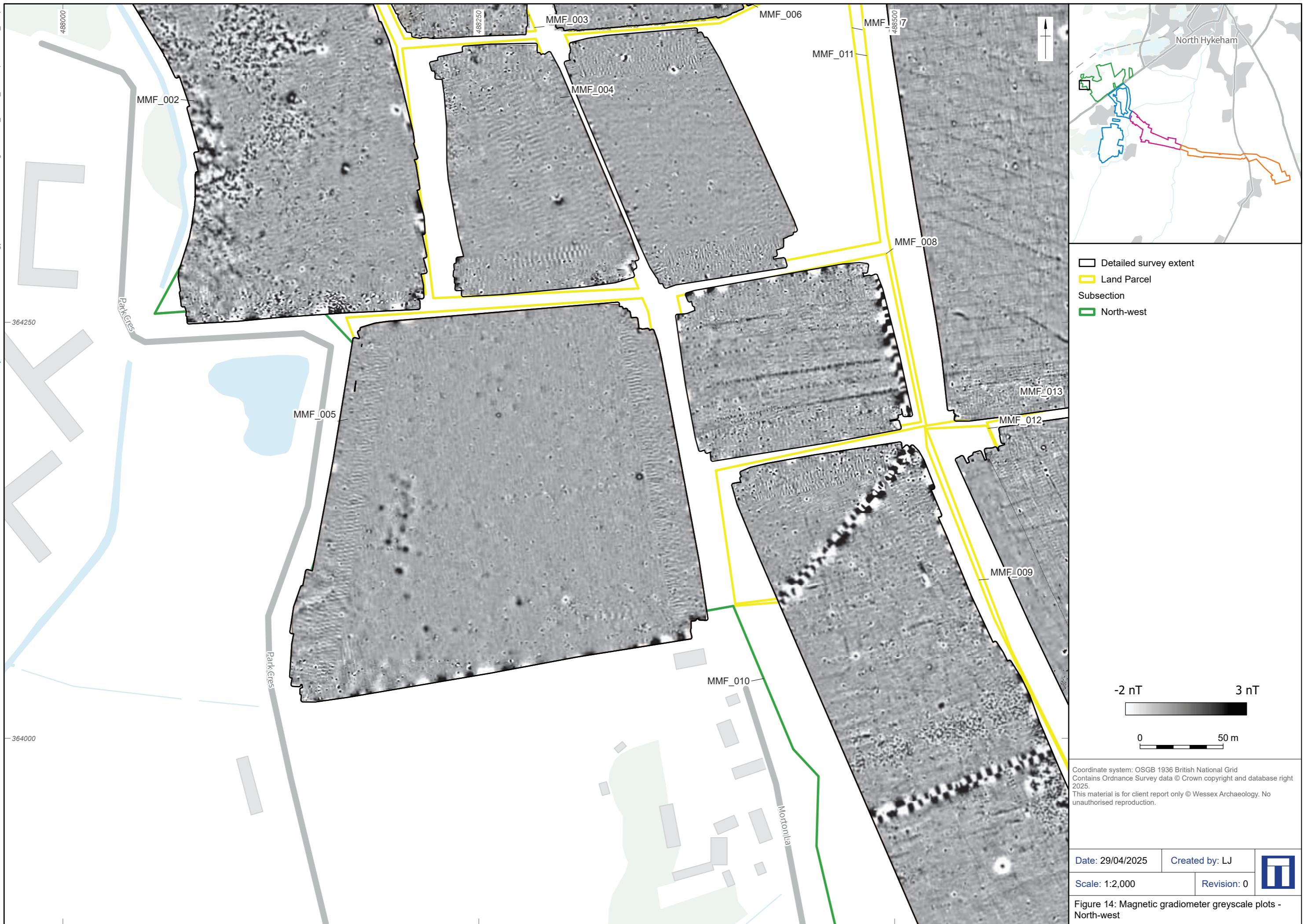


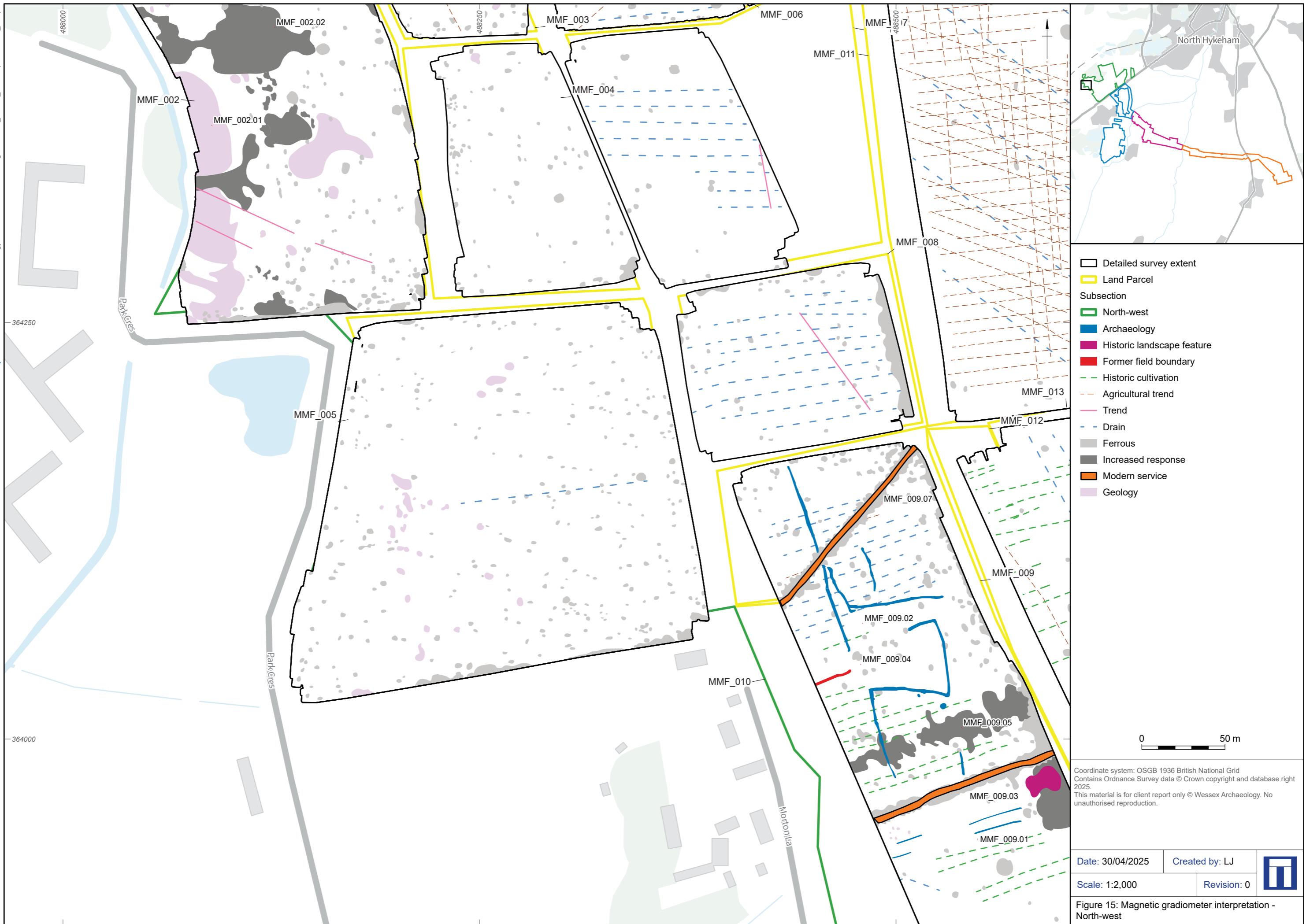


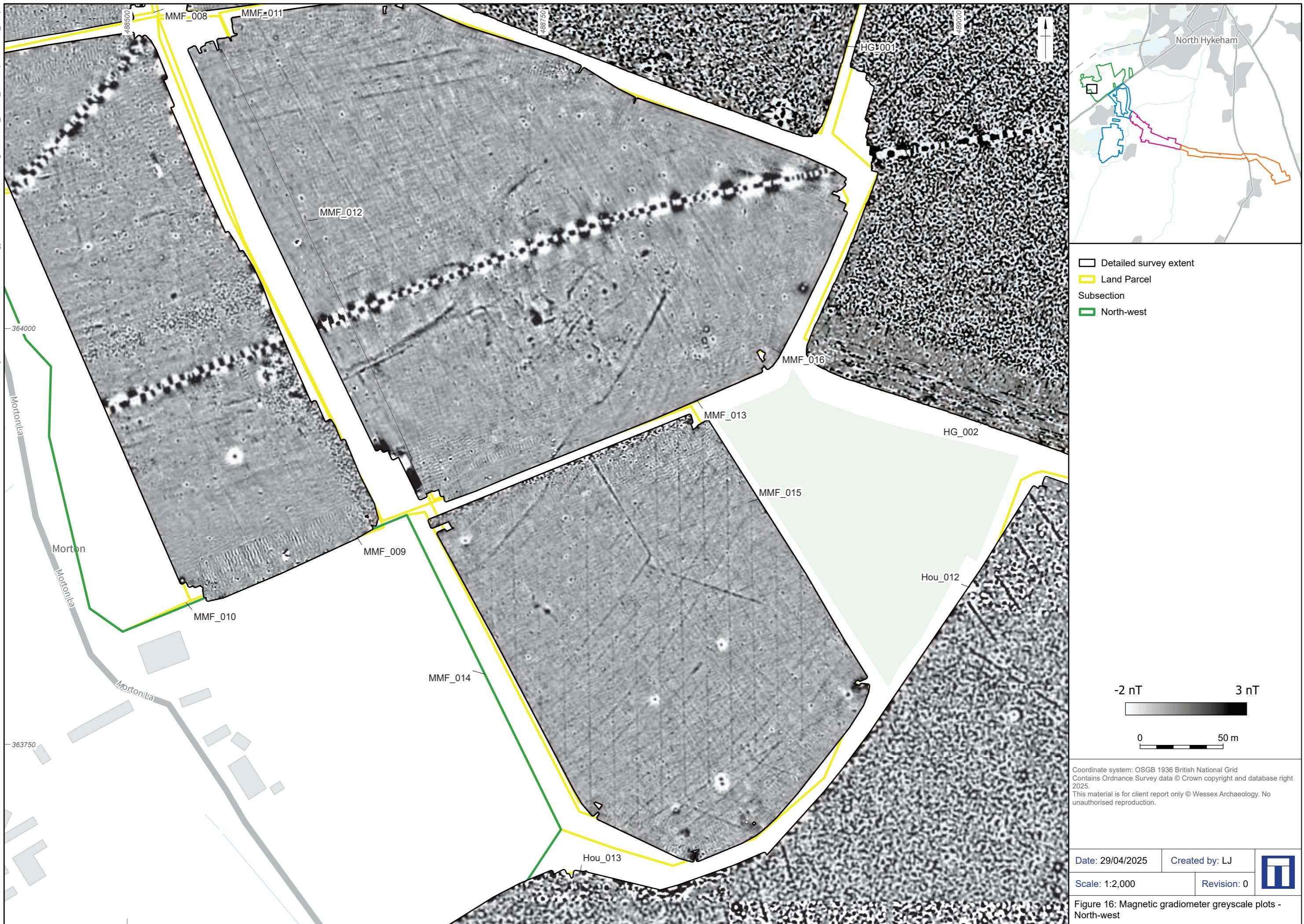




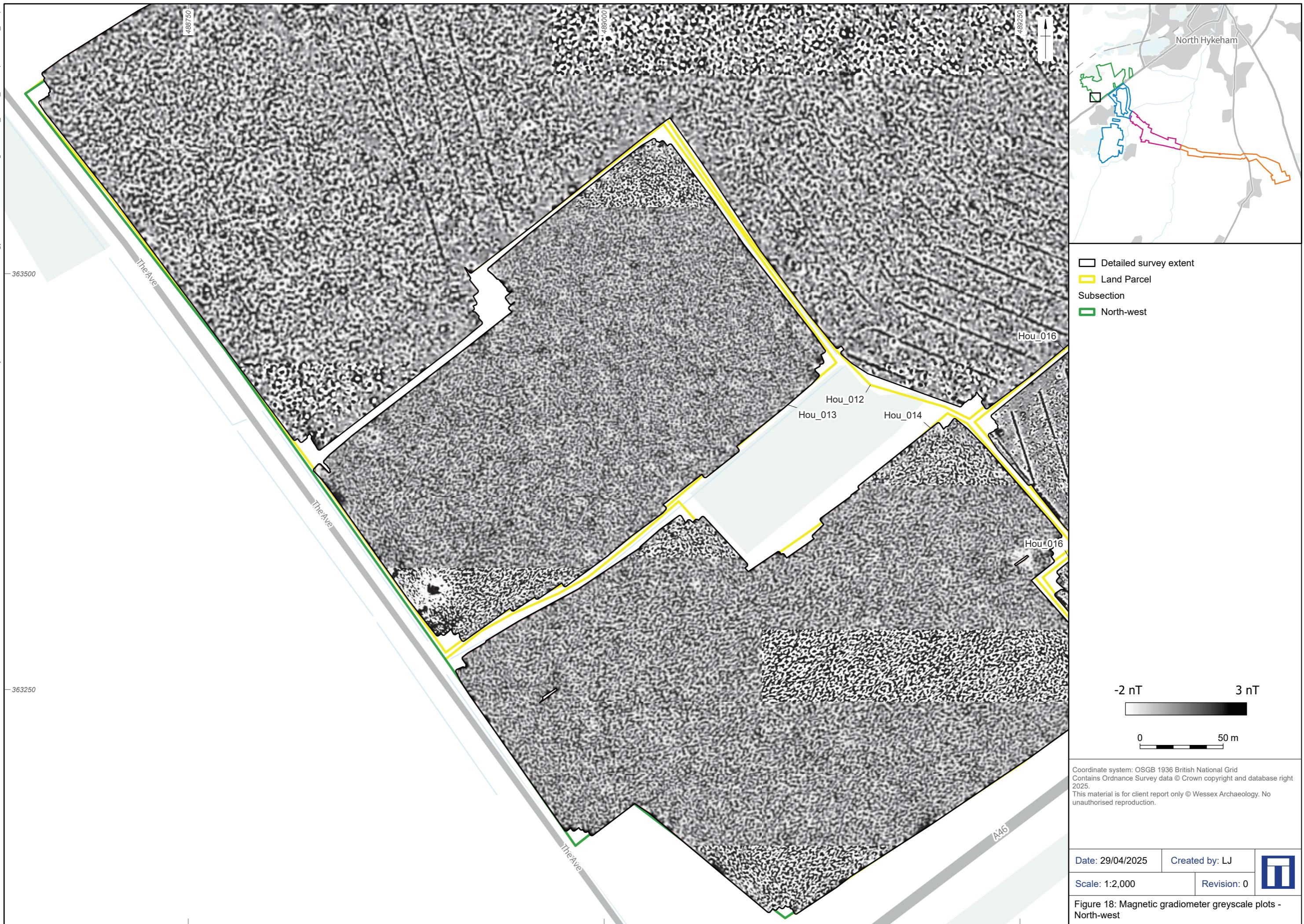




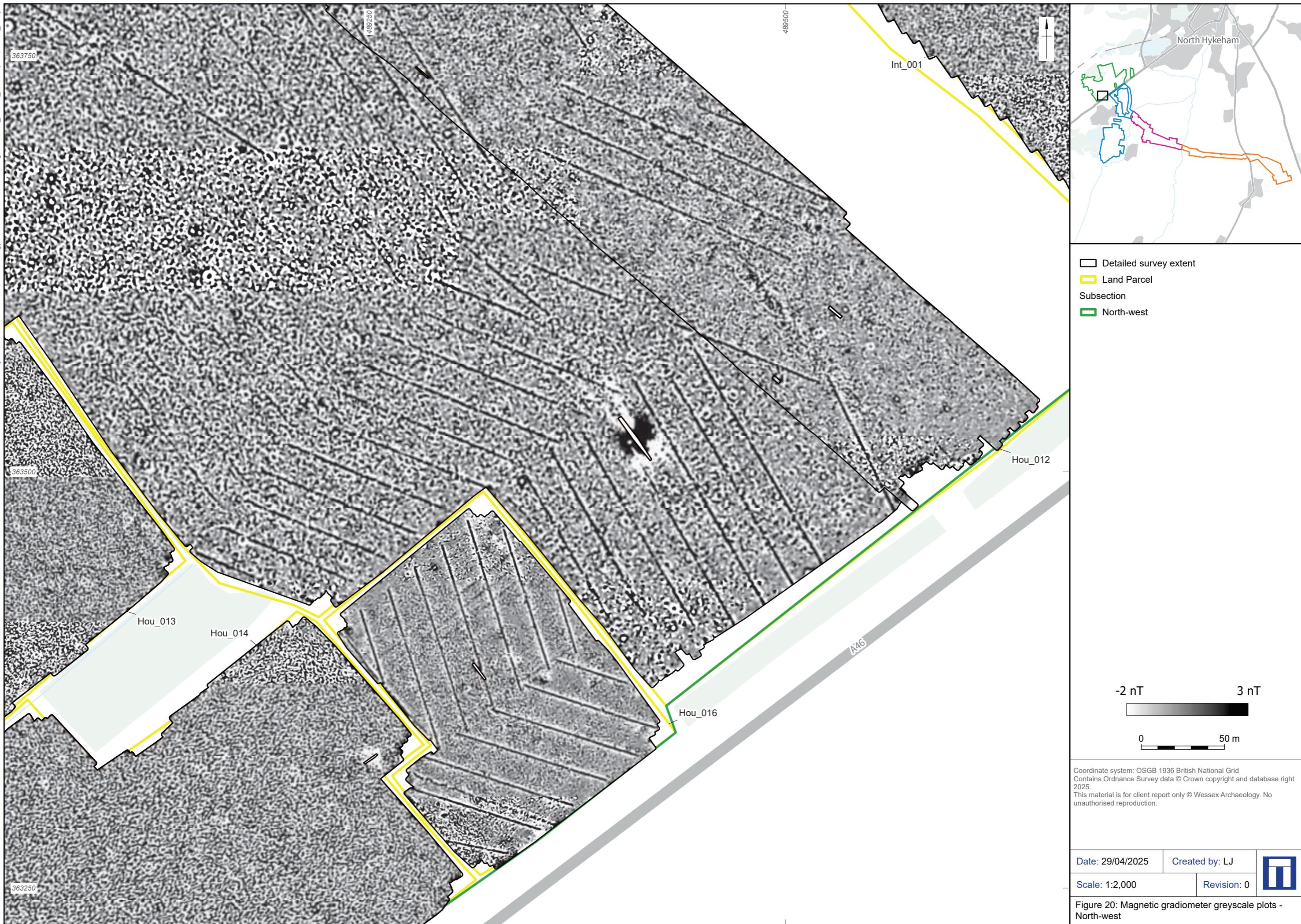






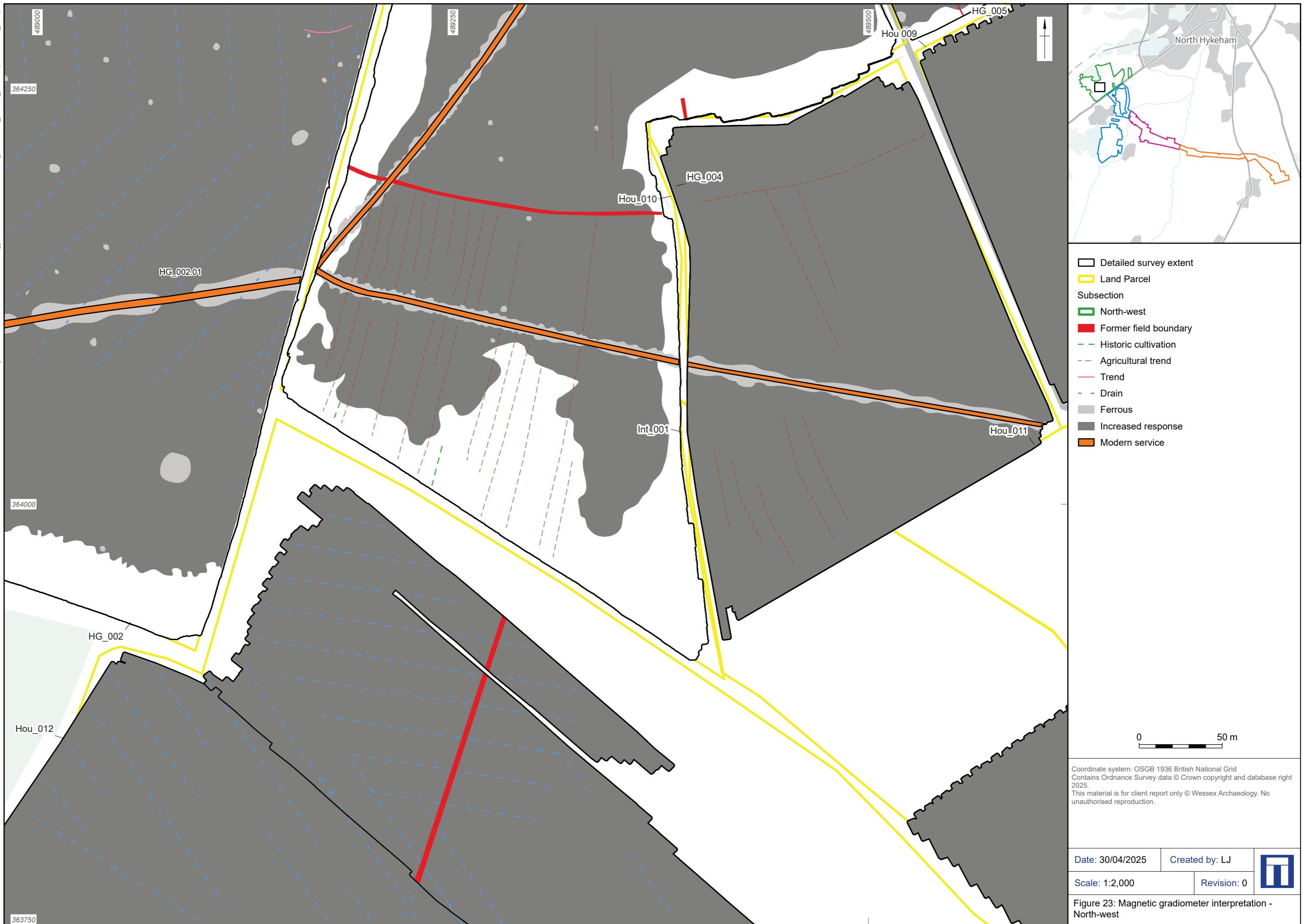




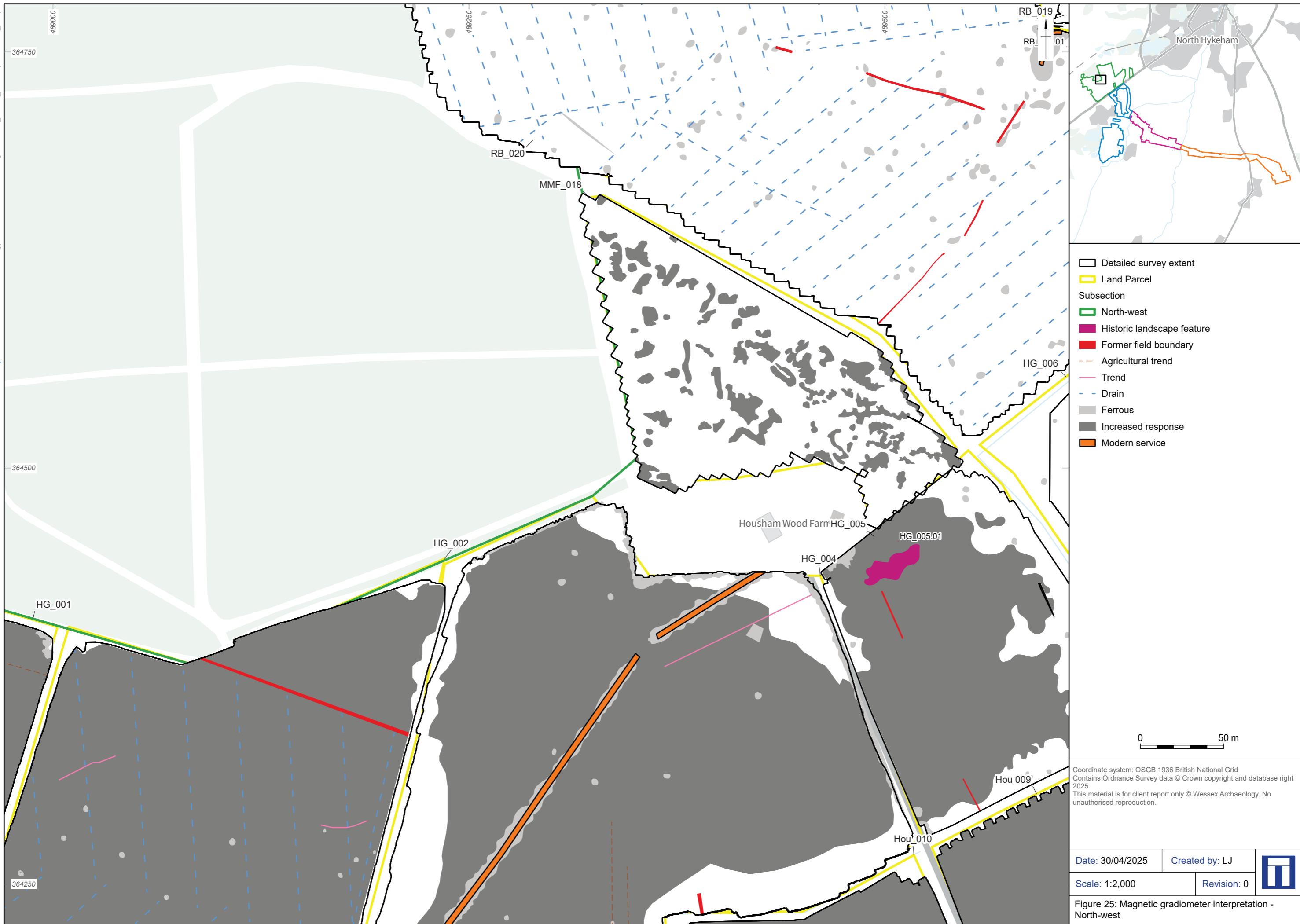


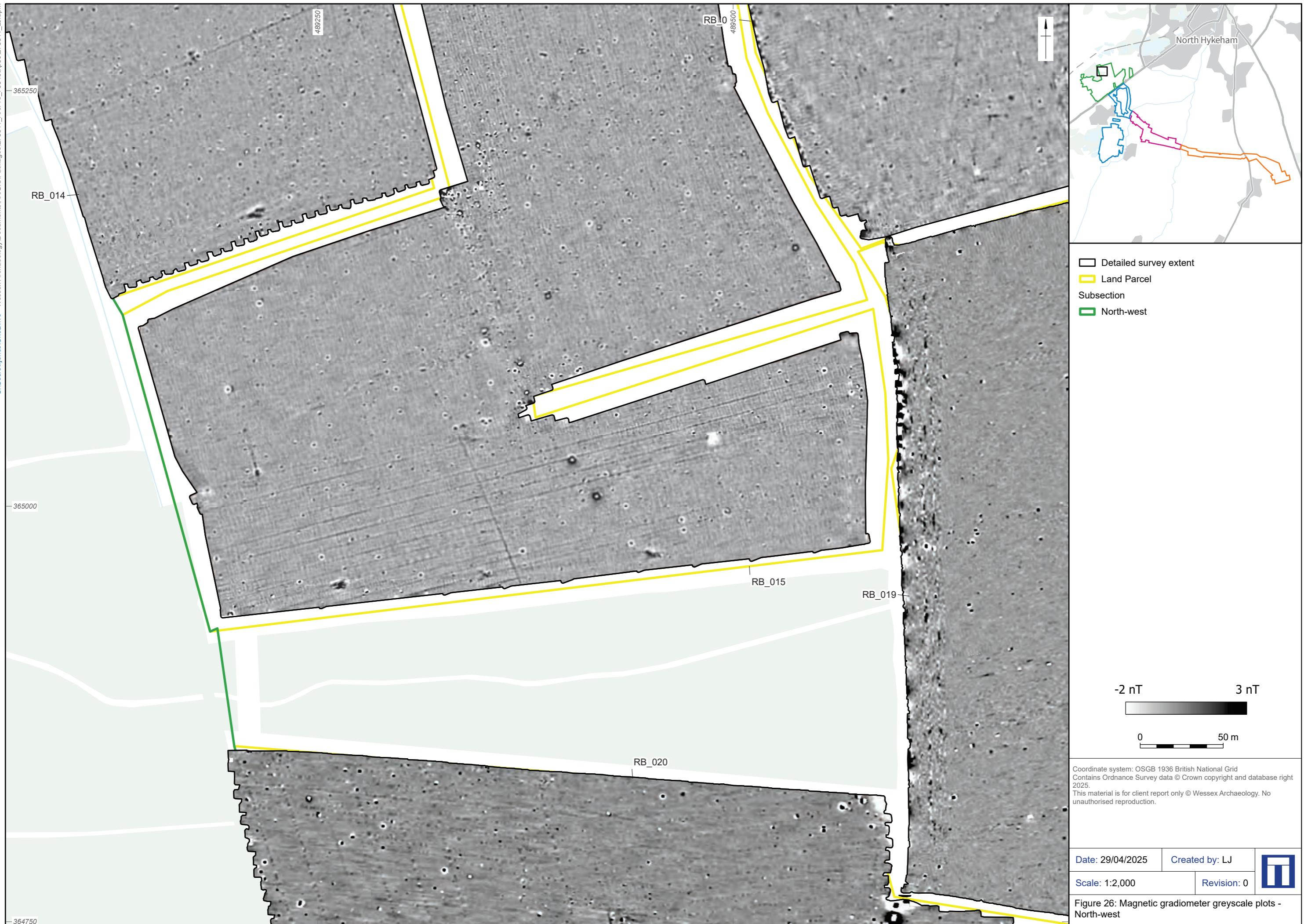


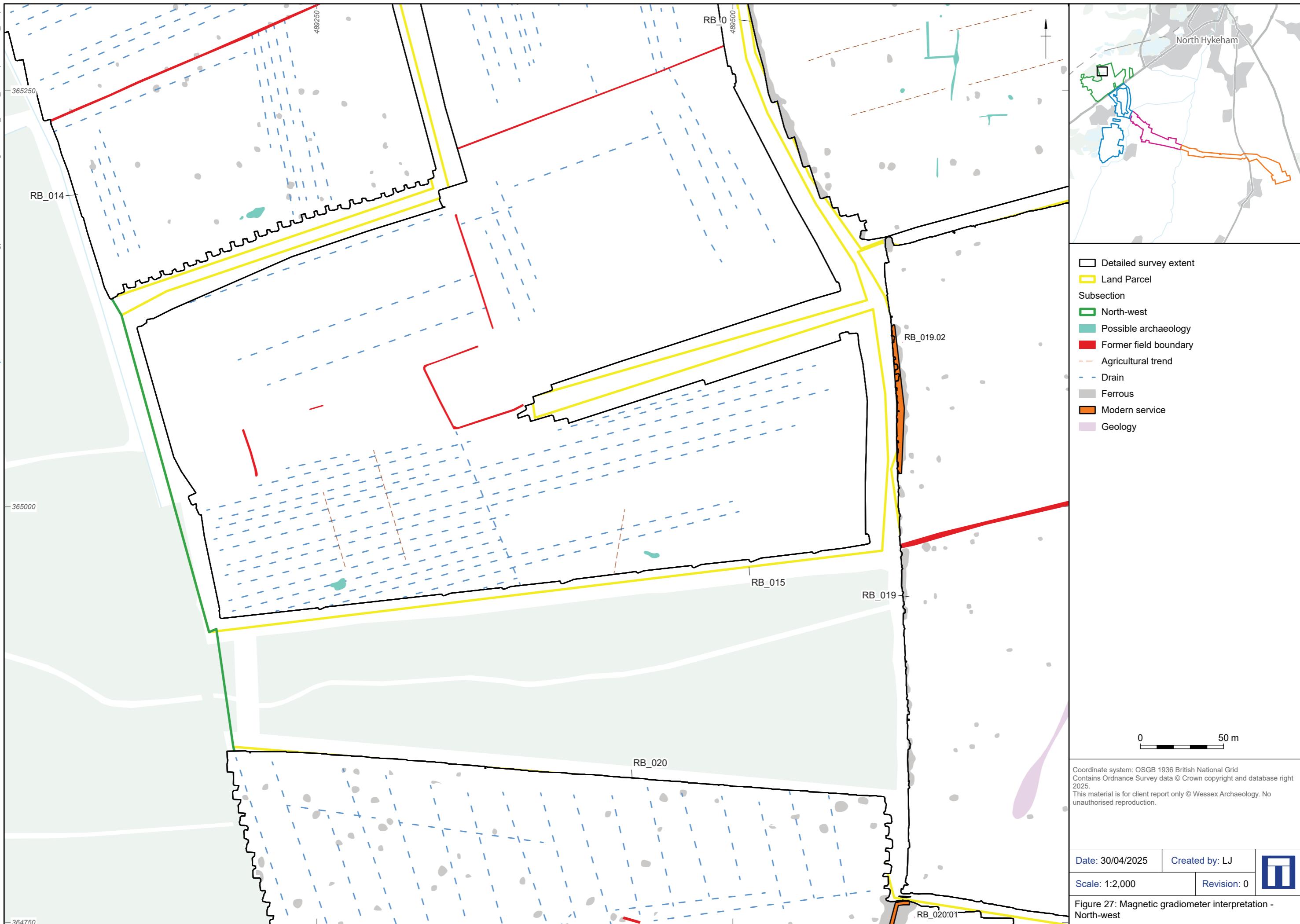


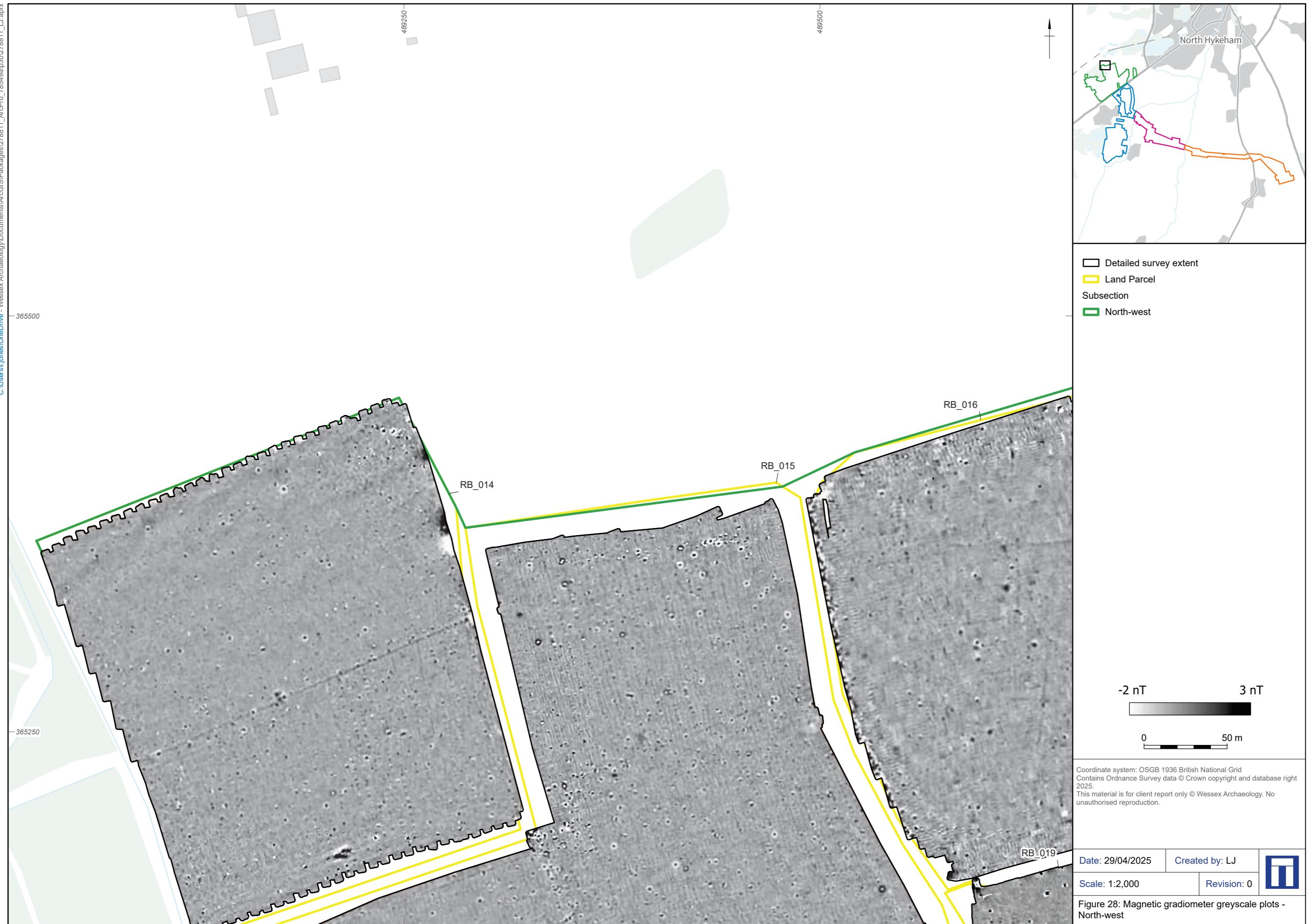


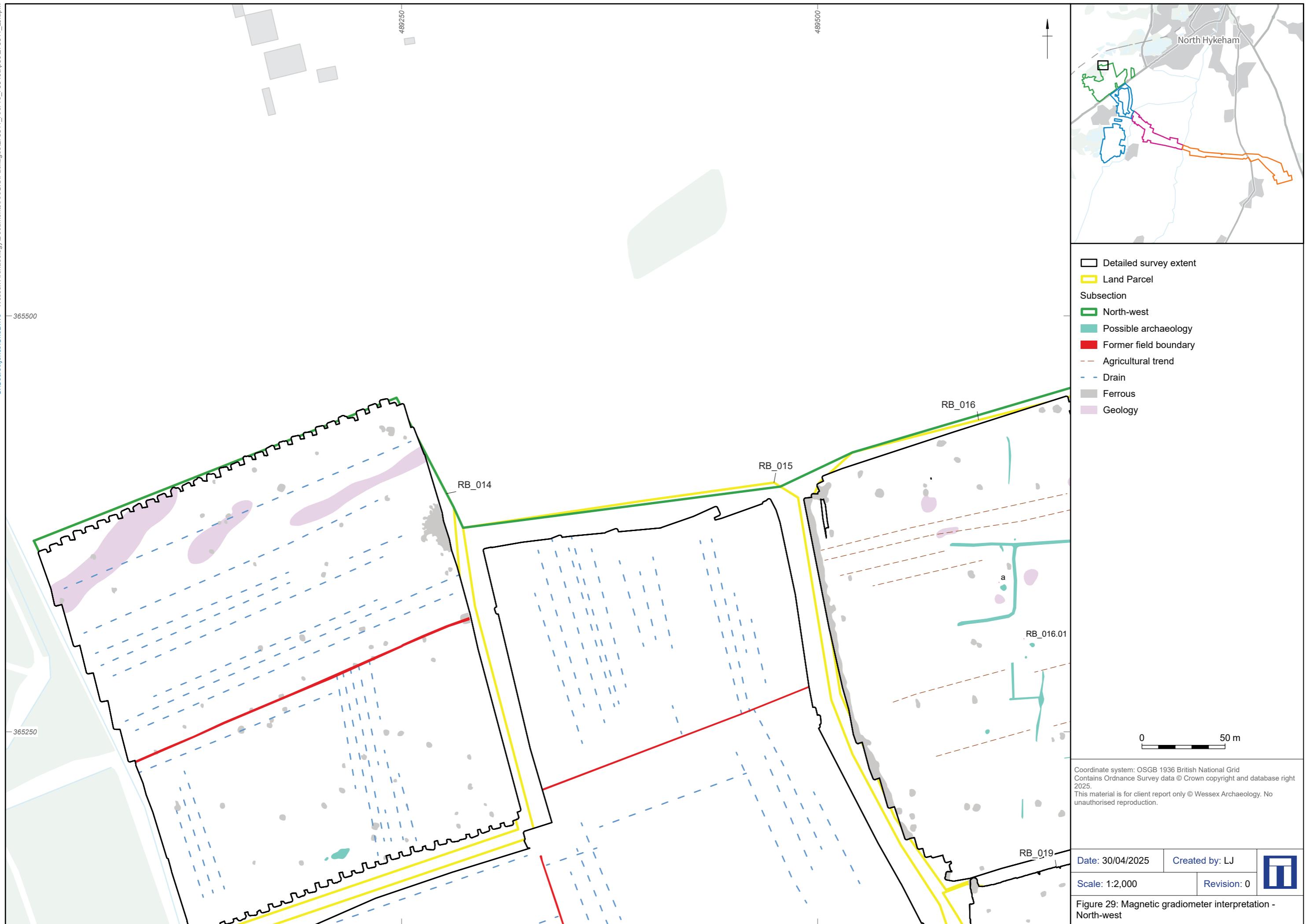


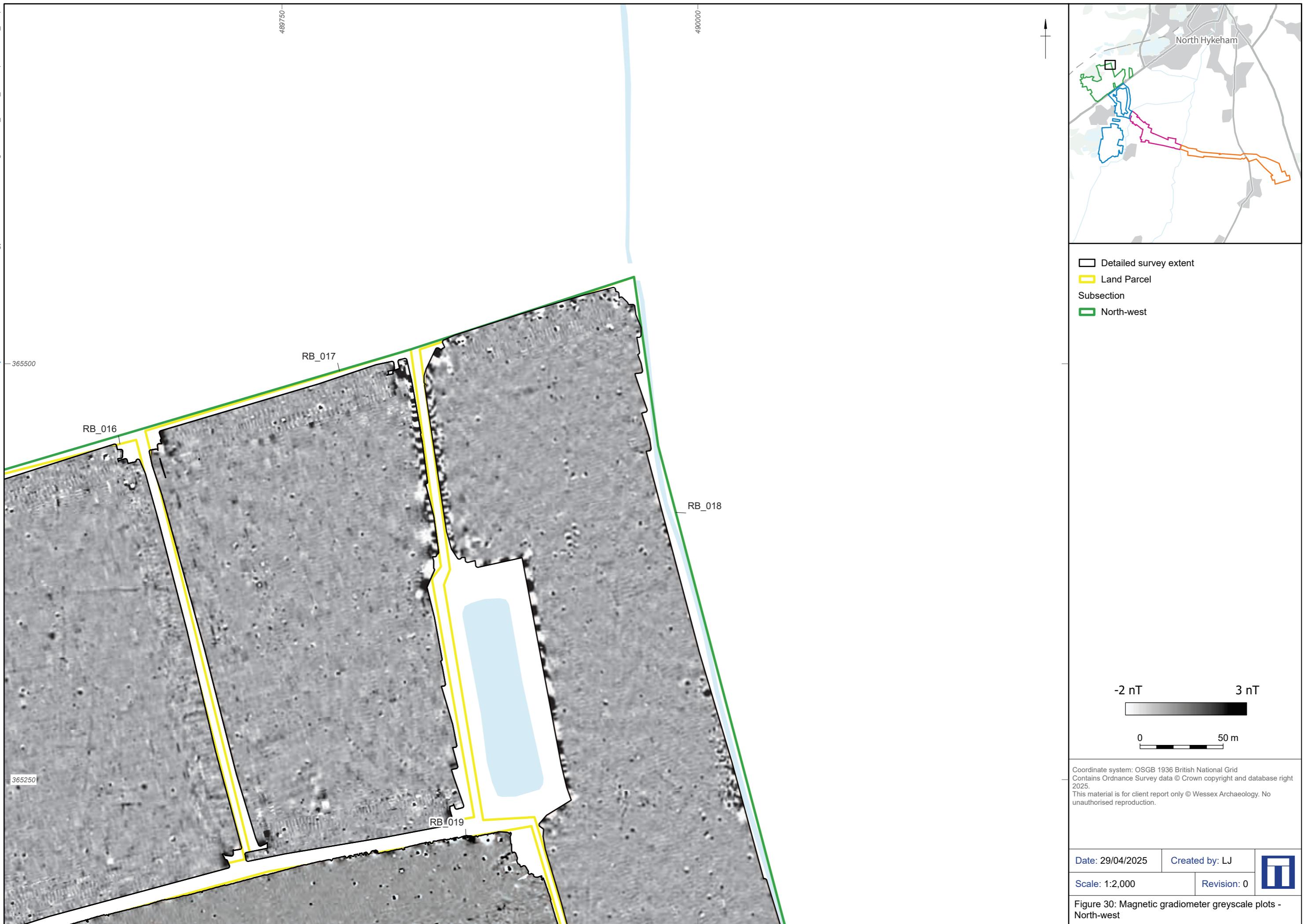






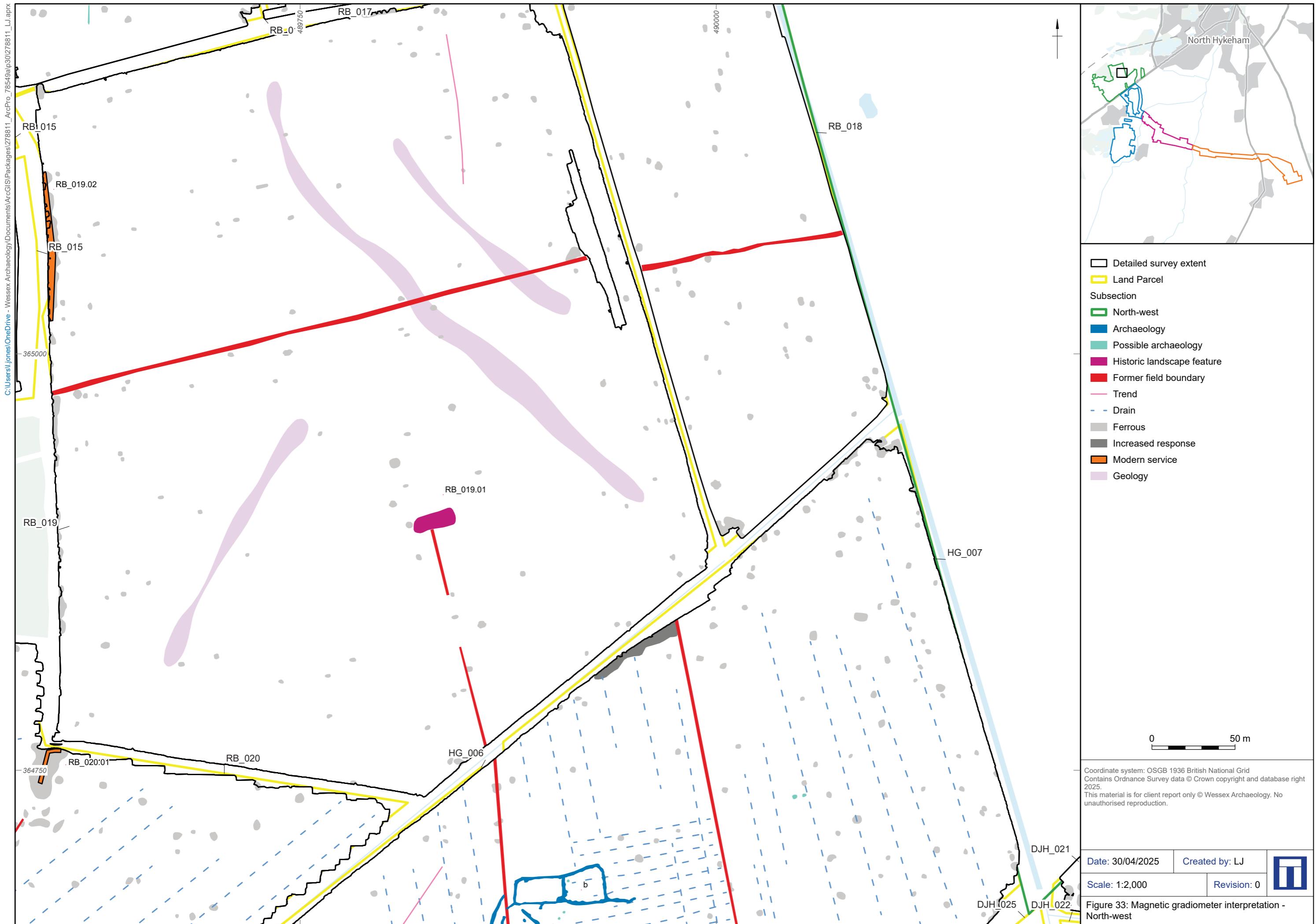


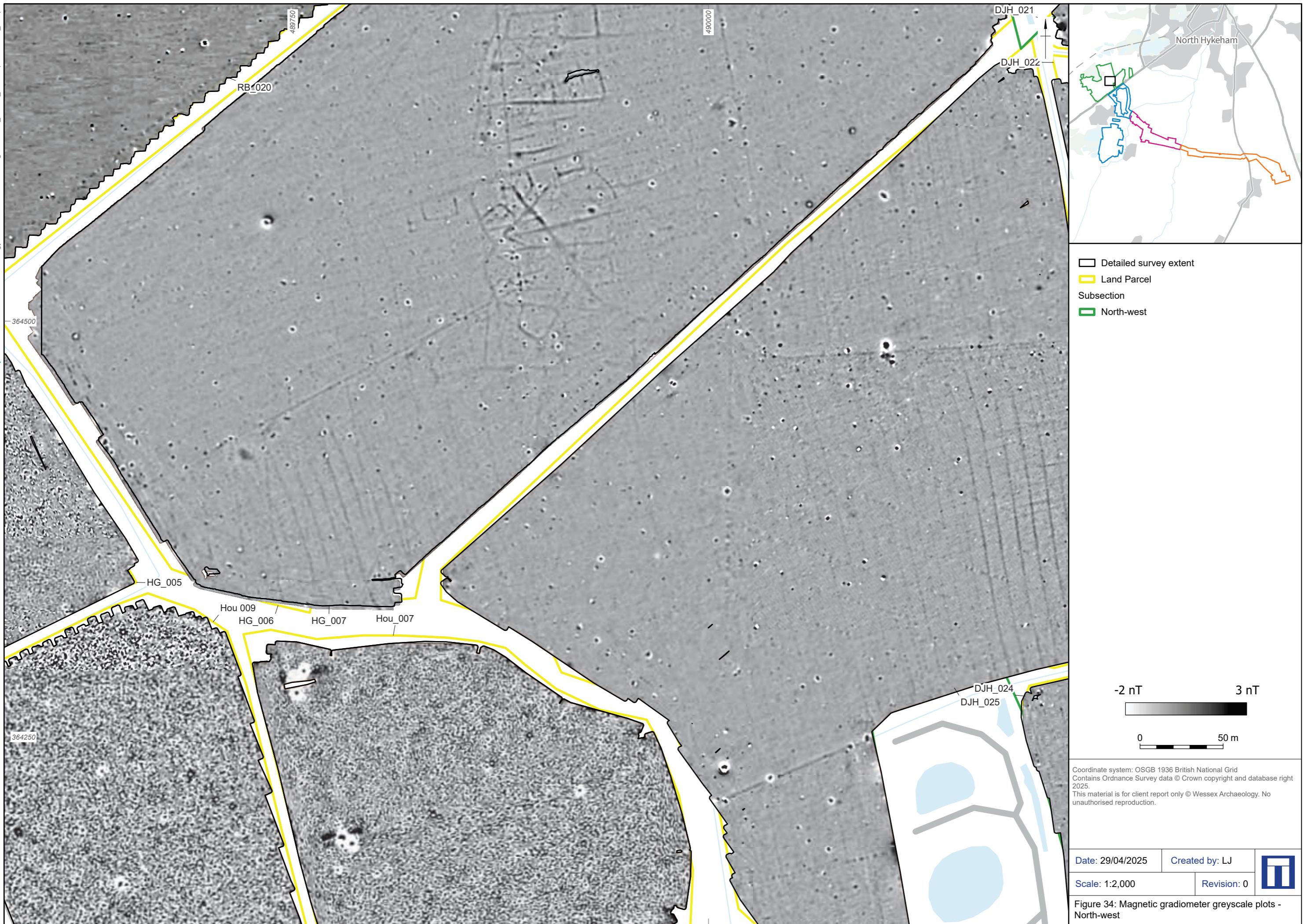


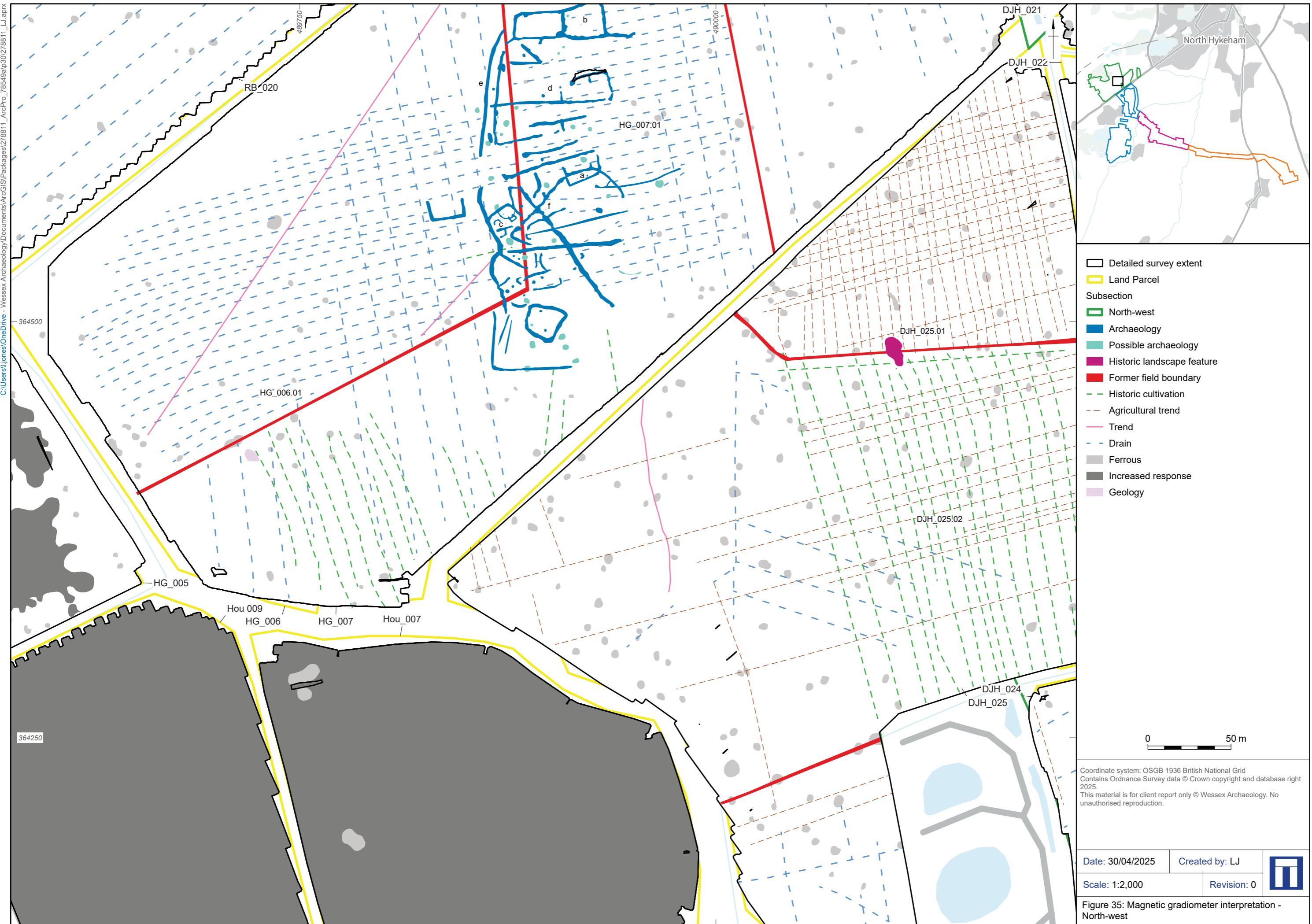




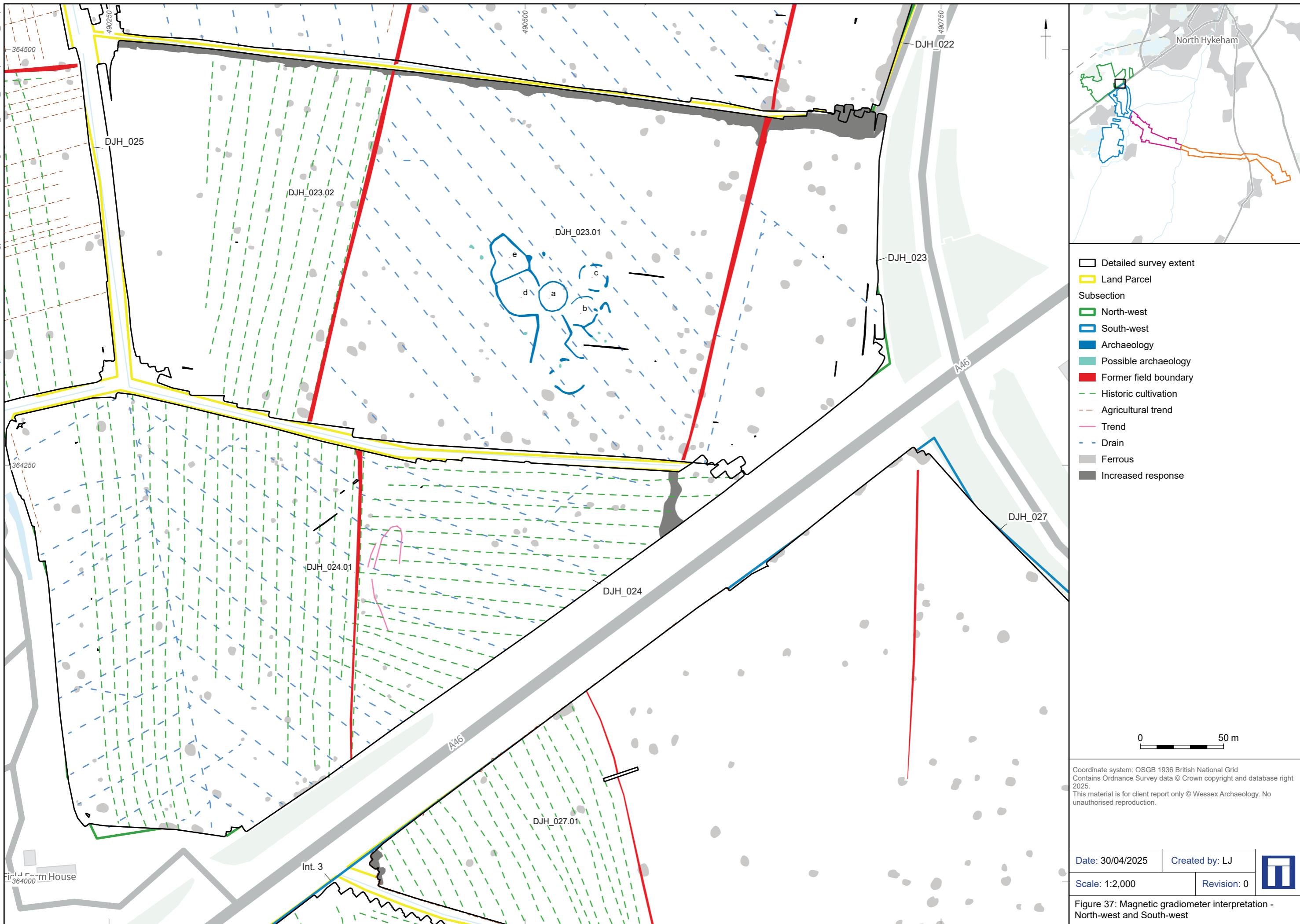


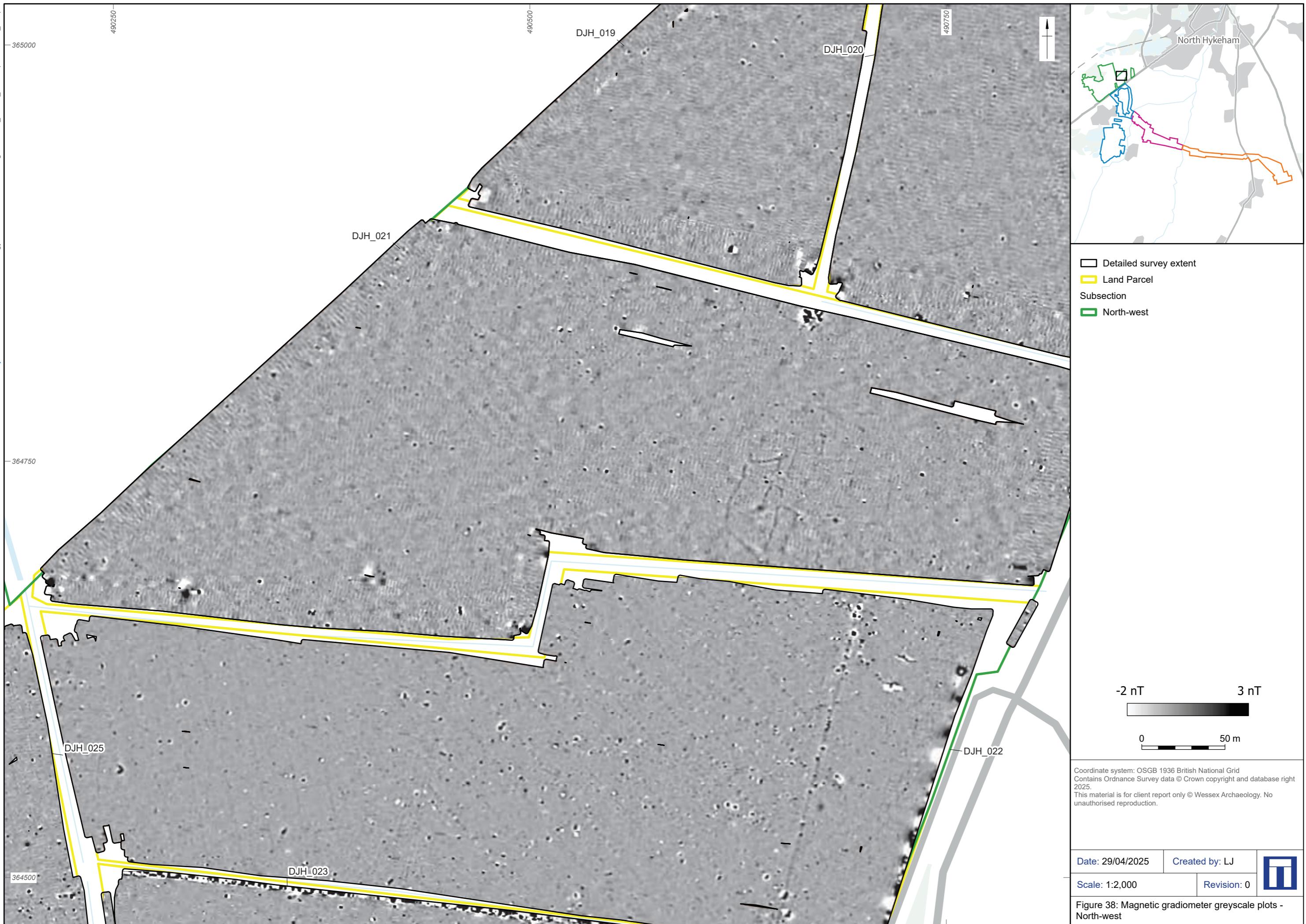


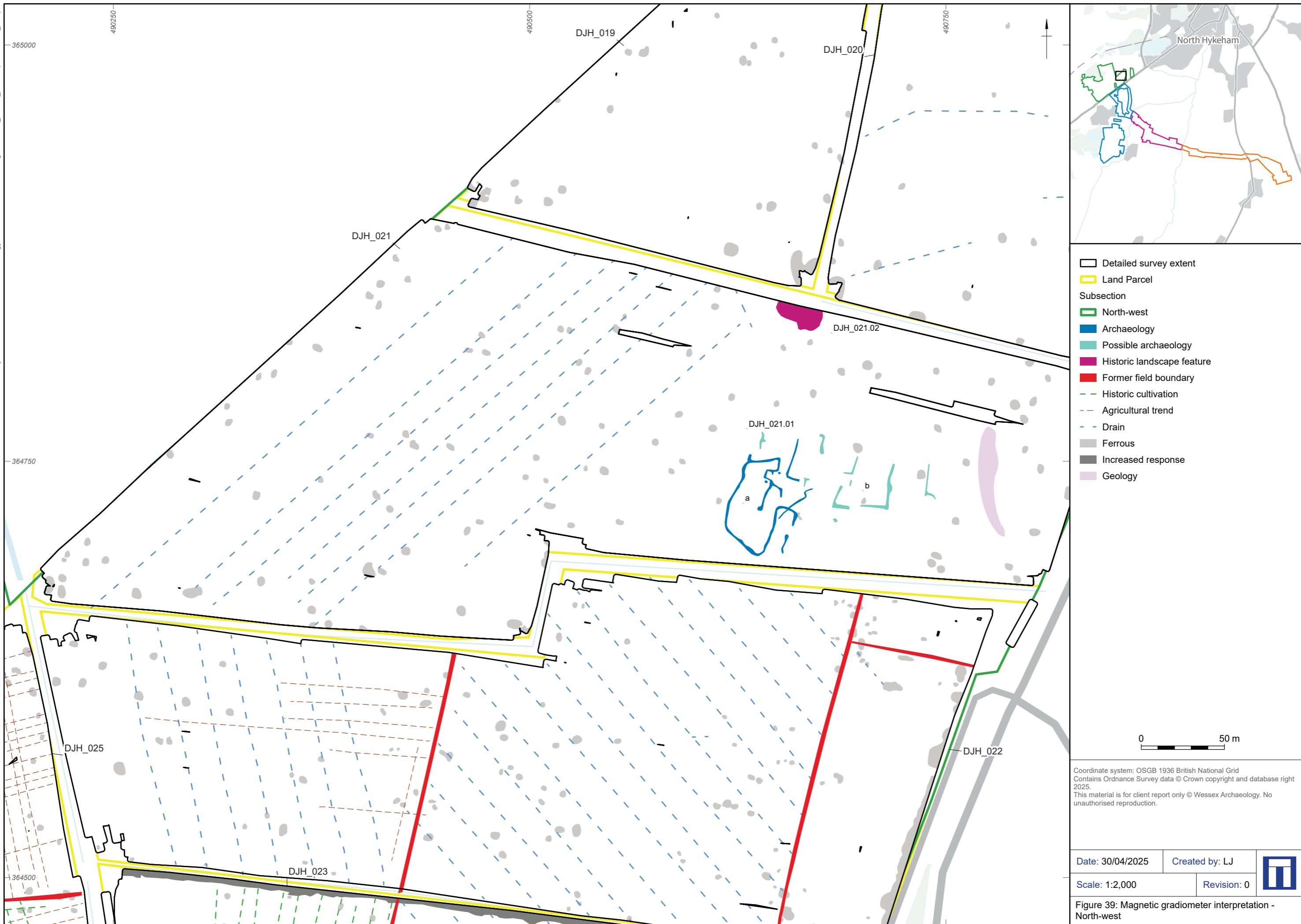




