

# GEOPHYSICAL SURVEY

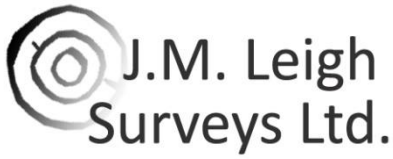
## REPORT

Greenhill Road,  
Co. Wicklow

Date:  
04/04/2019

Licence: 19R0059

J. M. Leigh Surveys Ltd.  
124 Oaklawn West  
Leixlip  
County Kildare  
[www.jmlsurveys.com](http://www.jmlsurveys.com)  
01 615 4647



J. M. Leigh Surveys Ltd.  
124 Oaklawn West,  
Leixlip, Co. Kildare  
Tel: 01 615 4647  
Mobile: 0879062729  
[www.jmlsurveys.com](http://www.jmlsurveys.com)

**GEOPHYSICAL SURVEY SUMMARY SHEET**  
**GREENHILL ROAD, WICKLOW, COUNTY WICKLOW**

<b>Site Name</b>	Greenhill Road, County Wicklow	<b>Ref No.</b>	19009
<b>Townland</b>	Corporation Lands	<b>Licence No.</b>	19-R-0059
<b>County</b>	Wicklow	<b>Licence Holder</b>	Joanna Leigh
<b>ITM (centre)</b>	E732008, N693053	<b>Purpose</b>	Pre-planning investigation
<b>Client</b>	De Faoite Archaeology	<b>Reference No.</b>	NA

**Ground Conditions** Survey was conducted in an open irregular shaped pasture field. Vegetation was low and suitable for survey. Electricity poles and manhole covers were present across the site and have resulted in some localized magnetic disturbance.

**Survey Type** Detailed gradiometer survey totalling c. 1.5 hectares

**Summary of Results**

The data is dominated by modern magnetic disturbance and isolated ferrous responses resulting from modern services and buried litter.

Within the data, series of parallel linear trends are indicative of ploughing activity. Two perpendicular trends suggest the remains of a former field division.

Short curvilinear trends are evident in the data. These may be of interest, perhaps representing plough damaged archaeological ditched features. However, the trends are barely discernible in the data and may equally represent more recent ground disturbance. An archaeological interpretation is cautious.

**Field Staff** Susan Curran & Joanna Leigh

**Report Date** 04/04/2019 **Report Author** Joanna Leigh

## **Contents**

1. Introduction	1
2. Survey ground conditions and further information	1
3. Survey Methodology	2
4. Data Display	2
5. Survey Results	3
6. Conclusion	3

## **Geophysical Survey Report**

### **Greenhill Rd., Wicklow, County Wicklow**

#### **1 Introduction**

- 1.1 A geophysical survey has been conducted by J. M. Leigh Surveys at a site in the townland of Corporation Lands, Wicklow town, County Wicklow. The survey was requested by De Faoite Archaeology on behalf of Wicklow County Council. The survey forms part of a wider archaeological study for a proposed housing development.
- 1.2 The application area is contained within a small irregular shaped field adjacent to Greenhill Road, to the south of Wicklow town, County Wicklow. Figure 1 presents the site and survey location at a scale of 1:1,500.
- 1.3 There are no recorded monuments within the application area or in the vicinity. A detailed gradiometer survey was undertaken to investigate the potential for unknown archaeology. It was the main aim of the survey to identify any responses that may represent archaeological features.
- 1.4 The detailed gradiometer survey was conducted under licence 19R0059 issued by the Department of Culture, Heritage and the Gaeltacht.

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

- 2.1 The survey was contained within a small irregular field. Ground conditions were excellent, comprising of recently cut pasture.
- 2.2 Several electricity poles and a telecommunications tower produced some localized magnetic disturbance. Although this is evident in the data, it has not affected the overall interpretation of results.
- 2.3 Modern services also run through the site. The modern manhole covers have resulted in large ferrous responses in the data.
- 2.4 In addition to extant modern features, further magnetic disturbance is noted in the dataset. Numerous buried modern litter and debris has resulted in a dense scatter of ferrous responses throughout the dataset. This has complicated interpretation, although responses of potential interest could still be identified.
- 2.5 To the north of the field, a farm track is included in the application area. This comprised of hardcore gravel and was not suitable for survey.

