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LAND SOUTH OF COSMESTON, SOUTH WALES:

GEOPHYSICAL SURVEY 2025



Photograph 1: *Looking southeast across Field 14 of survey in progress.*

Prepared by Dyfed Archaeological Services

For: WSP on behalf of Trydan Gwyrdd Cymru

Heneb

REGISTERED CIfA ORGANISATION

HENEB – DYFED ARCHAEOLOGICAL SERVICES

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LAND SOUTH OF COSMESTON, SOUTH WALES:

GEOPHYSICAL SURVEY 2025

By

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LAND SOUTH OF COSMESTON, SOUTH WALES: GEOPHYSICAL SURVEY 2025

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LAND SOUTH OF COSMESTON, SOUTH WALES: GEOPHYSICAL SURVEY 2025

CONTENTS

EXECUTIVE SUMMARY/ CRYNODEB GWEITHREDOL 1

1. INTRODUCTION 2

2. THE SITE 7

3. METHODOLOGY 9

4. RESULTS 11

5. INTERPRETATION AND DISCUSSION 58

6. CONCLUSIONS 64

7. SOURCES 65

8. GLOSSARY 66

APPENDIX I Trace and gridded greyscale plots 67

APPENDIX II Data Management Plan 84

FIGURES

Figure 1: Location map. 4

Figure 2: Location plan of survey area 5

Figure 3: Overview of geophysical survey. 6

Figure 4: Greyscale plot of geophysical survey in Field 1 12

Figure 5: Greyscale plot of geophysical survey in Fields 1 with interpretive overlay 13

Figure 6: Greyscale plot of geophysical survey in Field 2 and 2A overlain on satellite mapping. 15

Figure 7: Greyscale plot of geophysical survey in Fields 2 and 2A with interpretive overlay. 16

Figure 8: Greyscale plot of geophysical survey in Field 3 overlain on satellite mapping. 19

Figure 9: Greyscale plot of geophysical survey in Fields 3 with interpretive overlay. 20

Figure 10: Greyscale plot of geophysical survey in Fields 4 and 8 overlain on satellite mapping. 23

Figure 11: Greyscale plot of geophysical survey in Fields 4 and 8 with interpretive overlay. 24

Figure 12: Greyscale plot of geophysical survey in Field 5 overlain on satellite mapping. 27

Figure 13: Greyscale plot of geophysical survey in Field 5 overlain on satellite mapping. 28

Figure 14: Greyscale plot of geophysical survey in Field 6 overlain on satellite mapping. 31

Figure 15: Greyscale plot of geophysical survey in Field 6 with interpretive overlay. 32

Figure 16: Greyscale plot of geophysical survey in Field 7 overlain on satellite mapping. 34

Figure 17: Greyscale plot of geophysical survey in Field 7 with interpretive overlay. 35

Figure 18: Greyscale plot of geophysical survey in Field 9 overlain on satellite mapping. 37

Figure 19: Greyscale plot of geophysical survey in Field 9 with interpretive overlay. 38

Figure 20: Greyscale plot of geophysical survey in Field 10 overlain on satellite mapping. 40

Figure 21: Greyscale plot of geophysical survey in Field 10 with interpretive overlay 41

Figure 22: Greyscale plot of geophysical survey in Field 11 overlain on satellite mapping. 43

Figure 23: Greyscale plot of geophysical survey in Field 12 overlain on satellite mapping. 45

Figure 24: Greyscale plot of geophysical survey in Field 12 with interpretive overlay. 46

Figure 25: Greyscale plot of geophysical survey in Field 13 with interpretive overlay. 49

Figure 26: Greyscale plot of geophysical survey in Field 13 with interpretive overlay. 50

Figure 27: Greyscale plot of geophysical survey in Field 14 with interpretive overlay. 52

Figure 28: Greyscale plot of geophysical survey in Field 14 with interpretive overlay. 53

Figure 29: Greyscale plot of geophysical survey in Field 15 with interpretive overlay. 55

Figure 30: Greyscale plot of geophysical survey in Field 15 with interpretive overlay. 56

Figure 31: Overview of features discussed in interpretation and discussion. 59

PHOTOGRAPHS

Photograph 1: Looking southeast across the survey area from Field 14. Frontispiece

photograph 2: Looking northwest across proposed development area from Field 9. 8

Photograph 3: Looking southeast from Field 3 across the Bristol Channel and towards the northern coastline of Southwest England. 8

Photograph 4: Small piece of honeycomb worked flint found during the survey within the northern corner of Field 2. 18

Photograph 5: Heavily abraded piece of oxford ware mortarium found during the survey in Field 5. 30

Photograph 6: Prehistoric worked flint found during the survey in Field 5. 30

TABLE

Table 1: Archaeological and Historical Timeline for Wales 3

LAND SOUTH OF COSMOSTON, SOUTH WALES:
GEOPHYSICAL SURVEY 2025

EXECUTIVE SUMMARY

Heneb – Dyfed Archaeological Services were commissioned to undertake a geophysical survey on land south of Cosmeston, South Wales (centred on NGR ST 17779 68355). Geophysical survey was conducted across 56.3 hectares divided into 16 fields.

The purpose of the survey was to provide a better indication of the archaeological potential of the site and if required, enable targeting of any further archaeological mitigation requirements before or during the development.

Possible archaeological remains were identified throughout the survey area. These included potential ring ditches, enclosures, trackways and areas of activity that could range in date from the prehistoric, Romano British and medieval periods.

CRYNODEB GWEITHREDOL

Comisiynwyd Heneb - Gwasanaethau Archaeolegol Dyfed i gynnal arolwg geoffisegol ar dir i'r de o Cosmeston, De Cymru (yn ganolog ar NGR ST 17779 68355). Cynhaliwyd arolwg geoffisegol ar draws 56.3 hectar wedi'i rannu'n 16 maes.

Pwrpas yr arolwg oedd rhoi gwell syniad o botensial archeolegol y safle ac os oedd angen, galluogi targedu unrhyw ofynion lliniaru archeolegol pellach cyn neu yn ystod y datblygiad.

Nodwyd gweddillion archaeolegol posibl ledled ardal yr arolwg. Roedd y rhain yn cynnwys ffosydd cylch posibl, clostiroedd, llwybrau a mannau gweithgaredd a allai amrywio o ran dyddiad o'r cyfnodau cynhanesyddol, Brydeinig-Rufeinig a chanoloesol.

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1. INTRODUCTION

1.1 Project Commission

1.1.1 Dyfed Archaeological Services (a contracting arm of Heneb – the Trust for Welsh Archaeology) was commissioned by WSP on behalf of Trydan Gwyrdd Cymru to undertake a geophysical survey ahead of a proposed solar farm development on land south of Cosmeston, south Wales (centred on NGR ST 17779 68355; Figures 1–3).

1.1.2 The proposed development area (hereafter referred to as the 'Site') was subject to a draft Historic Environment Desk-Based Assessment (WSP 2025). The assessment found seven recorded non-designated built historic assets within the Site, all of which are considered to be of low heritage value. Alongside these sites however the assessment indicated a possible high potential for prehistoric archaeological remains and low to moderate potential for Roman archaeological remains at the Site.

1.1.3 Due to the identified archaeological potential the Historic Environment Desk-Based Assessment recommended a geophysical survey of the Site. The results of the geophysical survey should provide further information on the archaeological potential of the site by identifying subsurface features that could be indicative of archaeology.

1.1.4 The geophysical survey was undertaken using a fluxgate gradiometer, a method designed to detect subtle magnetic variations in the earth. This technique can identify subsurface features such as ditches, pits, or foundations that may not be visible at the surface.

1.1.5 The objective of the geophysical survey was to provide further information on the archaeological potential of the site, enabling informed decisions about the need for additional evaluation or mitigation measures before or during construction.

1.1.6 In order to obtain the latest information about the site to inform the background archaeological research, a request was made by Dyfed Archaeological Services to the local regional HER at Heneb-Glamorgan Gwent region for the records of every site that was located within a 1km diameter from the centre of the development (HER Enquiry Reference Number: 9228).

1.1.7 A Written Scheme of Investigation (WSI) outlining the methodology for the geophysical survey was prepared and submitted to Heneb, the archaeological advisors to the Vale of Glamorgan Council, for approval.

1.1.8 The results of the geophysical survey will contribute to understanding the archaeological significance of the site and guide further archaeological mitigation in accordance with Planning Policy Wales (2021) and Technical Advice Note 24: The Historic Environment (2017).

1.2. Scope of the Project

1.2.1 The aim of the project was:

- To undertake a geophysical survey using gradiometer of the accessible elements of the Site,
- To determine the likely presence or absence of any archaeological remains within the Site,
- To establish the character and extent of any potential archaeological remains within the Site that could be affected by the proposed works,

- To inform the need (or otherwise) for any future archaeological works on the Site by means of an illustrated report on the geophysical survey.

1.3 Report Outline

1.3.1 This report provides a summary and discussion of the geophysical survey and its results and puts those results within their regional and national context.

1.4 Abbreviations

1.4.1 Sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.5 Illustrations

1.5.1 Printed map extracts are not necessarily produced to their original scale.

1.6 Timeline

1.6.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

Table 1: Archaeological and Historical Timeline for Wales.

Period	Approximate date	
Palaeolithic –	*c.*450,000 – 10,000 BC	**Prehistoric**
Mesolithic –	*c.* 10,000 – 4400 BC	
Neolithic –	*c.*4400 – 2300 BC	
Bronze Age –	*c.*2300 – 700 BC	
Iron Age –	*c.*700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – *c.* AD 410	**Historic**
Post-Roman / Early Medieval Period –	*c.* AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period[1] –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20th century onwards	

[1] The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Heneb.

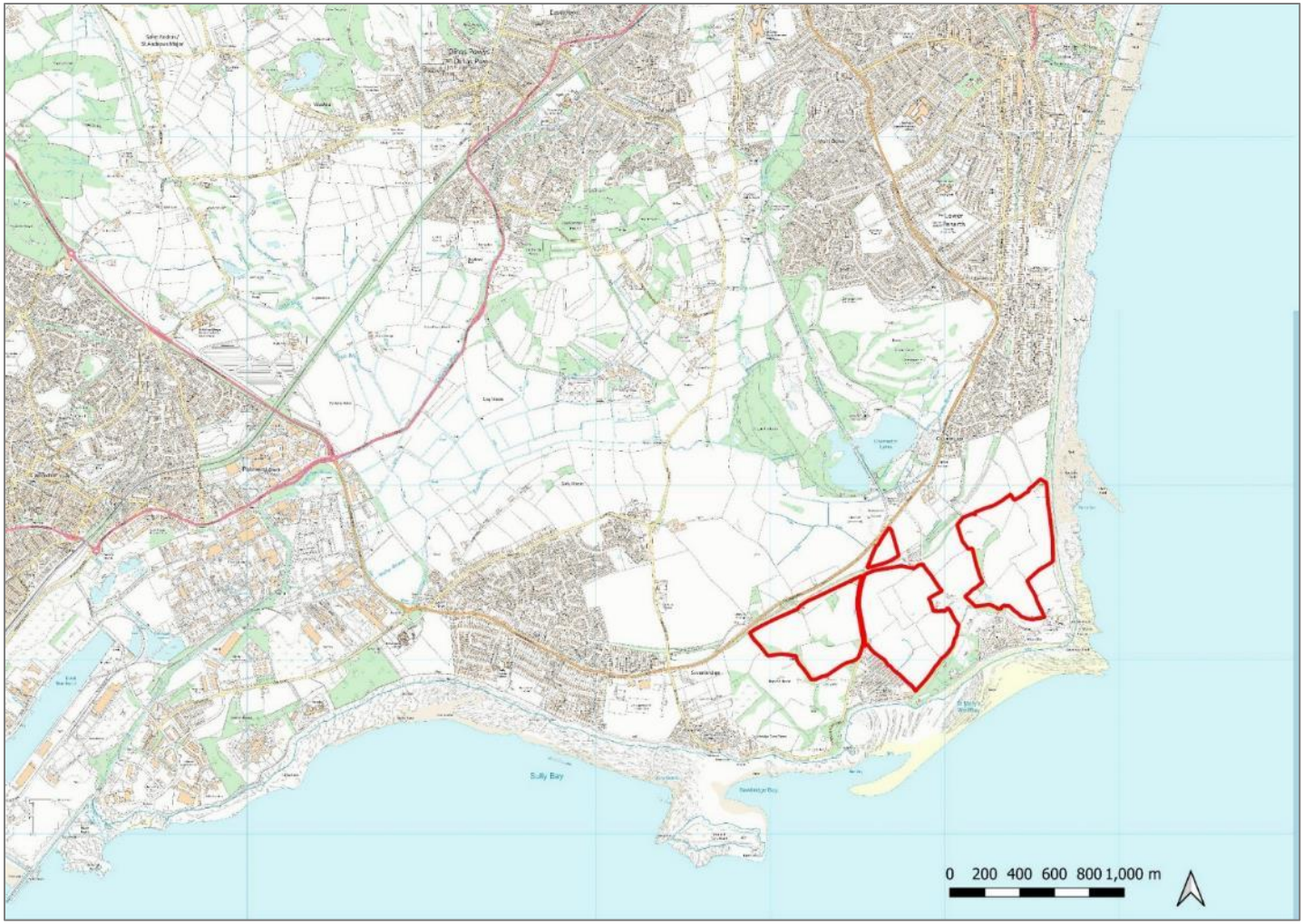


Figure 1: Location of the Site (red outline). Base Map: The Ordnance Survey (OS) Licence number is 100019311.



Figure 2: Location plan showing of area to be subjected to geophysical survey (red outline). Overlaid on satellite data © Google.

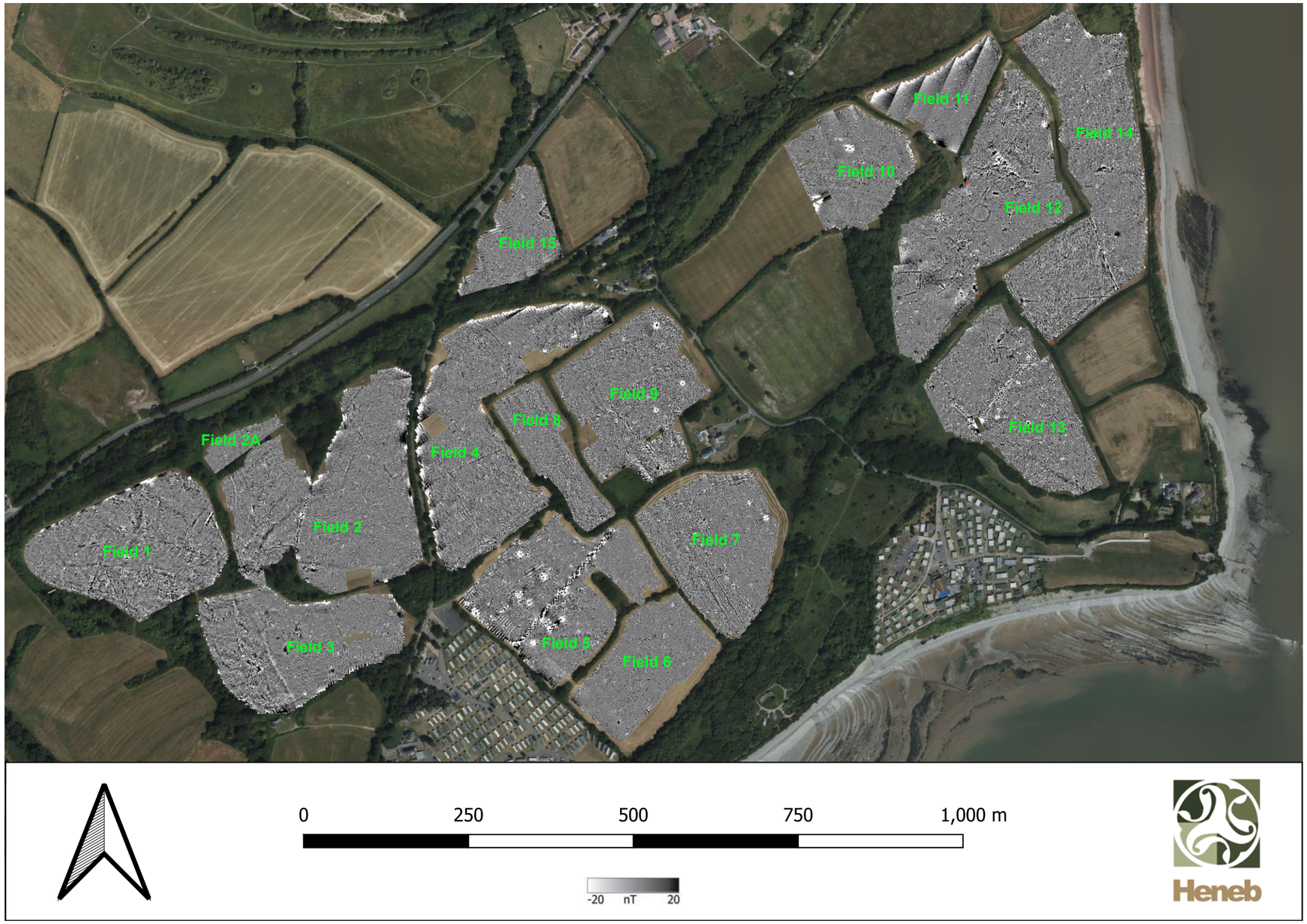


Figure 3: Overview of geophysical survey and field reference numbers, overlain on satellite mapping (©Bing).

2. THE SITE

2.1. The proposed development area (centred on NGR ST 17779 68355) is located 800m to the south of the small village of Cosmeston and 3.2 km south-southwest of Penarth in the Vale of Glamorgan, south Wales.

2.2. The survey area, which includes an initial outline solar farm and associated infrastructure, covers an area of 77.5 ha. This land is currently agricultural, sub-divided into 16 fields, all under arable cultivation and surrounded by well established hedgerows.

2.3. When considered as a whole, the survey area is undulating with gradually sloping ground running roughly east west through the centre of the survey area, and ridges of high ground running along the northern and southern extents. It lies in a coastal location on the northern edge of the Bristol Channel with traditionally fertile ground running up to low cliffs fronting the channel, with woodland along steeper valley slopes and coastal fringes.

2.4. The proposed development area has been subject to a Historic Environment Desk-Based Assessment (WSP 2025). The assessment indicated a possible high potential for prehistoric archaeological remains and low to moderate potential for Roman archaeological remains at the Site.

2.5 No archaeological investigation has been conducted within the Site boundary, although previous archaeological investigations within 75-240m from the Site boundary have identified prehistoric, Roman and medieval archaeological remains. The archaeological potential was considered to be at its highest at western section of the Site around Hopkins Mount, and the eastern section of the Site around Lavernock.

2.6 The identified above ground archaeological remains comprise two houses, a trig point pillar and four boundary stones. Palaeolithic, Mesolithic and Neolithic artefact scatters have been recorded at the western and eastern ends of the site, likely brought to the surface through ploughing activity. A Bronze Age hoard has also been reported towards the eastern end of the site, and as the site lies within the flood plain region of the River Cadoxton the potential for Prehistoric settlement has been highlighted. A possible Romano-British farmstead site has been identified from parchmarks in the western part of the site, although this identification is uncertain. However, some stray Roman artefacts have been discovered within 80m of the Site boundary. Some stray medieval pottery and roof tile fragments have been recorded towards the centre of the site, although these are considered to be general agricultural rubbish originating from the surrounding medieval settlements. Field boundaries were considered a possible remnant of medieval activity within the Site, with medieval settlements recorded at Cosmeston to the north and Lavernock to the southeast. The Site was largely agricultural land throughout the post-medieval period. World War II anti-aircraft and coastal batteries and searchlights line the coastline to the south.

2.7 The British Geological Survey records mixed bedrock across the Site. Beneath the western part of the survey area lies bands of conglomerates of the Mercia Mustone Group (marginal Facies), dolomite and dolomited limestones of the Friars Point Limestone Formation and limestone and mudstones of the St Mary's Well Bay Member. Towards the middle of the Site the bedrock is recorded as mudstones and limestones of the Penarth Group and St Mary's Well Bay Member, along with mudstones of the Lavernock Shales Member. These rocks also extended across the eastern end of the Site, along with mudstones of both the Blue Anchor Formation and Mercia Mudstone Group. A superficial geology is also recorded in the southern part of the survey area consisting of diamicton from Devensian

Till. Superficial deposits are recorded around the edges of the site and in particular along the southern coastal fringes, however none are recorded within the proposed developments boundaries (BGS online).



Photograph 2: Looking northeast across proposed development area from Field 9.



Photograph 3: Looking southeast from Field 3 across the Bristol channel and towards the northern coastline of southwest England.

3. METHODOLOGY

Data Collection

3.1 The geophysical survey was conducted utilising a fluxgate gradiometer equipped with two sensors at a 1m spacing, accompanied by a DL601 data logger. The gradiometer's sensitivity was configured to identify magnetic variations with a precision of 0.1 nanoTesla. The data was collected within a regulated grid, demarcated to a precision of 0.1 meters. With the aid of a Trimble R8's integrated GNSS system and a TSC5 controller, the grid was aligned with the local Ordnance Survey (OS) grid.

Ground Coverage

3.2 Geophysical techniques rely on discerning disparities in physical properties between the buried archaeological remains and the surrounding soil. To effectively characterise these features, it is necessary to conduct a comprehensive survey that not only captures all possible targets but also includes a sizeable portion of natural background response. Typically, the size of the survey area is constrained by external factors that could potentially undermine the survey data, such as chain-linked fences, telegraph poles and modern field boundaries, as these features affect the magnetic readings collected by the gradiometer. To mitigate the impact of these factors, a minimum distance of up to 5m from field boundaries is maintained. For larger modern ferrous objects such as pylons, a greater distance may be required. In total the survey area covered 56.3 ha of suitable ground.

Resolution

3.3 Data was collected using the zigzag traverse method in 30m x 30m grids, with a sample interval of 0.25m (four readings per meter) along the x-axis and a line separation of 1m along the y-axis.

Data Processing

3.4 The collected data underwent processing utilising *Terrasurveyor 3.0.36.1* and is presented with minimal processing. Typically, the data is subjected to "de-striping" to eliminate any striping effect produced by imbalances between the two sensors. It is then "clipped" to eliminate high values attributed to ferrous objects, which tend to obscure archaeological features and finer details. Additional processing functions may include "de-staggering" the data to correct line displacement errors caused by variations in traversal rate. The gradiometer readings were collected every 0.25m along the transect (x-axis) and 1.0m (or 0.25m in the higher resolution surveys) along the y-axis, resulting in an imbalanced grid. Therefore, by interpolating the data and adjusting the x and y-axes by an increased factor, the grid is better balanced. Finally, the "low pass filter" can be used to smooth the data without removing any archaeology.

Data Presentation and Interpretation

3.5 The data is presented in the form of a grey-scale plot, overlaid on satellite mapping, with minimal processing. The main magnetic anomalies were identified through a combination of the grey-scale plots at different processing stages, and XY traces enabled interpretation by visualising the magnitude and form of a geophysical anomaly. The results were compared with available sources such as satellite imagery, aerial photographs, LiDAR data and historic maps; an increased confidence in the interpretation of geophysical anomalies is gained when their character or form is well-documented, their existence was previously known, or corroborative

evidence is available. Examining the results, including the surrounding environment, often provides greater context and aids in the interpretation of individual features.

