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**LAND AT  
NORTHONS LANE,  
HOLBEACH,  
LINCOLNSHIRE**

**GEOPHYSICAL SURVEY**

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**Work undertaken for  
Bovis Homes Group PLC,  
Lincolnshire County Council  
and Mr Goodley**

**April 2015**

**Report produced by  
Jonathon Smith BA (Hons), MA**

**OASIS Ref: archaeol1-204520  
National Grid Reference: TF 34967 25303  
Accession No: LCNCC:2015.10**

APS Report No: **19/15**

**ARCHAEOLOGICAL  
PROJECT  
SERVICES**

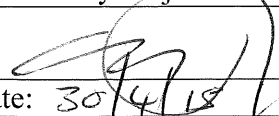
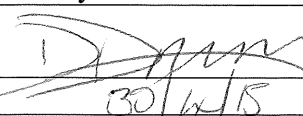




**Quality Control**  
Northons Lane,  
Holbeach,  
Lincolnshire,

HBNL15

Project Coordinator	Neil Jefferson
Site Staff	Jonathon Smith, Ryan Godbold, Mary Nugent, Fiona Walker, Kerry Brader, Neil Jefferson and Ian Jefferson
Survey processing and report	Jonathon Smith

Checked by Project Manager	Approved by Team Leader
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Date: 30/4/15	Date: 30/4/15



## CONTENTS

<b>1.</b>	<b>SUMMARY</b> .....	<b>1</b>
<b>2.</b>	<b>INTRODUCTION</b> .....	<b>1</b>
<b>2.1</b>	<b>DEFINITION OF AN EVALUATION</b> .....	1
<b>2.2</b>	<b>BACKGROUND</b> .....	1
<b>2.3</b>	<b>TOPOGRAPHY AND GEOLOGY</b> .....	1
<b>3.</b>	<b>GEOPHYSICAL SURVEY</b> .....	<b>1</b>
<b>3.1</b>	<b>METHODS</b> .....	1
<b>3.2</b>	<b>RESULTS</b> .....	3
<b>4.</b>	<b>DISCUSSION</b> .....	<b>4</b>
<b>5.</b>	<b>ACKNOWLEDGEMENTS</b> .....	<b>5</b>
<b>6.</b>	<b>PERSONNEL</b> .....	<b>5</b>
<b>7.</b>	<b>BIBLIOGRAPHY</b> .....	<b>5</b>
<b>8.</b>	<b>ABBREVIATIONS</b> .....	<b>5</b>

Appendix 1 The Archive

Appendix 2 OASIS Form

### List of Figures

Figure 1 General location plan

Figure 2 Site location map

Figure 3 Layout of survey area

Figure 4 Area 1, minimally processed data greyscale plot

Figure 5 Area 1, processed data greyscale plot

Figure 6 Area 1, interpretive greyscale plot

Figure 7 Area 2, minimally processed data greyscale plot

Figure 8 Area 2, processed data greyscale plot

Figure 9 Area 2, interpretive greyscale plot

Figure 10 Area 3, minimally processed data greyscale plot

Figure 11 Area 3, processed data greyscale plot

Figure 12 Area 3, interpretive greyscale plot

Figure 13 Overall results

Figure 14 Features overlaid on to historic maps

## 1. SUMMARY

*Detailed magnetic gradiometer survey was undertaken for Bovis Homes Group PLC, Lincolnshire County Council and Mr Goodley in connection with proposed development on land at Northons Lane, Holbeach, Lincolnshire. The survey totalled c. 35ha.*

*The site lies to the west of the Saxon town of Holbeach. Small quantities of Roman and medieval pottery has been recovered from the area surrounding the site. The survey revealed a possible drove way and a cluster of associated ditches at the western edge of the site. It also revealed a chain of five large pits and a faint but regular circular enclosure towards the south of the site.*

## 2. INTRODUCTION

### 2.1 Definition of an Evaluation

Geophysical survey is a non-intrusive method of archaeological evaluation. Evaluation is defined as ‘*a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site. If such archaeological remains are present Field Evaluation defines their character and extent, quality and preservation, and it enables an assessment of their worth in a local, regional, national or international context as appropriate*’ (CIfA 2014a).

### 2.2 Background

Archaeological Project Services was commissioned by the Robert Doughty Consultancy, on behalf of Bovis Homes Group PLC, Lincolnshire County Council and Mr Goodley to undertake a detailed magnetometer survey totalling some 35ha on land at Northons Lane, Holbeach, Lincolnshire. This was in advance of

proposed development of the area. The survey was carried out over ten days between 5<sup>th</sup> February and 29<sup>th</sup> April 2015.

Holbeach is first mentioned in the Domesday Survey of c. 1086. Referred to as *Holobec*, *Holobech* and *Holebech*, the name is derived from the Old English and means the ‘hollow (*hol*) back (*bac*)’ (Cameron 1998, 64).

Recent fieldwalking at the site recorded artefacts dating from the late Saxon to early modern period, together with a single worked flint of prehistoric date (Parker 2015).

It has been suggested that Northons Lane represents the probable Saxon coastline, the area south of the lane being inland (BGS 1992).

### 2.3 Topography and Geology

The site (centred approximately on NGR TF 34967 25303) is located either side of Northons Lane, to the west of Holbeach in the South Holland district of Lincolnshire (Figs 1 and 2).

Local soils are of the Wisbech Series, typically coarse silty calcareous alluvial gley soils (Robson 1990). These soils are developed upon a drift geology of younger marine alluvium which in turn seals a solid geology of Upper Jurassic West Walton Formation mudstones (BGS 1992).

## 3. GEOPHYSICAL SURVEY

### 3.1 Methods

Location and layout of the survey area is shown in Figure 3. The survey has been split into three areas for the ease of presenting results. The ground conditions varied from field to field. Some of the fields had been recently ploughed and were very challenging for the field

operatives. Some of the fields were filled with rows of mounds for flower bulbs, with narrow, slippery ruts in between. These also presented challenging conditions for the field operatives. The harrowed fields and cereal stubble in Area 3 were in a good condition for surveying. The weather was generally wet.

Three areas were deemed impossible to survey: At the very north of the site (Area 1) the fields were heavily rutted and had become unworkably boggy. In the middle of the site (Area 3) were subdivided allotments that presented a range of obstacles. A patch of woodland at the south was unsuitable for survey (Area 3). These areas totalled around 3ha, reducing the original survey area of 38ha to 35ha.

Survey was undertaken in accordance with English Heritage (2008) and CIfA (2014b) guidelines and codes of conduct.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. This records subtle changes in the magnetic field resulting from differing features in the soil. Changes as small as 0.2 nanoTesla (nT) in an overall field strength of c. 49,000nT can be accurately detected using this instrumentation, although in practice instrument interference and soil noise can limit sensitivity.

The mapping of anomalies in a systematic manner allows interpretation of the type of material present beneath the surface. Strong magnetic anomalies are generated by buried iron-based objects or by kilns or hearths, usually resulting in a bipolar (positive/negative) response. More subtle positive anomalies representing pits and ditches can be seen where these contain more topsoil which is normally richer in magnetic iron oxides and provides a contrast with the natural subsoil (but this can vary depending on the nature of the underlying deposits). A negative anomaly

may result from upcast bank material. Wall foundations can also show as negative anomalies where the stone is less magnetic than the surrounding soil, or as stronger positive and negative anomalies if of brick, but are not always responsive to the technique. It should be noted that not all features will be responsive and absence of anomalies does not necessarily indicate absence of archaeological features.

Magnetometers measure changes in the Earth's magnetic field. With two sensors configured as a gradiometer the recorded values indicate the difference between two magnetic measurements separated by a fixed distance. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame with a 1m separation between the sensing elements giving a strong response to deep anomalies.

#### *Sampling interval and data capture*

Readings were taken at 0.25m intervals along traverses 1m apart. This equates to 6400 sampling points in a full 40m x 40m grid. The Grad 601 has a typical depth of penetration of 0.5m to 1.0m although a greater range is possible where strongly magnetic objects have been buried in the site.

Readings are logged consecutively into the data logger which is downloaded daily either into a portable computer whilst on site or directly to the office computer. At the end of each job, data is transferred to the office for processing and presentation.

#### *Processing and presentation of results*

Processing is performed using specialist TerraSurveyor software. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves flattening the background levels with respect to adjacent traverses and adjacent grids (Destripe or zero median traverse). Despiking is also performed to reduce the



effect of the anomalies resulting from small iron objects often found on agricultural land. Further processing can then be carried out which may include low pass filtering to reduce ‘noise’ in the data and hence emphasise the archaeological or man-made anomalies.

The following are the processing techniques carried out on the processed gradiometer data used in this report:

1. DeStripe (sets the background median of each traverse within a grid to zero and is useful for removing striping effects)
2. Despike (useful for display and allows further processing functions to be carried out more effectively by removing extreme data values)  
Parameters: X radius = 2; Y radius = 2; Threshold = 3SD; Spike replacement = mean
3. Clip (excludes extreme values allowing better representation of detail in the mid range): -3 to 3nT.

