SITE ADJACENT CODDENHAM ROMAN FORT, BAYLHAM FARM, CODDENHAM, SUFFOLK

REPORT ON GEOPHYSICAL SURVEY, MARCH TO APRIL 2015

John Rainer, on behalf of the Suffolk Archaeological Field Group

Suffolk Archaeological Field Group

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1.1 SUMMARY

A magnetometer survey of a field immediately south of the Coddenham Roman fort complex was carried out to determine the extent of settlement outside the fort and the nature and position of other features in the area. A road from the fort to Colchester is thought to have extended through the field to a crossing over the River Gipping, its position assessed by crop marks.

The site is scheduled and the survey was subject to licence issued by English Heritage.

The survey found clear evidence of extensive activity alongside the likely road position. While little in the way of clear features other than pits were evident there, the amount and nature of magnetic noise found pointed to prolonged occupation. Other possible road alignments were found, plus perhaps a kiln, a roundhouse or circular enclosure, a section of fort ditches and features that may be docks leading into the site either side of the river crossing.

The ability to identify features was limited by three factors:

1. The amount of metal fencing, buried pipework, animal feeders and corrugated iron shed roofs across most of the site. This resulted in the survey being done in piecemeal sections. In particular, a double fence ran the length of the road position as a visitor walkway. While an admirable way to bring it to the attention of visitors, it prevented the road position from being surveyed.

2. The creation of the mere to the south east of the forts removing soil from key sections of the site, particularly in the north east section.

3. A number of fallen trees

The absence of any responses for the triple ditches of the larger fort running through the survey area, other than a possible small remnant to the north east, implies that they ran along the southern lines of the quadruple ditches of the smaller fort. The intact nature of crop marks for the quadruple ditches (figure 4) could therefore be taken as evidence for the smaller fort being the later of the two. The likely ditch intersection point was under small animal pens and was not surveyable.

1.2 CONTRIBUTORS

Field work was conducted and assisted by John Rainer, Mary Pereira, Alison Brown, Tom Lucking, John Fulcher, Gilbert Burroughes, Anne Dodds, Owen Strike, Pat and Malcolm Stewart, Lynda Bradley, Kevin Cooke, George Barlow, Mike Theobald, Di Maywhort and Jack Cade of the Suffolk Archaeological Field Group (SAFG). The SAFG is a sub-group of the Suffolk Institute of Archaeology and History.

1.3 ACKNOWLEDGEMENTS

The author wishes to thank Richard Storer for granting access to the site, John Fulcher of the SAFG for his support and preparatory work, Simon Picard and colleagues of Suffolk Archaeology CIC for gridding the site and Jude Plouviez of Suffolk County Council Archaeology Service for extensive support and advice.

1.4 DATE OF FIELDWORK AND REPORT

The fieldwork was carried out on the 16th, 17th, 21st,23rd, 24th and 25th March 2015, and the 3rd, 4th, 5th and 6th April 2015. This report was completed on 2nd May 2015.

1.5 SURVEY LICENCE

Ancient Monuments and Archaeological Areas Act 1979 - licence to carry out a geophysical survey at Baylham Roman Site, Coddenham, Suffolk.

Case No: SL00084109, Reference: AA/040381/5, Date: 30 July 2014
HAUID: 1006033

1.6 SUFFOLK HER SITE REFERENCE

CODD 003

1.7 CONTACT DETAILS

John Rainer: mail@jrainer.co.uk

2. INTRODUCTION TO THE SITE

2.1 The Site

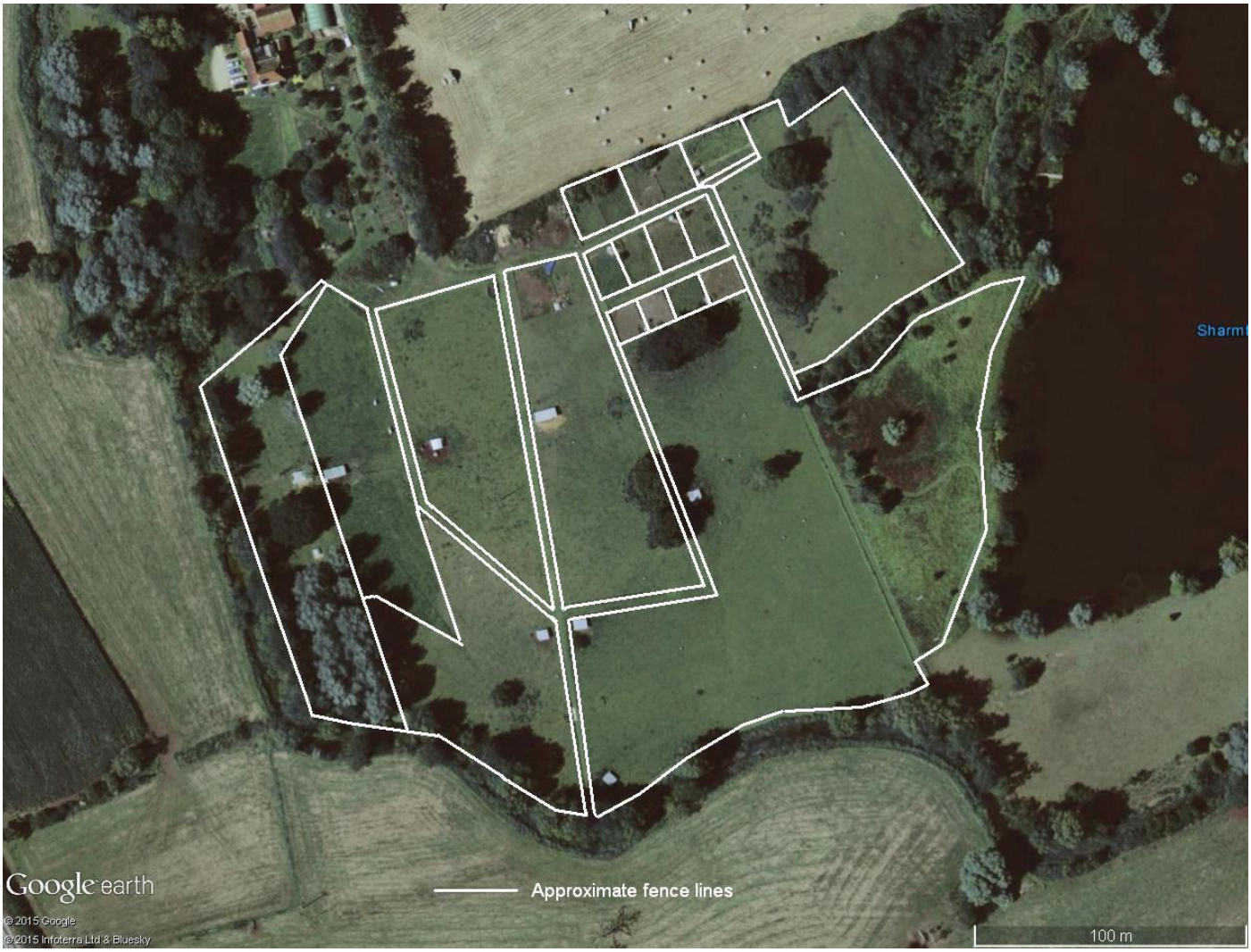

Figure 1: Site with fences and paddocks shown.

The survey area delineated in Figure 1 is part of Baylham Rare Breeds Farm. Open to the public, this is a working livestock farm dedicated to the breeding of traditional and rare breeds. It has been owned by Richard Storer since 1985 and is run by himself and his son, Neil, with the help of staff and volunteers. The farm is home to cattle, pigs, sheep, alpacas and a wide range of small animals.

The site is part of Combretovium, a 60 hectare open settlement, with occupation from the late Iron Age and Claudian periods through to the mid 4th century. The following is a description of the site as a whole and not just the area of survey, and includes areas to the north east forts' edges.

Traces of a Roman road running to a ford on the river at Sharmford have been identified. Associated with the settlement as a whole are 1st century hut circles with drainage gullies and rubbish pits. There is also 2nd to 3rd century occupation debris, plus a Roman Conquest-period enclosure, a 1st century cremation cemetery, two 2nd century pottery kilns, and a late 1st or 2nd century enclosure ditch with a gateway complex.

Rubbish pits and ditches are abundant and a timber-lined shaft 9.25 metres deep has been excavated, presumed to be a well. The quantity of finds has been taken by excavators to indicate the importance of the main settlement which lies under pasture nearer the river (and which is the subject of this survey).

Extension northwards is shown by the discovery of ditches and finds in Pool Fields. Roman burials have also been discovered in fields near the Sheepwalk.

Two Roman forts are known. The larger encloses about 14.5 acres (5.8 hectares) and its defences include a triple ditch system. The smaller fort of 5.3 acres (2.1 hectares) lies within this and is surrounded by a set of four ditches. The Roman Road form Colchester to Caistor passes through both sites.

2.2 Crop marks

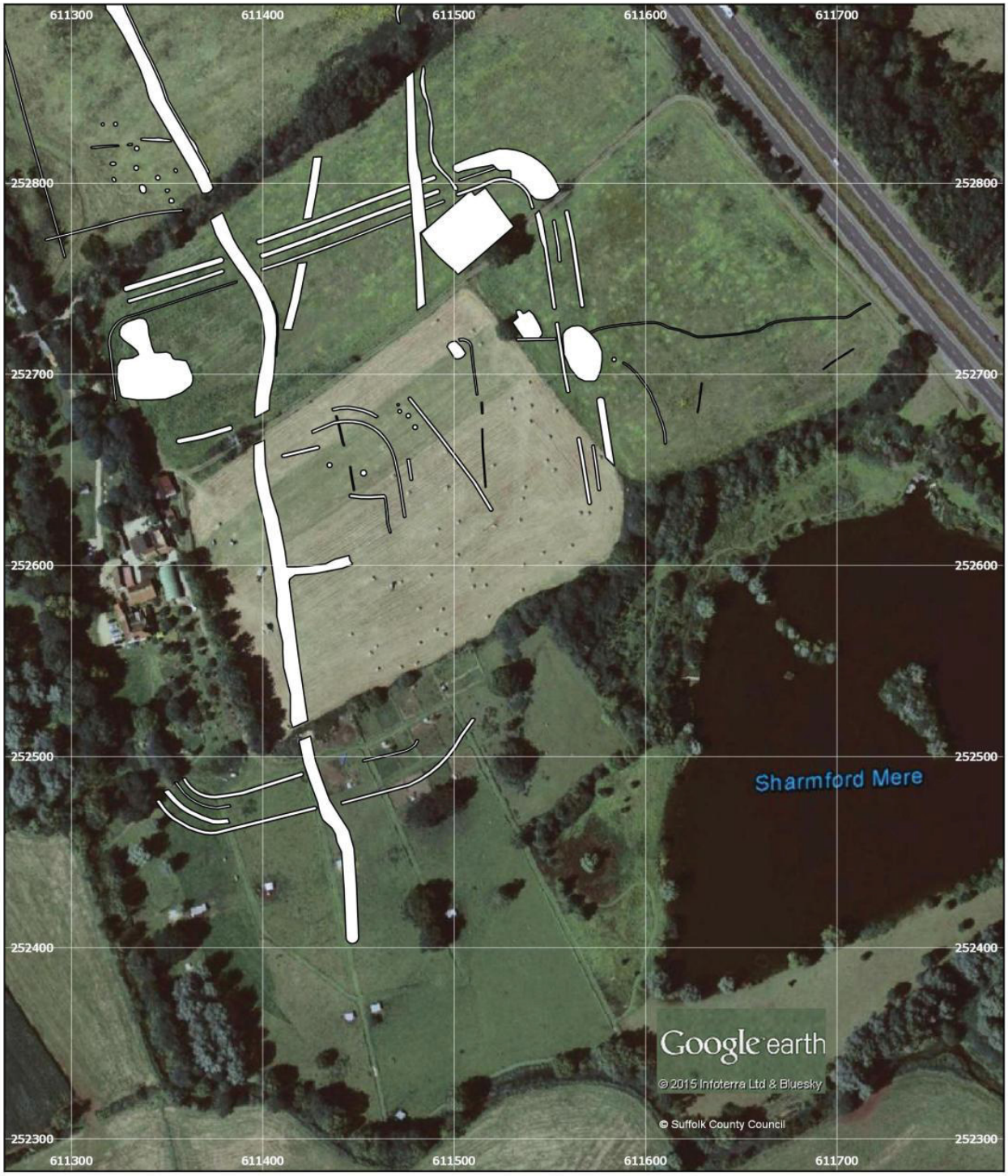

Figure 2: Site with plotted feature overlay, courtesy of Suffolk County Council.

Figure 2 above shows the plotted crop marks of the road through the forts and the ditches of the larger and smaller forts, mapped by Suffolk County Council.