### **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 adheres 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 1:1,250.
- 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 set is dominated by magnetic disturbance from modern services. An electricity pole, telecommunications mast and modern service drains and manhole covers have all produced magnetic responses reflected in the survey results. Although the magnetic disturbance is dominant, individual trends in the data may be of interest.
- 5.2 Parallel linear trends (1) are indicative of ploughing activity. Two trends (2) form a rectilinear pattern and most likely represent a former field boundary division.
- 5.3 To the west of the possible former field boundary (2) there are several curvilinear trends (3). Although these trends have a low magnetic response, it is possible that plough damaged curvilinear ditch features are represented here. This is speculative as the trends are barely discernible in the data and may equally represent further modern magnetic disturbance.
- 5.4 A small rectilinear trend (4) is located along the western extent of survey. An archaeological interpretation is unclear. Although it is possible that a plough damaged feature is present, it is equally likely that the trend results from more recent ground disturbance.

## **6 Conclusion**

- 6.1 The data is dominated by modern magnetic disturbance and isolated ferrous responses resulting from modern services and buried litter.
- 6.2 Within the data, series of parallel linear trends are indicative of ploughing activity. Two perpendicular trends suggest the remains of a former field division.
- 6.3 Short curvilinear trends are evident in the data. These may be of interest, perhaps representing plough damaged archaeological ditched features. However, the trends are barely discernible in the data and may equally represent more recent ground disturbance. An archaeological interpretation is cautious.
- 6.4 Consultation with a licensed archaeologist and with the Department of Culture, Heritage and the Gaeltacht is recommended to establish if any additional archaeological works are required.

## Technical Information Section

### Instrumentation & Methodology

#### *Detailed Gradiometer Survey*

This is conducted to clearly define any responses detected during scanning, or can be applied as a stand-alone methodology. Detailed survey is often applied with a sample interval of 0.25m and a traverse interval of 1m. This allows detection of potential archaeological responses. Data is collected in grids 40m x 40m, and data is displayed accordingly. A more detailed survey methodology may be applied where archaeological remains are thought likely. A survey with a grid size of 10m x 10m 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.

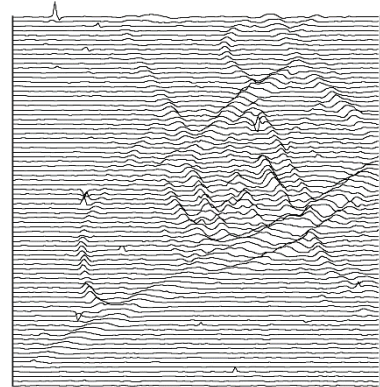
Frequent realignment of the instruments and zero drift correction; ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.1nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.



## 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 allows 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.*



## **Glossary of Interpretation Terms**

### ***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, storage 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.

### ***? Industrial***

Such anomalies generally possess a strong magnetic response and may equate with archaeological features such as kilns, furnaces, concentrations of fired debris and associated industrial material.

