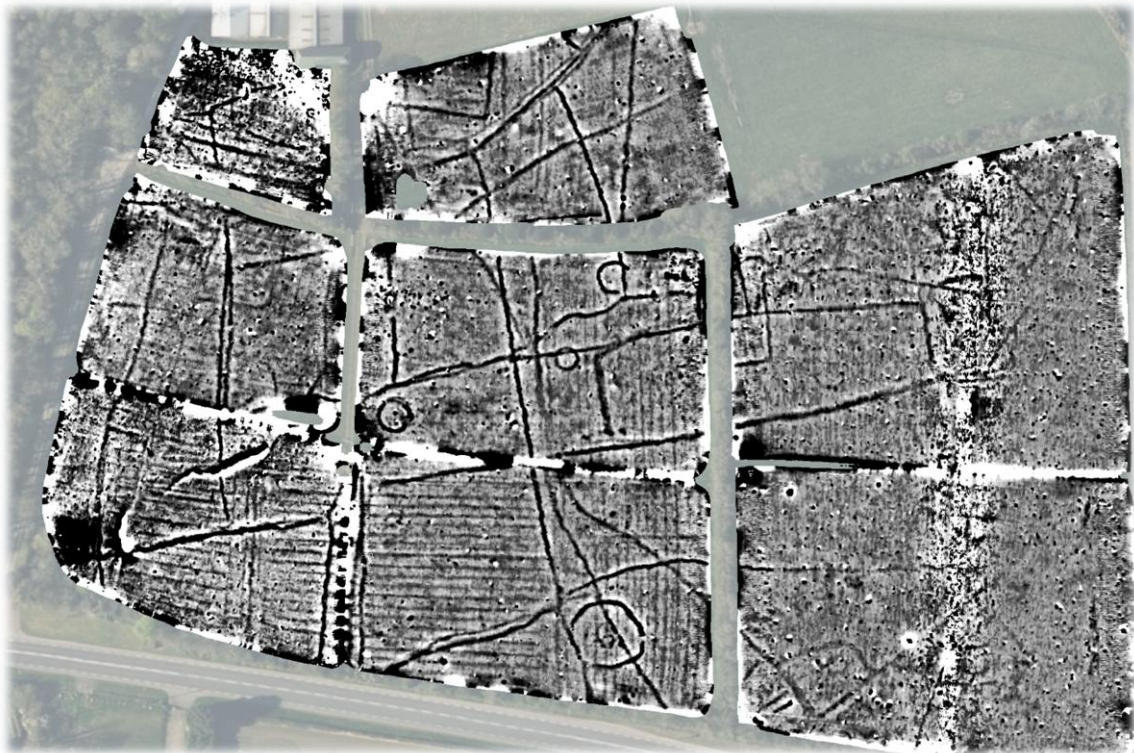


Archaeological Geophysical Survey N11/N25 Oilgate to Rosslare Harbour Scheme, Co. Wexford



Archaeological
Management Solutions



Prepared for Wexford County Council

By James Bonsall, Jeff O'Neill, Finn Melia, Liamóg Roche, & Marcin Leszczynski

March 2025

TITLE PAGE

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Geophysical Surveyors:	Liamóg Roche, Marcin Leszczynski, Alan Danaher, Finn Melia, Jeff O'Neill
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AMS Cultural Heritage Consultancy Limited trading as Archaeological Management Solutions

Company Registration No. 721173

Fahy's Road, Kilrush, Co. Clare. V15 C780

T +353 (0)65 906 2878

www.ams-consultancy.com

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The results, conclusions and recommendations contained within this report are based on information available at the time of its preparation. Whilst every effort has been made to ensure that all relevant data have been collated, the authors and AMS accept no responsibility for omissions and/or inconsistencies that may result from information becoming available subsequent to the report's completion.

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Summary

This report describes the results of Stage(i)i Geophysical Survey Services undertaken during Phase 3 design and environmental evaluation of the N11/N25 Oilgate to Rosslare Harbour scheme a project to develop an approximately 30km long section of high quality road between the southern end of the existing M11 Gorey to Enniscorthy motorway at Scurlocksbush and Rosslare Europort in Co. Wexford. Geophysical survey services were completed in 53 areas in 25 townlands.