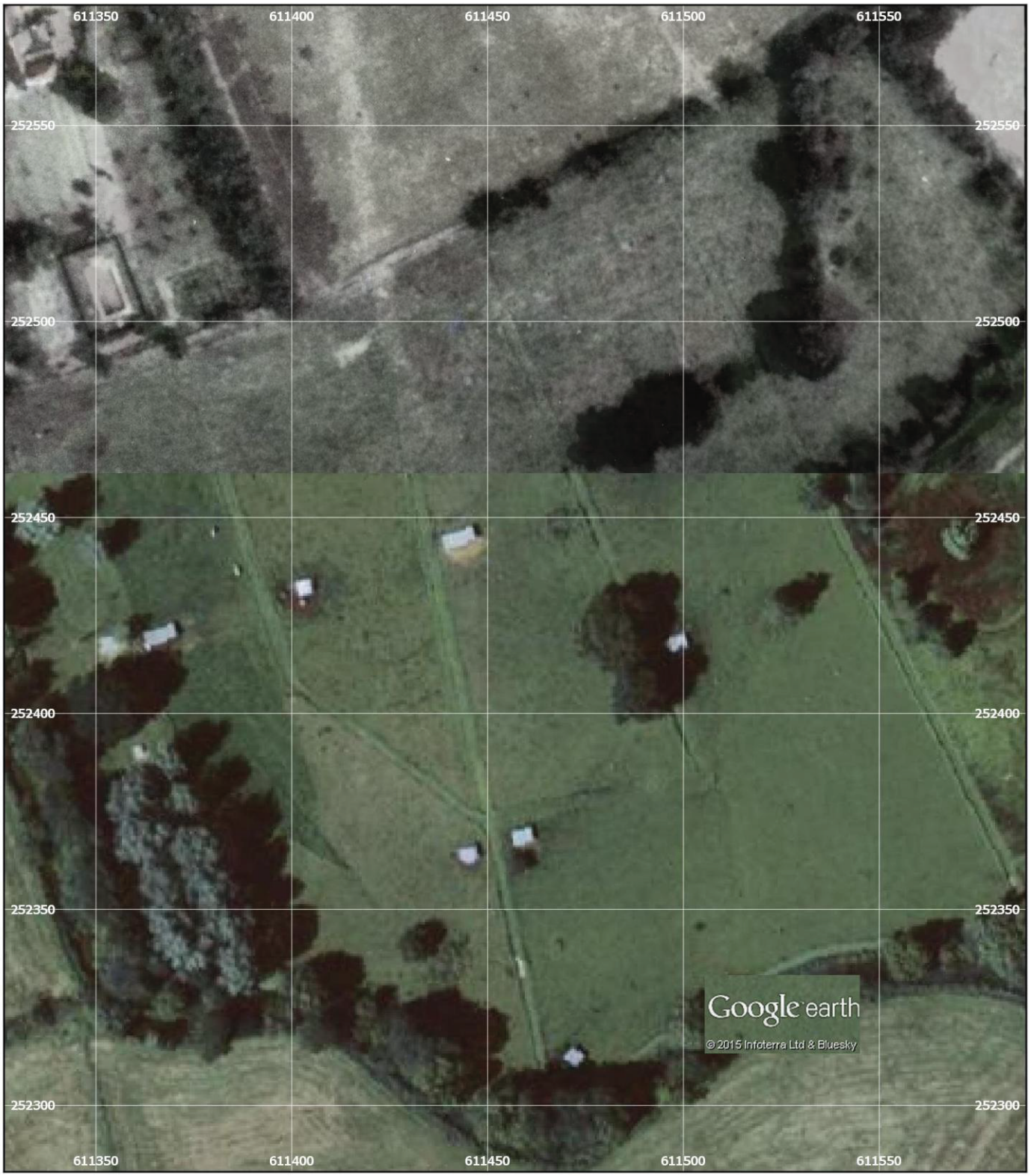

Figure 3: Aerial photograph added to site image to demonstrate road position.

In Figure 3, the road position visible in the overlaid aerial photograph can be seen to align with the centre walkway running south through the site. This walkway position was chosen by the farmer to show visitors that they were walking along the site of the Roman road. Additional aerial images appear to show the road running straight to the river, albeit with a slight kink in the top section.

Figure 4 Aerial photograph showing the fort ditches.

Figure 4 shows the forts' ditches in excellent detail, viewed from the west. To the right of the swimming pool is the survey area. The smaller fort ditches corner (top right) appear undisturbed and not crossed by the ditches of the larger fort. Unfortunately, this area lies today within a area of small animal pens that contain close fencing and permanent feeders. It is not surveyable by magnetometry.

2.3 Early mapping

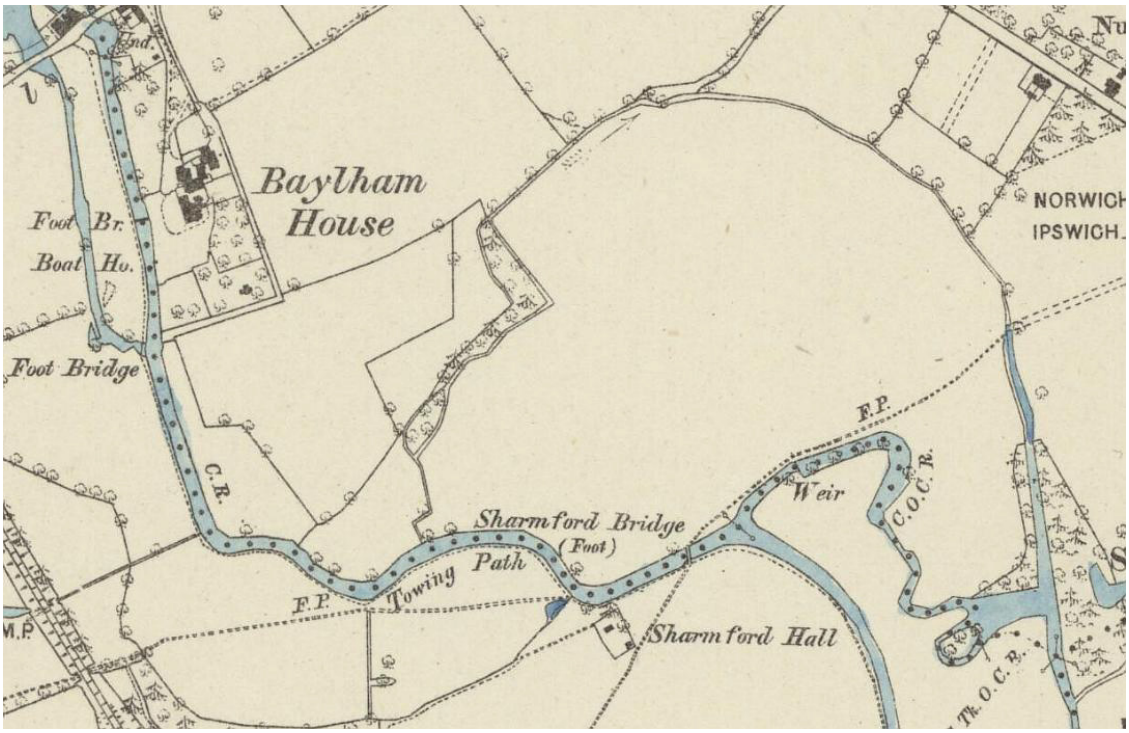

Figure 5: 1883 OS six inch mapping

Figure 5 shows the site (south of the Baylham House legend) before material was removed from land to the east, with subsequent landscaping to form a mere. A watercourse runs around the future mere site

and through the eastern side of the survey site. A field boundary is shown within the survey area. Both features can be discerned in LIDAR imagery.

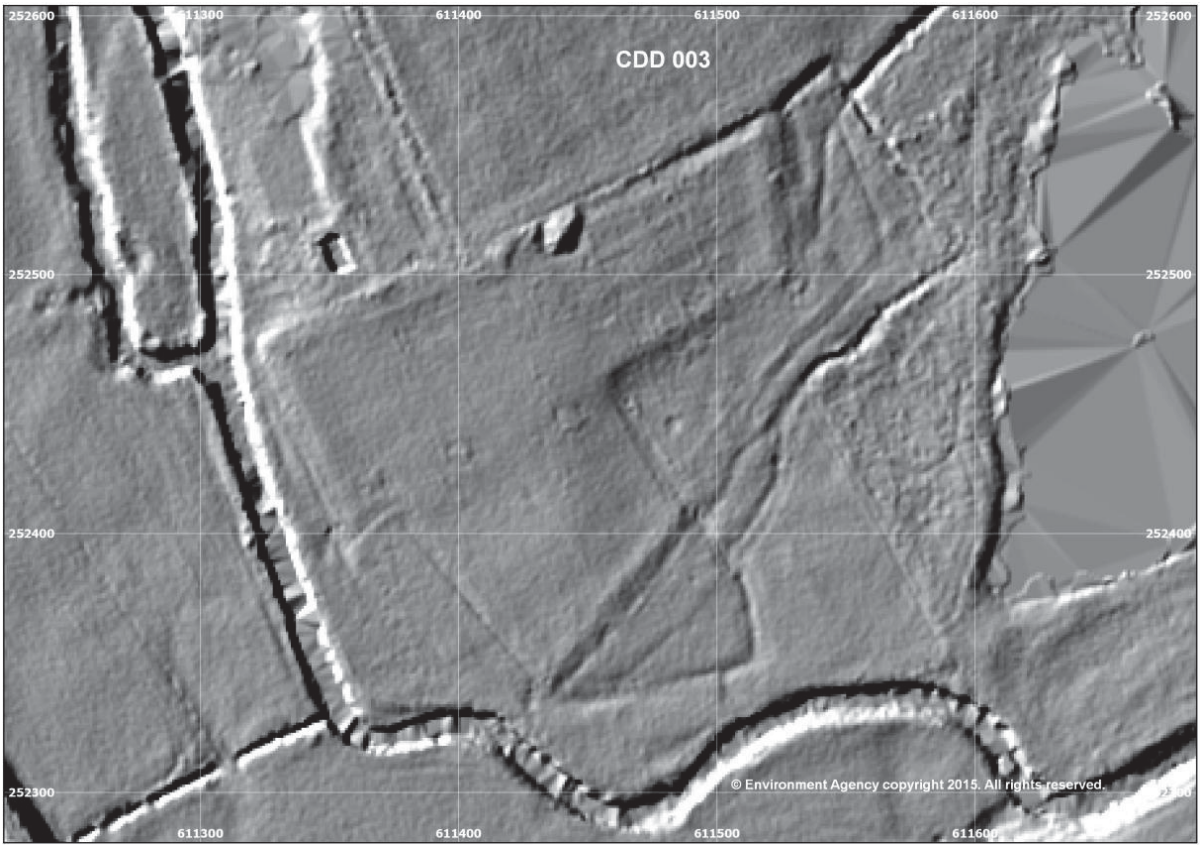

Figure 6: LIDAR image of the site, courtesy of Geomatics.

The T-shaped area showing in figure 6 is an elevated area, sloping down to the south.

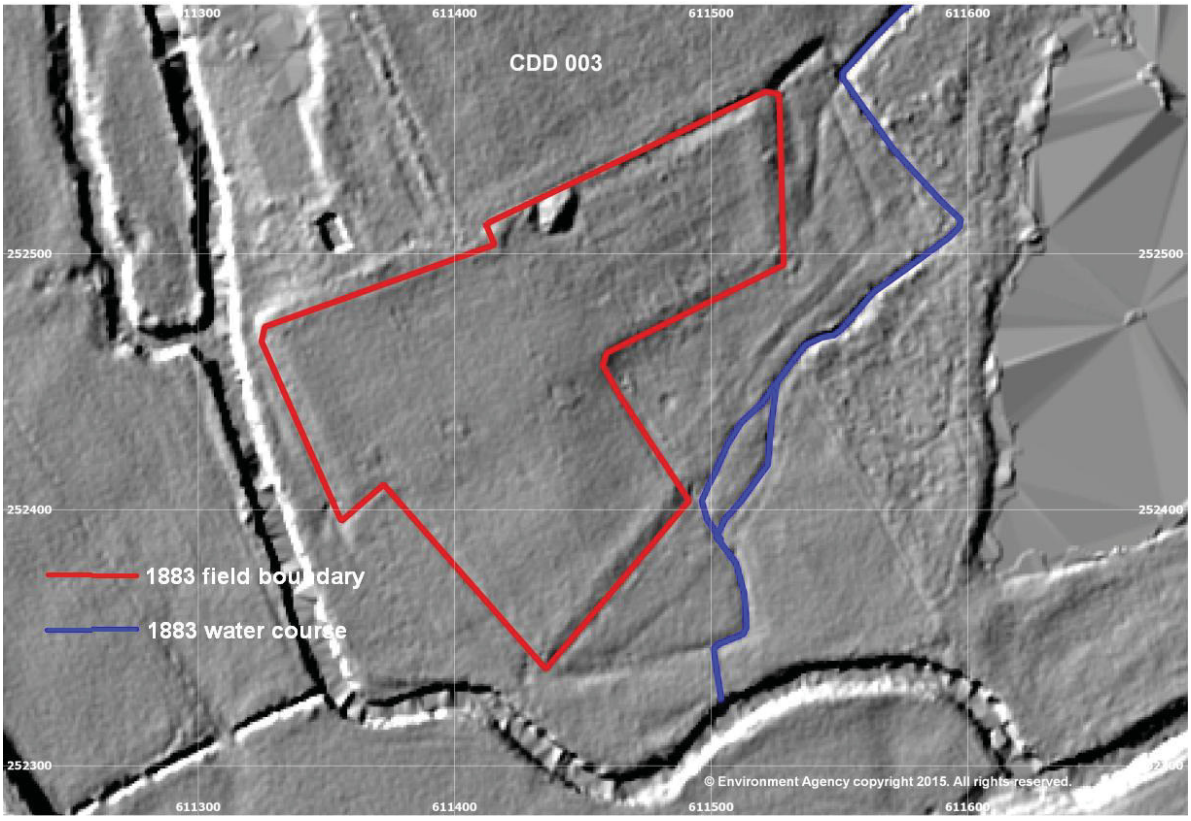

Figure 7: LIDAR image of the site with field boundary and water course, courtesy of Geomatics.

Figure 7 shows the 1883 field boundary and water course position. The purpose of including this image is to show where these features might influence the magnetometry survey results.

3. METHOD

Magnetometer survey was carried out over the enclosed areas delineated in figure 1. The survey was carried out on 30m grids staked out by Suffolk Archaeology CIC using high accuracy GPS. Grids were surveyed mainly in zig-zag mode. Survey was on a 'paddock by paddock' basis as it was not possible to integrate grids across the mesh and electrified fencing.

Equipment

A Bartington Grad601 single boom gradiometer was used for the survey, set to 100nT range. Gradiometer balancing was carried out at single points within each paddock identified as a low noise area. Grids were walked at 1m intervals, 4 samples per metre, 1.5 or 1.3m/s pace, with sampling approximately 20cm above the ground surface.

Results processing

Data was downloaded from the meter and analysed using Snuffler software. Prior to processing, obvious fence responses were removed from the grid data. To avoid compromising loss of archaeological features, responses exceeding +-12nT were chosen for deletion. This equated in most cases to a 3 metre wide loss of data adjacent to fences, although fence response still affected the data for a further 2 to 3 metres. A similar approach was taken to responses around sheds, gates and feeders.