### 3.2 Results

The presentation of the data for the site involves a print-out of the raw or minimally processed data as greyscale plots (Figs 4, 7 and 10; clipped for display but otherwise unprocessed) and greyscale plots of the processed data (Figs 5, 8 and 11). Magnetic anomalies have been identified and plotted onto interpretative drawings (Fig 6, 9 and 12) and overlain onto the site map (Fig 13).

#### *Known weaknesses in the data*

During the processing of Area 1 it became apparent that there was a sensor error on one of the machines used in the survey. This is visible as speckling in some of the grids in the eastern ploughed field, and is particularly apparent at the very north. However, the sensor error does not seem to have obscured any features, as the linear anomalies identified outside these areas

are still visible within the affected grids (Figs 5 and 6).

The survey conditions in the rutted fields have had a significant impact on the survey results. The ruts can be seen as ripples, or speckles, depending on the direction the ruts were crossed during the survey. There is a high chance that these ruts have obscured archaeological features, if they are present. Operatives with a longer stride were able to obtain cleaner results by overstepping the ruts between mounds, such as in the southwest of Area 2 (Fig 8).

#### *Area 1 (Fig 6)*

Several strong positive linear features are visible in Area 1. However, all of them correspond with shifting field boundaries shown on the 1887 and 1906 OS maps (shown in green) (Fig 14).

One weaker linear anomaly snakes across the east of the area, and might represent a ditch (shown with a broken red line). However, it is quite faint and might be of geological origin.

Two strong bi-polar linear anomalies are visible (shown with a blue line). The anomaly to the west is a trackway currently in use. The anomaly to the east is almost certainly a modern service trench.

#### *Area 2 (Fig 9)*

There are three positive linears in this area (shown with red lines). Although two of these are very faint, they are all quite straight and probably represent ditch features.

There is a large discrete positive anomaly (highlighted with a red circle). This is 10m x 6m oval and may be a pit feature.

Towards the edge of the fields, agricultural features are apparent. In addition, the current ruts in the fields are quite obvious in places. Where they have been crossed in a perpendicular manner, they appear as

regular, tight bands. Where they have been crossed in a diagonal manner, the effect is more chaotic. This probably accounts for the 'ripples' in the northern field. However, it is also possible these ripples represent flooding episodes in the subsurface silt and are a genuine representation of underlying geology.

#### *Area 3 (Fig 12)*

This area had the highest concentration of visible archaeology. In the northwest corner of the area is a series of parallel, slightly curving lines approximately 7m apart. These are possibly ridge and furrow, suggesting that this area is on the edge of a medieval field system. A similar but slightly wider spaced (8.5m) series of features can be seen at the northeast edge of the area and are probably also ridge and furrow.

At the eastern edge of the area is a double linear with a distinct kink in the middle. This is characteristic of drove ways for livestock. Two very faint parallel linears in the northeast of the area may be a branch or continuation of the drove way.

Surrounding the drove way are several sharply defined, but short, linears. Out of these, two partial enclosures are discernable, but the majority of the linears do not seem to form any distinct or recognisable features. The short, strongly positive linears may indicate dumps of highly magnetic material in otherwise more extensive, but largely magnetically neutral (and therefore invisible), ditches.

The northern extent of these short linears appears to be defined by a faint east-west ditch, which crosses the possible ridge and furrow. This suggests more than one phase of occupation is represented in the survey.

In the southwest corner of Area 3 is an east-west aligned linear with a sharp rectangular kink in it. This is probably a boundary ditch.

Towards the south of the area is a very faint, but quite regular, circular feature, 25m in diameter. Nearby is a series of four large, oval, positive features. The largest of these is 18m long and 12m wide. These are similar to the large pit observed toward the western edge of Area 2, and the five together form a loose northeast-southwest orientated group.

The field also has many obvious linears which either conform to boundaries shown on the 1887 Ordnance Survey Map (Fig 14), or that maintain the same orientation as the modern field system and are thought likely also to be modern in date.

## **4. DISCUSSION**

The survey revealed several clusters of archaeology. The main concentration is around a drove way and a patch of ridge and furrow at the west of the site (Area 3). Partial enclosures are apparent to the north and south of the drove way. These are difficult to interpret from the results of the survey alone as it appeared only short section of ditches were visible magnetically. In the southwest corner there is an undated boundary ditch with a sharp rectangular kink in it. Whilst some features of agricultural origin appear to be medieval or later, the date of other linears (red lines) remains unclear.

Towards the south of the site there are a series of five features which might be large pits. Near to the pits is a possible circular enclosure. The form suggests a prehistoric feature. Pre-Saxon features are likely to be buried by a significant depth of silt that put them at the limits of detection available to magnetometry; it was noted that the response was particularly faint, which may suggest a feature at depth. However, it is also possible that it is a more recent feature of Saxon or later date.

At the eastern edge of the site are three possible ditches that are undated and have

an unknown function.

A fieldwalking exercise was undertaken at the site (Parker 2015). With the exception of a single prehistoric worked flint (possibly brought to the surface by deep drain digging or otherwise imported to the site), the finds were of Saxon or later date. The assemblage comprised a small quantity of Late Saxon material and a substantial assemblage of medieval and early post-medieval material, all concentrated in the southeast of the site. Further concentrations of medieval and early post-medieval material were recovered towards the northwest of the site. The areas of greatest find recovery do not coincide with features identified by the geophysics. However, it should be noted a large portion of Area 3, which contained the majority of features identified by the geophysical survey, was under stubble and was not in a suitable condition for fieldwalking.

## 5. ACKNOWLEDGEMENTS

Archaeological Project Services wishes to acknowledge the assistance of Mr M. Braithwaite of Robert Doughty Consultancy Ltd who commissioned this work on behalf of Bovis Homes Group PLC, Lincolnshire County Council and Mr Goodley. Gary Taylor and Denise Drury (APS) edited the report.

## 6. PERSONNEL

Project coordinator: Neil Jefferson  
 Geophysical Survey: Jonathon Smith, Ryan Godbold, Mary Nugent, Fiona Walker, Kerry Brader, Neil Jefferson and Ian Jefferson  
 Survey processing and reporting: Jonathon Smith.

## 7. BIBLIOGRAPHY

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CIfA, 2014b *Standard and Guidance for Archaeological Geophysical Survey*.

English Heritage, 2008 *Geophysical Survey in Archaeological Field Evaluation*.

Parker, N. 2015 *Archaeological Fieldwalking on land off Northons Lane, Holbeach, Lincolnshire (HBNL15)*. APS Report no. 23/15

Robson, JD, 1990 *Soils of the Boston and Spalding District [Sheet 131]*, Memoirs of the Soil Survey of Great Britain

