

LBNG/03



# LAND EAST OF LYDNEY, GLOUCESTERSHIRE

Geophysical Survey

commissioned by CgMs Consulting

P1097/08/OUT

July 2015



# LAND EAST OF LYDNEY, GLOUCESTERSHIRE

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commissioned by CgMs Consulting

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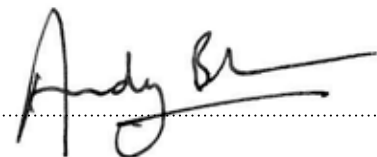
July 2015

project info

**HA JOB NO.** LBNG/03  
**NGR** SO 644 036  
**PARISH** Forest of Dean  
**LOCAL AUTHORITY** Gloucestershire  
**OASIS REF.** headlandS-218433

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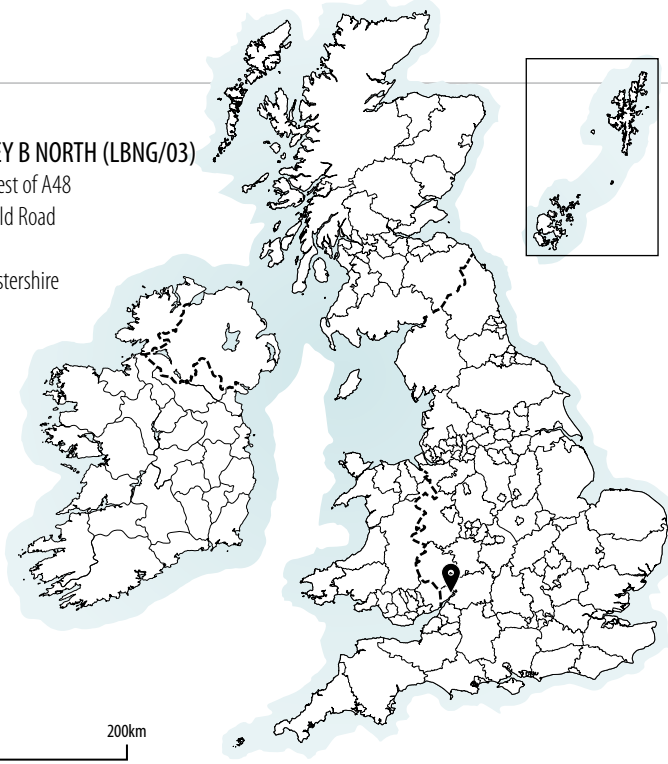
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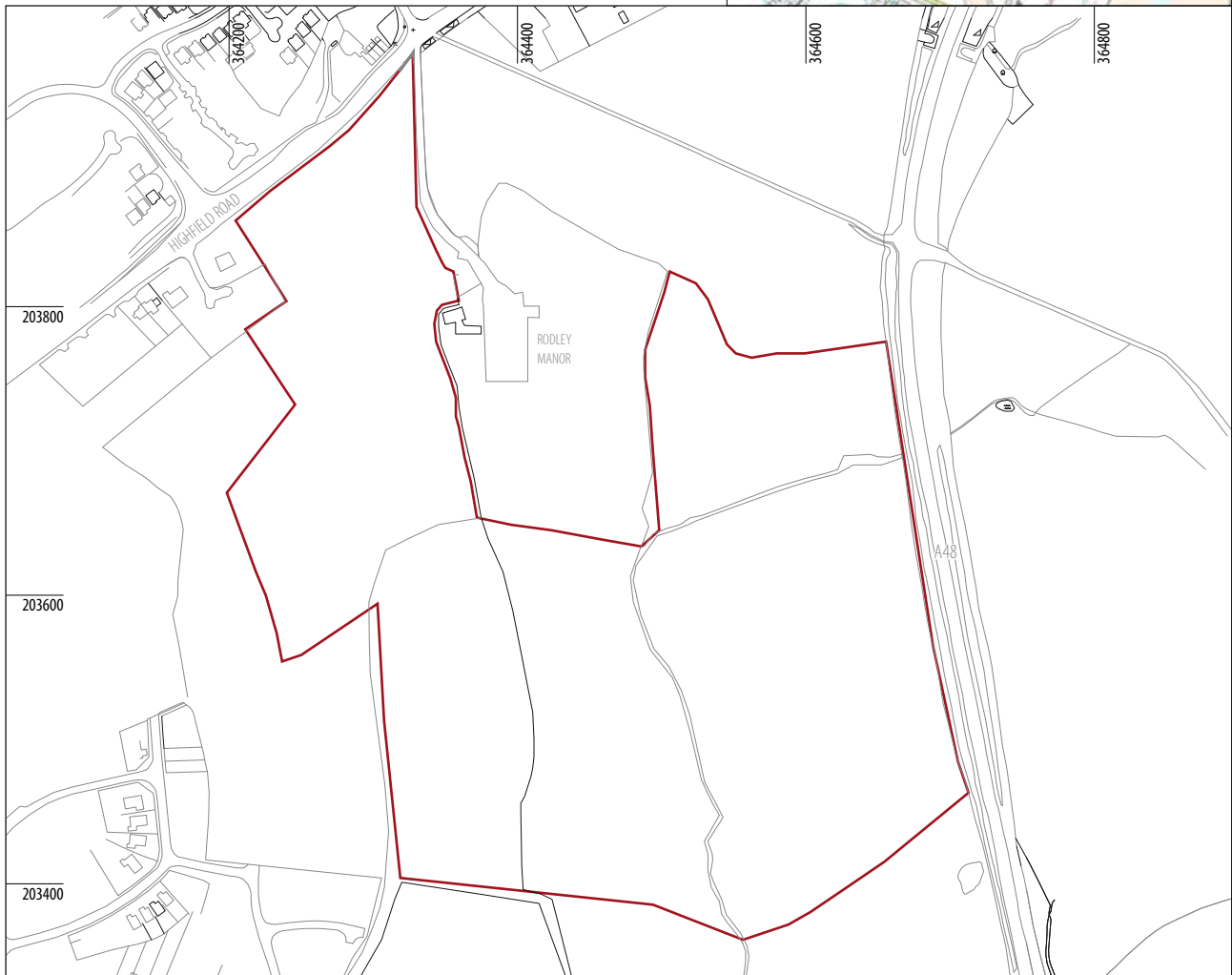
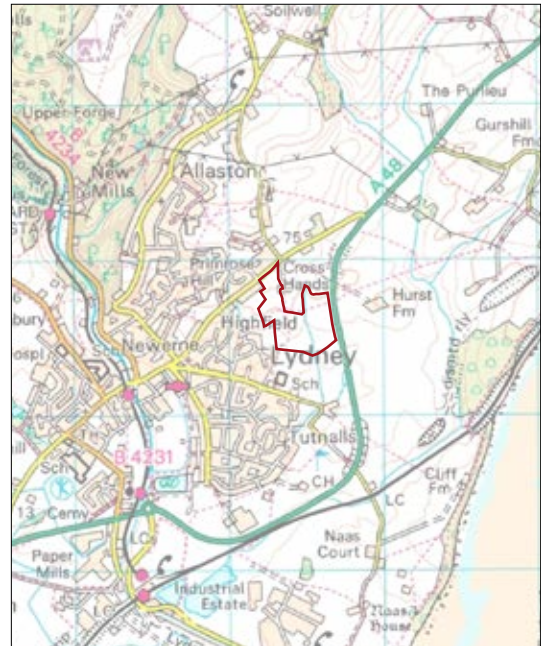
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**LYDNEY B NORTH (LBNG/03)**