Quality of Results

3.6 It is important to note that survey results and interpretation diagrams should not be considered as a conclusive representation of archaeological remains. Not all buried features will produce a detectable magnetic response that can be identified by the gradiometer. In assessing these recorded features, the shape serves as the primary diagnostic tool, alongside comparison with known features from other surveys. The magnitude of the magnetic response can also yield supplementary insights; for instance, a strongly recorded response may indicate burning, high ferric content, or geological thermoremanent magnetisation. While the context may provide additional indications, the interpretation of numerous features is still largely subjective.

3.7 All measurements provided are approximations, as determining precise measurements from fluxgate gradiometer surveys is challenging. The breadth and length of identified features may be influenced by their depth and magnetic strength.

4. RESULTS

4.1 General

4.1.1 The geophysical survey was conducted between the 25th of August and the 19th of September 2025. The survey was undertaken using two Bartington 601 fluxgate magnetometers.

4.1.2 The survey covered an area of approximately 56.3 hectares. This area was subdivided into 16 fields, which were predominantly under arable cultivation. These fields are identified on Figure 3. The remaining ground within the Site boundaries was unsuitable for surveying as it comprised hedgerows, dense vegetation and scrubby woodland, waterlogged ground and proximity to areas of magnetic interference.

4.1.3 The numbering system used to describe each field within the survey area (as illustrated on Fig.3) was generated Heneb – Dyfed Archaeological Services. The description of the results follows this numerical system, working roughly from the west of the survey area and finishing in the east.

4.1.4 All survey results were initially "clipped" to +/- 20 nT and are presented as greyscale plots overlaid on satellite mapping. Where required, these results have also been further clipped and de-spiked.

4.1.5 An additional figure showing an interpretative overlay is included for each field. Here, each anomaly discussed in the text is assigned a unique identifier, prefixed with the field number (e.g., Field 1, response 3 is represented as 1 (3)).

4.1.6 During the results and discussion historic mapping and LiDAR coverage is frequent referenced. The consulted sources and their respective shortenings in text are listed below:

- The Parish of Lavernock tithe map of 1844 (tithe mapping).
- 1st Edition Ordnance Survey 1885 - 1:2500 mapping (1st Edition OS mapping).
- Natural Resources Wales 2024 1m LiDAR Survey of Wales (LiDAR coverage).

4.1.7 A trace plot and a gridded greyscale plot of all fields is included in APPENDIX 1.

4.1.8 As with all geophysical surveys, the possibility of undiscovered archaeological remains cannot be dismissed. Significant archaeological features may survive but fail to produce a magnetic response, particularly in areas of magnetic disturbance, such as recorded in fields 5 and 11.

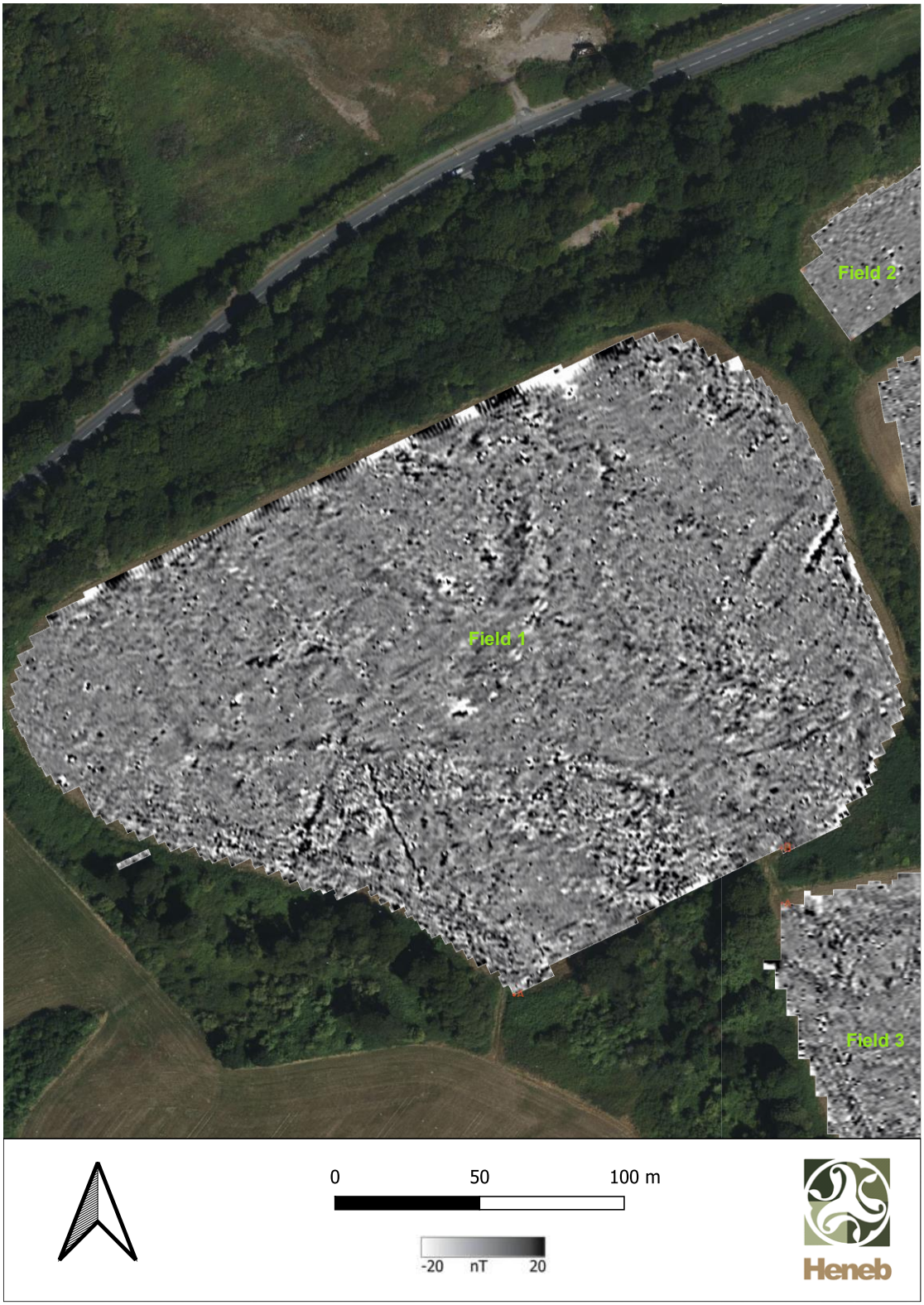


Figure 4: Greyscale plot of geophysical survey in Field 1 overlain on satellite mapping(©Bing).

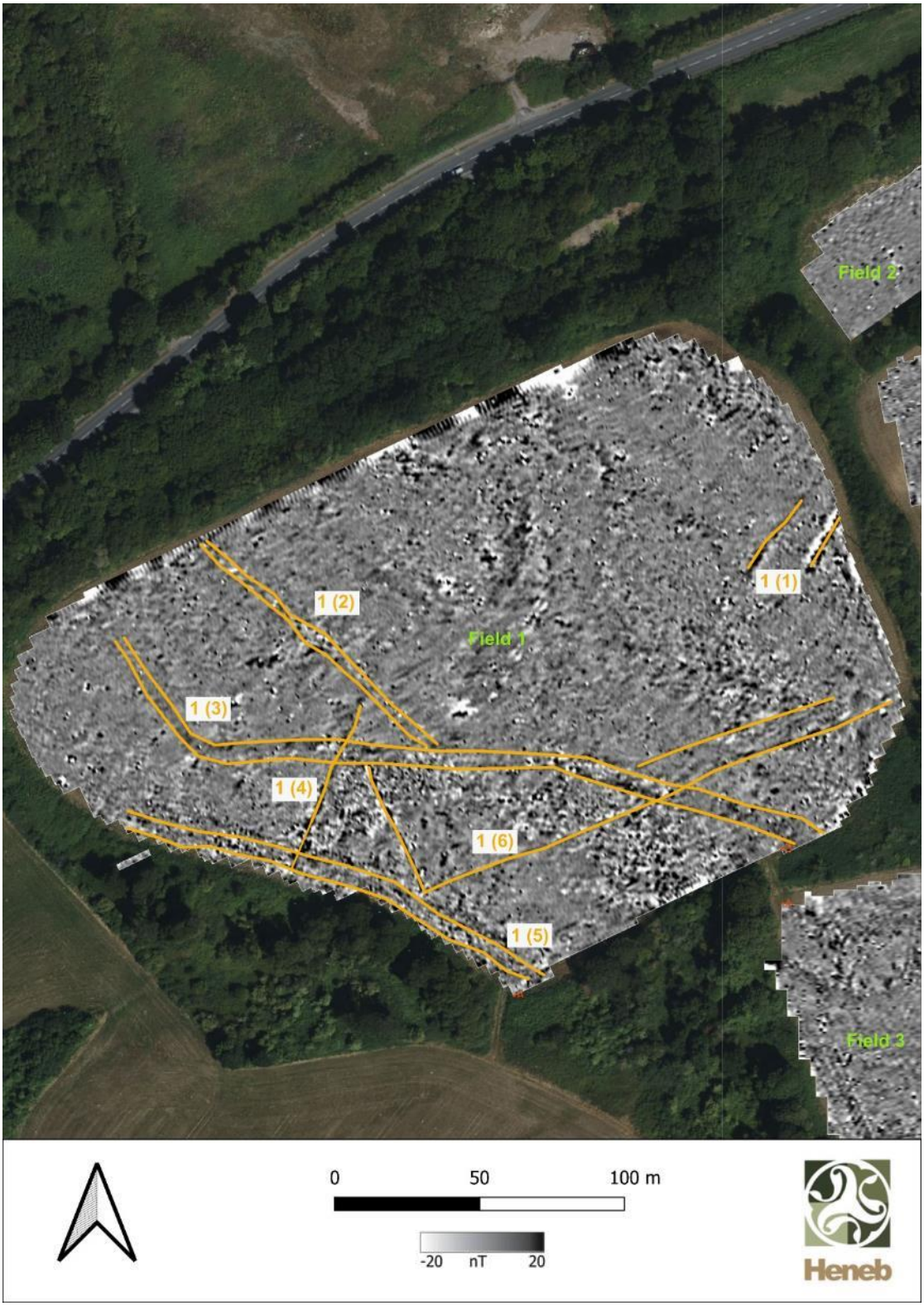


Figure 5: Greyscale plot of geophysical survey in Field 1 with interpretive overlay (Background mapping ©Bing).

4.2 Field 1 (Figures 4 and 5)

4.2.1 Field 1 was located at the western end of the Site, situated on a gentle northwest facing plateau overlooking the main B4267 Lavernock road to the immediate northwest. The field had been under arable cultivation and had recently been harvested. All four boundaries of this particular field were bounded by established hedge banks and enclosed with barbed and rabbit wire fence. The survey area covered 4.4 hectare.

4.2.2 The following responses were identified in Field 1:

- **Response 1 (1):**
  Response 1 (1) consists of two strong linear positive anomalies in the north-eastern part of the survey area. These two responses run approximately 40m long northeast-southwest, the eastern anomaly appears to give a very strong magnetic response and could be indicative of an iron-rich deposit within this linear.
- **Response 1 (2):**
  A weakly magnetic linear response, potentially representing the remains of a ploughed-out bank or small raised trackway, measuring roughly 110m long north-west/south-east. Alternatively, the slight dipolar response and linearity may be indicative of a service run.
- **Response 1 (3):**
  A very faint northwest-southeast orientated magnetic linear response recorded across the centre of Field 1, measuring around 260m long and could indicate the remains of a sunken trackway.
- **Response 1 (4):**
  A strong positive linear anomaly running northeast-southwest across the southwest area of Field 1. This likely represent a cut feature, such as a ditch potentially belonging to an earlier field system.
- **Response 1 (5):**
  Response 1 (5) comprises two weak linear positive anomalies in the south-western part of the survey area. These two responses run parallel for approximately 140m long northwest-southeast along the edge of Field 1, following the curve of the existing boundary and possibly represents the remains of a small trackway caused by the movement of agricultural vehicles.
- **Response 1 (6):**
  Response 1 (6) comprise a pair of southwest-northeast orientated positive linear anomalies with a potential return to the southwest. The main linear continued for 160m northeast to southwest and then turned sharply 90 degrees to the northwest, continuing for a further 40m. A parallel line to the north measured roughly 65m in length. An interpretation of this feature is uncertain, the linear responses are typical of buried ditches, the parallel lines potentially representing a former agricultural driveway used to move livestock.

4.2.3 None of the features described above appear on historic maps or in the LiDAR coverage of the area.

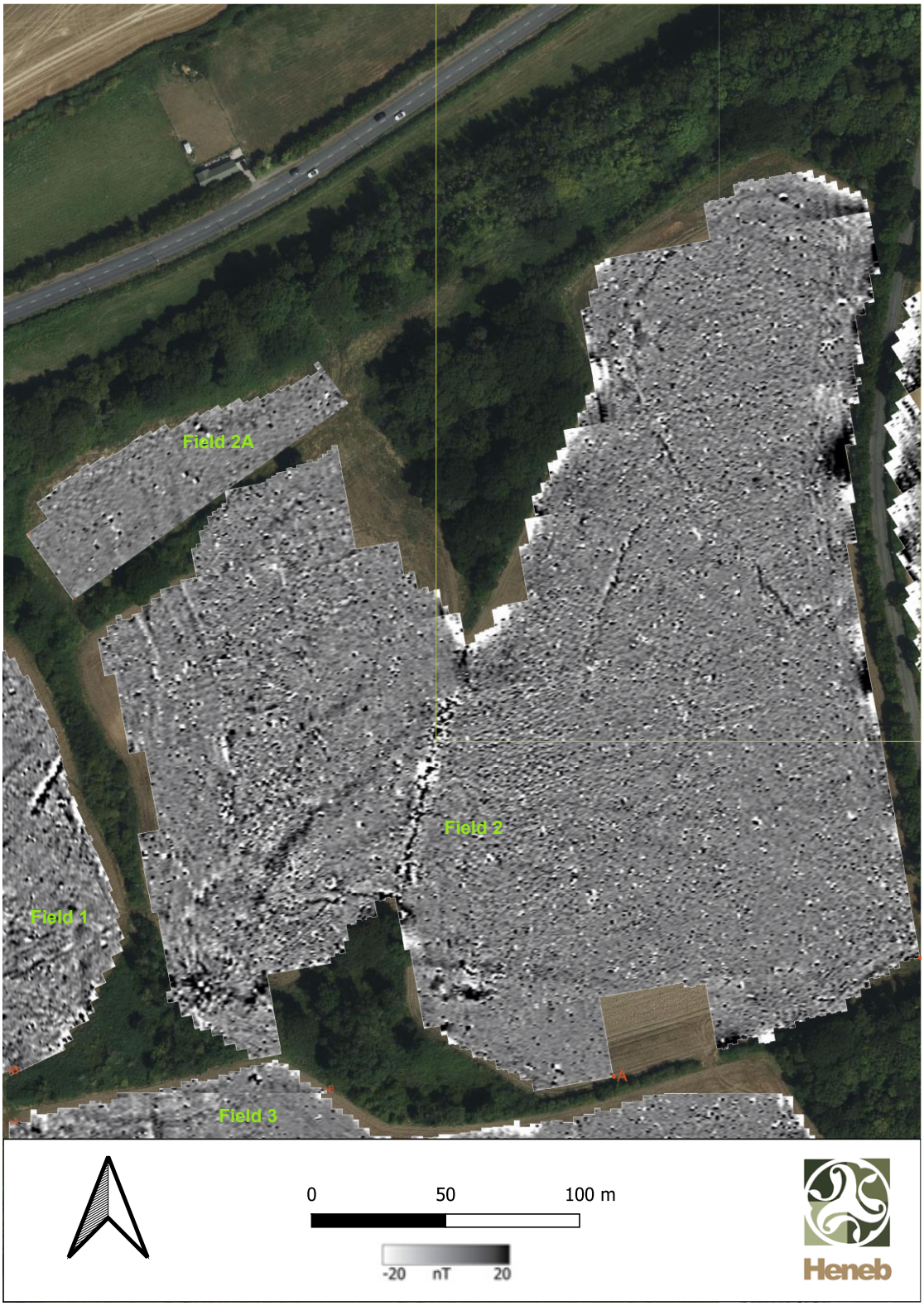


Figure 6: Greyscale plot of geophysical survey in Field 2 overlain on satellite mapping(©Bing).



Figure 7: Greyscale plot of geophysical survey in Fields 2 and 2 A with interpretive overlay (Background mapping ©Bing).

4.3 Fields 2 and 2A (Figures 6 and 7)

4.3.1 Fields 2 and 2A were located along the north-western edge of the Site, to the east of Field 1 and to the north of Field 3. In reality, the two fields were a single unit, separated only by a change in agricultural usage. These fields are therefore described together.

4.3.2 Fields 2 and 2 A are collectively one of the largest areas surveyed, with Field 2 currently under arable cultivation and Field 2A left to pasture. The ground within field 2 for the most part was relatively flat apart from the ground to the south and west, where it gently rose. A large linear manure heap was present within the southern end of the survey area and nearest the field entrance, preventing surveying at that location.

4.3.3 The following responses were identified in Fields 2 and 2A:

- **Response 2 (1):**
  Response 2 (1) is a magnetically positive linear anomaly that forms a sub rectangular shape in plan situated in the northeast corner of Field 2. The anomaly measures roughly 130m long northwest-southeast by 100m wide southwest-northeast and may represent buried boundary ditches associated with an earlier field system. This anomaly is not shown on historic mapping and therefore is considered to pre-date the earliest detailed mapping of 1844.

- **Responses 2 (2 and 3):**
  A second pair of faint positive linear responses were also recorded just to the southwest of response 2 (1). The northernmost response 2 (2) measured approximately 75m and is orientated northeast-southwest. Response 2 (3) situated directly to the south measures roughly 115m long and is orientated east-north-east by west-south-west. Both anomalies are considered to represent former field systems which are pre 1844 in date.

- **Responses 2 (4, 6 and 8):**
  Response 2 (4, 6 and 8) all comprise areas which contain multiple clusters of small strong magnetic readings which could represent areas of general past activity, such as general settlement debris, agricultural food processing or burning activity. Such interpretation is however highly speculative from geophysical survey results alone.

- **Response 2 (5):**
  A strong southwest-northeast orientated positive linear response, measuring 85m long and recorded within the central section of Field 2 (Response 2 (5)). This feature is presumed to be a backfilled field boundary ditch and is depicted on both the Lavernock parish tithe map dated 1844 and the later first edition ordnance survey map dated 1885.

- **Response 2 (7):**
  Response 2 (7) comprised a small east-west orientated magnetically positive linear anomaly within the southwest corner of the surveyed area. This small linear anomaly measures roughly 40m long and springs to form a Y shape on its western end. At this point it lies close to a roughly linear anomaly running to the northeast. This second anomaly is not labelled as it appears natural in origin, which may suggest response 2 (7) is part of a similar arrangement of natural submerged drainage channels.

- **Response 2 (9 and 10)**

  Response 2 (9 and 10) is recorded within the northwest corner of Field 2 and also continuing northwards into field 2A. These features were initially considered to represent naturally occurring subsurface drainage, however their regularity may also indicate an archaeological origin, and

they also appear to correspond to changes in surface vegetation visible on satellite imagery.

- **Response 2 (11)**

  Response 2 (11) is a band of slight magnetically positive readings across the southern part of the field. Given the relatively slight variations in readings it is possible this feature is part of the background geology, but a potential archaeological origin is possible.

4.3.4 During the survey a small piece of honeycomb worked flint was found within the northeast corner of field 2 and is suspected of be of a probable prehistoric date (photo 4).

4.3.5 Response 2 (5) was the only feature which is depicted on historic mapping and is shown in its earliest form on the Laverock parish tithe map dated 1844. This feature is also visible on the LiDAR coverage of the area. None of the other features mentioned are visible on the LiDAR data.



Photograph 4: Small piece of honeycomb worked flint found during the survey within the northern corner of Field 2.

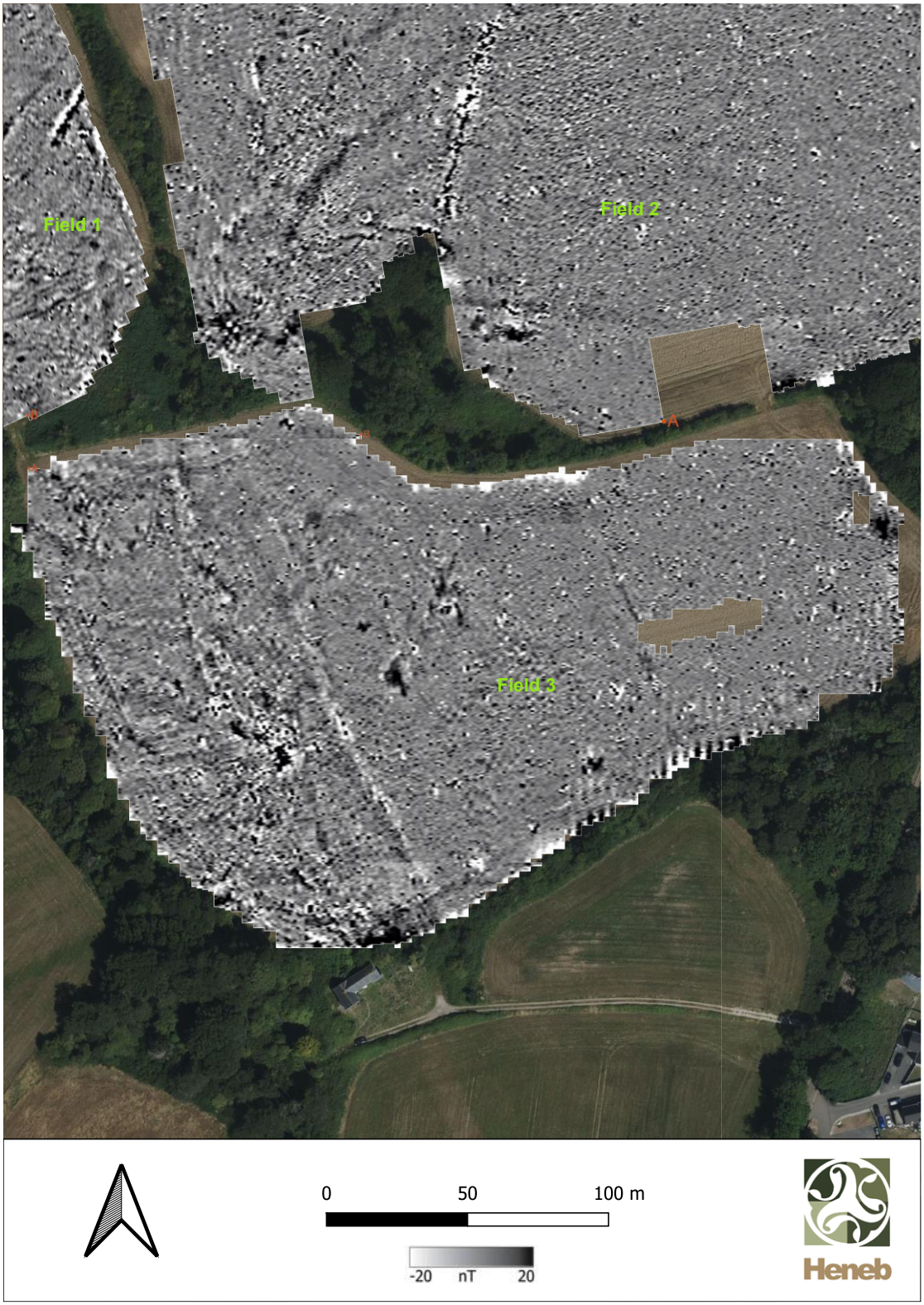


Figure 8: Greyscale plot of geophysical survey in Field 3 overlain on satellite mapping(©Bing).