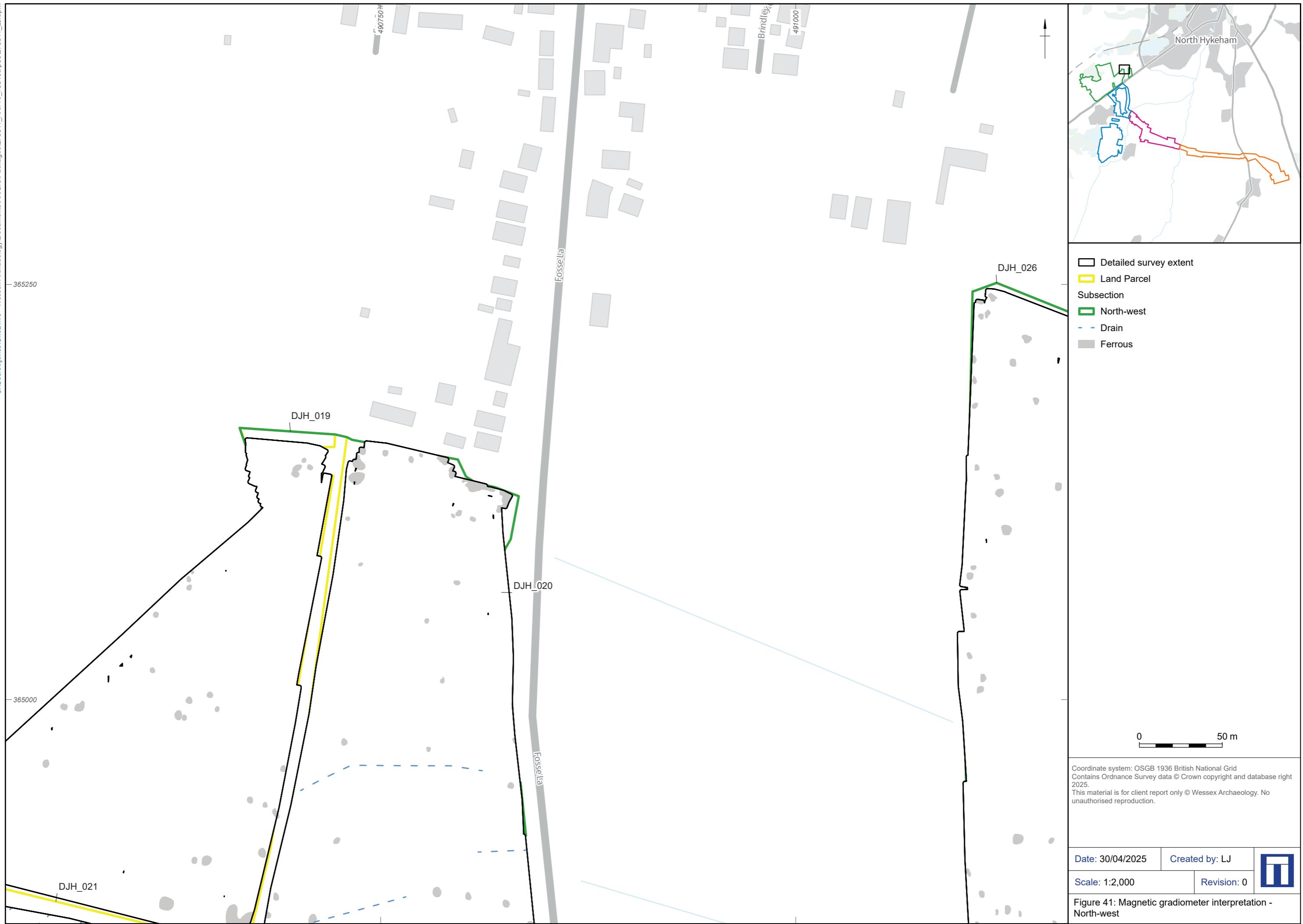


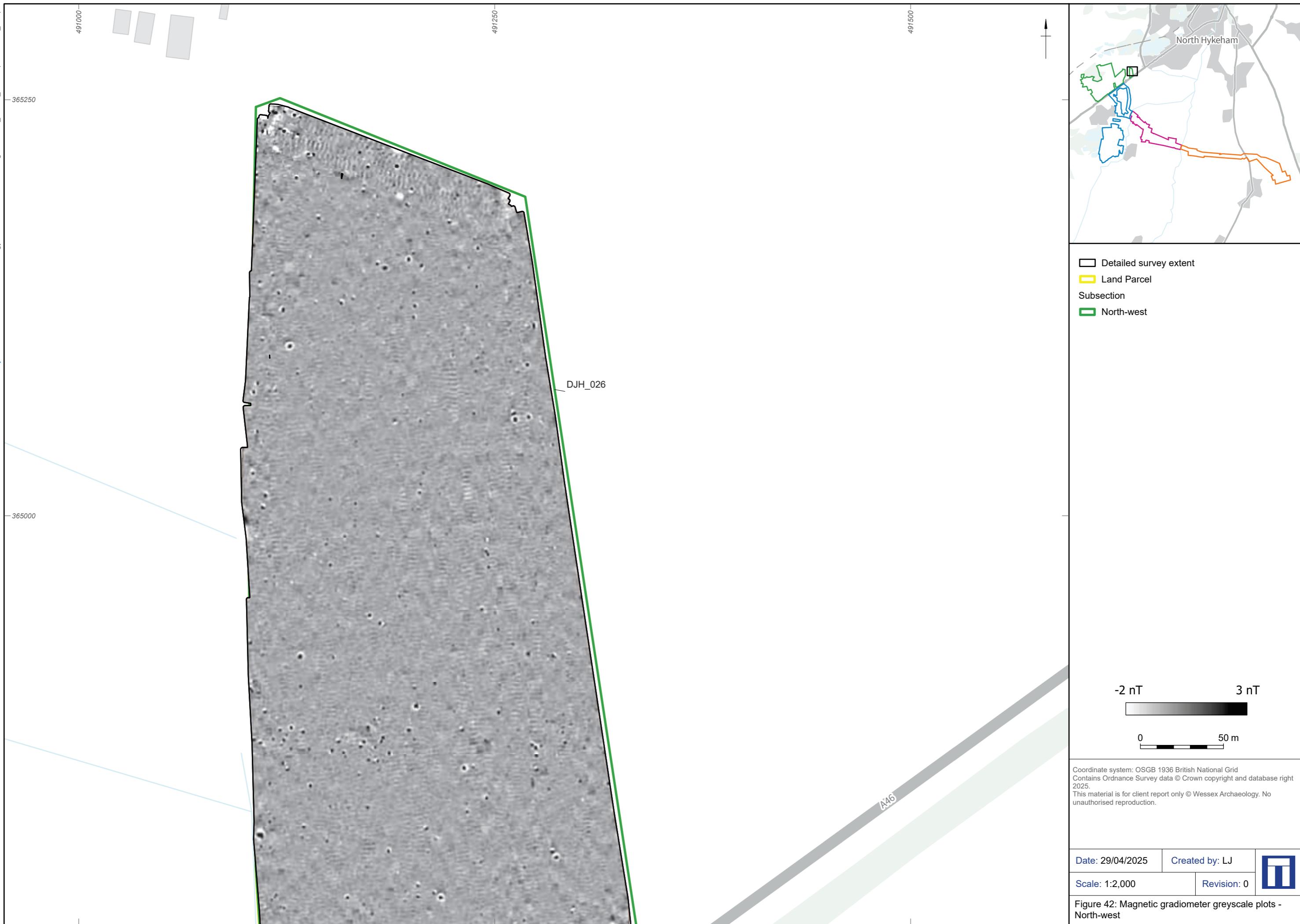


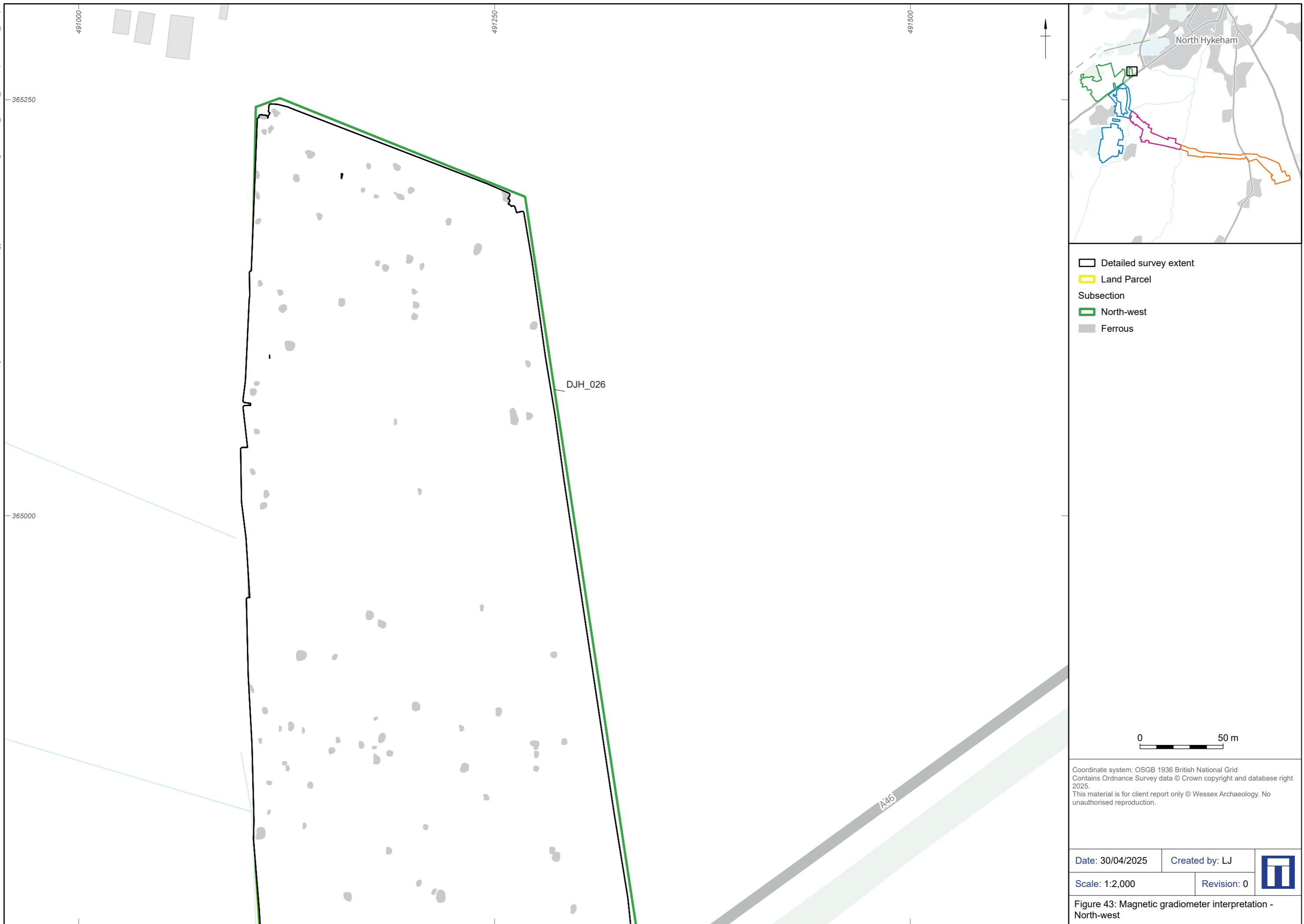


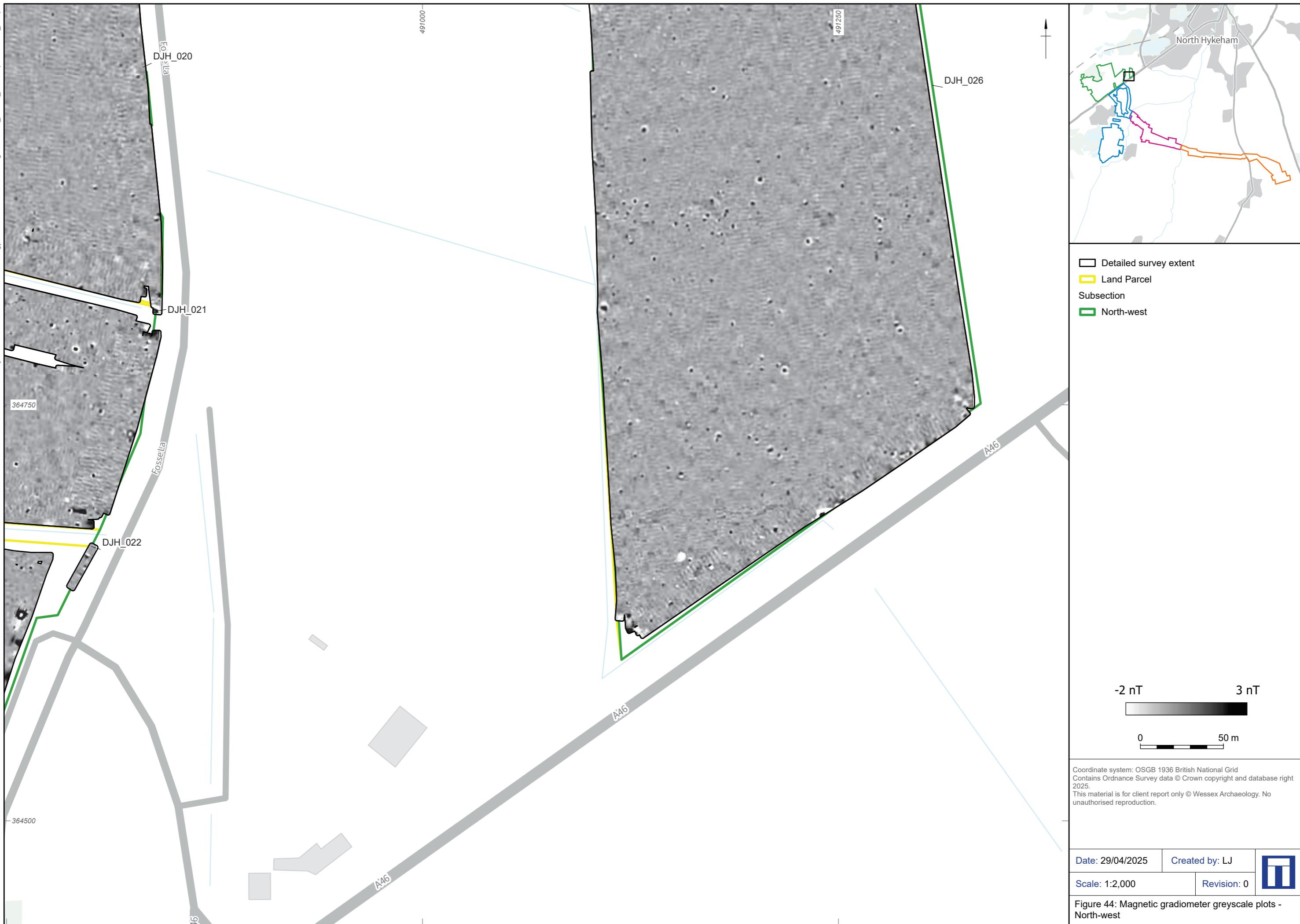


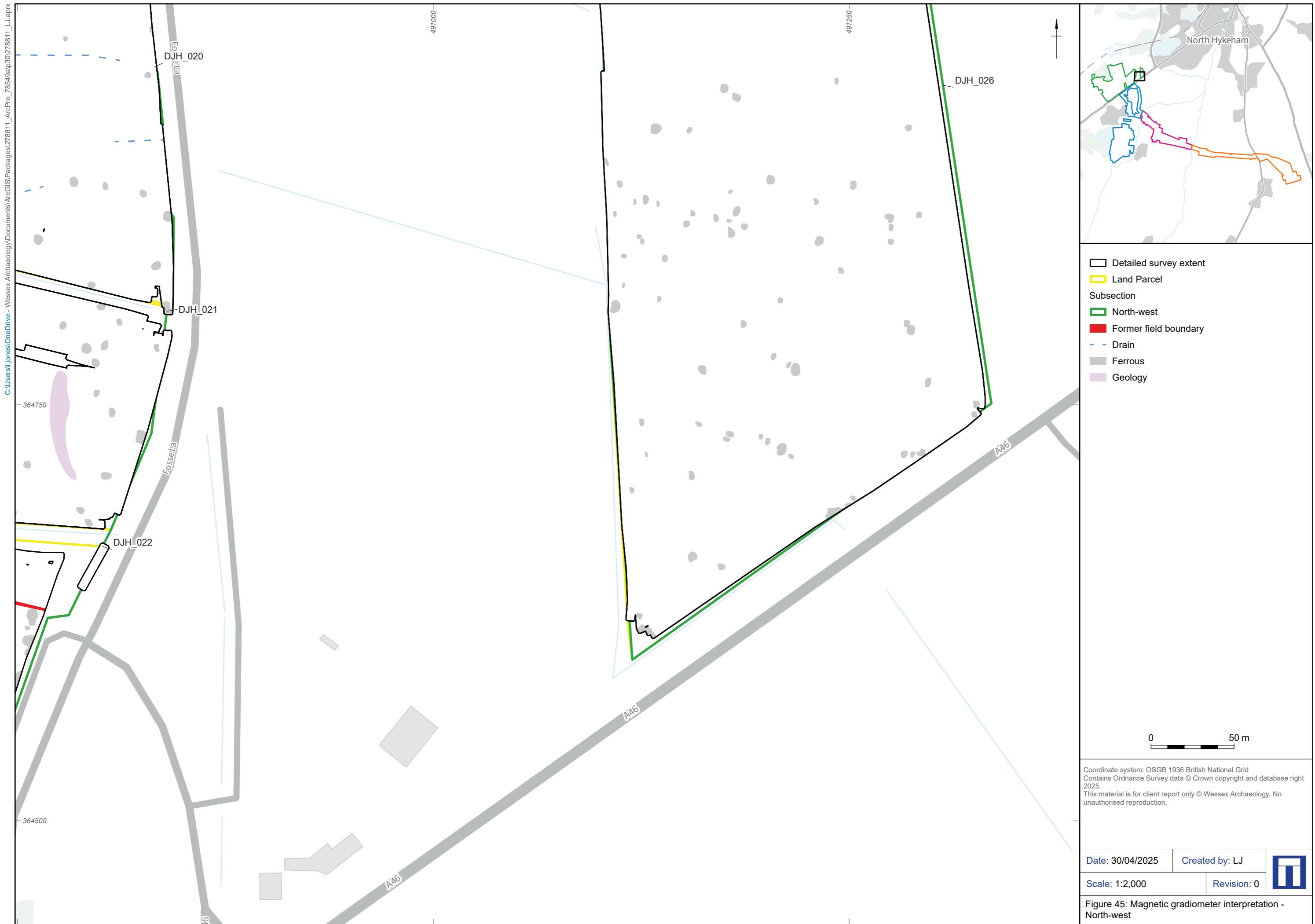


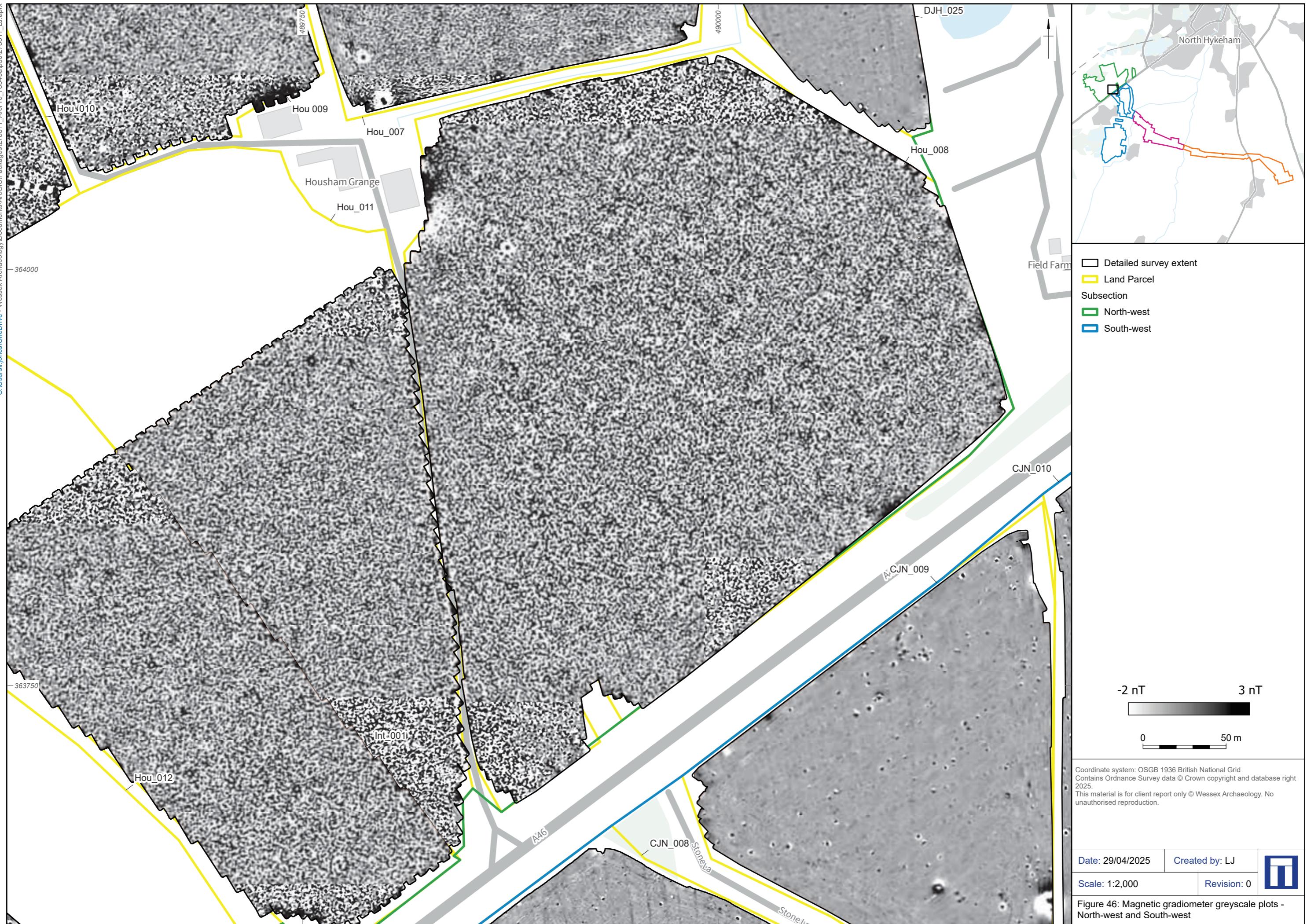


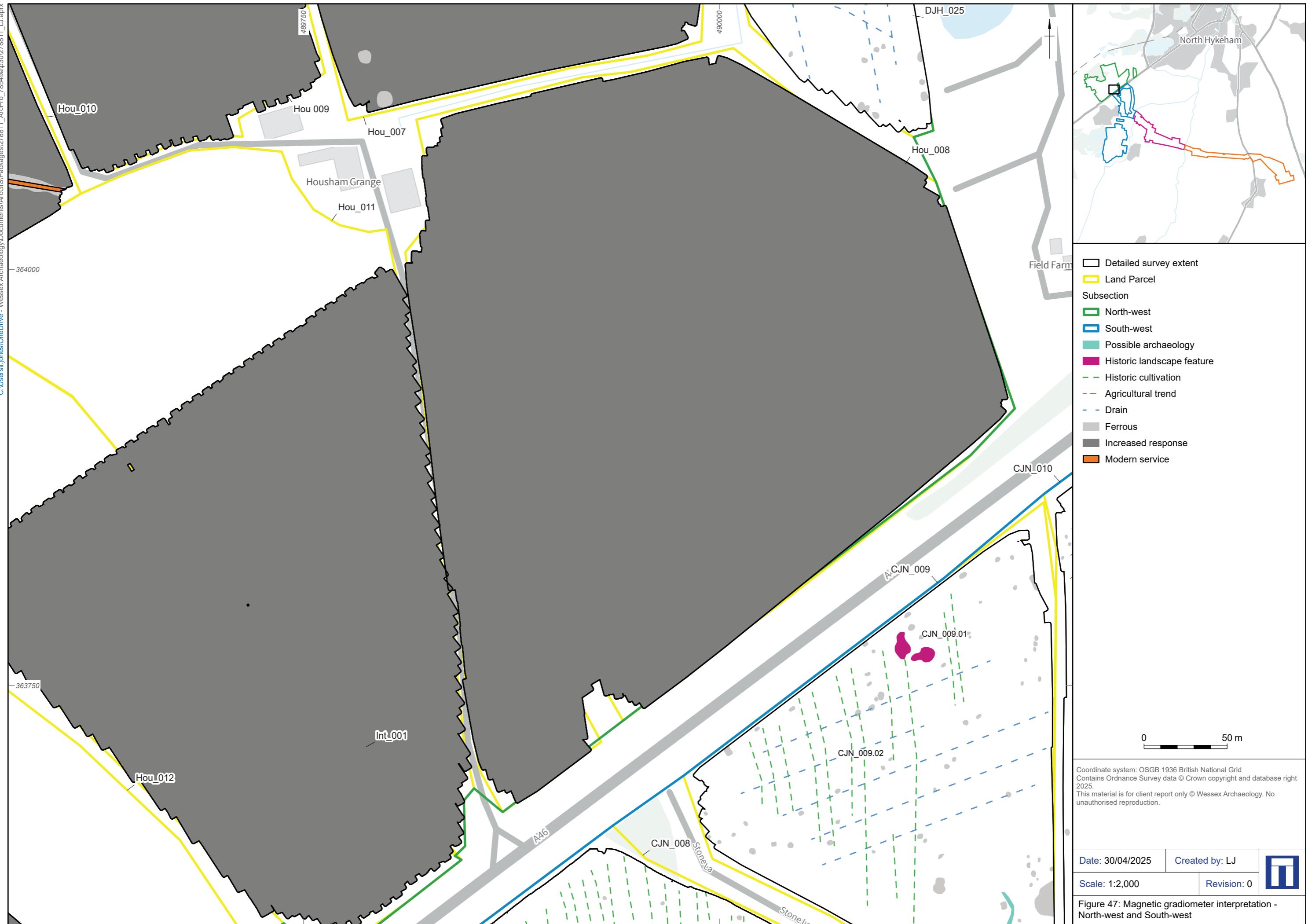


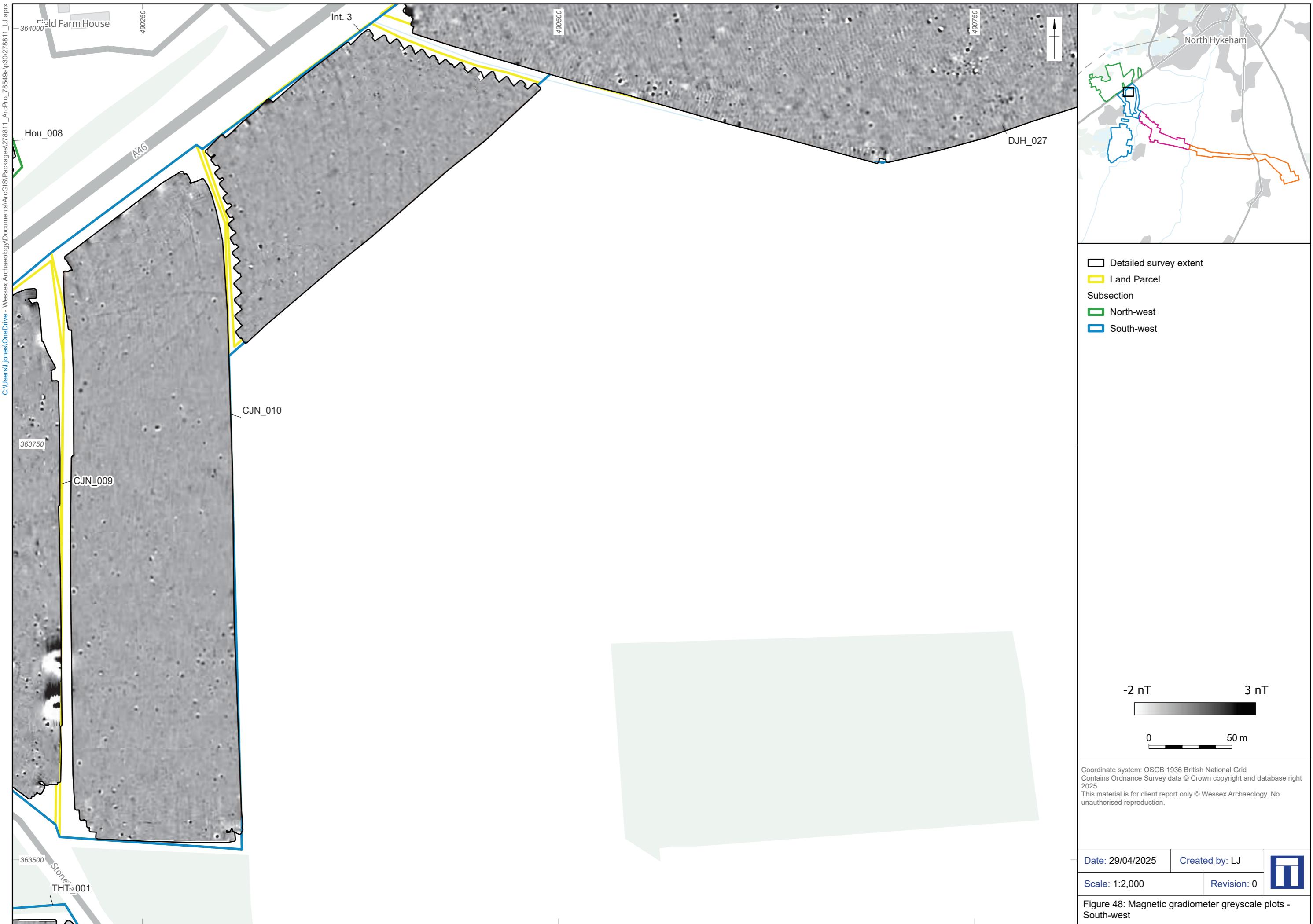


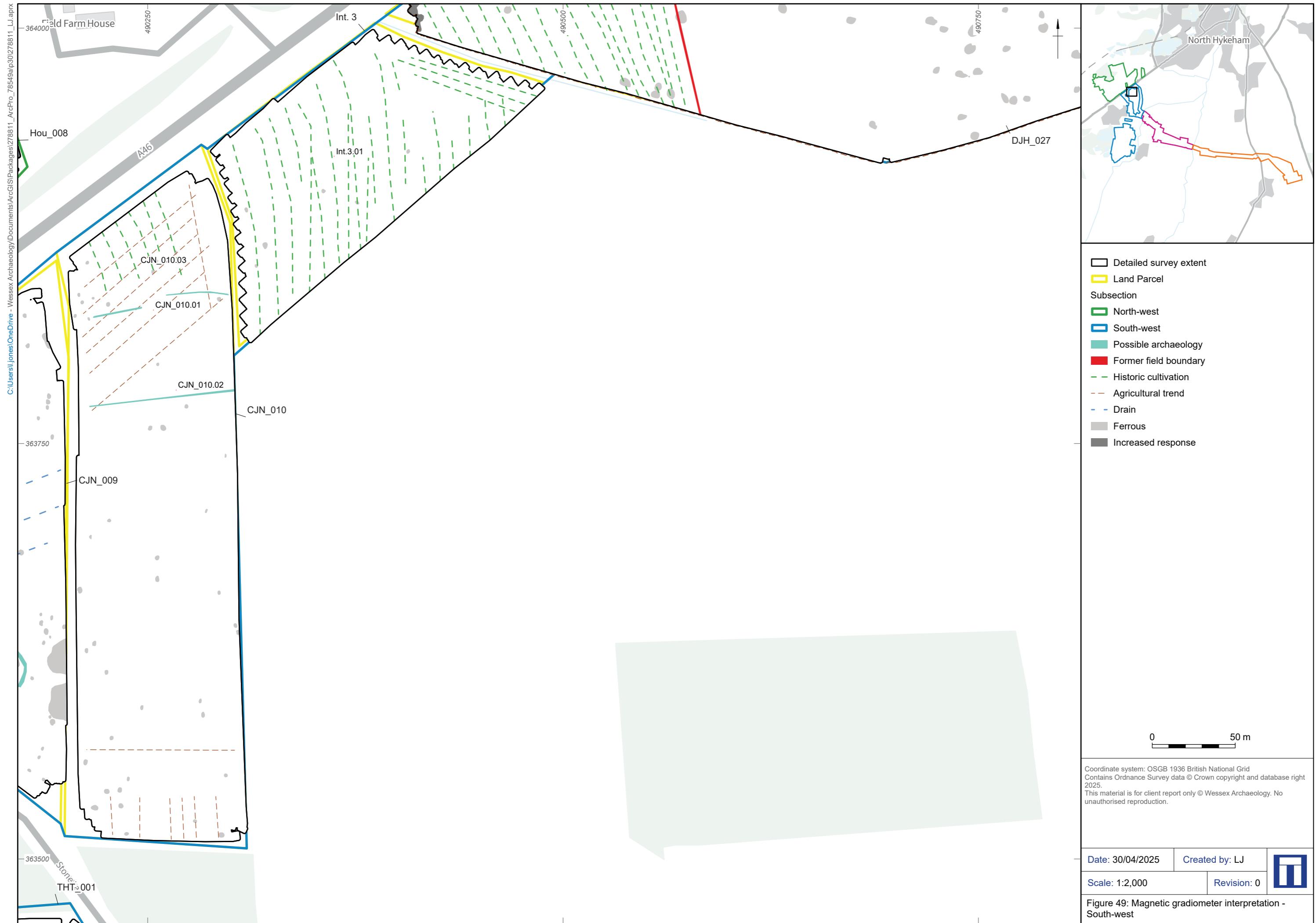




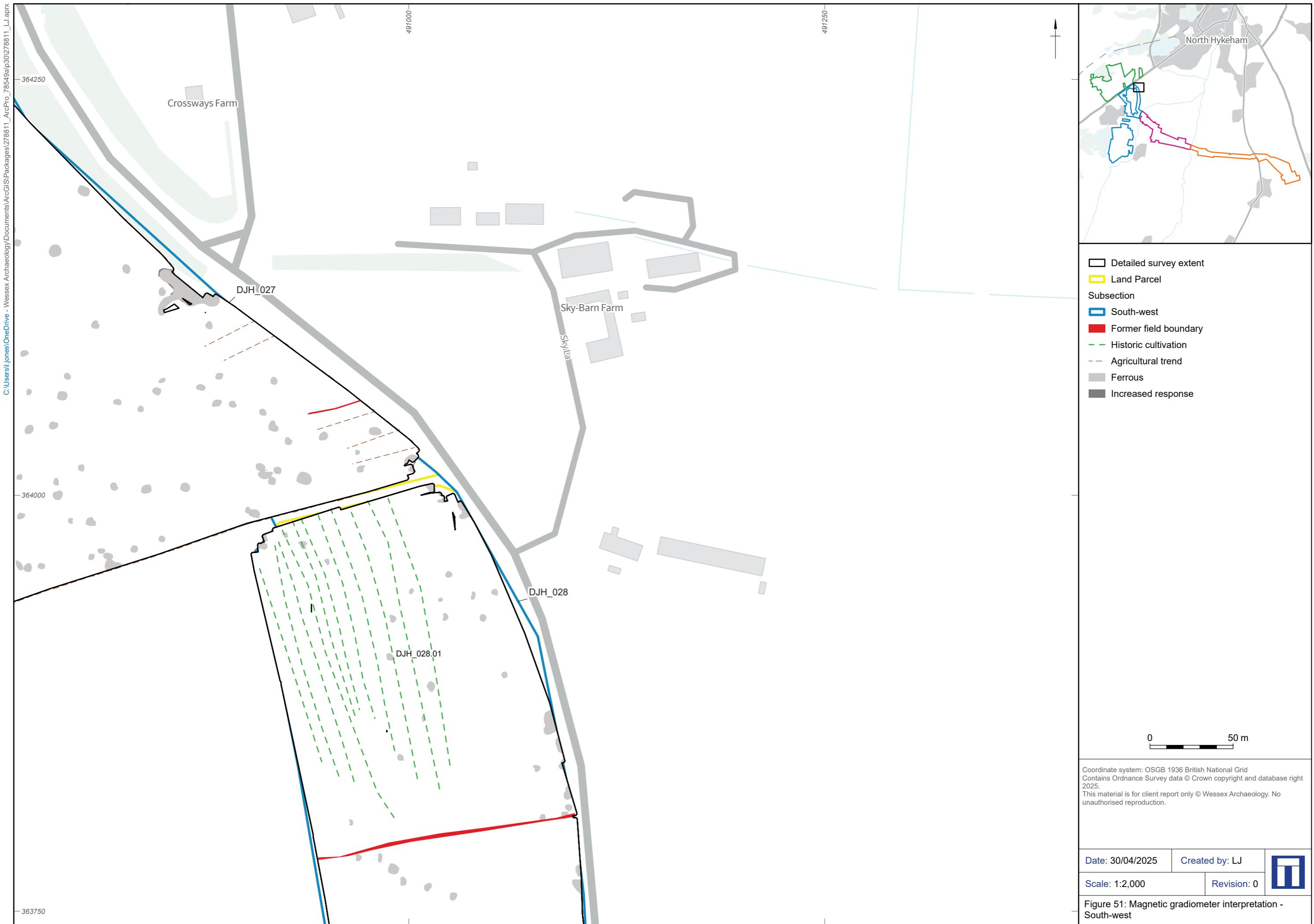


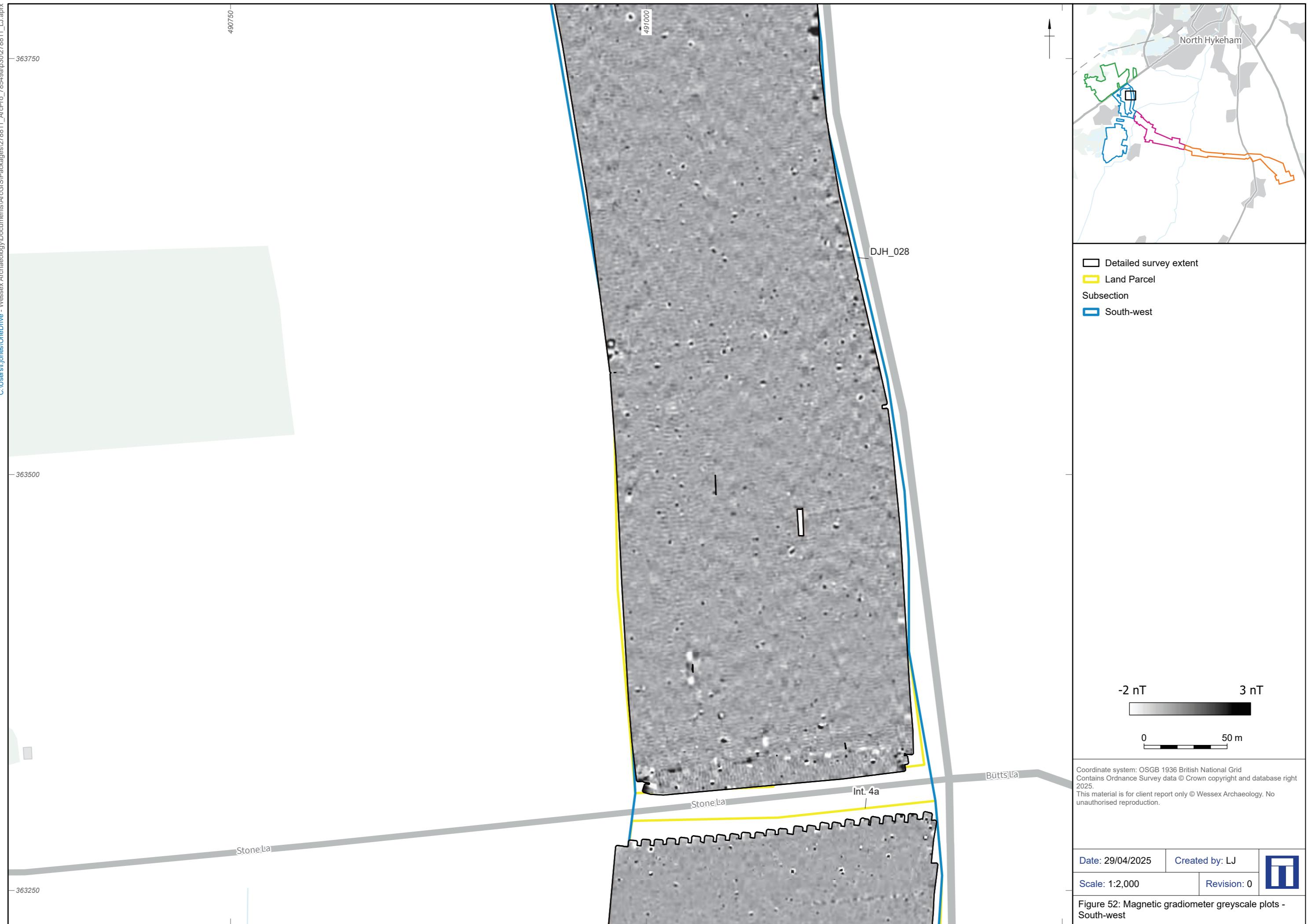


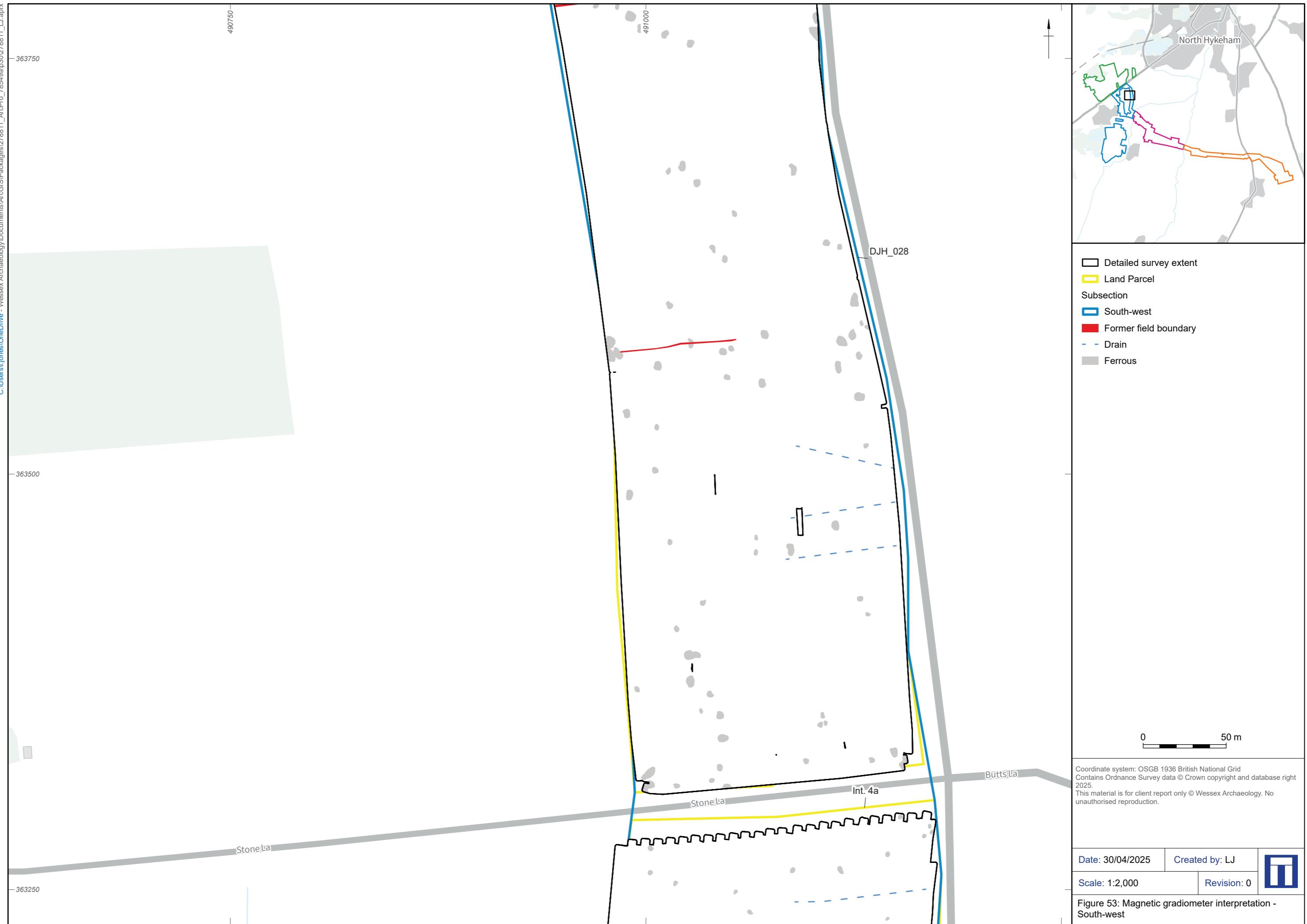


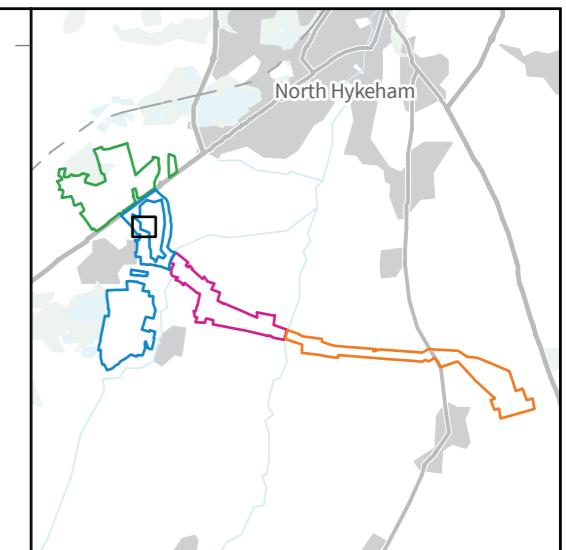




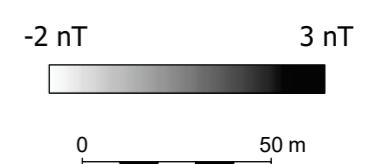






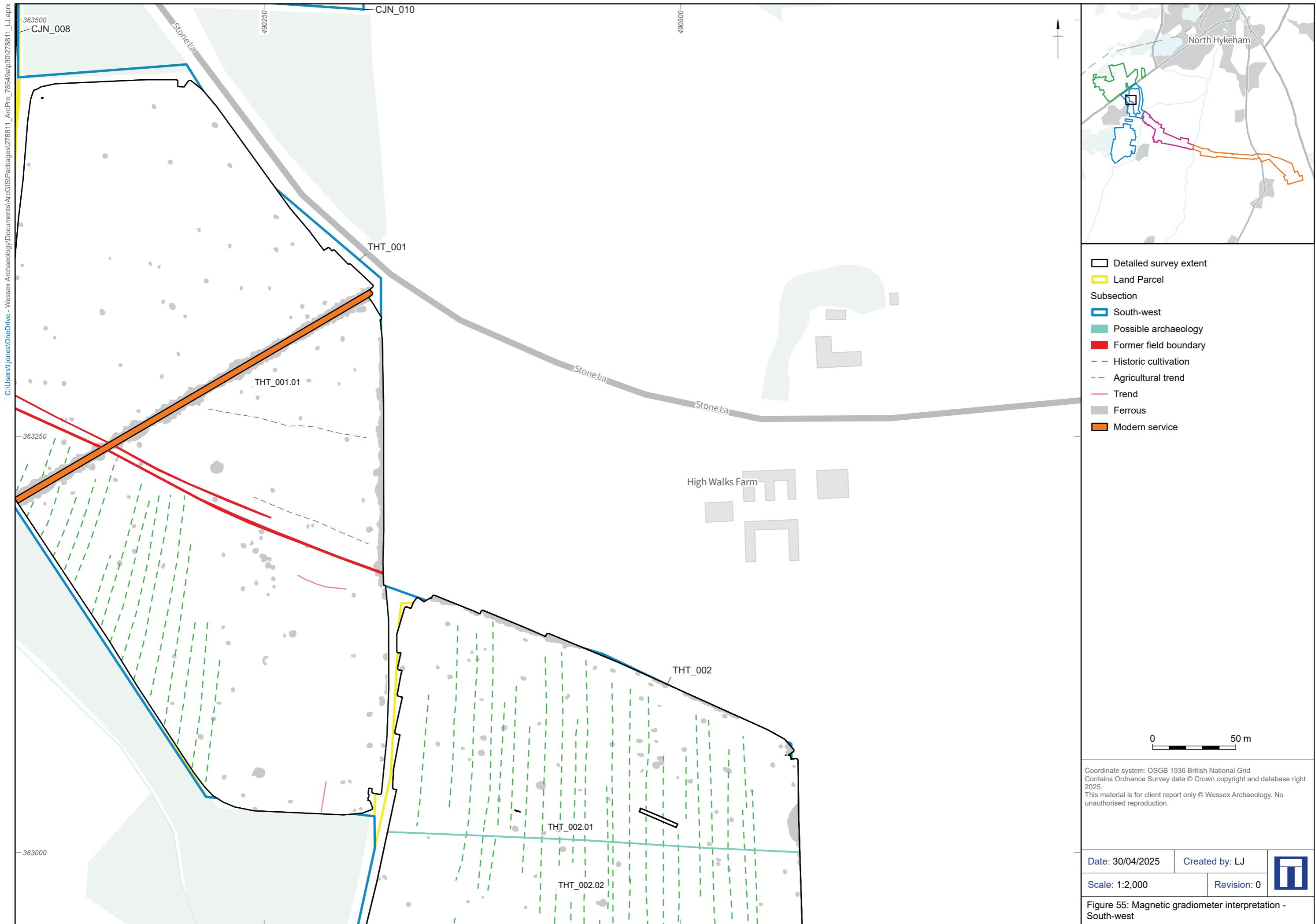


Detailed survey extent  
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 Subsection  
 South-west