land west of A48  
Highfield Road  
Lydney  
Gloucestershire





0 200km



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**KEY**

 geophysical survey area

0  250m  
scale 1:5,000 @ A4



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**ILLUS 1**

Site location

# LAND EAST OF LYDNEY, GLOUCESTERSHIRE

## Geophysical Survey

Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey covering approximately 14.5 hectares on agricultural land east of the village of Lydney, Gloucestershire, to provide further information to inform mitigation proposals required by Condition 26 attached to planning permission granted by Forest of Dean Council (Ref. P1097/08/OUT). The survey has identified archaeological anomalies suggestive of ditches, a rectangular enclosure, possible structures and areas of burning all of which are confined to the NE corner of the survey area. The anomalies corroborate and enhance the results of a previous programme of trial trenching in which Roman building material and iron-working material was recovered. Elsewhere, anomalies have been detected which reflect the former agricultural landscape as depicted on historical Ordnance Survey maps, whilst traces of earlier agriculture in the form of ridge and furrow cultivation is also identified. No anomalies were detected to confirm or negate the presence of a Roman road which is recorded as traversing the north of the survey area in the Gloucestershire Historic Environment Record. On this basis, the archaeological potential of the site is considered to be locally high in the vicinity of the archaeological anomalies but low across the remainder of the site.

## 1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by CgMs Consulting to undertake a geophysical (magnetometer) survey on land to the east of Lydney, Gloucestershire. The work was undertaken in accordance with a Project Design (Headland Archaeology 2015) submitted to and approved by the Local Planning Authority's archaeological advisor and in line with current best practice (David et al 2008). The survey was carried out between June 10th and June 16th 2015 in order to provide additional information on the archaeological potential of the site.

### 1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The consented development area (CDA) is located to the immediate east of Lydney, centred at NGR SO 644 036. The geophysical survey area comprises of five fields (Field 1 – Field 5) within an irregularly-shaped parcel of land which is roughly bound by Highfield Road to the north, the A48 Lydney Bypass to the east, Severnbanks Primary School to the south and residential properties and enclosed fields to the west (see **Illus 1**). The site is bisected by a minor watercourse which divides Fields 1 – 3 in the west from Field 4 and Field 5 in the east. At the time of the survey, the fields were under different stages of silage crop (see **Illus 2** to **Illus 11** inclusive).

The survey area is located on a south-facing gradient being at 70m above Ordnance Datum (aOD) at Highfield Road in the north and 33m aOD at the southernmost boundary.

An area within the north-east of Field 2 was overgrown at the time of the survey and was unsuitable for survey (see **Illus 4** and **Illus 12**) whilst isolated areas of vegetation within the centre of Field 3 could also not be surveyed.

### 1.2 GEOLOGY AND SOILS

The underlying bedrock comprises argillaceous rocks and interbedded sandstone of the Maughans Formation. No superficial deposits are recorded (British Geological Survey 2015). The soils are mainly classified in the Soilscape 8 association, characterised as loams and clays with impeded drainage (Landis 2015).

## 2 ARCHAEOLOGICAL BACKGROUND

The projected route of a Roman road is recorded in the Gloucestershire HER (HER 6212) as traversing the north of the survey area on a NE-SW alignment (see **Illus 12**). Trial trenching as part of



ILLUS 2

General view of Field 1, looking N



ILLUS 3

General view of Field 1, looking W



ILLUS 4

General view of Field 2, looking SW



ILLUS 5

General view of Field 2, looking SE



ILLUS 6

General view of Field 3 (W), looking S



ILLUS 7

General view of Field 3 (E), looking S

a previous archaeological evaluation of the wider area (Wessex Archaeology 2003) found no trace of the road. However, evidence for Roman activity was identified within the north-east of the survey area. Roman ditches were excavated in Trenches 74 and 76, whilst a wider spread of unstratified Roman pottery and ceramic building material encompasses Trenches 74, 76, 77, 78 and 105. It was the excavator's view that one or more Roman buildings must have once stood in the near vicinity. Within the south of this group of trenches, significant quantities of iron slag, medieval pottery and possible Roman tile were recovered from features within Trench 105.

The only other archaeological features of note which were identified from trial trenching across the survey area include a large circular feature within Trench 127 which was filled with post medieval material and undated features containing iron slag within Trench 125 (see **Illus 12**).

The site of Rodley Manor lies immediately outside of the geophysical survey area and is dated to the medieval period. Trial trenching in the vicinity of the manor identified two substantial buildings as well as significant evidence for small scale medieval iron smelting.





ILLUS 8

General view of Field 1, looking N



ILLUS 9

General view of Field 1, looking W



ILLUS 10

General view of Field 2, looking SW



ILLUS 11

General view of Field 2, looking SE

### 3 AIMS, METHODOLOGY AND PRESENTATION

The main aim of the geophysical survey was to provide additional information to inform mitigation proposals required by Condition 26 attached to planning permission granted for residential development.

The general archaeological objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to therefore determine the presence/absence and extent of any buried archaeological features; and
- to prepare a report summarising the results of the survey.

#### 3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. Features such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the Earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney and Gater, 2003). Further information

on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

Bartington Grad601 magnetic gradiometers were used during the survey, taking readings at 0.25m intervals on zig-zag traverses 1m apart within 30m by 30m grids, so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data.

The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble GeoXR model).

#### 3.2 REPORTING

A general site location plan is shown in **Illus 1** at a scale of 1:5,000. **Illus 2** to **Illus 11** inclusive are general site location photographs. **Illus 12** is a large scale (1:1,250) survey location plan displaying the processed greyscale magnetometer data, and the location of the previous trial trenches. An overall interpretation of the data is shown in **Illus 13** at the same scale. Detailed data plots ('raw' and processed) and interpretative illustrations are presented at a scale of 1:1,000 in **Illus 14** to **25** inclusive. For ease of presentation the survey area is divided into five 'sectors' (Sector 1 – 5). Sector boundaries are shown throughout the illustrations.



Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive.

The survey methodology, report and any recommendations comply with the Project Design and guidelines outlined by English Heritage (David et al. 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations reproduced from Ordnance Survey mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.

## 4 RESULTS AND DISCUSSION

Generally, a variable magnetic background response has been identified across the geophysical survey area with a notable increase in response across Field 5. This increase in response is potentially significant and is elaborated upon in the archaeology section below. The anomalies identified by the survey are discussed below and cross-referenced to specific examples depicted on the interpretative figures, where appropriate.