Figure 9: Greyscale plot of geophysical survey in Field 3 with interpretive overlay (Background mapping ©Bing).

4.4 Field 3 (Figures 8 and 9)

4.4.1 Field 3 lies at the southwestern end of the Site and to the immediate northeast of The Bay Caravan Park. To the northwest and northeast lies fields 1 and 2 respectively. The ground rises to the west, with a low north – south ridge along the western end of the field. The high ground affords excellent views to the south across the Bristol Channel and the northern coastline of southwest England. The field is bounded by established hedgerows on all sides and has recently been under arable cultivation. A large area of piled manure prevented surveying across a section the lower-lying ground to the east.

4.4.2 The following responses were identified in Field 3:

- **Response 3 (1):**

  A faint semi circular magnetically positive anomaly is present in the northwest corner of the survey area. This anomaly measures roughly 60m wide in diameter and may represent buried ditches forming part of a former field system or part of an indivual enclosure of uncertain origin.

- **Responses 3 (2 and 3):**

  Response 3 (2) comprised a magnetically positive linear anomaly that formed a roughly sub rectangular shape in plan, measuring 100m long northwest-southeast by 40m wide northeast-southwest. Situated within this anomaly was a second smaller magnetically positive anomaly 3 (3) which appeared circular in plan, measuring roughly 21m in diameter. Both features are positioned on high ground and with good views to the south and east. The circular anomaly is typical of prehistoric features ranging from domestic hut circles to funerary and ritual round barrows. The arrangement suggest a potential relationship to the surrounding sub-rectangular feature, which may be a larger enclosure or associated field system.

- **Response 3 (4):**

  Response 3 (4) was situated to the immediate south of responses 3 (2 and 3) and was recorded as a faint sub rectangular magnetically positive anomaly, measuring approximately 35m long northeast-southwest by 20m wide northwest-southeast. The magnetic responses are faint and therefore the feature may be ephemeral, however the location adjacent to the previous responses suggests a potential archaeological origin.

- **Response 3 (6)**

  A pair of faint magnetically positive linear anomalies recorded in the far southwestern corner of the survey. Both features were orientated northwest-southeast and measured 42m long. They are located in close proximity and alignment to an existing farmhouse to the south of the current field boundary and therefore may potential be related. This area also appears as a slight raised mound on LiDAR data which may also be indicative of some form of access arrangements to the farm.

- **Response 3 (7)**

  Response 3 (7) runs north – south across the western part of the survey area, measuring approximately 205m long in total, and approximately 3m to 4m wide. To the south, for around 119m, the feature is recorded as a negative anomaly, which could be indicative of a buried bank or trackway. The responses change to a weak positive signal for a final 86m to the north, which may indicate it becomes a cut feature into the rising ground. This magnetic responses and alignment suggest a potential former trackway or road. LiDAR data suggests this feature continues to the north preserved in current field boundaries, and also extends to the south towards the coast as a low earthwork.

- **Responses 3 (5, 8, 9, 10, 11 and 13)**

  This group of responses were distributed throughout the survey area in field 3 and represent discrete areas of magnetically positive anomalies that may represent buried pits or quarries. Responses 3 (5) and 3 (8) in particular are also visible on LiDAR data as slight depressions in the current ground surface.

- **Response 3 (12)**

  A faint magnetically positive linear anomaly running northwest-southeast across the centre of Field 3. This response measures approximately 57m long and may represent a field boundary belonging to a former field system (not marked on historic mapping).

4.4.3 During the survey it was noted that much of the ground within the mid and western areas of the field contained high concentrations of medium to large sized stones that were distributed across the surface of the field, likely produced through regular deep agricultural ploughing. The source for the stone could be naturally derived from the rising geology, although the presence of several anomalies identified in the geophysical survey may also indicate some stone may have archaeological origins, disturbed by modern ploughing.

4.4.4 Responses 3 (5, 7 and 8) are identifiable on the LiDAR coverage of the site. The remaining features described above do not appear on the LiDAR coverage, neither are any of the features identified on historic mapping.

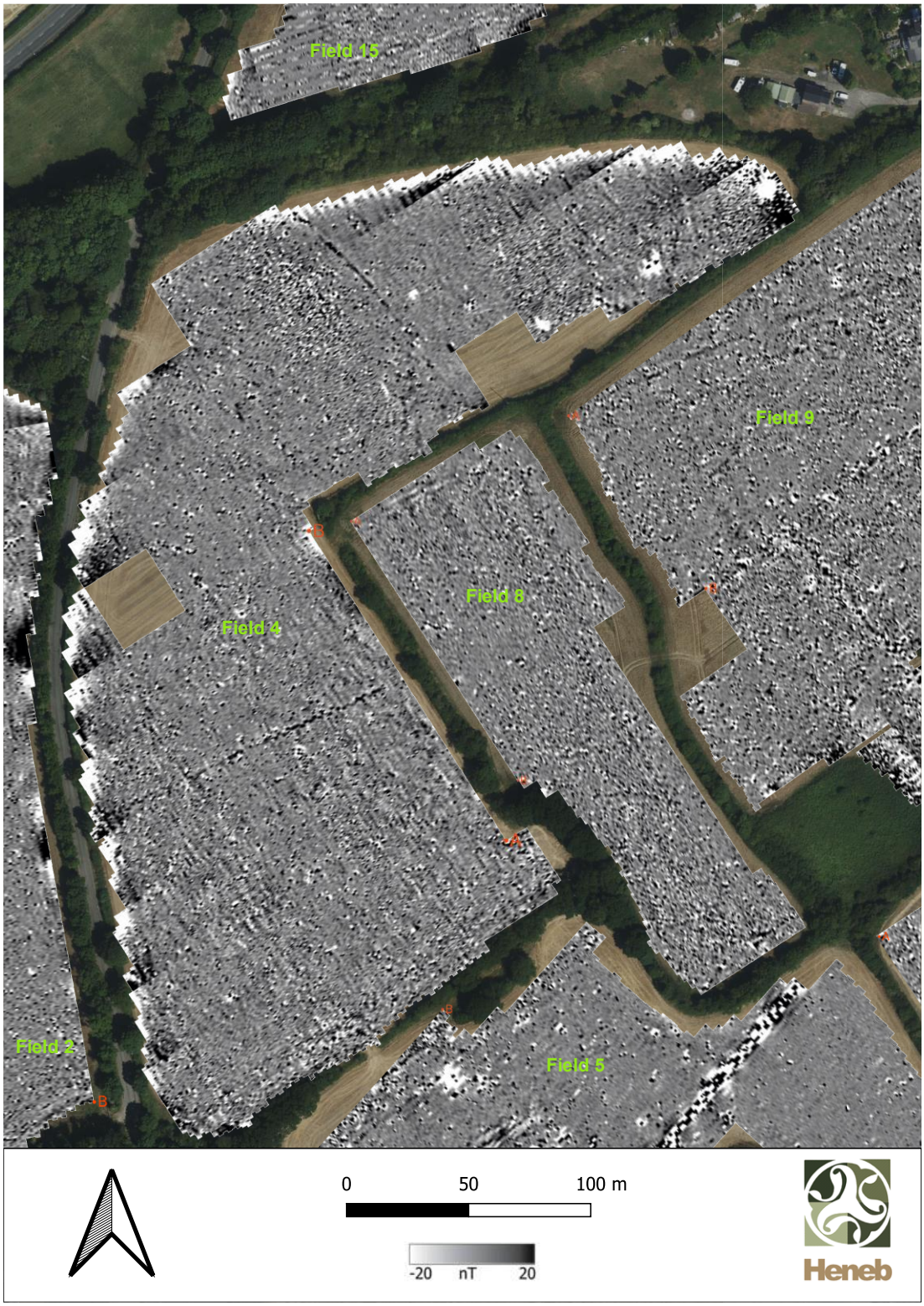


Figure 10: Greyscale plot of geophysical survey in Fields 4 and 8 overlain on satellite mapping(©Bing)

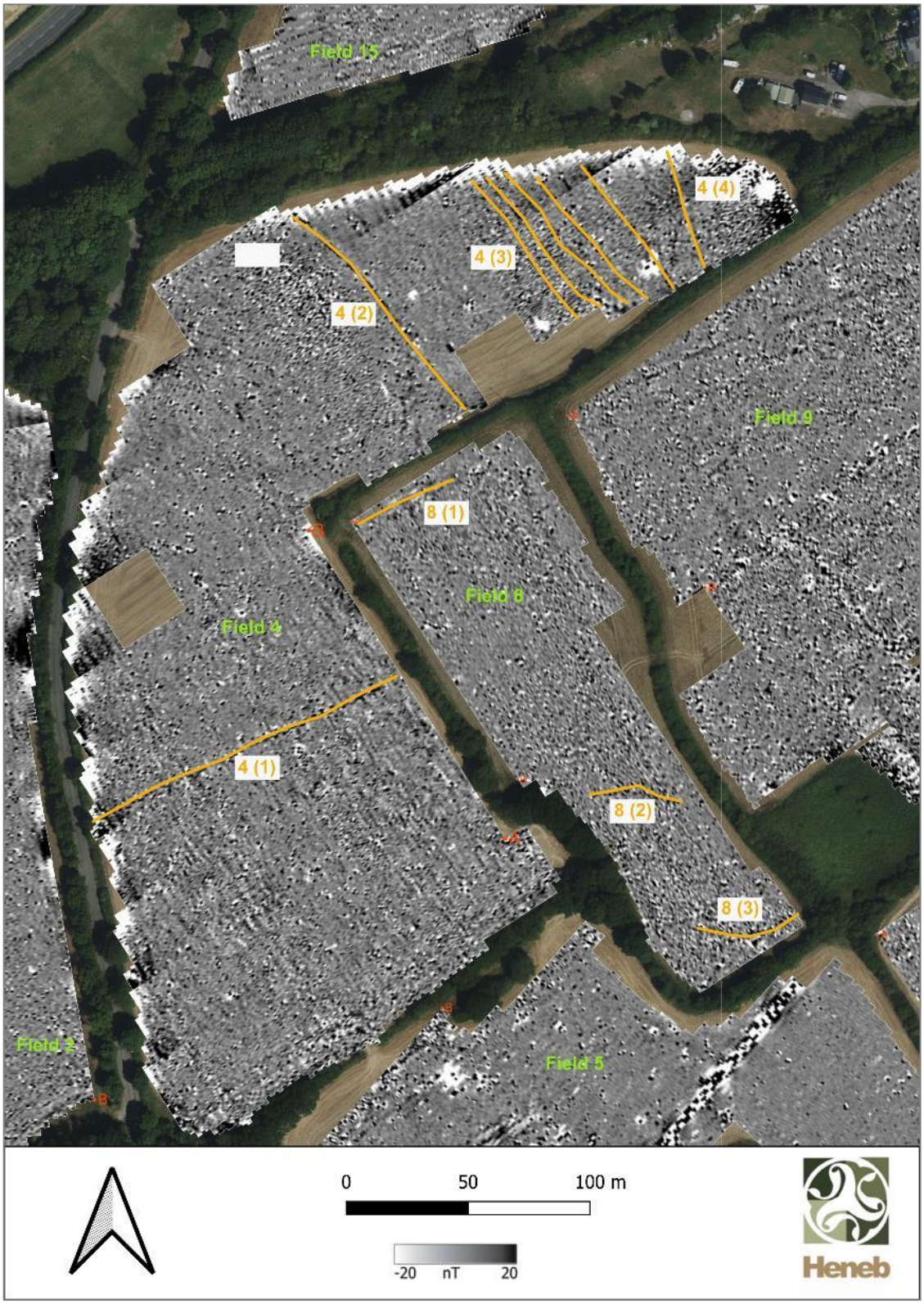


Figure 11: Greyscale plot of geophysical survey in Fields 4 and 8 with interpretive overlay (Background mapping ©Bing).

4.5 Field 4 (Figures 10 and 11)

4.5.1 Field 4 is located in the central section of the surveyed area, to the north of Field 5, west of Field 8 and east of Field 2, separated by St Mary's Well Bay Road. The field forms and L shape and predominantly lies on flat ground to the north with a gentle northwest facing slope along its western axis. It is currently under arable cultivation and had been recently ploughed. All sides of the field are bounded by well-established hedgerows.

4.5.2 The following responses were identified:

- **Responses 4 (1):**
  A strong magnetically positive linear anomaly heading on a northeast-southwest orientation and measuring approximately 129m long. This likely represents a buried ditch, potentially part of a former field boundary, similar to response 2 (1) recorded to the northwest, within Field 2.

- **Responses 4 (2):**
  Response 4 (2) is a similar strong magnetically positive linear anomaly running across the field and likely representing a buried ditch. The feature is orientated northwest-southeast measuring roughly 107m long. The line of the feature is depicted on the Lavernock parish tithe map (1844) as a field boundary, and still valid boundary on the 1885 1st edition Ordnance Survey map.

- **Response 4 (3):**
  A series of linear anomalies running southeast – northwest across the field. The concentration of roughly linear features could suggest agriculture ploughing or drainage.

- **Response 4 (4):**
  A faint magnetically negative linear anomaly running north - south across the northeast corner of Field 4. The anomaly measures 52m long, the magnetic readings suggesting a possible buried bank, which corresponds to the location of a field boundary depicted on the Lavernock parish tithe map of 1844.

4.5.3 Strong magnetic responses were recorded along the western and northern boundaries of the survey area, likely associated with the hidden barbed and rabbit wire fence.

4.5.4 None of the features mentioned above are shown on LiDAR coverage of the area.

4.6 Field 8 (Figures 10 and 11)

4.6.1 Field 8 is included out of sequence as it lies within the southeast angle of Field 4 and is therefore depicted alongside it. Field 8 is one of the smallest fields contained within the survey. The field is generally flat and contains a very slight southwest facing slope at the far southern end of the field. All sides of the field are bounded by well established hedge banks.

4.6.2 The following responses were identified:

- **Response 8 (1):**
  A very faint linear anomaly running northeast - southwest, measuring 67m long, close and almost parallel to the northern field boundary. It is possible this is associated with an earlier field boundary, although it may simply be related to the currently ploughing regime as both aerial photography and LiDAR suggest a deeper plough or trackway around the field periphery.

- **Responses 8 (2 and 3):**
  A pair of very weak magnetically positive anomalies recorded within the

southern end of Field 8. The weak signal and somewhat irregular nature suggests these feature are more likely caused by variations in the natural geology.

4.6.3 None of the features described above appear on historic maps of the area.

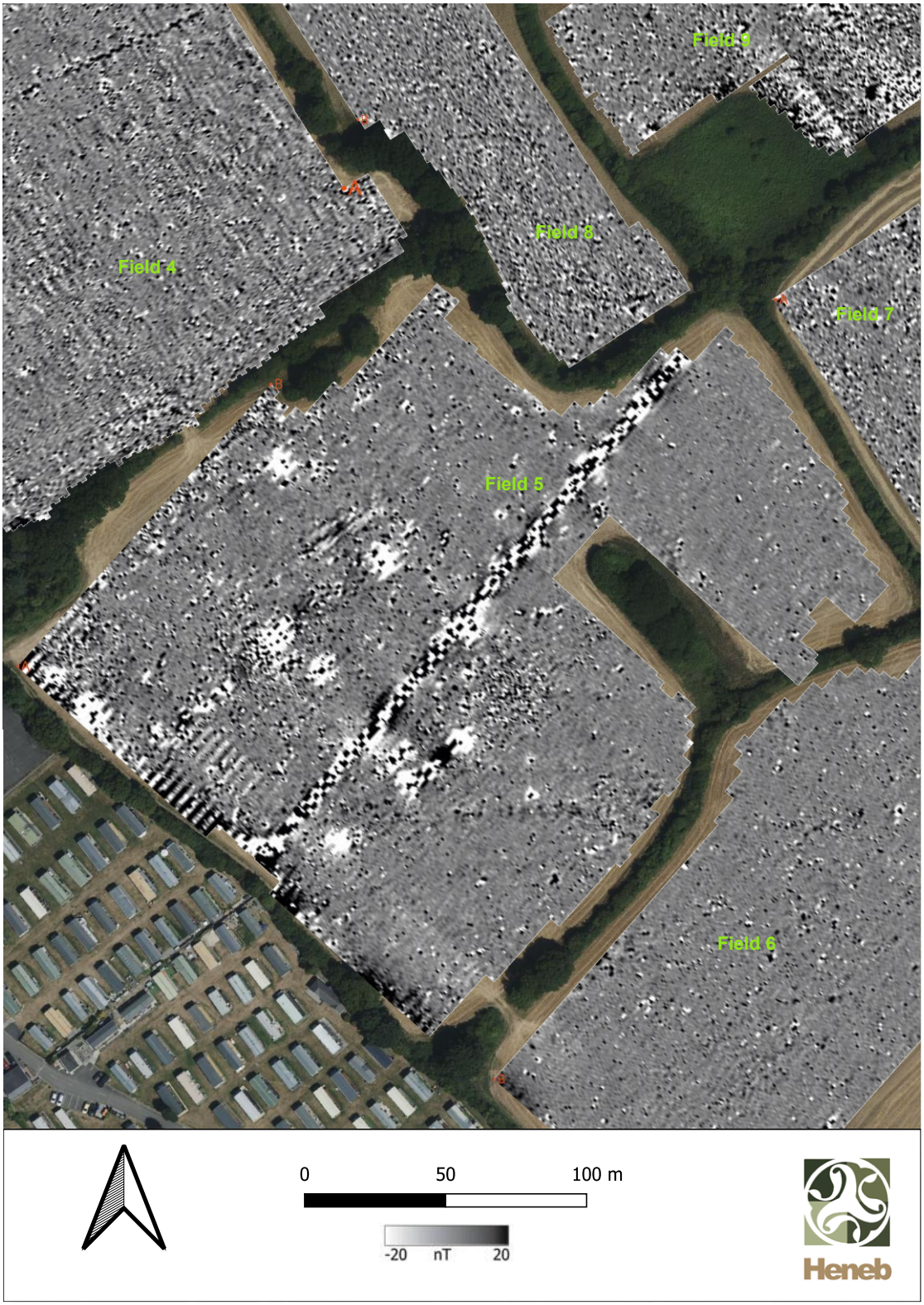


Figure 12: Greyscale plot of geophysical survey in Field 5 overlain on satellite mapping(©Bing)

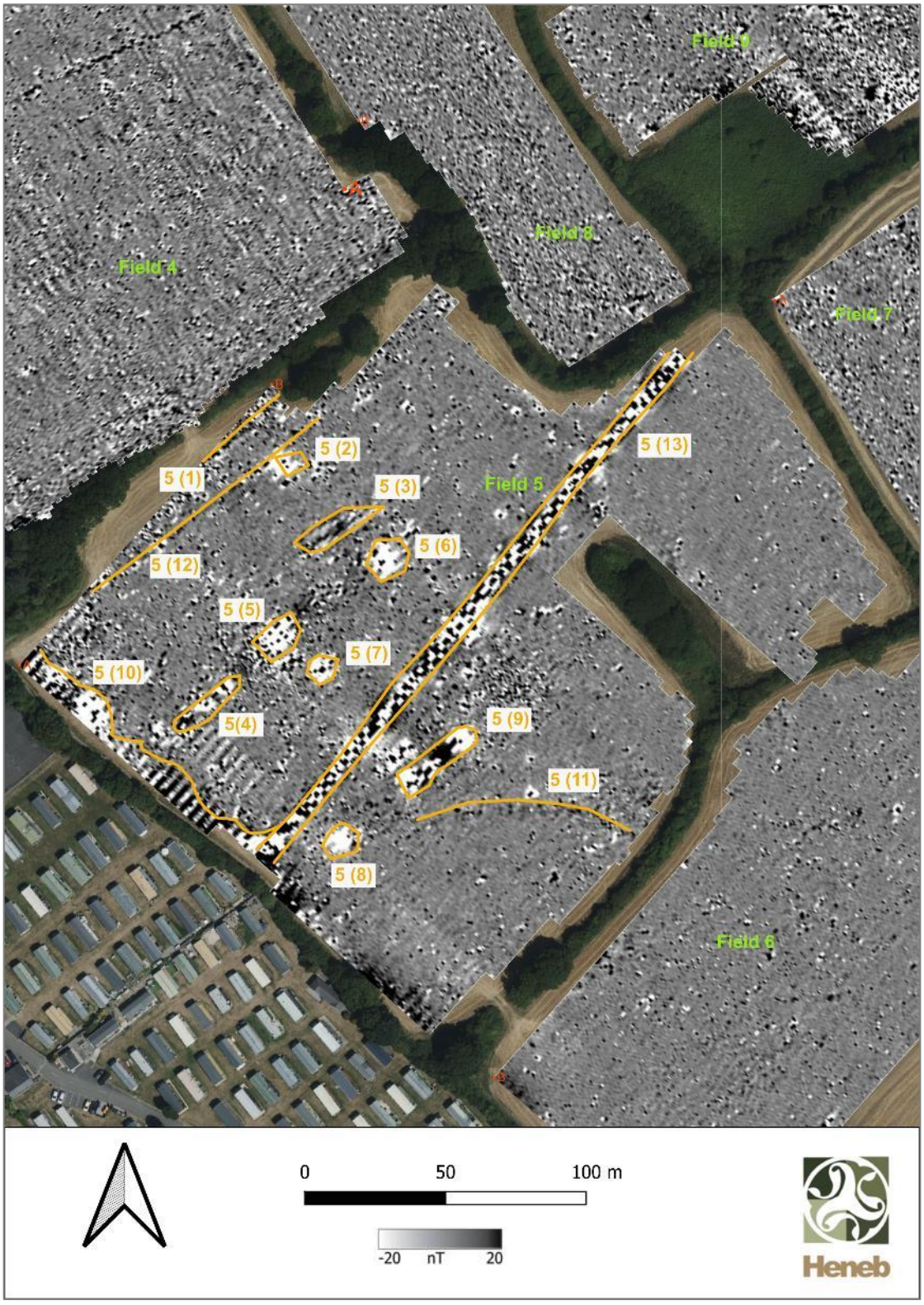


Figure 13: Greyscale plot of geophysical survey in Field 5 with interpretive overlay (Background mapping ©Bing).