All results were recorded in QGIS geographic information software using georeferenced images. All overlays have been produced by either production of georeferenced images or import of georeferenced raster layers, such as Suffolk Archaeology CIC's survey grid.

The co-ordinate reference system used for all results was:

"+proj=tmerc +lat_0=49 +lon_0=-2 +k=0.9996012717 +x_0=400000 +y_0=-100000 +ellps=airy +towgs84=375,-111,431,0,0,0,0 +units=m +no_defs"

4. SITE PLAN AND RESULTS REFERENCING

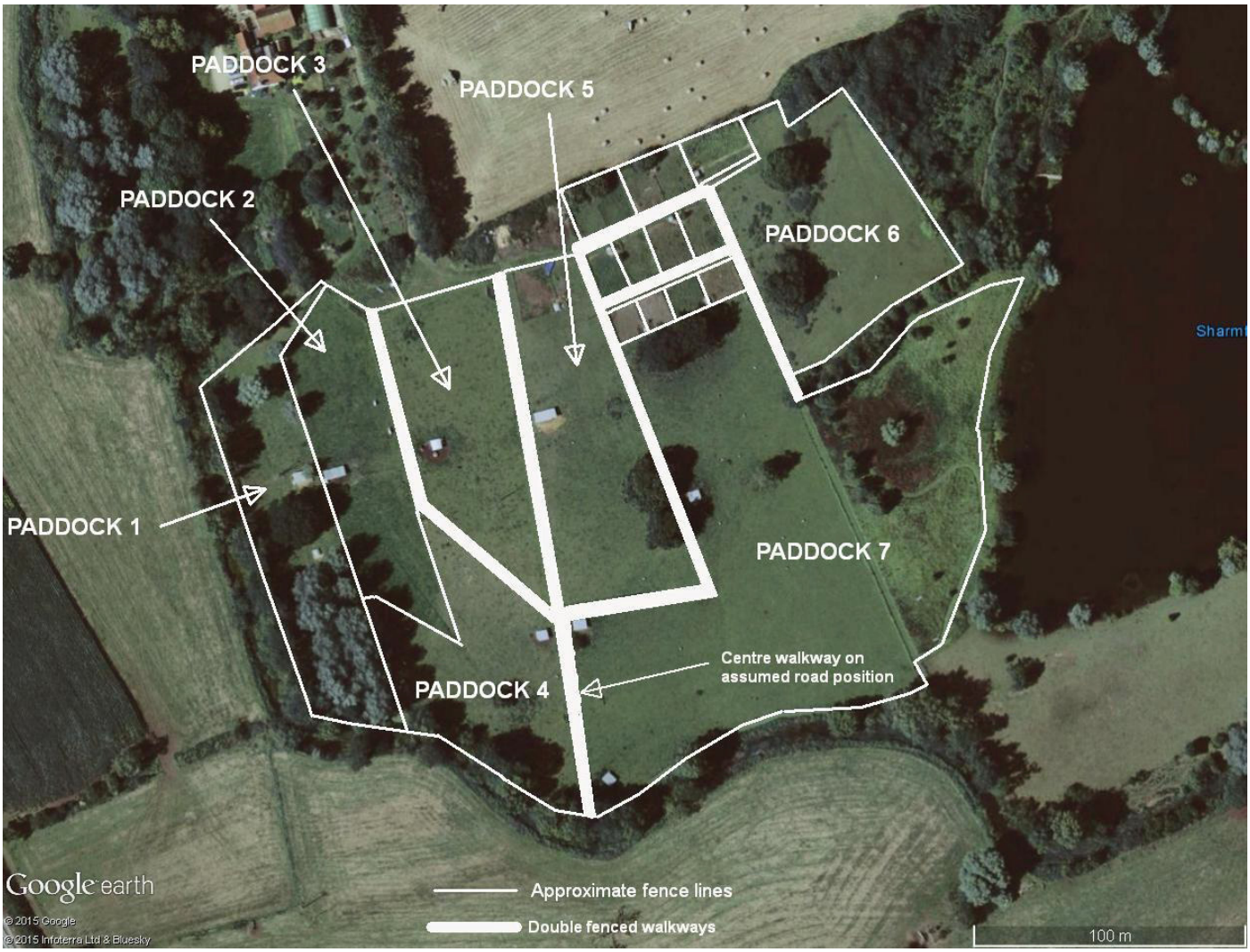

Figure 8: Paddock reference numbers

5. RESULTS AND OVERVIEW ANALYSIS

The nature of the site is such that the survey could not be conducted and analysed as a single grid to a single clipping range. Each paddock was separately surveyed with an appropriate clipping range for the results of each one.

An overview analysis of the survey as a series of composite images is given below, followed by assessment on a "paddock by paddock" basis, including typical response levels of selected features.

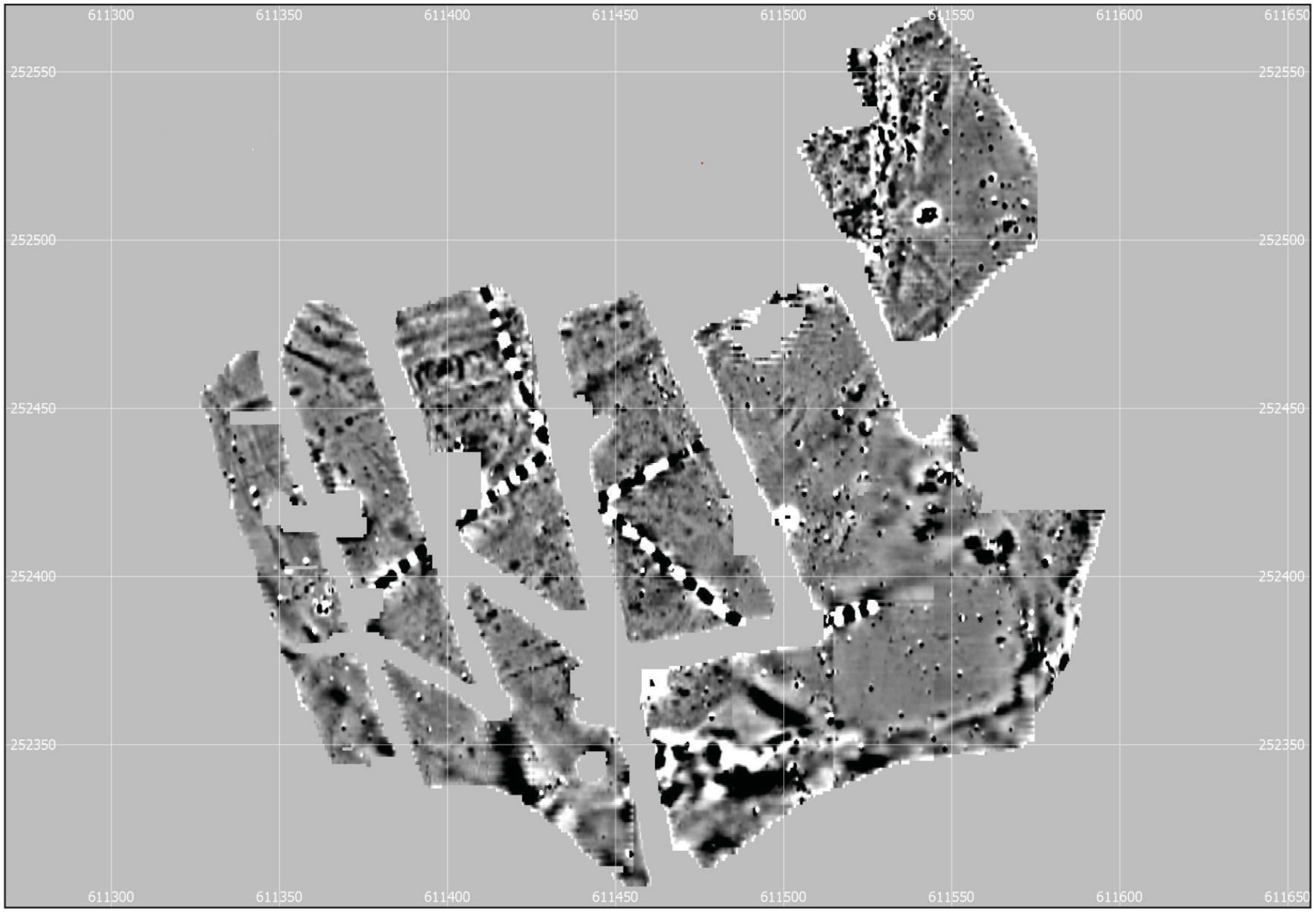

Figure 9: Results grouped as a single feature

Figure 10: Results grouped as a single feature on Google Earth background.

Figure 11: Results grouped as a single feature on LIDAR background, with features mapped in 19th century overlaid.

Figures 9 to 11 show the grouped results projected on different backgrounds.

5.1 Overview Analysis

For the purposes of this overview, it is assumed that the road course does lie in the unsurveyable centre walkway section, as set out in figure 8. It should be noted that the black/white linear responses lines in the results are derived from service piping.

In general, the site shows high levels of noise typically associated with long term occupation. The central paddocks (2,3, 4 and 5) images are clipped to +-10nT, with the others clipped from +-4 to 5nT. This means that the combined image understates just how noisy paddocks 2, 3, 4 and 5 are in comparison to the rest of the site.

From the noise responses, the assumption is that the site's main occupation area lies in two strips approximately 30m wide to the east and 50 to 60m wide to the west, of the road position as it runs south, falling away around 30m from the river. Away from this area there is still evidence of activity.

To the north of paddocks 2 and 3, the fort ditches can be seen. These exactly match the plotted crop marks shown in figure 2.

In the north eastern part of the site is a possible kiln, although the response there being a collection of small ferrous items at plough depth cannot be ruled out. In the same area, there are faint traces of linears running north east in the direction of the larger fort's ditch crop mark ends, although this is not conclusive.

Many parts of the site have traces of short linears present. Pit features abound and it is possible that some of the larger pit-like features may be buildings.

Paddock 5 has traces of a circular feature by the road. It cannot be discerned in the overview image but will be discussed later in the detailed analysis of each paddock.

The eastern part of the site has lost any features it may have had as it is clear it has been part of the mere area excavation and reinstatement. This includes paddock 6 to the north east. However, there are traces of what may be a road or track running NE/SW across the site through it, aligned with the likely road position to Coddenham. The LIDAR imagery shows parts of this and in some areas is supported by the geophysics results. Unfortunately, the combination of fencing, gates and sheds along the south western half of this possible feature have obscured any traces in the magnetometry results there.

Figures 13 and 14 are photos showing the elevated profile of two sections of this track or road feature that are evident on the site. Ground lines have been traced in white. If this feature is a roadway, it either joins the road running from the fort to the river or it is heading across it to a different river crossing point

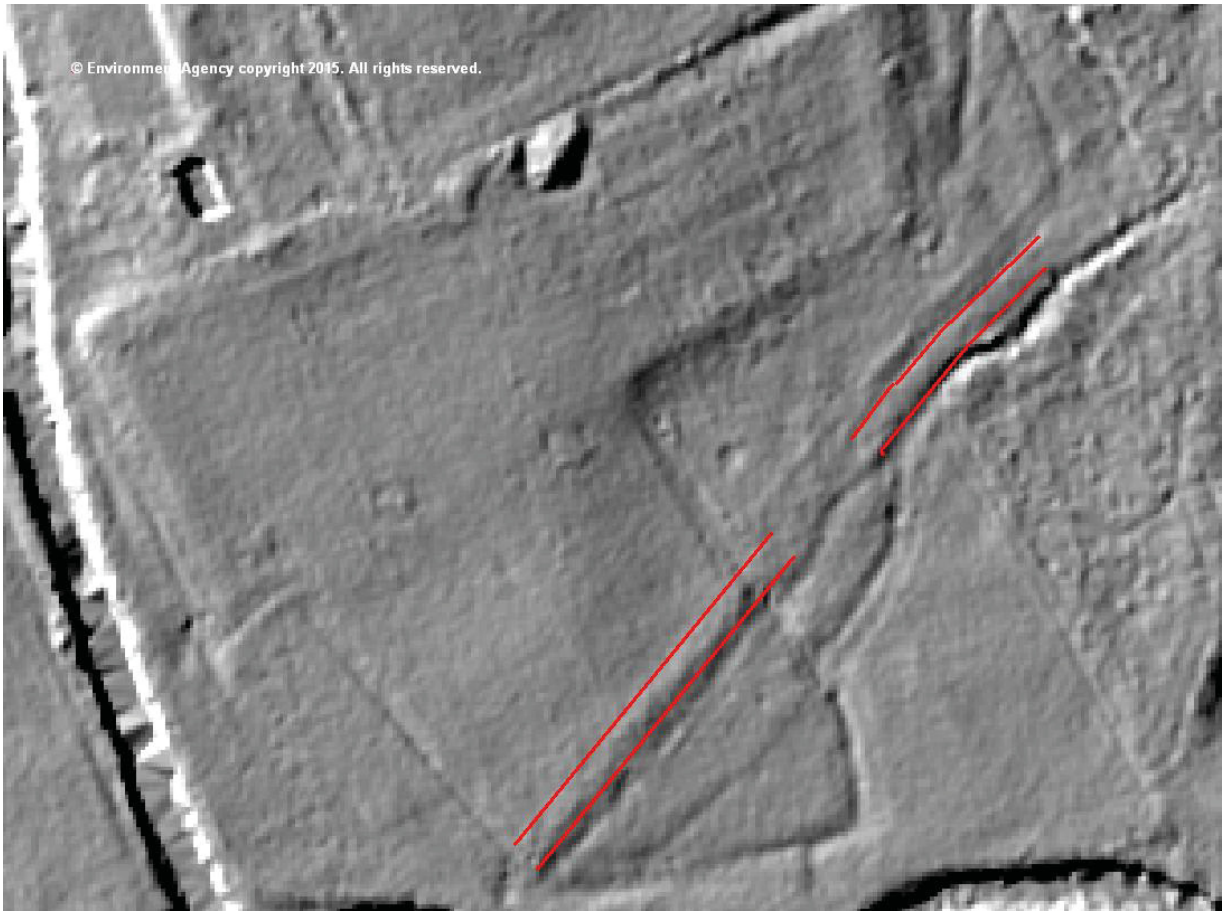

Figure 12: Possible track outlined in red

Figure 13:Possible track looking NE into paddock 6. Ground level traced in white.