### 4.1 FERROUS/MODERN ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on most sites, often being present as a consequence of manuring or tipping/infilling. On this site, there is no obvious pattern or clustering to their distribution to suggest anything other than a random background scatter of ferrous debris in the plough-soil.

Several high magnitude dipolar linear anomalies, **A – G**, have been detected across the western half of the survey area on a variety of orientations. These locate buried service pipes. The linear band of magnetic disturbance, **H**, on the eastern side of service pipe **E/F** is caused by a metalised farm track. Within the south of the survey area, a broad area of magnetic disturbance, **I**, corresponds to a former pond which is depicted on the first edition Ordnance Survey (OS) map (1880). The disturbance is caused by the magnetic material used to back-fill the former pond. Elsewhere, unless otherwise stated, magnetic disturbance at the perimeters of the survey area is caused by ferrous material within, or forming part of, the adjacent field boundaries.

### 4.2 AGRICULTURAL ANOMALIES

Analysis of historical OS mapping indicates that several field boundaries have been removed from within the survey area since the publication of the first edition OS map in 1880. Five of these

former boundaries have been detected by the survey as fragmented linear anomalies, **J–N**. Within the west of Field 3 (see **Illus 17**, **Illus 18** and **Illus 19**) an east-west aligned linear anomaly, **O**, is identified. The anomaly locates a soil-filled ditch, either a former field boundary which was removed prior to the publication of the first edition OS map, or a field drain running from a former pond (now overgrown and unsuitable for survey) in the east to the minor watercourse running along the western field boundary.

Elsewhere, faint parallel linear trends can be seen on a north/south alignment throughout Field 2 (see **Illus 14** to **Illus 19** inclusive). The anomalies are parallel with the exiting field boundaries and are thought to be due to modern ploughing. More widely-spaced, faint parallel linear trends have been identified across the western half of Field 4 (see **Illus 20**, **Illus 21** and **Illus 22**). This wider spacing is more typical of the medieval and post medieval practice of ridge and furrow cultivation. The characteristic striping in the data is due to the contrast between the former ridges and the in-filled furrows.

### 4.3 GEOLOGICAL ANOMALIES

Throughout the site numerous discrete, low magnitude, anomalies have been identified. In theory any of these anomalies could be due to an archaeological pit. However, the sheer number of these anomalies and their relatively even distribution precludes an archaeological interpretation and it is thought that the anomalies are caused by variations in the composition of the soils from which they derive. Faint sinuous trends within the east of Field 3 (see **Illus 17**, **Illus 18** and **Illus 19**) are interpreted as being geological in origin, perhaps being due to the presence of localised alluvial deposits associated with the adjacent watercourse.

### 4.4 QUARRYING? ANOMALIES

Three shallow topographical features of similar size were noted during the course of the fieldwork. All of these features manifest in the data as broad and amorphous areas of magnetic disturbance, **P–R**, in Field 2, Field 3 and Field 4 respectively. Each are thought to be due to the magnetic material used to fill former ponds or quarry pits. Area **R** corresponds to a large circular feature identified during the excavation of Trench 127 (see **Illus 12**). The upper fills of the feature contained post-medieval pottery, ceramic building material and blast furnace slag and this material is likely to account for the magnetic disturbance identified by the survey.

### 4.5 ARCHAEOLOGICAL AND POSSIBLE ARCHAEOLOGICAL ANOMALIES

Unless otherwise stated, anomalies of archaeological origin are thought to be caused by soil-filled cut features such as ditches, often forming part of a system of land division and enclosure, and by discrete features, such as pits, which may be indicative of settlement activity.

A clear area of archaeological potential has been identified within Field 5 and the north-east corner of Field 4 as a series of linear and rectilinear anomalies within a broad area of increased background response (see **Illus 20**, **Illus 21** and **Illus 22**). The anomalies correspond

to the approximate area in which Roman features and artefacts were recovered during trial trenching. Within the north-east corner of Field 5 a clear rectangular enclosure, **S**, can be seen on a north-east/south-west orientation. The enclosure measures 18m by 30m and contains a rectangular anomaly, **T**, within its centre, possibly a structure, measuring 12m by 7m.

The enclosure is appended to the eastern edge of a north-west/south-east aligned linear anomaly, **U**, which is thought to be due to the soil-fill of a ditch. Towards the south of this ditch, a second possible enclosure, **V**, is identified. This enclosure is also appended to the eastern side of the ditch and is smaller, fragmented and D-shaped in form. The broad amorphous area of magnetic disturbance, **W**, to the immediate south of **V** may also be of archaeological interest, perhaps being due to a spread of enhanced material. However, the disturbance is located at an entrance to the field and so equally may be caused by ground disturbance and/or material used as hard-standing.

As already mentioned, the general background response within the east of Field 5 is notably elevated. This is likely to be due to spreads of archaeological material within the topsoil, perhaps having been redistributed by ploughing. Two broad bands of increased response, **X** and **Y**, project westwards from the archaeological anomalies. No obvious archaeological anomalies are visible within this elevated background but it is possible that any low magnitude anomalies of archaeological potential, if present, may be masked or obscured within the affected area.

Within the north-east of Field 4 a second possible structure, **Z**, is identified as a rectangular anomaly measuring 6m by 15m. The possible structure appears to be oblique to the enclosures in Field 5 and therefore may relate to a separate phase of activity. To the immediate south-west of the possible structure a broad, amorphous and high magnitude anomaly, **Aa**, is identified. The magnitude of the anomaly is suggestive of the burning of materials at high temperatures, and given the significant quantities of iron slag which was recovered in Trench 105 (see **Illus 12**), it is likely that the anomaly relates to metal working.

Within the south of Field 3 (see **Illus 17**, **Illus 18** and **Illus 19**) discrete areas of magnetic enhancement, **Ab**, have been attributed a possible archaeological origin given the identification of archaeological features with Trench 125. However, no clear archaeological pattern is discernible in the data and any of these anomalies could equally be due to localised variations in the soils.

## 5 CONCLUSION

The geophysical survey has identified a clear area of archaeological potential within the north-east corner of the survey area. Anomalies have been identified which are suggestive of enclosures, two structures, and areas of burning whilst broad areas of elevated background response are likely to be due to spreads of archaeological material. The survey corroborates and enhances the results of a previous programme of trial trenching in which Roman pottery, building material and metal working material was recovered. The southernmost structure is aligned oblique to the majority of the archaeological anomalies raising the possibility that it originates from a separate phase of activity at the site.