### ***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.

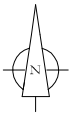
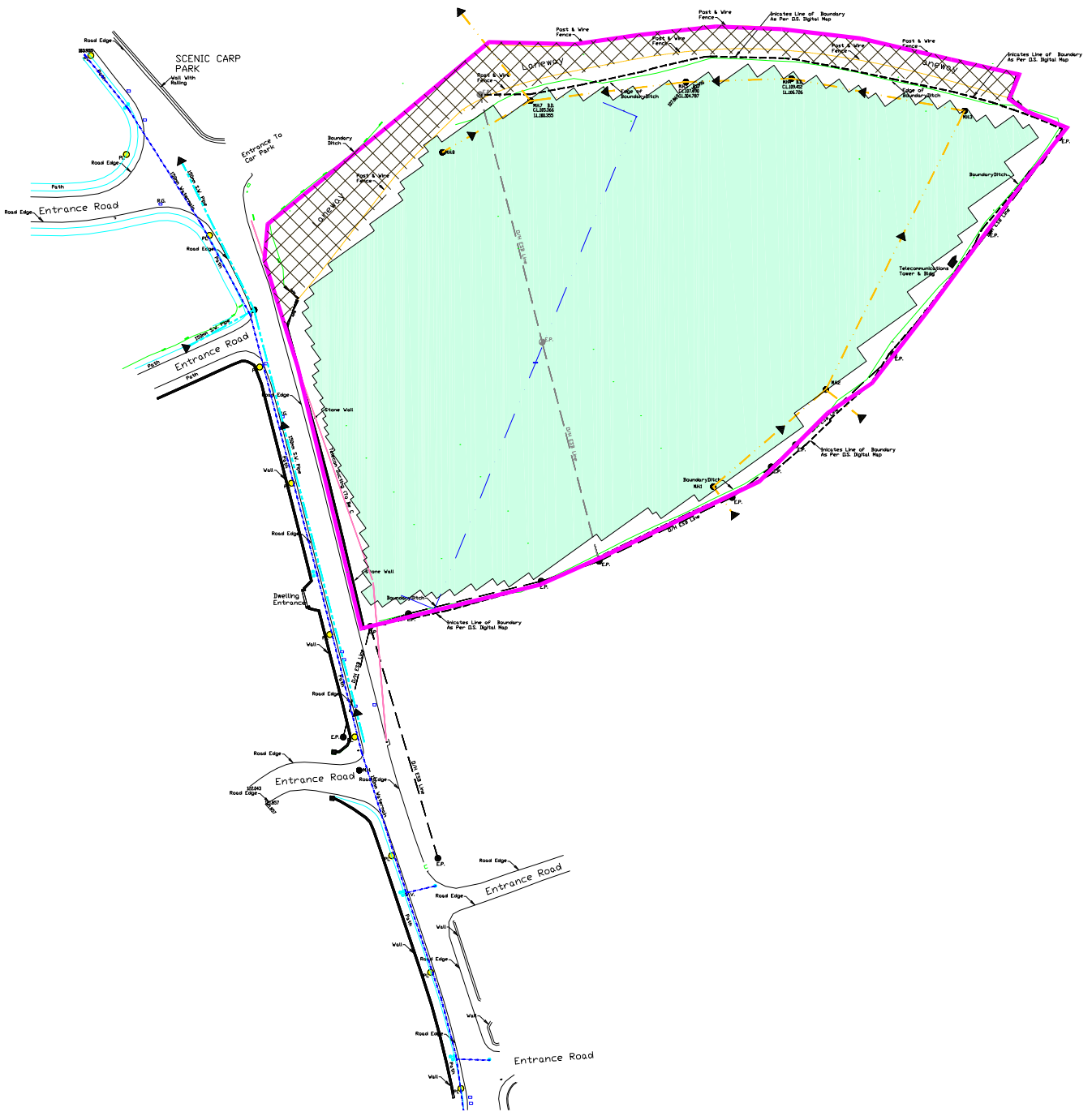
National Soil Survey of Ireland (1980) *General soil map second edition (1:575,000)*. An Foras Taluntais.


**List of Figures**


<b>Figure</b>	<b>Description</b>	<b>Paper Size</b>	<b>Scale</b>
Figure 1	Site & survey location diagram	A4	1:1,500
Figure 2	Summary greyscale image	A3	1:1,250
Figure 3	Summary interpretation diagram	A3	1:1,250