The investigation comprised high-resolution magnetic gradiometry and electromagnetic induction - apparent electrical resistivity undertaken by Archaeological Management Solutions (AMS) for Wexford County Council between September 2023 to December 2024.

Other than commonly identified pits, isolated points of burning and linear/curvilinear boundary features, the most significant archaeological sites identified in the 'archaeological' or 'possible archaeological' categories were:

- GS-01: 1-2 (potential burnt mound/area of burning)
- GS-03: 3-1 (potential burnt mound/area of burning)
- GS-04: 4-2 (potential burnt mound/area of burning)
- GS-07: Multiple anomalies indicating a potential burnt mound complex/areas of burning
- GS-08: 8-1 (potential burnt mound/area of burning)
- GS-10: 10-1 (pentagonal enclosure); 10-2 (Ringfort - rath WX032-060----
- GS-13: 13-6 and 13-7 (Ringfort rath WX032-029----
- GS-15: Multiple anomalies indicating a potential burnt mound complex/areas of burning
- GS-16: 16-1—16-4 (potential burnt mounds/areas of burning)
- GS-23: 23-6 & 23-7 (potential burnt mounds/areas of burning)
- GS-28: Multiple anomalies indicating a potential burnt mound complex/areas of burning
- GS-31: 31-1 & 31-1E (possible enclosure)
- GS-32: 32-2 & 32-2E (possible enclosure); 32-3 & 32-1E (possible enclosure)
- GS-37: 37-6 (Ringfort - rath WX042-080----); 37-1 & 37-2 (ring-ditches); 37-4 (enclosure); 37-38 (possible enclosure); 37-3 (Ringfort - rath WX042-085----
- GS-38: 38-1 (Ringfort - rath WX042-085----); 38-2 (enclosure)
- GS-41: 41-19 (potential burnt mound/area of burning)
- GS-45: 45-2, 45-3 & 45-4 (Concentric enclosures)
- GS-46: 46-1 (potential burnt mound/area of burning)
- GS-47: Field systems and 47-55 (possible rectangular enclosure); 47-91 (possible enclosure); 47-12 (ring-ditch); 47-13 (ring-ditch); 47-17 (ring-ditch); 47-24/47-25 (enclosure); 47-31 (ring-ditch); 47-93 (rectangular enclosure); all located within GS-47 that lies immediately south of a Windmill WX048-001002-, 78m south of a castle – unclassified WX048-001001, 22m north of WX048-003 holy well, 128m east of WX048-002 church and graveyard and 120m north of WX048-114 enclosure.
- GS-48: 48-33, 48-34 & 48-1E (large enclosure surrounding WX048-114----, 125m diameter) and multiple contiguous enclosures
- GS-50: 50-2, 50-3, 50-4 (Ringfort – rath WX048-115----) and multiple enclosures/ring-ditches
- GS-51: 51-30 (field system WX048-116001-); 51-04 (ring-ditch WX048-116002-); 51-02 (enclosure WX048-116003-); 51-26 (enclosure WX048-116004-); 51-25 (enclosure WX048-116005) and multiple ring-ditch features: 51-01, 51-03, 51-39, 51-40, 51-05, 51-07, 51-08, 51-10, 51-06, 51-07, 51-41, 51-08, and 51-63.
- GS-53: Large-scale ecclesiastical-style enclosures 53-21/53-49 (inner enclosure); 53-1/53-2 and 53-1E (middle enclosure); 53-11 and parts of 53-20/53-6/53-29/53-28 (outer enclosure); 53-3 (semi-circular enclosure); 53-8 (sub-rectangular enclosure); 53-4 (sub-circular enclosure); and field systems surrounding church and graveyard WX048-006006-, WX048-006-001
- GS-59: 59-9 & 59-10 (potential burnt mounds/area of burnings)

- GS-62: 62-4—62-6 (potential burnt mound complex/areas of burning)

Recommendations are subject to the agreement of the National Monuments Service of the Department of Housing, Local Government and Heritage, the National Museum of Ireland and the local planning authority where required and should only be carried out in accordance with the necessary approvals. Please note that the statutory and local authorities may issue alternative and/or additional recommendations/conditions.