4.7 Field 5 (Figures 12 and 13)

4.7.1 Field 5 is located to the south of Fields 4 and 8, and to the north of Field 6 and the Bay Caravan Park. The field slopes gently towards the southwest and to the southeast within the far southeast corner of the field. It was under arable cultivation and bounded by established hedgerows on all sides with a metal boundary fence on its southwest side.

4.7.2 The following responses were identified:

- **Response 5 (1):**
  Response 5 (1) was a strong magnetically positive linear anomaly orientated northeast – southwest, broadly parallel to the existing northern field boundary and measured 37m long. The location of this response corresponds to the boundary of a trackway depicted on the parish tithe map of Lavernock dated 1844.
- **Responses 5 (2, 4-9):**
  Several discrete anomalies with very high magnetically dipolar responses clustered in an almost regular pattern across the western half of the field. Such strong responses are typically from buried metallic objects, often of modern origin, enhanced by their regular arrangement respecting the current boundaries of the field.
- **Response 5 (3)**

  A strong largely magnetically positive semi-linear response. The locations adjacent to the above response may suggest this too is likely to have modern origins.
- **Response 5 (10):**
  Strong dipolar responses along the western edge of the field, likely caused by the metallic fencing along this side.
- **Response 5 (11)**

  A faint curvilinear anomaly was recorded with the southeastern end of the survey area. The relatively faint and somewhat sporadic responses suggests this may be a naturally occurring anomaly, and corresponds roughly with a change of slope visible on the LiDAR coverage.
- **Response 5 (12):**
  A faint magnetically positive linear anomaly running northwest - southeast across the northern edge of Field 5. The anomaly measures approximately 86m long, potentially the result of agricultural deep ploughing, although it also appears to align with the suspect modern features of % (2, 4 – 9).
- **Response 5 (13)**

  A highly magnetic dipolar linear response marking the known route of a modern water pipeline.

4.7.3 Other than response 5 (1) none of the features mentioned above are shown on historic mapping or LiDAR coverage of the area.

4.7.4 During the survey a single piece of Oxford-ware mortarium, dating to the Romano British period, was retrieved from the topsoil within the centre of Field 5 (Photo 5). A prehistoric worked flint flake was also recovered from the mid northwestern end of the survey area (Photo 6).



Photograph 5: Heavily abraded fragment of Oxford-ware mortarium found during the survey in Field 5.



Photograph 6: Prehistoric worked flint found during the survey in Field 5.



Figure 14: Greyscale plot of geophysical survey in Field 6 overlain on satellite mapping(©Bing)



Figure 15: Greyscale plot of geophysical survey in Field 6 with interpretive overlay (Background mapping ©Bing).

4.8 Field 6 (Figures 14 and 15)

4.8.1 Field 6 was a small, roughly rectangular field oriented roughly northeast - southwest. It was located at the southern edge of the survey area, south of Fields 5 and 7. The field was under arable cultivation and bounded by established hedgerows with a metal fence line bordering the southwest edge. A large linear area of dense natural vegetation occupied the area along the southeastern boundary of the field which was unsuitable for survey.

4.8.2 The following responses were identified:

- **Response 6 (1):**
  A discrete strong positive response, potentially represent a cut feature such as a pit.

- **Response 6 (2)**

  A second discrete response, but with bipolar reading suggesting a buried ferrous object. Such objects are typically found to be modern material amongst the plough soil.

4.8.3 Neither feature is noted on either historic mapping or LiDAR coverage.

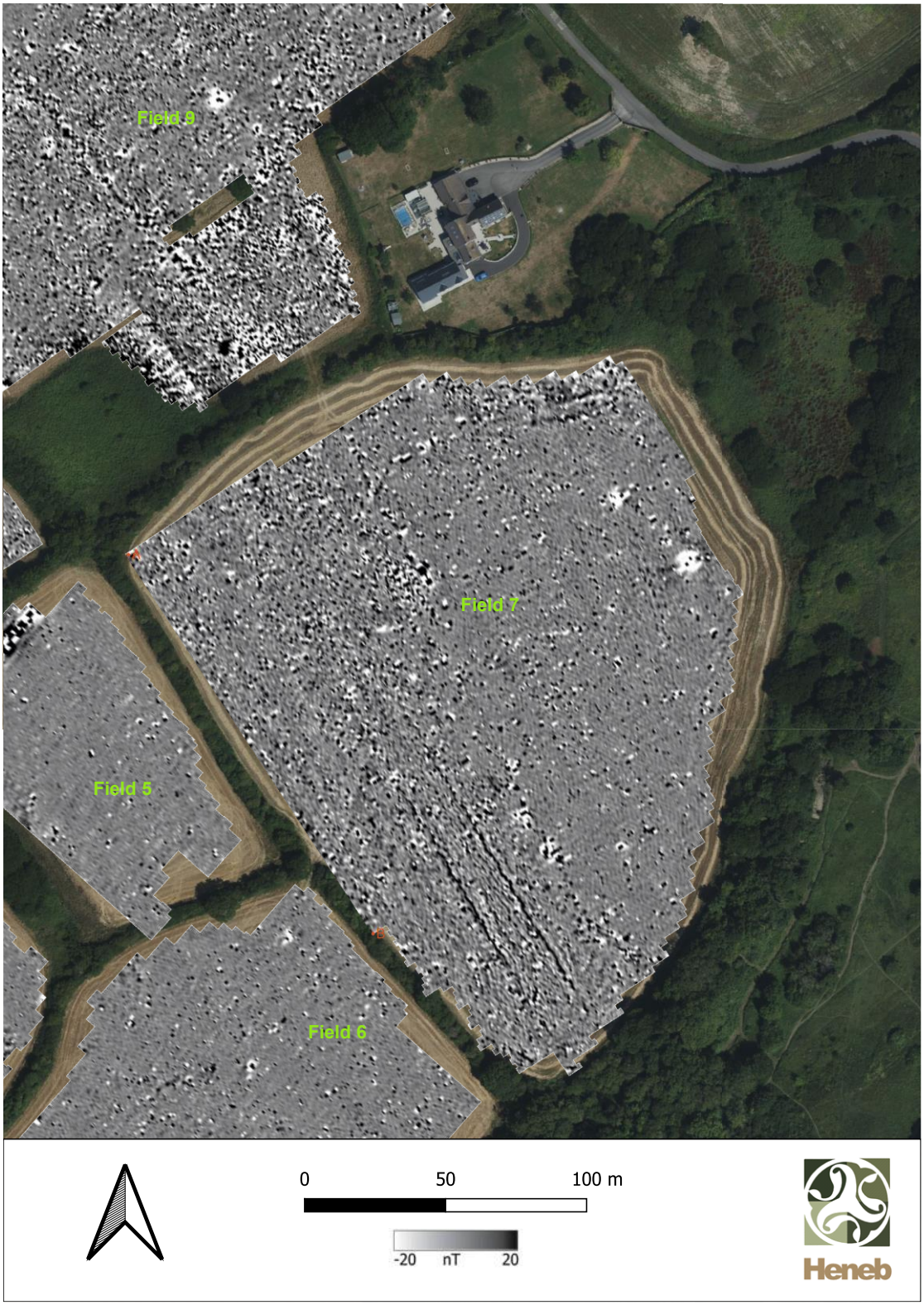


Figure 16: Greyscale plot of geophysical survey in Field 7 overlain on satellite mapping(©Bing)

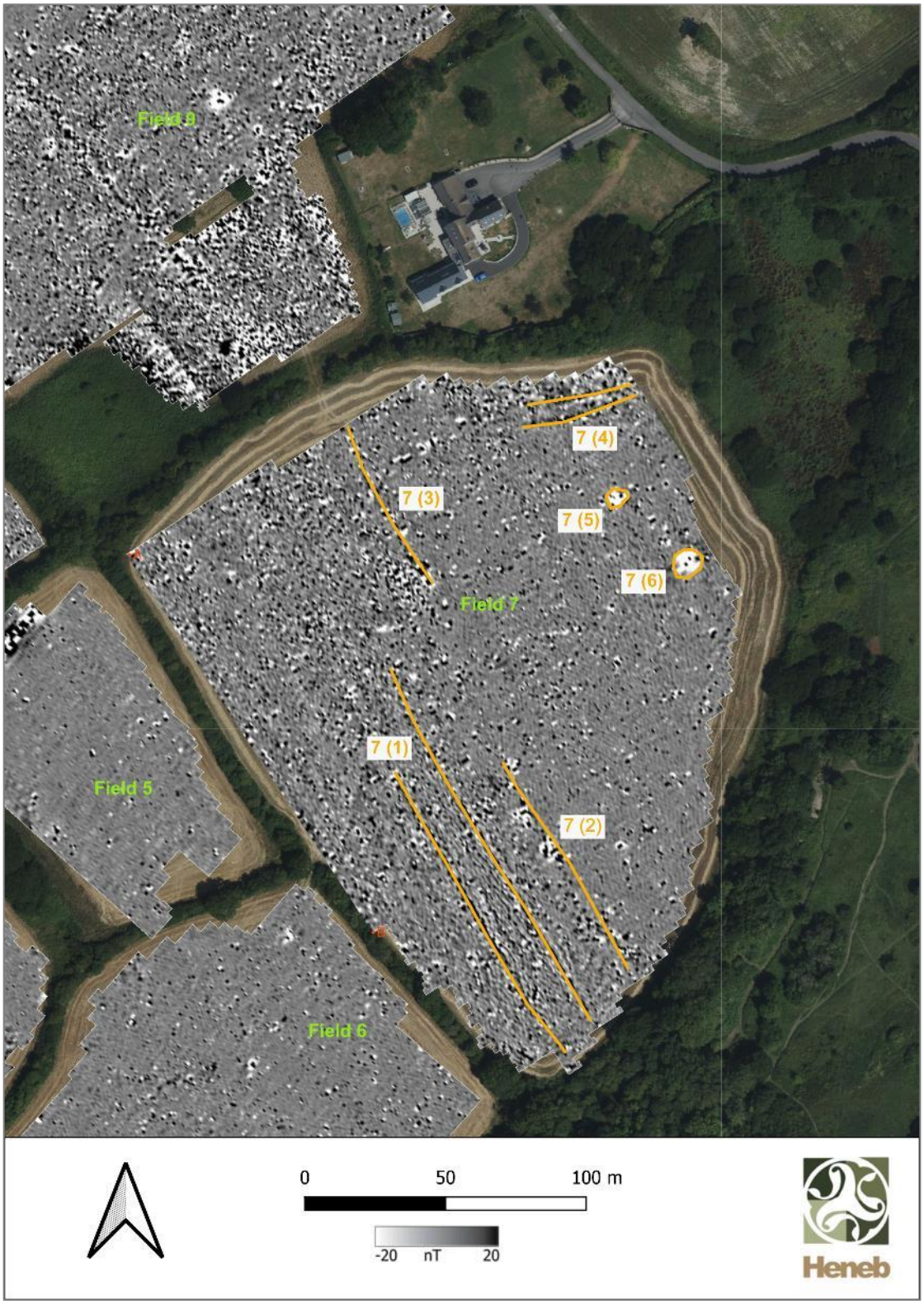


Figure 17: Greyscale plot of geophysical survey in Field 7 with interpretive overlay (Background mapping ©Bing).

4.9 Field 7 (Figures 16 and 17)

4.9.1 Field 7 is located to the northeast of Field 6 and to the south of Field 9 in the central part of the Site. This field is roughly flat and had recently been used for arable cultivation. Along the northern and eastern periphery of the field a band of dense natural vegetation was present which was unsuitable for survey.

4.9.2 The following responses were identified:

- **Response 7 (1):**
  A parallel pair of southeast - northwest orientated positive linear anomalies. The western linear appeared shorter, measuring 95m in length, with the eastern linear continuing for 130m in length. It would appear likely both anomalies would have continued northwards but have since been removed by deep agricultural ploughing. This feature does not appear on historic mapping or LiDAR coverage and an interpretation is uncertain although it is aligned with current and historic field boundaries (see 7 (2-3)). It may therefore be related to the agricultural practices within the field or potentially some form of former agricultural driveway used to move livestock.

- **Responses 7 (2-3)**

  Responses 7 (2) and 7 (3) were recorded as faint positive linear anomalies running northwest - southeast. The positioning of both anomalies correspond to a field boundary depicted on the Lavernock tithe map dated 1844 and likely represent the ploughed out drainage channel alongside the boundary, partly removed through deep modern agricultural ploughing.

- **Response 7 (4):**
  A short parallel pair of positive linear responses recorded within the northern corner of the field. Both anomalies were oriented southwest-northeast and similarly measured 18m in length. Such parallel features in agricultural settings are often indicative of the buried remains of a former field boundary, although no such feature is recorded on historic mapping. The location within the existing field boundary, but similar in alignment, may suggest this is related to agricultural activities within the field.

- **Response 7 (5-6):**
  A pair of discrete, strong negative to dipolar responses. Such strong responses are likely caused by ferrous material within the plough soil, typically more modern in date.

4.9.3 These features described above do not appear in the LiDAR coverage of the area.

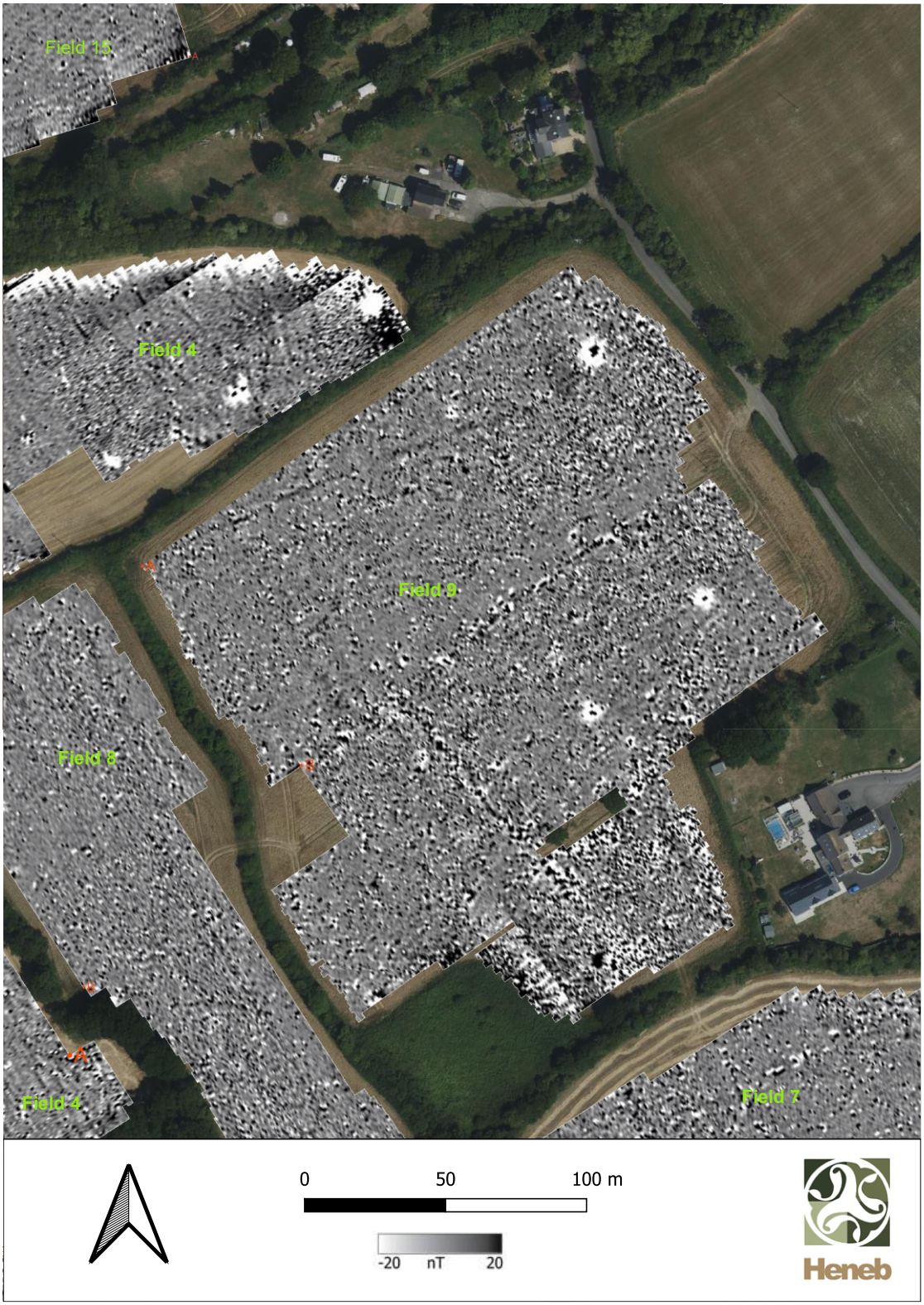


Figure 18: Greyscale plot of geophysical survey in Field 9 overlain on satellite mapping(©Bing)



Figure 19: Greyscale plot of geophysical survey in Field 9 with interpretive overlay (Background mapping ©Bing).

4.10 Field 9 (Figures 18 and 19)

4.10.1 Field 9 is situated to the immediate northwest of Sutton Farm, northeast of Field 8 and northwest of Field 7. The field slopes gently to the northeast before becoming flat within its central and northeast portions. The field had been under arable cultivation, bordered by established hedgerows and stock fencing. The presence of a linear manure pile within the northeast edge of the field along with a band of natural vegetation prevented surveying in that area.

4.10.2 The following geophysical responses were identified:

- **Response 9 (1):**

  A faint positive linear anomaly running roughly southwest - northeast for around 167m in length. This likely represents a buried ditch, with a possible break midway along its length. It may represent an earlier field boundary ditch, not aligned to the current boundaries and not depicted on historic mapping.

- **Response 9 (2):**
  A faint positive linear anomaly crossing the current field, likely marking the location of a former field boundary. This boundary is depicted on both the 1844 tithe map and the later 1st Edition Ordnance Survey map of the area.

- **Response 9 (3):**
  Another faint positive linear anomaly that respects the line of response 9 (2) above, and runs to the southern field boundary. This also likely represents a former field boundary that is depicted within this location on both the parish tithe map of Lavernock dated 1844 and the later 1st Edition Ordnance Survey map of the area.

- **Response 9 (4):**
  A short segment of a positive linear anomaly that corresponds to a boundary depicted on both the parish tithe map of Lavernock dated 1844 and the later 1st Edition Ordnance Survey map of the area.

- **Responses 9 (5-7):**
  Three discrete, strong negative to dipolar responses, likely caused by ferrous objects within the ploughsoil.

4.10.3 None of the features described above appear in the LiDAR coverage of the area.

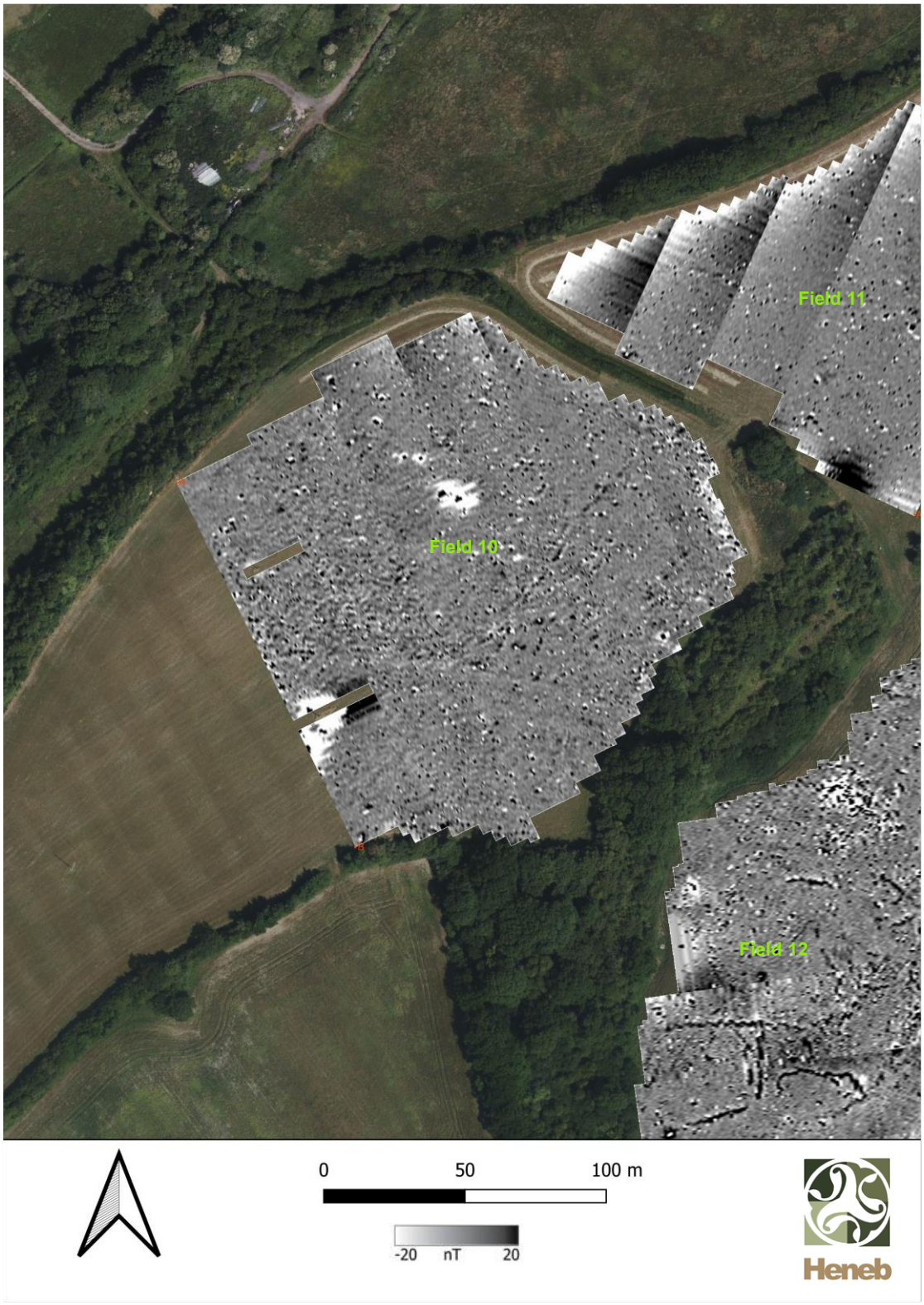


Figure 20: Greyscale plot of geophysical survey in Field 10 overlain on satellite mapping(©Bing)

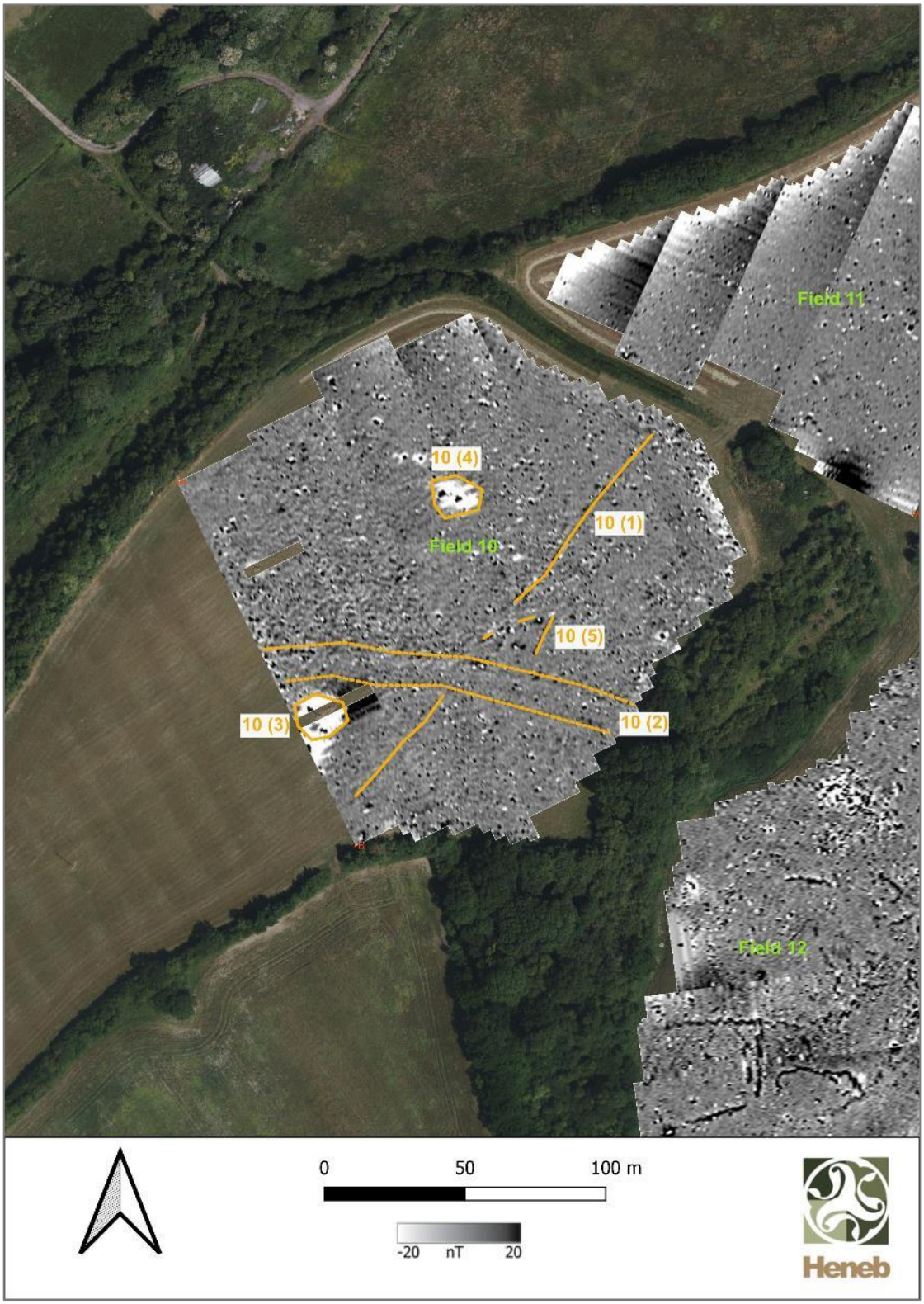


Figure 21: Greyscale plot of geophysical survey in Field 10 with interpretive overlay (Background mapping ©Bing).