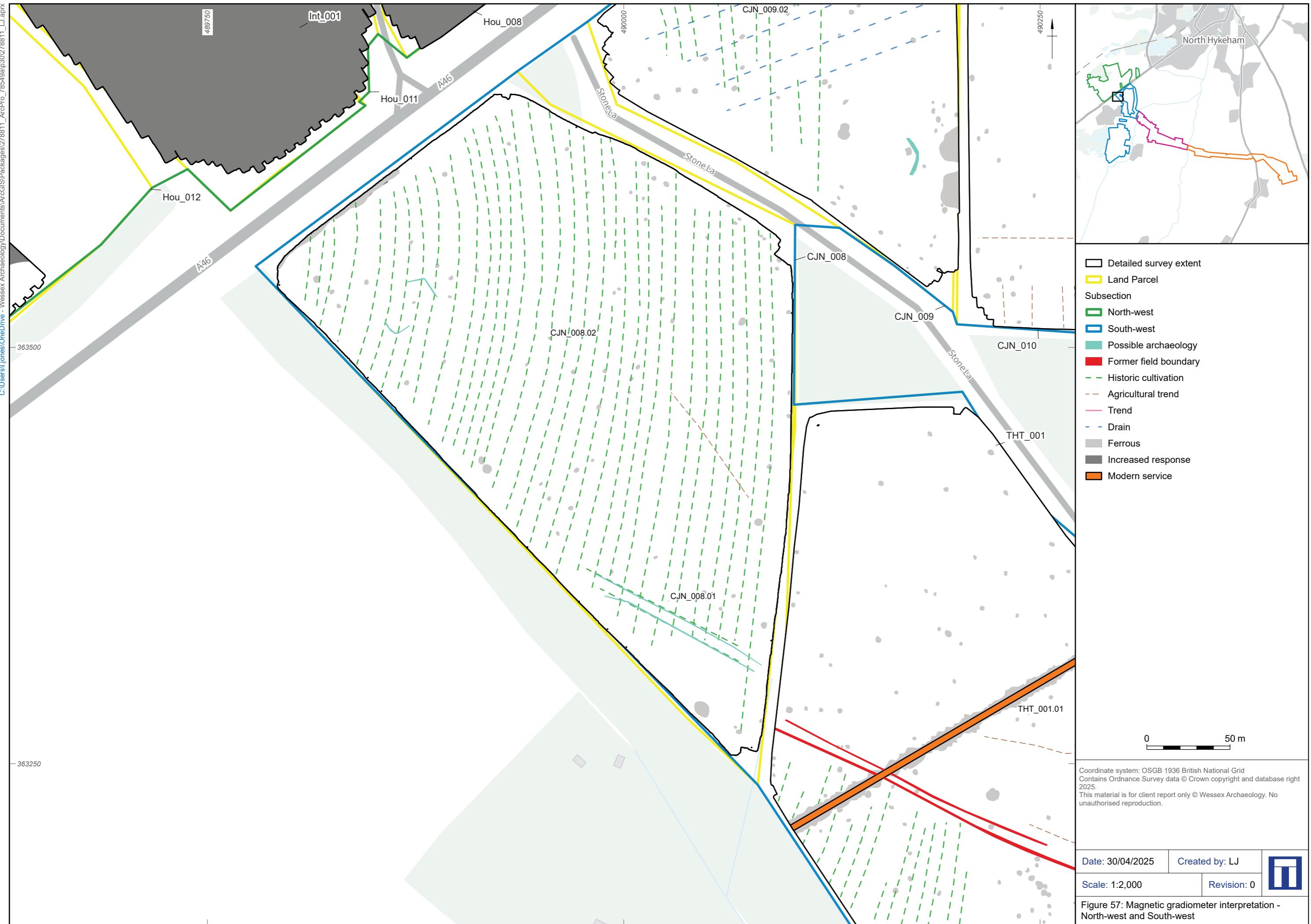


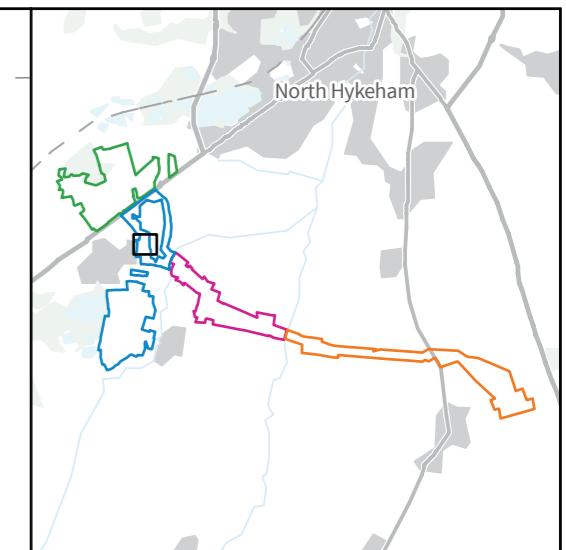
Coordinate system: OSGB 1936 British National Grid  
 Contains Ordnance Survey data © Crown copyright and database right 2025.  
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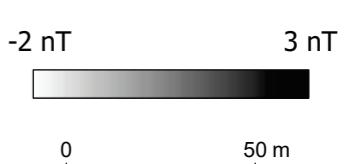






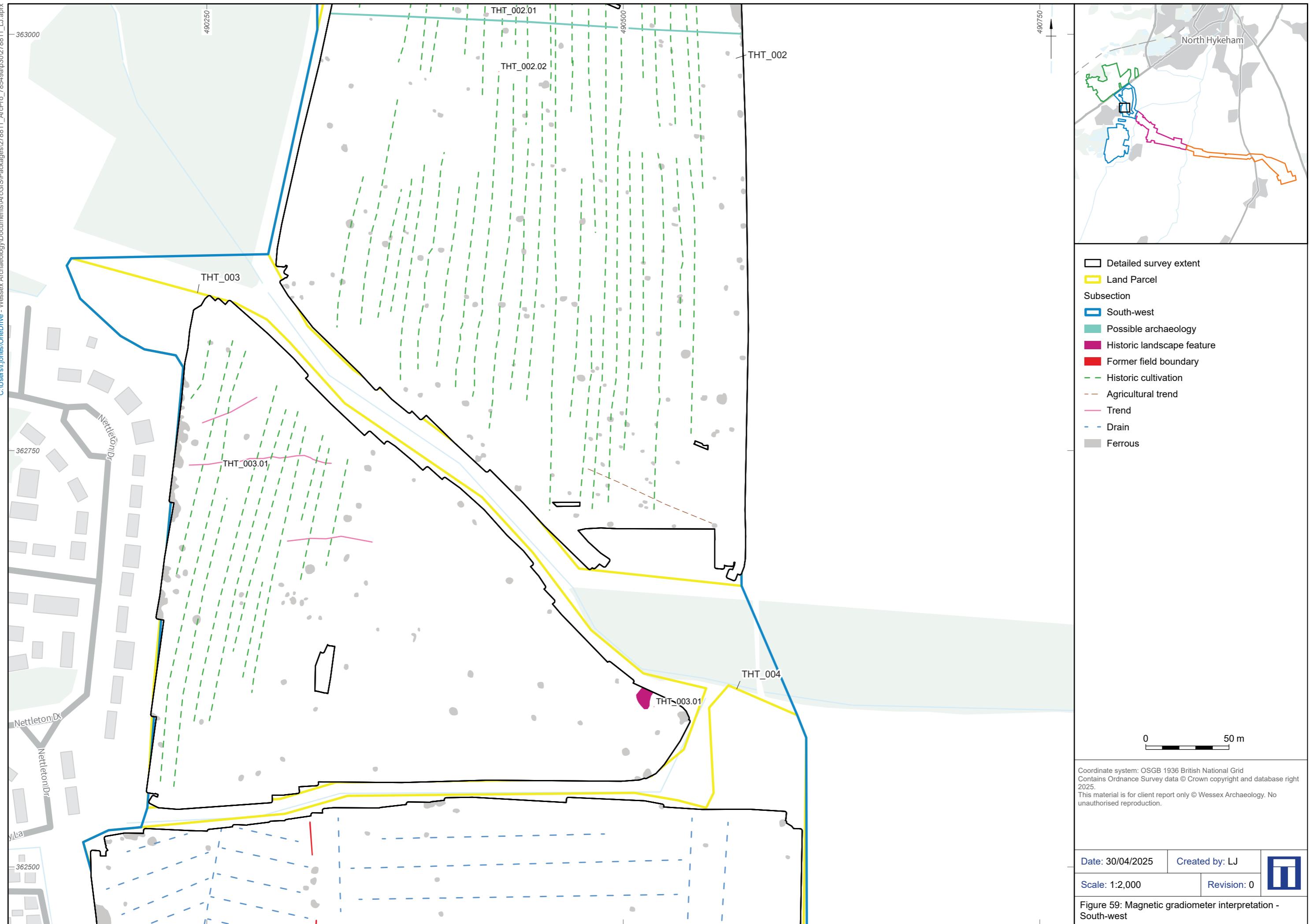


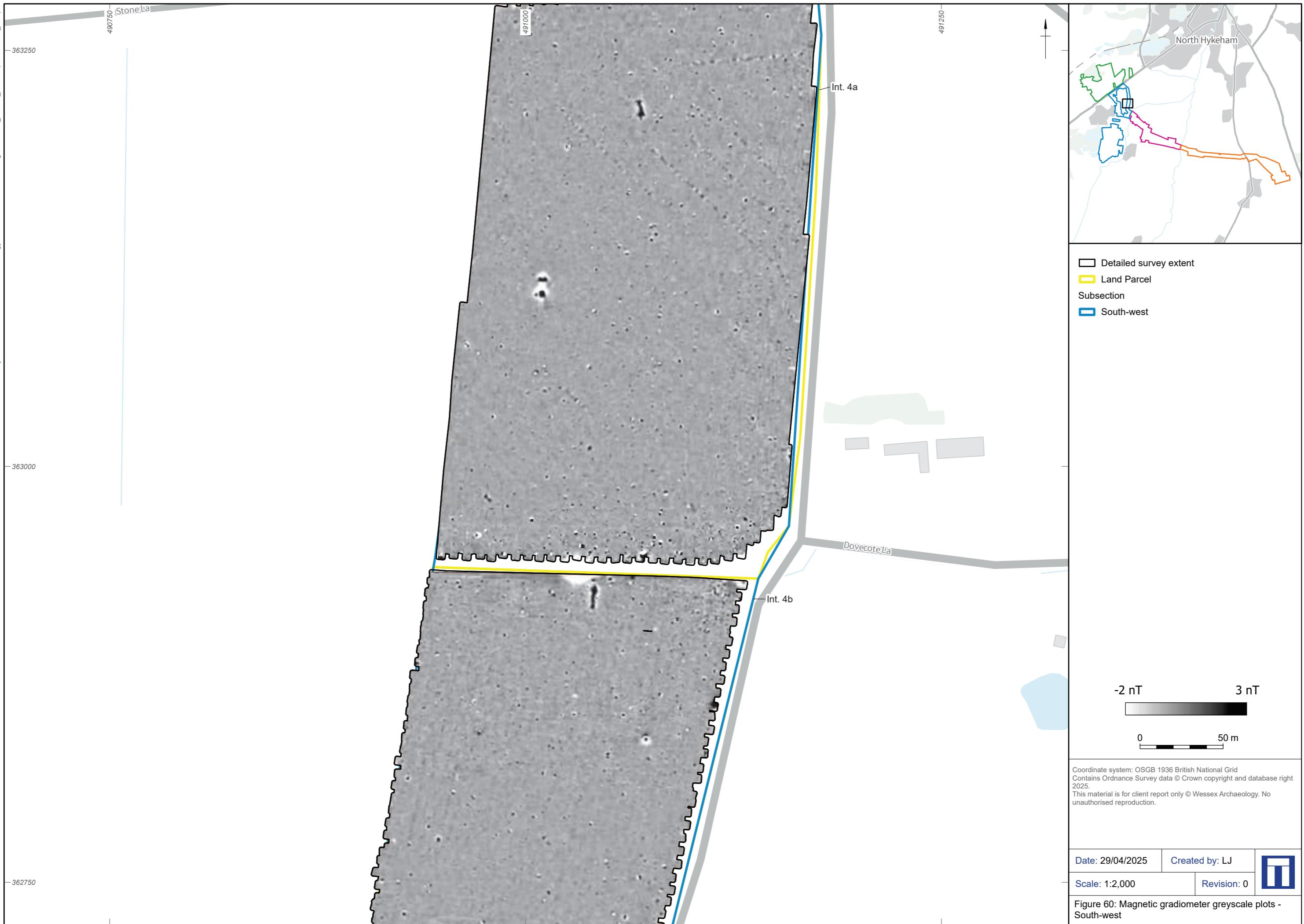
Detailed survey extent  
Land Parcel  
Subsection  
South-west

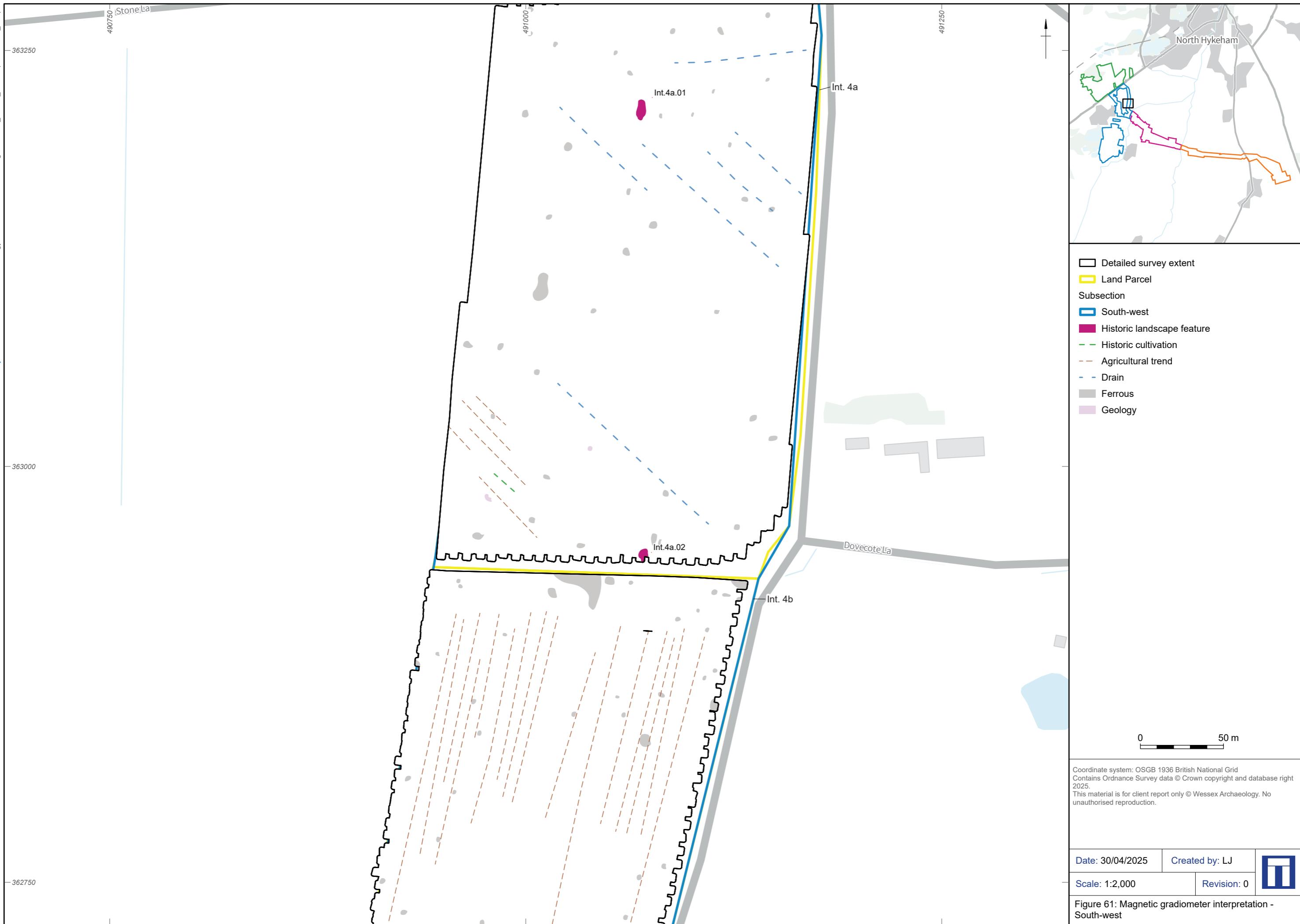


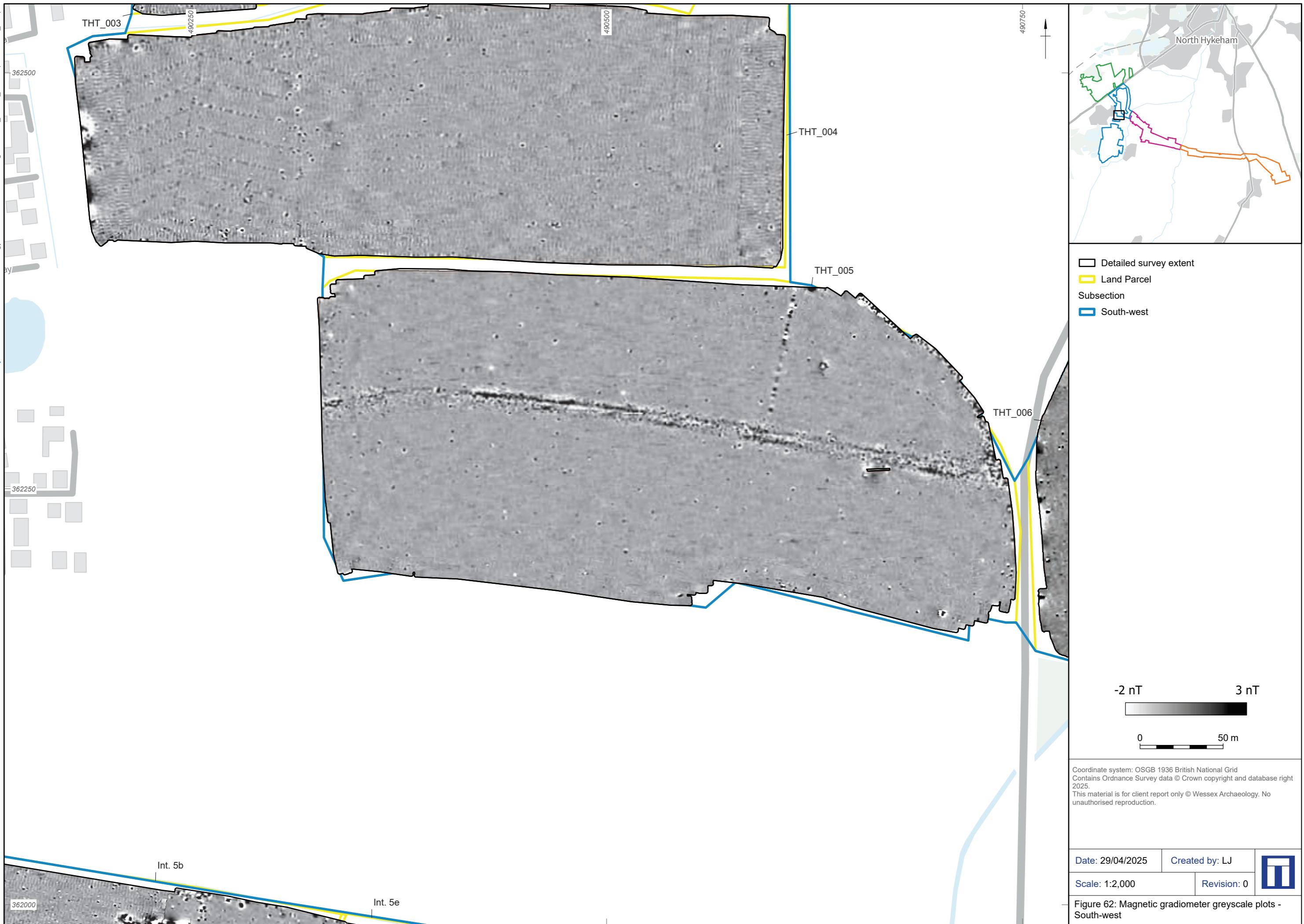
Coordinate system: OSGB 1936 British National Grid  
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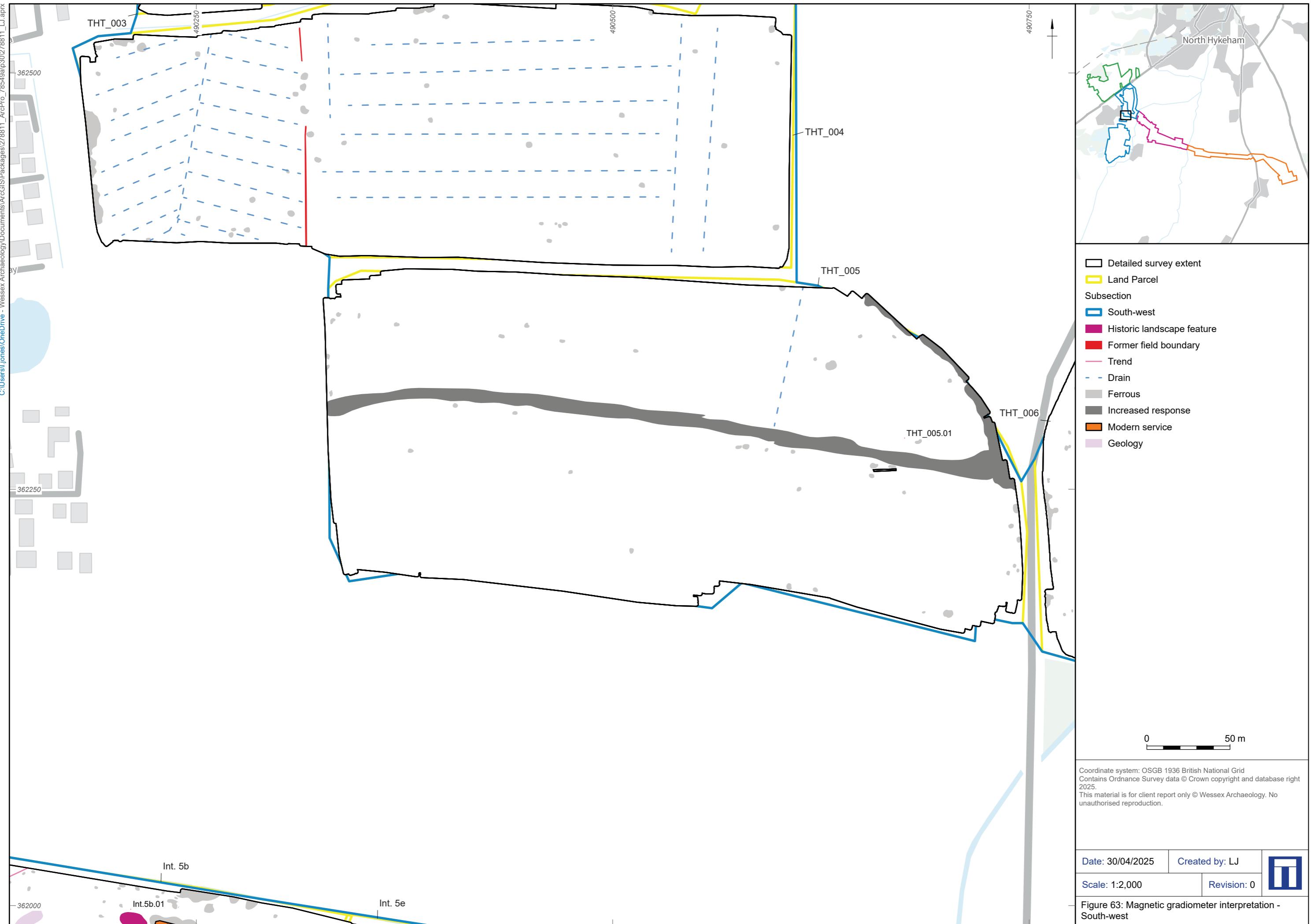
Date: 29/04/2025 | Created by: LJ |   
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Figure 58: Magnetic gradiometer greyscale plots - South-west