Figure 14: Looking north east across the southern end of paddock 5. Ground level traced in white.

Perhaps the most intriguing response areas are either side of the likely river crossing point.

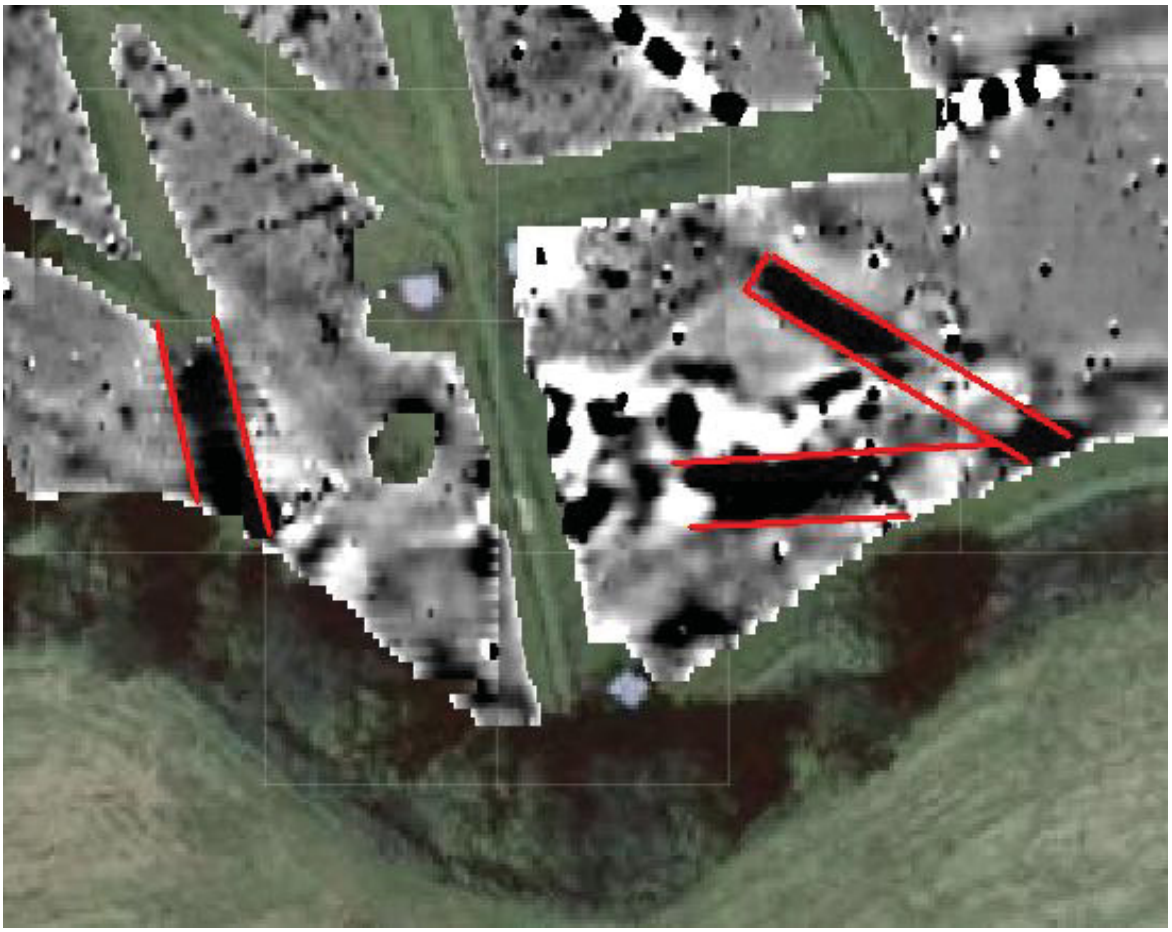

Figure 15: Responses either side of river crossing

In figure 15, the black and white responses east of the road/crossing point are ferrous responses from a gate and a former cattle feeder position. There may be archaeological features there but they have been obscured.

The areas outlined in red do not appear to be from quantities of ferrous items and are more typical of ditch fill. However, at 6 to 7m wide they are of considerable size. One possibility is that they might be docks either side of the river crossing point. The eastern one clearly ends at the edge of the main occupation noise area. The western one may do the same but fencing has taken out any response there.

5.2 Results assessed by paddock number

5.2.1 Paddock 1

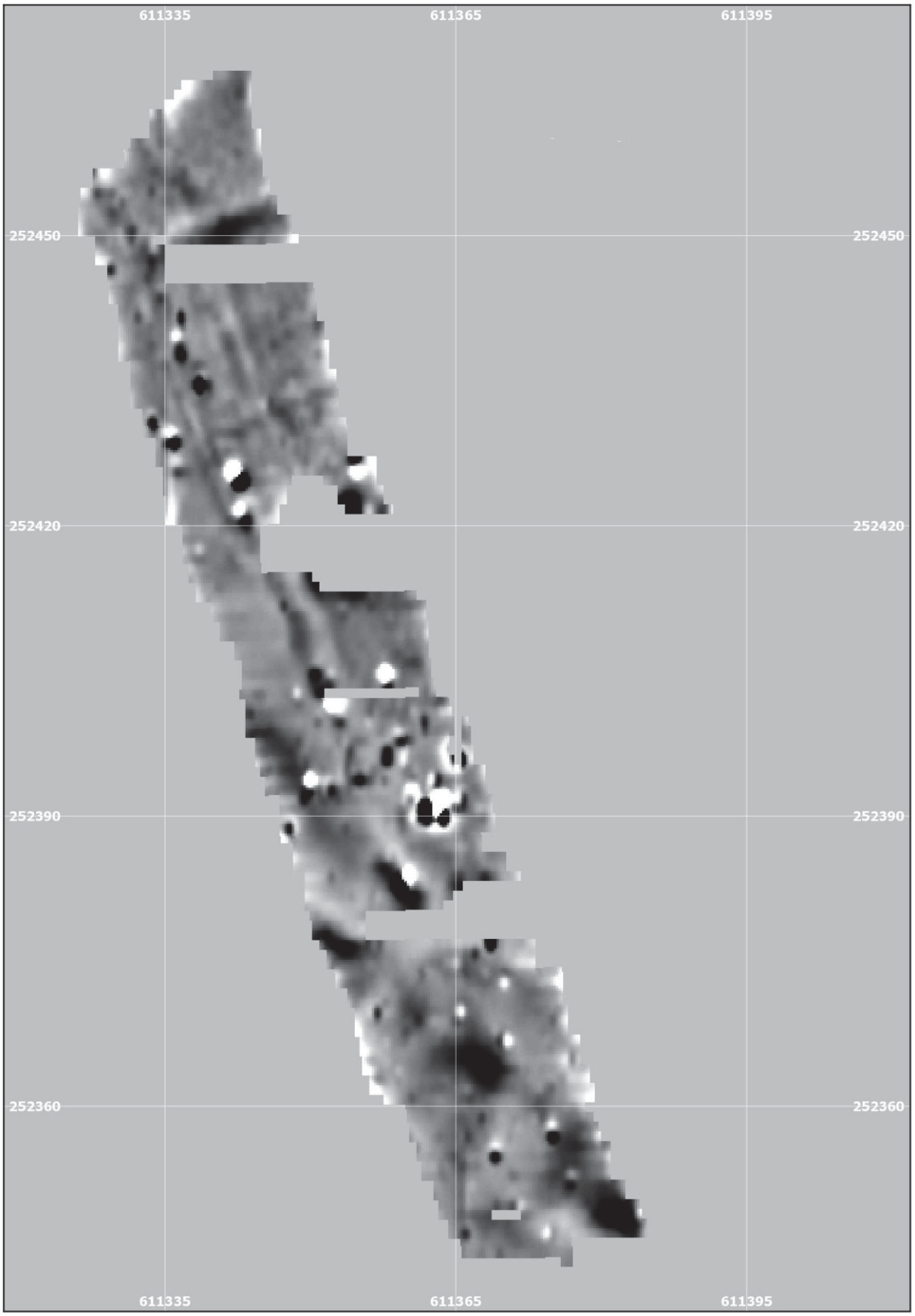

Figure 16: Magnetometry results for Paddock 1. Clipped to +-5nT

Paddock 1 with typical response levels added

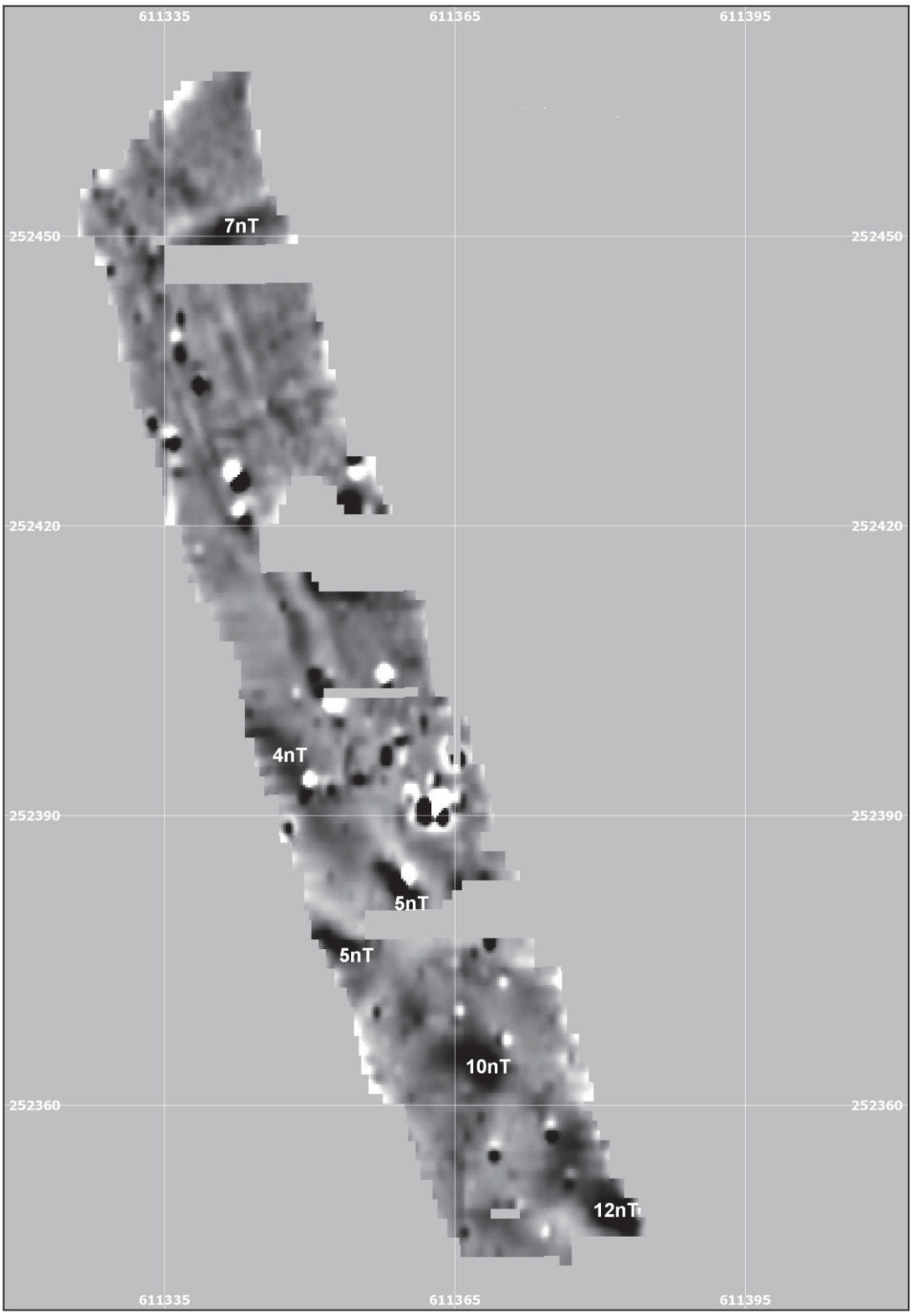

Figure 17: Paddock 1 magnetometry results with typical area responses in nanoteslas added

Paddock 1 assessment

A broad 7nT response, typical of a filled feature such as a ditch is evident in the north of the plot. Unfortunately, a fallen tree and fencing has prevented it being fully resolved. Linears run down from it to the SSE; one of these corresponds to the former field boundary there. In the southern half are a group of response areas, broadly rectilinear, within faint broad features whose extent cannot be determined. One or more of these areas may be structures. More fallen trees and a cattle shed have affected the survey extent.