4.11 Field 10 (Figures 20 and 21)

4.11.1 Field 3 lies in the eastern block of surveyed fields located on an area of relatively high ground that overlooks the Bristol Channel to the south and east. The field had recently been under arable cultivation and was surrounded by established hedge banks.

4.11.2 The following geophysical responses were identified:

- **Responses 10 (1 and 5):**
  A faint positive linear response, which is also visible as a linear depression on the LiDAR coverage of the area. This anomaly aligns with a field entrance and is probably caused by the movement of agricultural vehicles.
- **Response 10 (2):**
  A faint curvilinear negative response that continues southeast into Field 12. This feature corresponds to a gradual slope within the field and is therefore considered to be of natural origin.
- **Response 10 (3):**
  A highly magnetic response caused by the presence of a modern overhead power line pole.
- **Response 10 (4):**
  A very strong discrete bipolar response. Such strong readings are likely caused by buried ferrous object contained within the plough soil.

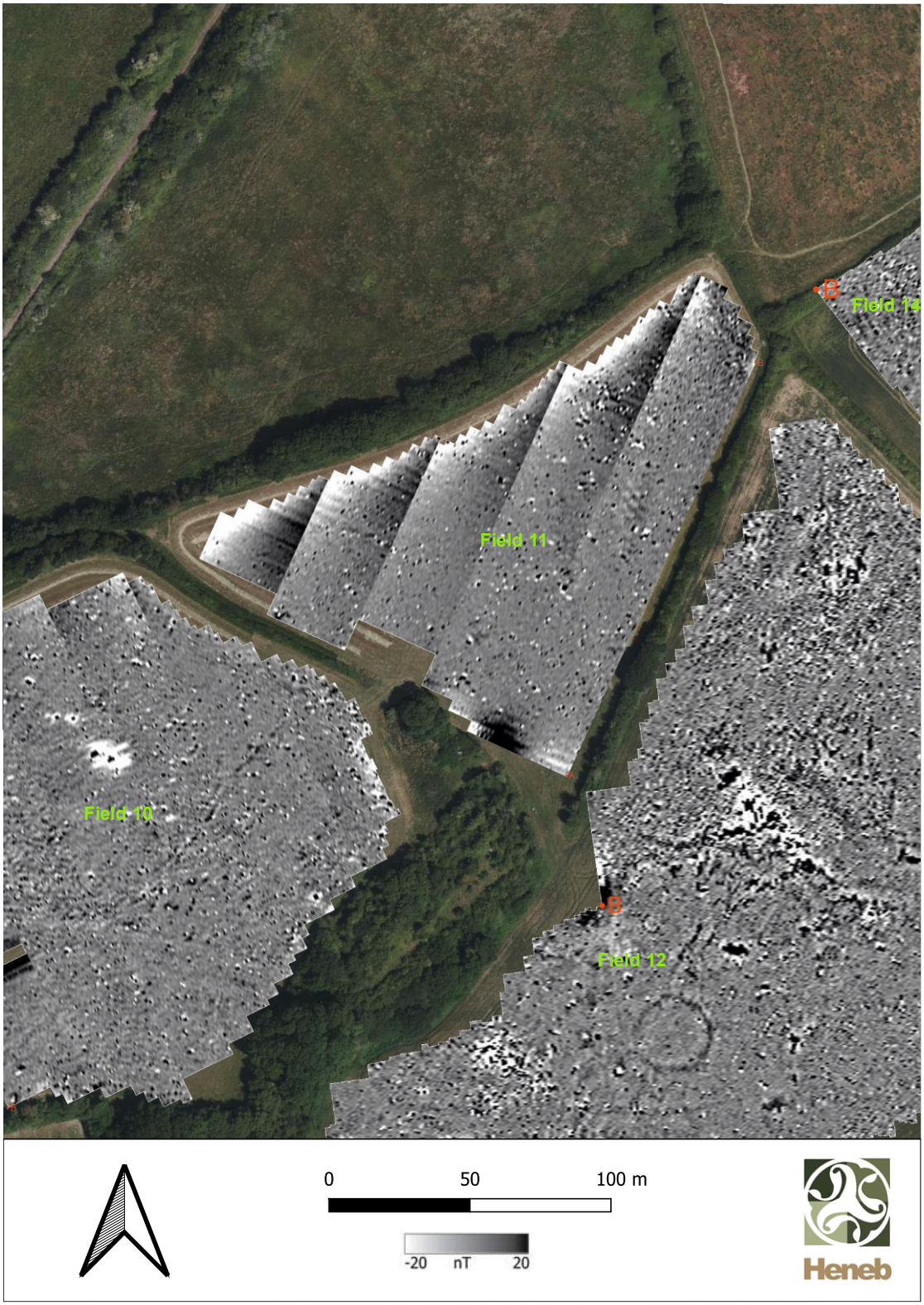


Figure 22: Greyscale plot of geophysical survey in Field 11 overlain on satellite mapping(©Bing)**.**

4.12 Field 11(Figure 22)

4.12.1 Field 11 is located to the east of Field 10 and north of Field 12 and west of Field 14. It is a small triangular shaped field, used for arable cultivation and bounded by mature hedgerows reinforced with stock fencing.

4.12.2 Strong bipolar responses were visible along the northern edge of the field, originating from the metallic fencing affecting readings in this area. Otherwise no significant responses were identified in this area.

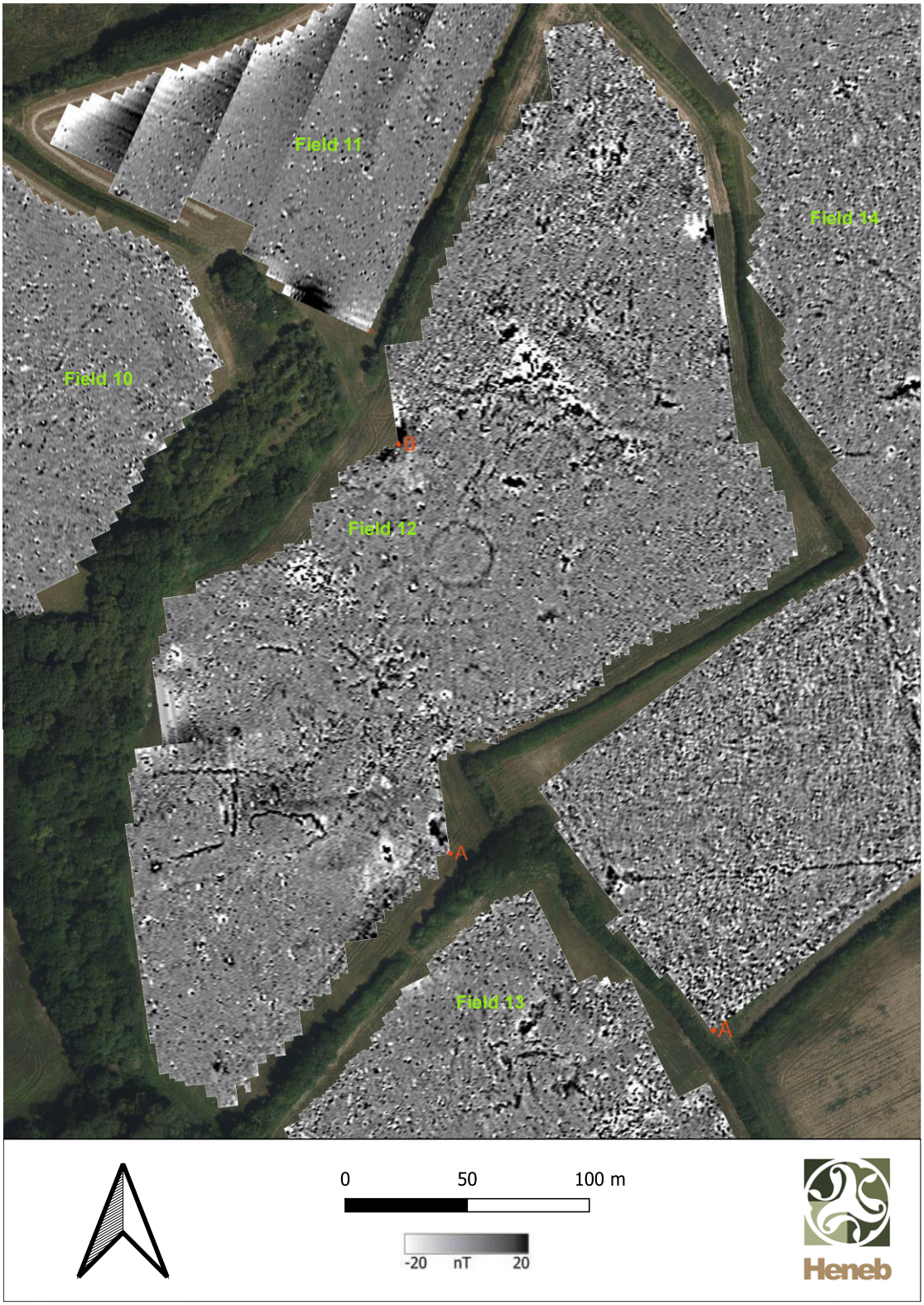


Figure 23: Greyscale plot of geophysical survey in Field 12 overlain on satellite mapping(©Bing)**.**

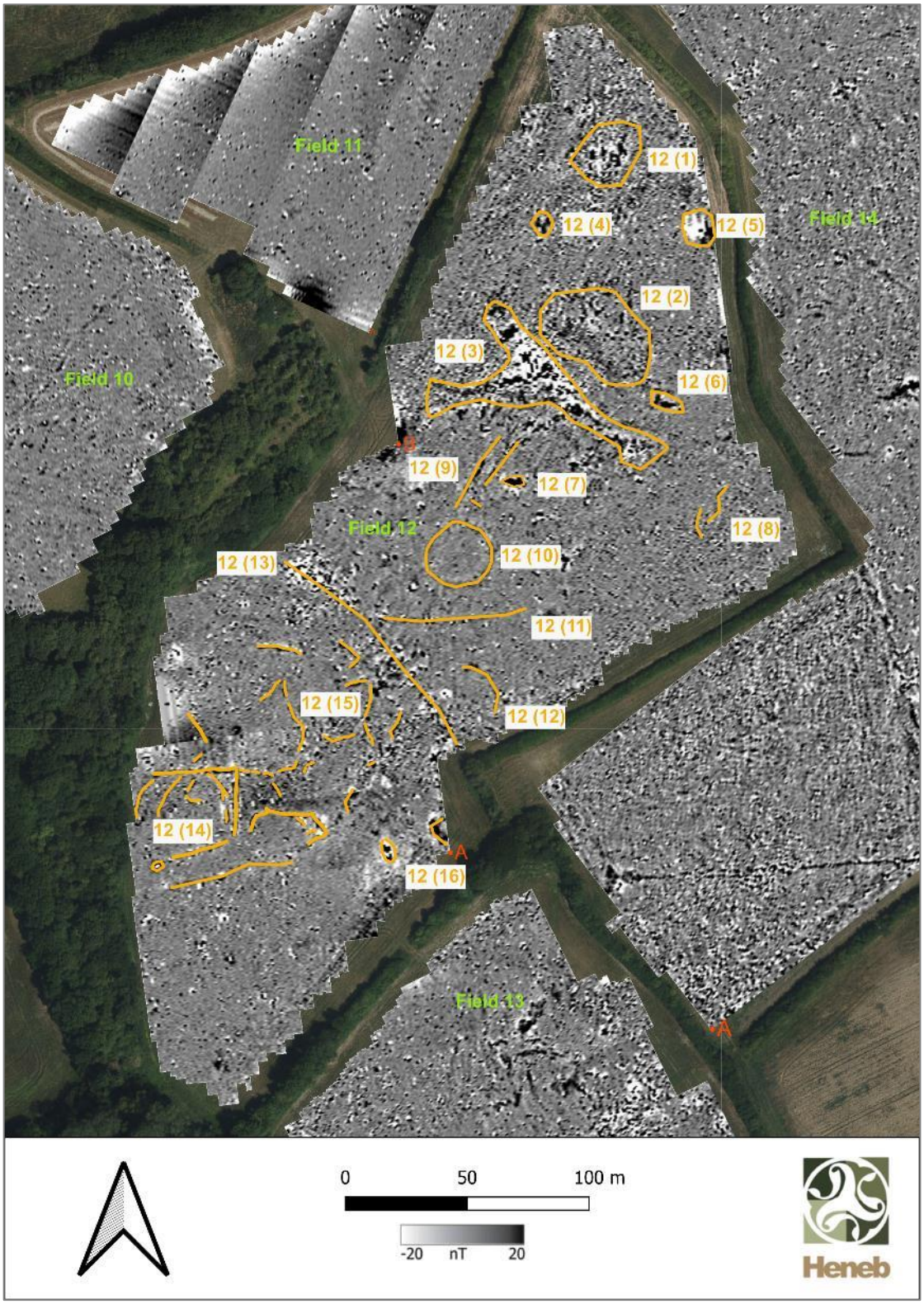


Figure 24: Greyscale plot of geophysical survey in Field 12 with interpretive overlay (Background mapping ©Bing).

4.13 Field 12 (Figures 23 and 24)

4.13.1 Field 12 is located to the northwest of Field 13 and southeast of Field 11. It is among the largest fields surveyed, with an elongated form-oriented north - south that slopes gently to the south for the most part and then rises sharply onto a plateau to the fields southern extent, with excellent views to the south and east across the Bristol Channel. The field was under arable cultivation and was bounded by mature hedgerows reinforced with stock-proof fencing.

4.13.2 The following geophysical responses were identified:

- **Responses 12 (1-3):**
  Three areas of mixed high responses distributed throughout the northeastern part of Field 12. Some of the stronger bipolar responses may indicate ferrous material, weaker spreads of bipolar responses could be indicative of areas of heating activity, such as hearths, bonfires and kilns. Spreads of higher responses such as these can often therefore be indicators of general settlement activity.

- **Responses 12 (4-7):**

  Discrete anomalies of largely positive responses, with one (12 (5)) bipolar response. These anomalies may be indicative of cut features such as pits, with the bipolar response possibly indicative of ferrous material. Given the proximity to areas 12 (1-3) above, they may also be part of an area of general settlement activity.

- **Response 12 (8):**
  A pair of relatively weak positive linear anomalies towards the corner of Field 12. These features are relatively ephemeral in comparison to other responses within this field, and somewhat irregular in layout, which could indicate a natural origin.

- **Response 12 (9):**

  A parallel pair of positive linear responses situated within the centre of the field that could represent a pair of ditches, potentially the boundaries to a trackway or ditches accompanying an embanked boundary. This feature only runs a short distance however, and may be associated with either 12 (10) to the south, or 12 (3) to the north, potentially even linking the two.

- **Response 12 (10):**
  A strong circular positive response within the centre of Field 12, measuring approximately 23m in diameter and is considered to represent a circular ditch. Such features are often indicative of prehistoric enclosures, such as a Neolithic ring ditch, Bronze Age round barrow or large prehistoric hut. This corresponds to the ring ditch identified from aerial photograph (PRN 03118s).

- **Response 12 (11):**
  A very faint positive linear anomaly situated within the central area of Field 12. Given the location it is possible this is related to the potential prehistoric activity represented by 12 (10), however there is some indication it may extend through adjacent linear feature 12 (13), considered to be a post-medieval field boundary, and could therefore be related to an associated post-medieval trackway.

- **Response 12 (12)**

  A weak curvilinear positive response, measuring approximately 25m long. The curvilinear nature and location a short distance south of 12 (10) may suggest a link between the two, potentially therefore prehistoric in origin.

- **Response 12 (13)**

  A faint negative linear anomaly extending across the field from north to south, with associated areas of mixed responses along its length, particularly at the northern end and midway along. This feature corresponds to a field boundary depicted on both the 1844 tithe map and later 1st Edition Ordnance Survey map of the area. This boundary also follows and demarcates the rise onto the plateau located within the southern area of the field. The areas of mixed responses presumably relate to ploughed out bank material or areas of burning associated with the clearance of the hedgerow.

- **Response 12 (14)**

  A fairly strong positive linear response, likely representing a buried ditch which appears to demarcate a roughly square enclosure, measuring 33m east - west by 30m north – south, with a break and possible entrance on the southeast side.

  Within the centre of the enclosure are several discrete, weakly magnetic linear and curvilinear anomalies which may represent related activity such as foundation slots for timber buildings or associated structures.

  A separate irregular shaped anomaly extends from the eastern edge of the enclosure and may form some sort of annex. A faint east - west orientated linear anomaly lies to the south of the square enclosure, and may indicate the irregular annex extends along the southern side of the enclosure.

  These enclosure appear to correspond to a site recorded from aerial images by the RCAHMW, and described as the possible remnants of a farmstead or shrunken medieval village (PRN 02779s).

- **Response 12 (15)**
  A grouping of several short segmented curvilinear and linear positive responses lying on the raised plateau to the northeast of enclosure 12 (14). These sections of linear anomalies may be related to either activity associated with the enclosure, or indeed be fragmented sections of a separate, roughly circular enclosure measuring around 32m in diameter.

- **Response 12 (16)**
  A pair of highly magnetic responses recorded near to the southeast edge of Field 12. The strength of the response suggests they may be associated with industrial activity rather than representing discrete cut features.

4.13.3 Response 12 (12) was the only feature depicted on historic mapping, recorded on the Laverock parish tithe map of 1844. Features 12 (10) and 12 (14) have in part been previously identified from aerial photography and recorded on the regional Historic Environment Record. None of the features mentioned above are shown on LiDAR coverage of the area.



Figure 25: Greyscale plot of geophysical survey in Field 13 overlain on satellite mapping(©Bing)**.**



Figure 26: Greyscale plot of geophysical survey in Field 13 with interpretive overlay (Background mapping ©Bing).

4.14 Field 13 (Figures 25 and 26)

4.14.1 Field 13 is a large, sub-rectangular field located in the southeast corner of the Site. The field is located to the south of Field 12 and to the northwest of the small hamlet of Lavernock, once part of a larger medieval village. The field slopes gently towards the southeast and southwest, used for arable cultivation, and surrounded by established hedge banks.

4.14.2 The following geophysical responses were identified:

- **Response 13 (1):**
  A grouping of irregular shaped positive linear responses which may represent a series of buried ditches or similar cut features. The purpose of these features is unclear but appears to mark an area of potential activity in the northern corner of the field.
- **Response 13 (2):**
  A positive linear anomaly, extending southeast to northwest. This corresponds to a former field boundary depicted on both the tithe map of 1844 and the later 1st Edition Ordnance Survey map of the area.
- **Response 13 (3):**
  This represents a L-shaped negative anomaly which measures 55m long and possibly relates to a former agricultural hedge boundary or bank. This feature is not represented on historic mapping however it does clearly respect the line of former field boundary 13 (2) and is assumed therefore to be related.
- **Response 13 (4):**

  A highly magnetic response caused by the presence of a modern overhead power line pole.
- **Response 13 (5):**

  A strong positive linear anomaly, representing a former field boundary depicted on both the tithe map of Lavernock dated 1844 and the later 1st Edition Ordnance Survey map of the area. The former boundary is also visible on LiDAR coverage.
- **Response 13 (6):**
  A weakly positive linear response measuring 36m northeast - southwest. This may represent a former field boundary or trackway, although the responses appear somewhat diffuse, potentially indicating a natural origin to the anomaly. This feature does not appear on historic mapping or on LiDAR coverage of the area.
- **Response 13 (7):**

  A weak positive linear response orientated north-south and measuring 69m in length. This may represent a former agricultural field boundary or drainage feature within the field. This feature is not represented on historic mapping and does not appear in the LiDAR coverage of the area.
- **Response 13 (8)**

  A discrete strong dipolar response, likely caused by ferrous material within the plough soil.