## 8. ABBREVIATIONS

BGS British Geological Survey  
 CIfA Chartered Institute for Archaeologists





Figure 1 - General location plan

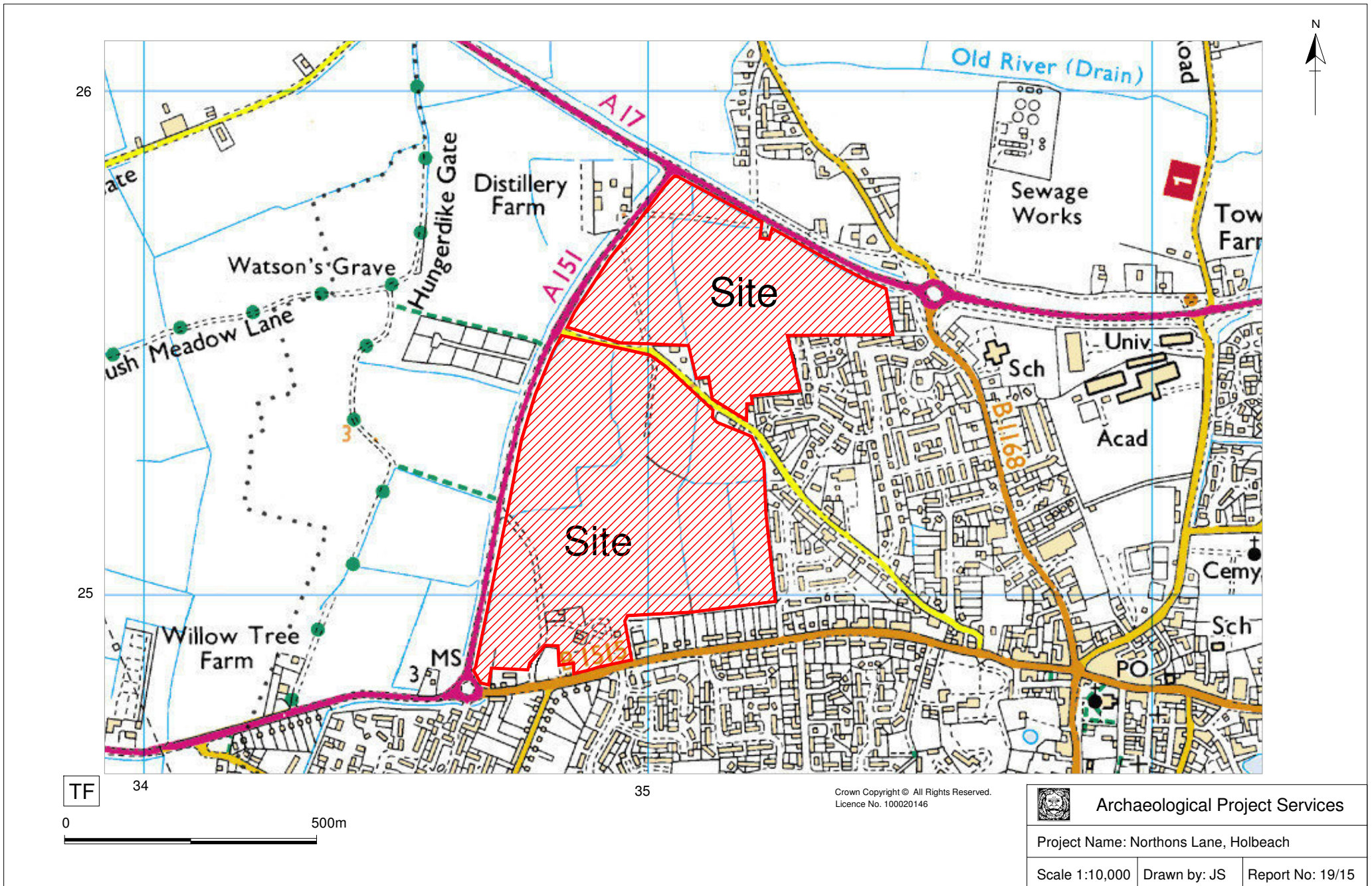


Figure 2 - Site Location

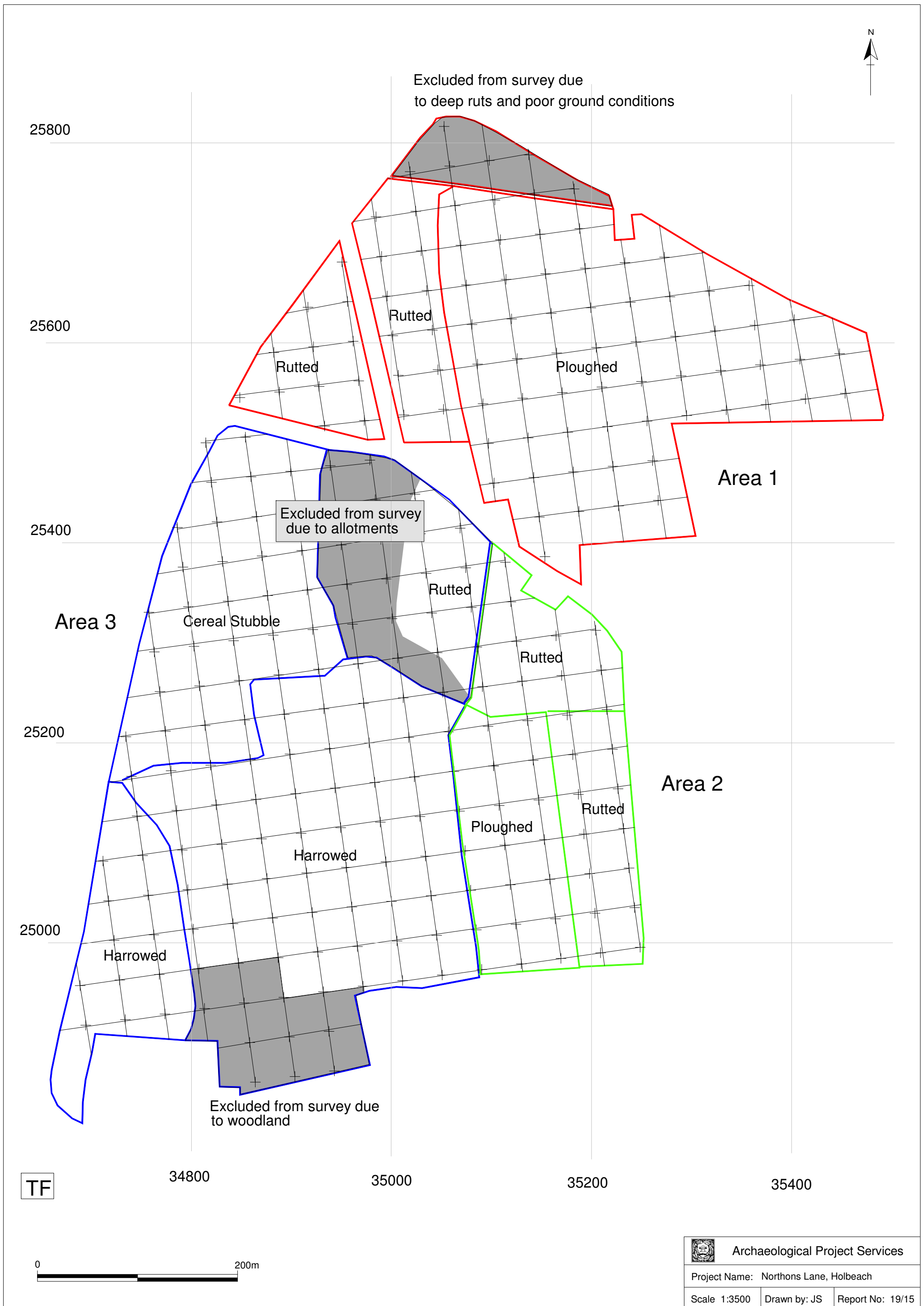


Figure 3 - Site Layout

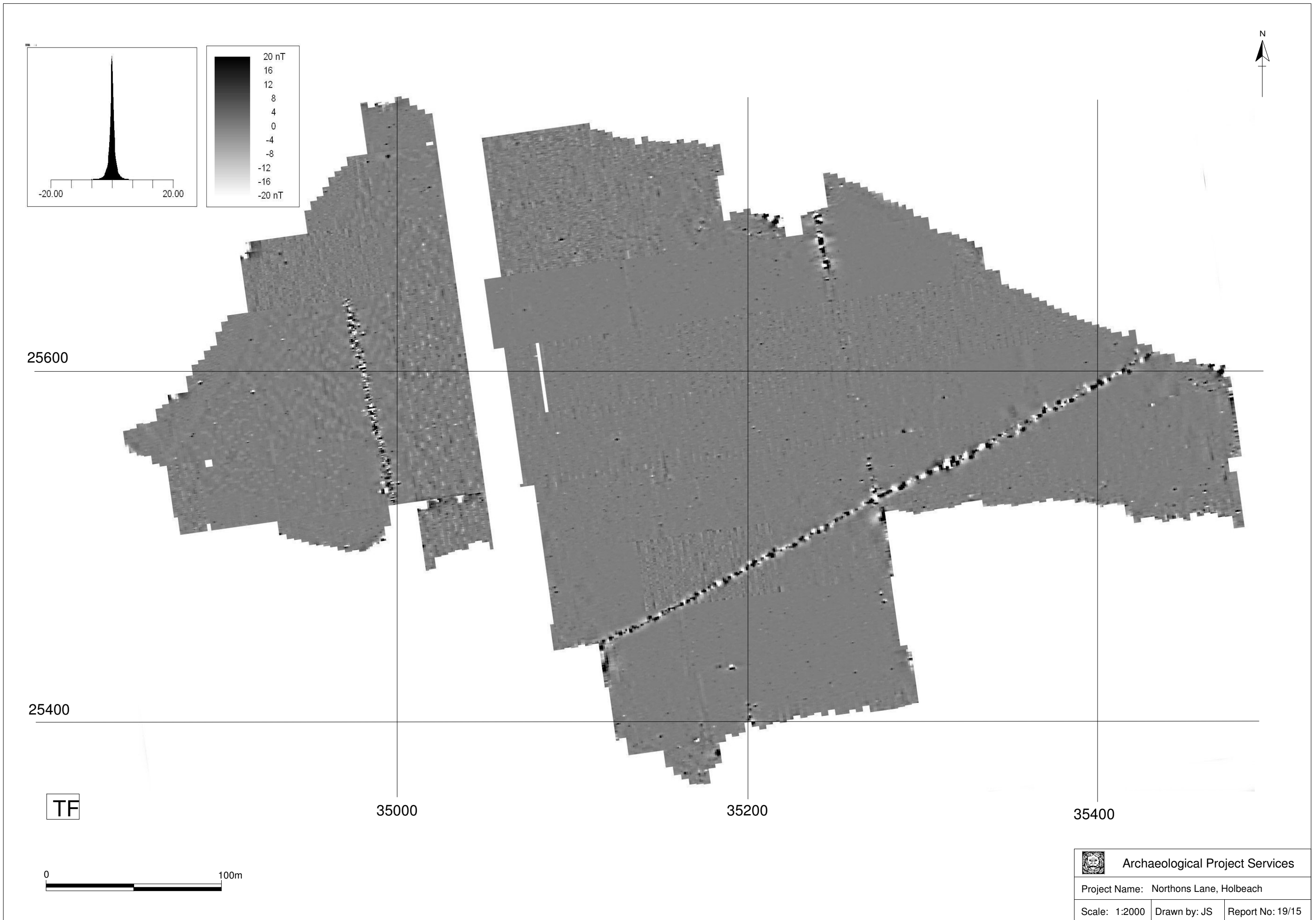


Figure 4 - Area 1, minimally processed greyscale plot



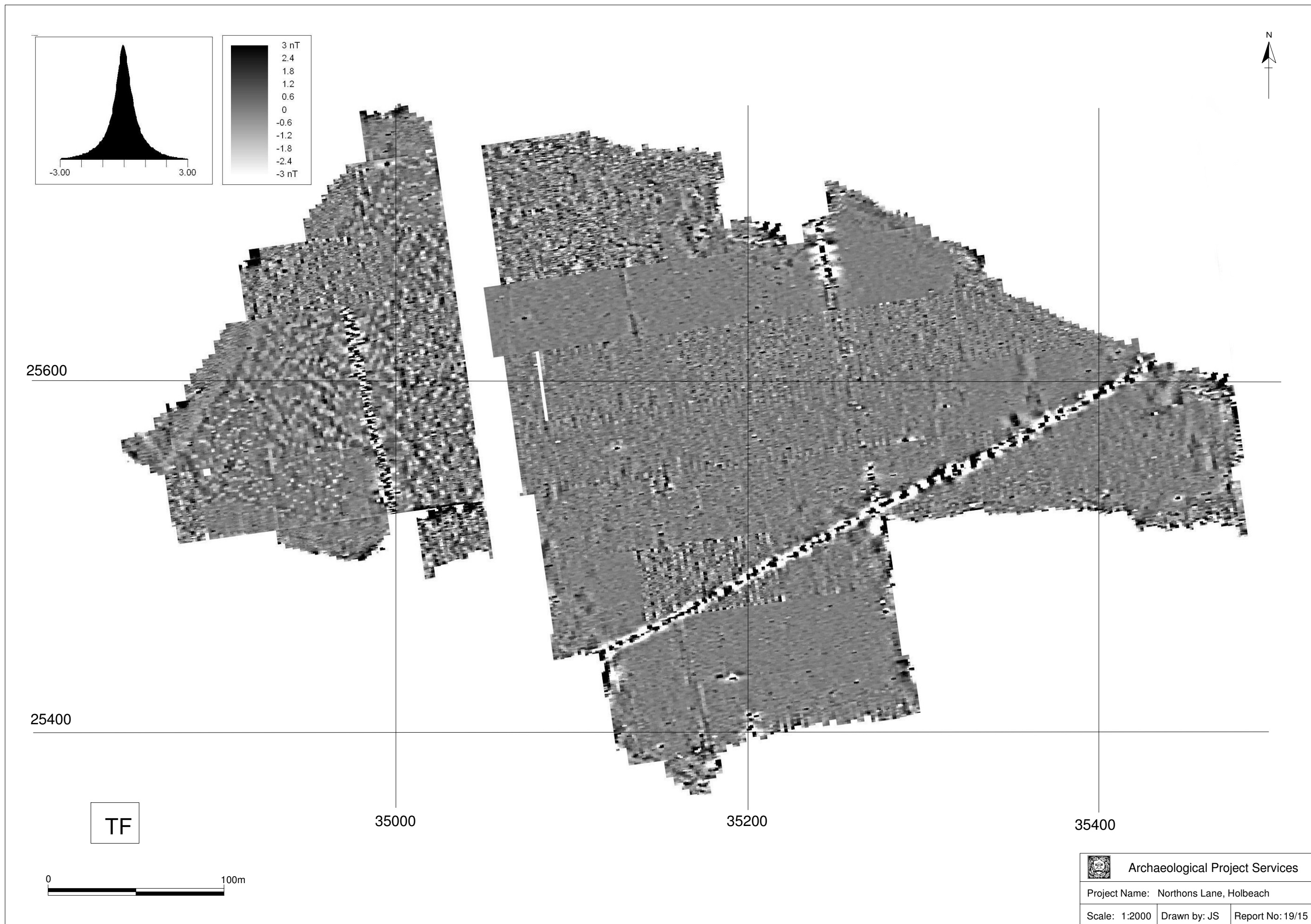


Figure 5 - Area 1, processed greyscale plot

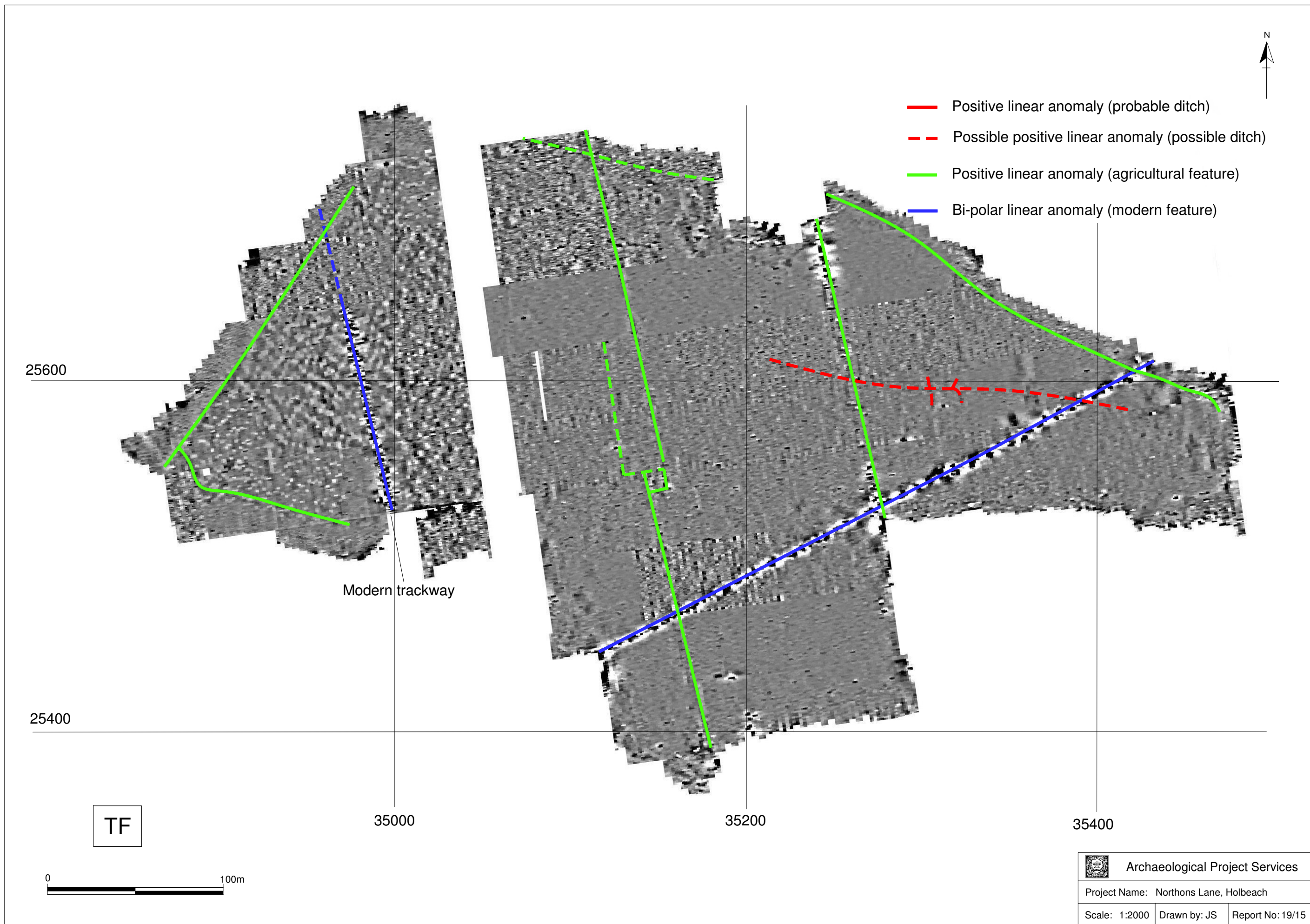


Figure 6 - Area 1, interpreted plot



Figure 7 - Area 2, minimally processed greyscale plot

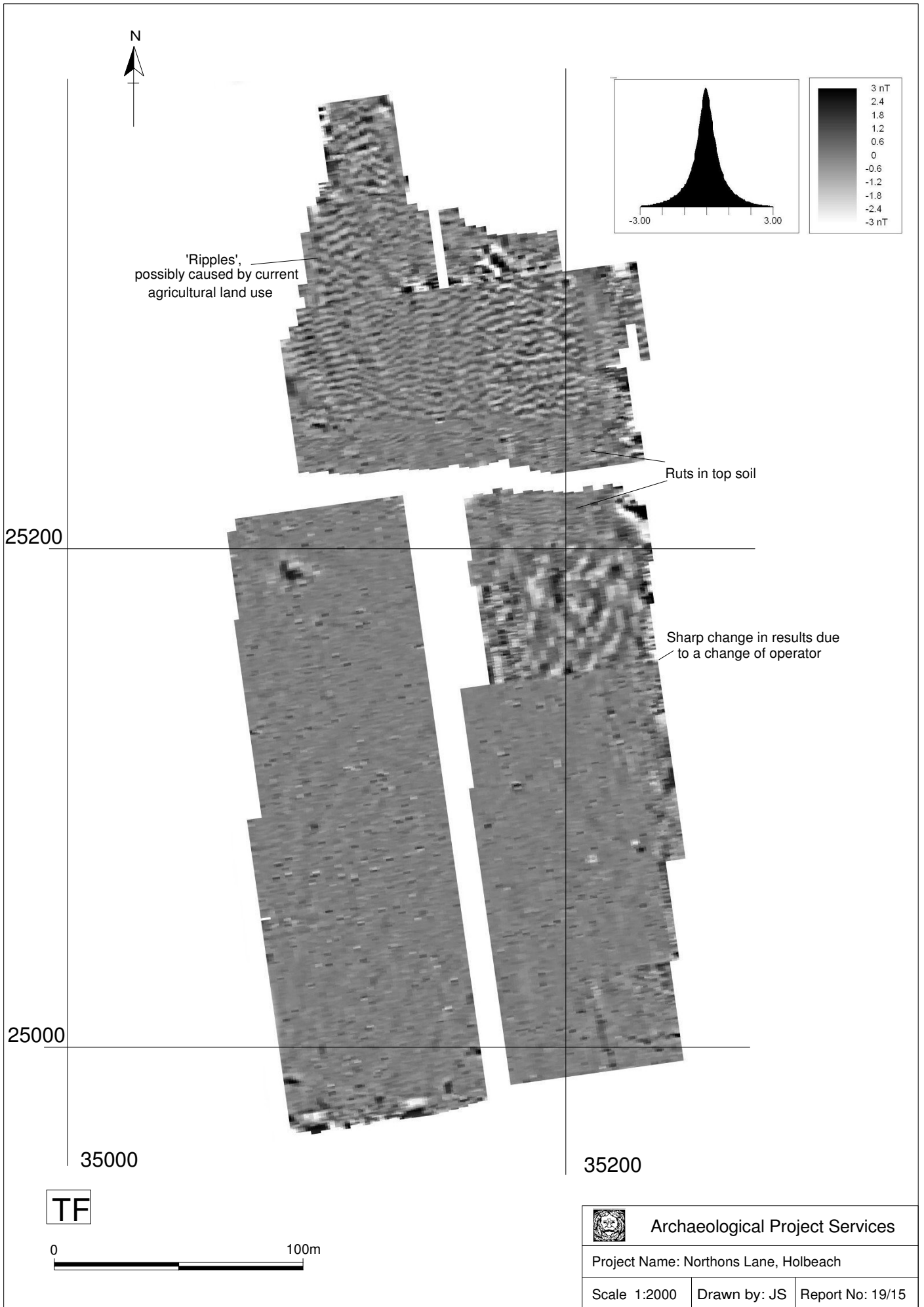


Figure 8 - Area 2, processed greyscale plot

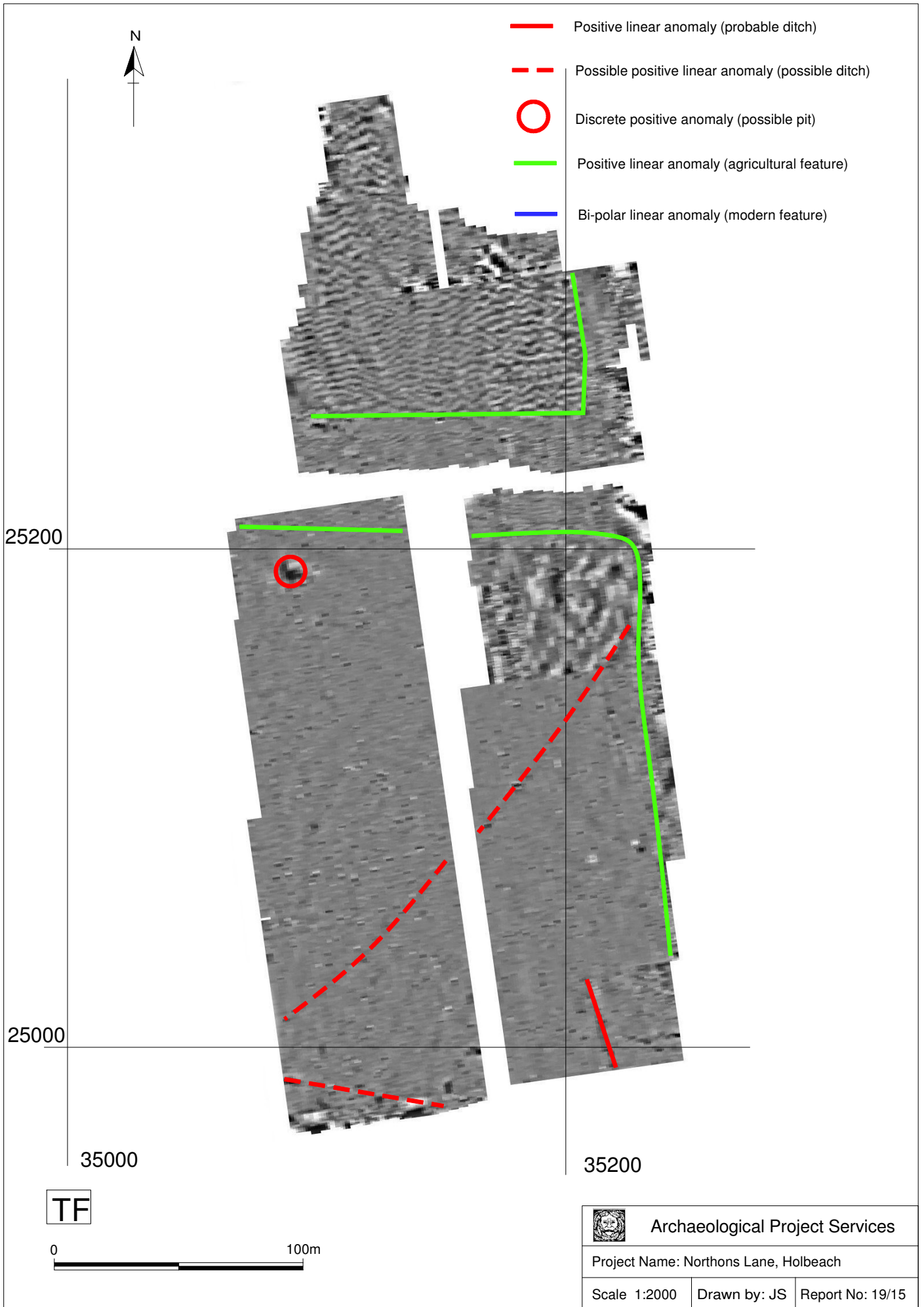


Figure 9 - Area 2, interpreted greyscale plot

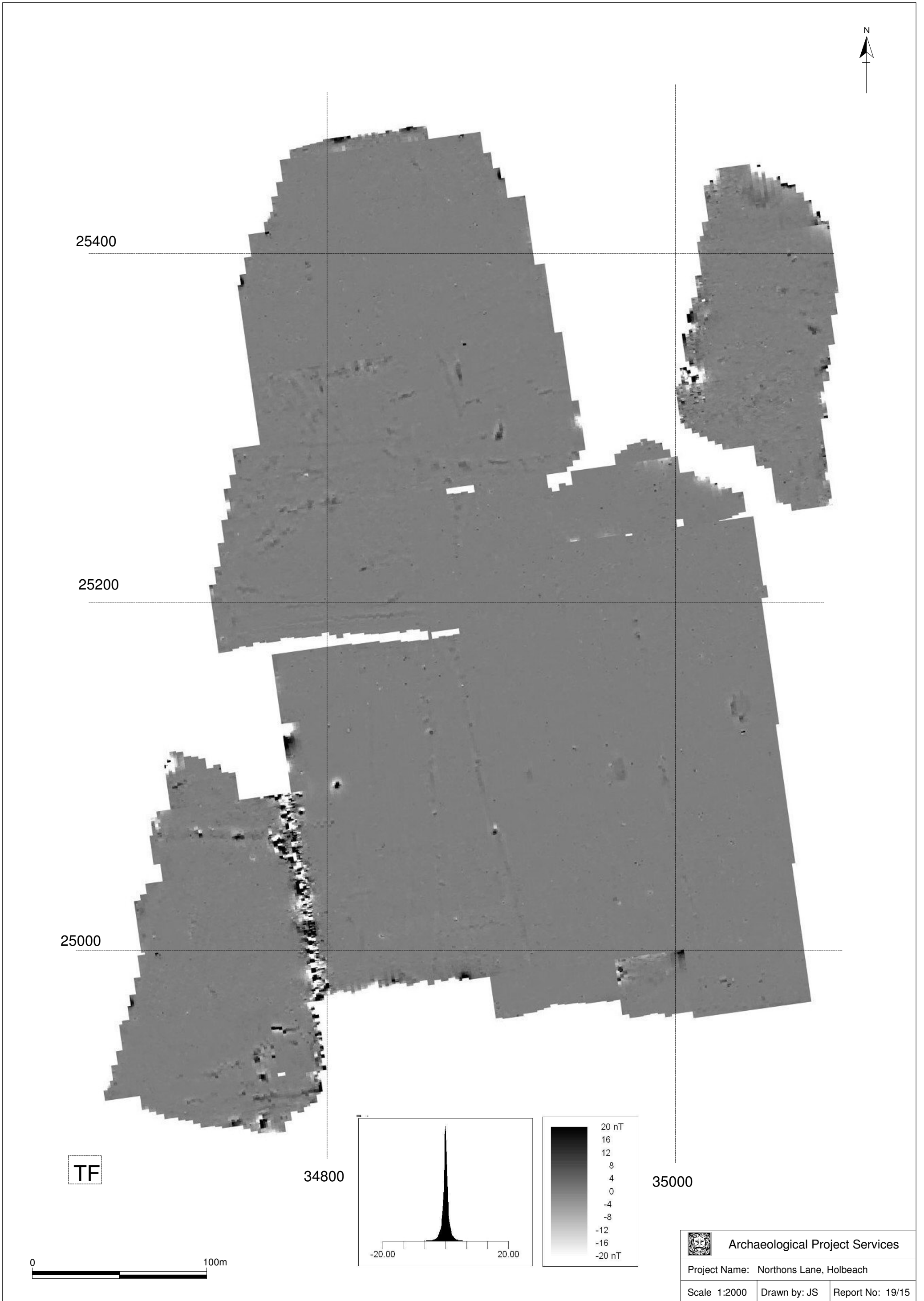


Figure 10 - Area 3, minimally processed greyscale plot

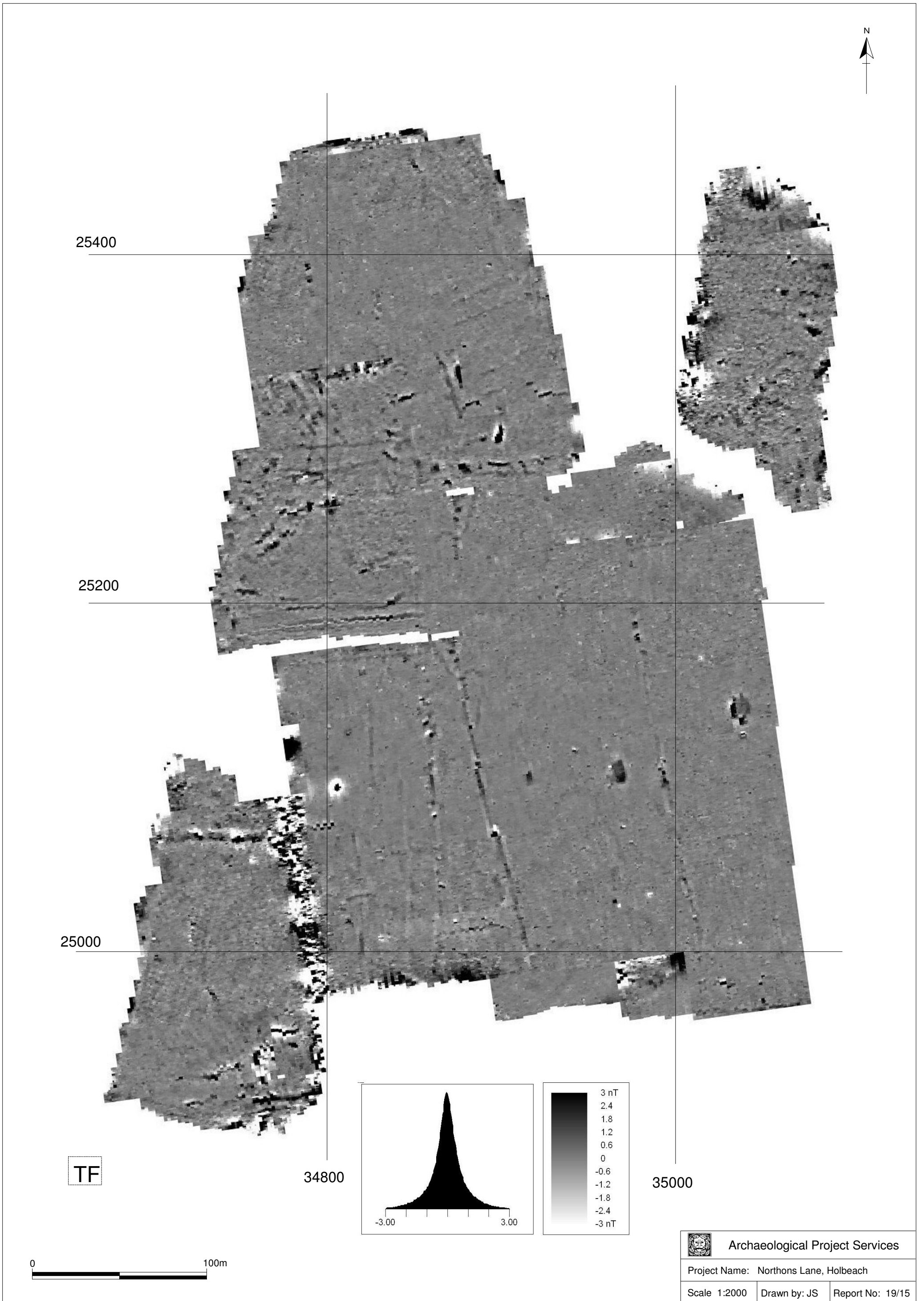