5.2.2 Paddock 2

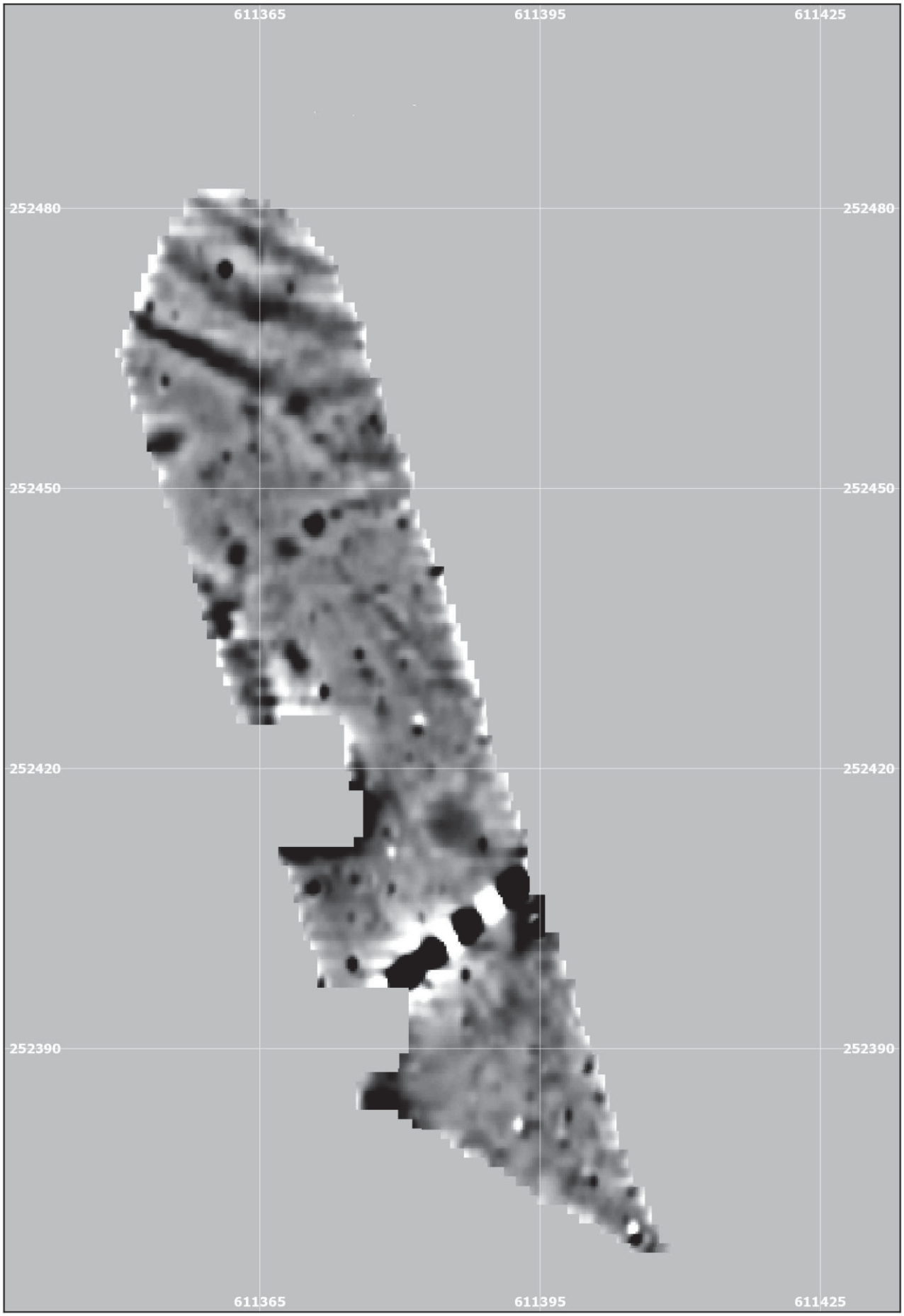

Figure 18: Magnetometry results for paddock 2. Clipped to +-10nT

Paddock 2 with typical response levels added

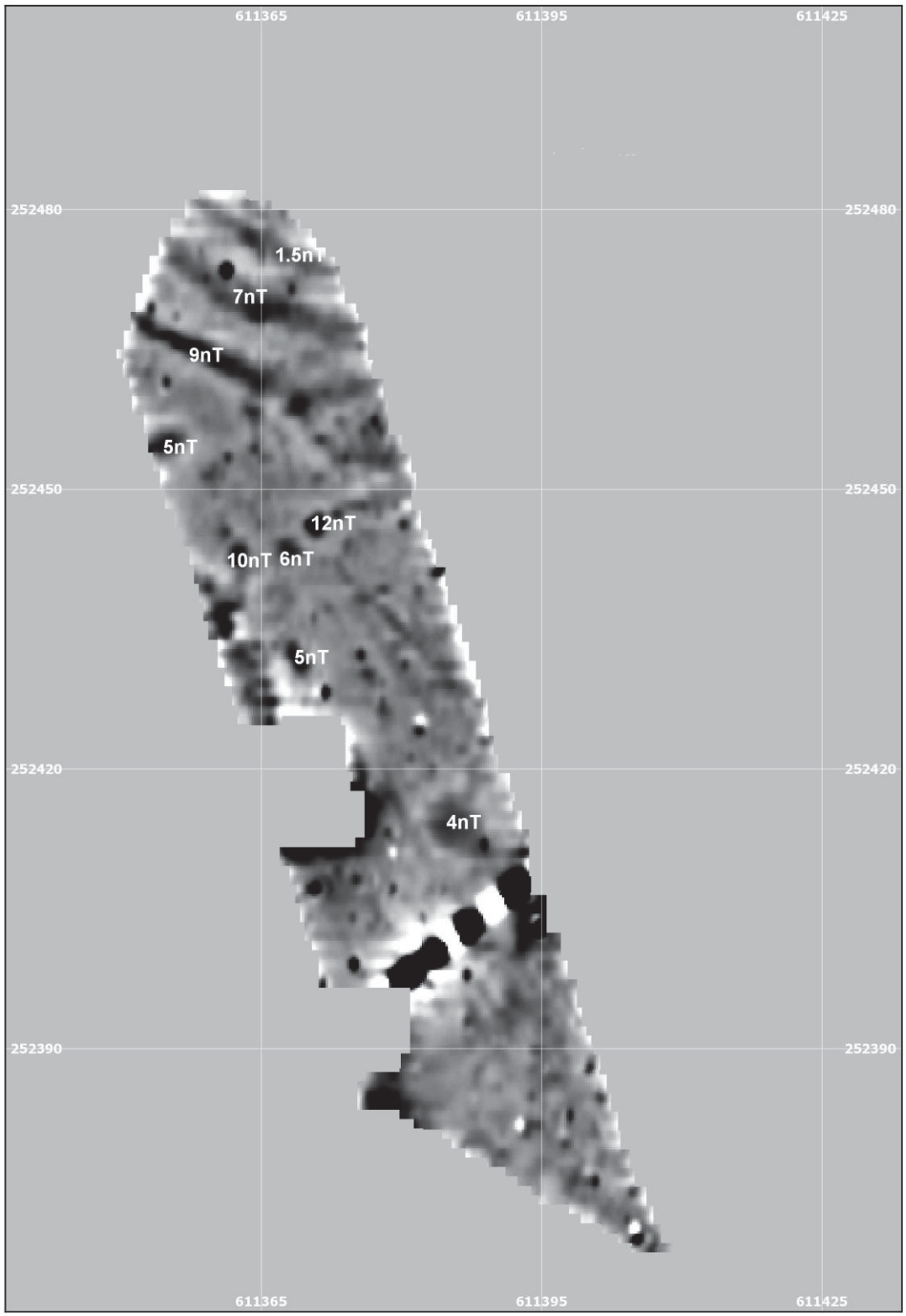

Figure 19: Paddock 2 magnetometry results with typical area responses in nanoteslas added

Paddock 2 assessment

To the north of the paddock, three of the four fort ditches are clearly visible. The fourth would be to the north and has been obscured by fence responses.

South of the ditches are numerous responses typical of pits or filled features, ranging from one to two metres in diameter. Just north of the service pipe (<100nT) is a circular area six metres in diameter. This may be the site of a structure.

Even with the service pipe response present, the degree of clipping (+-10nT) needed to give a presentable image indicates lengthy occupation of this area.

Short linears are evident. There is the possibility that some responses may align as per figure 20 to give a 10m x 20m structure or enclosure.

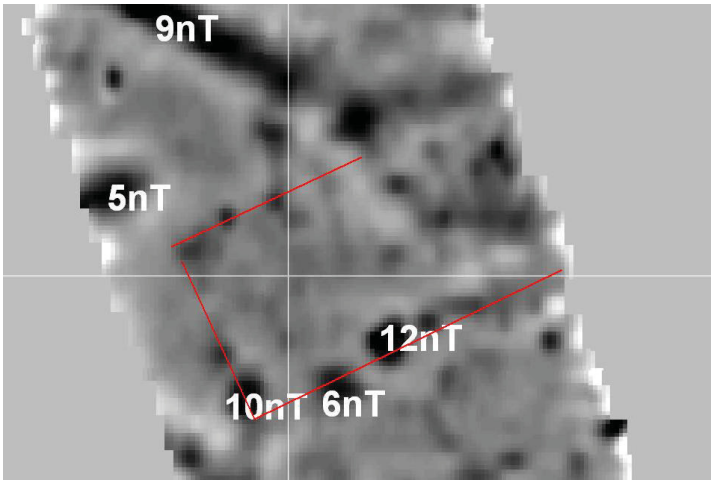

Figure 20: Possible rectilinear in Paddock 2.