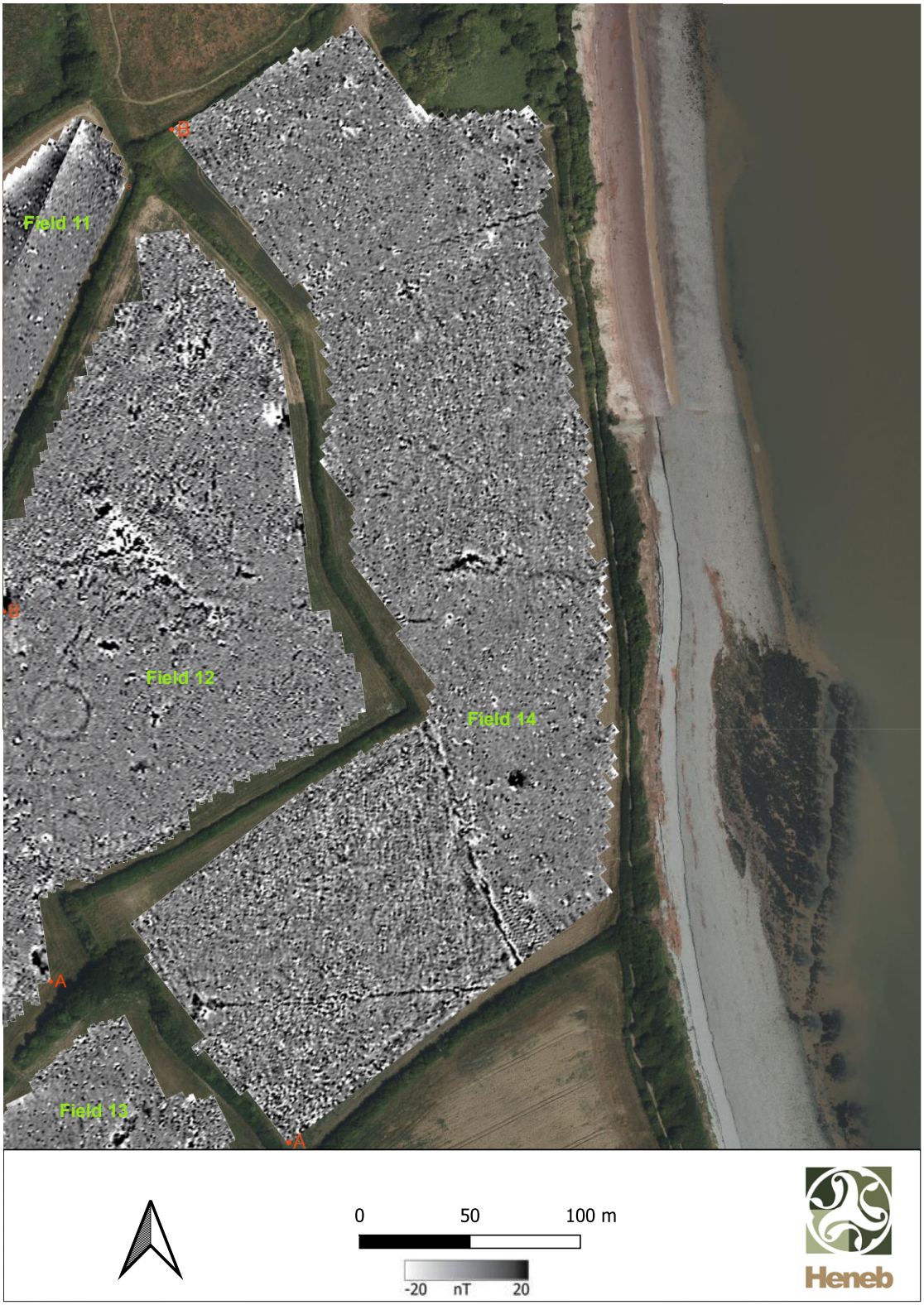


Figure 27: Greyscale plot of geophysical survey in Field 14 overlain on satellite mapping(©Bing)**.**



Figure 28: Greyscale plot of geophysical survey in Field 14 with interpretive overlay (Background mapping ©Bing).

4.15 Field 14 (Figures 27 and 28)

4.15.1 Field 14 is a large roughly L-shaped field located at the far eastern end of the Site, east of Field 12 and northeast of Field 13. The field comprises a constant moderate southeast facing slope used for arable cultivation. All sides of the field are surrounded by established hedge banks and reinforced with livestock fencing.

4.15.2 The following geophysical responses were identified:

- **Response 14 (1):**
  A strong positive linear response measuring 44m long and orientated northeast - southwest. This feature corresponds to an agricultural field boundary depicted on the parish tithe map of 1844 and the later 1st Edition Ordnance Survey map of the area.
- **Response 14 (2):**
  A small irregular segment of a strong positive linear response located near to the centre of Field 12. The feature appears discrete, the strength of the response would suggest an possible archaeological origin, although the irregular appearance makes explanation difficult.
- **Response 14 (3):**
  A very short segment of positive linear response, measuring 11m in length and oriented east - west. This would appear to represent a cut feature, such as a short ditch, but the function remains unclear.
- **Response 14 (4):**
  A strong positive linear response orientated northwest - southeast and corresponding to a former field boundary depicted on both the 1844 parish tithe map and later 1st Edition Ordnance Survey map of the area.
- **Response 14 (5)**

  A positive linear response orientated east-west and measuring 134m long. This feature is not depicted on any historic map or LiDAR coverage of the area, however the similarity in form and location to response 14 (4) would suggest this is also likely to represent a former field boundary, albeit one that is likely to have been removed prior to the production of the parish tithe map in 1844.
- **Response 14 (6)**

  A discrete feature of relatively strong positive readings. This would suggest a cut feature, such as a pit, although the strength of the readings may indicate a possible metallic object within the plough soil.



Figure 29: Greyscale plot of geophysical survey in Field 15 overlain on satellite mapping(©Bing)**.**



Figure 30: Greyscale plot of geophysical survey in Field 15 with interpretive overlay. Also marking a nearby enclosure noted on the satellite imagery, within the red square. (Background mapping ©Bing).

4.16 Field 15 (Figures 29 and 30)

4.16.1 Field 3 is a small, triangular field located at the far northern end of the central survey area, to the north of field 4. The field is flat, used for arable cultivation, and surrounded by well established hedge banks. A road runs along the western boundary, and a former railway cutting along the southern boundary.

4.16.2 The following geophysical responses were identified:

- **Response 15 (1):**
  A strong positive linear anomaly forming a right angle against the eastern edge of the surveyed area. This may represent a ditch forming part of a square enclosure measuring 16m northeast-southwest by 17m northwest-southeast, continuing below the eastern field boundary. This feature appears as a slightly darkened area on both aerial photography and LiDAR data, but is not marked on historical mapping.

4.16.3 Examination of recent satellite imagery during the production of this report identified a potentially similar anomaly to that of 15 (1), visible as a cropmark to the northwest and across the main B4267 road. The site of this cropmark is marked in red on Figure 30.

4.16.4 Strong magnetic interference was encountered along western edge of the field, likely caused by a metal livestock fence.

5. INTERPRETATION AND DISCUSION

5.1 General

5.1.1 The survey for the most part was undertaken during a period of prolonged dry weather, which had dried and hardened the ground. The weather changed with periods of heavy rain as the survey progressed across the eastern part of the Site, waterlogging some areas. Both weather conditions produced some challenging surveying conditions, however generally a good coverage of the survey area was achieved. Areas of dense vegetation, waterlogged ground, hedgerows, piles of manure, farm machinery and other large metallic objects limited some areas of the survey, however the survey was able to cover over 56 hectares giving a good representation of the entire Site.

5.1.2 All of the fields, with the exception of Field 2A, were under a state of arable cultivation and had been recently harvested prior to the survey. It is assumed these fields have been heavily ploughed over a prolonged period which is likely to have impacted on potential buried archaeological remains, subsoils and bedrock. Disturbed bedrock was particularly evident in Fields 1,2 ,3 and 9. Plough soil may also mask potential buried archaeology, and these factors should be noted when assessing the survey data. Background geology was visible within the survey results in several fields, particularly Fields 1, 2, 10 and 12, which may mask mire subtle archaeological remains. However, the background geology generally appeared suitable for depicting potential archaeological features.

5.1.3 Areas of magnetic disturbance are noted in some of the survey results. This was particularly evident in Field 11 where a large magnetic disturbance was recorded running parallel to the northwest boundary of the field and may have originated from a buried metallic pipe or a succession of redundant livestock fencing in the hedgerow. Overhead electrical power line poles were also noted and affected results in their vicinity, however the overhead lines themselves do not appear to have unduly affected survey results.

5.1.4 It is important to note that geophysical surveys such as this cannot detect all potential archaeological features. The interpretations presented below should be regarded as preliminary, and more intrusive archaeological investigations will be necessary to confirm the findings.



Figure 31: Overview of features discussed in interpretation and discussion**.**

5.2 Field Boundaries

5.2.1 Linear anomalies were identified across most of the fields surveyed, often visible as magnetically positive responses that are indicative of buried ditches. Cross-referencing these anomalies with historic maps, including the tithe map of the 1840s and Ordnance Survey maps from the 1880s onward, confirmed many of these anomalies were associated with former field boundaries in Fields 2, 4, 5, 7, 9, 12, 13 and 14. The similarities in form would suggest more of these linear anomalies also corresponded to former field boundaries in Fields 1, 2, 3, 8, 9 and 14, the assumption being that they pre-date the mapping records of the mid-19th century onwards.

5.2.2 In most cases, the current boundaries in the area consist of banks often planted with hedges, with slight ditches on either side. This form would likely be visible within the survey results as a negative linear anomaly flanked by positive responses. Feld boundaries visible in these results however appear largely to comprise a single linear anomaly of positive responses. The variation in responses may be due to the specific morphology of the boundaries, as they are no longer extant and are subject to changes over time.

5.2.3 Boundaries identified from historic mapping are marked in light blue on Figure 31. Boundaries that do not appear on historic mapping and are assumed to pre-date the mid-19th century, but nevertheless appear to respect known boundaries are marked in dark blue as it is assumed these boundaries are also post-medieval in date. These boundaries are assumed to be of limited archaeological significance. Assumed boundaries that appear to pre-date these field systems, and therefore may be medieval or earlier in origin and of greater archaeological significance, are marked in green.

5.3 Prehistoric ring ditches (Figure 32)

5.3.1 Ring ditches are a common archaeological feature identified in geophysical surveys, identified as a circular feature of varying diameter and typically have two primary interpretations. One possibility is a round barrow, funerary and ritual monuments dating to the Bronze Age (circa 2500–750 BC). These barrows often contain one or more burials or cremations and are usually located on elevated ground overlooking adjacent valleys. In geophysical surveys, the detected anomalies are usually the ditches that encircle the barrows, created during their construction.

5.3.2 Another possibility is a roundhouses, structures most commonly dating to the Iron Age (circa 750 BC–43 AD), though some examples may originate in the Bronze Age and other examples continuing into the post-Roman period. These can be residential buildings that could be isolated in the landscape (more typical in the Bronze Age) or part of a collected, often defended, settlement (more typical in the Iron Age). In geophysical data, the anomalies generally correspond to the drainage ditches or gullies that surrounded these structures. In rare cases of excellent preservation, central features like hearths or postholes may also be detected.

5.3.3 Many other features across a broad date range are possible, from Neolithic henge monuments to post-medieval sheepfolds or horse gins and therefore care must be taken in any interpretation, but the prehistoric features mentioned above are typically the more prevalent in geophysical surveys.

5.3.4 The possible prehistoric ring ditches are marked on Figure 31 in red.

Field 12

5.3.5 Within Field 12, there is a good example of a potential ring ditch (Response 12 (10)), situated in the centre of the field and forming a complete circle with a strong positive response. This potential ring ditch and has previously been recorded as a circular crop mark depicted on aerial photography (PRN

03118s). A short distance to the south lies a second potential ring ditch, (Response 12 (12)), although less convincing with a weaker response and only a partial arc. Of the two main possibilities the size of these features may suggest Bronze Age barrows rather than hut circles. These features are distributed across high ground in eastern part of the Site with good visibility across the Bristol Channel to the south, generally considered a good location for such monuments.

Field 3

5.3.6 A less convincing example of a possible ring ditch was recorded within the western edge of Field 3. (Response 3 (3)) produced a very faint positive circular response and was less prominent than its counterparts within the east of the survey, however it is worth considering that Field 3 has been heavily ploughed and any potential archaeological remains may have been denuded or masked by plough debris. Surrounding responses, if contemporary, suggest this may be part of a wider complex of enclosures, potentially therefore domestic in origin.

5.4 Enclosures (Figure 32)

5.4.1 Four possible enclosures were identified within the survey area, located in Fields 3, 12, and 15. These features are marked on Figure 31 in pink.

Field 3

5.4.2 In Field 3, the possible enclosure consists of Responses 3 (1, 2, 3 and 4)). Collectively these form a series of sub-rectangular and curvilinear enclosures spread across the higher ground at the western end of the field, containing within it the possible ring ditch 3 (3).

5.4.3 The presence of the ring ditch may suggest these features form an area of prehistoric settlement activity. Of note however is the Hopkins Mount enclosure (PRN 01720s), which lies around 220m to the southwest of this enclosure group. This has been recorded as a cropmark enclosure from aerial photography and interpreted as either a Romano British farmstead or a small coastal fortlet which affords excellent views of the Bristol Chanel (Evans, 2001). It is possible these two sites could be contemporary and potentially more directly linked, circular enclosures have been recorded in Romano-British farmsteads elsewhere in Wales.

Field 12

5.4.4 In Field 12 two separate possible enclosures were recorded, located on the higher ground in the southern part of the field.

5.4.5 The westernmost enclosure consists of a roughly square enclosure (Response 12 (14)) previously identified from aerial photography (PRN 02779s). This enclosure has a possible smaller outer annex extending from its eastern and southern sides. Several small linear and curvilinear anomalies situated within the centre of the enclosure may indicated the presence of built features within the enclosure, suggesting an area of domestic and settlement activity. timber beam slots possibly for potential domestic buildings and other associated structures. This site has previously been interpreted as a possible outlying farmstead forming part of the former medieval settlement of Lavernock to the southeast. The dateable form as depicted on the survey results is inconclusive and may equally be prehistoric in date.

5.4.6 A short distance to the northeast a series of anomalies may form a second area of enclosures (Response 12 (15)) more curvilinear in nature. This enclosure measures roughly 32m in diameter, the curvilinear nature more typical of a prehistoric date.

5.4.7 The proximity of both potential enclosures may suggest a link between the two, or potentially a transition from an area of prehistoric activity

represented by the curvilinear enclosure (12 (15)), to Romano-British activity represented by the more rectangular enclosure (12 (14)).

Field 15

5.4.8 Field 15 contains a small, partially exposed, roughly square enclosure with a strong positive response (15 (1)). The alignment of the feature would suggest it extends beyond the surveyed area and beneath the adjacent field boundary, thereby pre-dating the current field system. Satellite imagery revealed another small square enclosure 145m to the northwest, approximately 20m square and seemingly on a similar orientation. Both enclosures may be associated with Cosmeston Medieval village (Prn 009948s) which is located roughly 274m to the northeast. However, a larger rectangular enclosure (PRN 05131s), measuring approximately 65m by 75m, lies just over 700m to the west, which also exhibits some similarities, but this has been interpreted as a possible Romano-British villa site.

5.5 Potential trackways (Figure 32)

5.5.1 Three possible trackways were identified during the survey, situated within Field 1, 3 and 13. These features are identified on Figure 31 in purple.

Field 1

5.5.2 Trackway (Response 1 (3)) was a positive linear anomaly running diagonally across Field 1 in a northwest - southeast direction. The feature measured approximately 276m long, the survey results suggesting it continued as a cutting rather than a raised feature throughout its course. There is no depiction of a trackway on historic mapping. It does however appear to cut through, and potentially relate to some earlier field boundaries (see 5.2) and heads towards the northwest corner of Field 3, within which are a series of potential enclosures which may date to the prehistoric or Roman British period (see 5.4).

Field 3

5.5.3 Within the western area of Field 3 a northwest - southeast linear anomaly (Response 3 (7)) was recorded, measuring approximately 188m long by 3.5m wide. The survey results would suggest it transitions from a built feature to the south, to a cutting to the north. This feature is not shown on historic mapping and no remains are visible on LiDAR coverage within the field. However, LiDAR coverage to the south shows a clear linear earthwork continuing the line of this feature directly south towards the coastline at St Mary's Well Bay, seemingly ignoring current field boundaries. To the north of Field 3 the alignment appears to be preserved in current field boundaries, extending the line northward to the Lavernock Road, and then continuing beyond that to run directly past the potential Romano-British villa site (PRN 05131s) to the north.

5.5.4 The placement of the trackway with the western area of Field 3 may also suggest it is contemporary with the grouping of suspected Romano British enclosures immediately west of the trackway (see 5.4).

Field 13

5.5.5 At the eastern end of the survey within Field 13 a somewhat diffuse positive linear anomaly (Response 13 (6)) was recorded. The somewhat weaker responses make this an uncertain feature, but it may represent another trackway. It runs on a northwest - southeast orientation for roughly 107m before fading. This feature is not depicted on historic mapping, it does however run in the direction of Lavernock to the southeast, once a larger medieval settlement

5.6 General potential

5.6.1 In addition to the features outlined about the geophysical survey identified anomalies across the site for which there is no clear explanation, along with features that may be the result of ongoing agricultural practices and many that are considered likely to be modern in origin, but the archaeological potential of all these sites remains uncertain. These features are marked on Figure 31 in orange.

5.6.2 Areas of general potential activity have been identified in Fields 2, 3, 12 and 13. In Field 2 relatively discrete clusters of potential activity are noted throughout the field, but there is no clear pattern to associate them with a particular type of activity or period. In Field 3 these areas of activity may be associated with enclosures noted in section 5.4, related to potential Romano-British settlement and agricultural activities. Similarly in Field 12 these areas of activity could be associated both with enclosures noted in section 5.4, and possible prehistoric ring ditches noted in section 5.3. A further area of activity is recorded at the northern end of Field 13, which may relate to outlying activity associated with the enclosures of Field 12 to the north, or potentially to general medieval settlement activity associated with the former medieval settlement of Lavernock to the southeast.

5.6.3 Features considered likely to be associated with agricultural tracks, drainage and ploughing have been identified in Fields 1, 2, 4, 5, 7, 8, 10 and 13. These are generally considered to be of less archaeological significance, although it should be noted that it is likely this area has been subject to agricultural practices since the prehistoric period.

5.6.4 A number of discrete features are identified throughout the survey, potentially a combination of isolated cut features such as pits, and ferrous material. Both are typical features of geophysical surveys across a large area. In agricultural settings ferrous material can often come from a variety of iron objects, often agricultural detritus, mixed in to the plough soil. However, anecdotal evidence from this area has raised the possibility of unexploded ordnance from the Second World War. A number of coastal batteries and searchlight stations were positioned along this coastline to protect the city and port of Cardiff to the northeast, as such the potential for some of these discrete readings to represent ordnance from related axis bombing raids should not be overlooked.

6. CONCLUSIONS

6.1 A geophysical survey, using a fluxgate gradiometer, was conducted by Dyfed Archaeological Services (a contracting arm of Heneb – the Trust for Welsh Archaeology) for WSP on behalf of Trydan Gwyrdd Cymru in the area of a proposed solar farm at Cosmeston, Penarth, Vale of Glamorgan. The surveyed area covered 56.3 hectares, currently subdivided into 15 fields under arable cultivation and one field under pasture. A possible high potential for prehistoric archaeological remains and low to moderate potential for Roman archaeological remains had been previously identified for the survey area.

6.2 Despite some challenging weather conditions, a relatively comprehensive survey was possible across the Site, with generally good and reliable results returned from the survey. A variety of anomalies were identified across the Site, with areas of archaeological potential highlighted.

6.3 Potential archaeological remains included a cluster of possible ring ditches, enclosures and areas of activity in the eastern part of the site, contained largely within Field 12 but potentially extending in surrounding areas. These features have been tentatively identified as prehistoric through to Romano-British, although previous interpretations also suggest a possible medieval date to activity in this area.

6.4 A second cluster of potential archaeological remains were identified at the western end of the Site, largely within Field 3, but again potentially extending into surrounding areas and including a possible trackway. These features have been tentatively identified as Romano-British in date.

6.5 An outlying enclosure of potential Romano-British or medieval date was also identified towards the northern end of the site, within Field 15.

6.6 Other identified features include possible former field boundaries of mixed dates, some of which are identifiable on historic mapping, other features of agricultural activity and various discrete features, many of which may be relatively modern in date. These features are generally considered to be of lesser archaeological significance than the clusters of activity noted above.

6.7 As with all geophysical surveys, it is important to note that geophysical surveys cannot detect all potential archaeological features. The interpretations presented here should be regarded as preliminary, and more intrusive archaeological investigations may be necessary to confirm the findings. Any such decisions for further works should rest with Heneb – Development Management in their role as archaeological advisors to the Local Planning Authority.

7. SOURCES

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8. GLOSSARY

Fluxgate Gradiometer	An instrument used to measure magnetism to search for areas of disturbed ground that may be associated with subsurface archaeological features.
nanoTesla (nT)	A unit of measurement of a magnetic field.
Ferrous object	Metals and alloys that contain iron.
Dipole	An anomaly consisting of a single positive response with an associated negative response forming a 'halo effect'. The negative and positive response is of equal magnitude but opposite polarity and are caused by the same feature. Dipole anomalies are very commonly observed across a range of sites, particularly agricultural land. Generally, unless the dipoles form part of a larger pattern or feature they are regarded as not significant. They are usually the result of modern ferrous rich debris such as brick and tile fragments as well as objects such as horseshoes or broken ploughshares, which lie within the topsoil.

APPENDIX I: Geophysical survey results presented as trace plots and minimally processed greyscale plots.

Shown in order described in text.