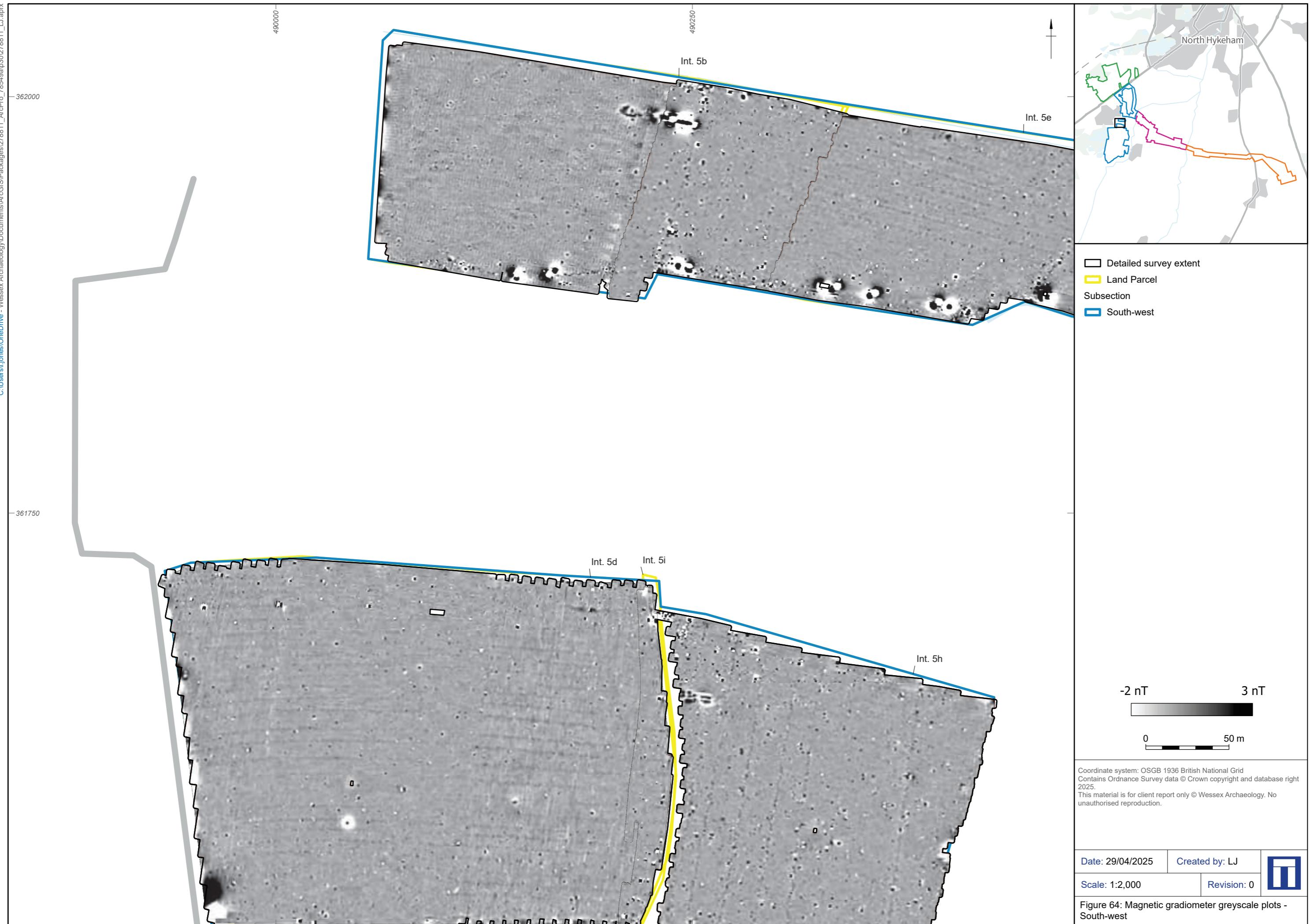




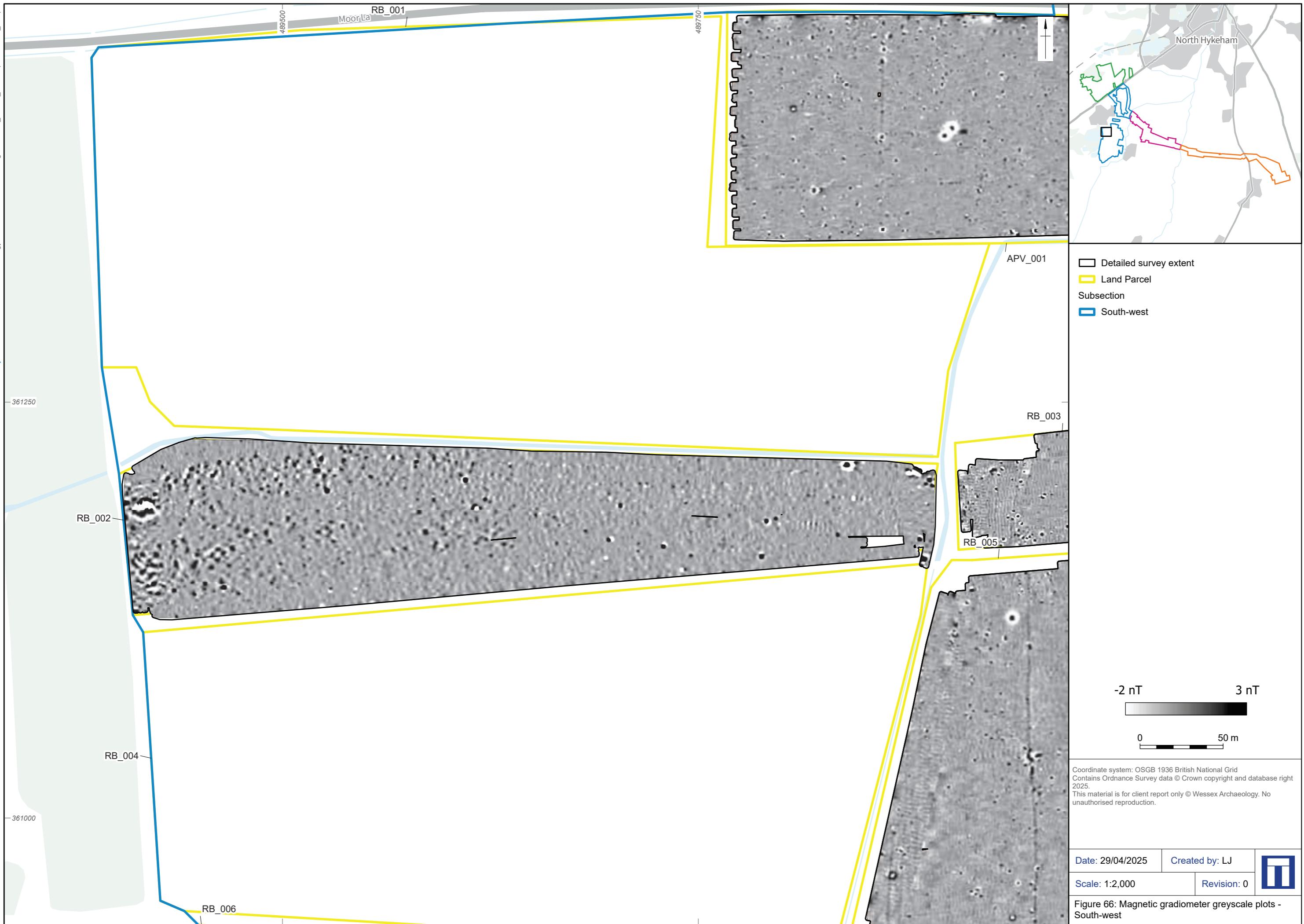


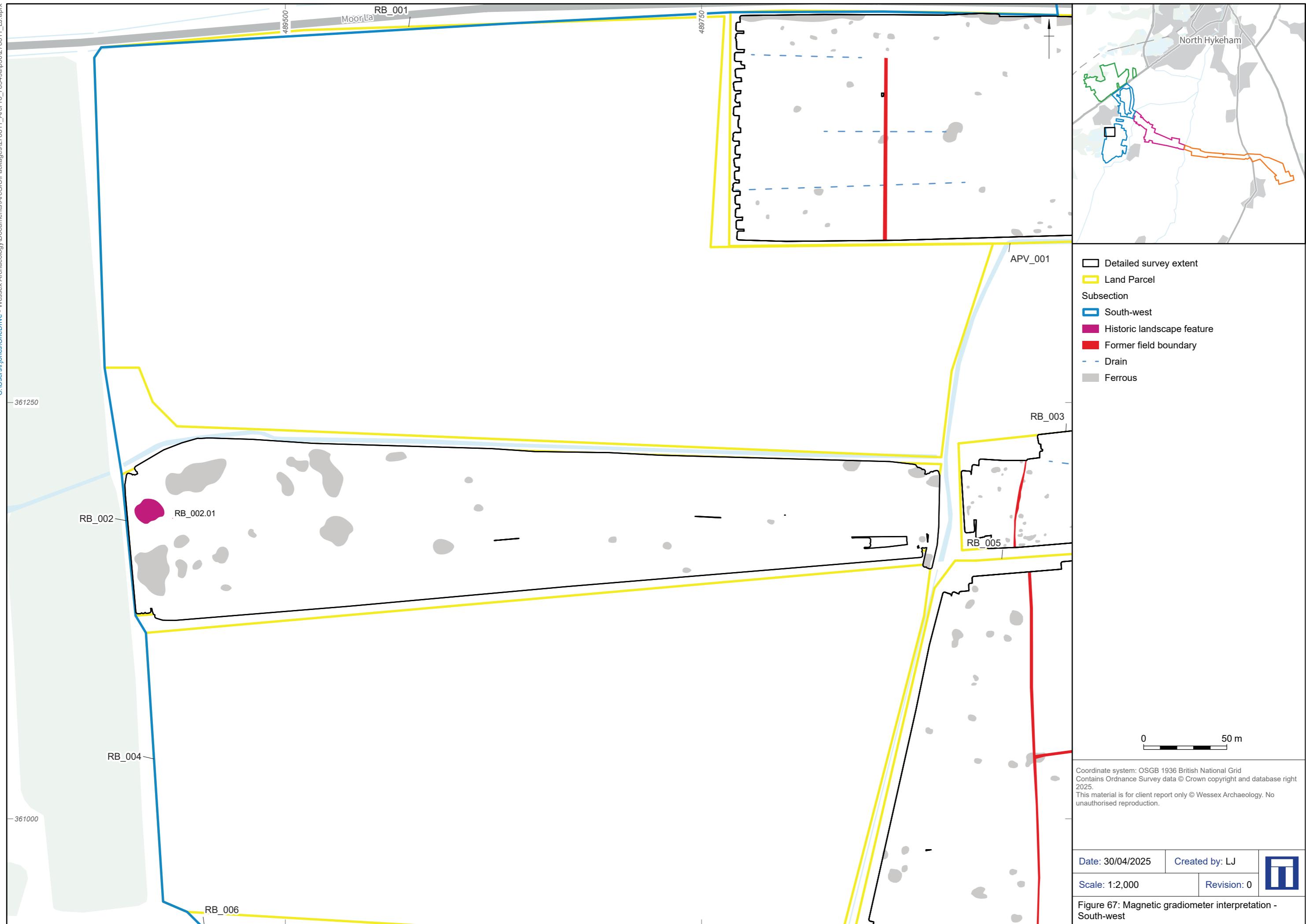


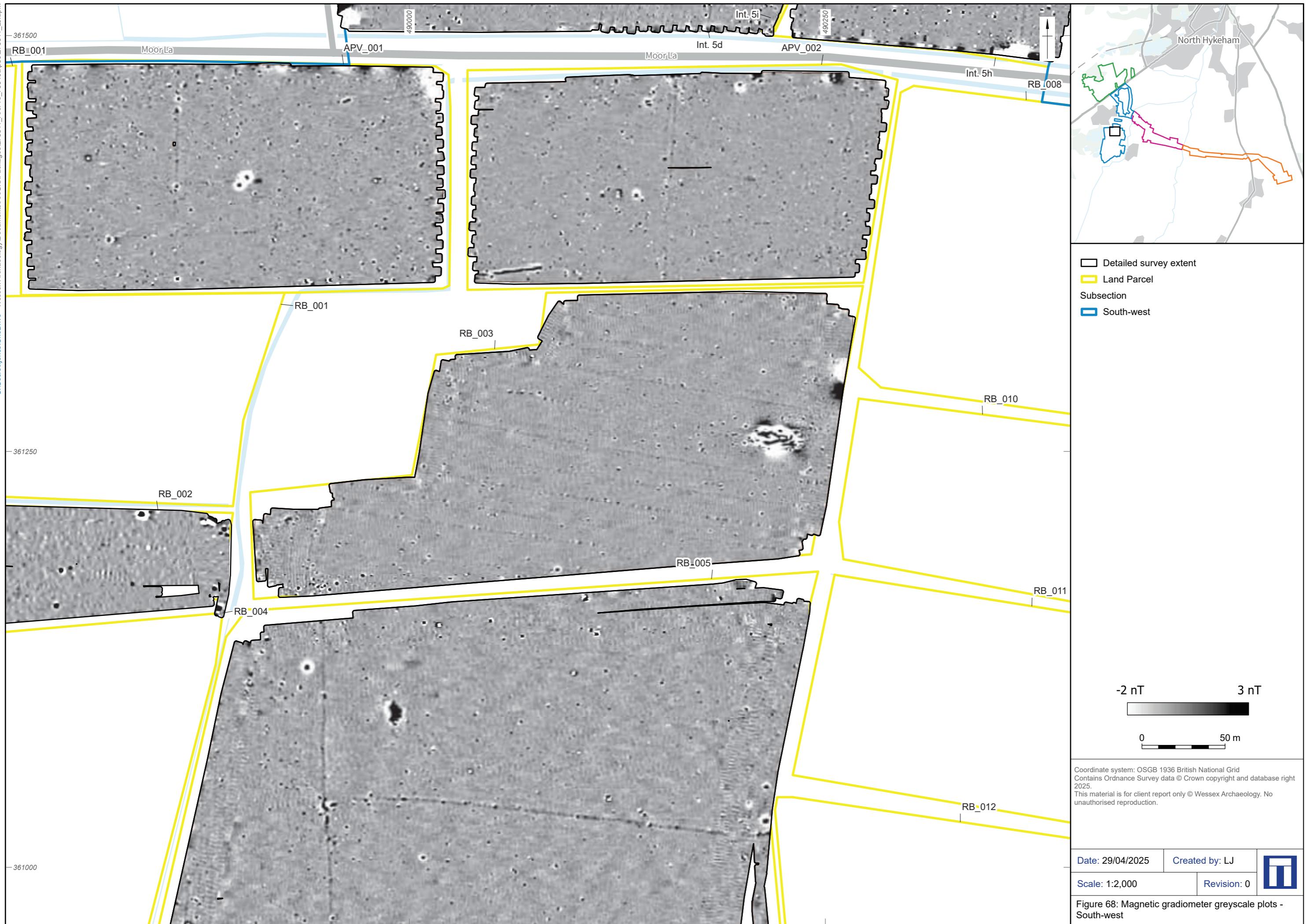


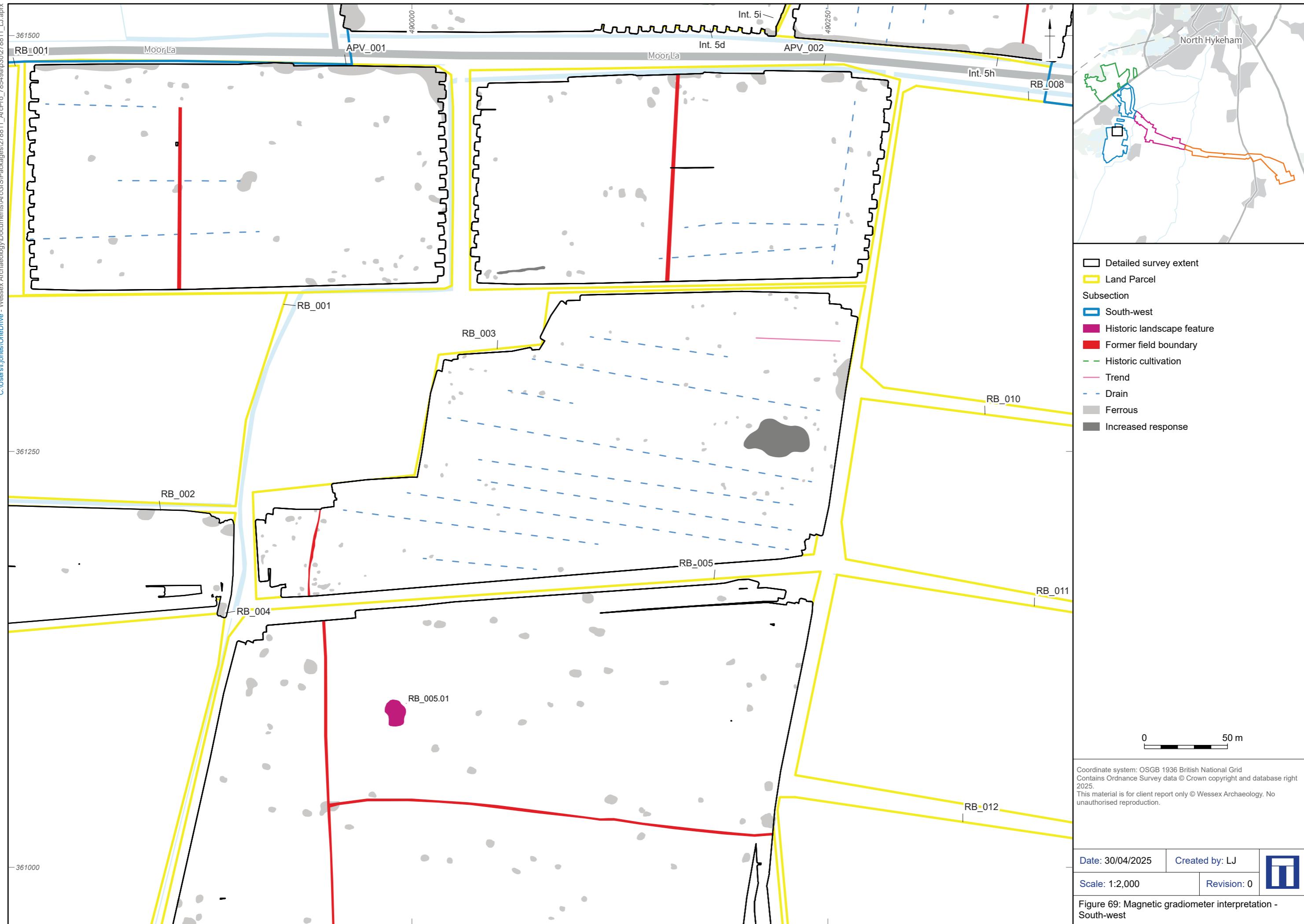


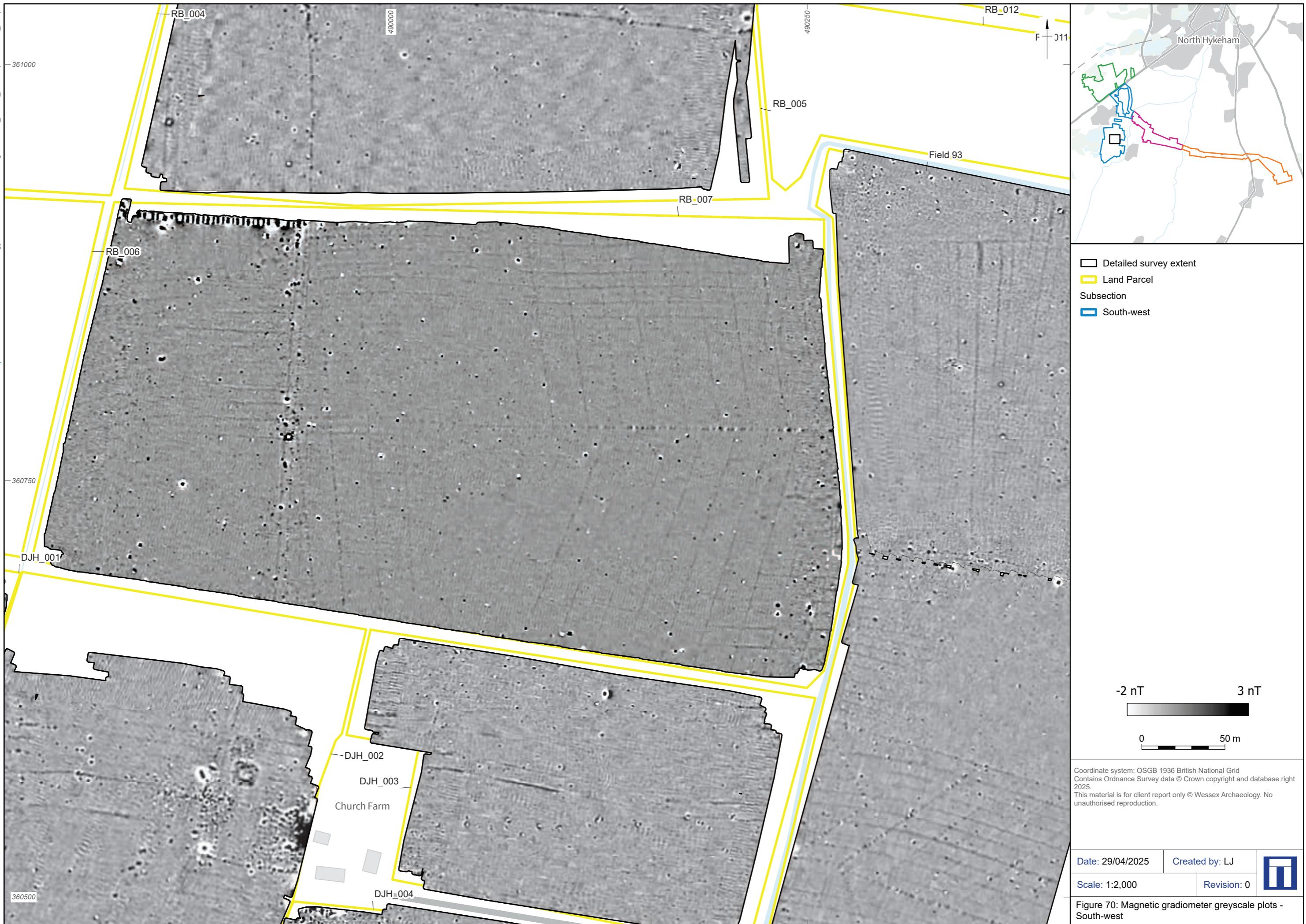


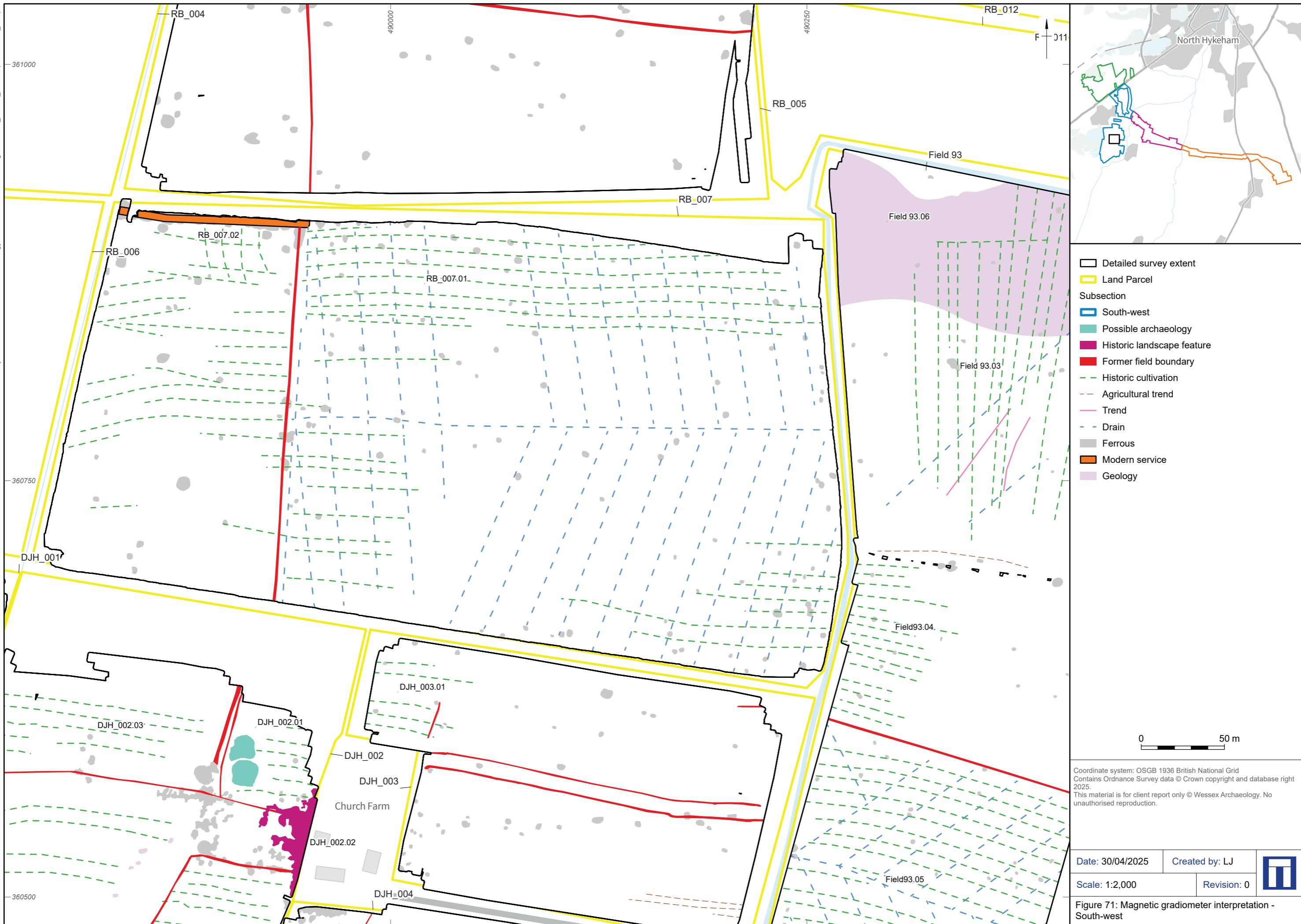


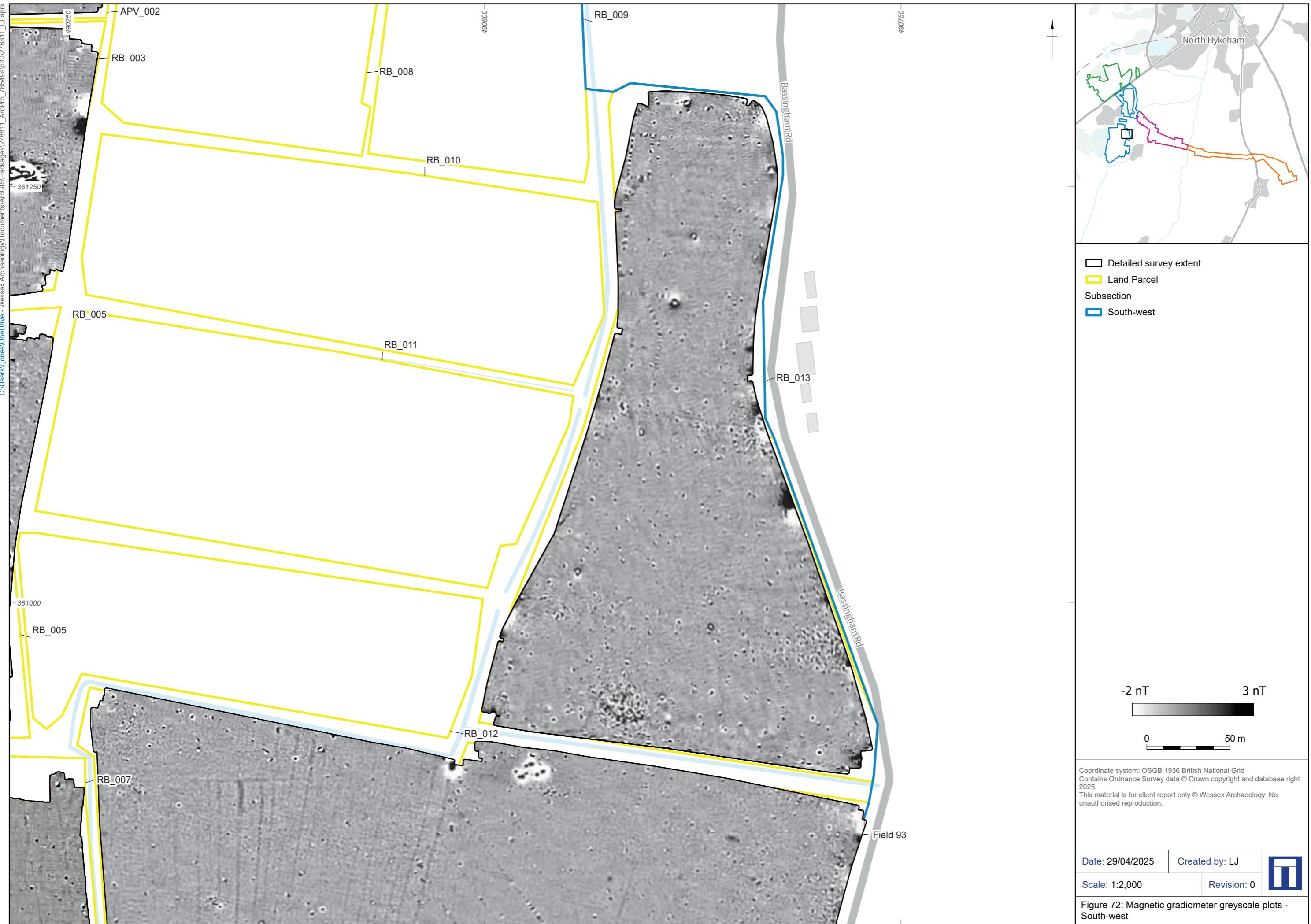


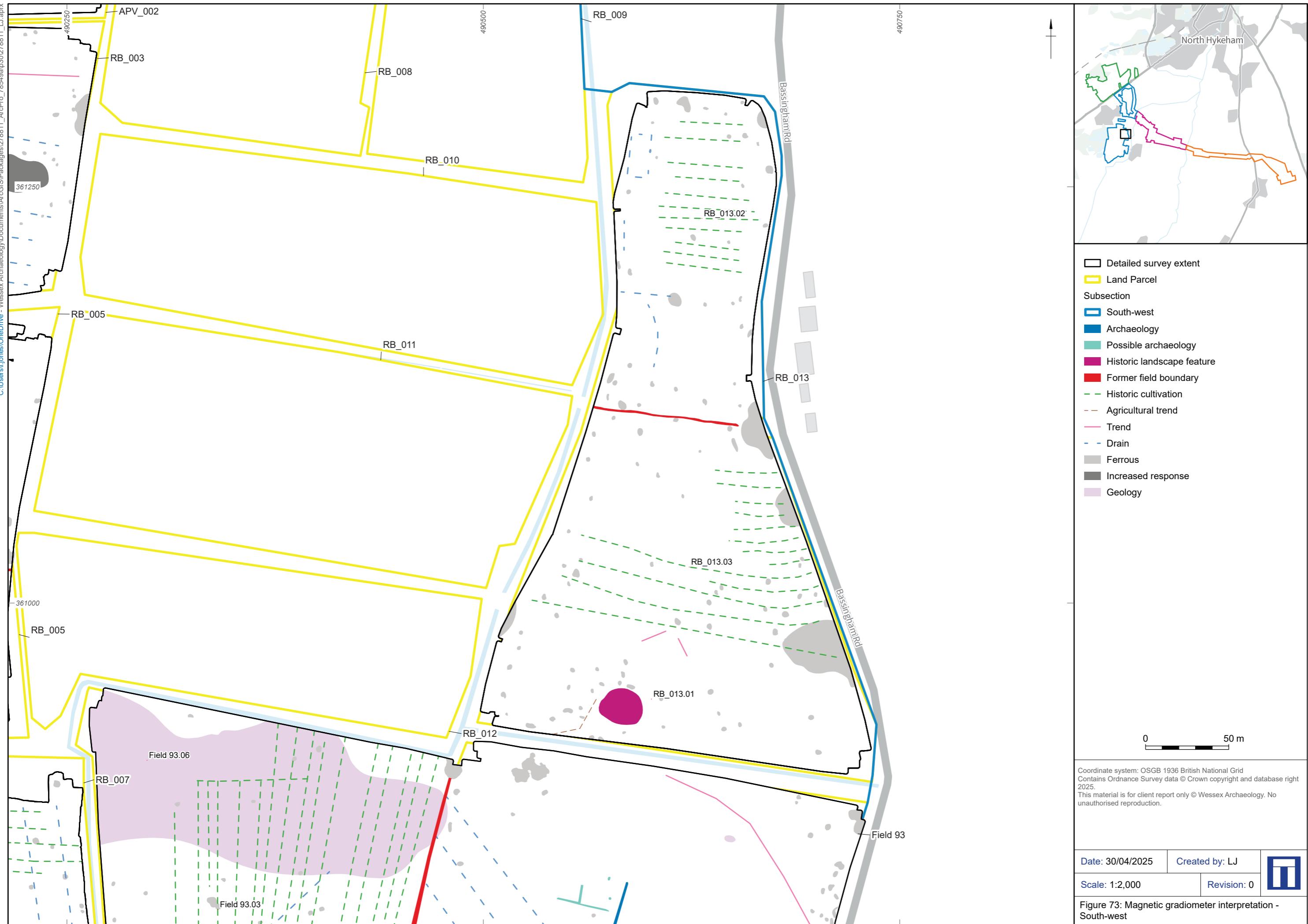


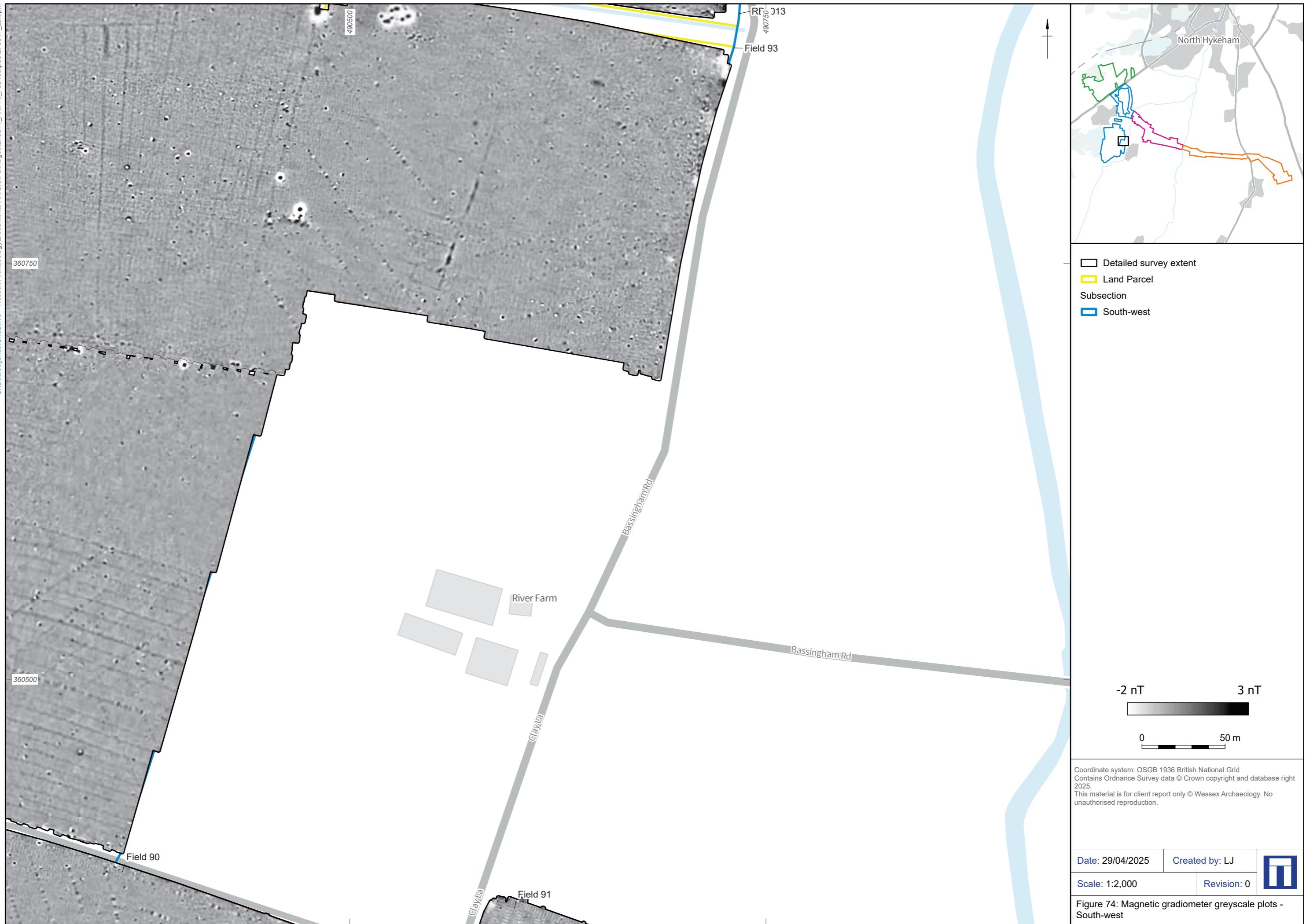


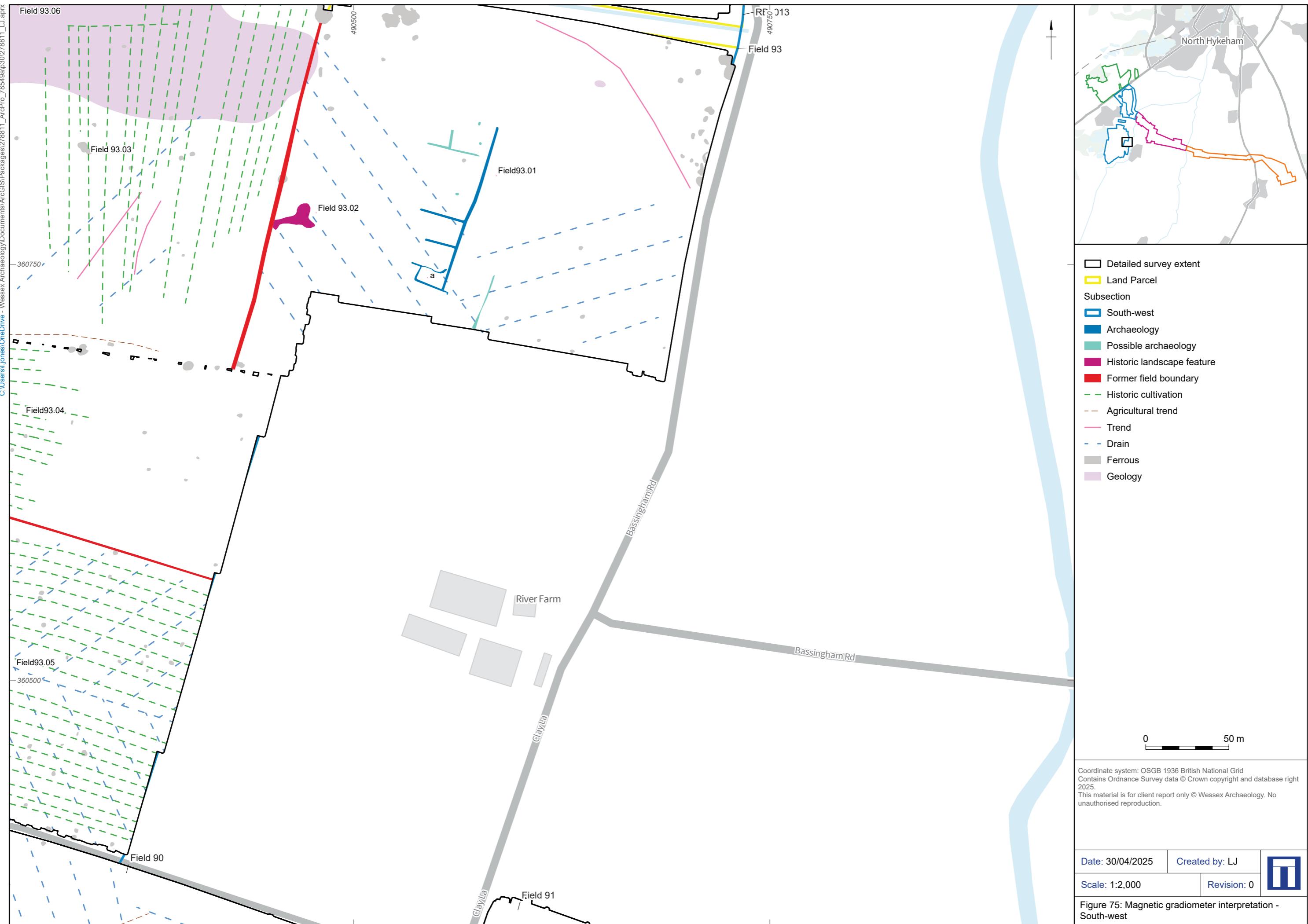


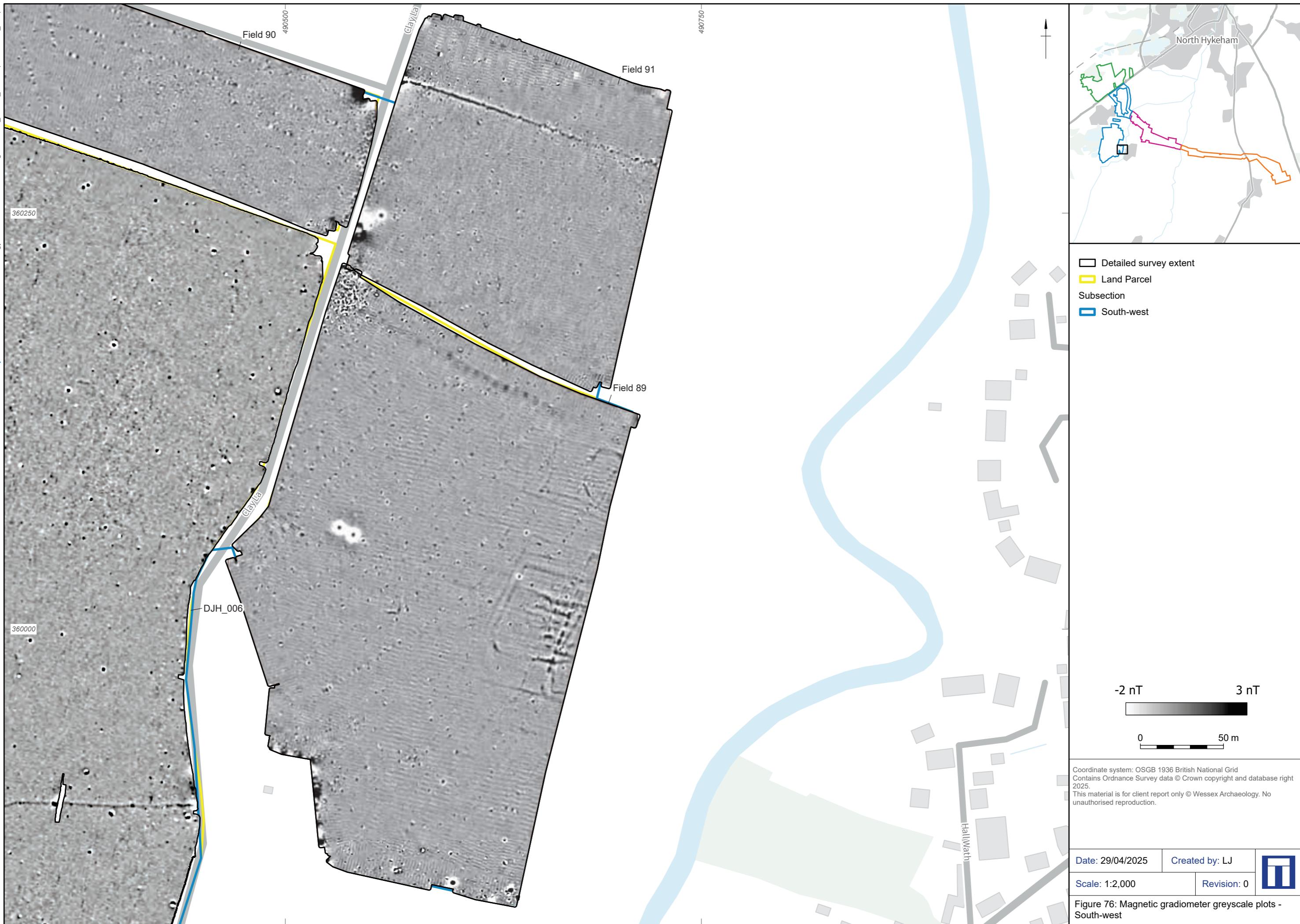


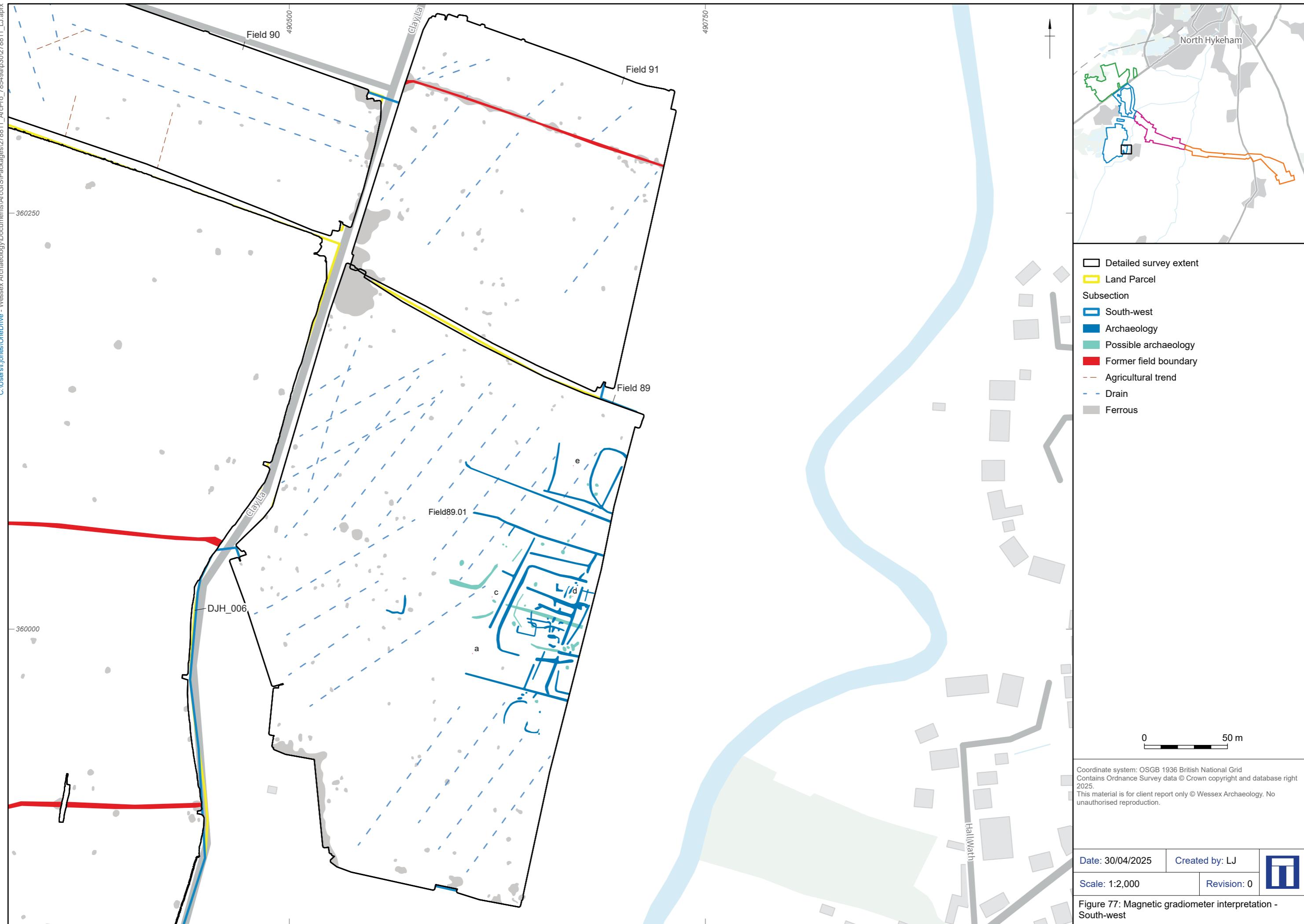




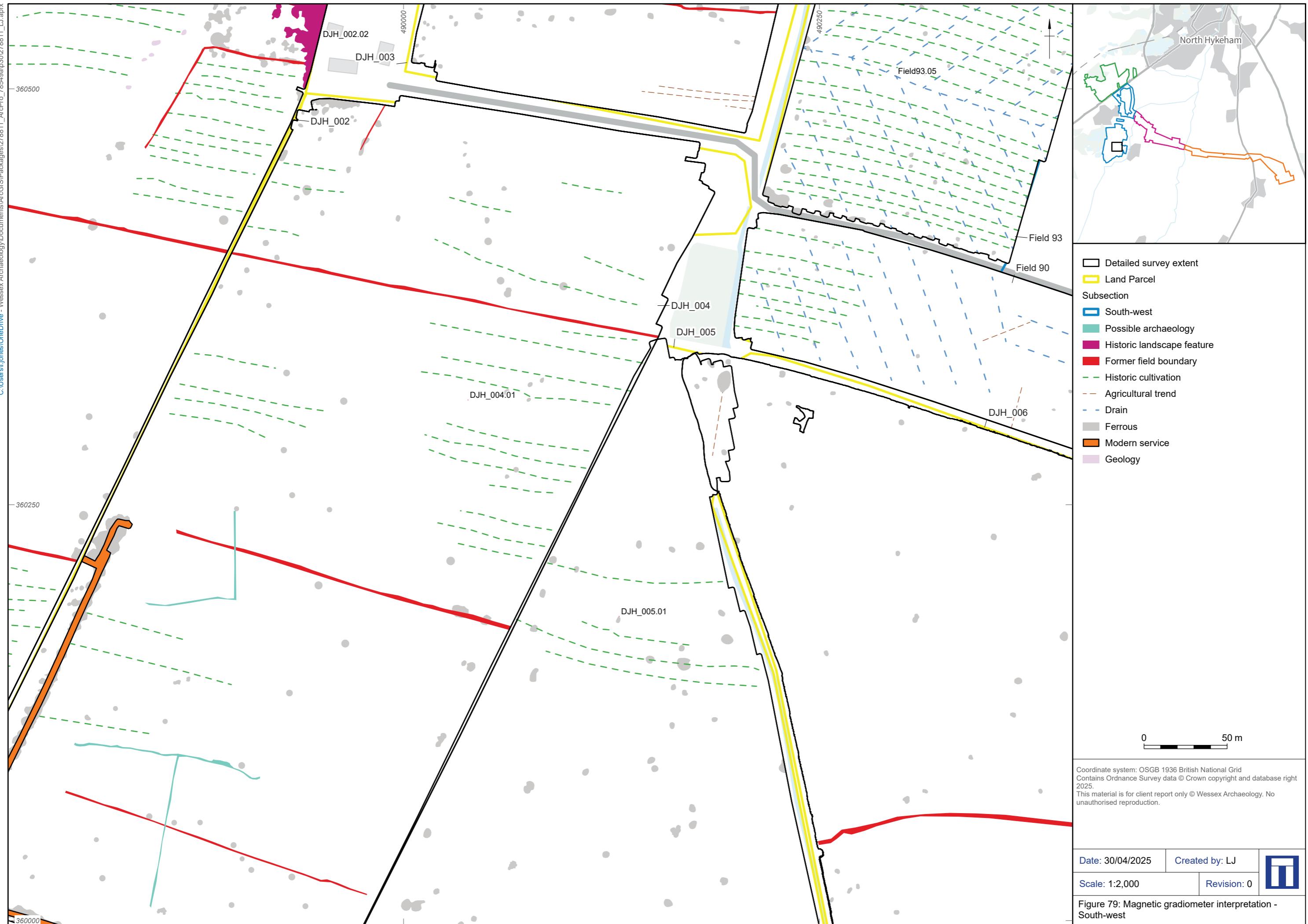


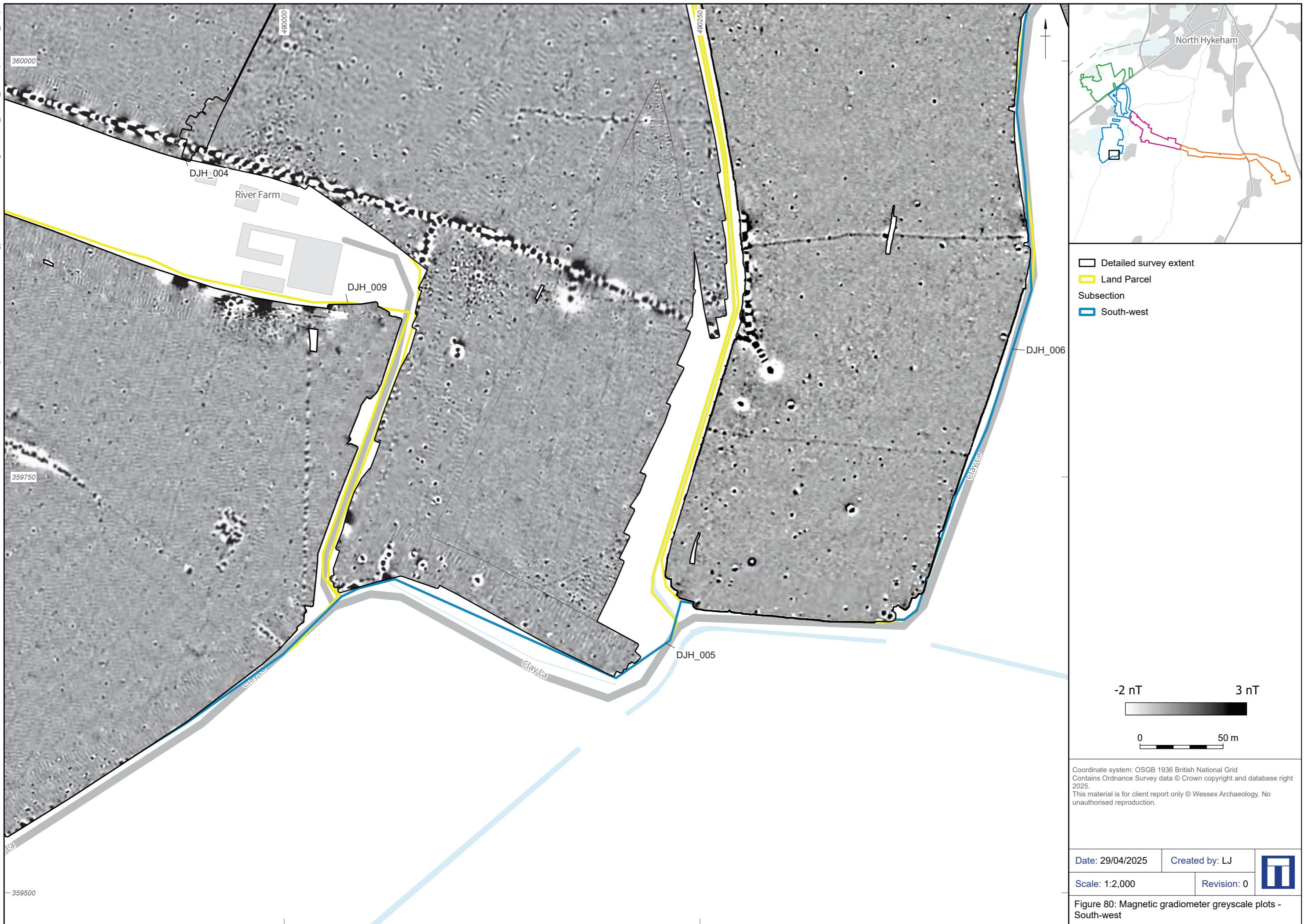


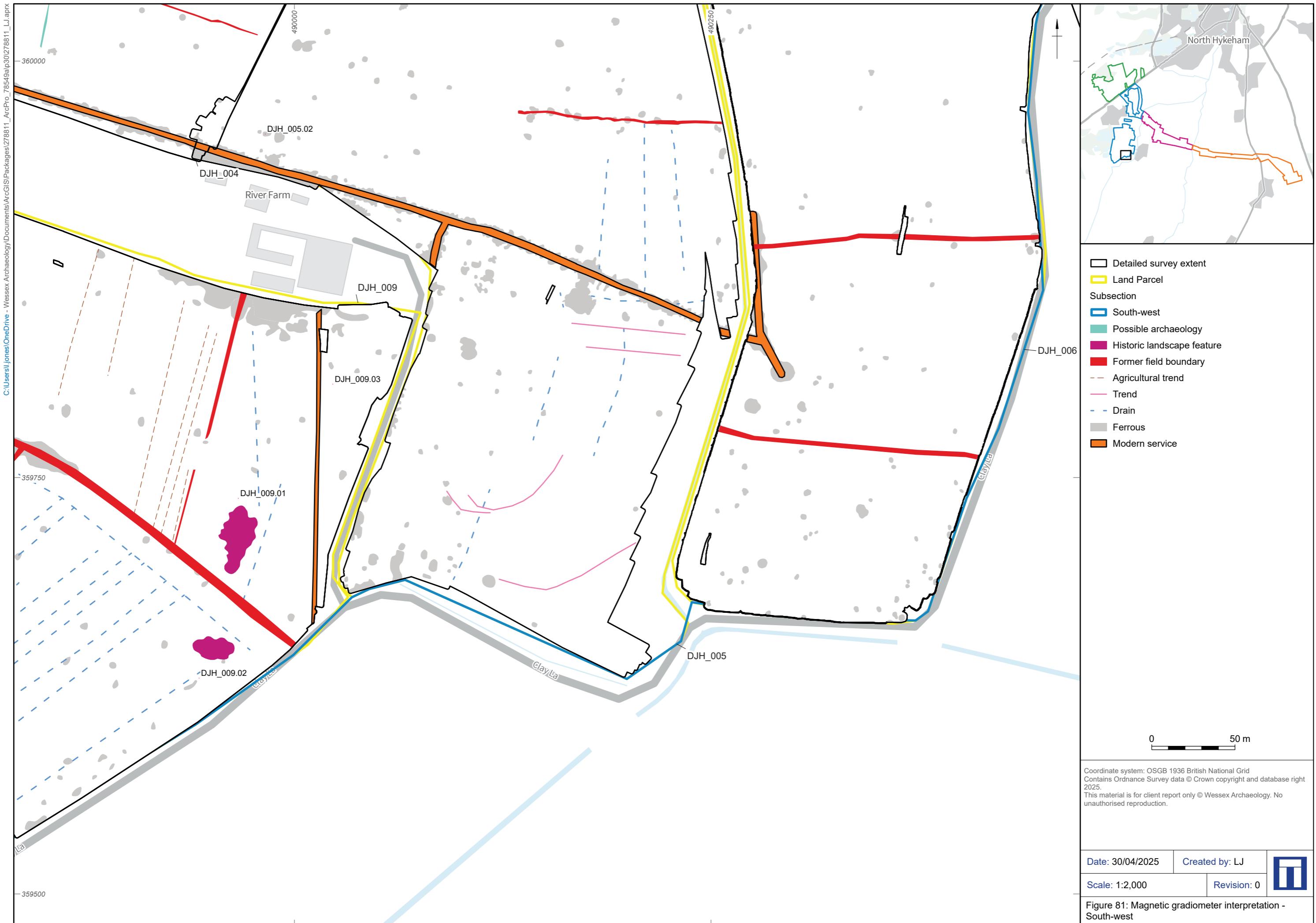