5.2.3 Paddock 3

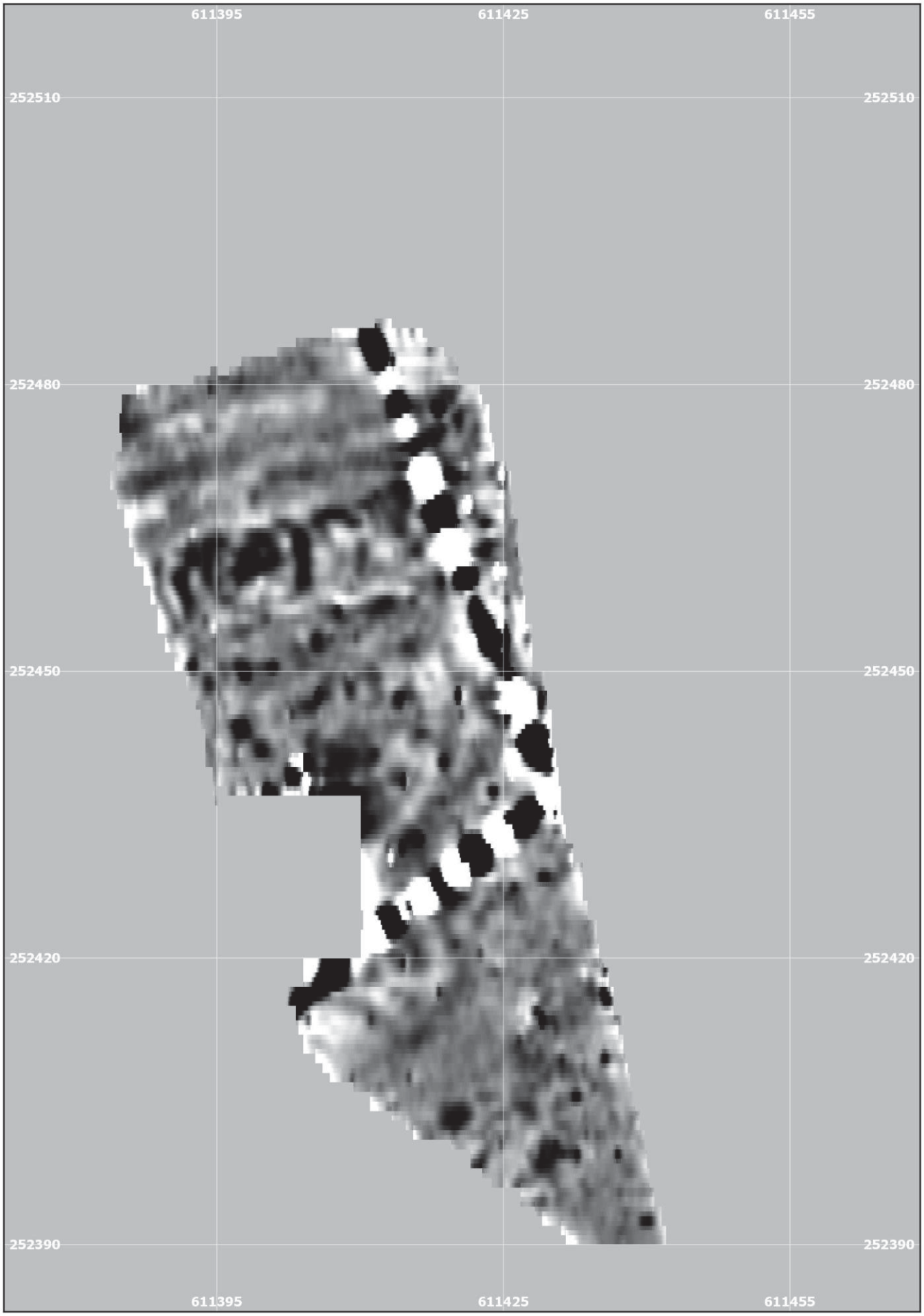

Figure 21: Magnetometry results for paddock 3. Clipped to +-10nT

Paddock 3 with typical response areas added

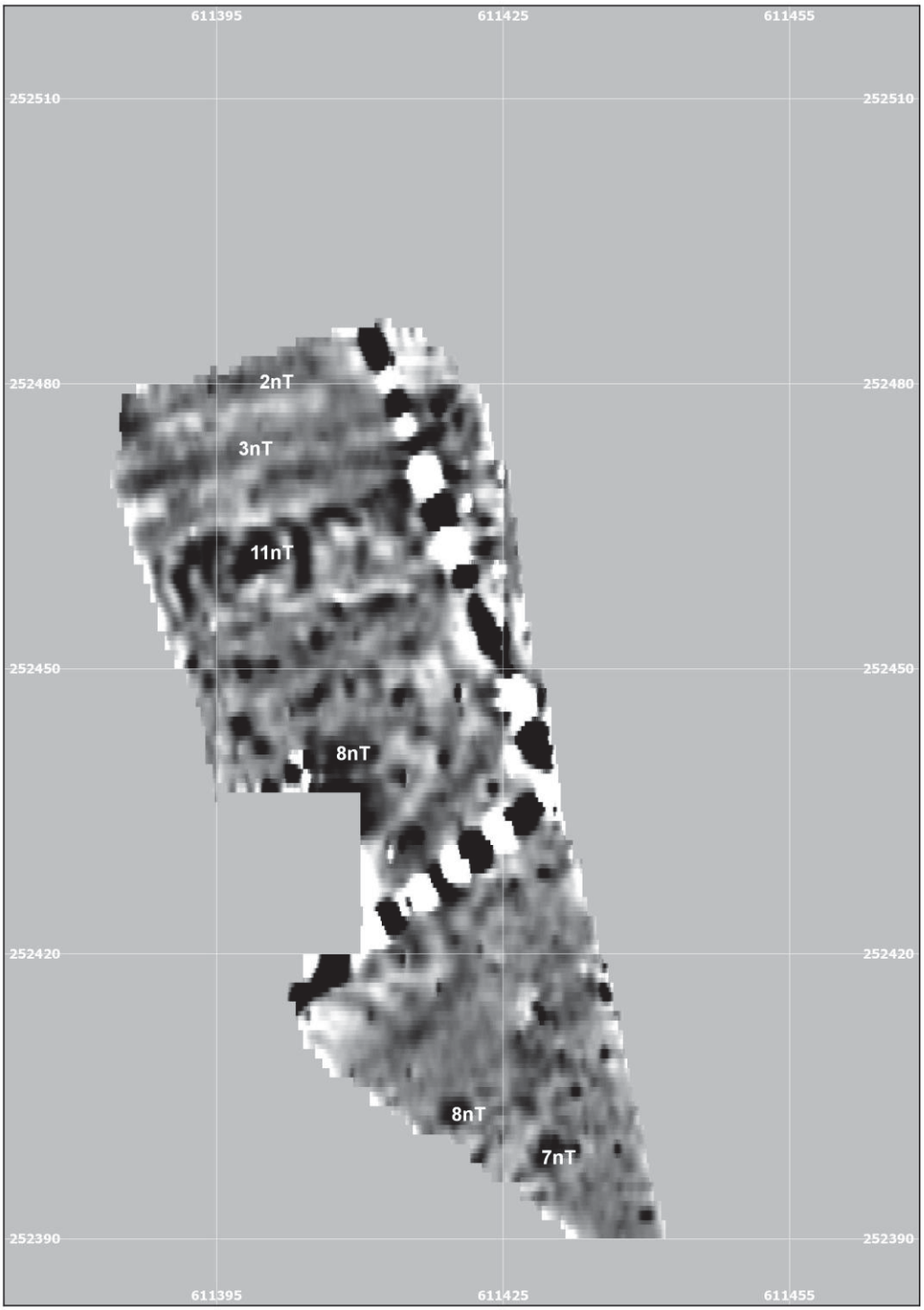

Figure 22: Paddock 3 magnetometry results with typical area responses in nanoteslas added

Paddock 3 assessment

As per paddock 2, this is a area of overall high magnetic response. This is in part due to the service pipe but the results clearly show large numbers of response areas, probably pits. The largest of these is approximately 3m in diameter. There is some negative fringing in and adjacent to the 'elbow' of the service pipe line that may indicated fired material but this may be due to the combined effect of the pipework and the corrugated iron-roofed cattle shed that has been cropped out on the western side.

At least two of the fort ditches are evident crossing the northern section of the paddock. There may be a third along the northern edge. South of these features, the ground is heavily disturbed.

5.2.4 Paddock 4

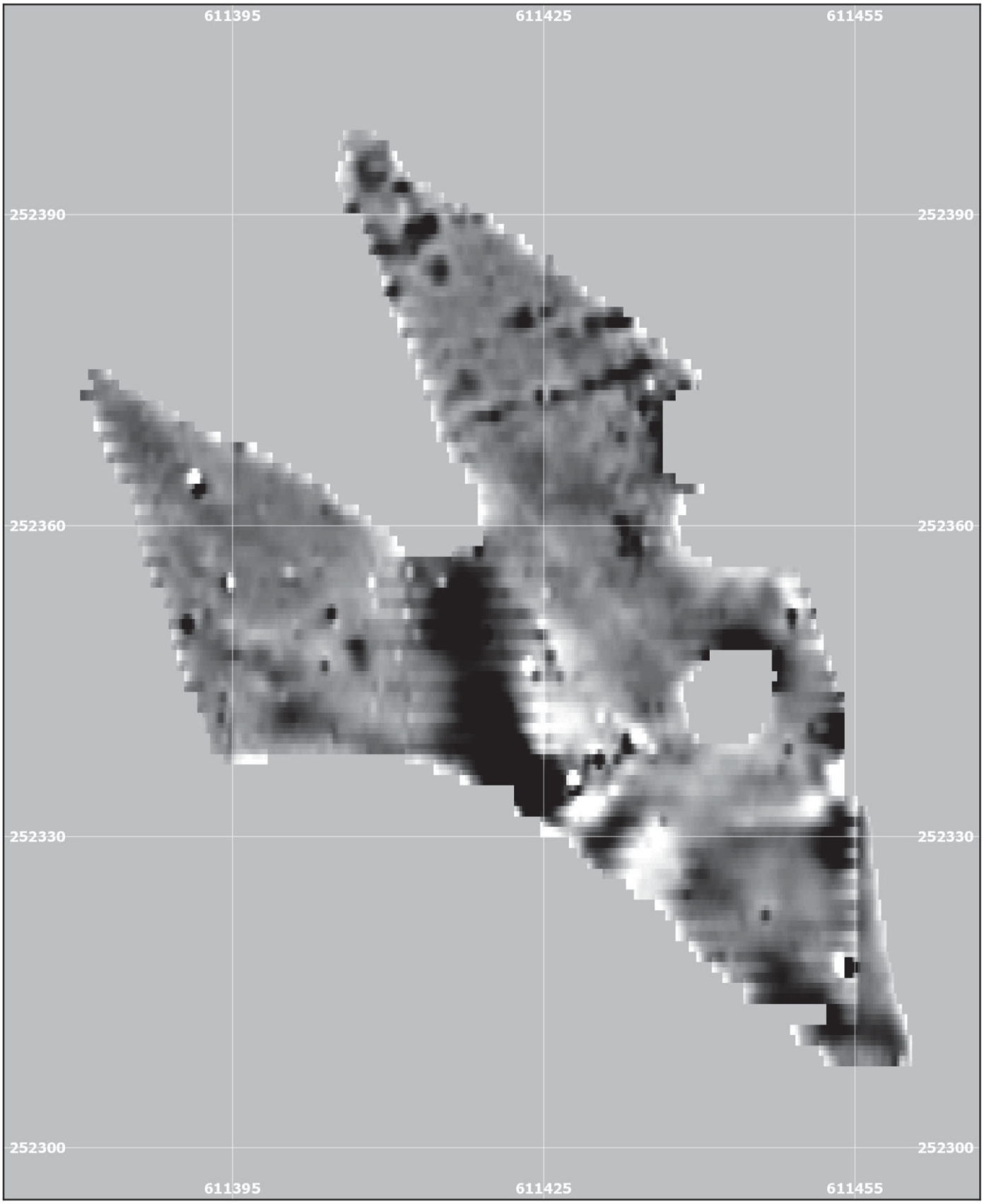

Figure 23: Magnetometry results for paddock 4. Clipped to +-10nT

Paddock 4 with typical response areas added

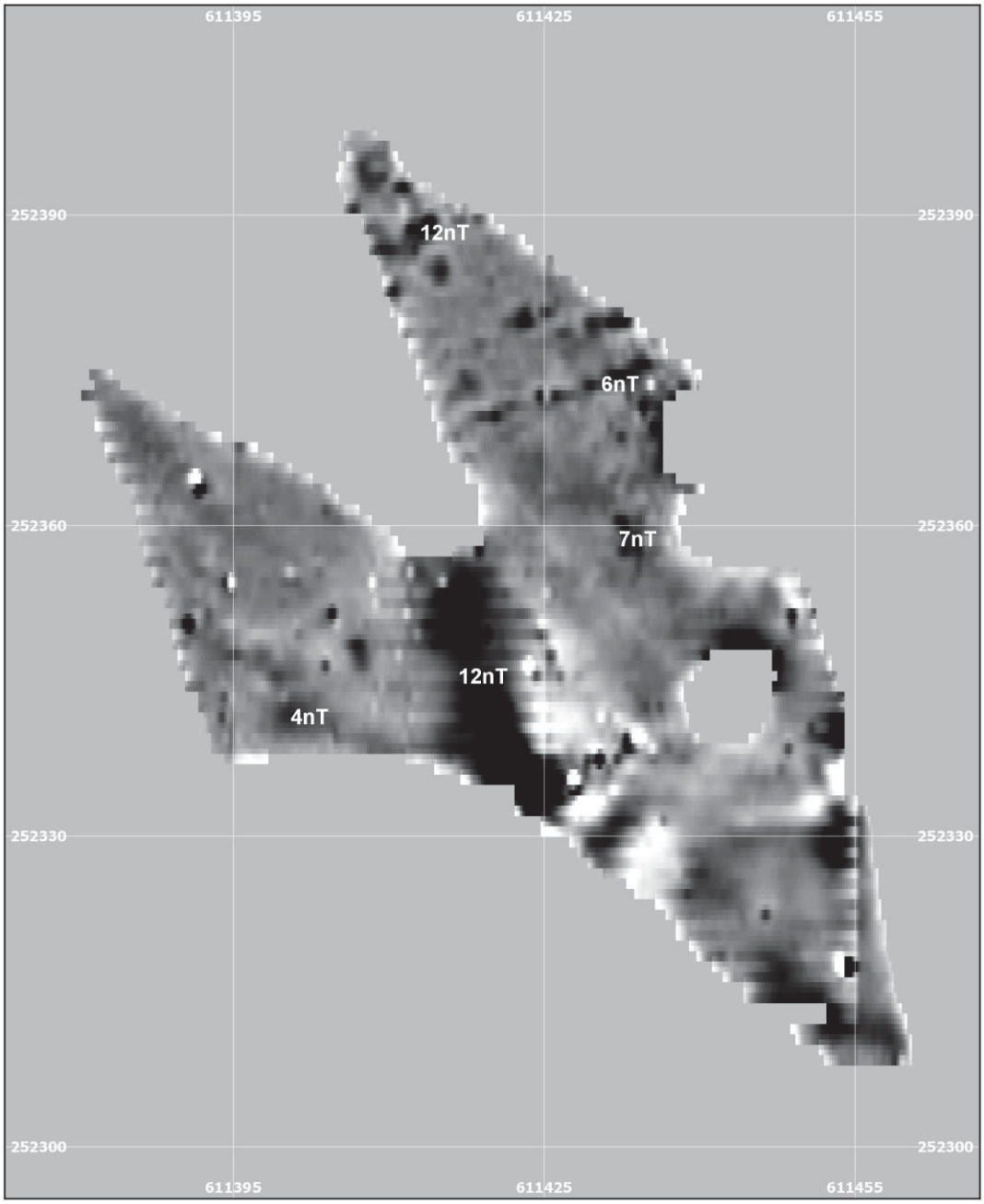

Figure 24: Paddock 4 magnetometry results with typical area responses in nanoteslas added

Paddock 4 assessment

Once more, a magnetically noisy area, affected by fencing, gates, a shed and (where the hole is) a fixed cattle feeder. However, what is of interest is the broad linear 12nT response running slightly west of north from the river.

The surface response is approximately 6.5m wide and taken on its own, could be seen as a very large ditch perhaps 5m or more across. At 12nT, the response is too high to be the kind of broad positive response area associated with watercourses and flood-prone areas.

However, this area abuts the road to the east at the point where the latter meets the river. There are similar features, described later, on the eastern side of the road, leading up from the river. This may be a dock - a wide cutting to bring in boats to aid the transfer of goods from river transport. Whatever the feature's origins, the response points to a deep and wide area filled with magnetically noisy soil.