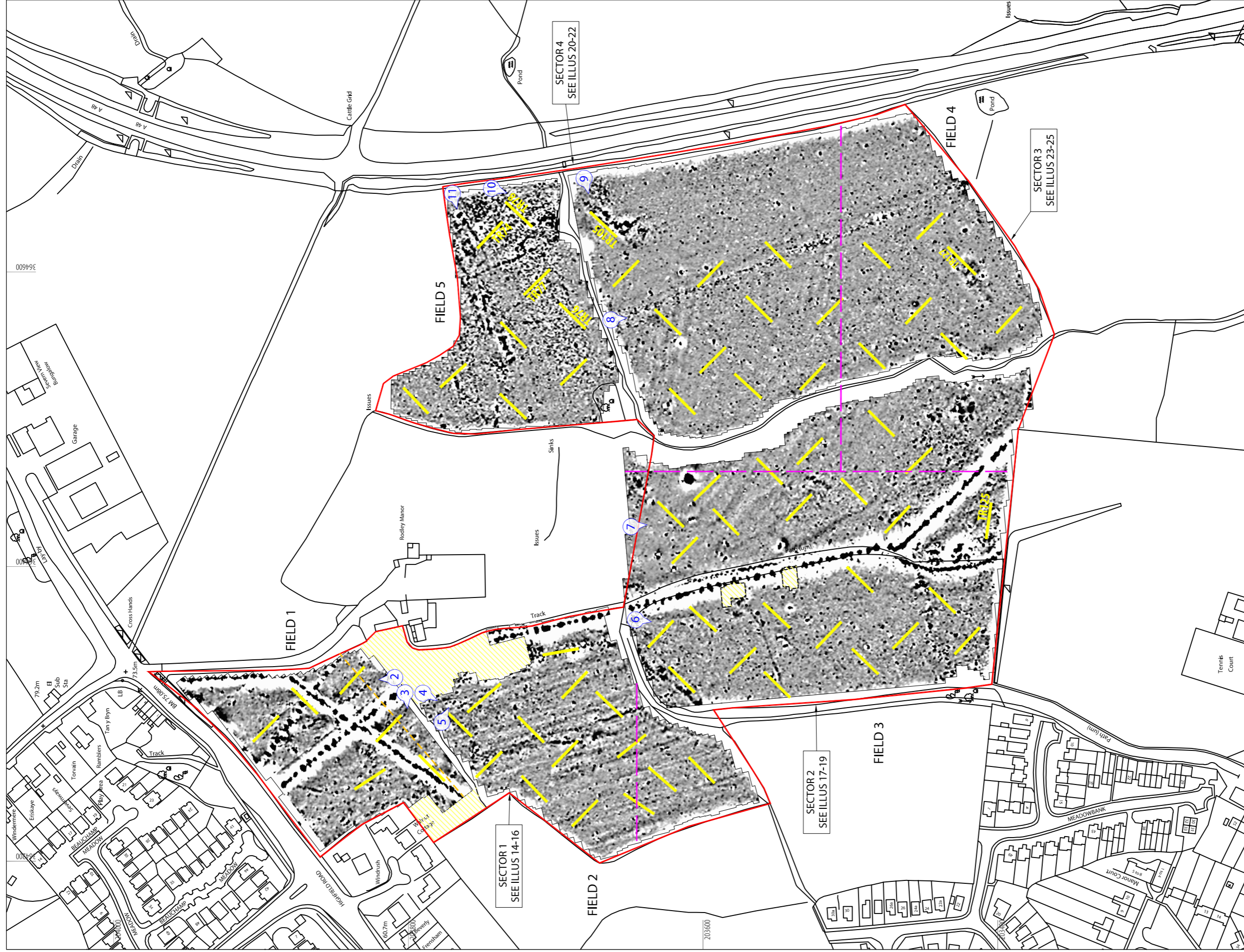
Elsewhere, anomalies have been identified which reflect the agricultural landscape as depicted on historical OS maps, whilst traces of ridge and furrow cultivation hint at an earlier medieval or post medieval agricultural landscape. Localised areas of magnetic disturbance, corresponding to shallow topographical features, may be due to back-filled ponds or for the extraction of aggregates.

No anomalies have been identified to either confirm or negate the presence of a Roman road which is recorded in the Gloucestershire Historic Environment Record as traversing the north of the survey area. However, it should be noted that there may be insufficient magnetic contrast between the material used in the construction of the road surface (clay, sand and gravel) and the prevailing substrata, for the road surface to manifest as a magnetic anomaly. Nevertheless, based solely on the results of the geophysical survey, the archaeological potential of the site is considered to be locally high where archaeological anomalies are identified, and low across the remainder of the site.

## 6 REFERENCES

- British Geological Survey 2015 [www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html](http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html). (Viewed June 30th 2015).
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- Wessex Archaeology 2003 *Land East of Lydney Gloucestershire: Archaeological Evaluation* Internal report Wessex Archaeology.





- Geophysical survey area
- Location and direction of ILLUS 2-11
- Sector boundary
- Area unsuitable for survey
- Archaeological trial trench (WA 2003)
- Postulated route of Roman road (HER 6212)

Scale: 1:2,500  
Scale bar: 0 to 50m  
North arrow

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ILLUS 12  
Survey location showing processed greyscale magnetometer data and previous trial trench locations (1:2,500)





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INTERPRETATION  
Former field boundary  
Geology  
Geology  
Magnetic Enhancement  
Quarrying?  
Magnetic Enhancement  
Archaeology?

TYPE OF ANOMALY  
Linear  
Linear Trend  
Magnetic Enhancement  
Magnetic Enhancement  
Magnetic Enhancement

INTERPRETATION  
Ferrous Material  
Service Pipe  
Ferrous Material  
Field Drain  
Ridges and Furrow  
Agricultural

TYPE OF ANOMALY  
Dipolar Isolated  
Dipolar Linear  
Magnetic Disturbance  
Linear Trend  
Linear Trend  
Linear Trend

Scale: 1:2,500 @ A3  
0 50m

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ILLUS 13  
Overall interpretation of magnetometer data (1:2,500)







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client:  
0 25m  
Scale 1:1,000 @ A3

nt  
-1.0 2.0  
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— Sector boundary

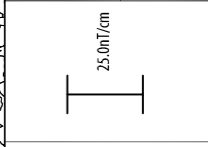
ILLUS 14  
Processed greyscale magnetometer data; Sector 1 (1:1,000)