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

A1.01	Raw data XY-Trace plot	A2	1:625
A1.02	Raw data greyscale image	A2	1:625



 Application area

 Detailed gradiometer survey

 Not suitable for survey

0 metres 60

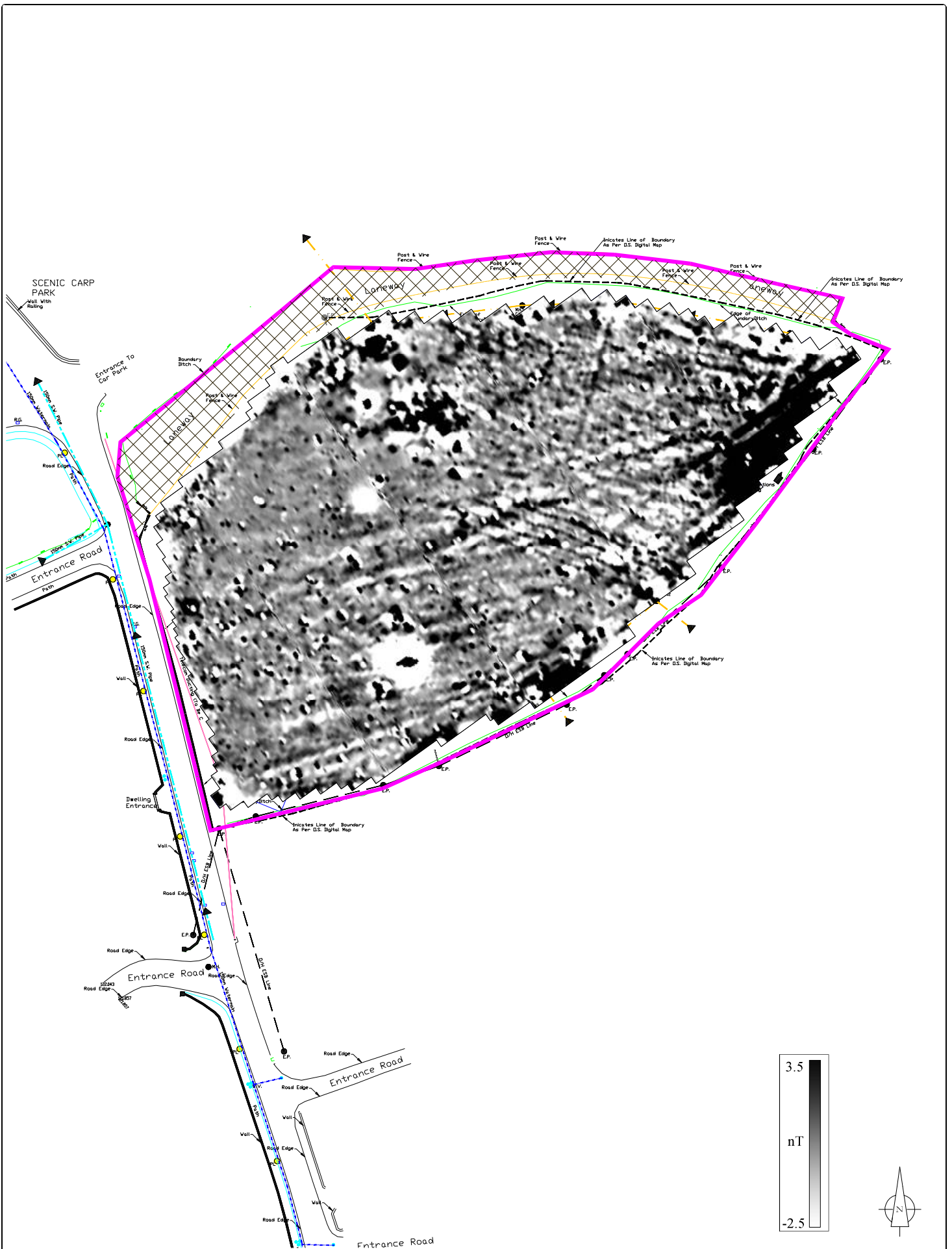
Client:  
De Faoite Archaeology


Project:  
Geophysical Survey  
Greenhill Road  
County Wicklow


Title:  
Site & Survey Location

**J.M. Leigh**  
surveys  
www.jmlsurveys.com

Scale @ A4: 1:1,500  
Figure: 1  
Licence No.: 19R0059  
Issue Date: 04.04.2019



 Application area

 Not suitable for survey

0 metres 50

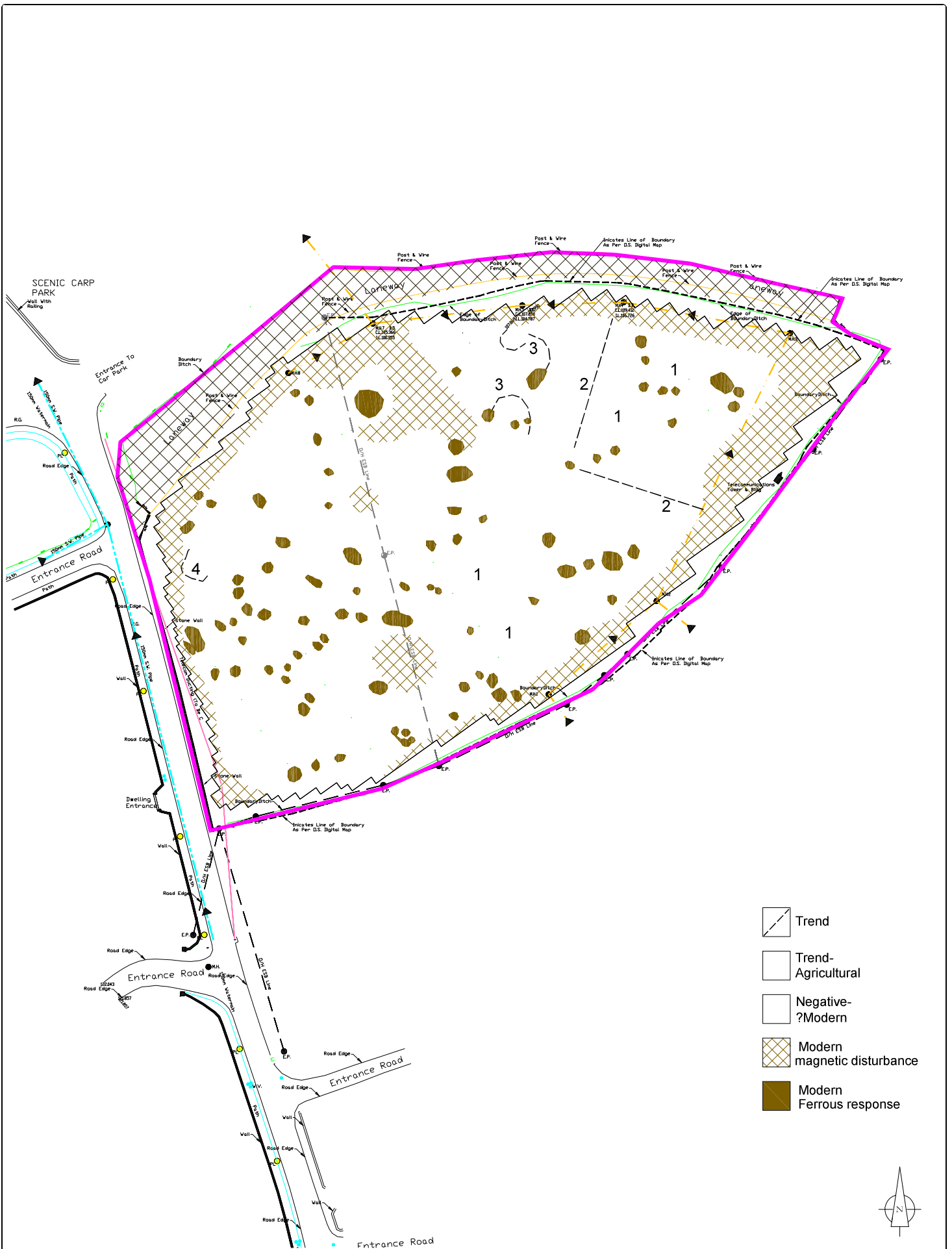
Client:  
De Faoite Archaeology

Project:  
Geophysical Survey  
Greenhill Road  
County Wicklow

Title:  
Summary Greyscale Image

**J.M. Leigh**  
surveys  
www.jmlsurveys.com

Scale @ A4: 1:1,250  
Figure: 2  
Licence No.: 19R0059  
Issue Date: 04.04.2019



Application area	Not suitable for survey		<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Client: De Faoite Archaeology</p> </div> <div style="width: 45%;"> <p>Project: Geophysical Survey Greenhill Road County Wicklow</p> </div> </div>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Title: Summary Interpretation</p> </div> <div style="width: 45%; text-align: right;"> <p><b>J.M.Leigh</b> surveys www.jmlsurveys.com</p> </div> </div>		<p>Scale @ A4: 1:1,250 Figure: 3 Licence No.: 19R0059 Issue Date: 04.04.2019</p>	