5.2.5 Paddock 5

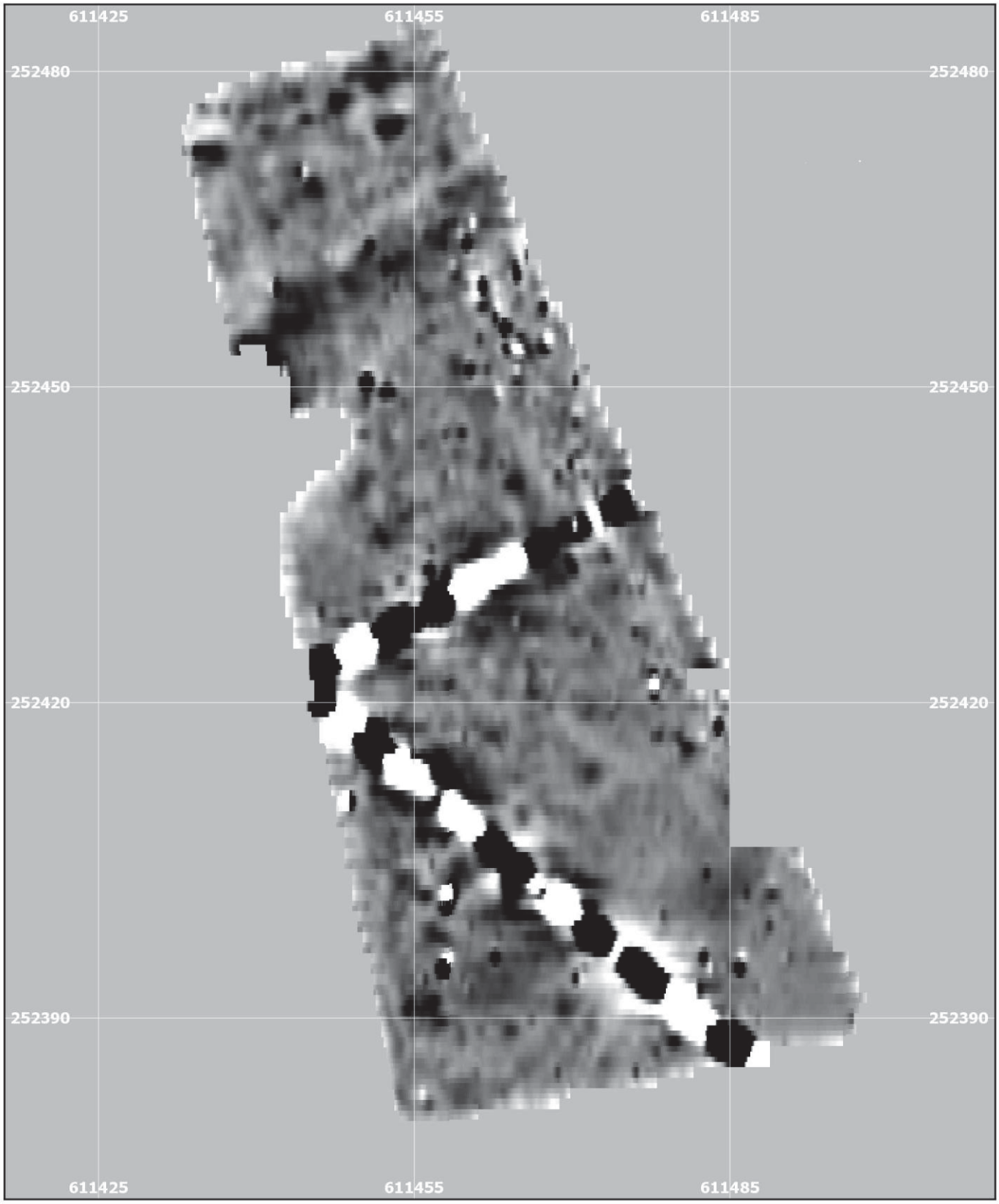

Figure 25: Magnetometry results for paddock 5. Clipped to +-10nT

Paddock 5 with typical response areas added

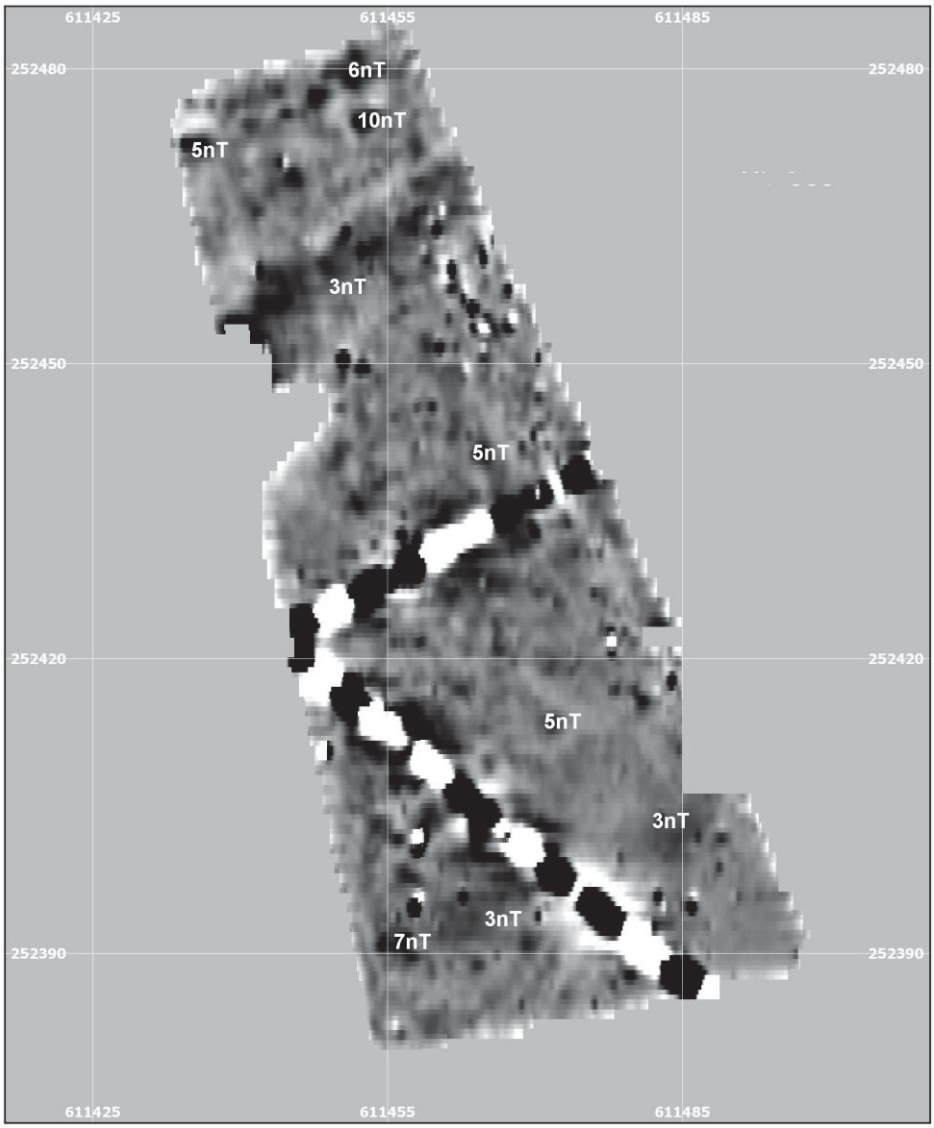

Figure 26: Paddock 5 magnetometry results with typical area responses in nanoteslas added

Paddock 5 assessment

This is another area of high response levels, even taking the service pipe response into account. There are large numbers of responses, although many do not appear to delineate any larger features. Crossing the northern part is an 11m wide response area. There is a bank at this point which it overlays but it is not aligned with it. It starts to cross the bank heading north east but any further trace of it is under small animal pens. Going further north east, it would cross paddock 6. There is some evidence of that but the area there is not well-defined before being lost in the excavated area for the mere. It is difficult to say just what this feature is - track, enclosure or structure.

At the southern end of the paddock are two areas shown as 3nT. On its own, the eastern one is unremarkable but it is an area aligned with the possible track discussed earlier. It corresponds to the raised area shown in figure 14. Unfortunately, if it does continue southwest, as it approaches the pipework, any response is masked and the same effect happens on crossing it.

There are some faint circular features evident. Just north of the service pipe are three overlapping circles, albeit too weak to be conclusive. A more promising circular area, with a central area of noise is to the south. These are shown in figure 27. Note that the features are not as complete as depicted; more an assembly of curving responses. The upper and lower ones have diameters of 17 to 18m respectively.