Figure 11 - Area 3, processed greyscale plot

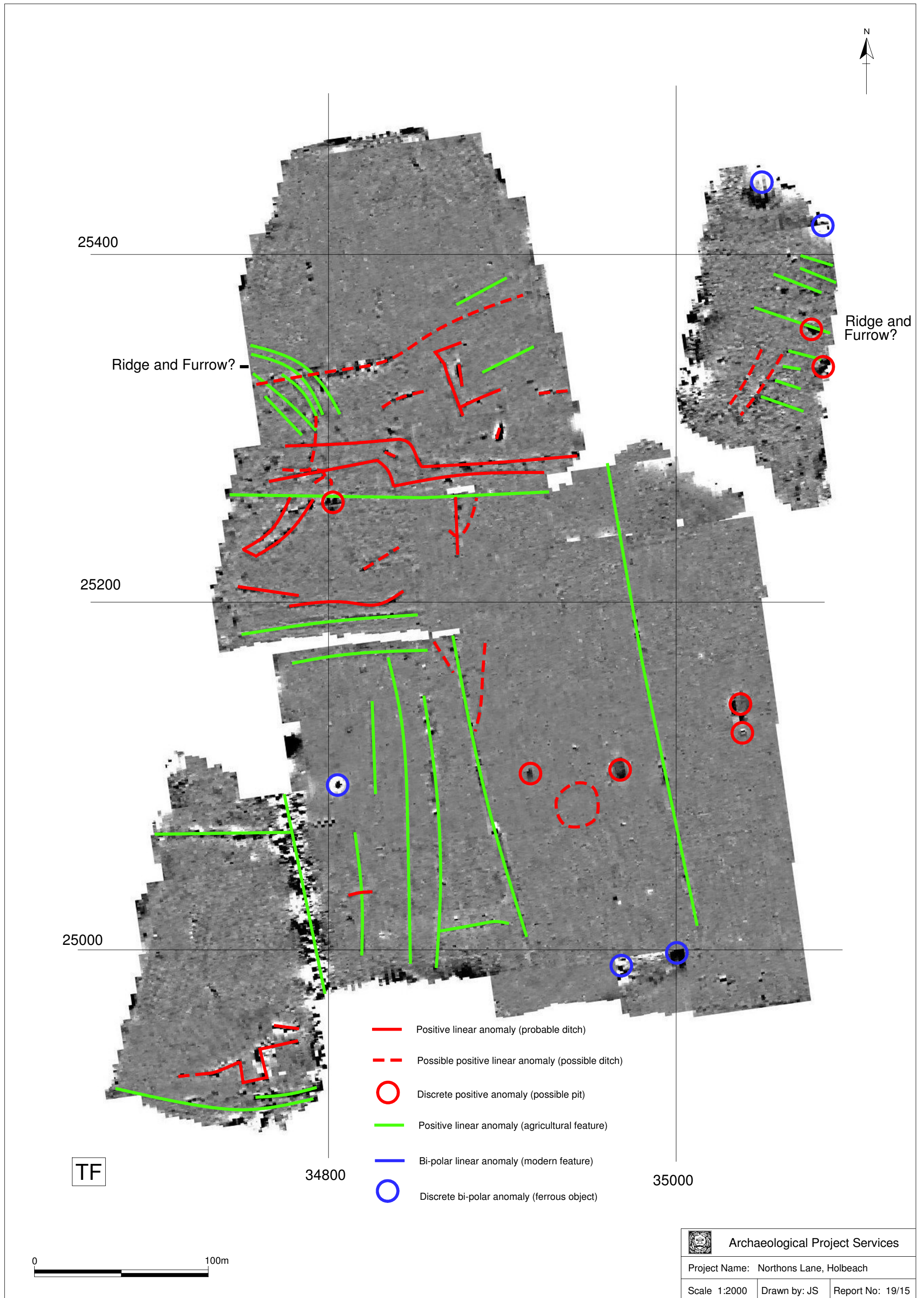


Figure 12 - Area 3, interpreted greyscale plot



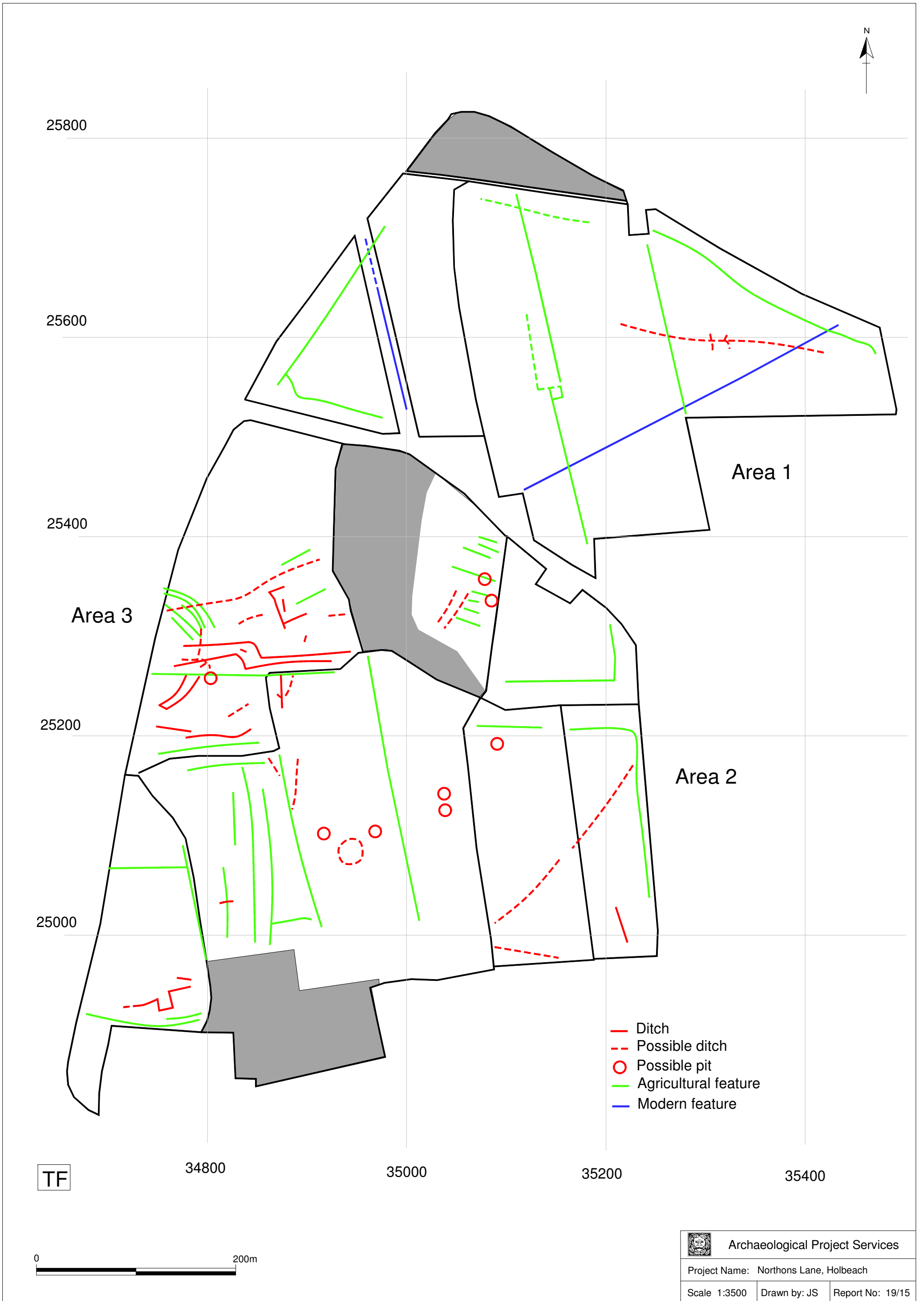

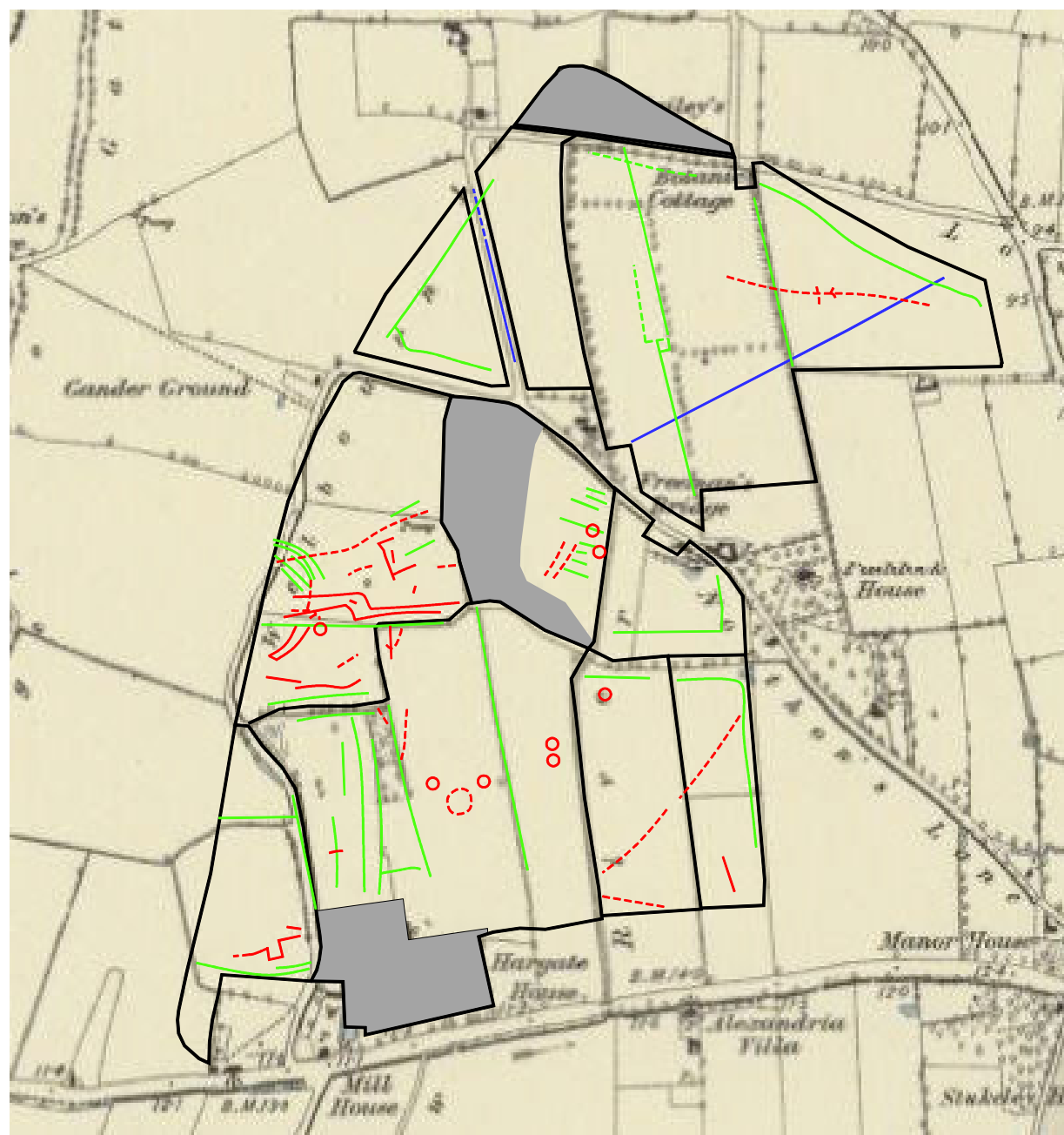
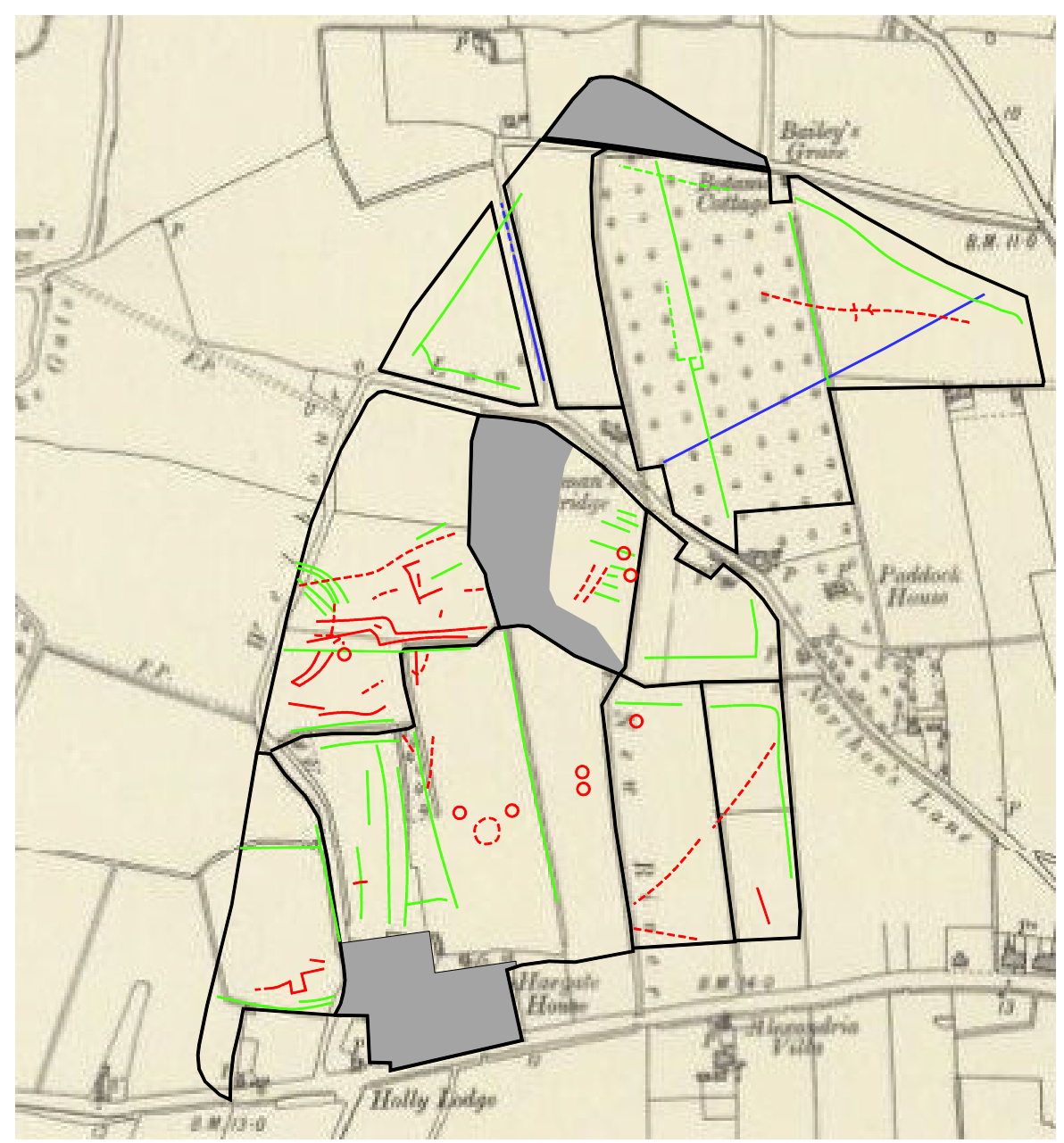


Figure 13 - Overall Results

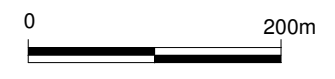
 <b>Archaeological Project Services</b>		
Project Name: Northons Lane, Holbeach		
Scale 1:3500	Drawn by: JS	Report No: 19/15



Ordnance Survey Lincolnshire Sheet CXXXV S.W. 1887



Ordnance Survey Lincolnshire Sheet CXXXV S.W. 1906



- Ditch
- - - Possible ditch
- Possible pit
- Agricultural feature
- Modern feature

	Archaeological Project Services	
Project Name: Northons Lane, Holbeach		
Scale: 1:6000	Drawn by: JS	Report No: 19/15

Figure 14 - Features overlaid on to historic maps

## Appendix 1 THE ARCHIVE

The archive consists of:

- 9 Daily record sheets
- 1 Report text and illustrations