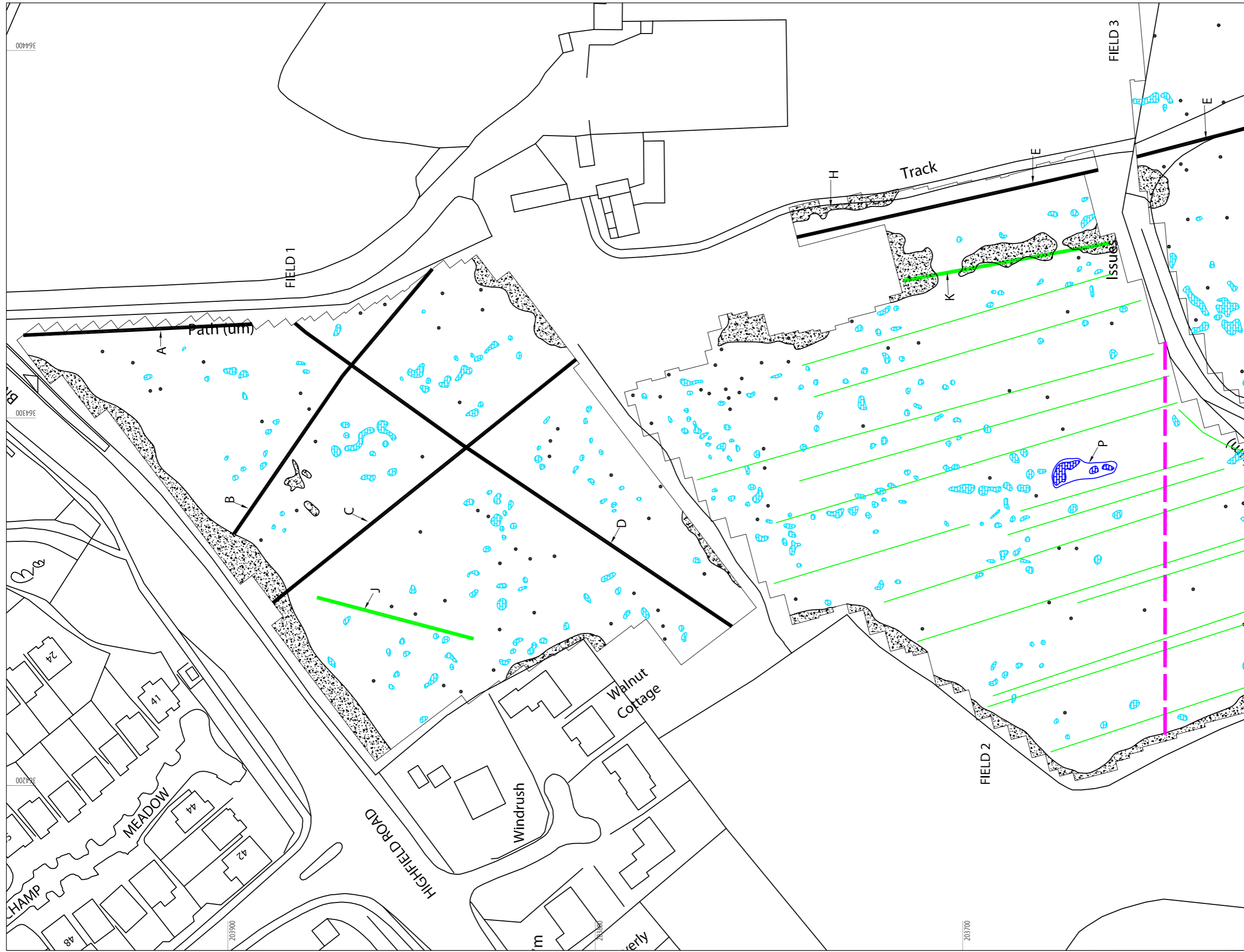
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Sector boundary  
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<p>project: Land east of Lydney Gloucestershire (LBNG/03) client: CgMS Consulting</p>	<p>NORTH</p> <p>0 25m Scale 1:1,000 @ A3</p>
<p>TYPE OF ANOMALY</p> <ul style="list-style-type: none"> <li>Magnetic Enhancement</li> <li>Quarrying?</li> </ul>	<p>INTERPRETATION</p> <ul style="list-style-type: none"> <li>Quarrying?</li> </ul>
<p>TYPE OF ANOMALY</p> <ul style="list-style-type: none"> <li>Dipolar Isolated</li> <li>Dipolar Linear</li> <li>Magnetic Disturbance</li> <li>Linear Trend</li> <li>Linear</li> <li>Magnetic Enhancement</li> </ul>	<p>INTERPRETATION</p> <ul style="list-style-type: none"> <li>Ferrous Material</li> <li>Service Pipe</li> <li>Ferrous Material</li> <li>Agricultural</li> <li>Former field boundary</li> <li>Geology</li> </ul>
<p>Sector boundary</p>	<p>Based on Ordnance Survey mapping supplied by the Client © Crown Copyright 2015</p>

ILLUS 16  
Interpretation of magnetometer data, Sector 1 (1:1,000)





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client: CgMs Consulting

Scale bar: 0 to 25m  
Scale: 1:1,000 @ A3  
Based on Ordnance Survey mapping supplied by the Client © Crown Copyright 2015

Legend:  
-1.0 | 2.0 nT  
Sector boundary (pink dashed line)

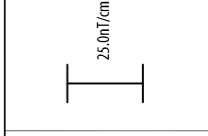






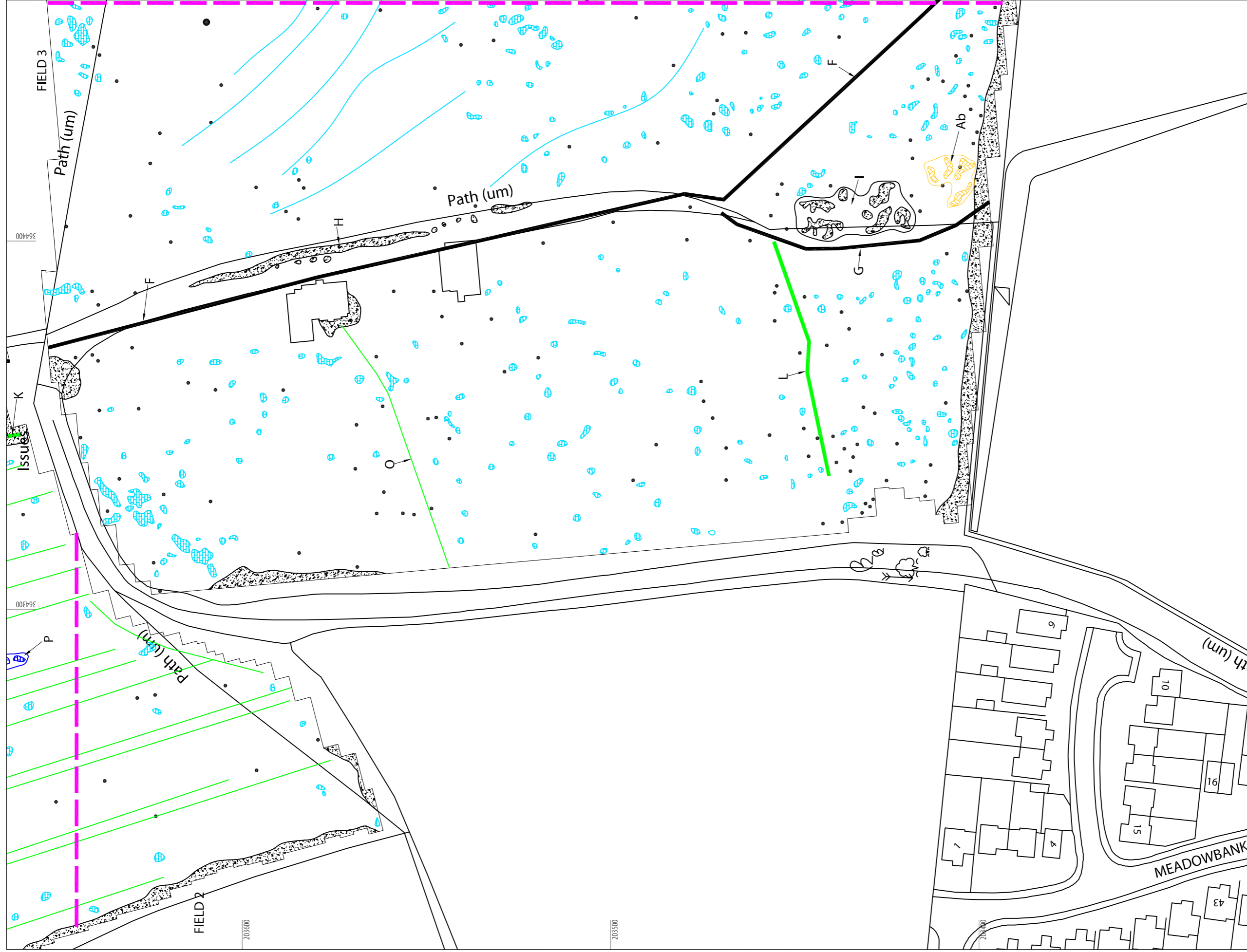
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www.headlandarchaeology.com

