

# GEOPHYSICAL SURVEY

## REPORT

Ardrew,  
Athy,  
County Kildare

Date:  
04/05/2021

Licence: 21R0065

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**GEOPHYSICAL SURVEY SUMMARY SHEET**  
**ARDREW, ATHY, COUNTY KILDARE**

<b>Site Name</b>	Ardrew, Athy.	<b>Ref No.</b>	21013
<b>Townland</b>	Ardrew	<b>Licence No.</b>	21-R-0065
<b>County</b>	County Kildare	<b>Licence Holder</b>	Joanna Leigh
<b>ITM (centre)</b>	E667519, N692885	<b>Purpose</b>	Pre-planning investigation
<b>Client</b>	National Development Finance Agency	<b>Reference No.</b>	N/A

**Ground Conditions** Survey was conducted within the eastern half of a field which comprised agricultural land. The field comprised of knee-high cereal crop at the time of survey.

**Survey Type** Detailed gradiometer survey totalling c. 2.6 hectares.

**Summary of Results**

The geophysical survey data is largely dominated by modern magnetic disturbance which may obscure more subtle archaeological responses.

Former field boundaries are evident which correspond with those depicted on OS historic mapping.

Two curvilinear trends have been identified; an archaeological interpretation is cautious given the high level of modern ferrous disturbance in the dataset.

**Field Staff** Joanna Leigh

**Report Date** 04/05/2021

**Report Author** Susan Curran

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## **Geophysical Survey Report Ardrew, Athy, County Kildare**

### **1 Introduction**

- 1.1 A geophysical survey has been conducted by J. M. Leigh Surveys Ltd. at a site in the townland of Ardrew in Athy, County Kildare. The survey was requested by TVAS Ltd. on behalf of the National Development Finance Agency. The survey forms part of a pre-planning application for a proposed social housing development.
- 1.2 The application area is contained within the eastern half of a large agricultural field located along Fortbarrington Road. It is bounded by a housing development to the south and by a single domestic dwelling to the north. Figure 1 presents the site and survey location at a scale of 1:3,000.
- 1.3 There are no recorded monuments within the application area. An 'Enclosure' (KD035-031) is located c. 400m to the east and a 'Burial' (KD035-049) is recorded c. 460m to the north-east. A 'Moated site' (KD035-024) is situated c. 700m to the north and a 'Ringfort - rath' (LA020-001) lies c. 760m to the south. A recorded 'Excavation – miscellaneous' (KD035-101) which uncovered oak timbers lying in river sediments is located c. 610m to the south-east.
- 1.4 The main aim of the survey was to identify any responses which may represent previously unknown archaeological remains within the application area. It is the objective of the survey to identify the location, nature and extent of any responses of potential archaeological interest.
- 1.5 The detailed gradiometer survey was conducted under licence 21R0065 issued by the Department of Housing, Local Government and Heritage.

### **2 Survey ground conditions and further information**

- 2.1 The survey area was contained within the eastern half of a large agricultural field which was under crop at the time of survey. The crop was knee high but did not impede survey fieldwork.

### **3 Survey Methodology**

- 3.1 A detailed gradiometer survey detects subtle variations in the local magnetic field and measurements are recorded in nano-Tesla (nT). Some archaeological features

such as ditches, large pits and fired features have an enhanced magnetic signal and can be detected through recorded survey.

- 3.2 Data was collected with a Bartington Grad 601-2 instrument. This is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey fast and effective.
- 3.3 The instrument is calibrated in the field to ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.01nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.
- 3.4 All data was collected in 'zigzag' traverses. Grid orientation remained constant throughout to facilitate the data display and interpretation.
- 3.5 Data was collected with a sample interval of 0.25m and a traverse interval of 1m, providing 6400 readings per 40m x 40m grid. The survey grid was set-out using a GPS VRS unit. Survey tie-in information is available upon request.
- 3.6 The survey methodology, data presentation and report content adhere to the European Archaeological Council (EAC) (2016) 'Guidelines for the use of Geophysics in Archaeology'.