- Digital data

File names	HBNL15 W01.xgd to W911.xgd HBLN15 Y01.xgd to Y909.xgd HBNL15 New01.xgd to New13.xgd  HBNL15.xcp, HBNL15_area1.xcp, HBNL15 east.xcp
Explanation of codes used in file names	xgd files are magnetometer grids, named with site code and number in the order surveyed. Grids suffixed with '-a' are re-orientated copies. xcp files are composites containing record of all the data and processes used to produce the end product
Description of file formats	All files are in plain text xml format with header data defining survey and processing parameters
List of codes used in files	D indicates a "dummy" value within the composite data
Hardware, software and operating systems	TerraSurveyor 3.0.25.1 running under Windows 7
Date of last modification	30.04.1015
Indications of known areas of weakness in data	

All primary records are currently kept at:

Archaeological Project Services, The Old School, Cameron Street, Heckington, Sleaford, Lincolnshire NG34 9RW

Final destination address:

The Collection  
Art and Archaeology in Lincolnshire  
Danes Terrace  
Lincoln  
LN2 1LP

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Site Code: HBNL15

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# OASIS DATA COLLECTION FORM: England

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## Printable version

**OASIS ID: archaeol1-204520**

### Project details

Project name	Northons Lane, Holbeach: Geophysical survey
Short description of the project	a 35ha magnetometry survey of fields surrounding Northons Lane, Holbeach. The survey revealed possible ridge and furrow, a probable drove way, a circular enclosure and a group of pit like features.
Project dates	Start: 05-02-2015 End: 28-04-2015
Previous/future work	Yes / Not known
Any associated project reference codes	HBNL15 - Sitecode