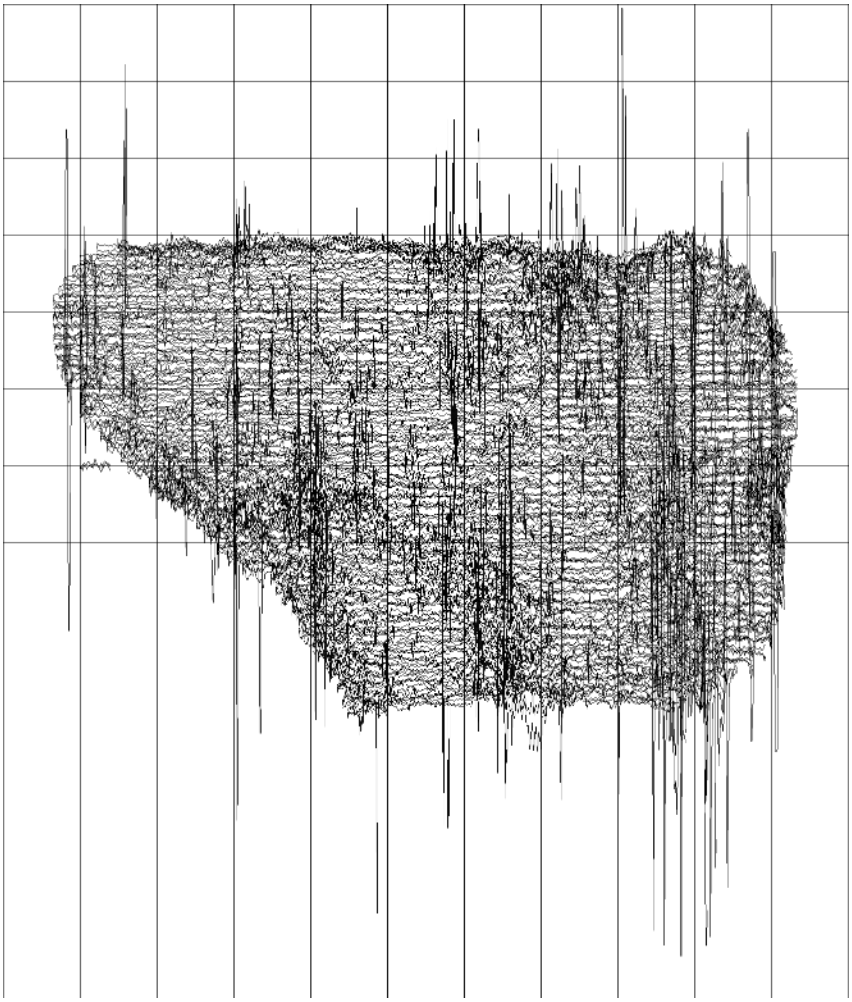


Figure 32: Field 1 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

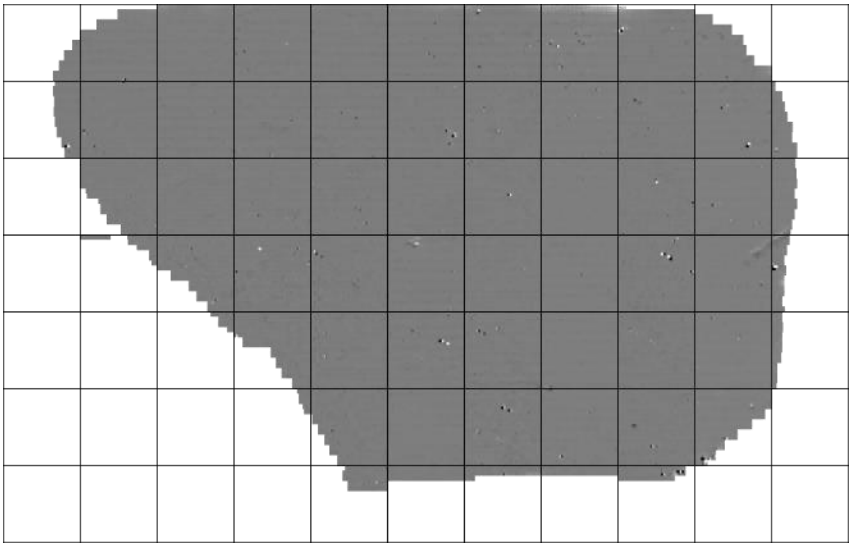


Figure 33: Field 1 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

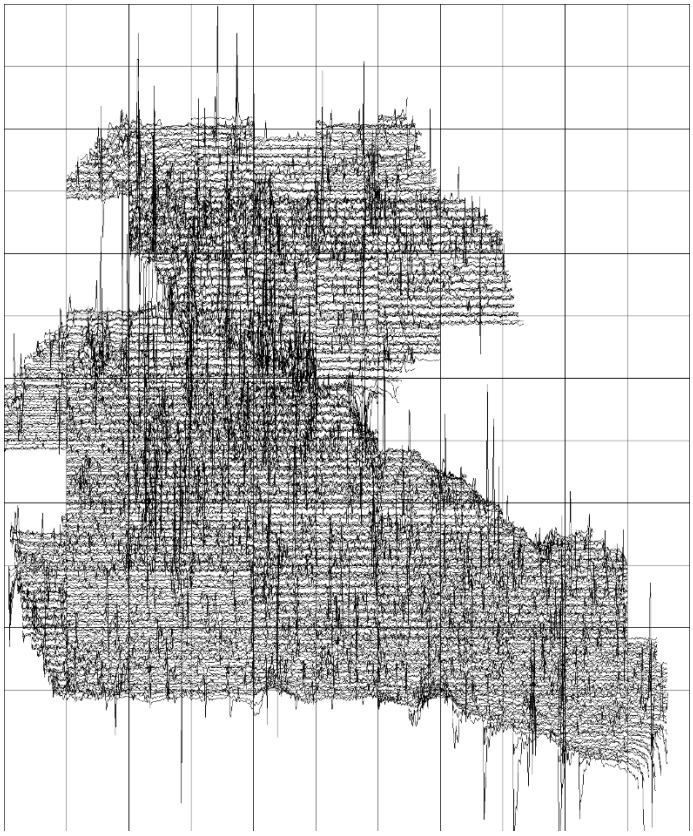


Figure 34: Field 2 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is to the right.

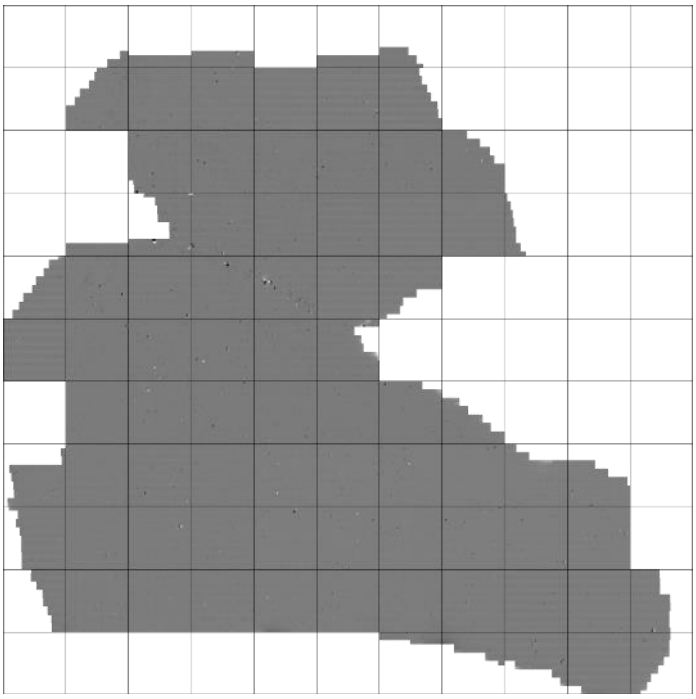


Figure 35: Field 32 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to the right of the page.

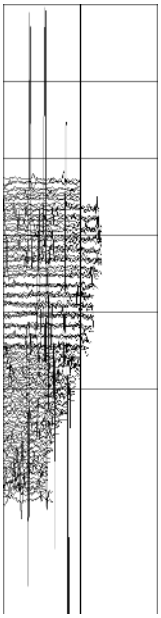


Figure 36: Field 2A geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is to the right.

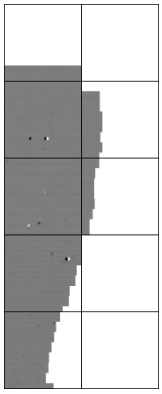


Figure 37: Field 2a geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to the right of the page.

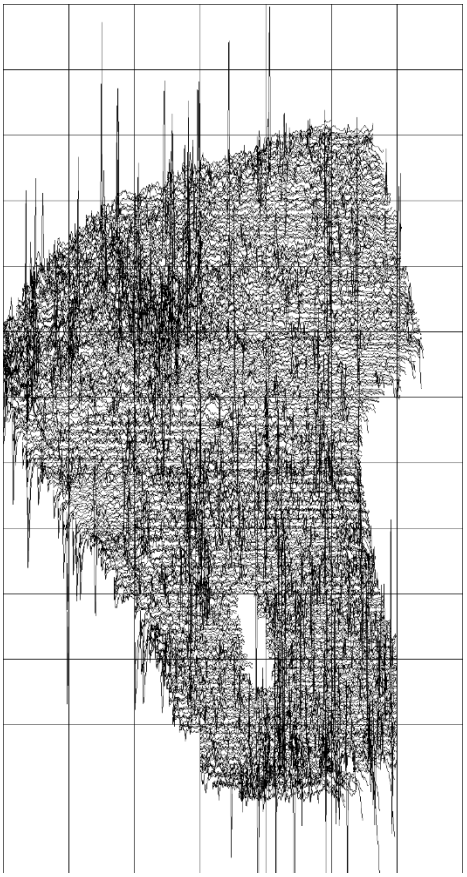


Figure 38: Field 3 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is to the right.

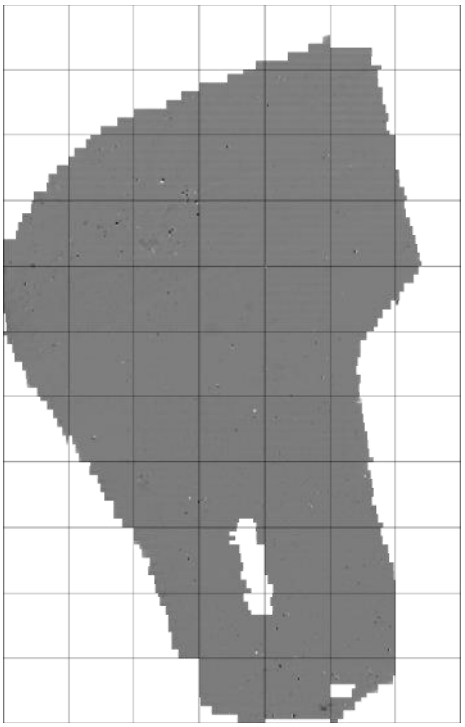


Figure 39: Field 3 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to the right of the page.

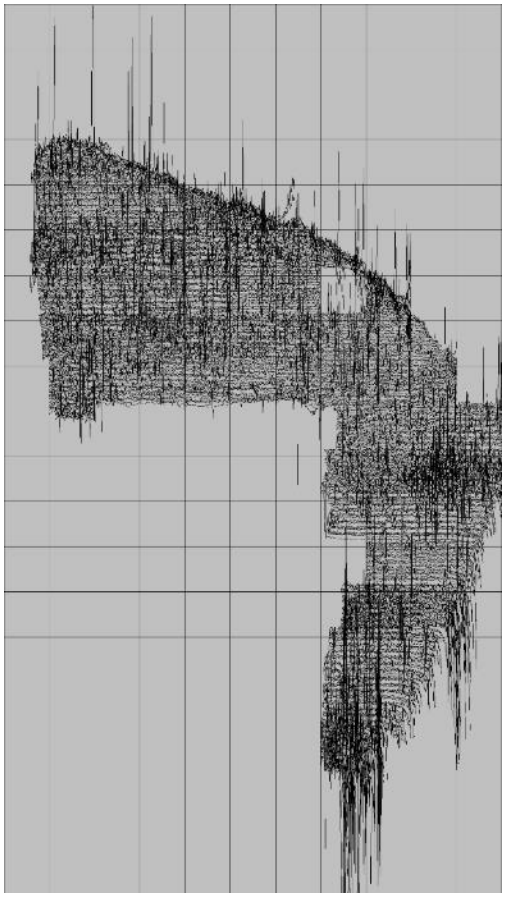


Figure 40: Field 4 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is to the right.

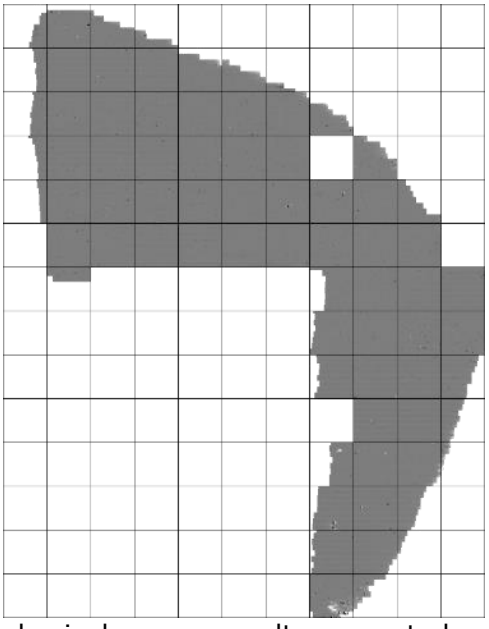


Figure 41: Field 4 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to the right of the page.