project: Land east of Lydney  
Gloucestershire  
(LBNG/03)  
client: CgMs Consulting



25.0m/1cm  
Sector boundary  
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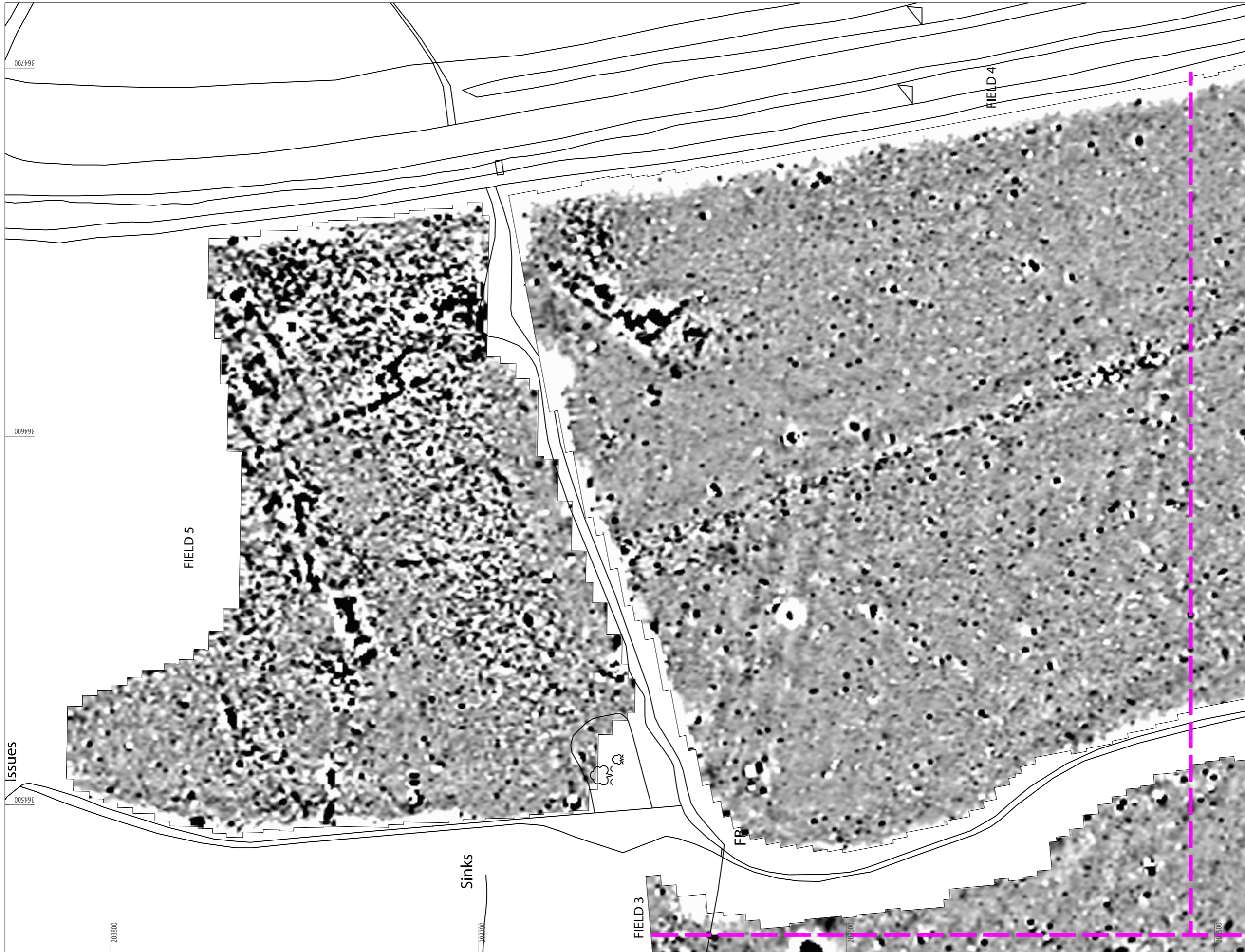


 <b>HEADLAND ARCHAEOLOGY</b> NORTH Unit 16, Hillside Beeston Road Leeds LS11 8ND 0113 387 6430 www.headlandarchaeology.com	
project: Land east of Lydney Gloucestershire (LBNG/03)	client: CgMS Consulting
TYPE OF ANOMALY Linear Trend Magnetic Enhancement Magnetic Enhancement Magnetic Enhancement	INTERPRETATION Geology Geology Quarrying? Archaeology?
TYPE OF ANOMALY Dipolar Isolated Dipolar Linear Magnetic Disturbance Linear Trend Linear Trend Linear	INTERPRETATION Ferrous Material Service Pipe Ferrous Material Field Drain Agricultural Former field boundary
Scale 1:1,000 @ A3 0 25m	

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ILLUS 19  
interpretation of magnetometer data, Sector 2 (1:1,000)





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Scale: 1:1,000 @ A3  
0 25m  
N  
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nt  
-1.0 2.0  
Sector boundary

ILLUS 20  
Processed greyscale magnetometer data; Sector 3 (1:1,000)