#### **4 Data display**

- 4.1 A summary greyscale image and accompanying interpretation diagram are presented in Figures 2 and 3, at a scale of 1:1,000.
- 4.2 Numbers in parenthesis in the text refer to specific responses highlighted in the interpretation diagram (Figure 3).
- 4.3 Isolated ferrous responses highlighted in the interpretation diagram most likely represent modern ferrous litter and debris and are not of archaeological interest. These are not discussed in the text unless considered relevant.
- 4.4 The raw gradiometer data is presented in archive format in Appendix A1.01. The raw data is displayed as a greyscale image and xy-trace plot, both at a scale of 1:500. The archive plots are used to aid interpretation of the results and are used for reference only. The archive plots are available as PDF images upon request.
- 4.5 The display formats referred to above and the interpretation categories are discussed in the summary technical information section at the end of this report.

## 5 Survey Results & Conclusion

- 5.1 The data is largely dominated by modern ferrous disturbance. It is clear from aerial mapping (2005-2012) that there were several structures and an access route located within the easternmost part of the application area. Surface traces have since been removed but their existence is evident from the level of magnetic disturbance within this area. The disturbance extends along the southern boundary, adjacent to the housing development. This development was built in 2009 and it is likely that much of this disturbance is associated with this phase of activity and has also possibly been ploughed further into the field. It is possible that the substantial magnetic disturbance may obscure more subtle archaeological responses in the eastern and southern parts of the survey area.
- 5.2 A spread of magnetic disturbance forms a linear pattern (1) which runs approximately east/west across the northern half of the dataset. This spread of ferrous material corresponds with the approximate location of a former field boundary which is depicted on OS 6inch and 25inch mapping.
- 5.3 A poorly defined linear trend (2) extends westwards from (1), following the same trajectory. This corresponds with a further field boundary which is depicted on OS 6inch mapping (not present on the 25inch mapping), most likely a continuation of (1).
- 5.4 A poorly defined linear trend (3) runs approximately north/south, perpendicular to (1) and (2). This is consistent with the location of a former field boundary which is evident on both OS 6inch and 25inch mapping.
- 5.5 A faint circular trend (4) is located at the western extent of the magnetic disturbance (1). Although this is circular in form, an archaeological interpretation is tentative. This is barely discernible in the data and may equally represent a continuation of the modern disturbance. No clear archaeological interpretation can be provided.
- 5.6 Two poorly defined curvilinear trends (5) have been identified in the north-eastern corner of the dataset and may be of archaeological potential. However, given the strength of the responses and the high level of modern disturbance within this area, an archaeological interpretation is highly cautious. They may equally represent more deeply buried ferrous debris.
- 5.7 Consultation with a licensed archaeologist and with the Department of Housing, Local Government and Heritage is recommended to establish if any additional archaeological works are required.

## 6 Technical Information Section

### Instrumentation & Methodology

#### *Detailed Gradiometer Survey*

Detailed gradiometer survey can either be targeted across a specific area of interest or conducted as a blanket survey across an entire application area, often as a standalone methodology.

Sampling methodologies can vary but a typical survey is conducted with a sample interval of 0.25m and a traverse interval of 1m. This allows detection of potential archaeological responses. Data is often collected in grids measuring 40m x 40m, with the data displayed accordingly. A more detailed survey methodology may be applied where archaeological remains are thought likely. This can sometimes produce results with a more detailed resolution. A survey with a grid size of 20m x 20m and a traverse interval of 0.5m will provide a data set with high resolution.



#### ***Bartington GRAD 601-2***

The Bartington Grad 601-2 instrument is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey very fast and effective. The sensors have a separation of 1m allowing greater sensitivity.

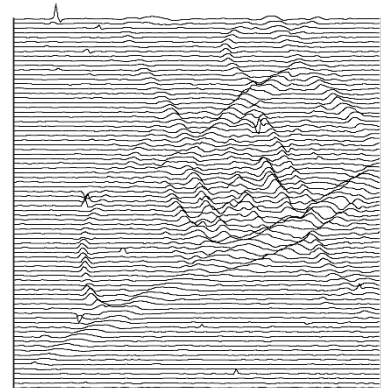


Frequent realignment of the instruments and zero drift correction ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.1nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.

## Gradiometer Data Display & Presentation

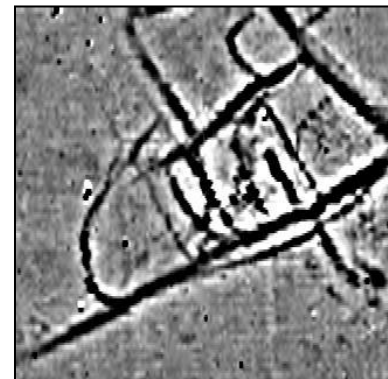
### **XY Trace**

The data are presented as a series of linear traces, enabling a semi-profile display of the respective anomalies along the X and Y-axes. This display option is essential for distinguishing between modern ferrous materials (buried metal debris) and potential archaeological responses. The XY trace plot provides a linear display of the magnitude of the response within a given data set.