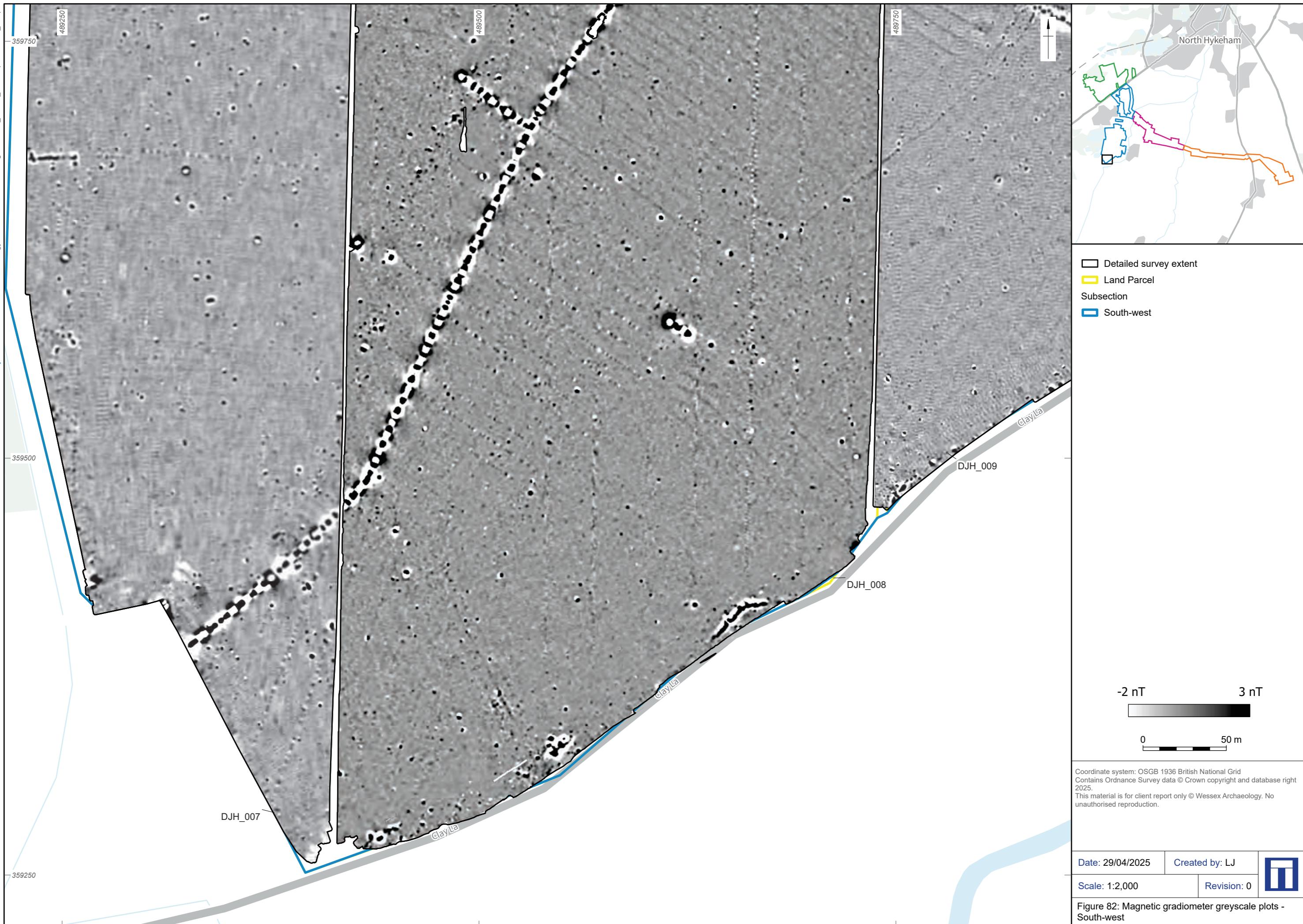


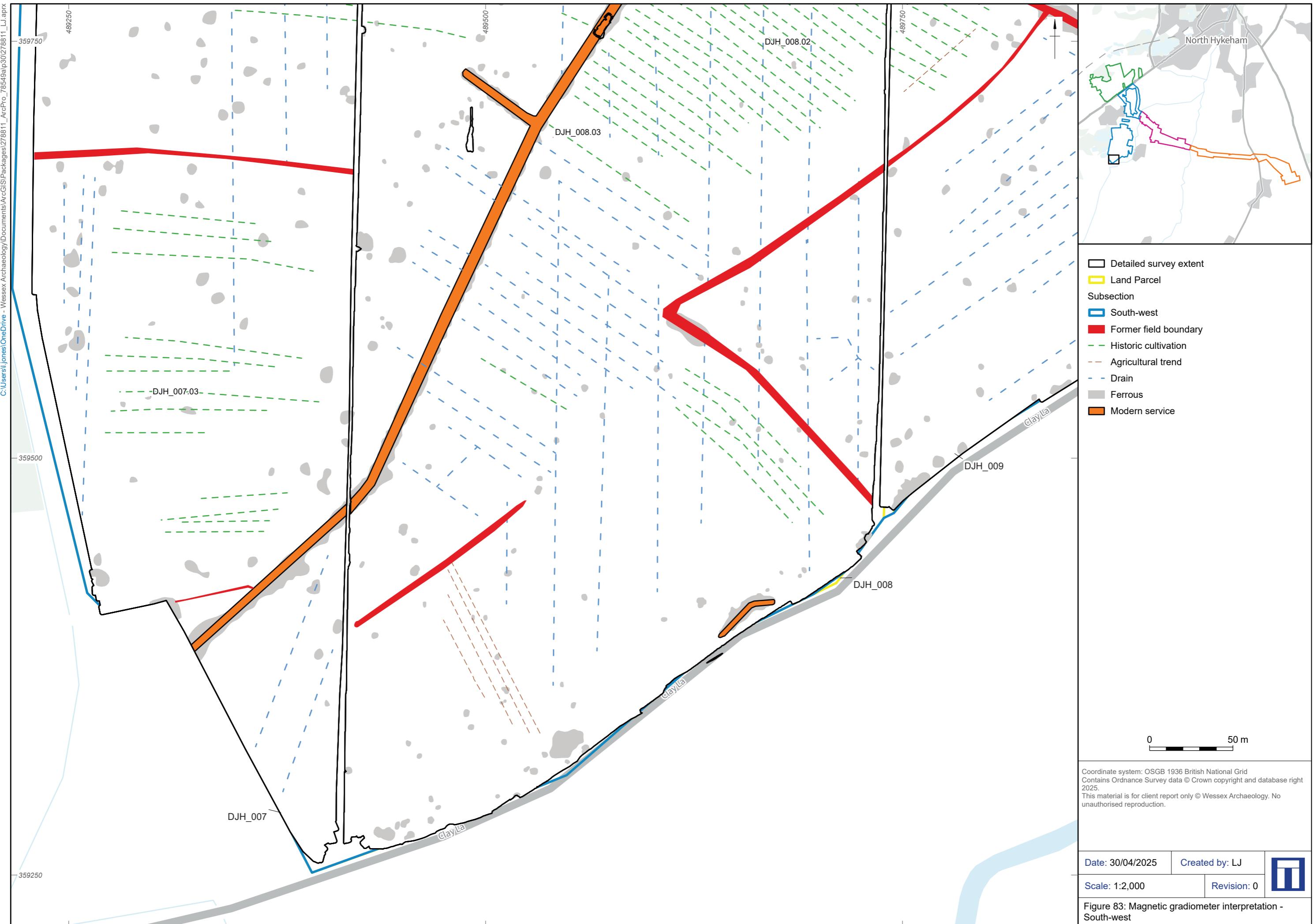


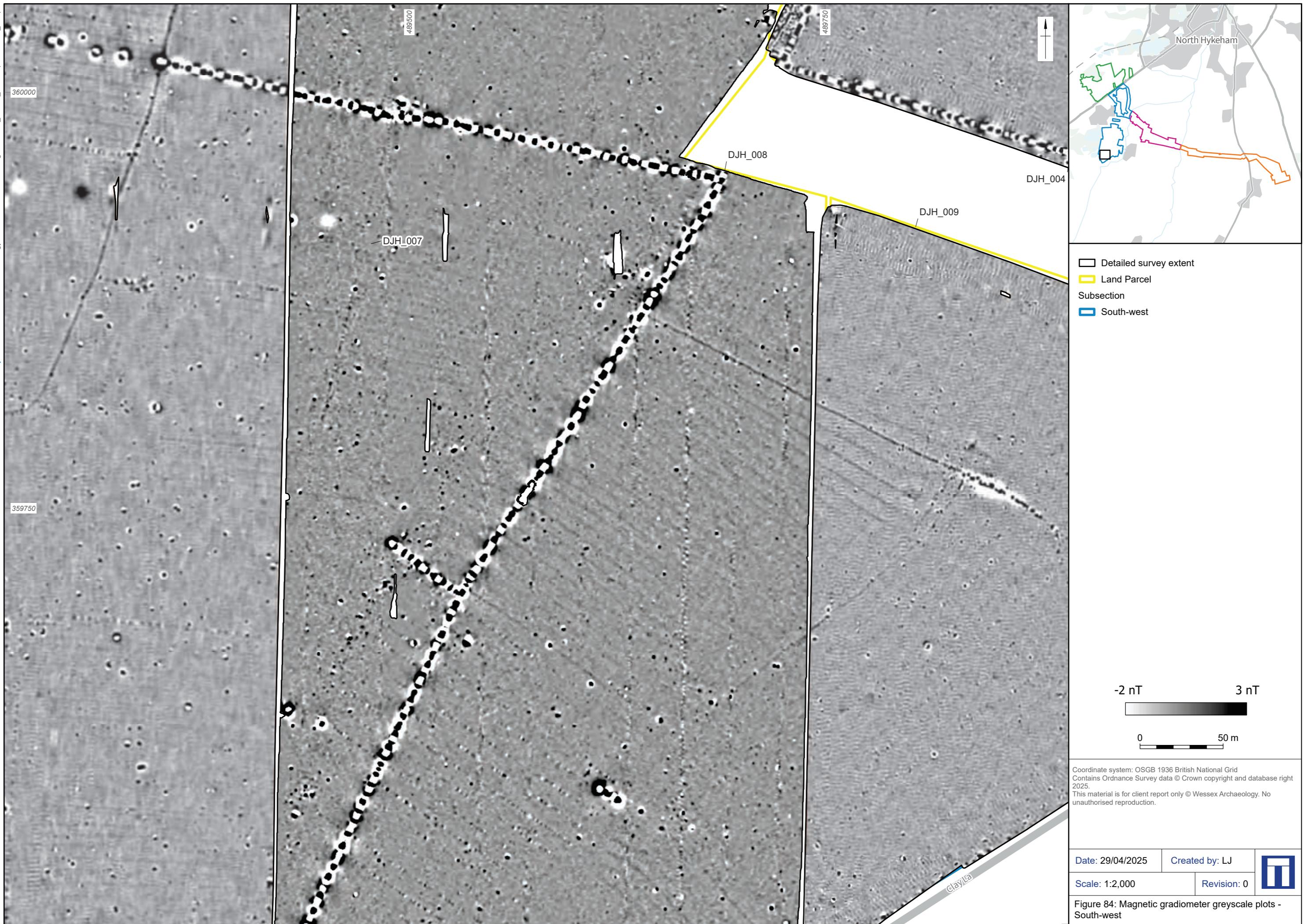


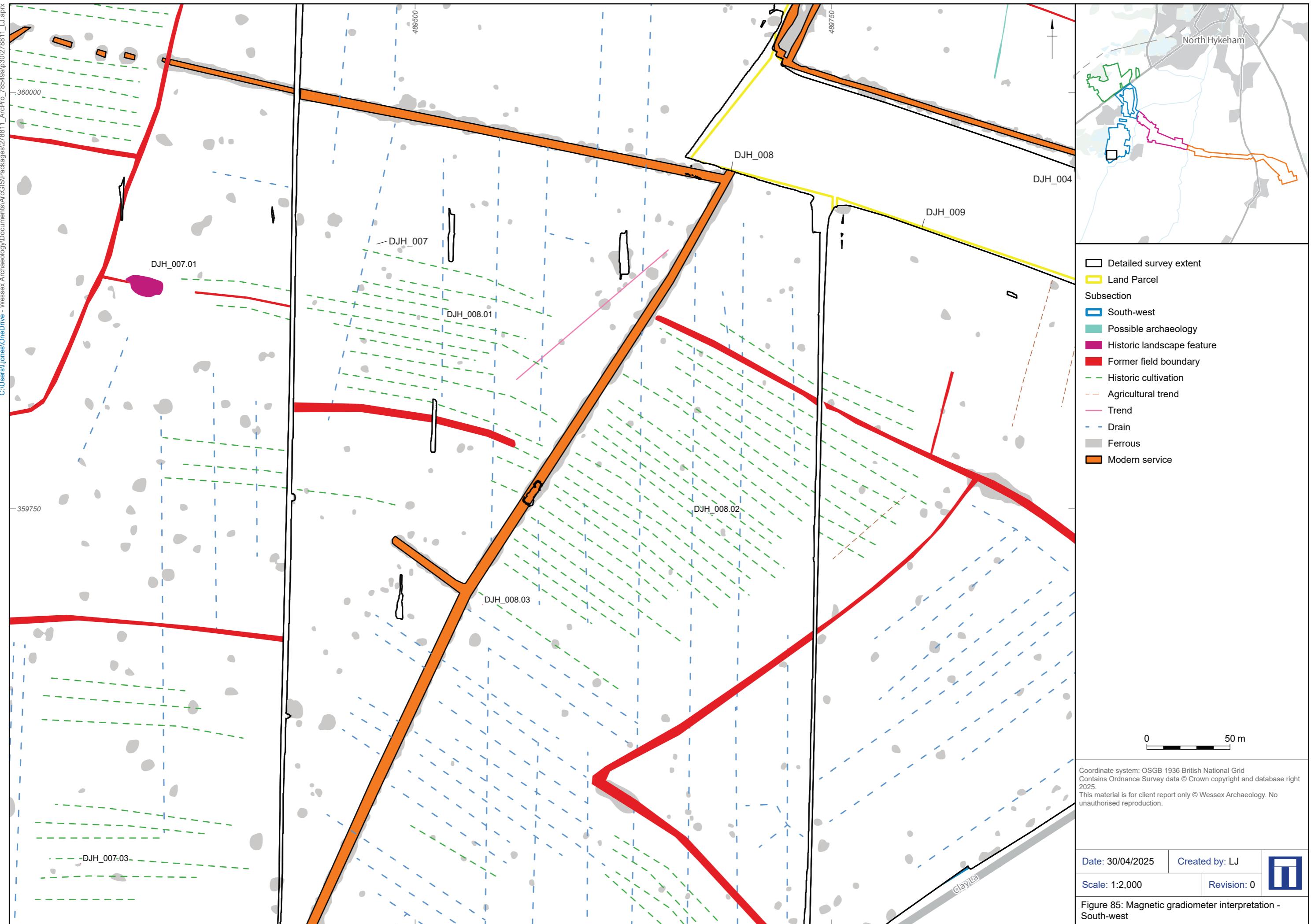


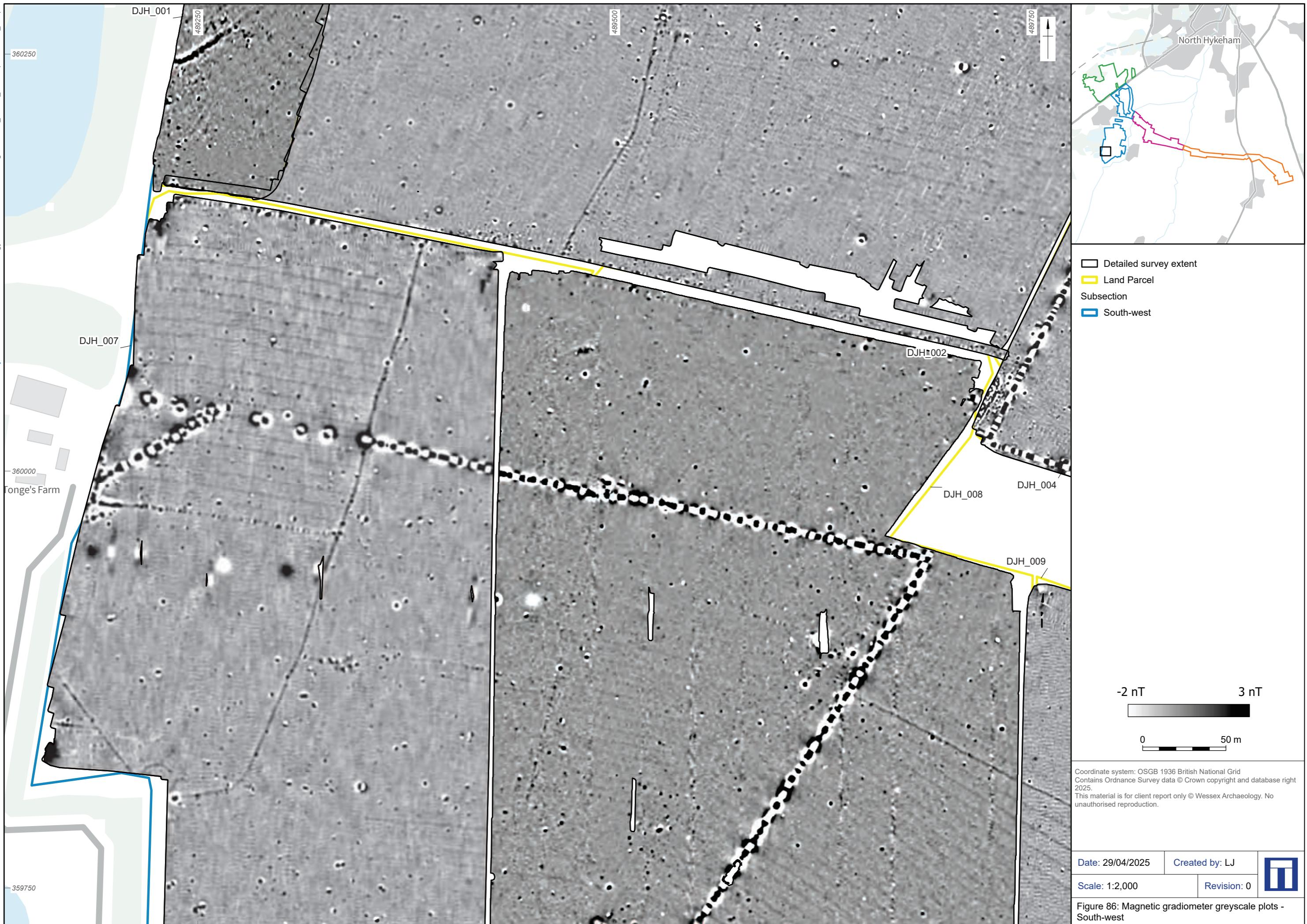


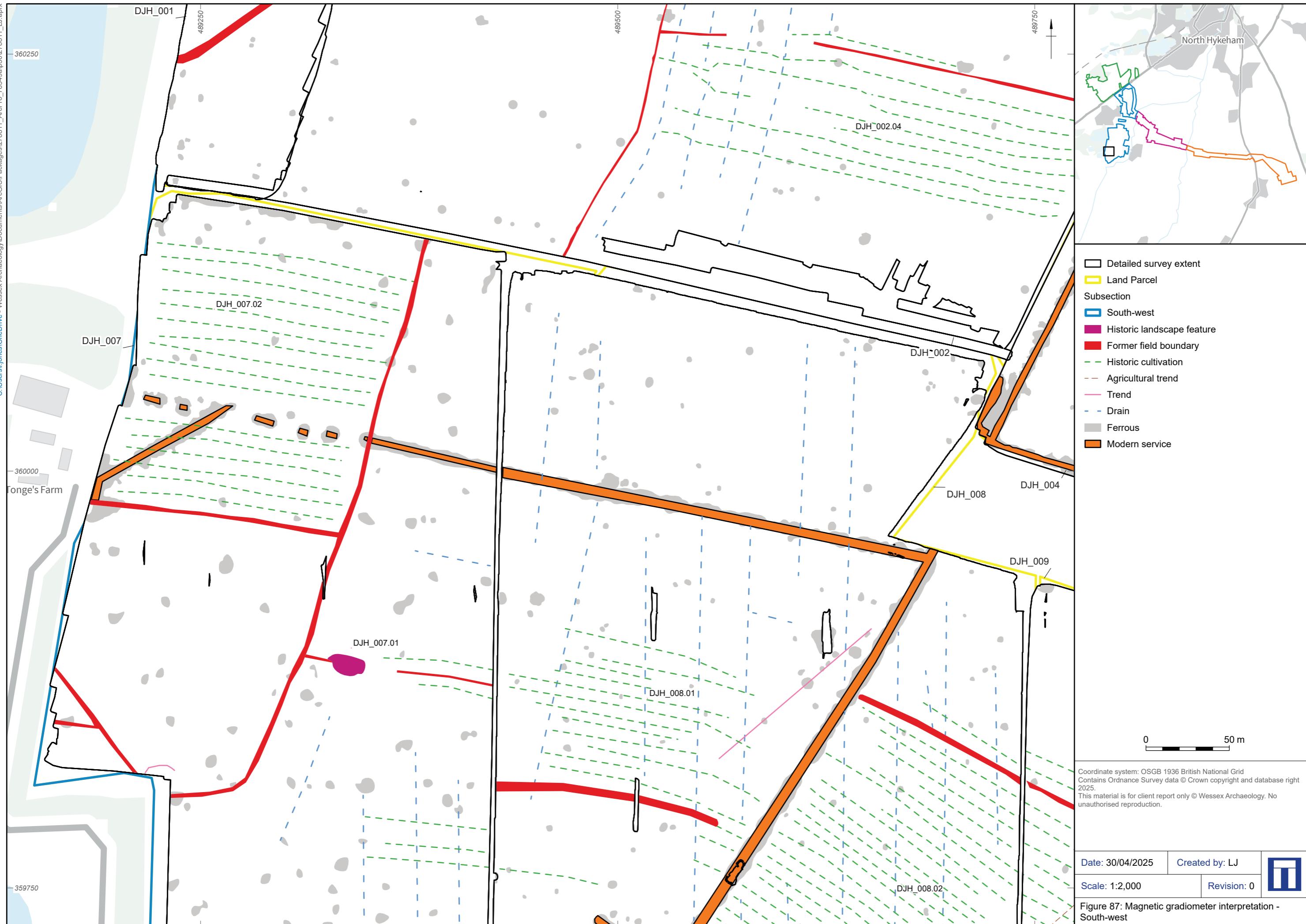


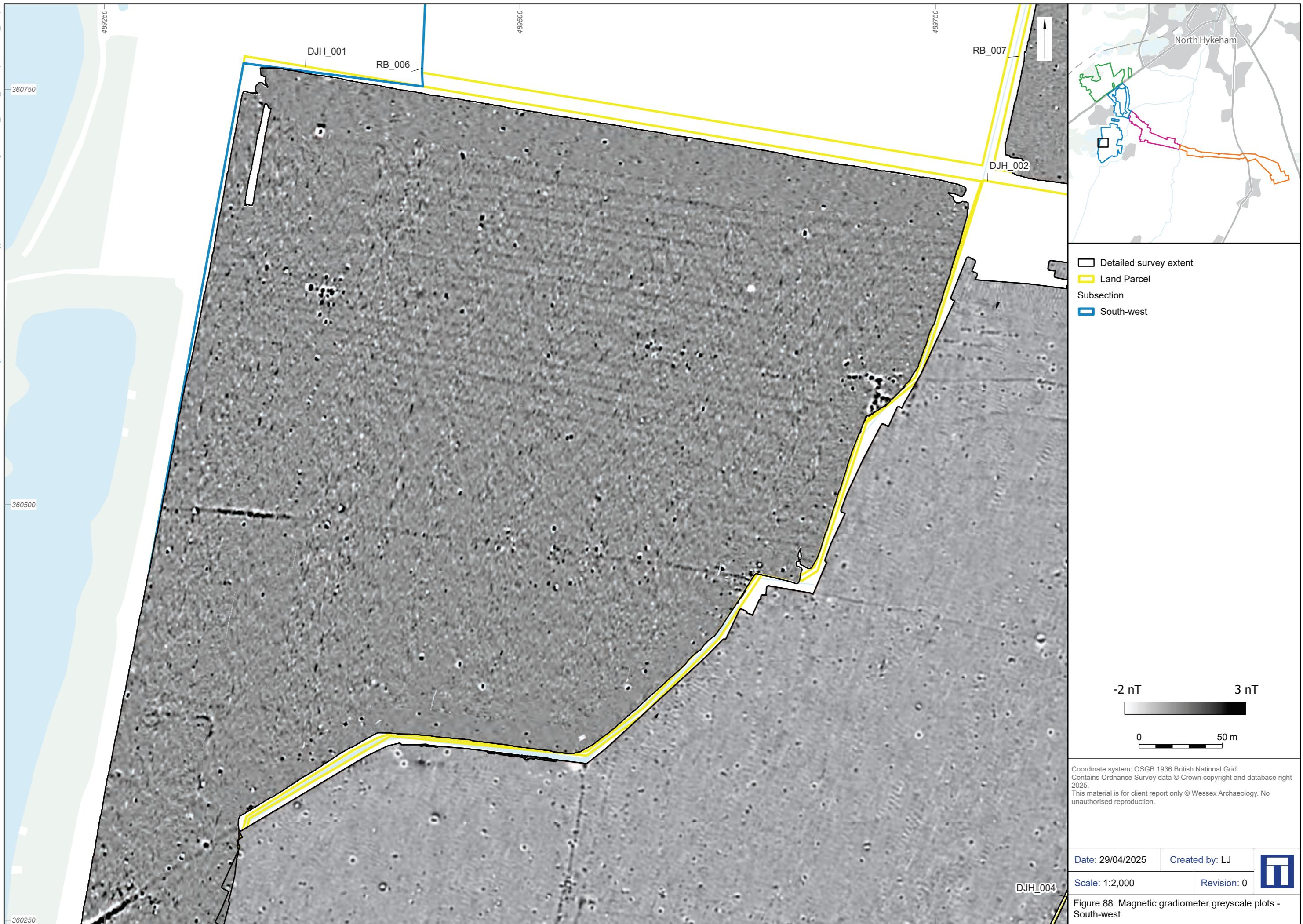


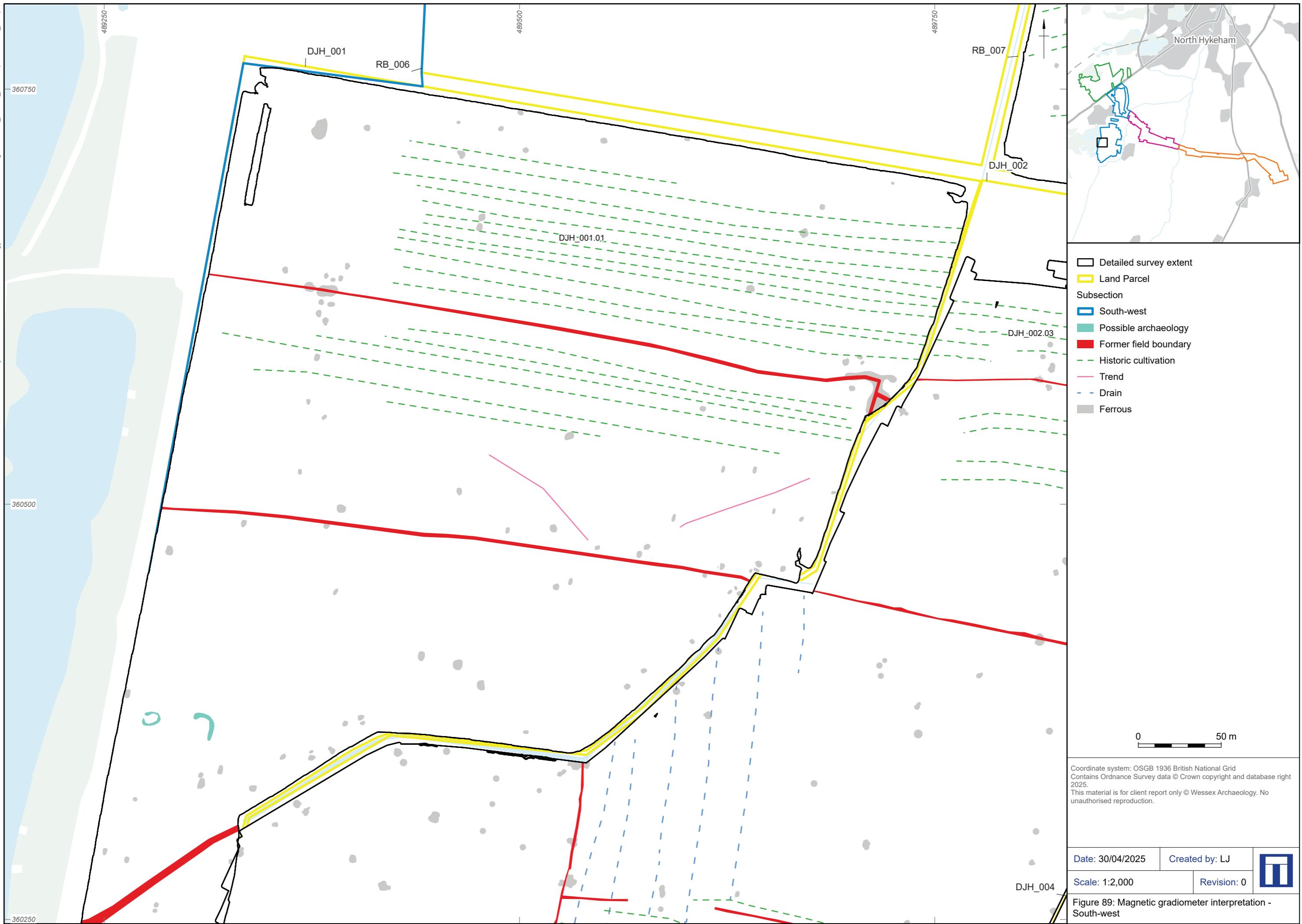


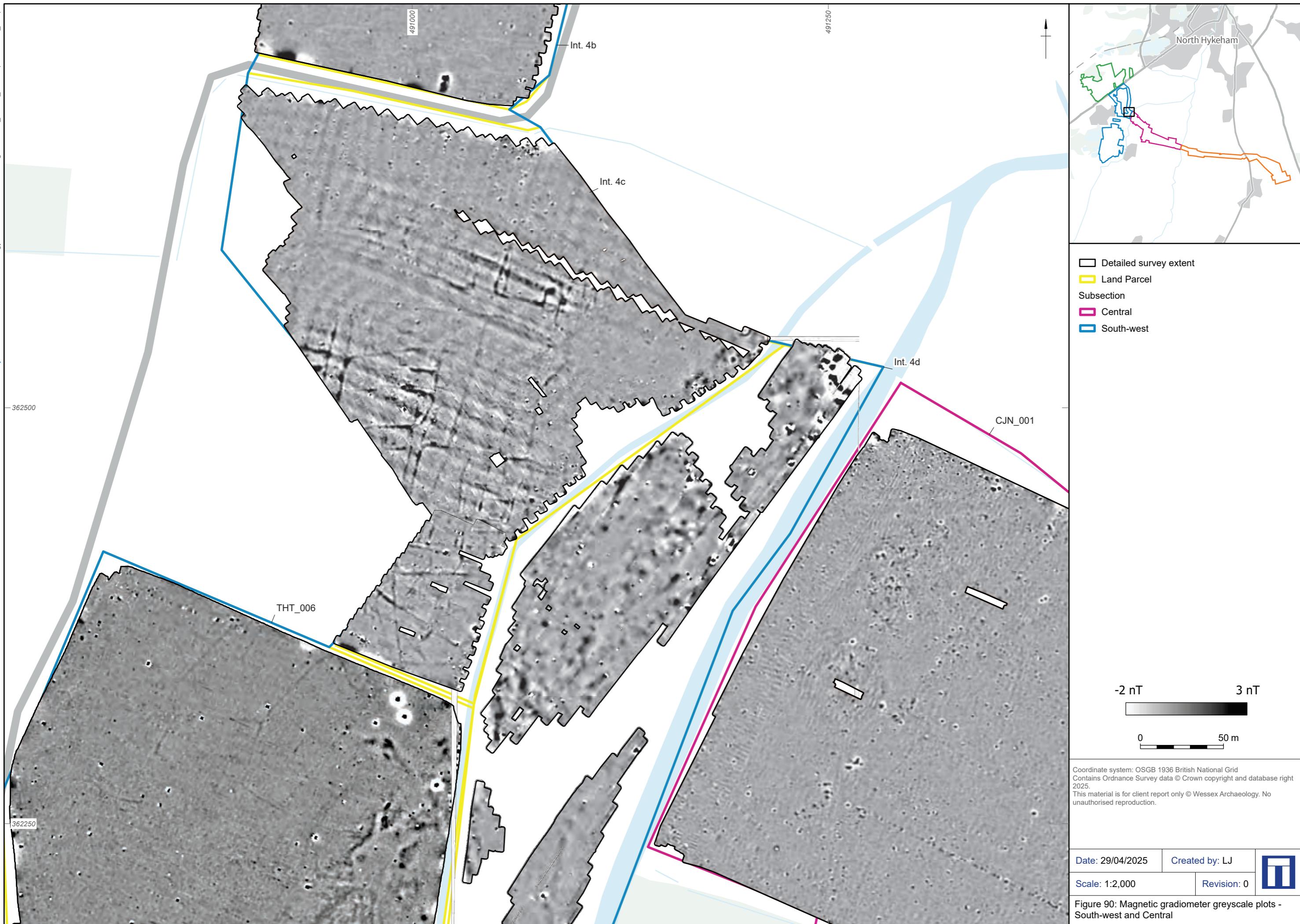


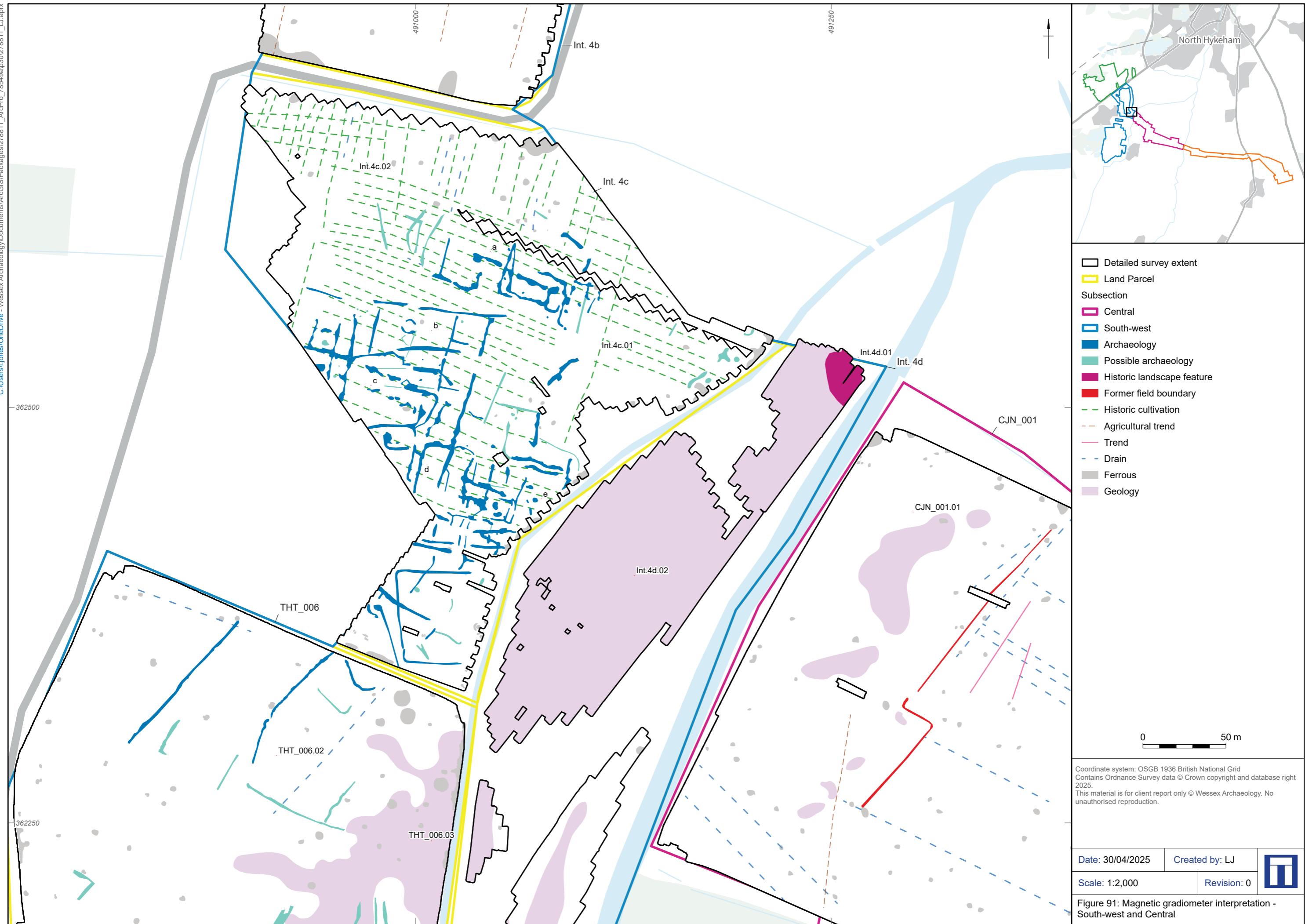


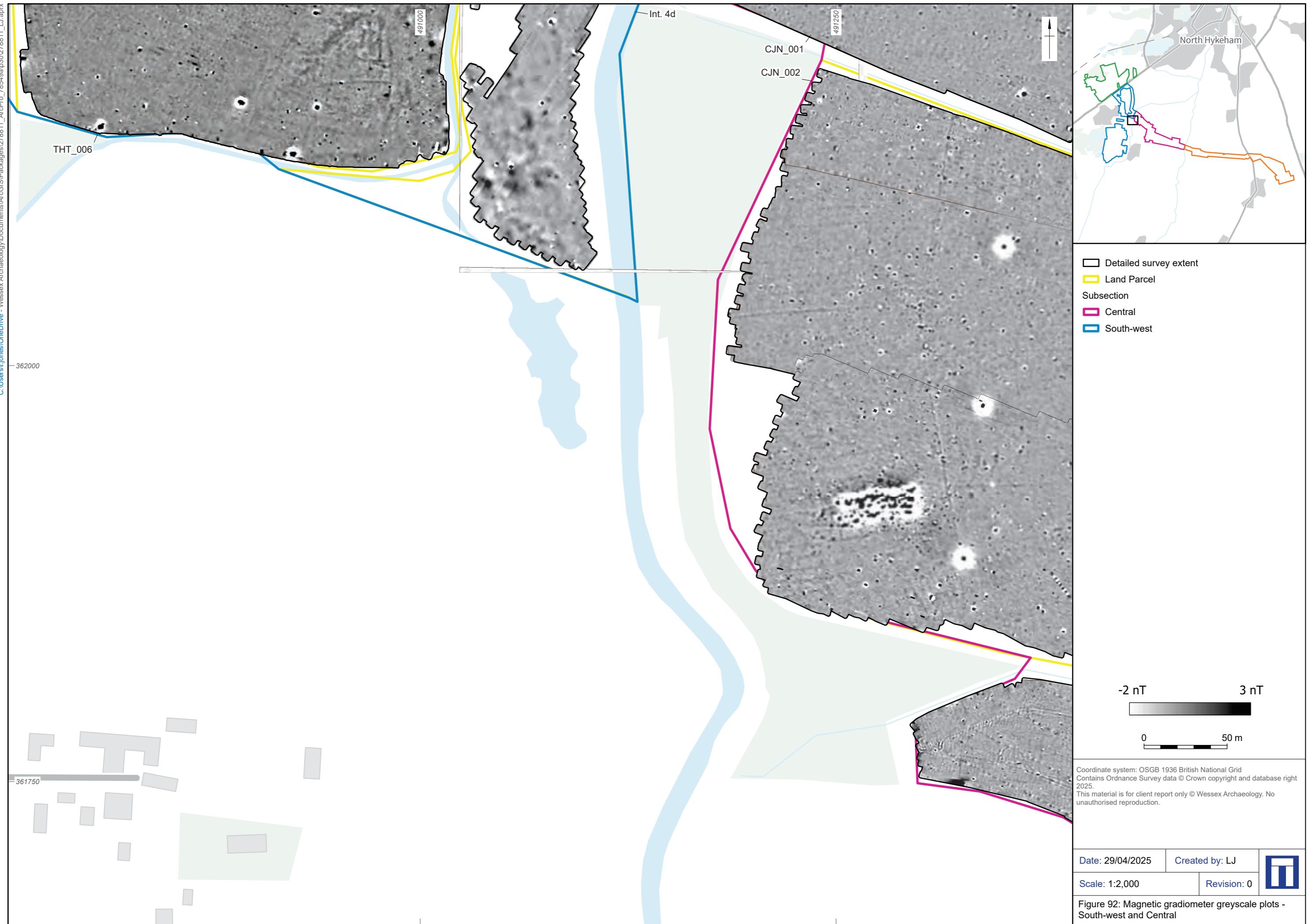


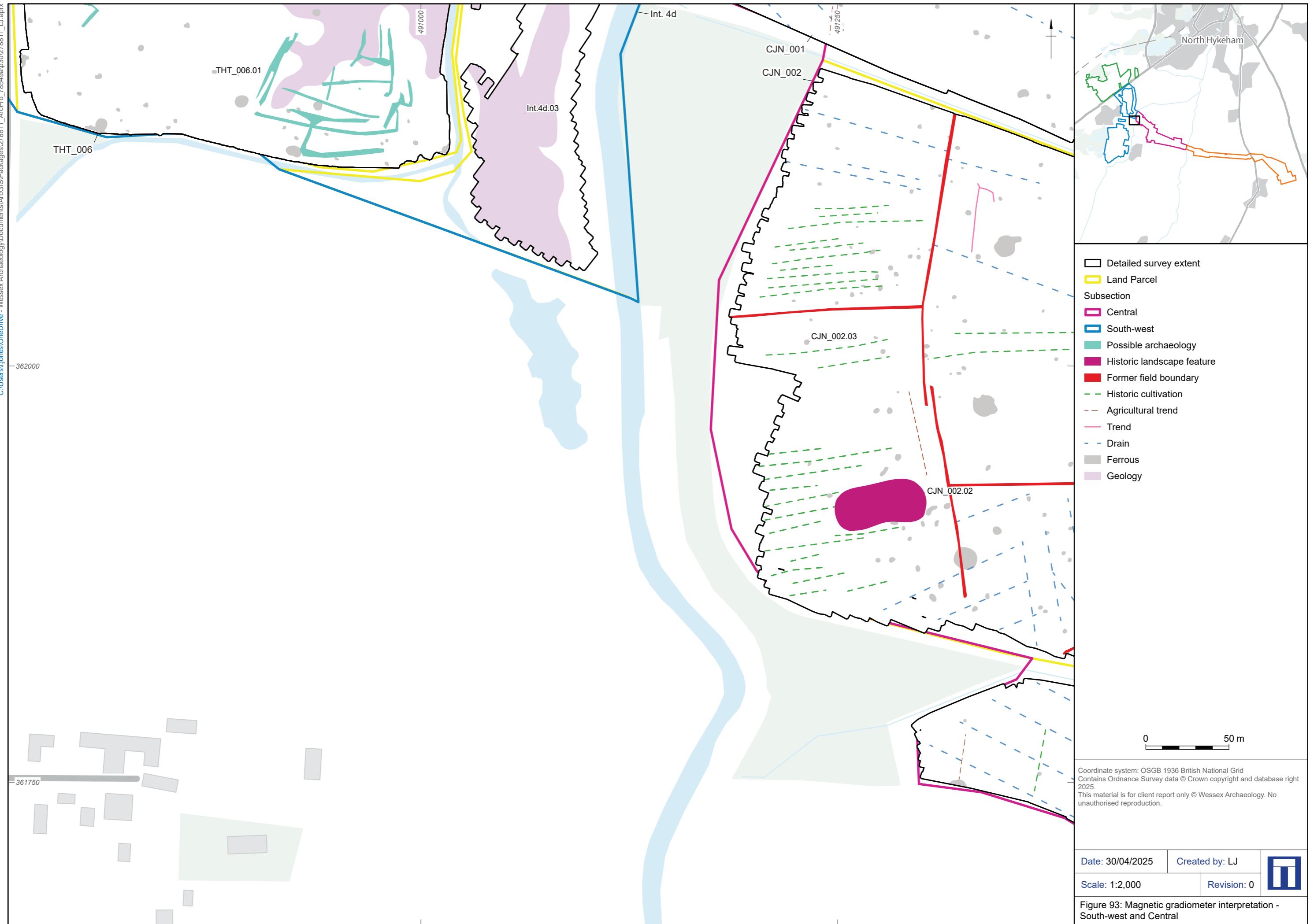




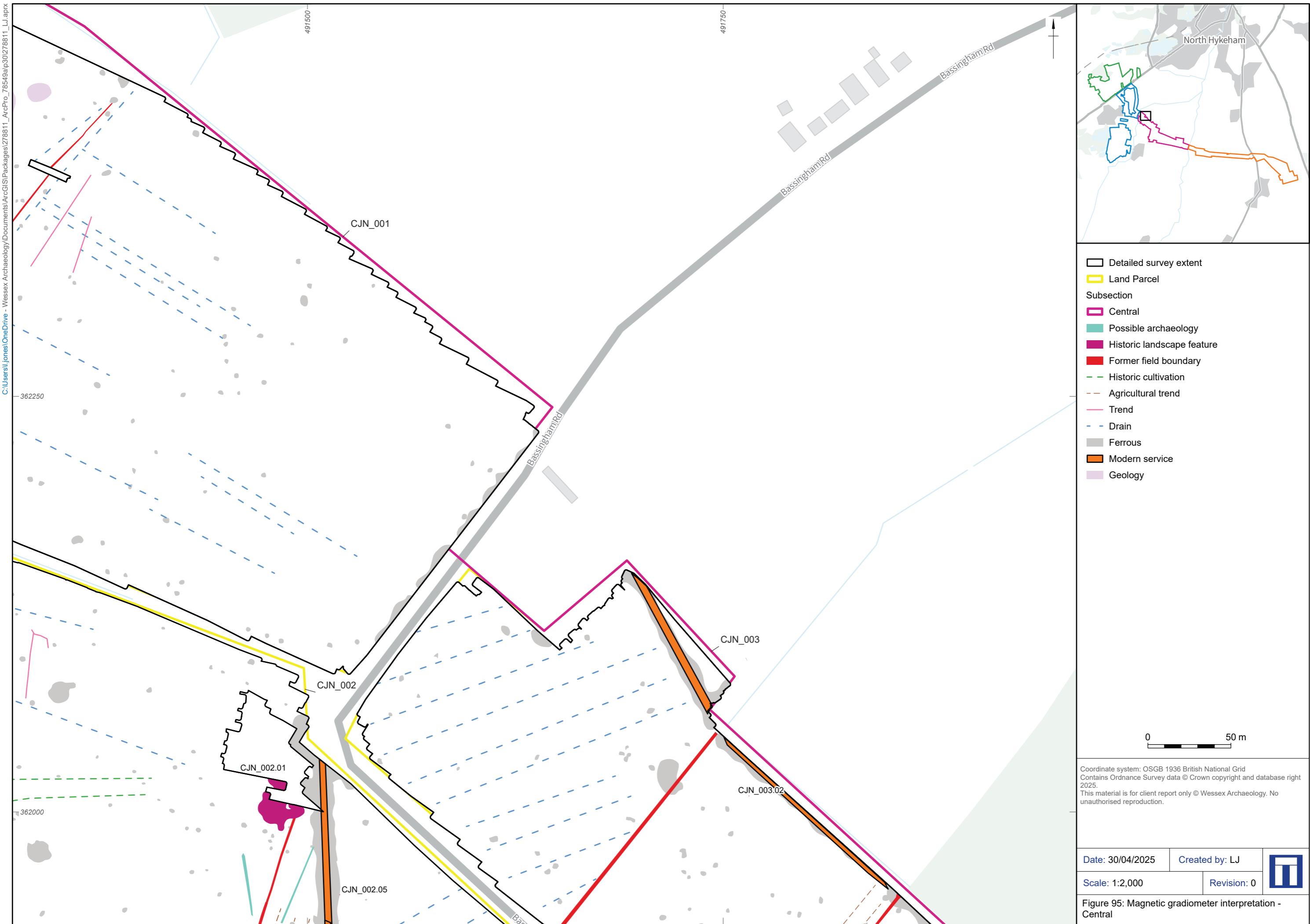


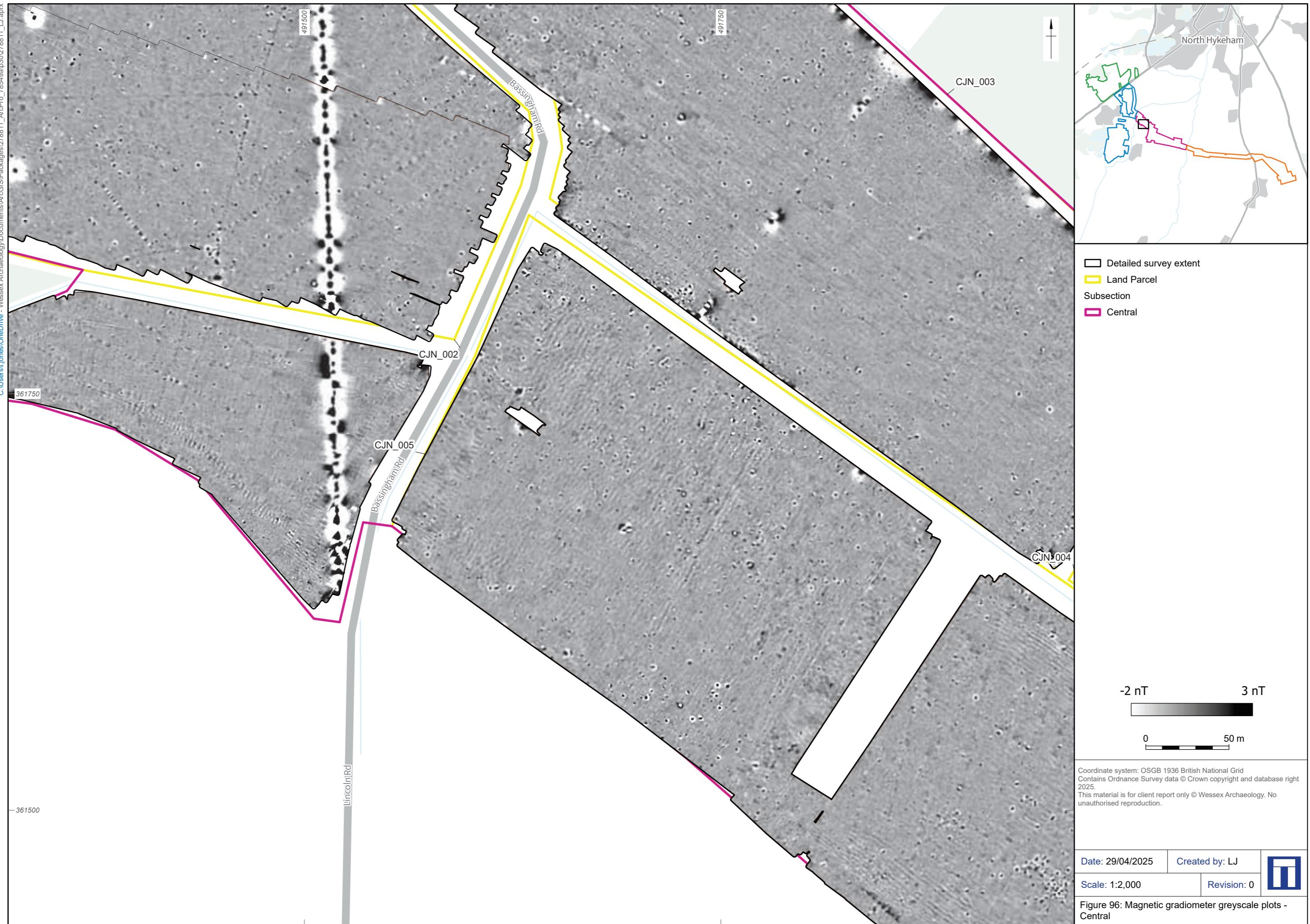


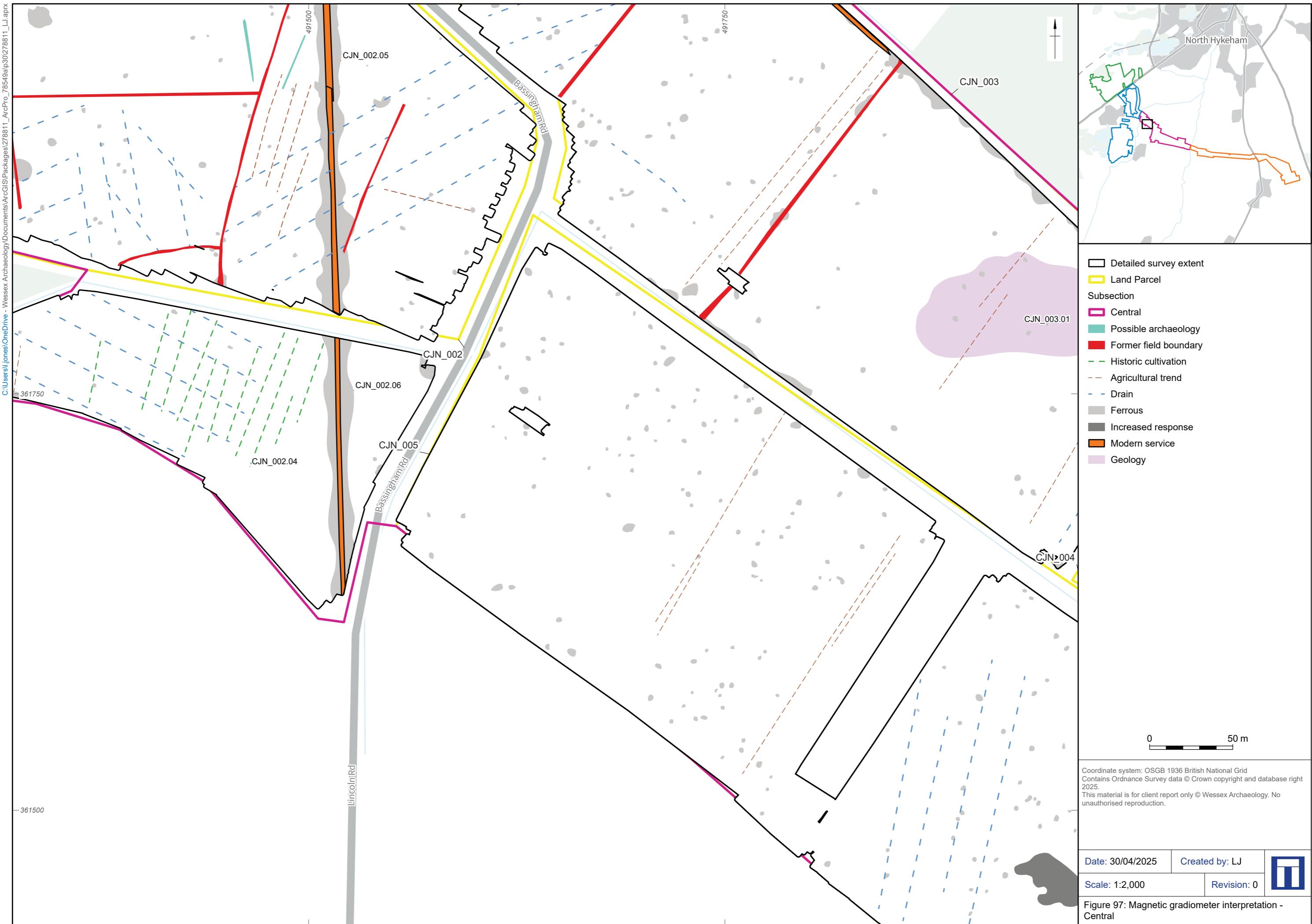


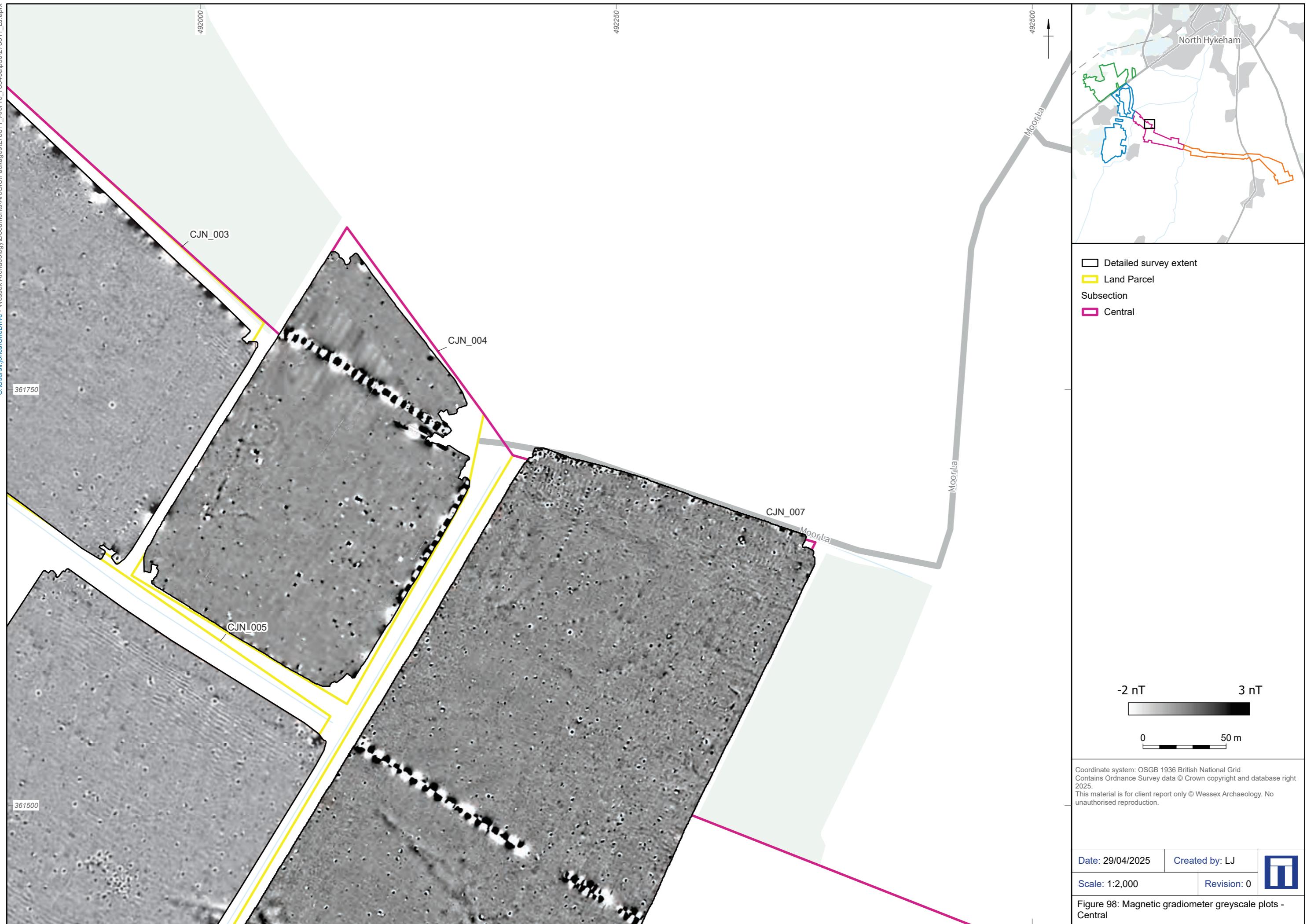


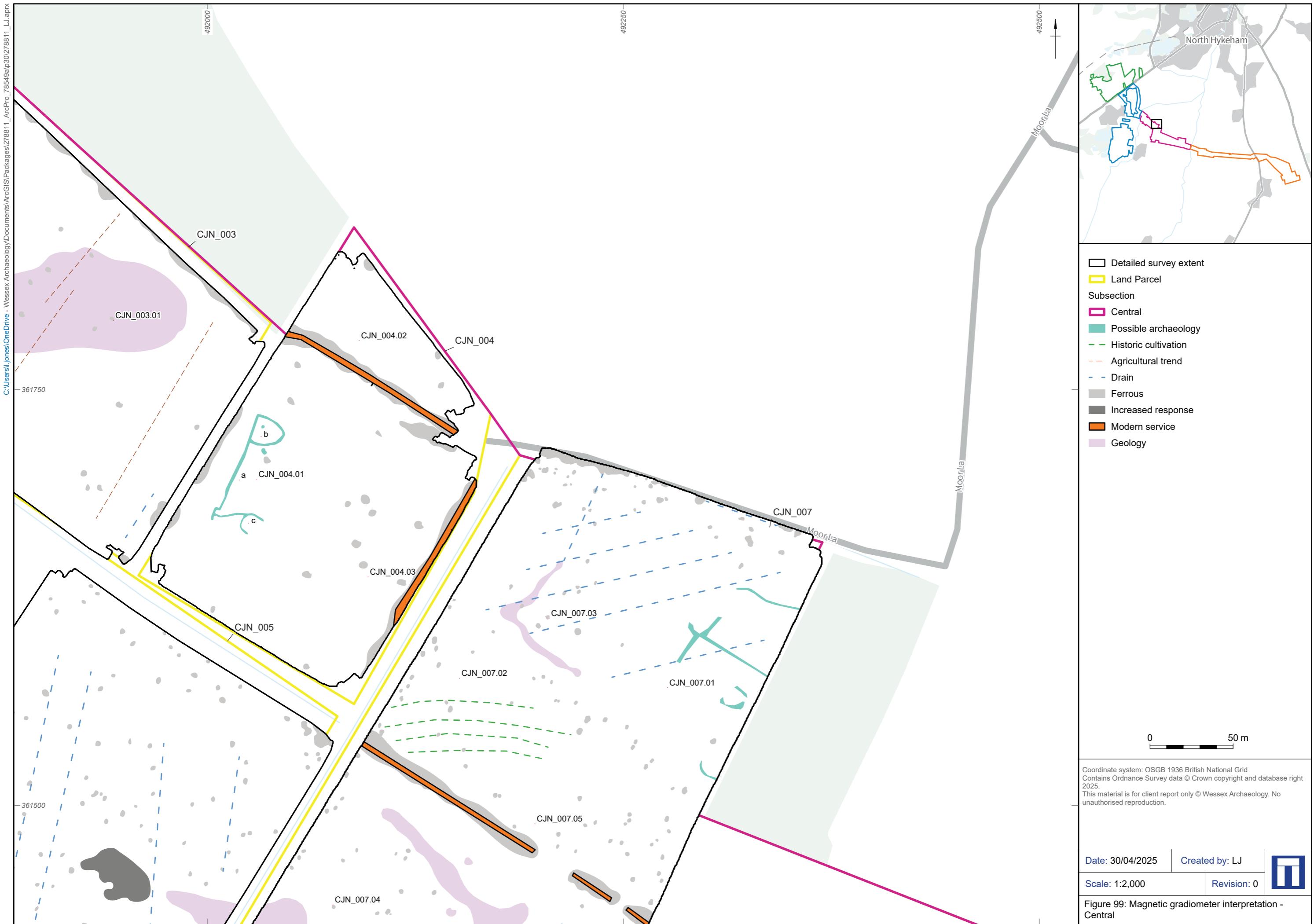