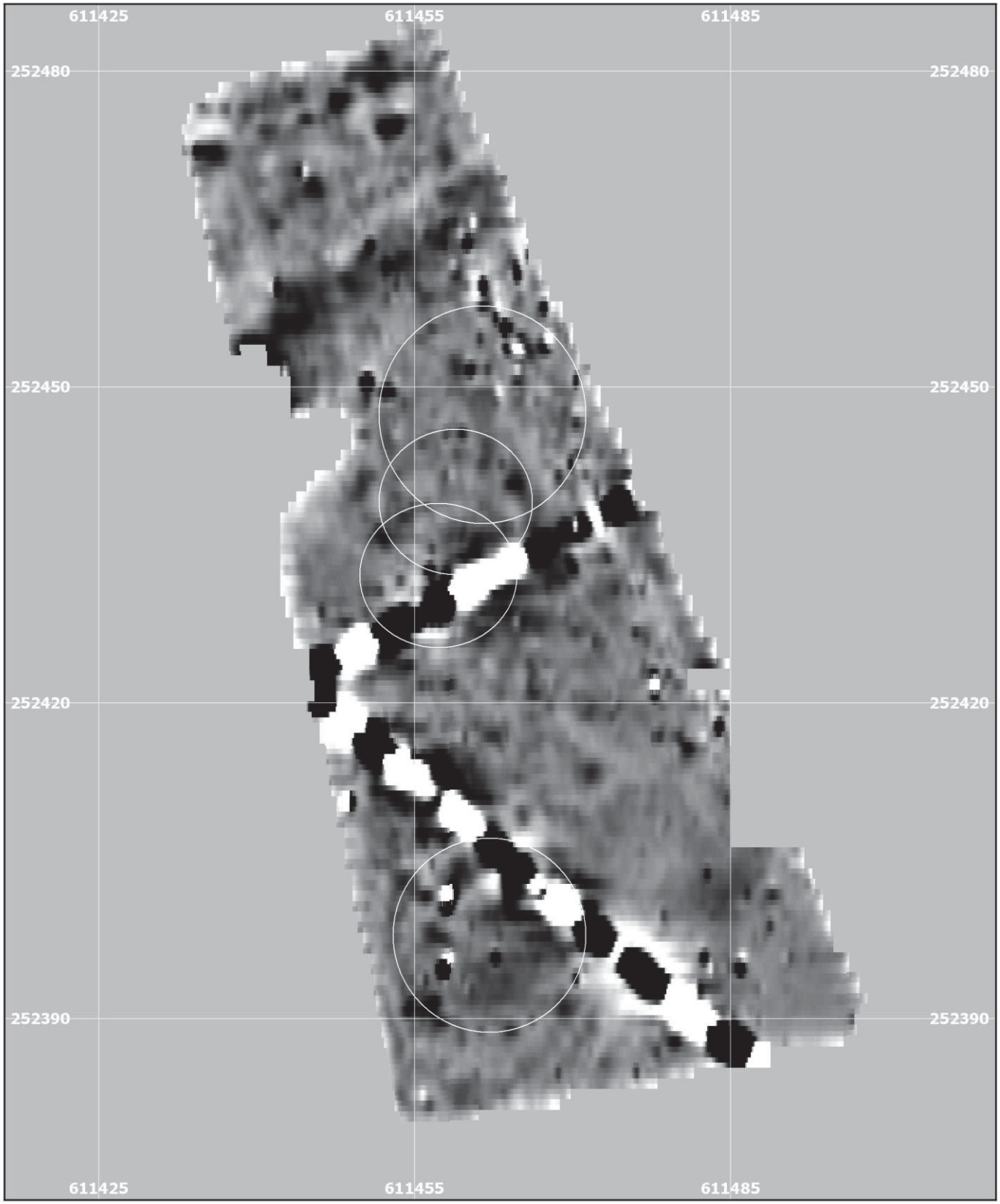

Figure 27: Possible circular features in Paddock 5

5.2.6 Paddock 6

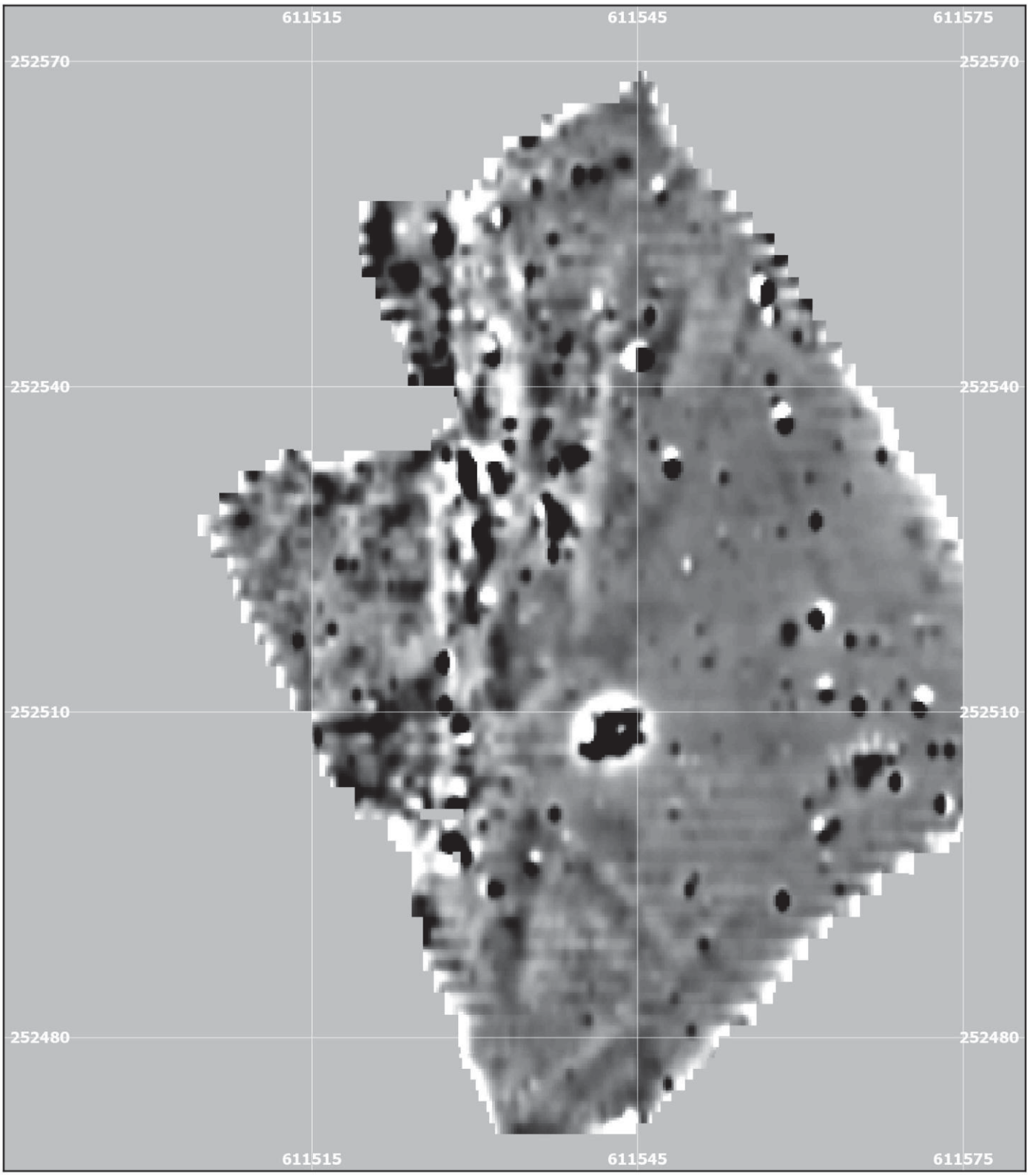

Figure 28: Magnetometry results for paddock 6. Clipped to +-4nT

Paddock 6 with typical response areas added

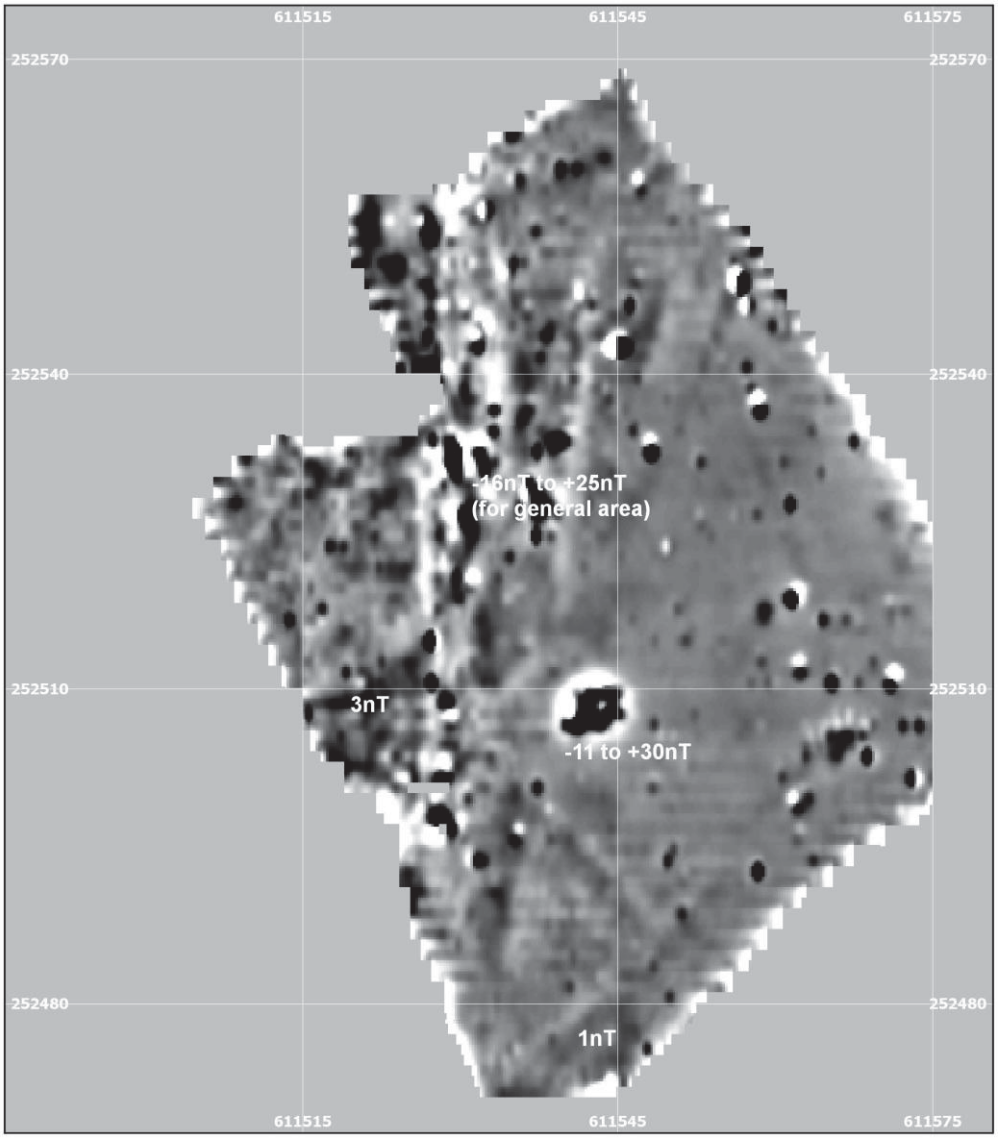

Figure 29: Paddock 6 magnetometry results with typical area responses in nanoteslas added

Paddock 6 assessment

It was hoped that this area would capture the location of the triple ditches of the larger fort. However, the removal of soil to the east and the presence of a large amount of magnetic noise elsewhere has resulted in little, if any, evidence of these remaining. There are faint, short traces in the northern section of two linears heading in the direction of the crop mark ends of the triple ditches but nothing conclusive. The western side shows occupation noise while much of the central area shows ferrous responses and general ground disturbance. The latter may be associated with flow from the ditch across the north of the area as evident in figure 6.

In the centre is a kiln-like response. Its magnetic profile in a section across is shown in figure 30.

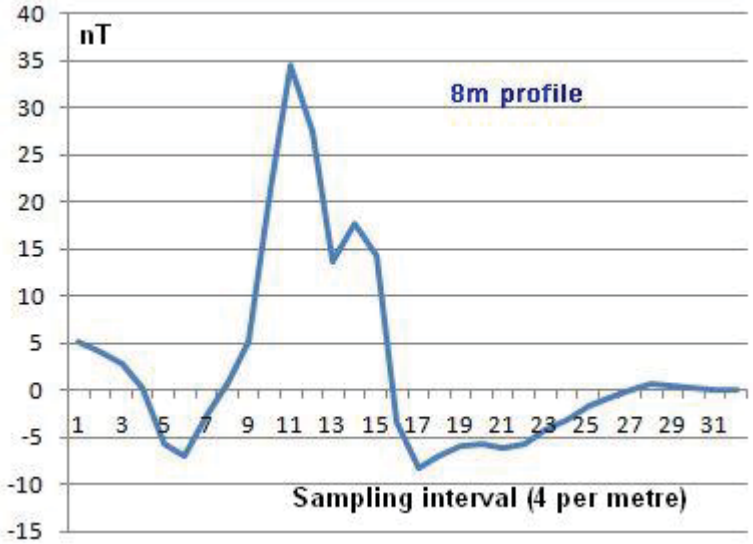

Figure 30: 8m profile section of response area in Paddock 6

Although this response is reasonably consistent with a kiln, it may be due to a quantity of small ferrous items at plough depth or similar, particularly as it is situated in an area in or at the edge of where the mere has been excavated.

Heading southeast from the southern end of the site are some faint linears. There appear to be four in parallel but these are not traceable any further south east.

5.2.7 Paddock 7

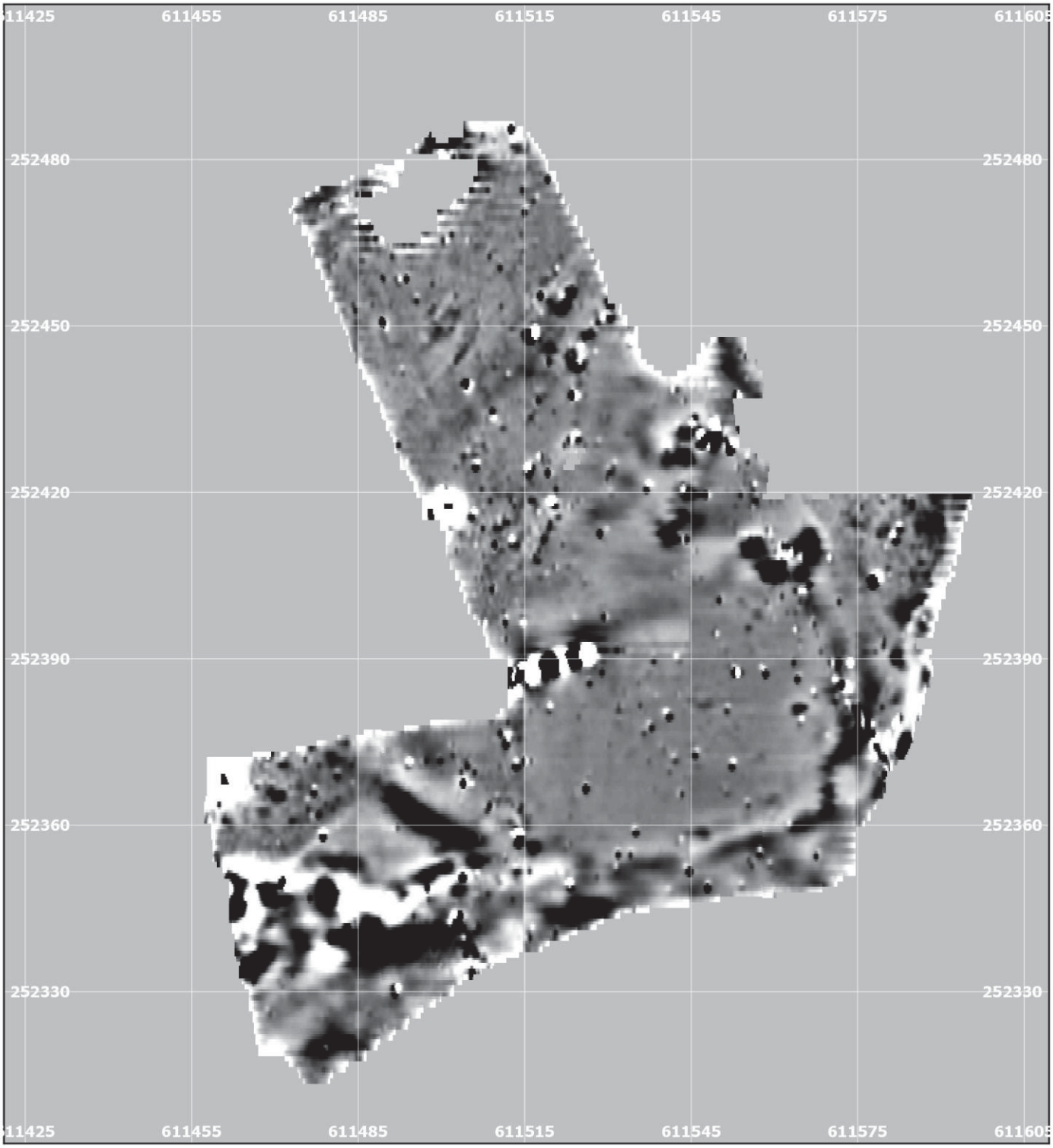

Figure 31: Magnetometry results for paddock 7. Clipped to +-5nT

Paddock 7 with typical response areas added

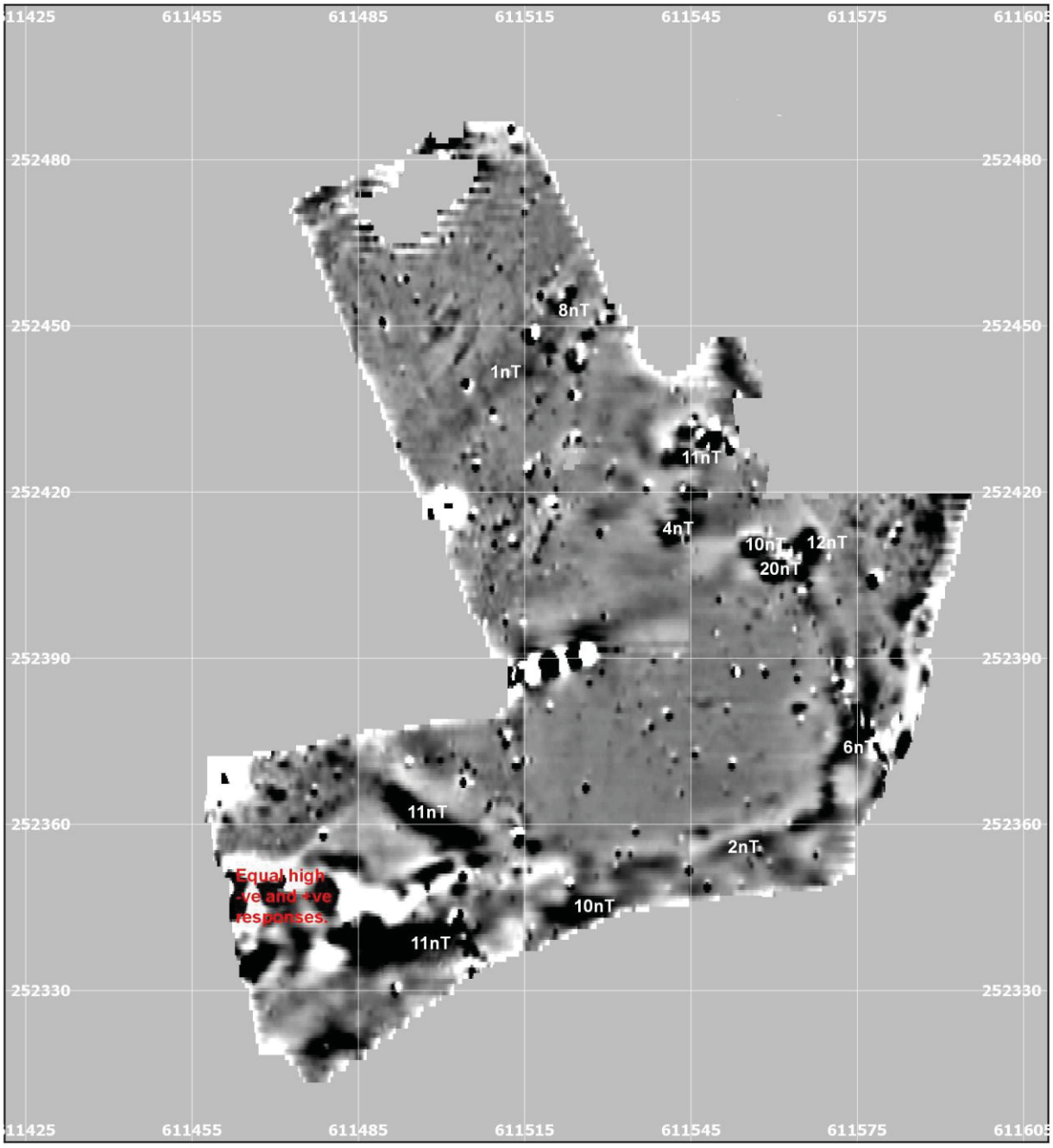

Figure 32: Paddock 7 magnetometry results with typical area responses in nanoteslas added

Paddock 7 assessment

By far the largest of the surveyed paddocks, this was surveyed by several group members. Much of its eastern section is at a lower level than the rest of the site and would have been at risk of flooding. Little is showing in that section. The area of noise to the extreme east is due to fencing and a water main, plus signs of modern debris and other material probably associated with landscaping the mere.

On the western side, the two white areas with a central positive response are where sections of steel pipework are embedded in the ground. Crossing the paddock at the position of the 1nT response area in the northern section is a faint linear band that corresponds to the possible road/track position discussed earlier.

Elsewhere, the possible dock(s) to the southwest have already been discussed in the overview section. Figure 32 shows the area of equal positive and negative responses, probably due to ferrous material.

6. REFERENCES

Pastscape website: Monument number:388704 Combretovium

Suffolk Historic Environment Record CODD 003