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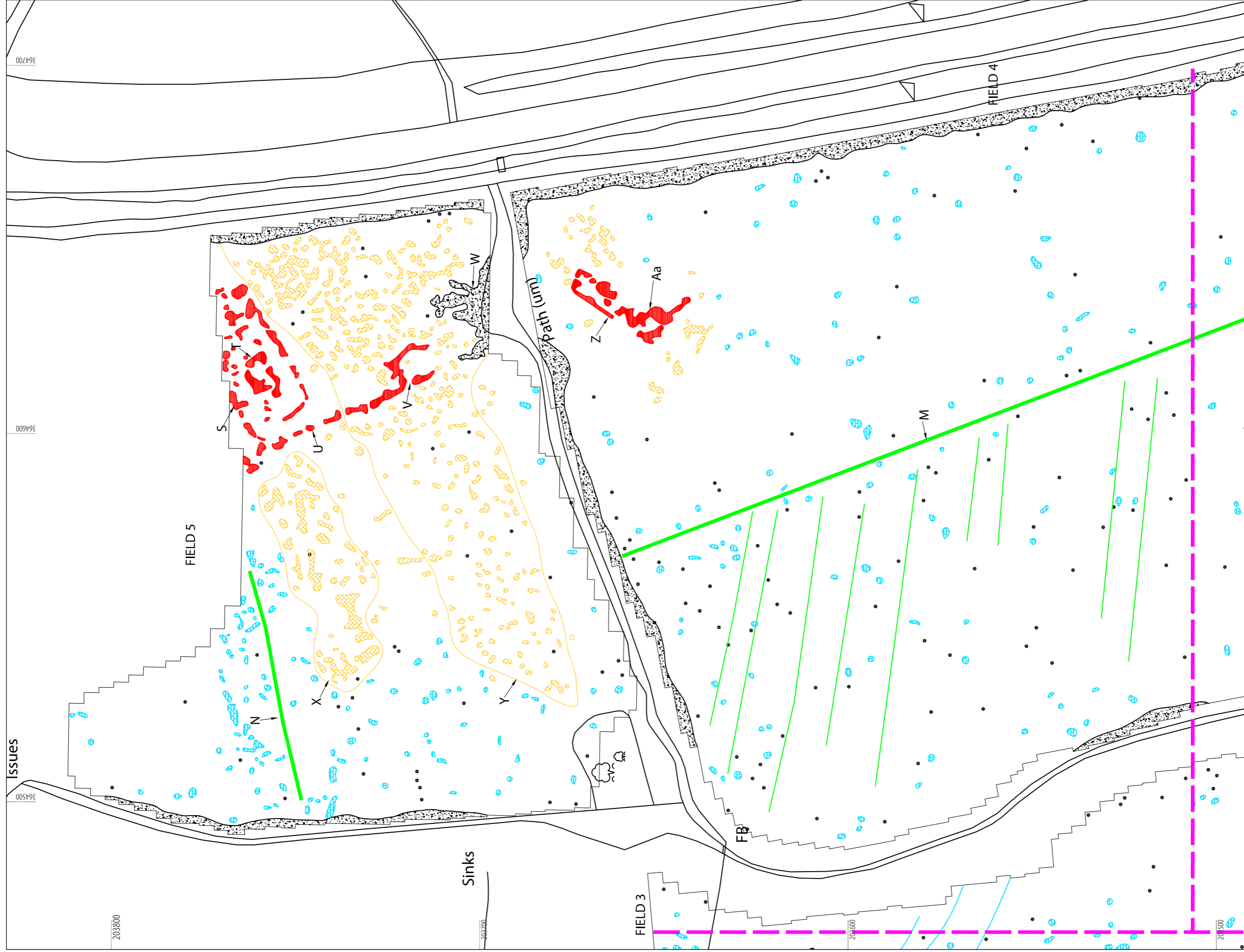
25.0m  
I

Scale 1:1,000 @ A3  
0 25m  
N

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<p><b>HEADLAND ARCHAEOLOGY</b> NORTH Unit 16, Hillside Beeston Road Leeds LS11 8ND 0113 387 6430 www.headlandarchaeology.com</p>	
<p>project: Land east of Lydney Gloucestershire (LBNG/03) client: CgMS Consulting</p>	<p>Scale 1:1,000 @ A3 0 25m</p>
<p>TYPE OF ANOMALY</p> <ul style="list-style-type: none"> <li>Dipolar Isolated</li> <li>Magnetic Disturbance</li> <li>Linear Trend</li> <li>Linear</li> <li>Linear Trend</li> <li>Magnetic Enhancement</li> </ul>	<p>INTERPRETATION</p> <ul style="list-style-type: none"> <li>Ferrous Material</li> <li>Ferrous Material</li> <li>Ridge and Furrow</li> <li>Former field boundary</li> <li>Geology</li> <li>Geology</li> </ul>
<p>TYPE OF ANOMALY</p> <ul style="list-style-type: none"> <li>Magnetic Enhancement</li> <li>Magnetic Enhancement</li> </ul>	<p>INTERPRETATION</p> <ul style="list-style-type: none"> <li>Archaeology?</li> <li>Archaeology</li> </ul>
<p>— Sector boundary</p>	
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(LBNG/03)  
CgMs Consulting

client:

0 25m  
Scale 1:1,000 @ A3

nt  
-1.0 2.0

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— Sector boundary

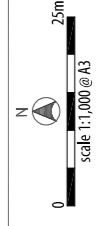




— Sector boundary

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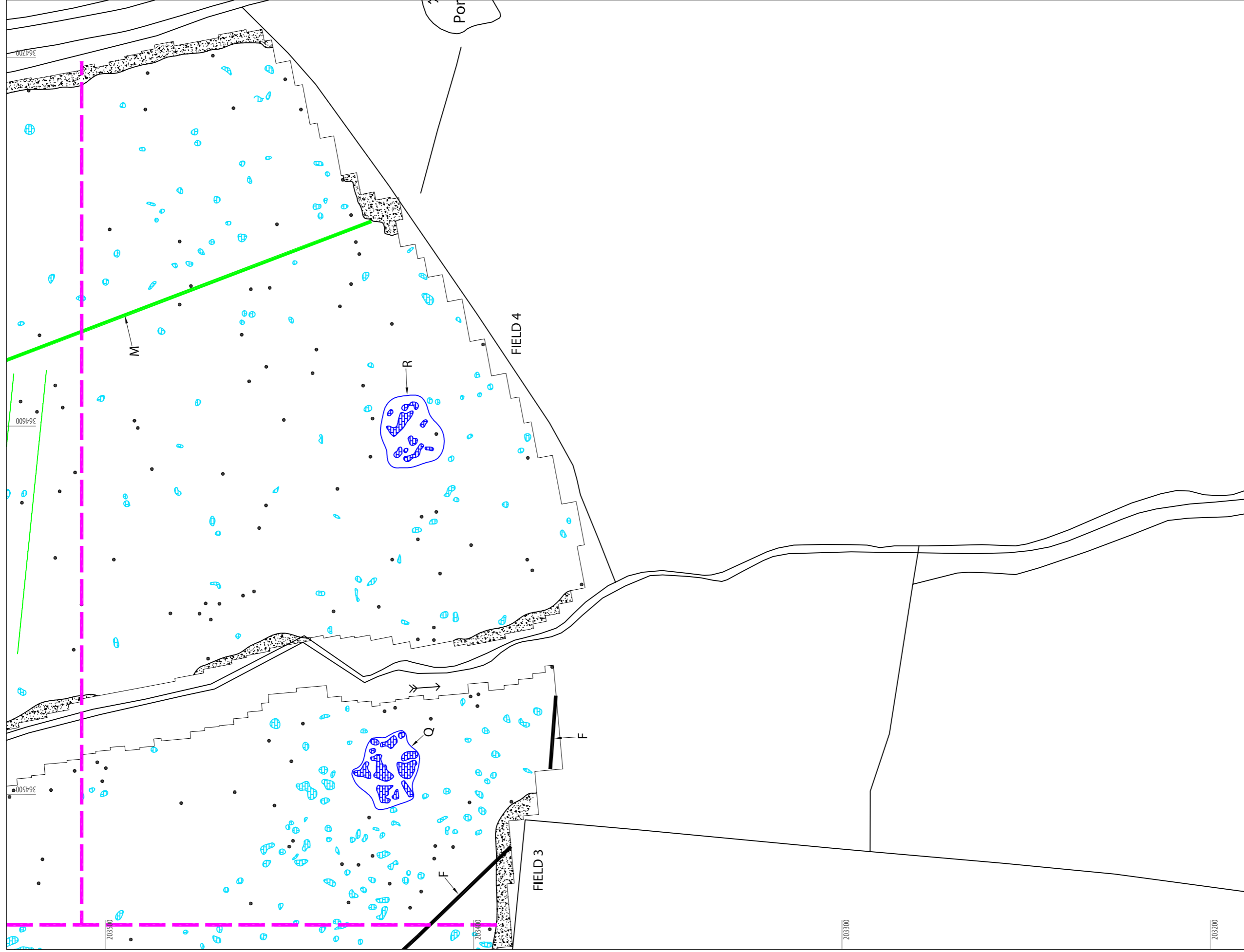
25.0m/cm