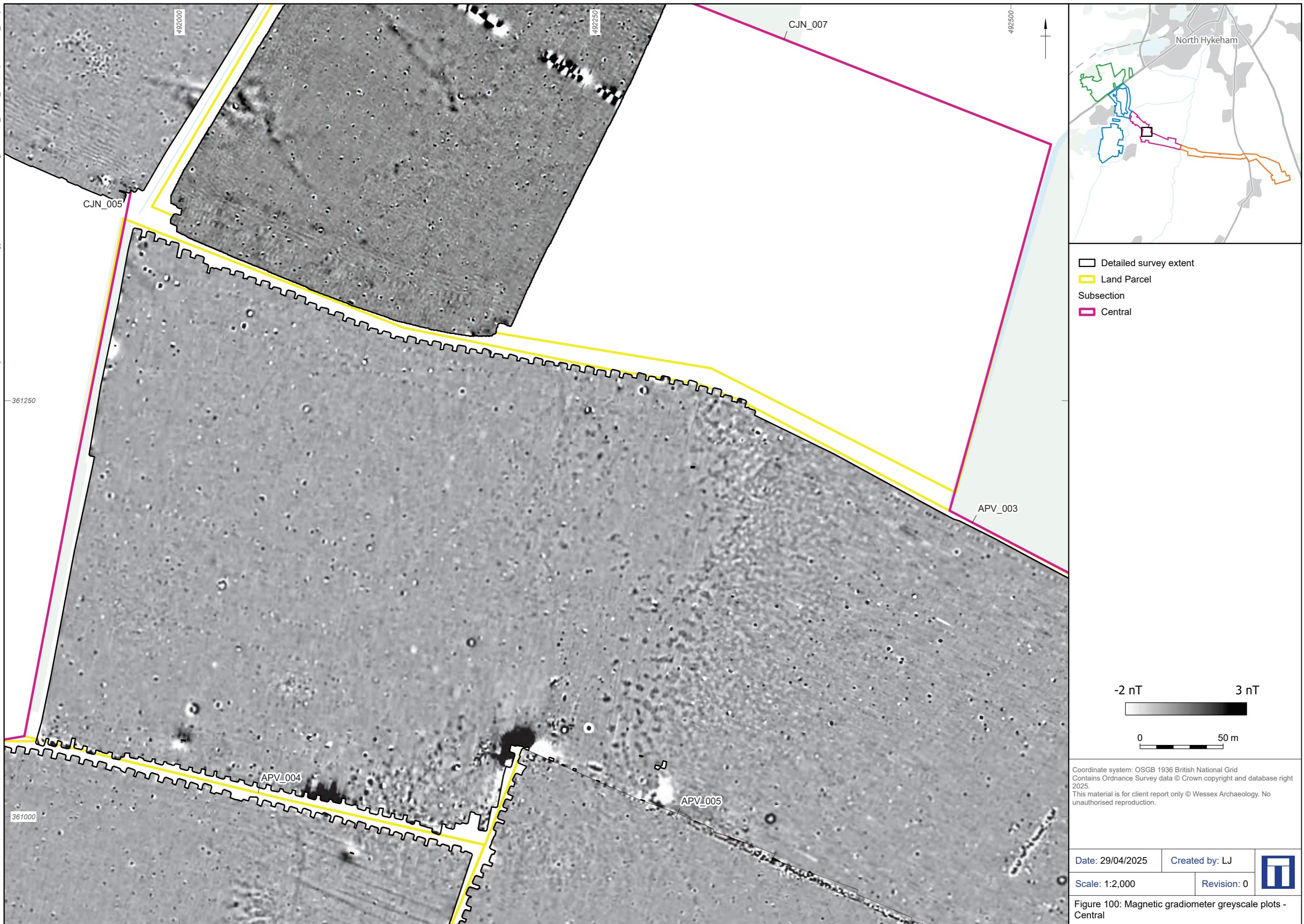


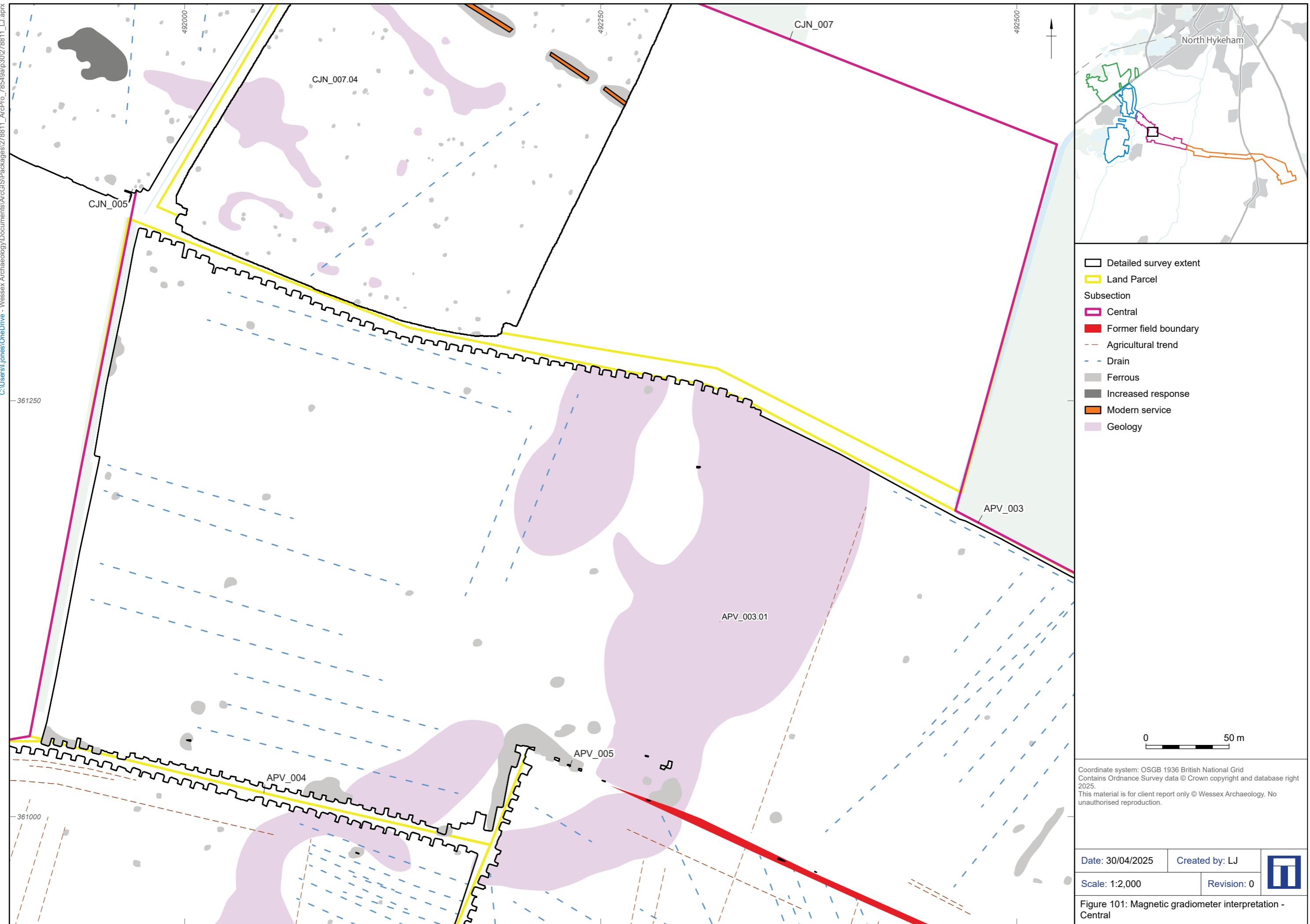


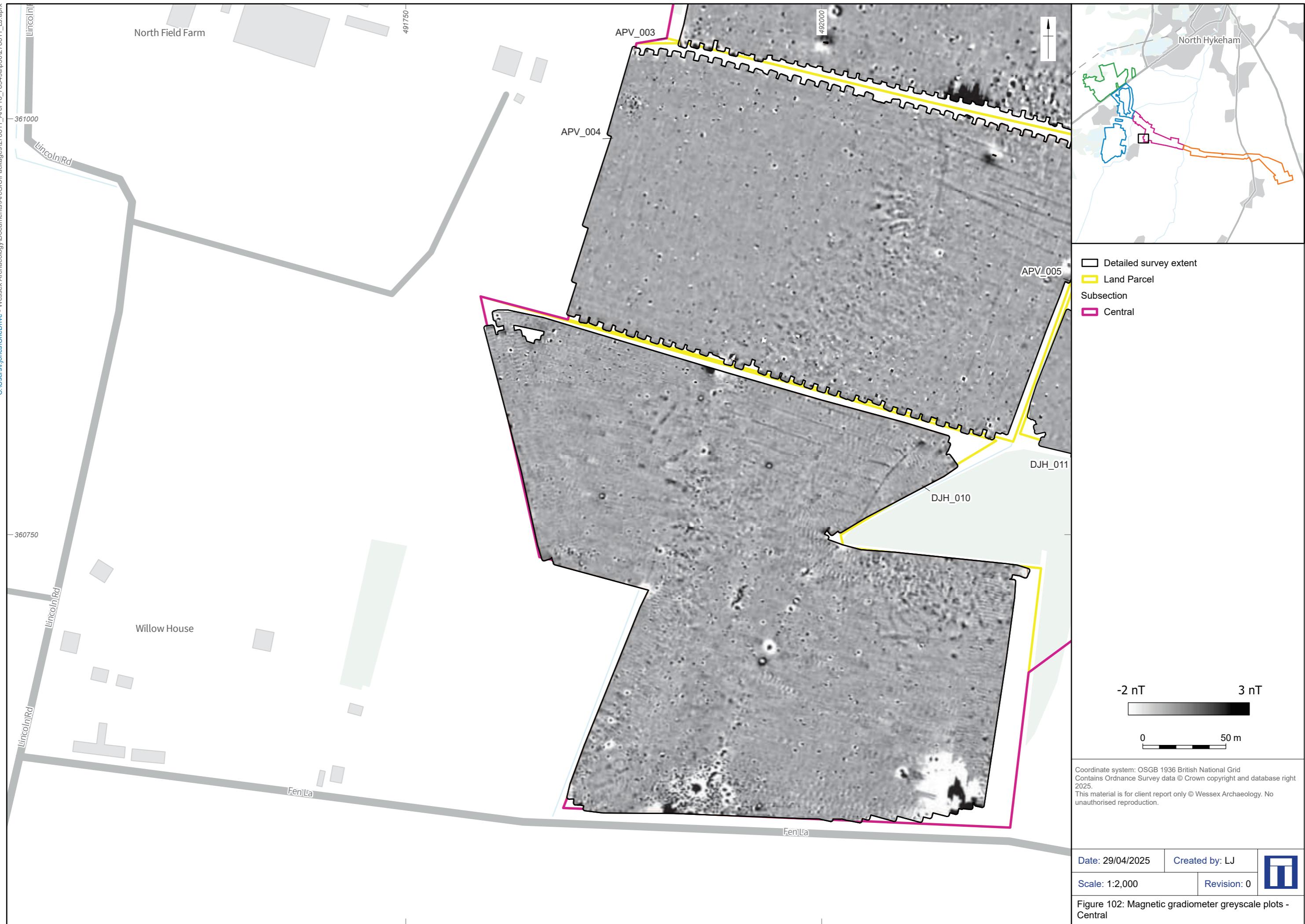




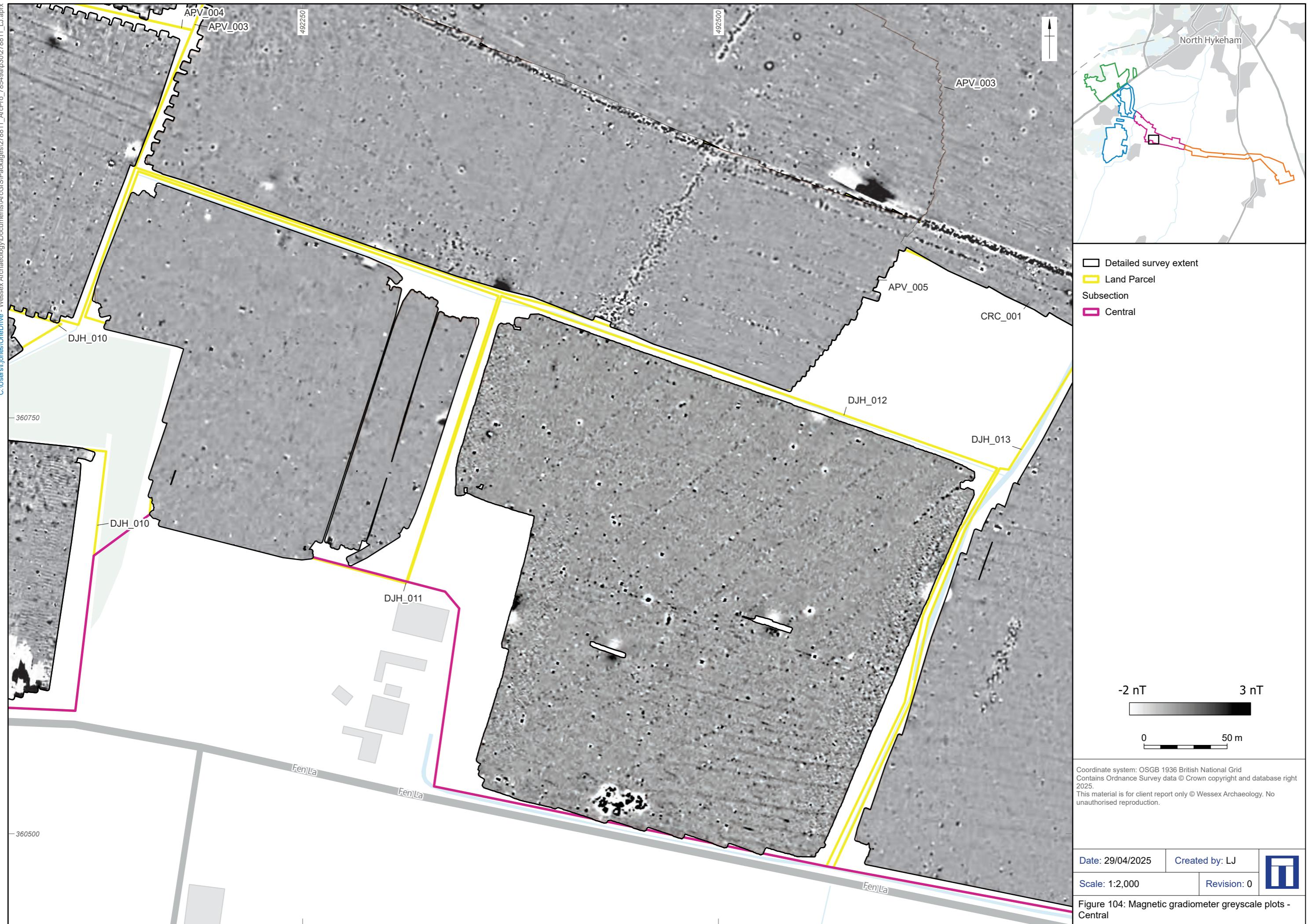


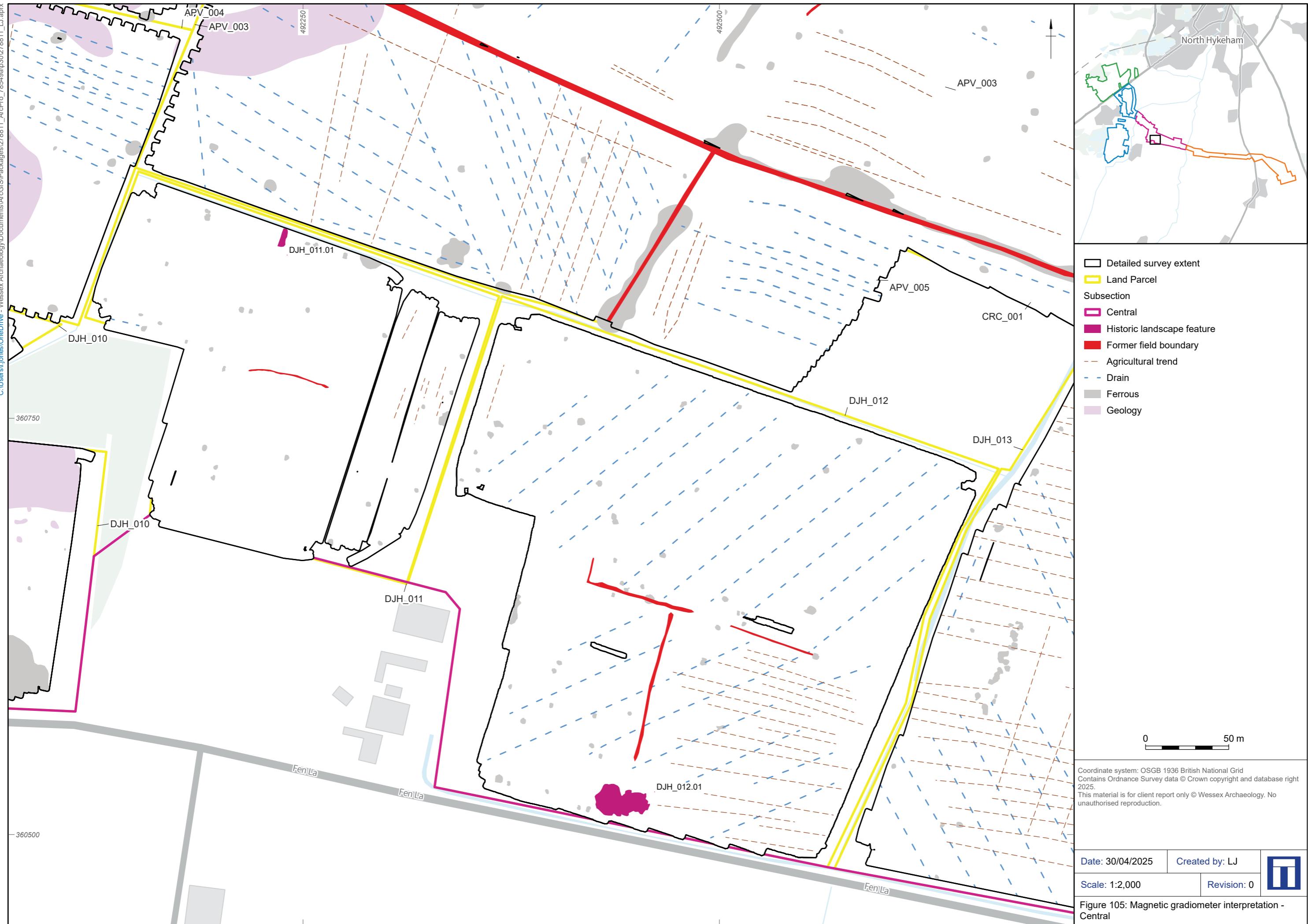


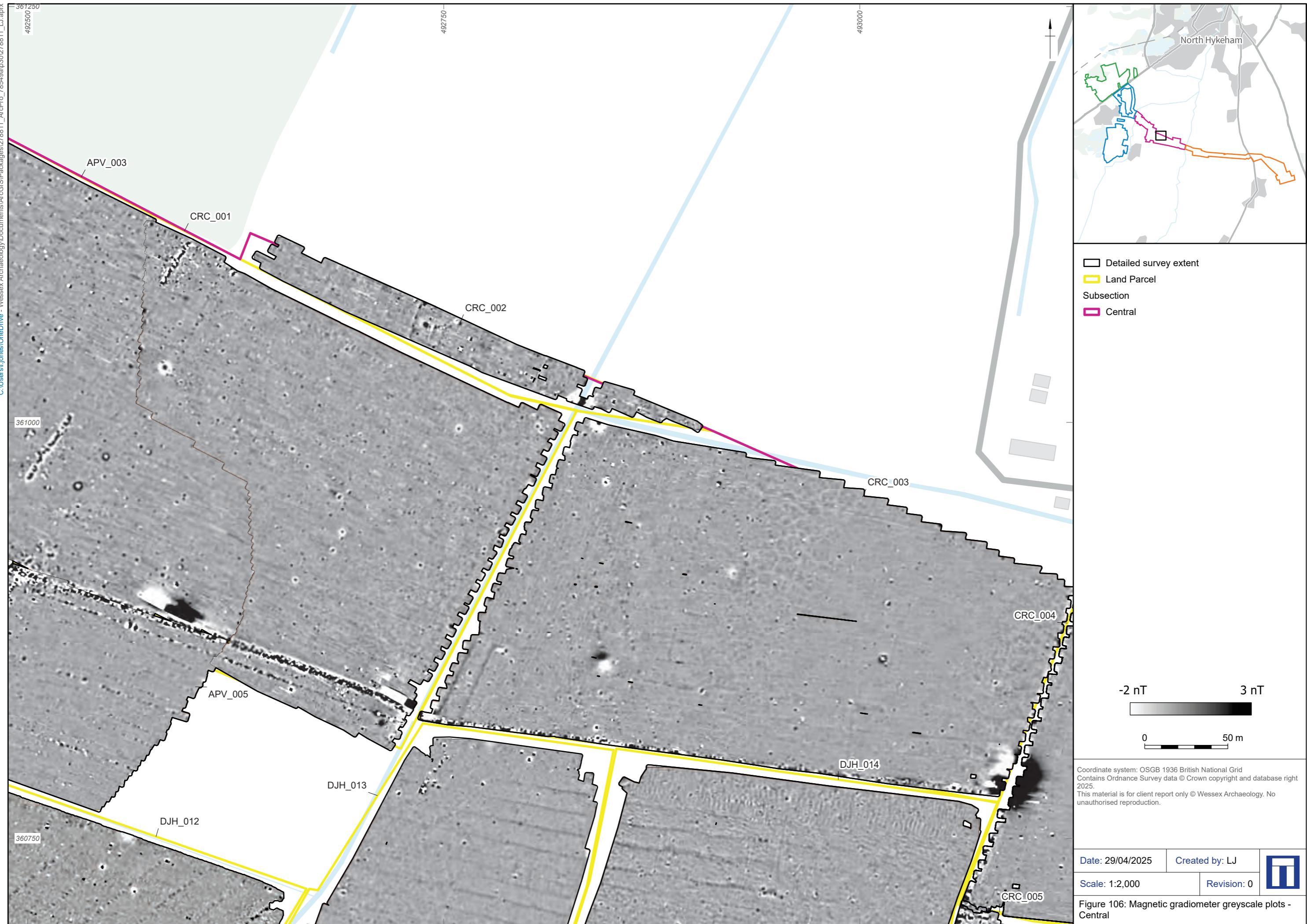


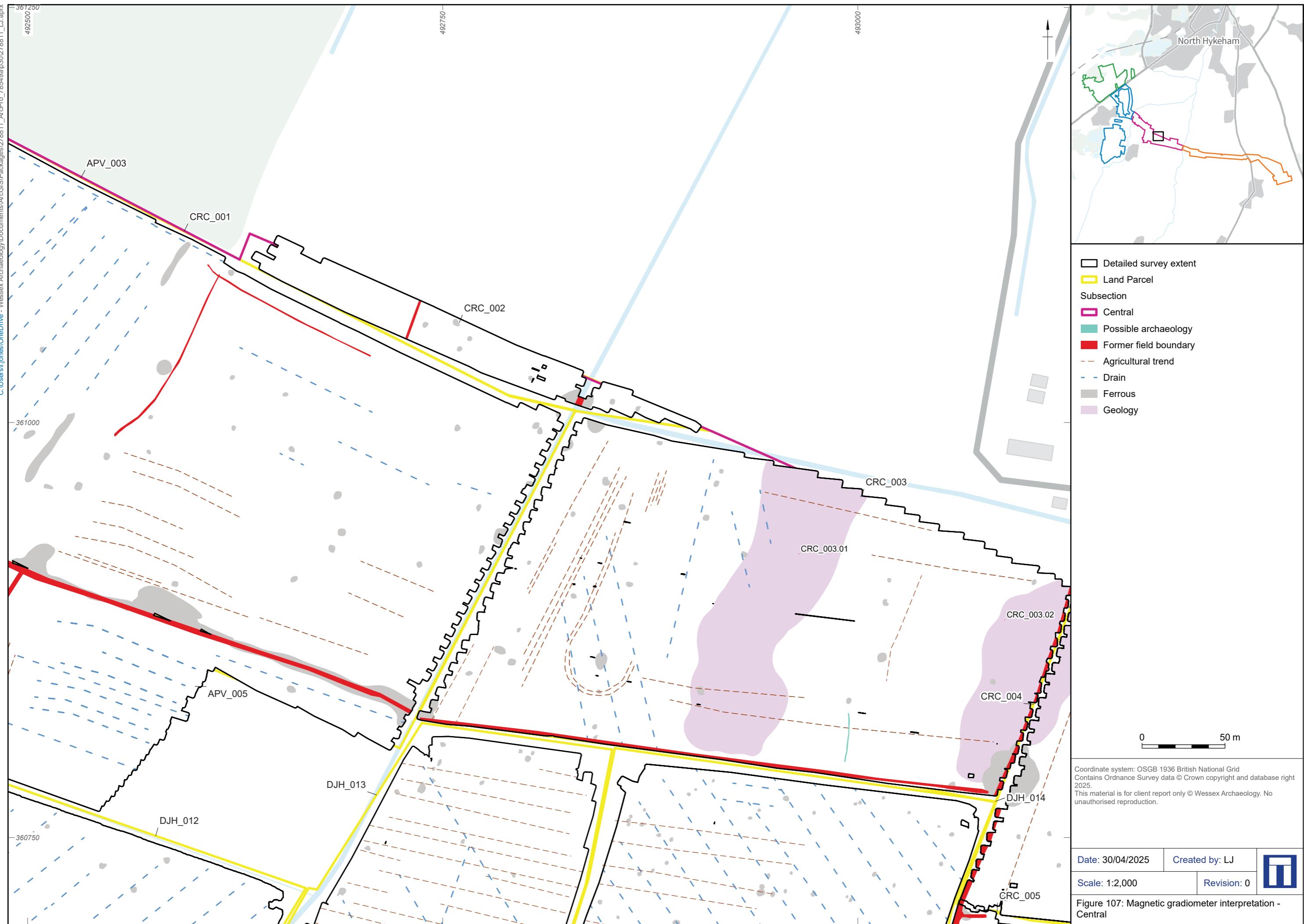


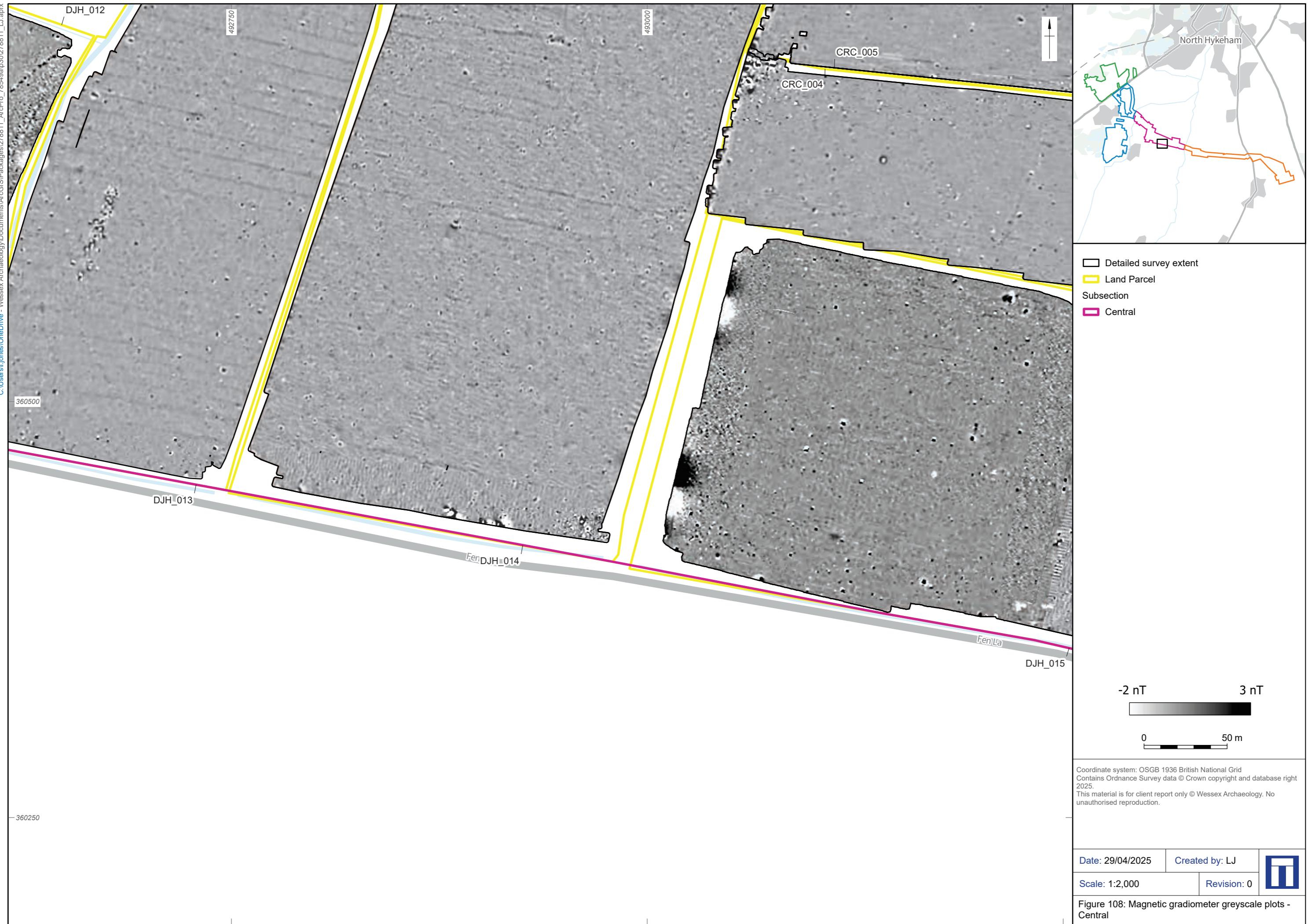


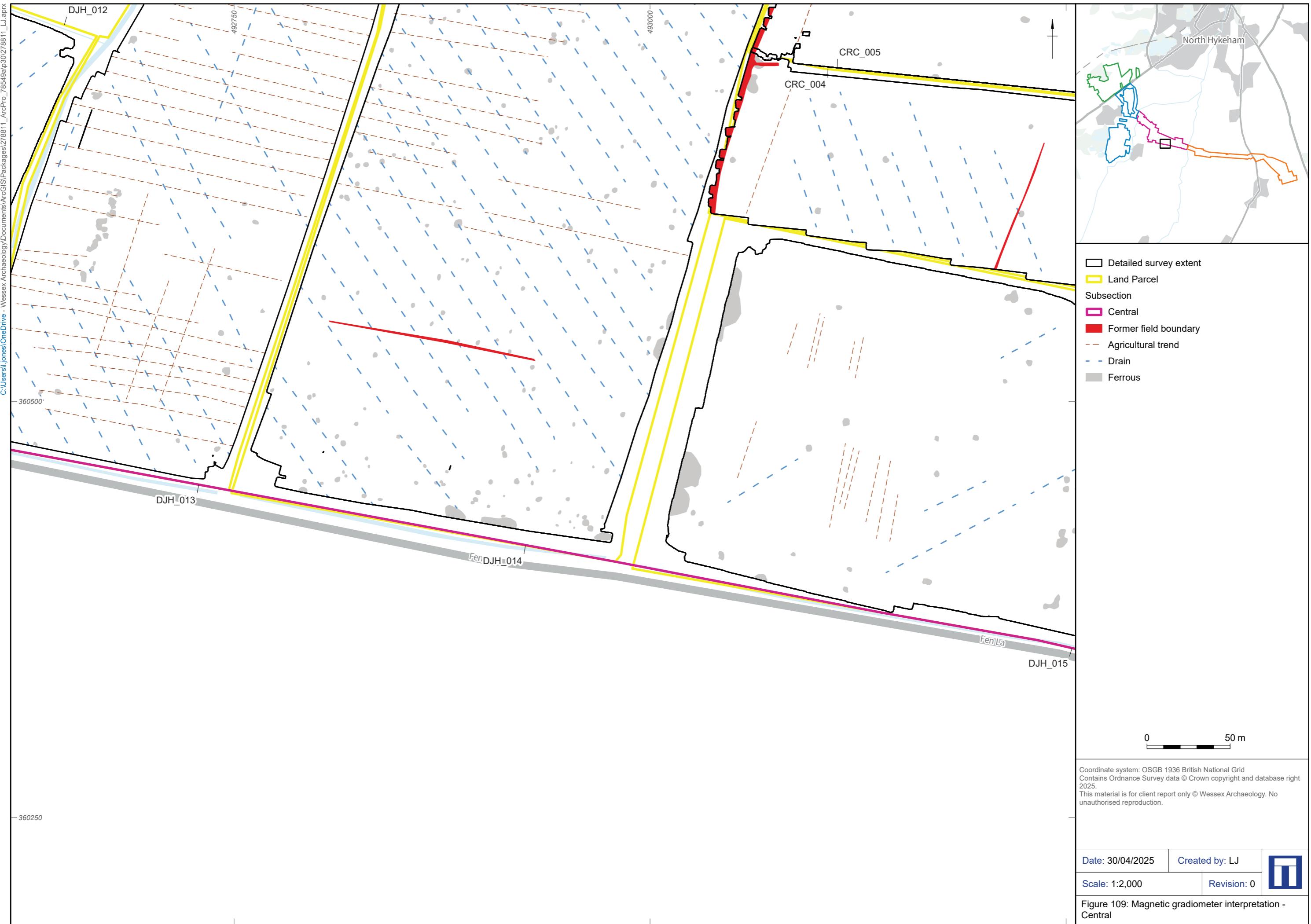






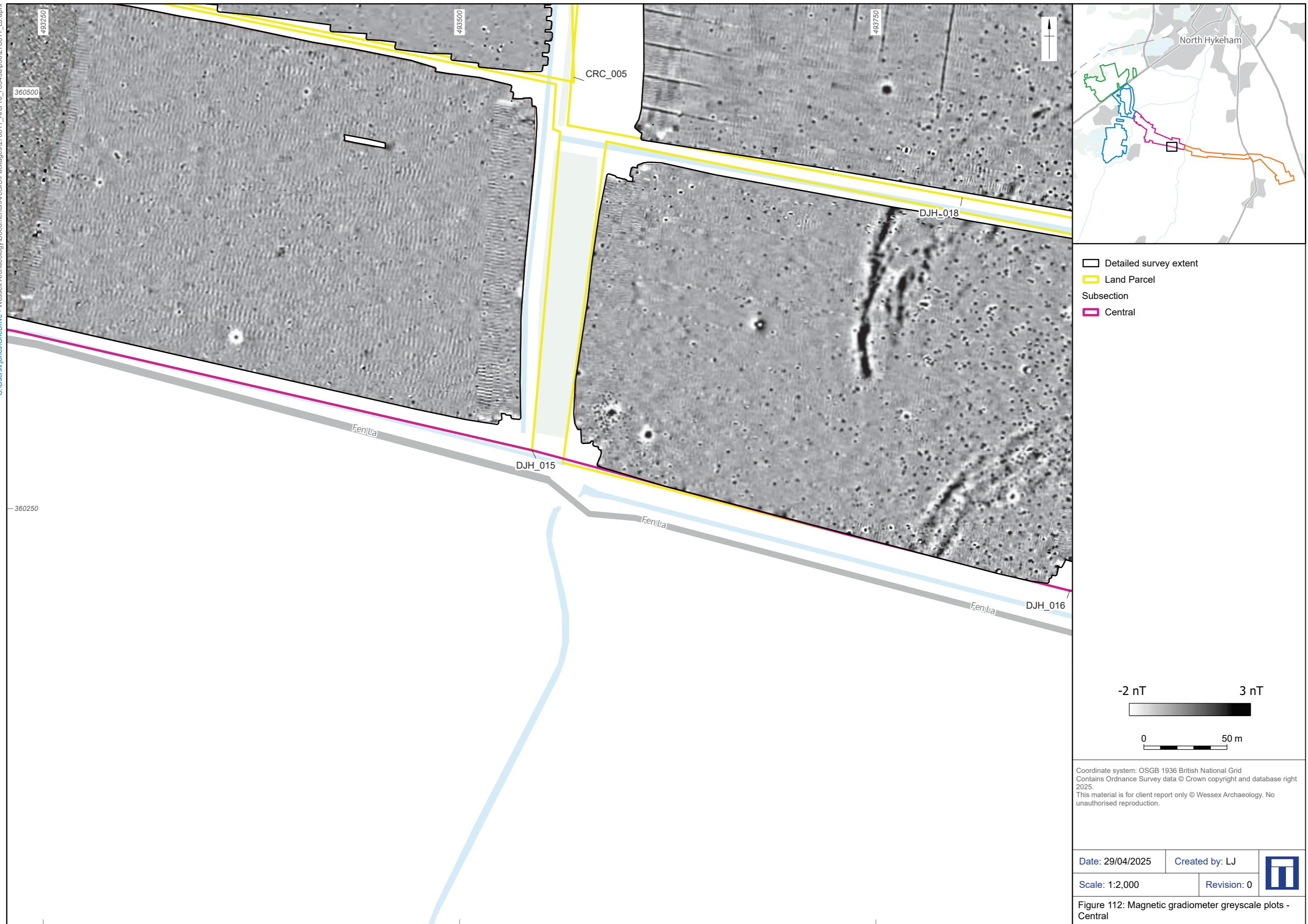


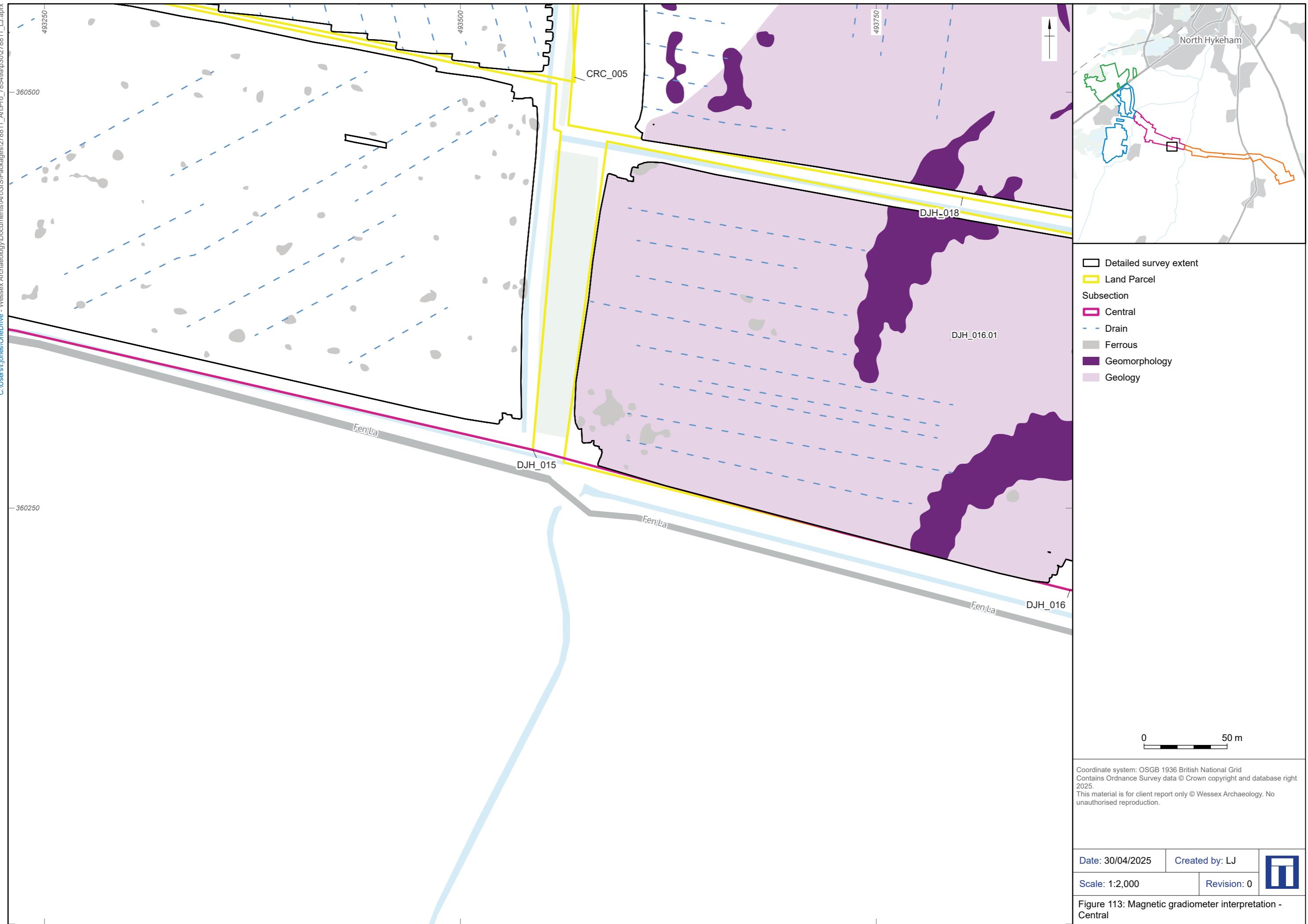


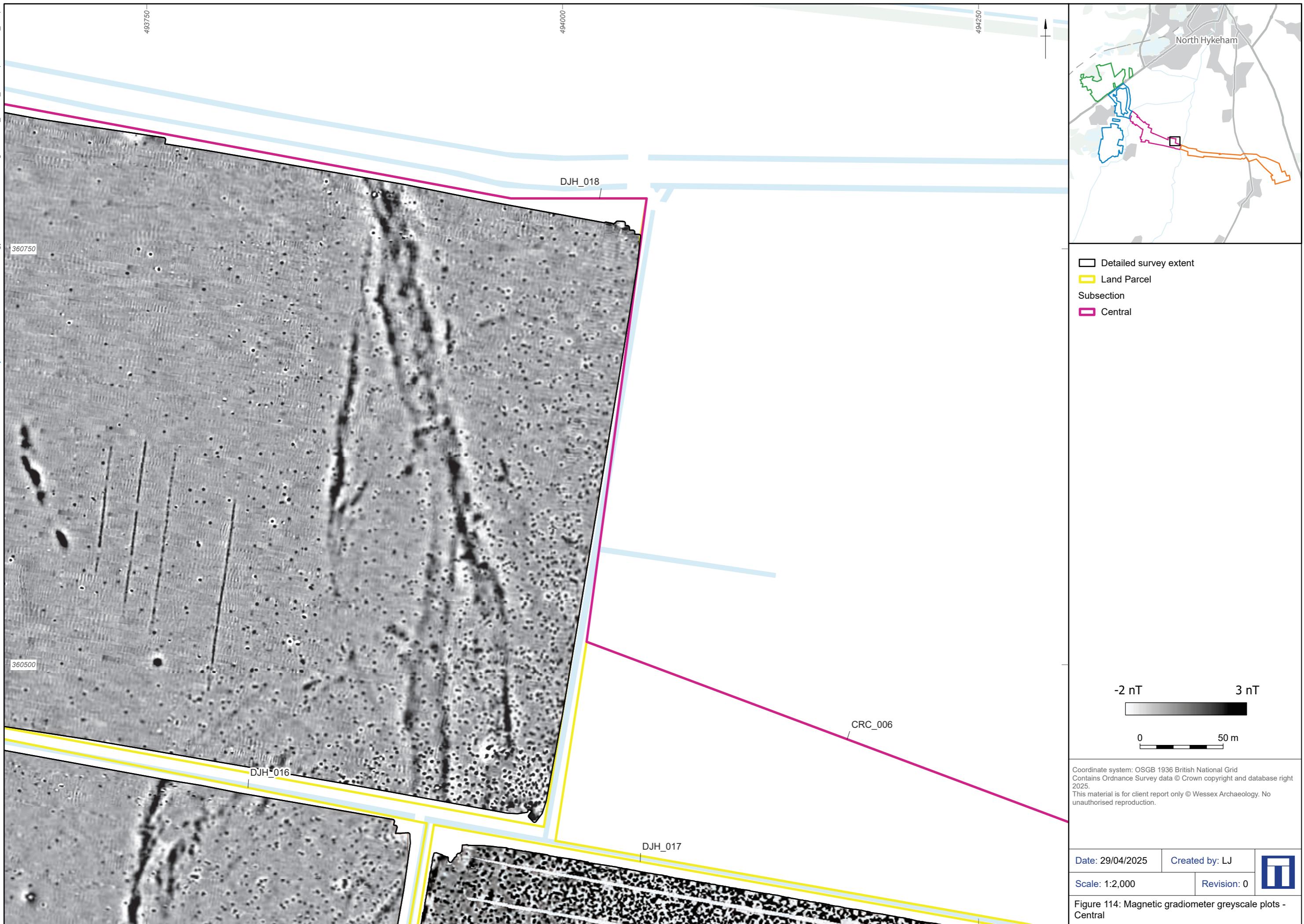


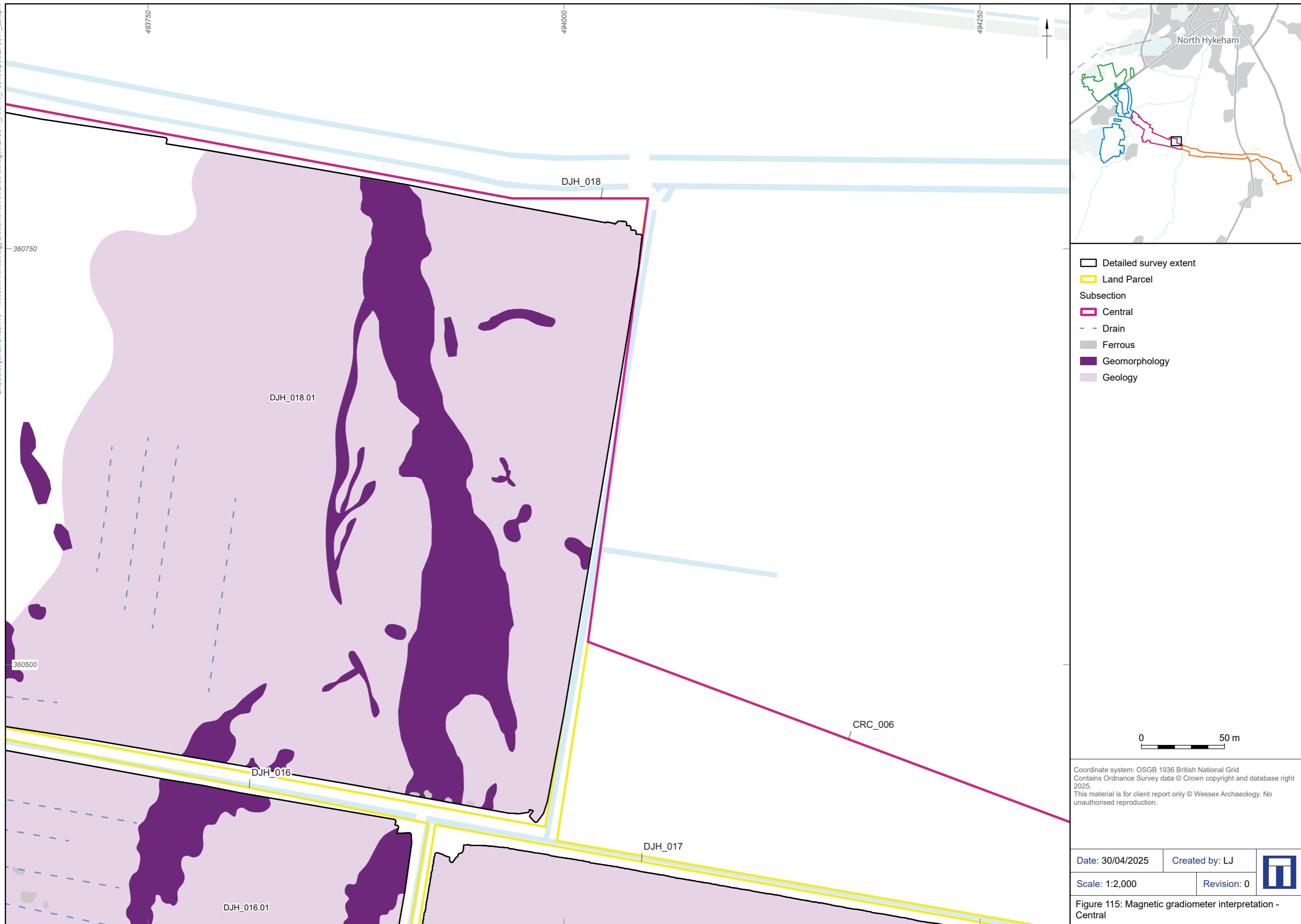


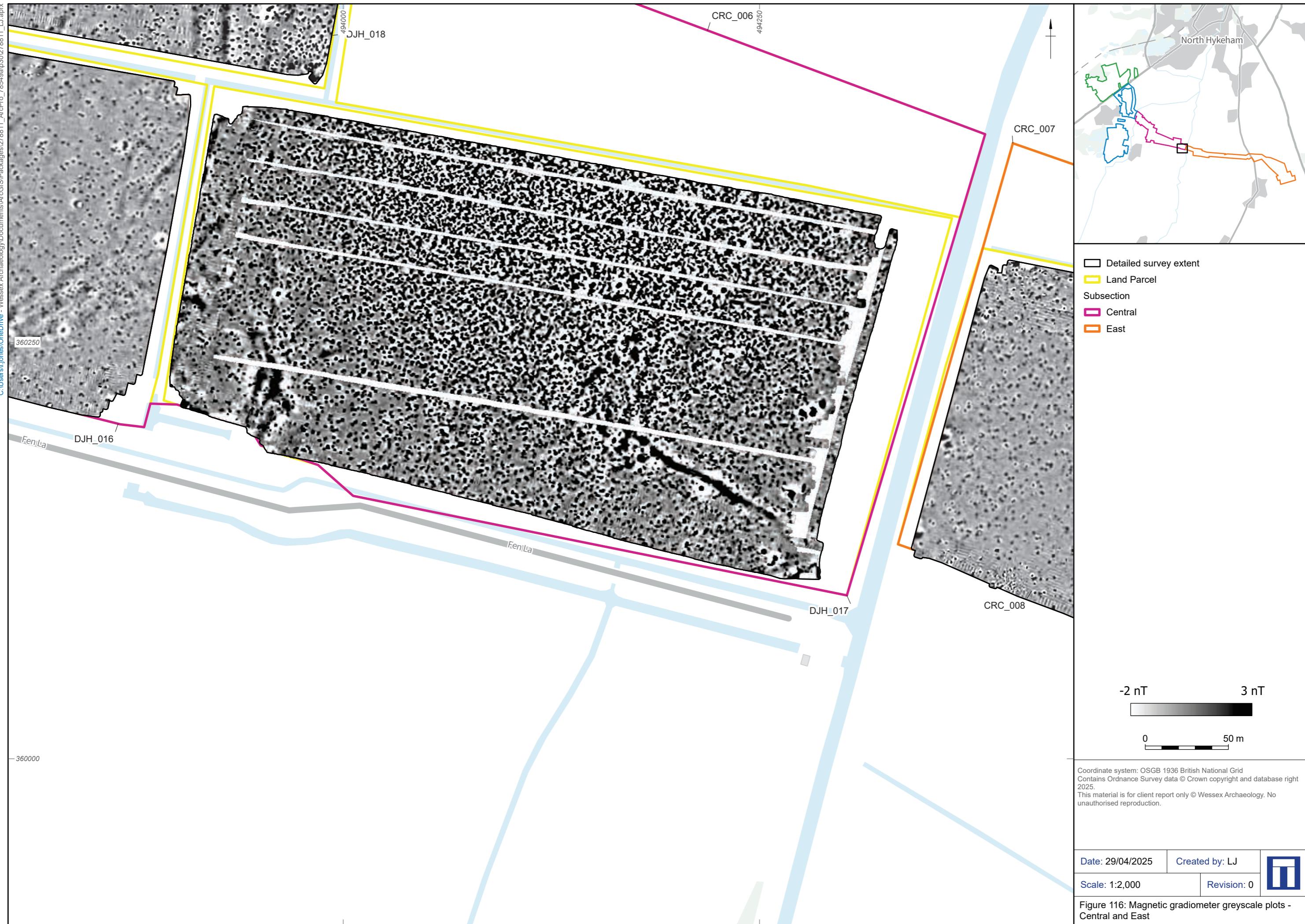


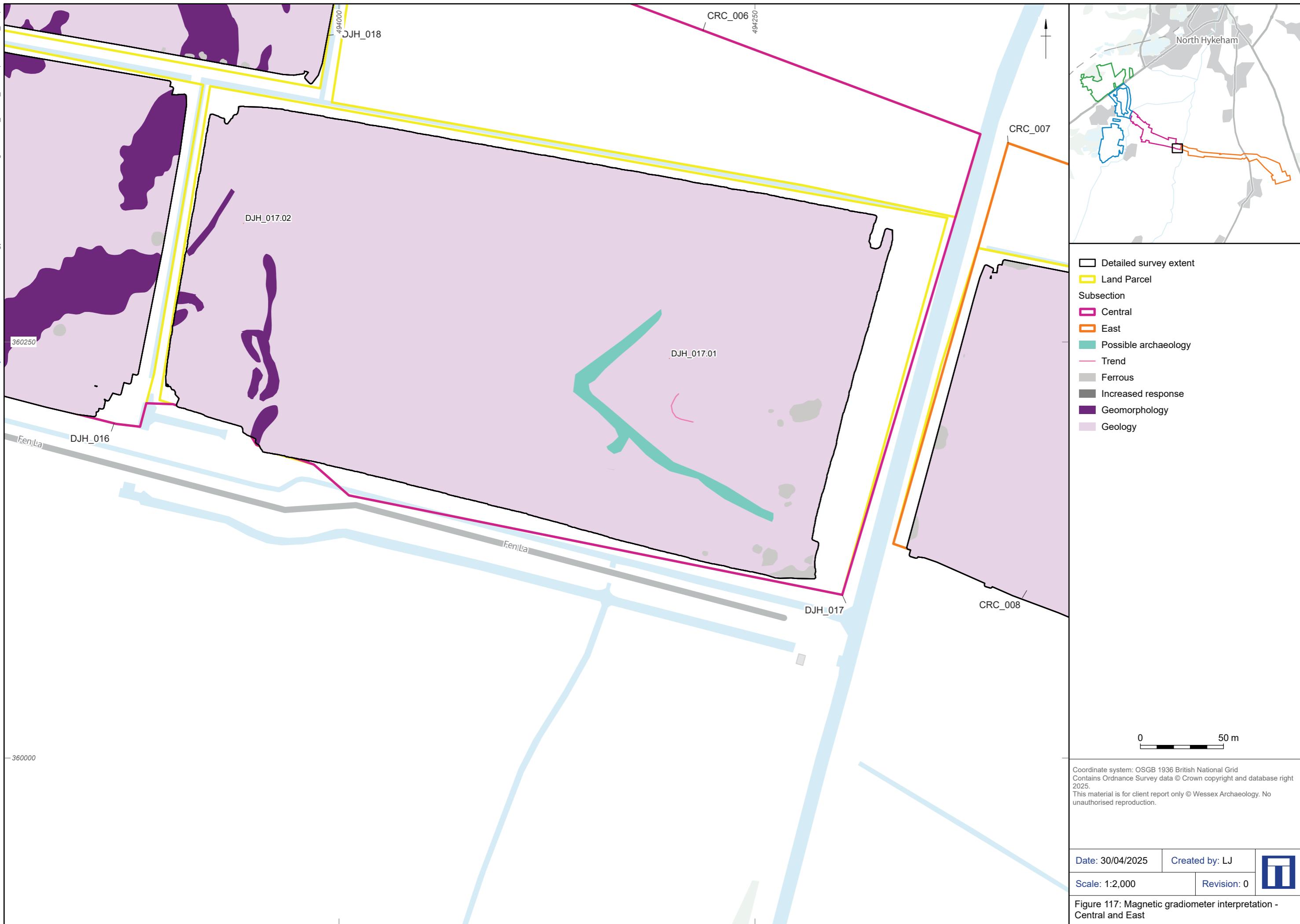




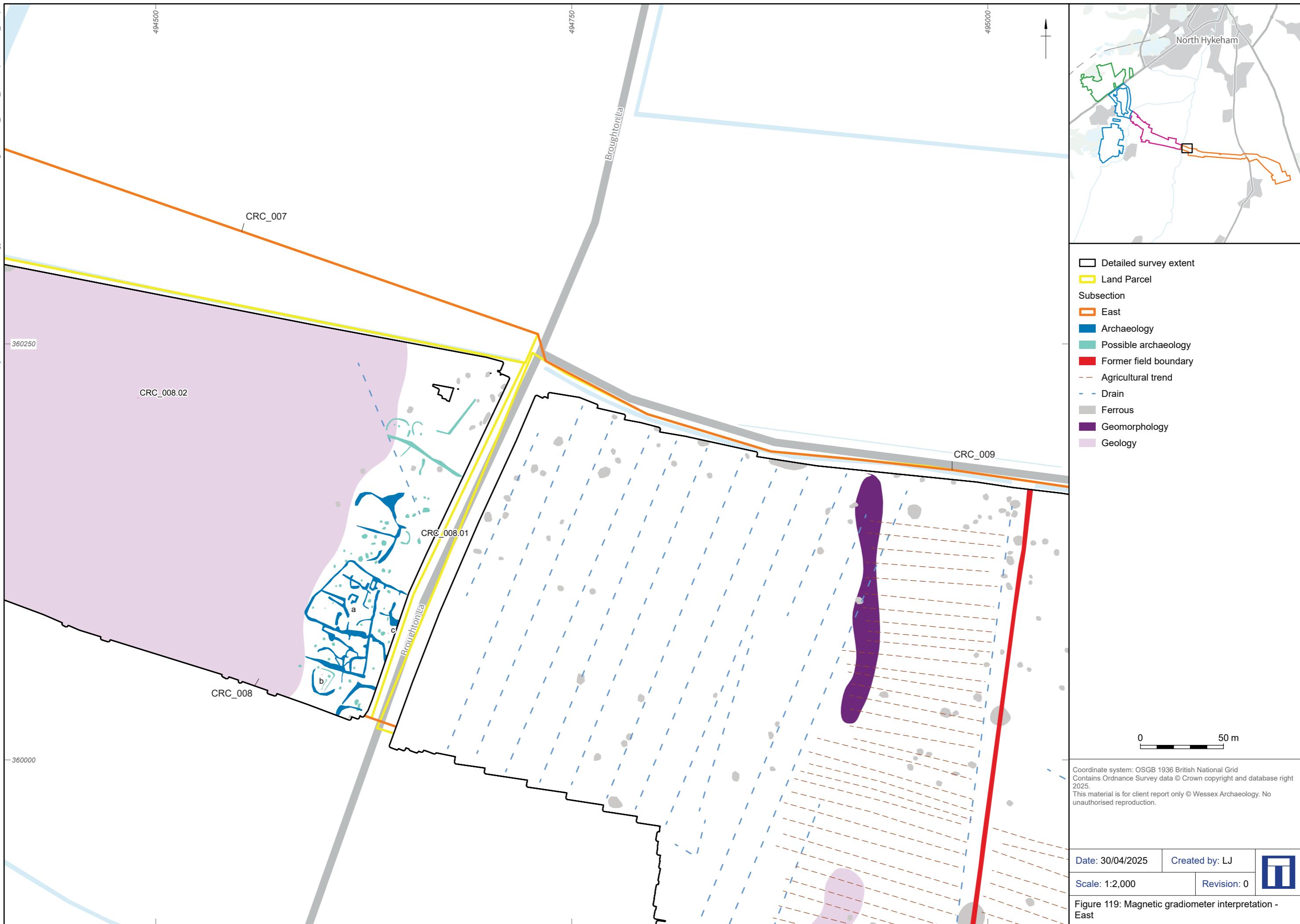