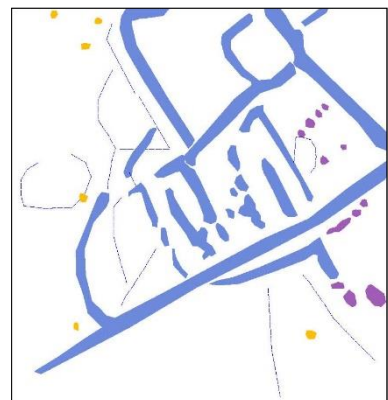
### **Greyscale\***

As with dot density plots, the greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within the given data set. This display method also enables the identification of discrete responses that may be at the limits of instrument detection. In the summary diagrams processed, interpolated data is presented. Raw un-interpolated data is presented in the archive drawings along with the xy-trace plots.



### **Interpretation**

An interpretation of the data is made using many of the plots presented in the final report, in addition to examination of the raw and processed data. The project managers' knowledge and experience allow a detailed interpretation of the survey results with respect to archaeological potential.



*\*XY Trace and raw greyscale plots are presented in archive form for display of the raw survey data. Summary greyscale images of the interpolated data are included for presentation purposes and to assist interpretation. The archive plots are provided as PDF images upon request.*



## **Glossary of Interpretation Terms**

Categories of responses may vary for different data sets. The list below are the most used categories for describing geophysical responses, as presented in the summary interpretation diagrams.

### ***Archaeology***

This category refers to responses which are interpreted as of clear archaeological potential and are supported by further archaeological evidence such as aerial photography or excavation. The term is generally associated with significant concentrations of former settlement, such as ditched enclosures, pits, and associated features.

### ***?Archaeology***

This term corresponds to anomalies that display typical archaeological patterns where no record of comparative archaeological evidence is available. In some cases, it may prove difficult to distinguish between these and evidence of more recent activity also visible in the data.

### ***Area of Increased Magnetic Response***

These responses often lack any distinctive archaeological form, and it is therefore difficult to assign any specific interpretation. The resulting responses are site specific, possibly associated with concentrations of archaeological debris or more recent disturbance to underlying archaeological features.

### ***Trend***

This category refers to low-level magnetic responses barely visible above the magnetic background of the soil. Interpretation is tentative, as these anomalies are often at the limits of instrument detection.

### ***Ploughing/Ridge & Furrow***

Visible as a series of linear responses, these anomalies equate with recent or archaeological cultivation activity.

### ***?Natural***

A broad response resulting from localised natural variations in the magnetic background of the subsoil; presenting as broad amorphous responses most likely resulting from geological features.

### ***Ferrous Response***

These anomalies exhibit a typically strong magnetic response, often referred to as 'iron spikes,' and are the result of modern metal debris located within the topsoil.

### ***Area of Magnetic Disturbance***

This term refers to large-scale magnetic interference from existing services or structures. The extent of this interference may in some cases obscure anomalies of potential archaeological interest.

## **Bibliography**

European Archaeological Council (EAC) (2016) '*Guidelines for the use of Geophysics in Archaeology*' by Armin Schmidt, Paul Linford, Neil Linford, Andrew David, Chris Gaffney, Apostolos Sarris and Jörg Fassbinder.

English Heritage (2008) '*Geophysical guidelines: Geophysical Survey in Archaeological Field Evaluation.*' Second Edition.

Gaffney, C. Gater, J. & Ovenden, S. (2006) '*The use of Geophysical Techniques in Archaeological Evaluations.*' IFA Paper No. 6.

Gaffney, C & Gater, J (2003). '*Revealing the buried past: Geophysics for Archaeologists.*' Tempus Publishing Limited.