Any associated project reference codes	LCNCC:2015.10 - HER event no.
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 4 - Character Undetermined
Monument type	RIDGE AND FURROW Medieval
Monument type	DROVE WAY Uncertain
Monument type	ENCLOSURE Uncertain
Monument type	PITS Uncertain
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Not recorded
Prompt	Planning condition
Position in the planning process	Not known / Not recorded
Solid geology (other)	Upper Jurassic West Walton Formation mudstones
Drift geology	ALLUVIUM
Drift geology	Wisbech Series, coarse silty calcareous alluvial gley soils

(other)

Techniques Magnetometry

**Project location**

Country England

Site location LINCOLNSHIRE SOUTH HOLLAND HOLBEACH Northons Lane

Postcode PE12 7HJ

Study area 35.00 Hectares

Site coordinates TF 349670 253030 52.8080128482 0.00255329497454 52 48 28 N 000 00 09 E  
Point**Project creators**

Name of Organisation Archaeological Project Services

Project brief originator Consultant

Project design originator Neil Jefferson

Project director/manager Neil Jefferson

Project supervisor Jonathon Smith, Mary Nugent

Type of sponsor/funding body Developer

**Project archives**

Physical Archive Exists? No

Digital Archive recipient The Collection

Digital Archive ID LCNCC:2015.10

Digital Contents "Survey"

Digital Media available "Geophysics", "Images raster / digital photography", "Survey", "Text"

Paper Archive recipient The Collection

Paper Archive ID LCNCC:2015.10

Paper Contents "Survey"

Paper Media available "Correspondence", "Diary", "Map", "Plan", "Report", "Survey "

**Project bibliography 1**

Publication type Grey literature (unpublished document/manuscript)

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## OASIS:

Please e-mail Historic England for OASIS help and advice

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