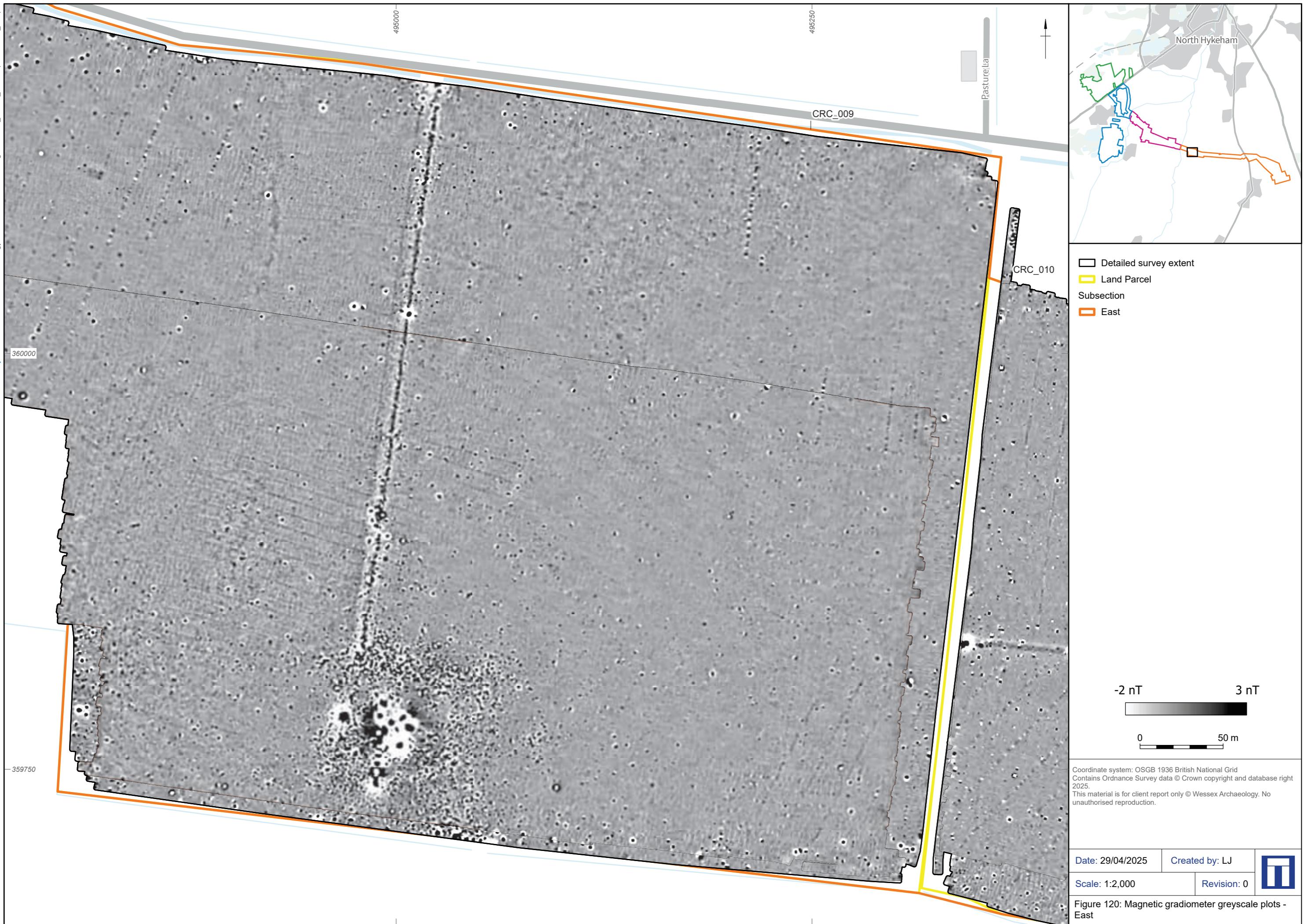




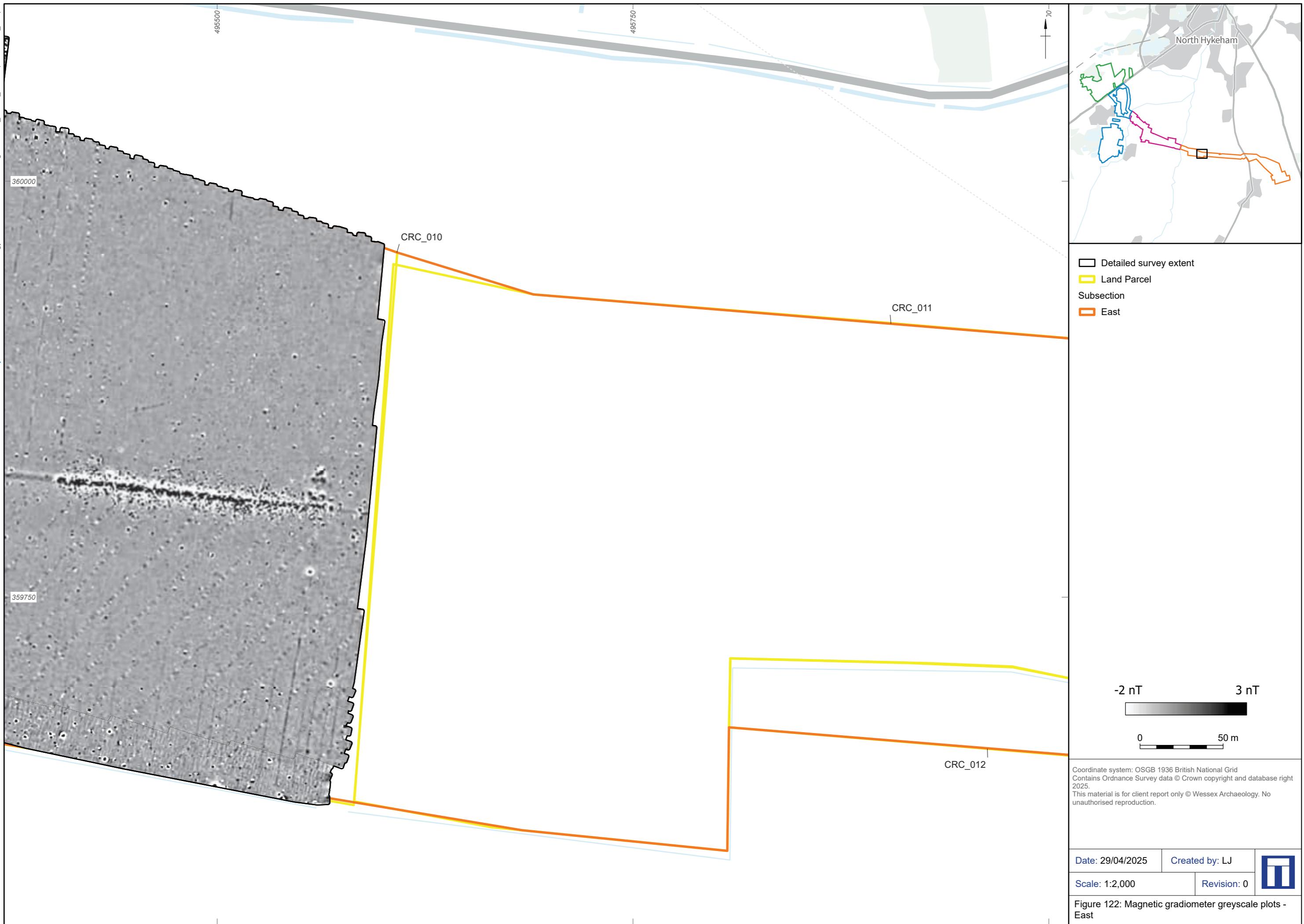


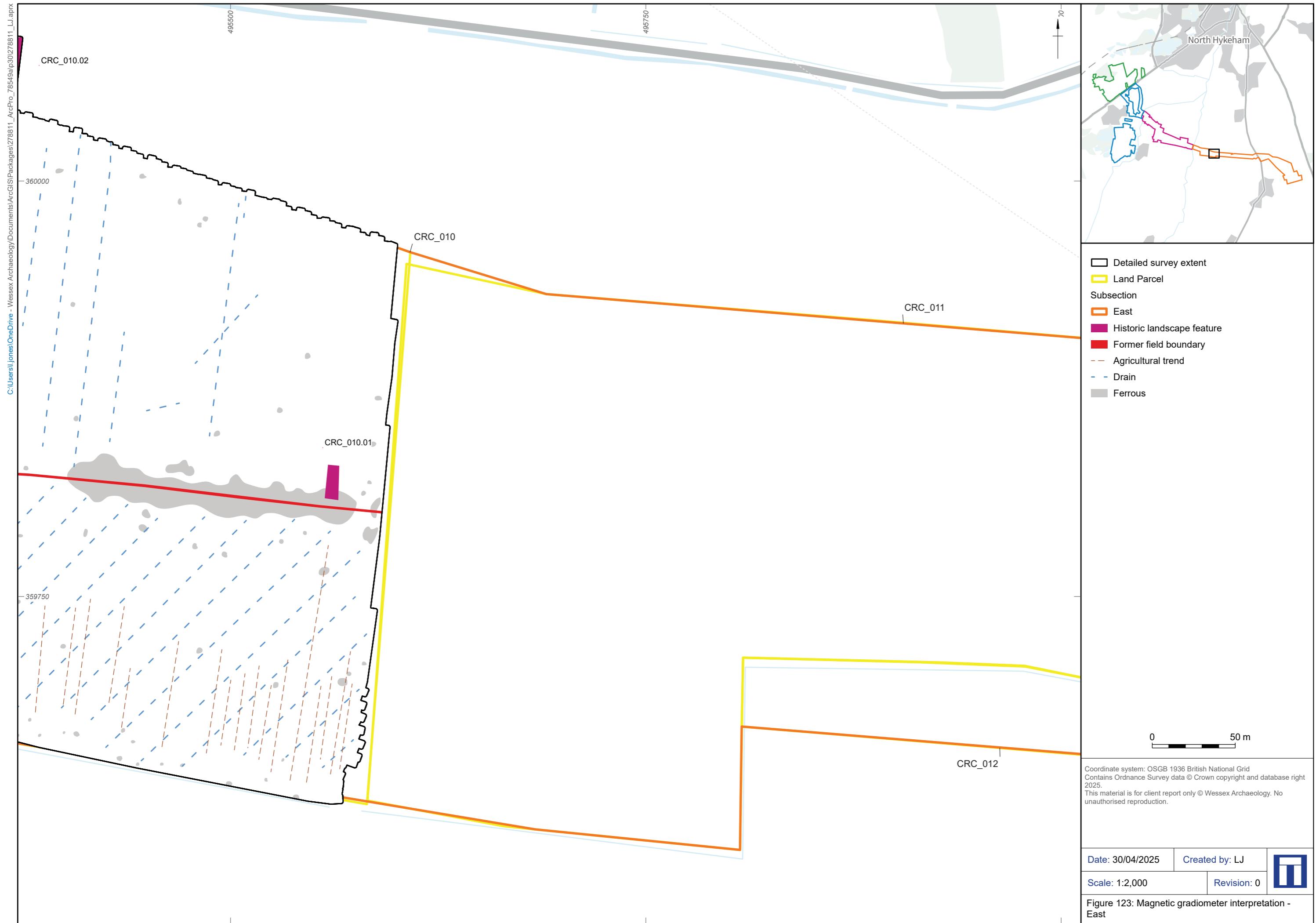


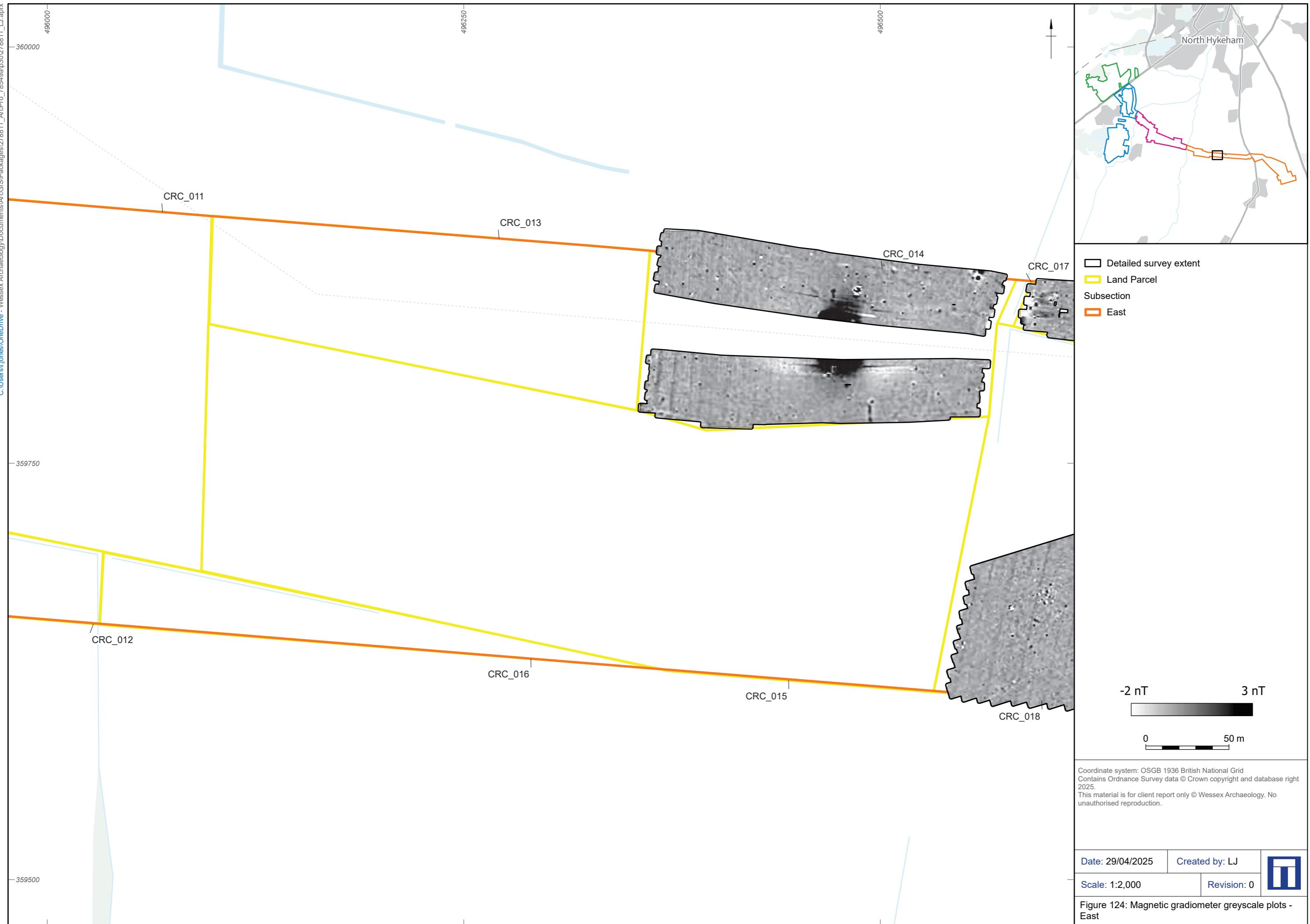


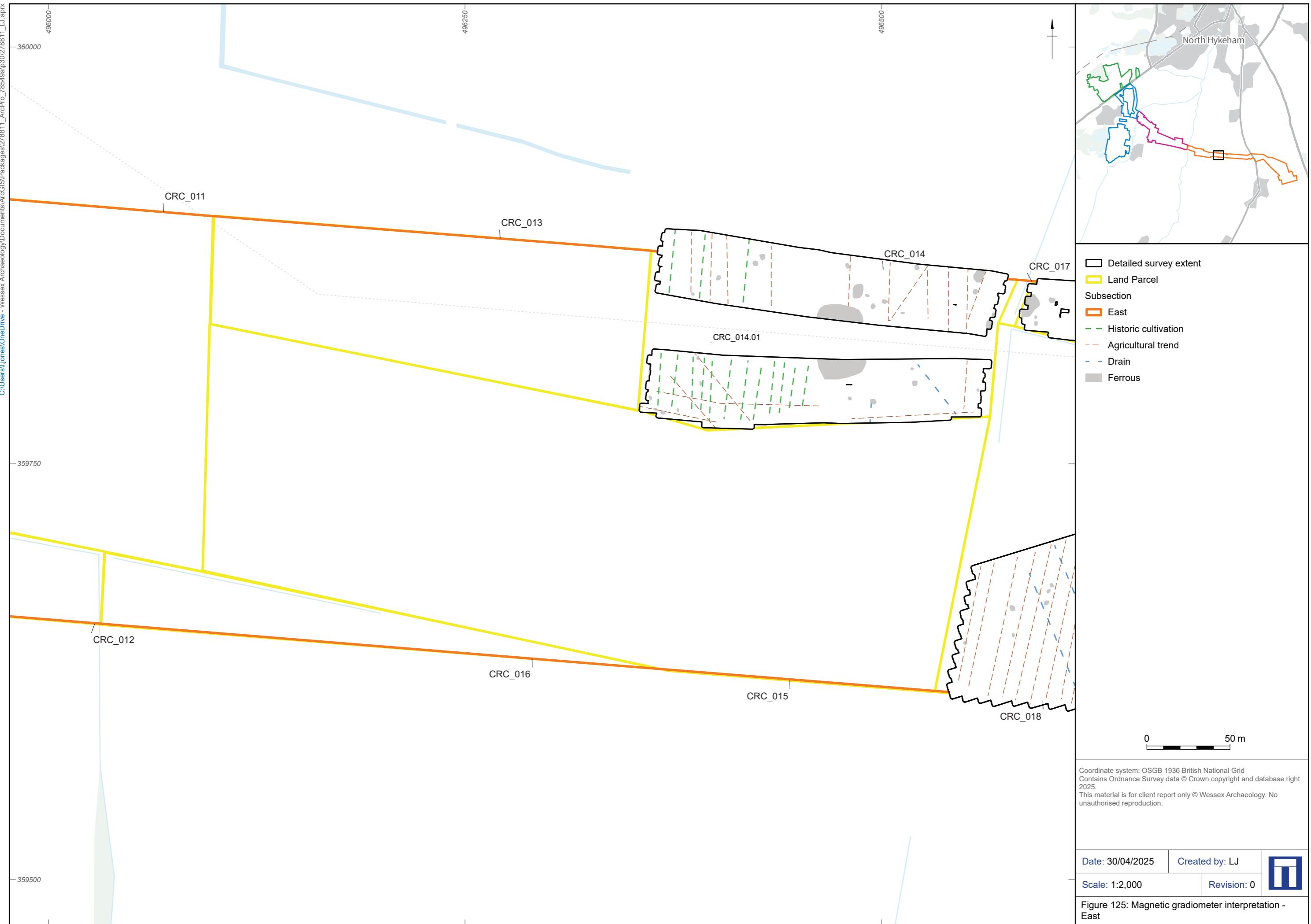


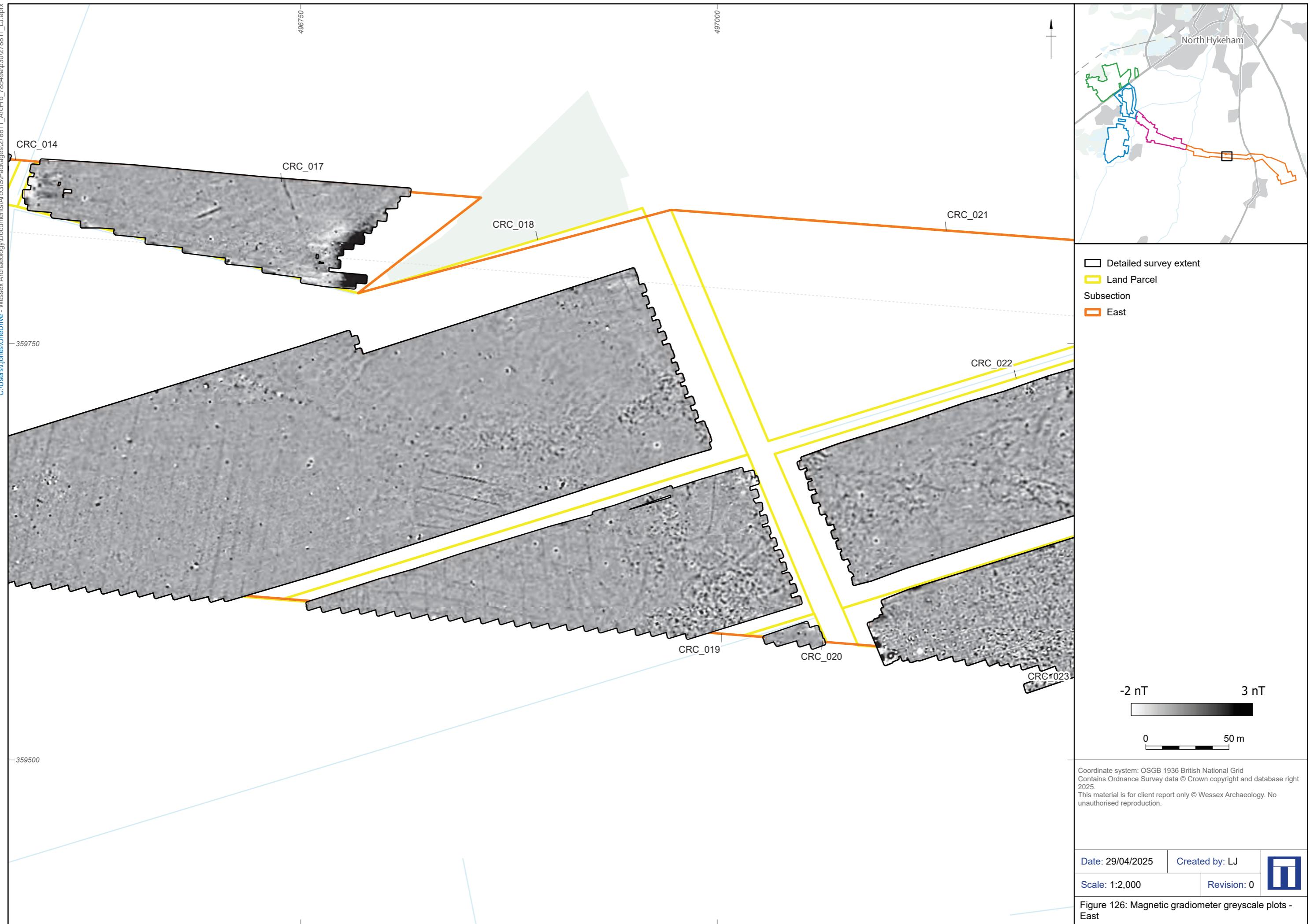


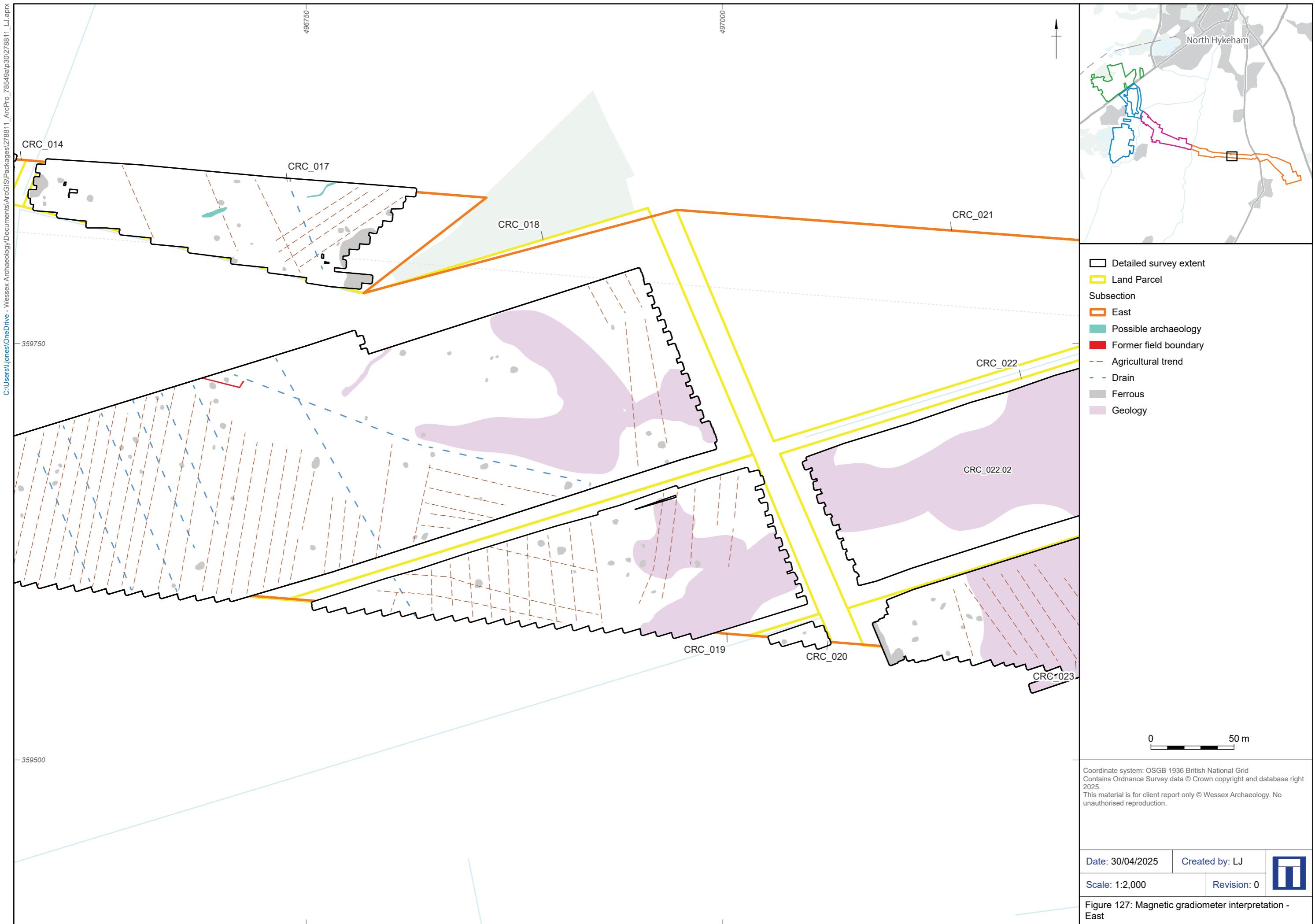


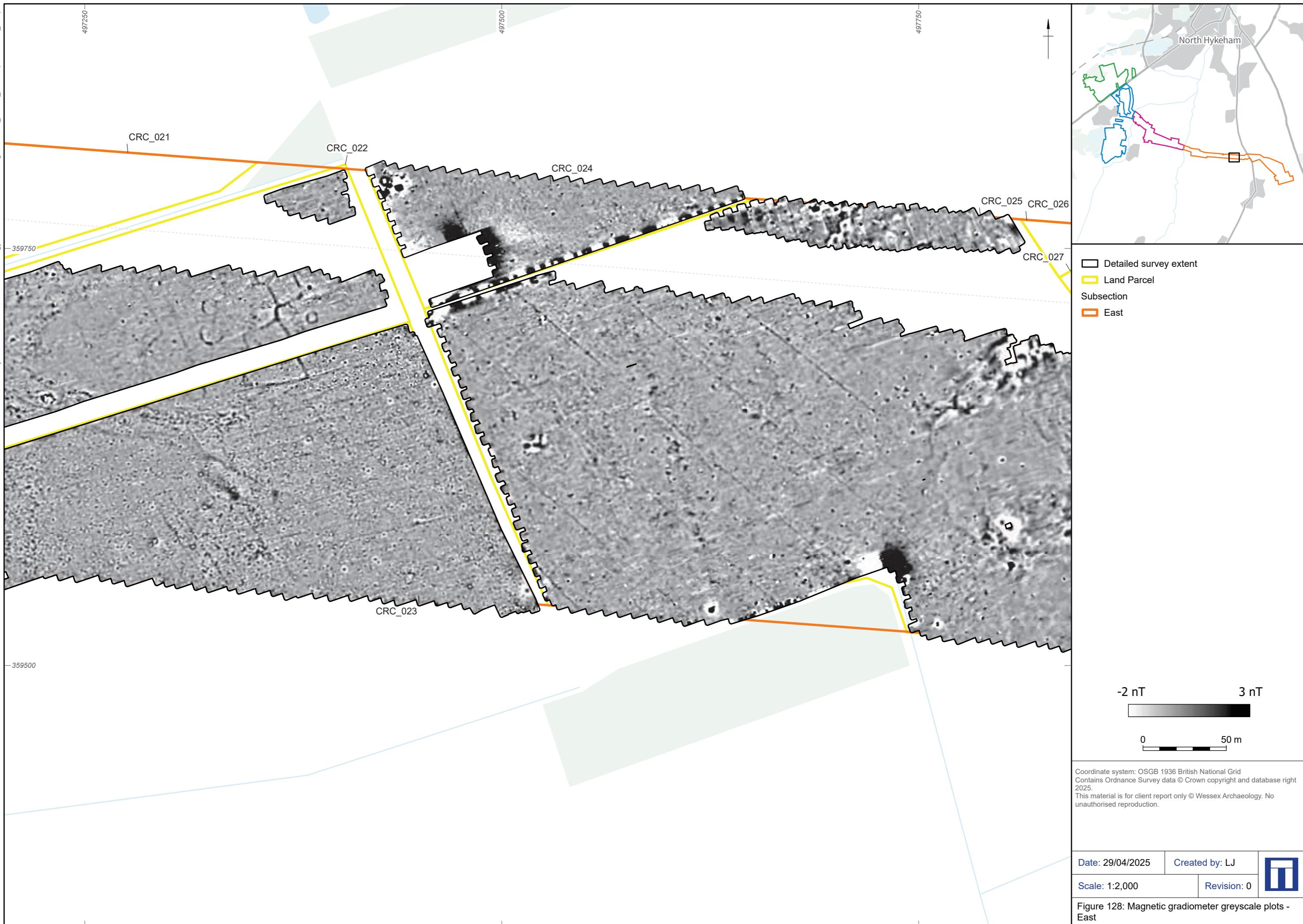


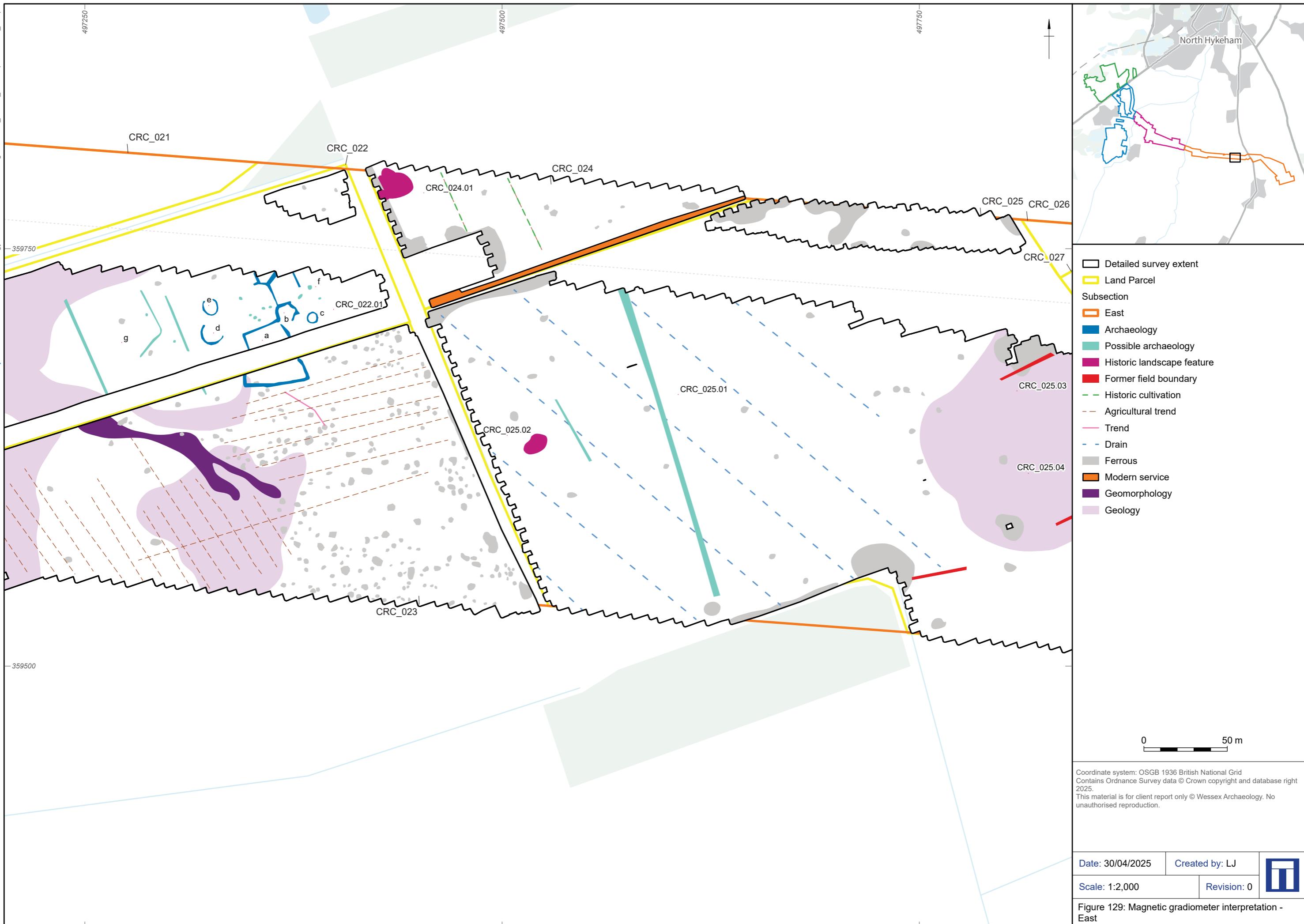


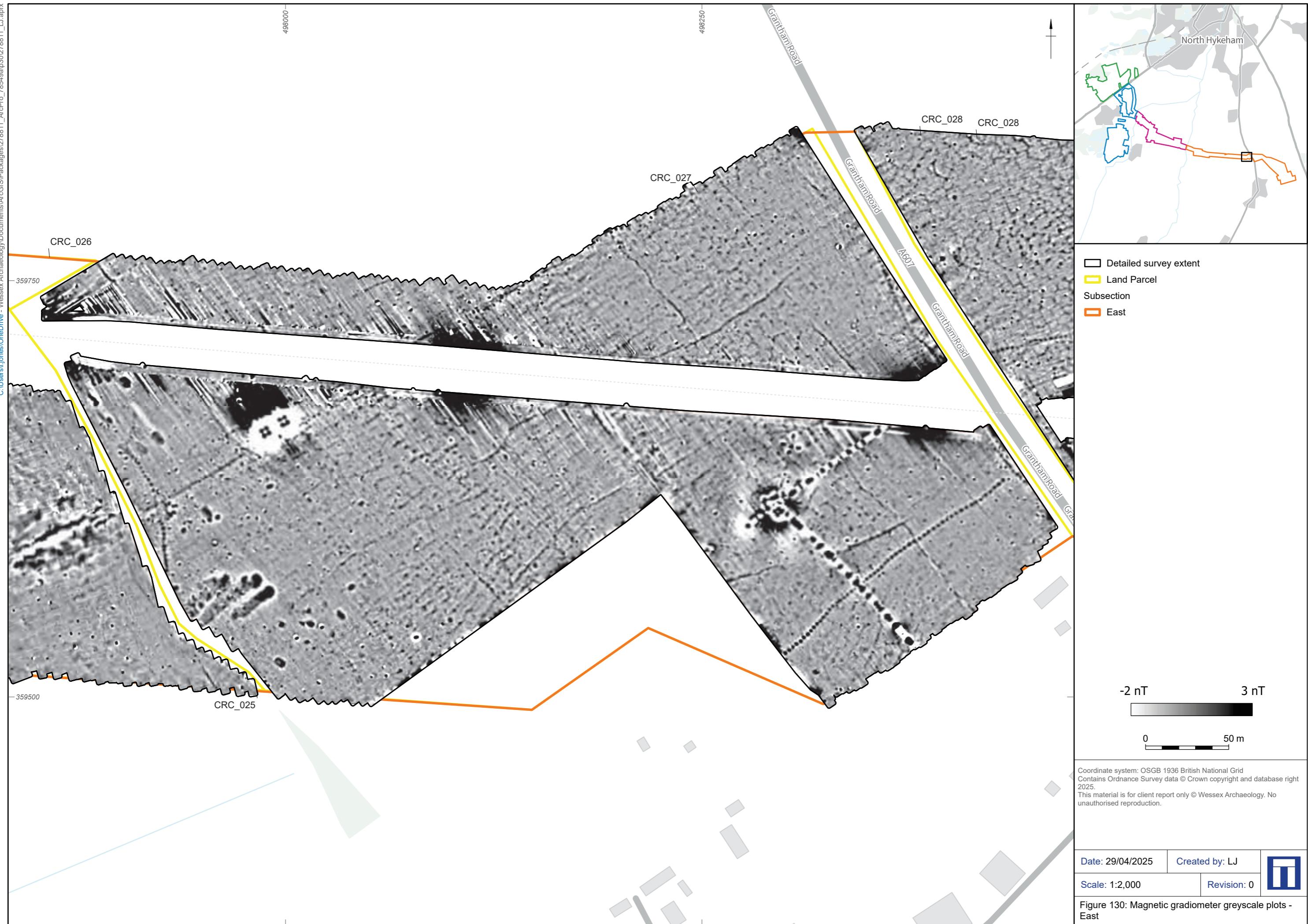


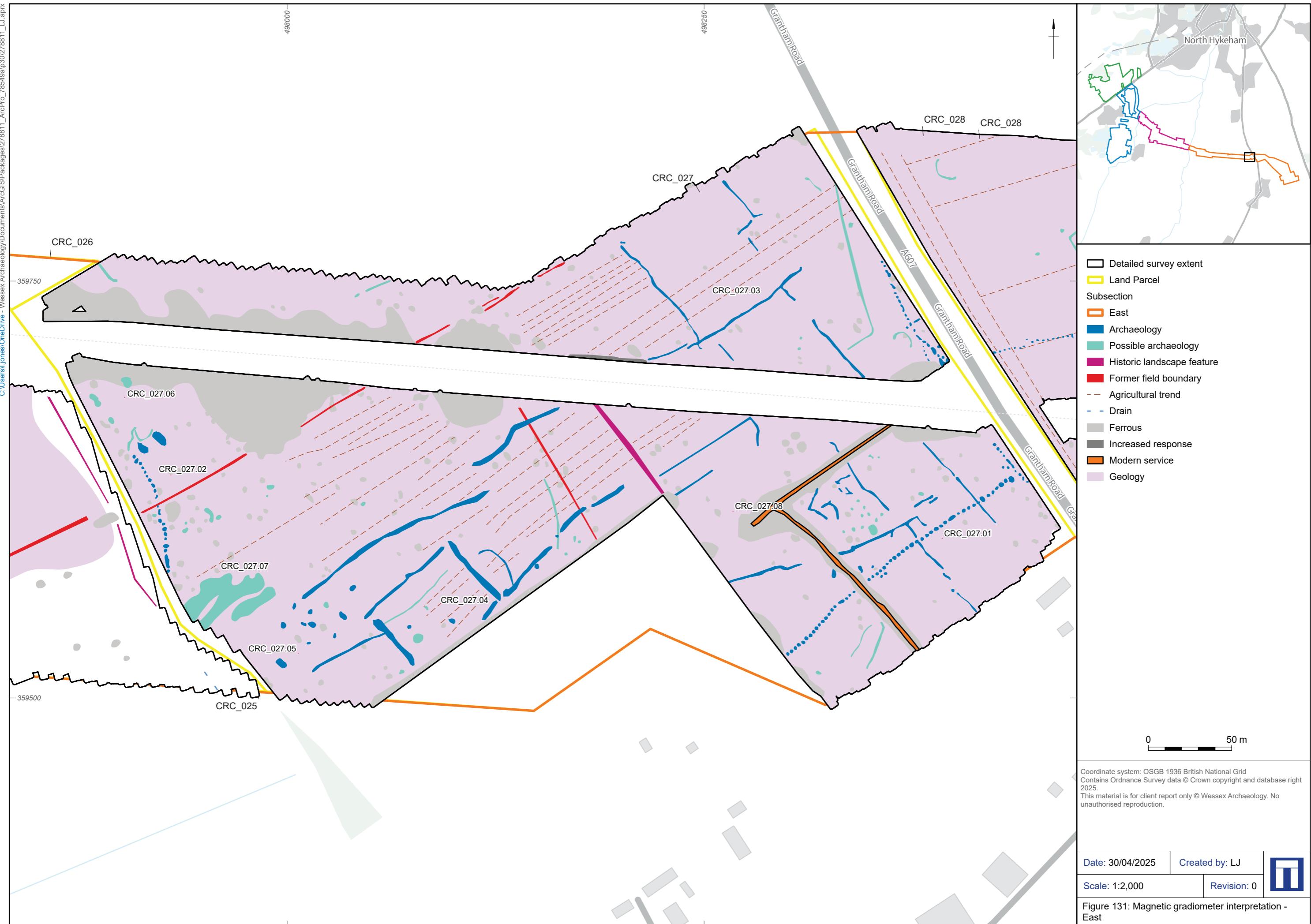


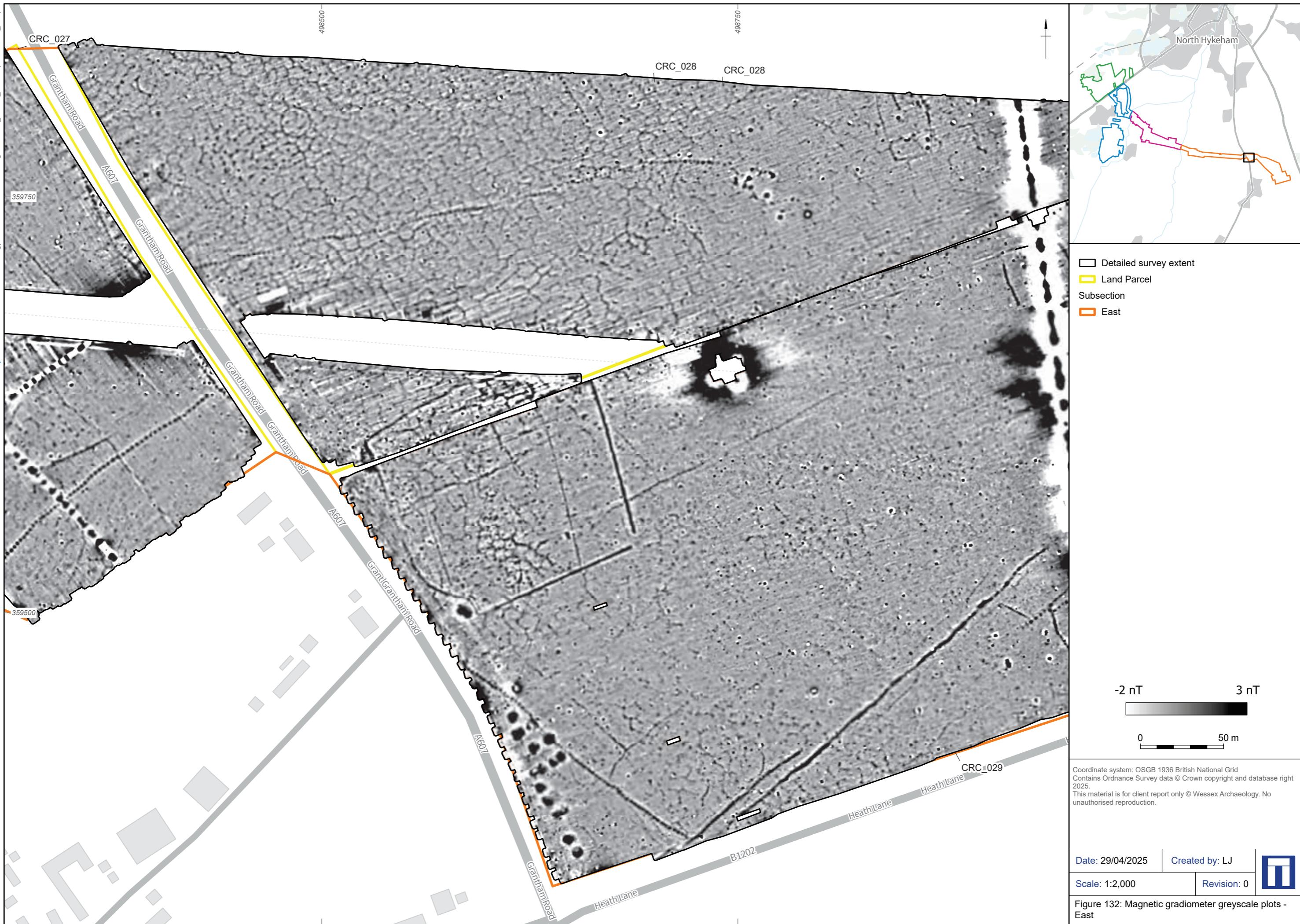


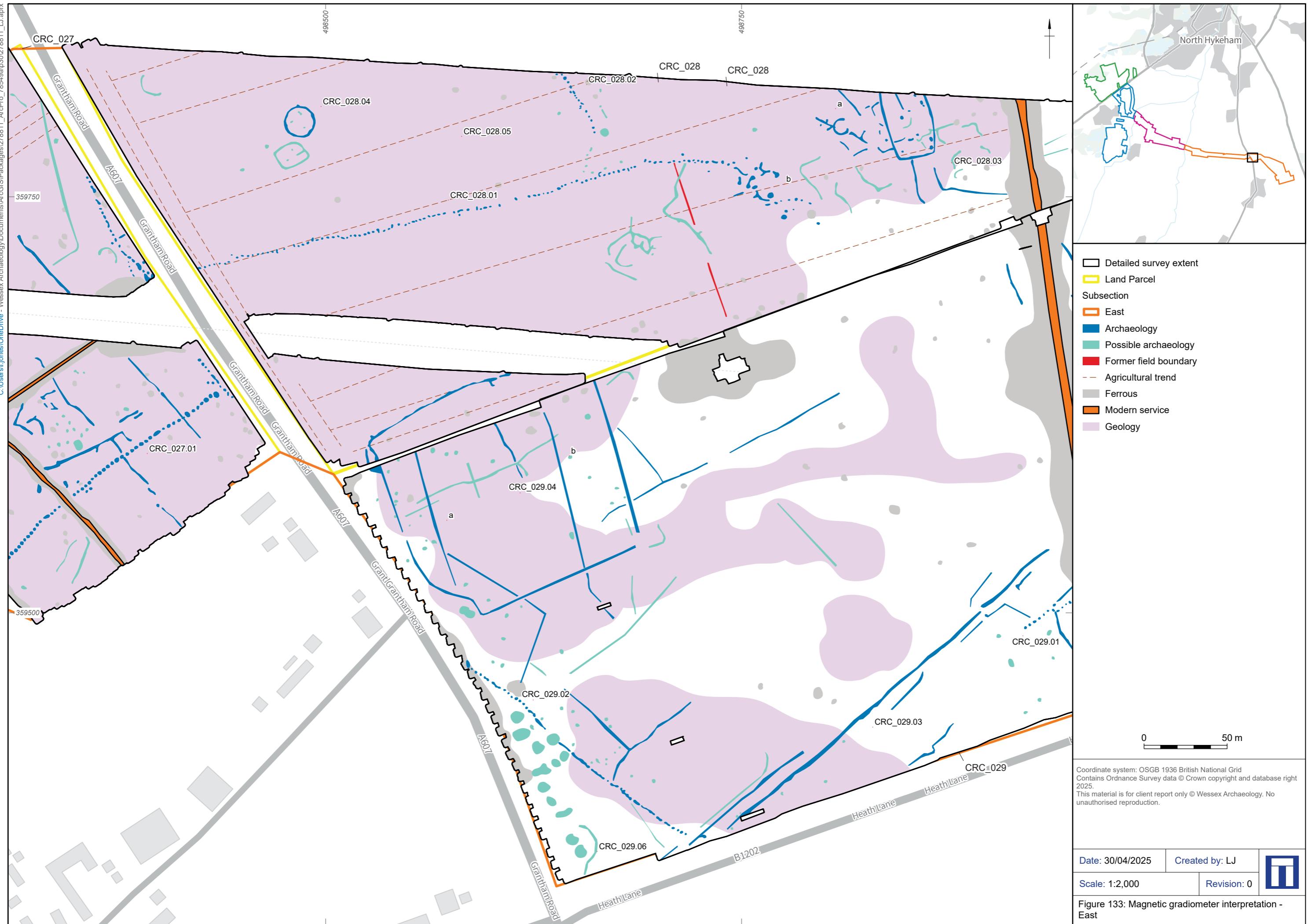


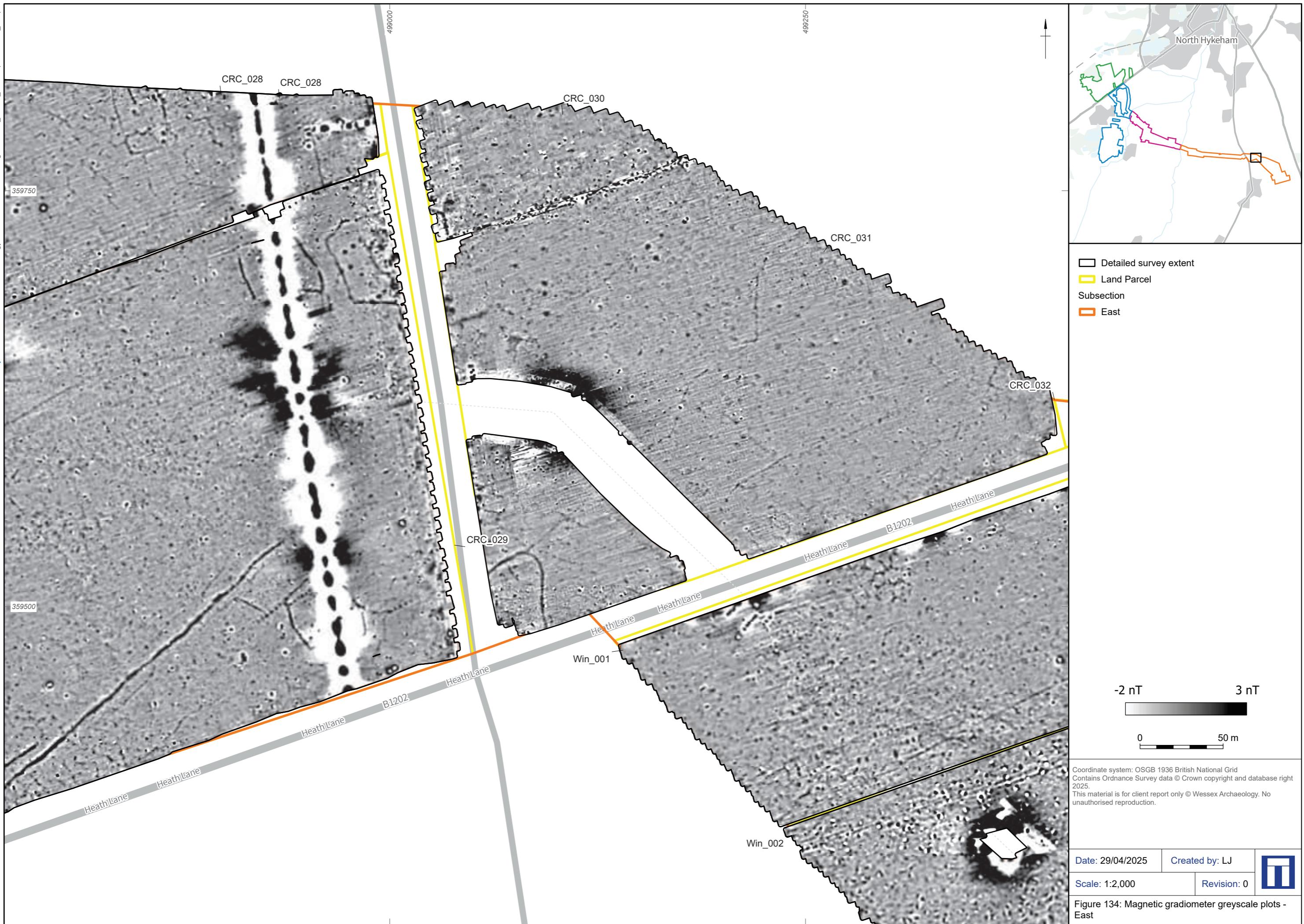


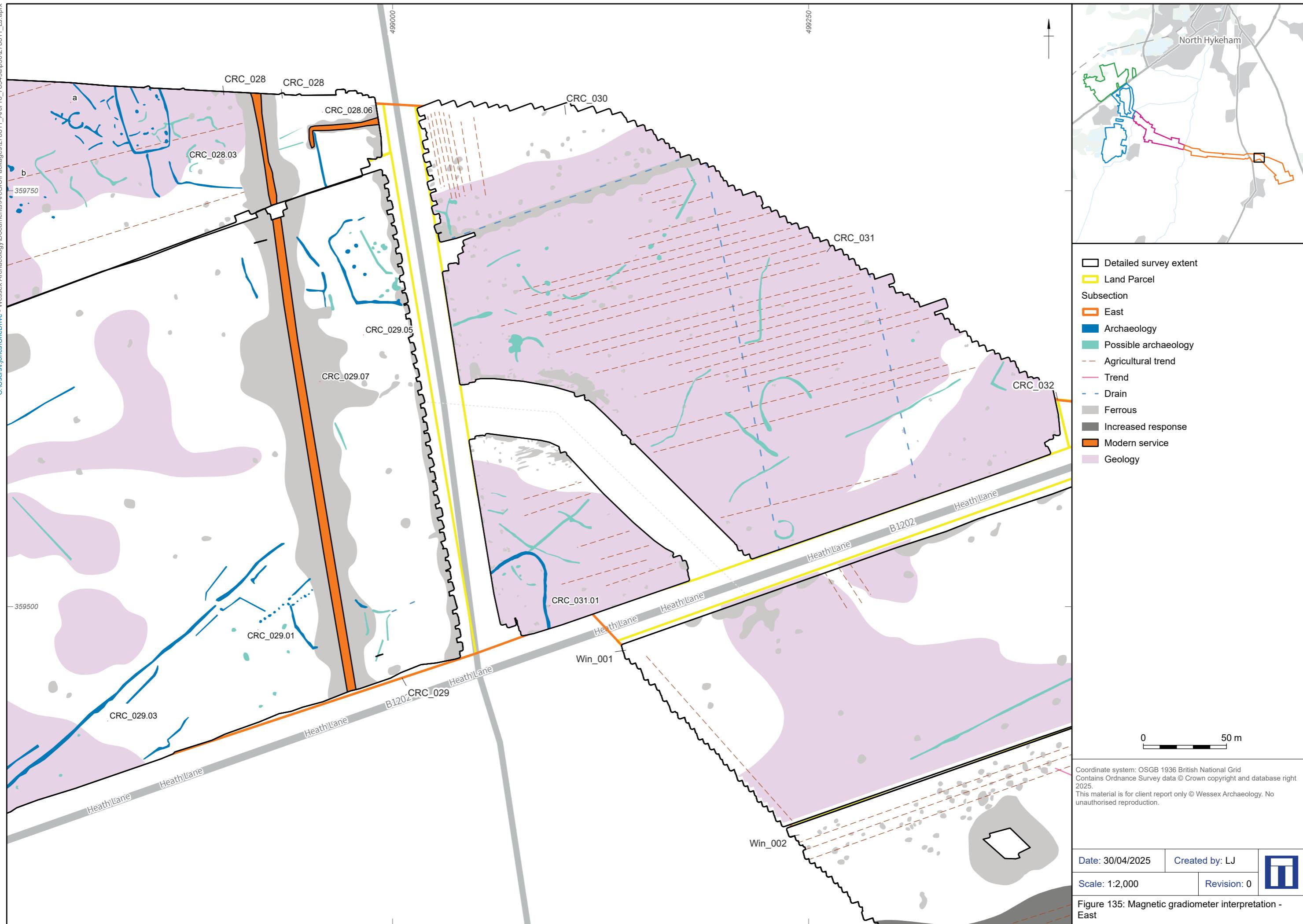


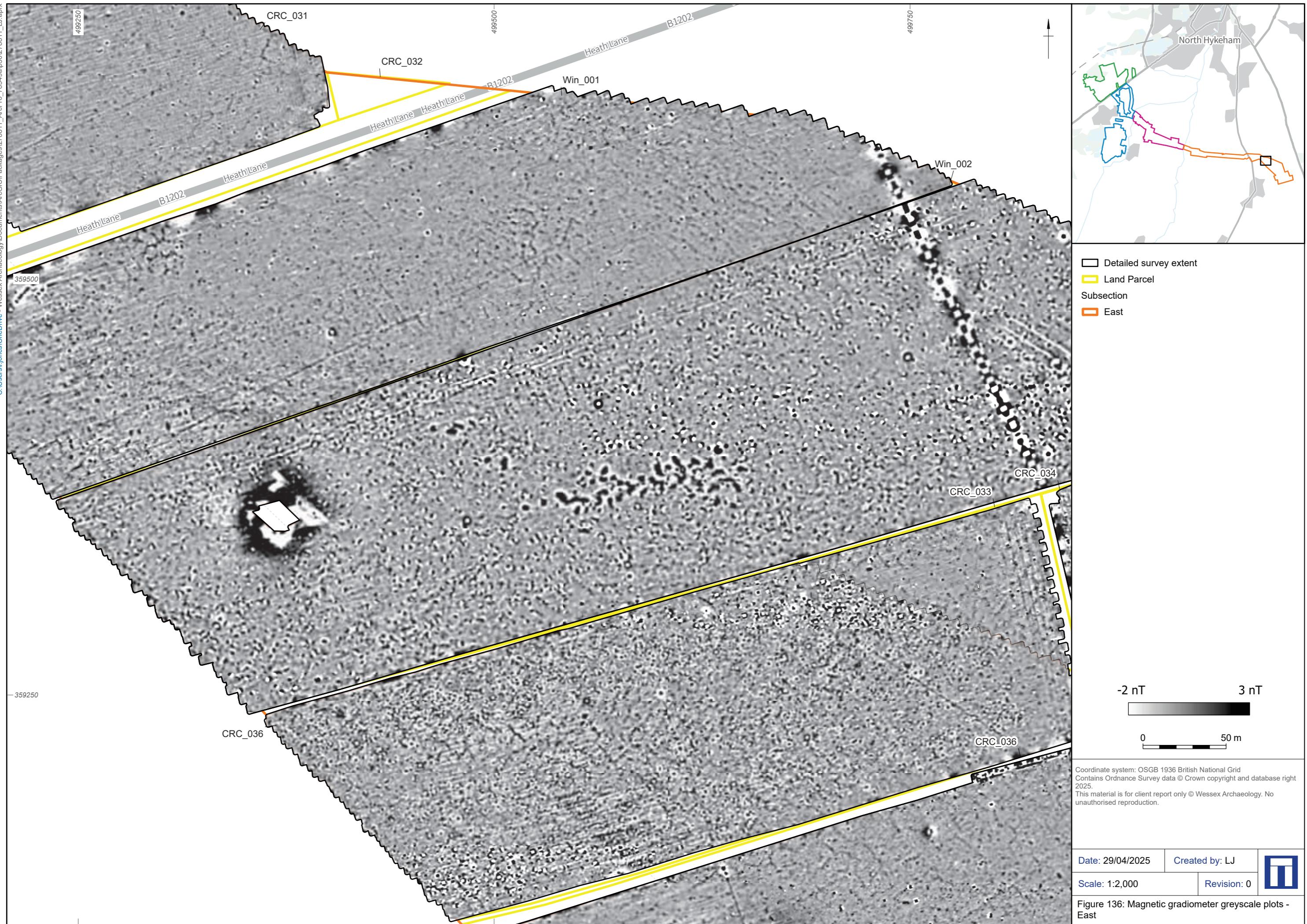