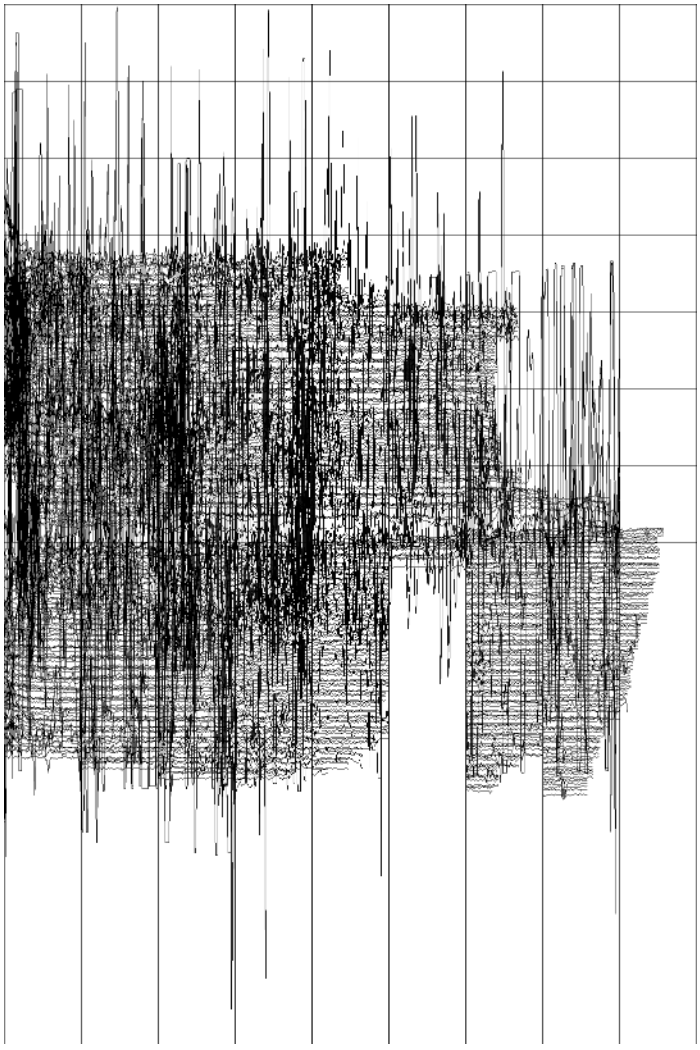


Figure 42: Field 5 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

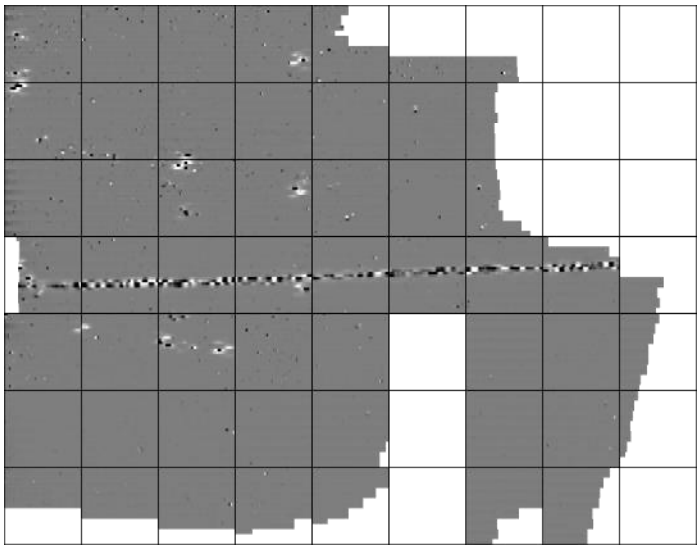


Figure 43: Field 5 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

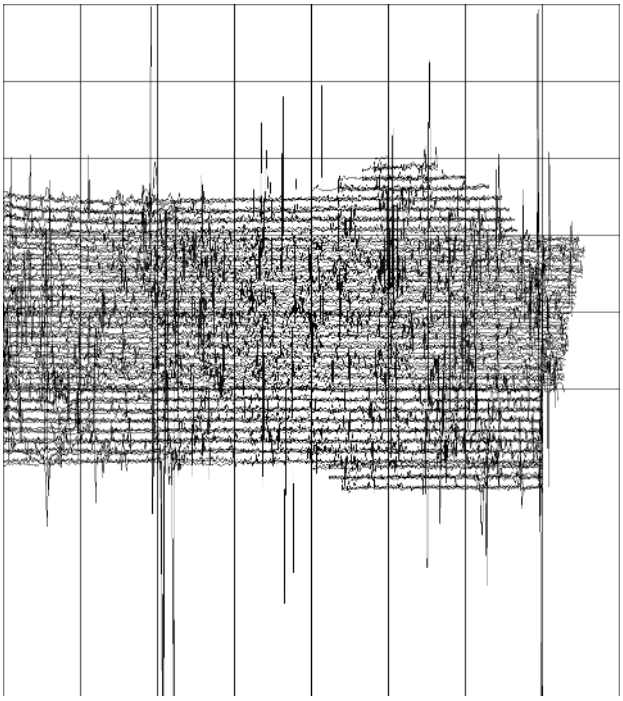


Figure 44: Field 6 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

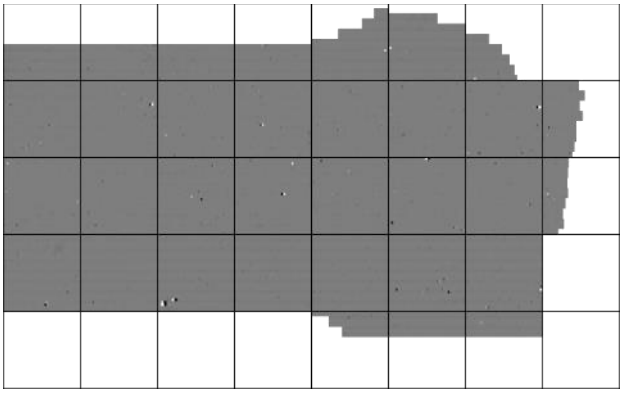


Figure 45: Field 6 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

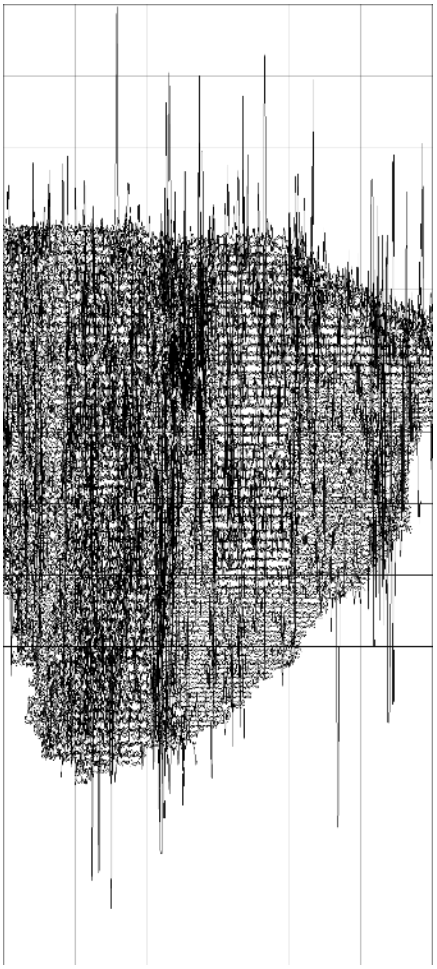


Figure 46: Field 7 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

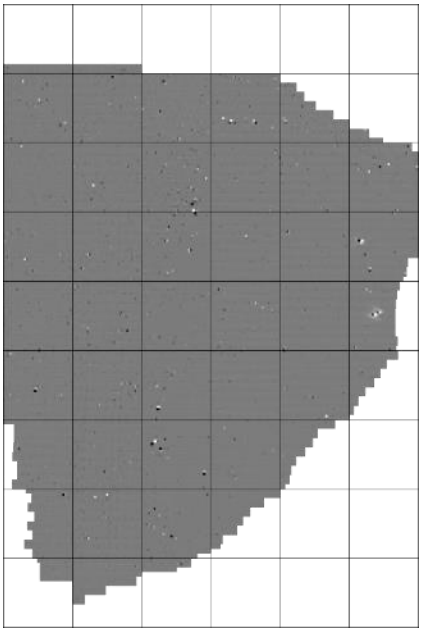


Figure 47: Field 7 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

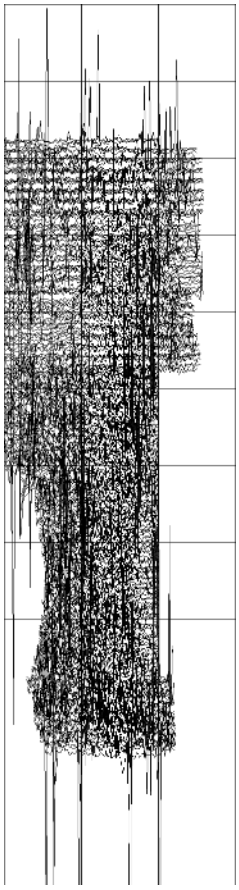


Figure 48: Field 8 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

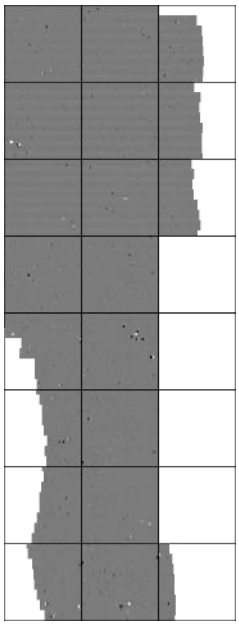


Figure 49: Field 8 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

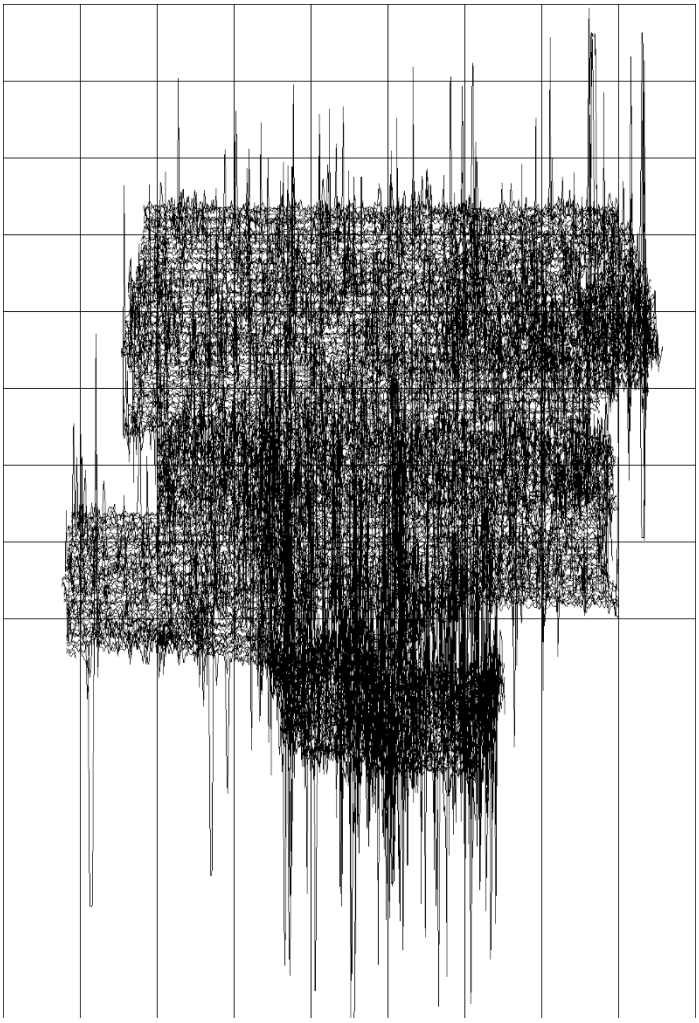


Figure 50: Field 9 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

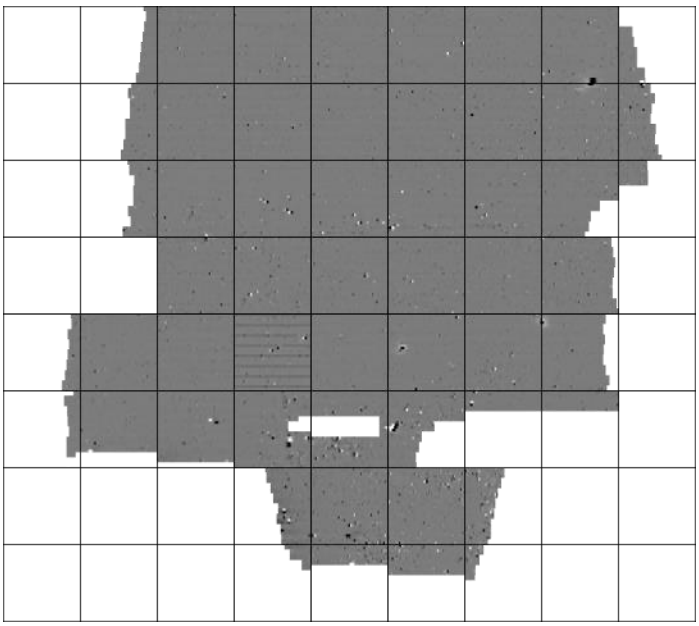


Figure 51: Field 9 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

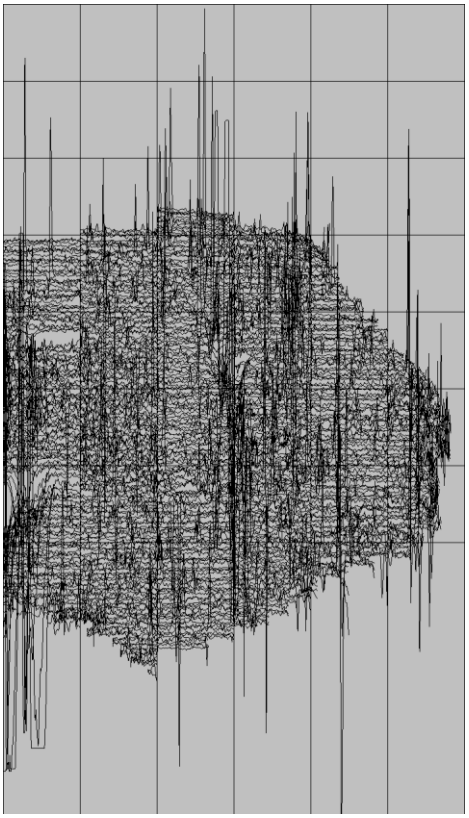


Figure 52: Field 10 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

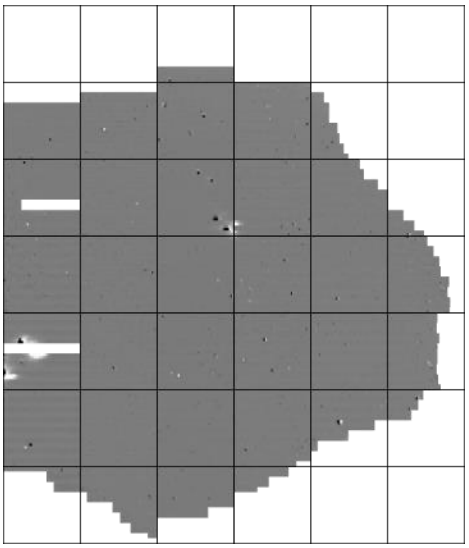


Figure 53: Field 10 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to towards the top of the page.

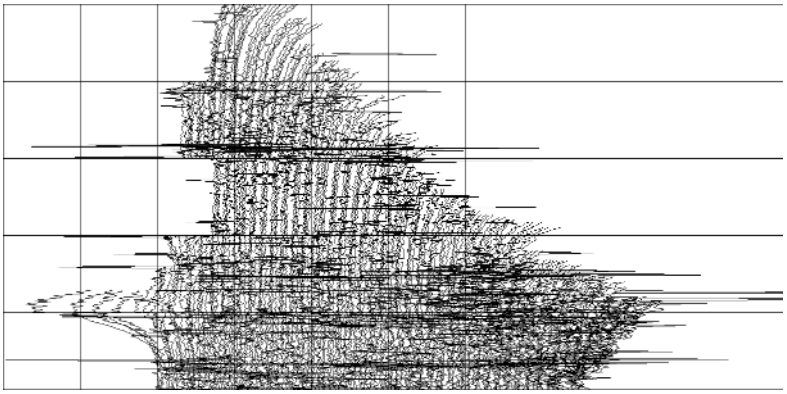


Figure 54: Field 11 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

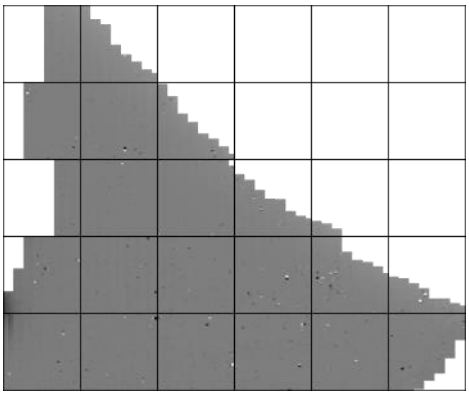


Figure 55: Field 11 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

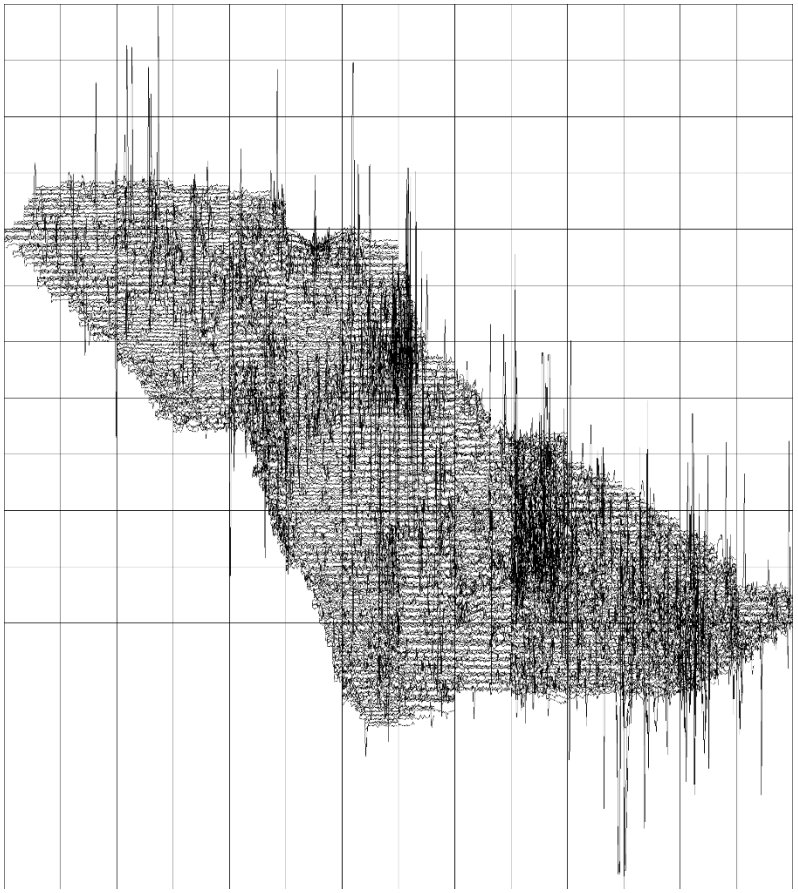


Figure 56: Field 12 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is towards the top of the page.

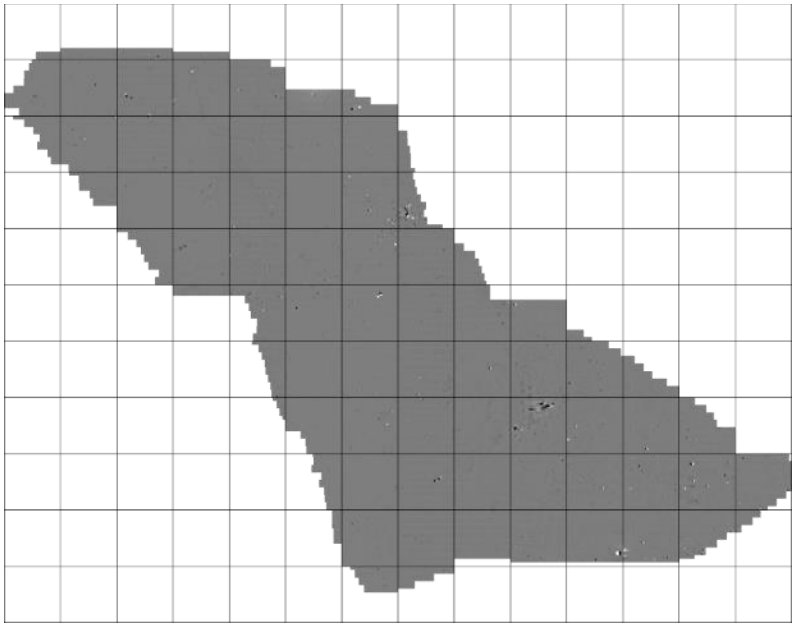


Figure 57: Field 12 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is towards the top of the page.

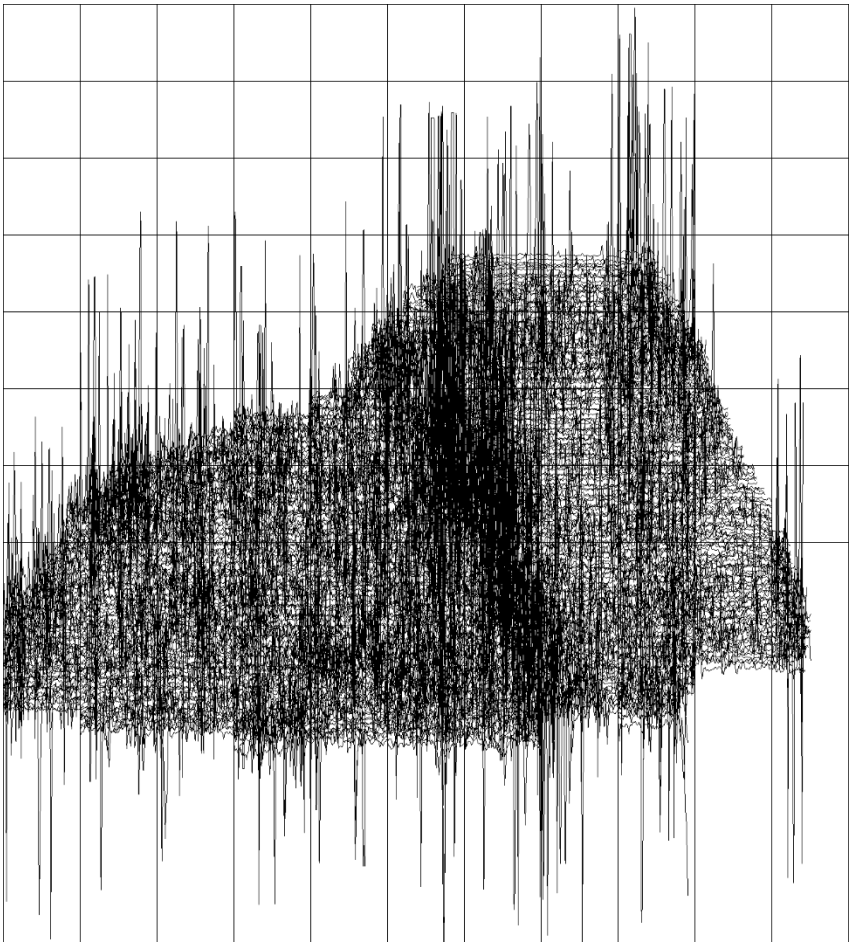


Figure 58: Field 13 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is to the right.

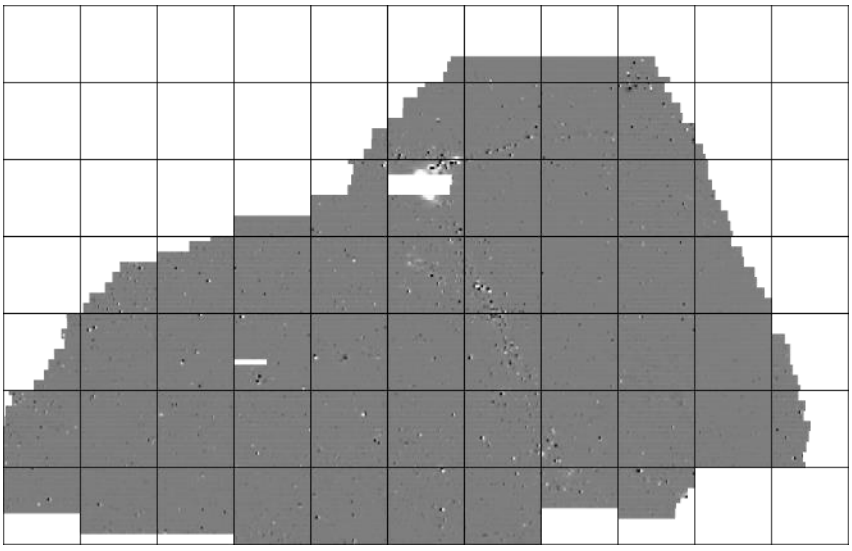


Figure 59: Field 13 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to the right of the page.

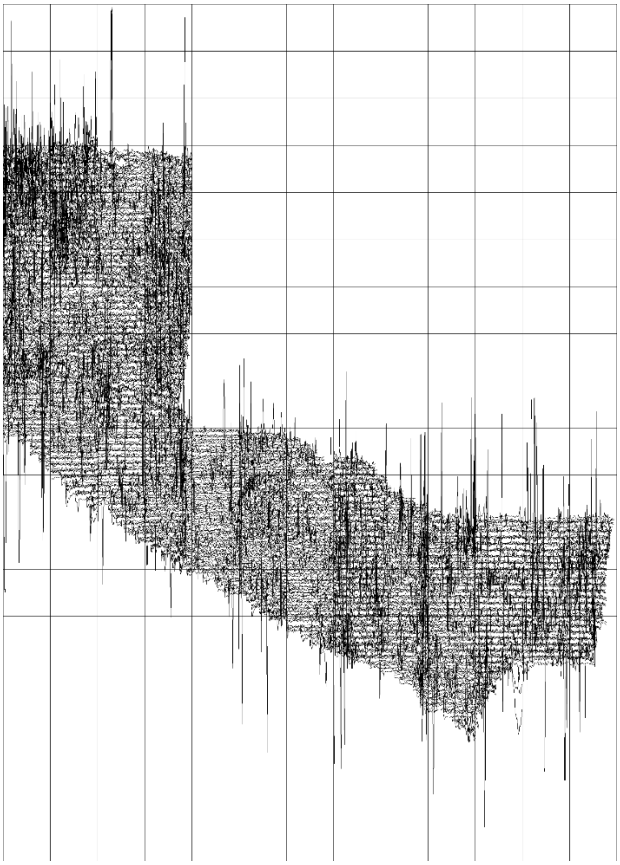


Figure 60: Field 14 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is to the right.

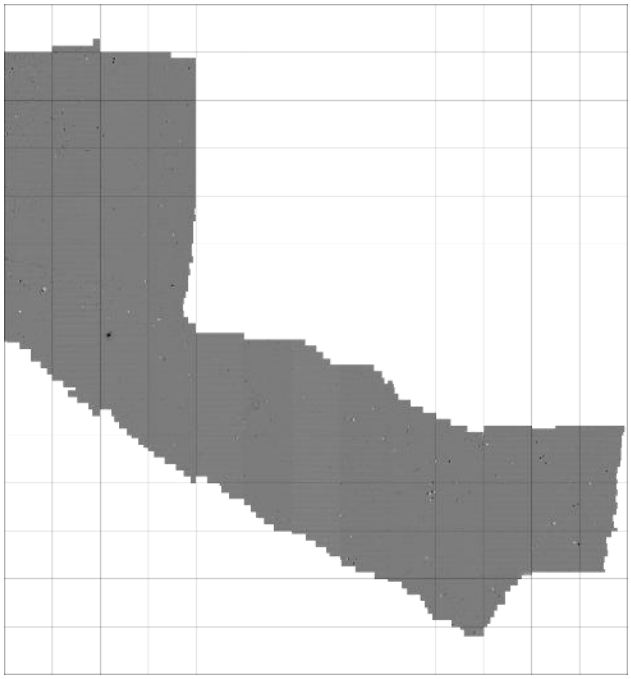


Figure 61: Field 3 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to the right of the page.

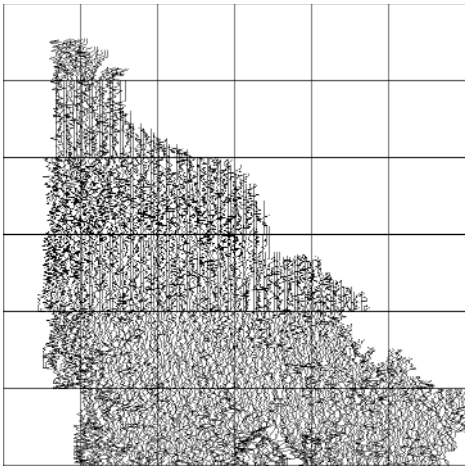


Figure 62: Field 15 geophysical survey results presented as a trace plot giving an indication of the strength of responses. Each square is represented a 30m² grid. North is to the right.

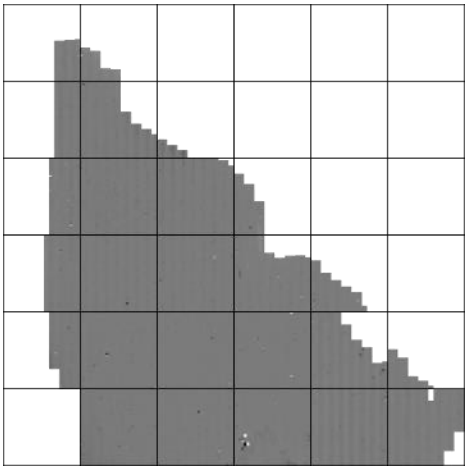


Figure 63: Field 15 geophysical survey results presented as a minimally processed greyscale plot. Each square is represented a 30m² grid, north is to the right of the page.

APPENDIX II: DATA MANAGEMENT PLAN

This Data Management Plan (DMP) is produced in accordance with the *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives (Chartered Institute for Archaeologists 2014, updated 2020).* The table below is based on the Work Digital / Think Archive guidance for digital archives prepared by DigVentures, on behalf of Archaeological Archives Forum and in partnership with the Chartered Institute for Archaeologists. The project was funded by Historic England (Project No. 7796).

Section 1: Project Administration

Project Ref. No and name
FS25-007- Cosmeston, Penarth
ERN (if known)
E009071
Project Type
Geophysical Survey
Client
WSP on behalf of Trydan Gwyrdd Cymru
Project Manager / Data Contact
Fran Murphy
Principal Archaeologist on site
Andrew Shobbrook
Date DMP created
10/10/2025
Date DMP last updated
31/10/2025
Related data management policies
Written Scheme of Investigation Chartered Institute for Archaeologists (CIfA) *Standards & Guidance* Heneb – Dyfed Archaeology archive retention policy Brown 2011, Archaeological Archives: a guide to best practice in creation, compilation, transfer and curation NPAAW, 2017, The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales 2017 RCAHMW, 2015, RCAHMW guidelines for Digital Archives, Version 1 WAT, 2018, Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)

Section 2: Data Collection

Data Type (Delete as appropriate)
Documents Written Scheme of Investigation, Risk Assessment – Word doc & PDFs Final report – Word doc & PDF Illustrations –Affinity Designer files **Images** Site photographs – Jpeg & Tiff (for archive) **Geophysical Survey** In house survey – XGD files, XCP files **Survey** In house surveys - .dxf files, GIS files (see below) **GIS** Esri Shapefiles.

Data acquisition
All data will be collected as per the methodologies and guidance stated in the WSI (Fieldwork / Methodology).

Section 3: Documentation and metadata

Documentation and metadata accompanying the data
All data recovered will be archived in accordance with the guidance stated in the WSI (Post Fieldwork Reporting & Archiving)

Section 4: Ethics and legal compliance

Management of any ethical, copyright and Intellectual Property Rights (IPR) issues
All personal data collected during the course of the project will be handled in accordance with Heneb-Dyfed Archaeology *Personal Data Protection Policy* (2018, revised 2020) and current *Code of Practice*. Licence agreements will be established, and Copyright permissions will be sought as appropriate (eg reproduced mapping extracts, archive material, specialist reports) prior to the submission of the data and/or inclusion in the publication of the project results.

Section 5: Data Security: Storage and Backup

Data storage, accessibility, and safety during research
All site-produced data will be stored digitally at the first available opportunity. All digital information is stored on the Heneb-Dyfed Archaeology server, accessible by members of the staff. This will be checked regularly by the Project Manager. All digital data on the server is backed-up at regular intervals. The server contains ample capacity for all anticipated site data, and appropriate protocols are in place to manage any potential digital malfunction or cyber-attack.

Section 6: Selection and Preservation

Data retention, sharing, and preservation
Data will be retained as per Heneb-Dyfed Archaeology *Archive Retention Policy* (2018).
Long-term preservation plan for the dataset
The digital archive relating to the project will be deposited with the NMR, held and maintained by the RCAHMW, Aberystwyth and will be created in accordance with their practices. The final report will be submitted to the regional Historic Environment Record in PDF format, along with any additional information they require. If a different digital repository to the NMR is used, their own procedures will be established at the outset of a project and followed. If a project includes artefacts to be deposited at a museum, arrangements will be made prior to the commencement of the project, and a copy of the digital archive will be sent with the artefacts. Archiving costs are included within the project budget.

Section 7: Data Sharing

Sharing and accessibility
The dissemination of data is detailed in the WSI (Post-Fieldwork Report and Archiving).

Section 8: Responsibilities

Responsibilities
Data collection, storage and manipulation will be carried out by the site team. The Project Manager will be responsible for the implementation of the data management plan.



Heneb