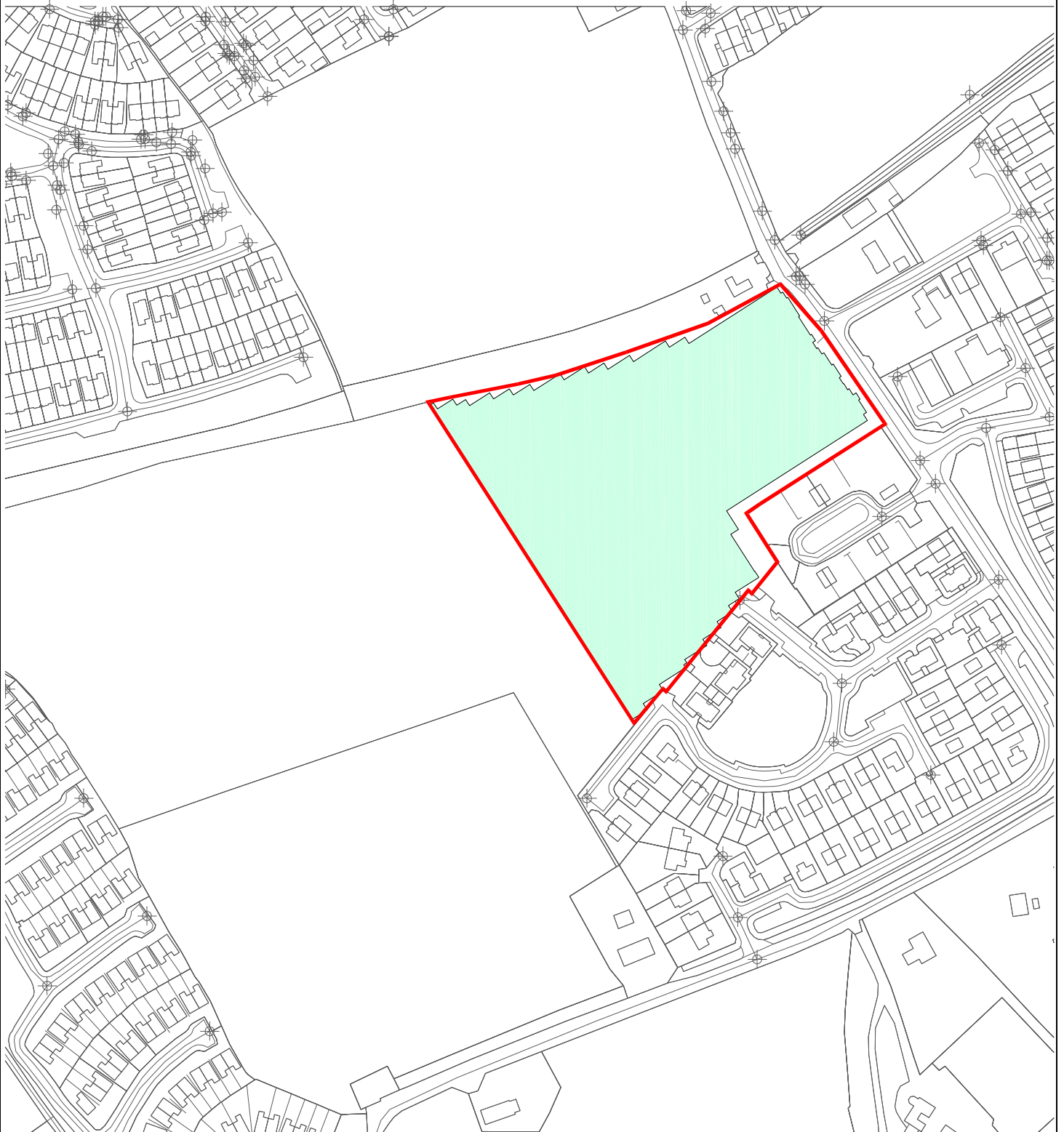
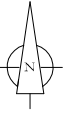
National Soil Survey of Ireland (1980) *General soil map second edition (1:575,000)*. An Foras Taluntais.

**List of Figures**

<b>Figure</b>	<b>Description</b>	<b>Paper Size</b>	<b>Scale</b>
Figure 1	Site & survey location diagram	A4	1:3,000
Figure 2	Summary greyscale image	A3	1:1,000
Figure 3	Summary interpretation diagram	A3	1:1,000

***Archive Data Supplied as a PDF Upon Request***

A1.01	Raw data greyscale image & XY-Trace plot	A0	1:500
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Application Area



Detailed  
Gradiometer Survey

0 metres 120

Client:

TVAS Ltd.