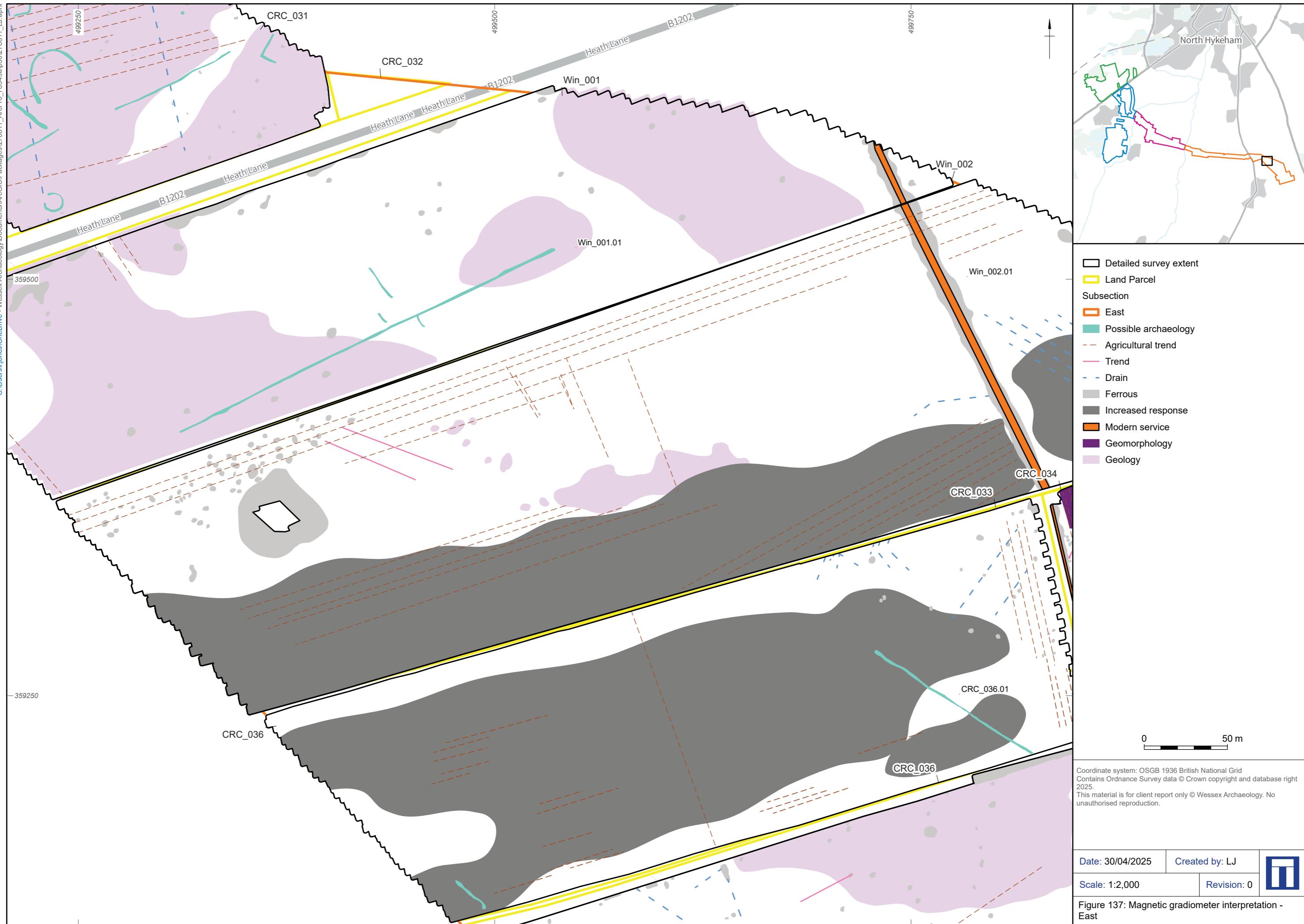


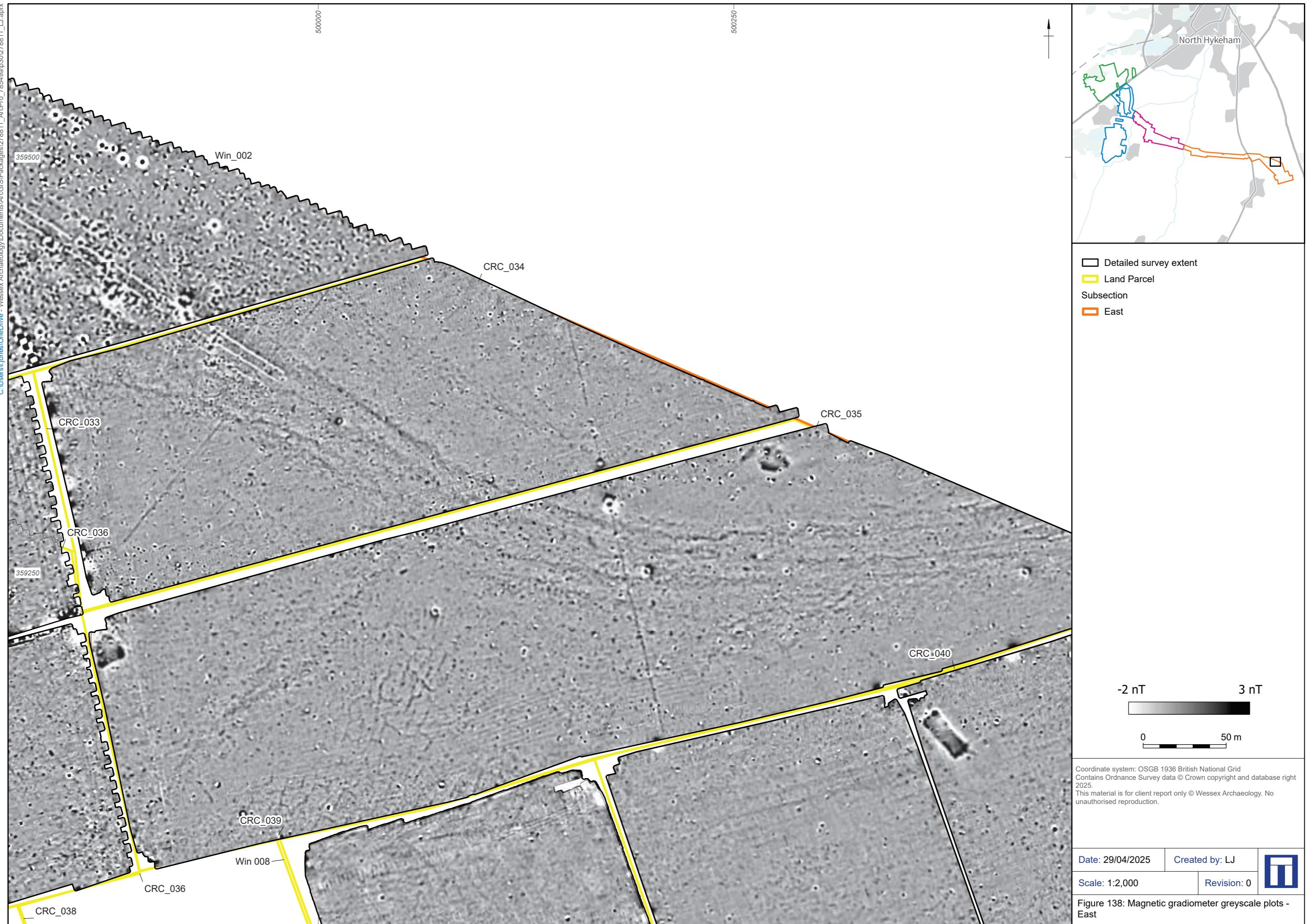


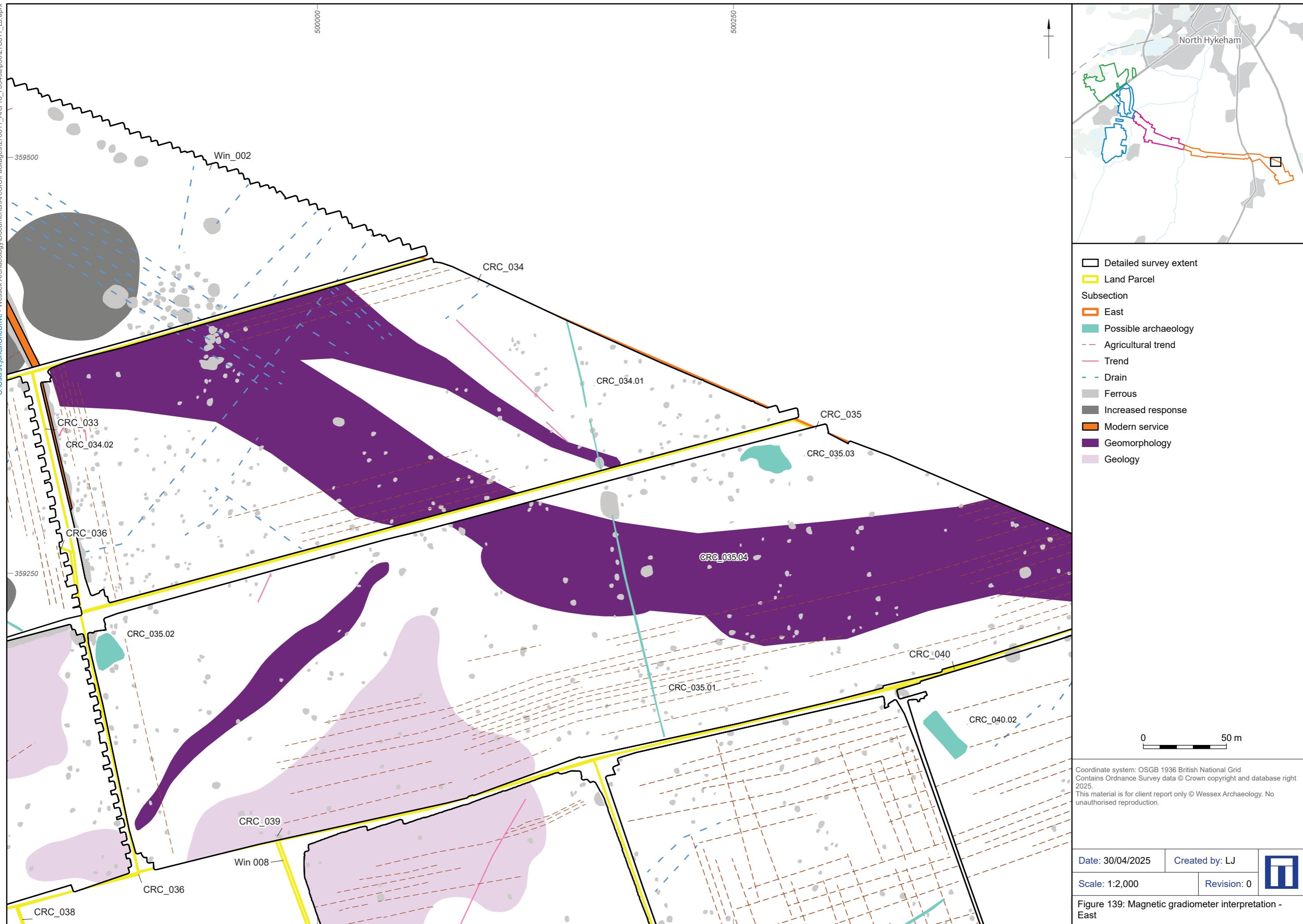


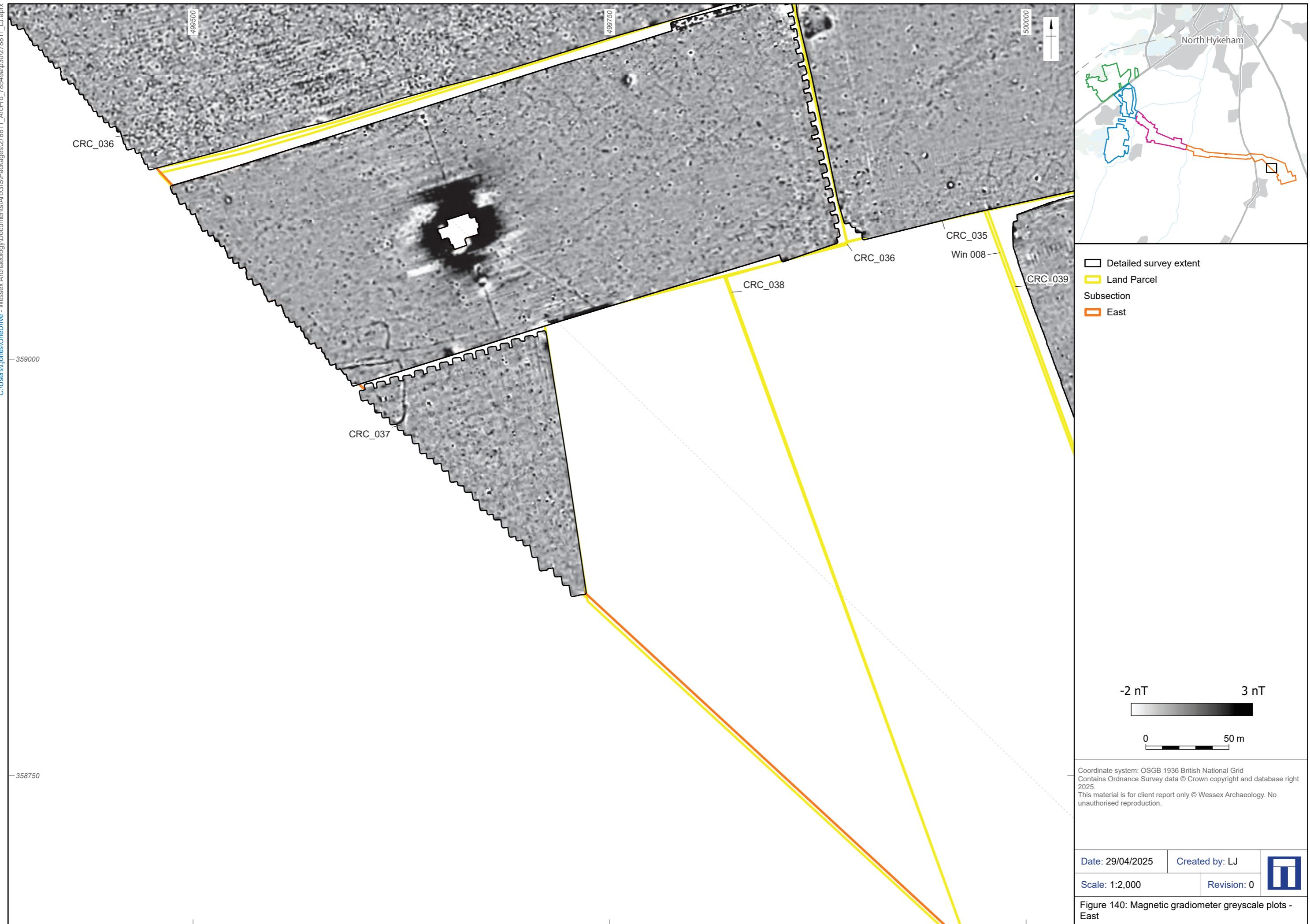


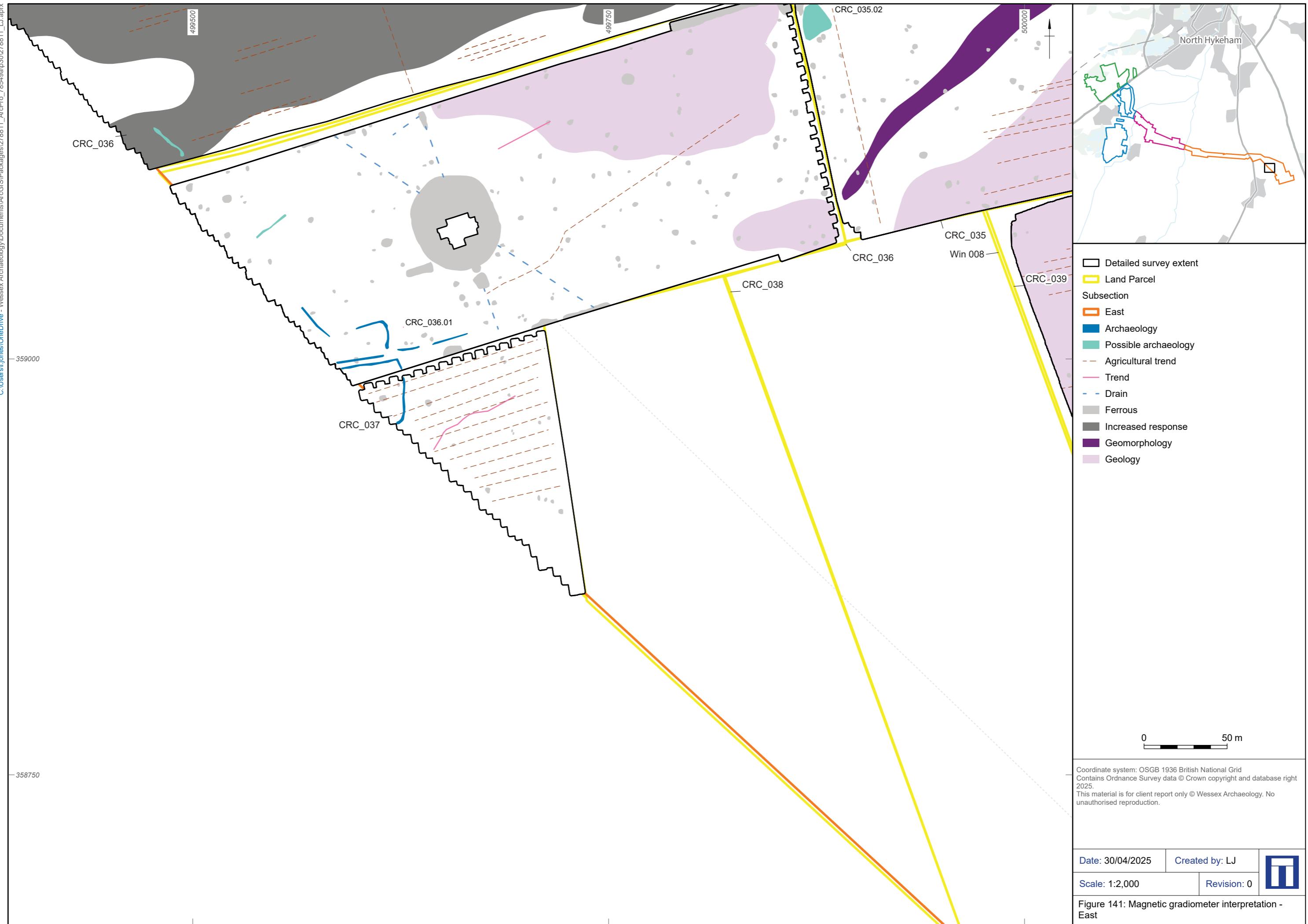


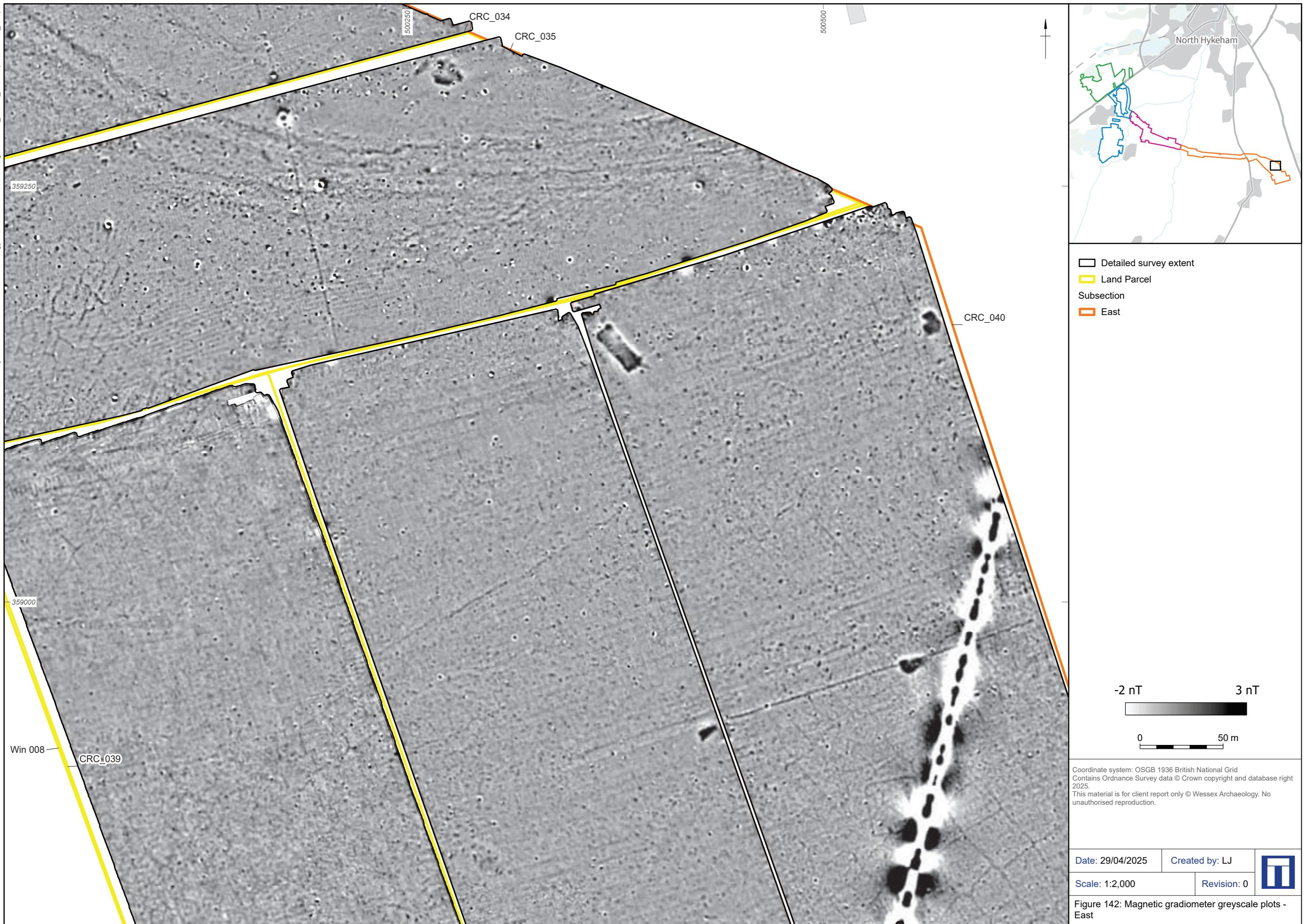


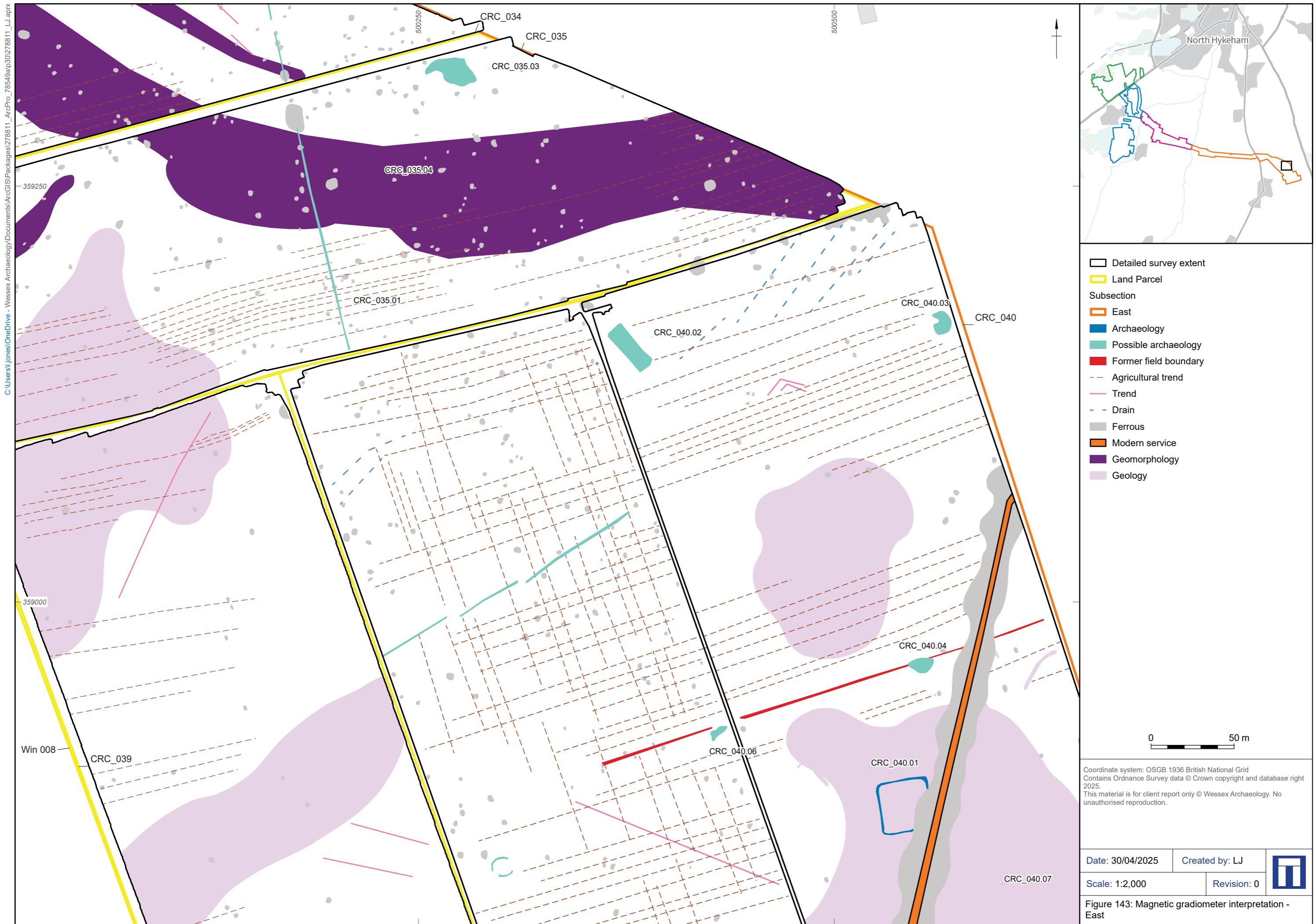


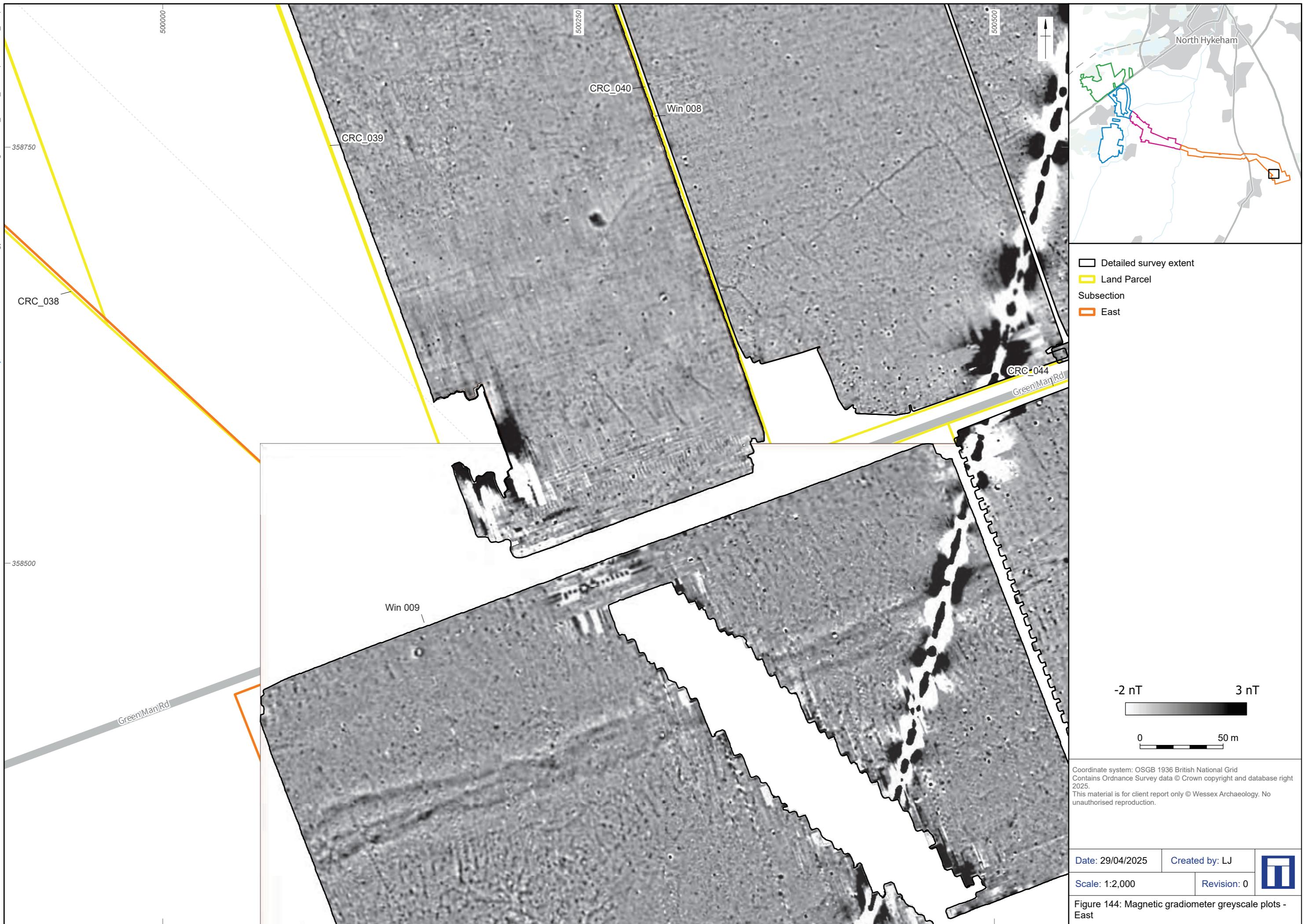


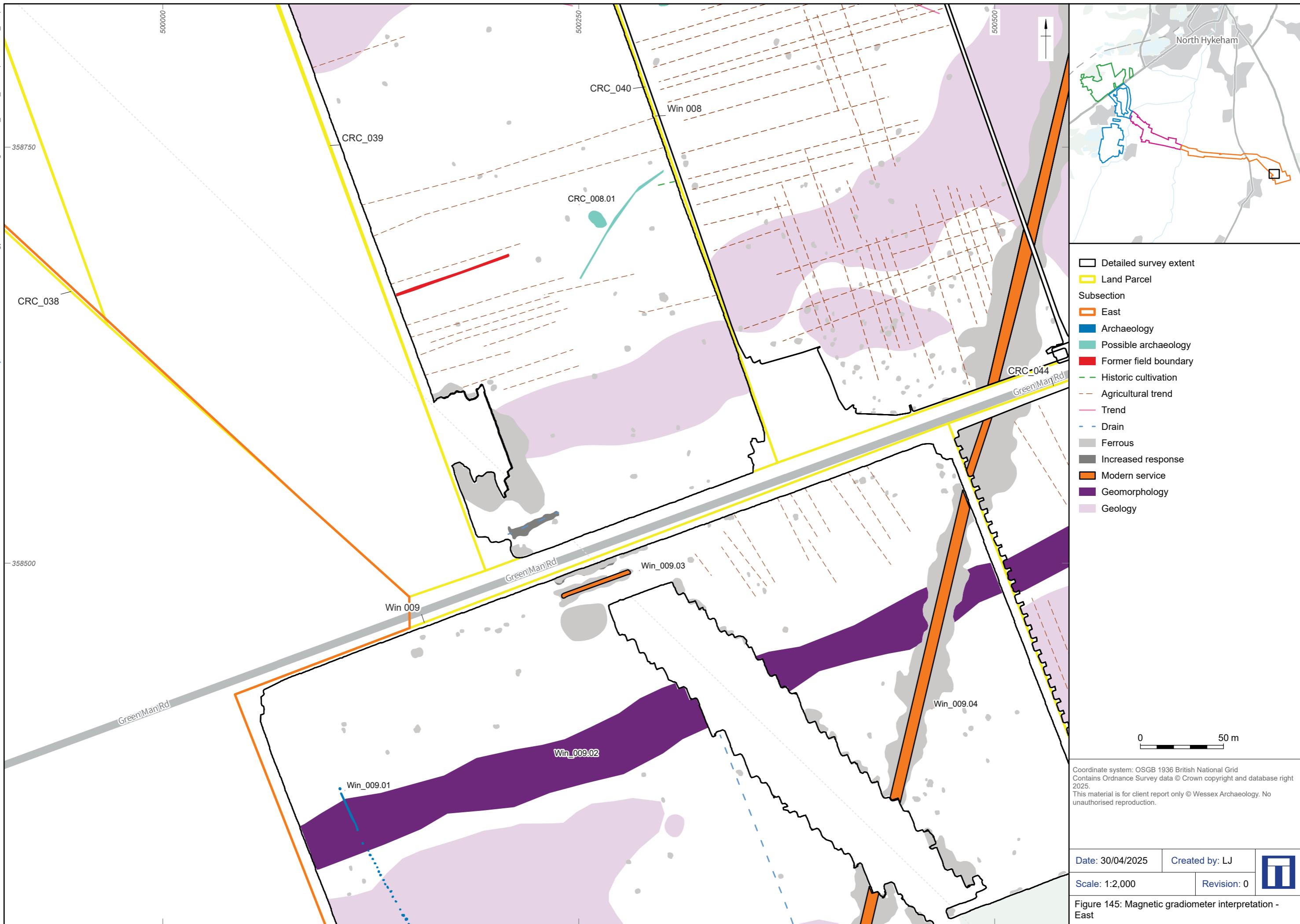


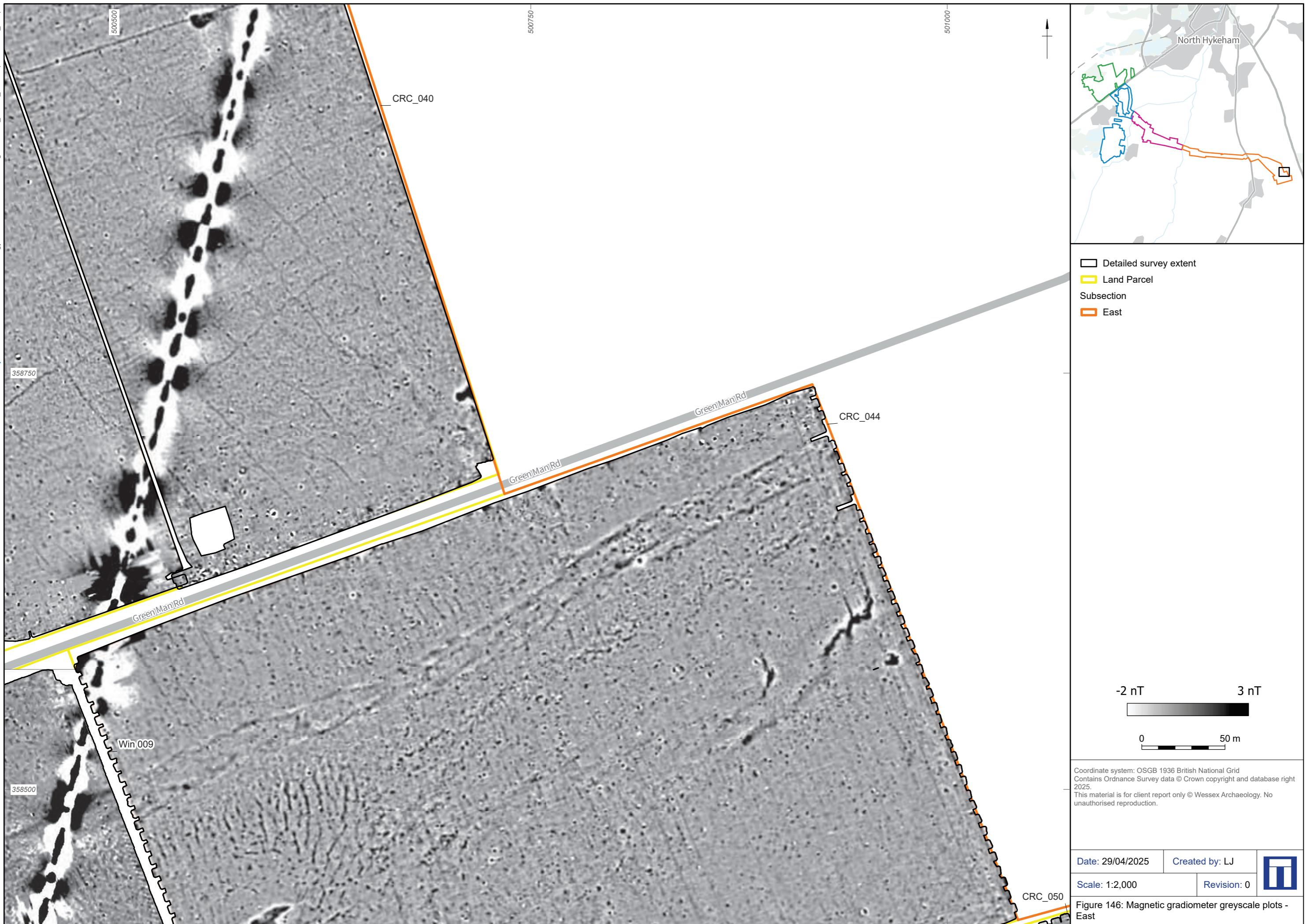


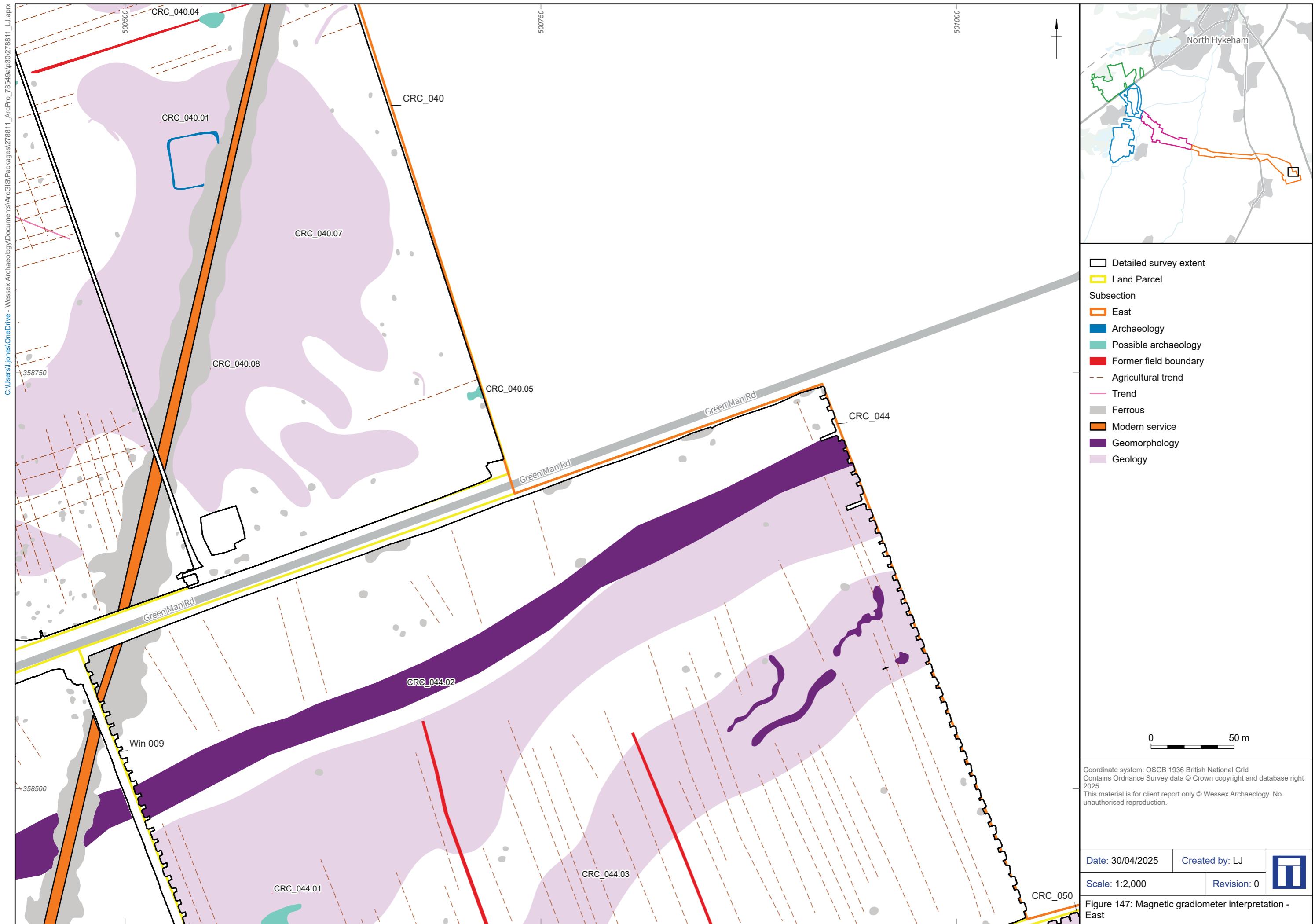


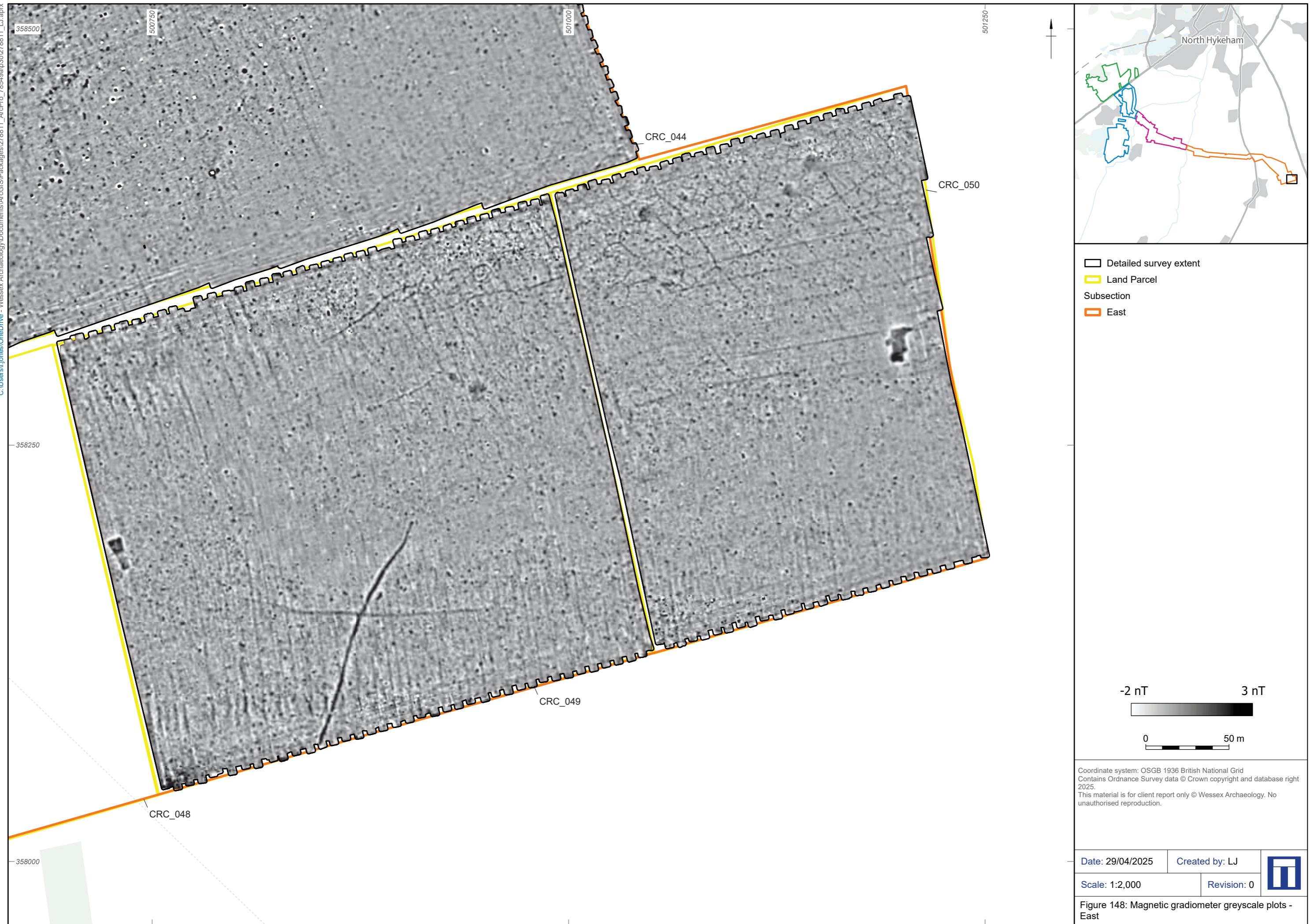


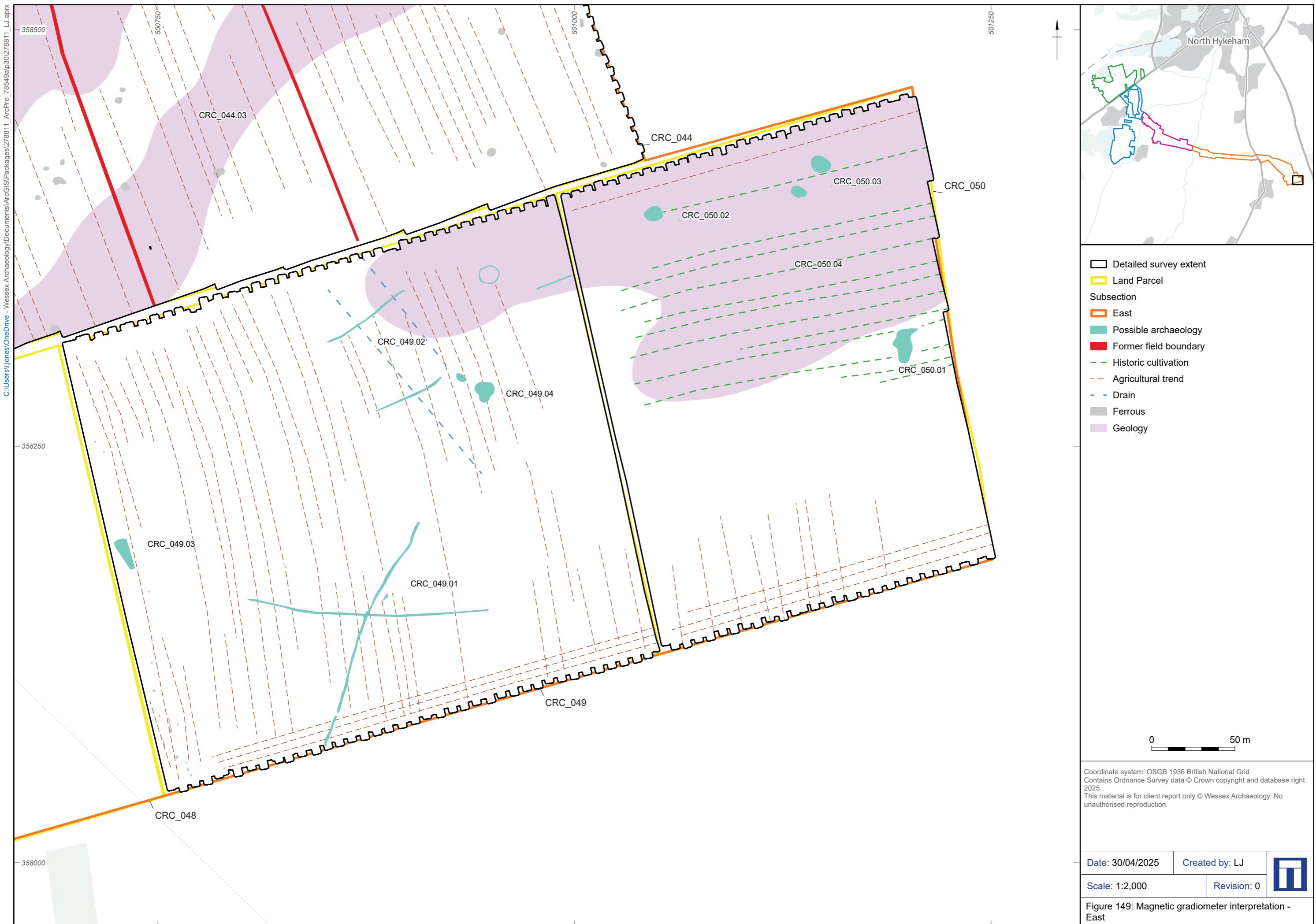


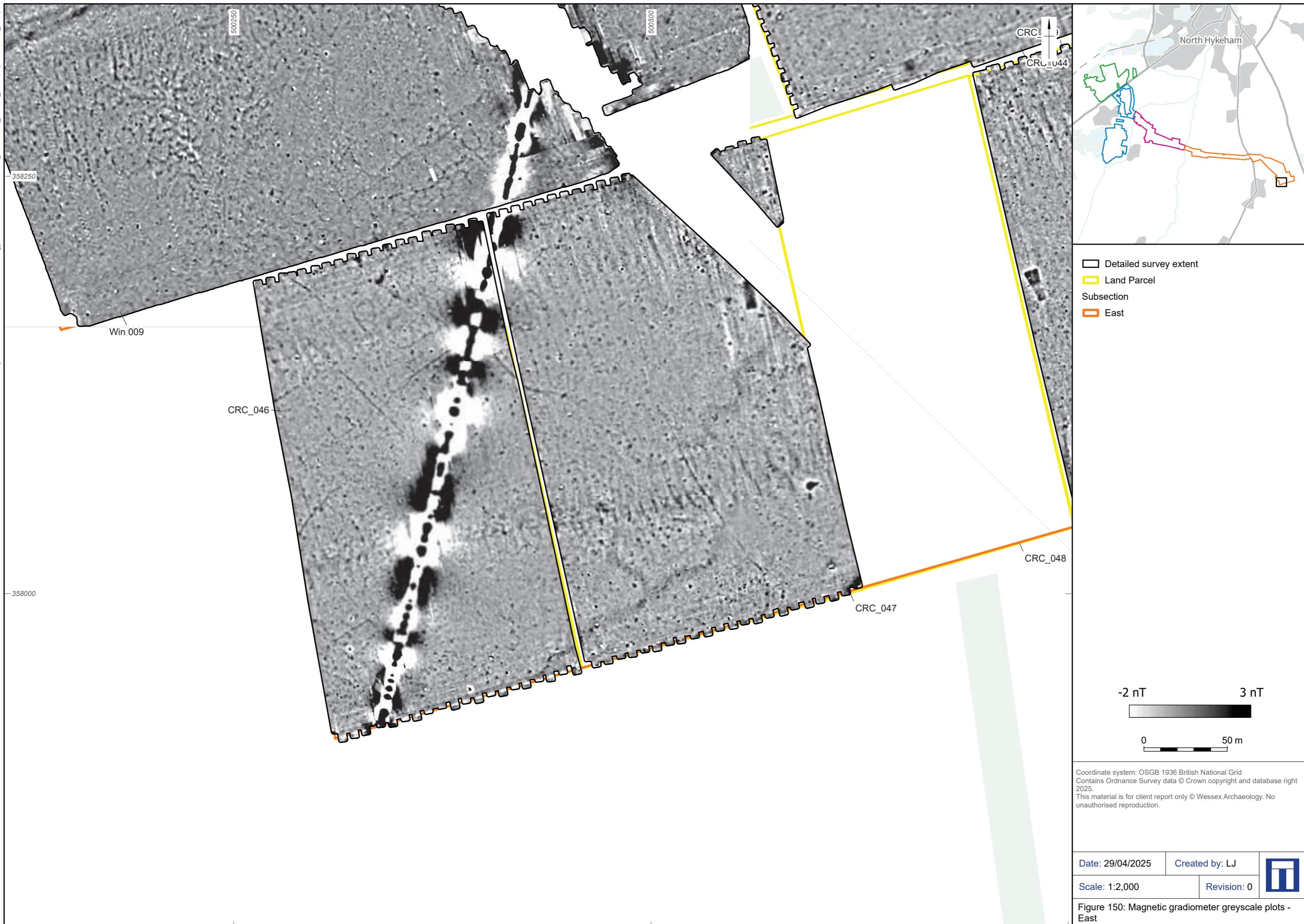


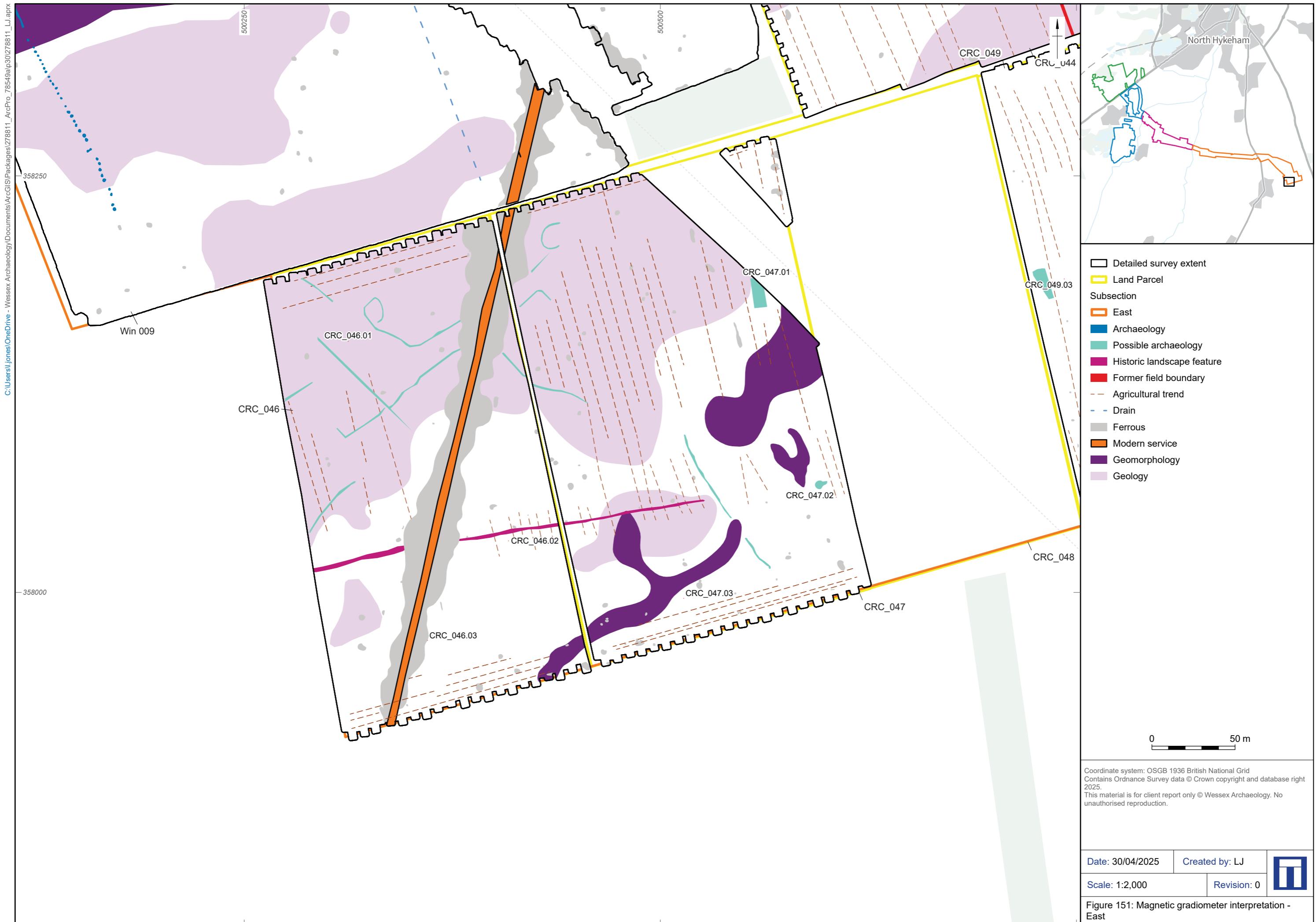














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