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project: Land east of Lydney Gloucestershire (LBNG/03)	client: CgMS Consulting	TYPE OF ANOMALY Magnetic Enhancement 	INTERPRETATION Quarrying?
TYPE OF ANOMALY Dipolar Isolated Dipolar Linear Magnetic Disturbance Linear Trend Linear Magnetic Enhancement	INTERPRETATION Ferrous Material Service Pipe Ferrous Material Ridge and Furrow Former field boundary Geology	Scale 1:1,000 @ A3 	

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## 7 APPENDICES

### APPENDIX 1 MAGNETIC SUSCEPTIBILITY AND SOIL MAGNETISM

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

#### TYPES OF MAGNETIC ANOMALY

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

#### *Isolated dipolar anomalies (iron spikes)*

These responses are typically caused by ferrous material either on

the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

#### *Areas of magnetic disturbance*

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

#### *Linear trend*

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

#### *Areas of magnetic enhancement/positive isolated anomalies*

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

#### *Linear and curvilinear anomalies*

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.



## APPENDIX 2 SURVEY LOCATION INFORMATION

The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble 5800 model). The accuracy of this equipment is better than 0.01m. The survey grids were then superimposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

## APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises:

an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associated world file, and a PDF of the report

At present the archive is held by Headland Archaeology (UK) Ltd although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the relevant Historic Environment Record Office).

## APPENDIX 4 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headlandS-218433

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### PROJECT DETAILS

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<b>Project name</b>	Land east of Lydney, Gloucestershire
<b>Short description of the project</b>	Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey covering approximately 14.5 hectares on agricultural land east of the village of Lydney, Gloucestershire, to provide further information to inform mitigation proposals required by Condition 26 attached to planning permission granted by Forest of Dean Council (Ref. P1097/08/OUT). The survey has identified archaeological anomalies suggestive of ditches, a rectangular enclosure, possible structures and areas of burning all of which are confined to the NE corner of the survey area. The anomalies corroborate and enhance the results of a previous programme of trial trenching in which Roman building material and iron-working material was recovered. Elsewhere, anomalies have been detected which reflect the former agricultural landscape as depicted on historical Ordnance Survey maps, whilst traces of earlier agriculture in the form of ridge and furrow cultivation is also identified. No anomalies were detected to confirm or negate the presence of a Roman road which is recorded as traversing the north of the survey area in the Gloucestershire Historic Environment Record. On this basis, the archaeological potential of the site is considered to be locally high in the vicinity of the archaeological anomalies but low across the remainder of the site.
<b>Project dates</b>	Start: 10-06-2015 End: 16-06-2015
<b>Previous/future work</b>	Yes / Yes
<b>Any associated project reference codes</b>	LBNG15 - Sitecode
<b>Any associated project reference codes</b>	003 - Contracting Unit No.
<b>Any associated project reference codes</b>	P1097/08/OUT - Planning Application No.
<b>Type of project</b>	Field evaluation
<b>Site status</b>	None
<b>Current Land use</b>	Grassland Heathland 5 - Character undetermined
<b>Monument type</b>	N/A None
<b>Monument type</b>	N/A None
<b>Significant Finds</b>	N/A None
<b>Significant Finds</b>	N/A None
<b>Methods &amp; Techniques</b>	Geophysical Survey
<b>Development type</b>	Housing estate
<b>Prompt</b>	Planning condition
<b>Position in the planning process</b>	After outline determination (e.g. As a reserved matter)
<b>Solid geology (other)</b>	Maughans Formation
<b>Drift geology (other)</b>	None
<b>Techniques</b>	Magnetometry

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### PROJECT LOCATION

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<b>Country</b>	England
<b>Site location</b>	GLOUCESTERSHIRE FOREST OF DEAN LYDNEY Land east of Lydney, Gloucestershire
<b>Postcode</b>	GL15 5FF
<b>Study area</b>	14.50 Hectares
<b>Site coordinates</b>	SO 644 036 51.7295268975 -2.51551870101 51 43 46 N 002 30 55 W Point



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#### PROJECT CREATORS

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<b>Name of organisation</b>	Headland Archaeology
<b>Project brief originator</b>	Consultant
<b>Project design originator</b>	Headland Archaeology
<b>Project director/manager</b>	Boucher, A
<b>Project supervisor</b>	Harrison, D
<b>Type of sponsoring/funding body</b>	Developer

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#### PROJECT ARCHIVES

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<b>Physical Archive exists</b>	No
<b>Digital Archive recipient</b>	In house
<b>Digital Contents</b>	None
<b>Digital Media available</b>	Geophysics
<b>Paper Archive exists</b>	No

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#### PROJECT BIBLIOGRAPHY 1

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<b>Publication type</b>	Grey literature (unpublished document/manuscript)
<b>Title</b>	Land east of Lydney, Gloucestershire: Geophysical Survey
<b>Author(s)/Editor(s)</b>	Harrison, D
<b>Date</b>	2015
<b>Issuer or publisher</b>	Headland Archaeology
<b>Place of issue or publication</b>	Leeds
<b>Description</b>	Unibind report and pdf
<b>ENTERED BY</b>	David Harrison (david.harrison@headlandarchaeology.com)
<b>ENTERED ON</b>	21 July 2015





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