Project:

Geophysical Survey  
Andrew, Athy,  
County Kildare

Title:

Site & Survey Location

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Scale @ A4: 1:3,000  
Figure: 1  
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0 metres 40

-3.0 nT 5.0

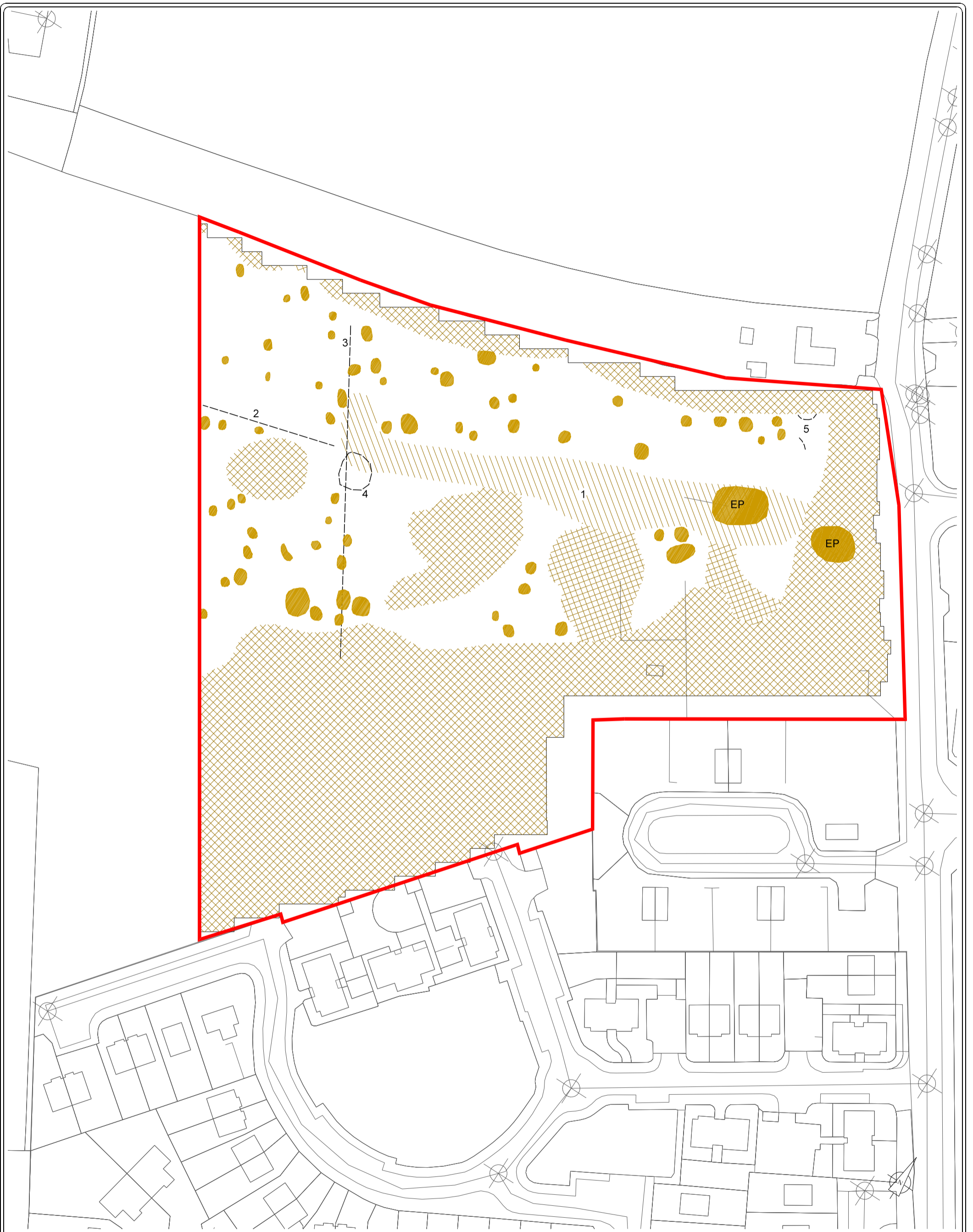
Client:  
TVAS Ltd.

Project:  
Geophysical Survey  
Ardrew, Athy,  
County Kildare

Title:  
Summary Greyscale Image

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Scale @ A3: 1:1,000  
Figure: 2  
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0 metres 40



Modern ferrous



Modern magnetic disturbance



Modern magnetic disturbance  
?Field boundary



Trend

Client:

TVAS Ltd.

Project:

Geophysical Survey  
Ardrew, Athy,  
County Kildare

Title:

Summary Interpretation Diagram

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Scale @ A3: 1:1,000  
Figure: 3  
Licence No.: 21R0065  
Issue Date: 04.05.2021