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Abbreviations and Definitions

Abbreviation	Definition
AAP	Area of Archaeological Potential
AMS	Archaeological Management Solutions
EC_a	Apparent Electrical Conductivity
EMI	Electromagnetic Induction
ER_a	Apparent Electrical Resistivity
GIS	Geographical Information System
GSI	Geotechnical Site Investigations
HCP	Horizontal coplanar
ITM	Irish Transverse Mercator
NIAH	National Inventory of Architectural Heritage
NMS	National Monuments Service
OS	Ordnance Survey
REAR	N25 Rosslare Europort Access Road
SMR	Sites and Monuments Record
TII	Transport Infrastructure Ireland
WCC	Wexford County Council
WMS	Web Map Service
ZoN	Zone of Notification

Coordinate System

All grid coordinates in this report use the Irish Transverse Mercator (ITM) coordinate reference system unless otherwise stated.

1 Introduction

1.1 Project Background

This report describes the results of an Archaeological Geophysical Survey along the the proposed N11/N25 Oilgate to Rosslare Harbour Scheme, Co. Wexford. This scheme is covered by the provisions of the Code of Practice agreed between Transport Infrastructure Ireland (TII) and the Minister of Arts, Heritage, Regional, Rural and Gaeltacht Affairs (TII & DAHRRGA 2017).

The proposed N11/N25 Oilgate to Rosslare Harbour Road Scheme will consist of a combination of existing road and new road corridor to provide improved connectivity from Oilgate to Rosslare Europort in Co. Wexford. The proposed scheme will consist of approximately 30km of road carriageway, roadway overbridges, roadway underbridges, accommodation structures, railway crossings, footway/cycle facilities and associated local road/access tie-ins (Figure 1).

The on-site elements of the required Stage(i)i Geophysical Survey Services were carried out across 25 townlands and 53 study areas: (Figure 2, Figure 3, Table 1). GS-01 to GS-63 were all surveyed as part of the Oilgate to Rosslare scheme, GS-62 & GS-63 are also partly located within lands to be acquired for construction of the adjacent N25 Rosslare Europort Access Road project. The survey areas encompass a wider area than the proposed scheme, and it is important to note that not all geophysical anomalies that have been classified as 'archaeological' or 'possible archaeological' will necessarily be impacted by the proposed road development. The impact assessment forms part of the on-going design and environmental evaluation.

The geophysical surveys were located in the townlands of Scurlocksbush, Coolnaboy, Theoil, Tinnahask, Whitefort, Garrycleary, Kyle Upper, Garrywilliam, Kereight, Kavanaghspark, Killowen, Cullentra, Newtown, Clonard Great, Sinnottstown, Rowestown, Coolpeach, Kilmacree, Stephenstown, Ballybrennan Little, Ballybrennan Big, Yoletown, Churchtown, Ballydrane, Hayesland and Ballygerry.

The geophysical surveys were confined within the lands specified by the client in the tender, or in additional areas agreed with the client during the course of the survey. The geophysical surveys were undertaken in accordance with the terms of the contract for the provision of archaeological services between TII and AMS.

Table 1: Geophysical Survey Areas

GS Area No	Methodology	Townland	Proposed Area (Ha)
GS-01	Magnetometry	Scurlocksbusbush	0.56
GS-02	Magnetometry	Scurlocksbusbush	1.37
GS-03	Magnetometry	Scurlocksbusbush	0.16
GS-04	Magnetometry	Coolnaboy	2.79
GS-05	Magnetometry	Coolnaboy	3.43
GS-06	Magnetometry	Theoil	4.34
GS-07	Magnetometry	Tinnahask	1.30
GS-08	Magnetometry and EMI ER _a	Whitefort	0.30
GS-10	Magnetometry	Whitefort	2.60
GS-13	Magnetometry	Garrycleary	3.88
GS-14	Magnetometry	Kyle Upper	3.22
GS-15	Magnetometry	Garrywilliam	0.72
GS-16	Magnetometry	Garrywilliam	0.89
GS-17	Magnetometry and EMI ER _a	Kereight	1.44
GS-18	Magnetometry and EMI ER _a	Kereight	1.27
GS-19	Magnetometry and EMI ER _a	Kereight	0.90
GS-20	Magnetometry and EMI ER _a	Kereight	4.63
GS-21	Magnetometry	Kavanaghspark	0.63
GS-23	Magnetometry	Killowen	1.73
GS-24	Magnetometry	Killowen	1.60
GS-25	Magnetometry	Killowen	0.82
GS-26	Magnetometry and EMI ER _a	Cullentra	0.84
GS-27	Magnetometry and EMI ER _a	Cullentra	0.82
GS-28	Magnetometry and EMI ER _a	Cullentra	1.95
GS-30	Magnetometry	Newtown	1.92
GS-31	Magnetometry and EMI ER _a	Clonard Great	0.60
GS-32	Magnetometry and EMI ER _a	Clonard Great	1.83
GS-33	Magnetometry and EMI ER _a	Clonard Great	1.42
GS-34	Magnetometry and EMI ER _a	Clonard Great	0.54
GS-35	Magnetometry	Sinnottstown	1.11
GS-36	Magnetometry	Sinnottstown	8.28
GS-37	Magnetometry	Rowestown	4.74

GS Area No	Methodology	Townland	Proposed Area (Ha)
GS-38	Magnetometry	Coolpeach	4.92
GS-39	Magnetometry	Kilmacree	1.86
GS-40	Magnetometry	Kilmacree	1.66
GS-41	Magnetometry	Kilmacree	2.55
GS-42	Magnetometry	Stephenstown	0.93
GS-43	Magnetometry	Stephenstown	0.16
GS-45	Magnetometry and EMI ER _a	Ballybrennan Big	3.83
GS-46	Magnetometry and EMI ER _a	Ballybrennan Big	1.36
GS-47	Magnetometry and EMI ER _a	Ballybrennan Big	11.64
GS-48	Magnetometry and EMI ER _a	Ballybrennan Big	6.24
GS-49	Magnetometry and EMI ER _a	Ballybrennan Big	0.98
GS-50	Magnetometry and EMI ER _a	Ballybrennan Big	3.54
GS-51	Magnetometry and EMI ER _a	Yoletown	7.44
GS-52	Magnetometry and EMI ER _a	Yoletown	3.29
GS-53	Magnetometry and EMI ER _a	Churchtown	6.81
GS-58	Magnetometry and EMI ER _a	Ballydrane	1.43
GS-59	Magnetometry and EMI ER _a	Hayesland	2.48
GS-60	Magnetometry and EMI ER _a	Hayesland	1.22
GS-61	Magnetometry and EMI ER _a	Hayesland	0.54
GS-62	Magnetometry and EMI ER _a	Ballygerry	5.46
GS-63	Magnetometry and EMI ER _a	Ballygerry	0.19

1.2 Proposed Development

The proposed N11/N25 Oilgate to Rosslare Harbour Road Scheme will consist of a combination of existing road and new road corridor to provide improved connectivity from Oilgate to Rosslare Europort in Co. Wexford. The proposed scheme will consist of approximately 30km of road carriageway, roadway overbridges, roadway underbridges, accommodation structures, railway crossings, footway/cycle facilities and associated local road/access tie-ins.

1.3 Purpose and Scope of this Assessment

The project covers an area of 223ha within Scurlocksbus, Coolnaboy, Theoil, Tinnahask, Whitefort, Garrycleary, Kyle Upper, Garrywilliam, Kereight, Kavanaghspark, Killowen, Cullentra, Newtown, Clonard Great, Sinnottstown, Rowestown, Coolpeach, Kilmacree, Stephenstown, Ballybrennan Big,

Yoletown, Churchtown, Ballydrane, Hayesland and Ballygerry, townlands. The purpose of the geophysical survey was to identify any potential geophysical anomalies of archaeological significance that are likely to indicate the location of features/structures/deposits of archaeological origin in the survey area. The Geophysical Survey (GS) Areas were located along the N11/N25 Oilgate to Rosslare Harbour preferred route corridor between the southern end of the previously constructed M11 Gorey to Enniscorthy project and Rosslare Harbour. The planned surveys covered an area of 130 ha of the preferred route corridor.

The survey comprised high-resolution magnetic gradiometry, and electromagnetic induction (EMI) (that collected apparent electrical resistivity data). The surveys were overseen by Dr James Bonsall and undertaken by Liamóg Roche (Archaeological Geophysical Remote Sensing Director) and supported by Marcin Leszczynski (Geophysical Supervisor), Jeff O'Neill (Geophysical Supervisor), Alan Danaher (Geophysical Assistant) and Finn Melia (Geophysical Assistant) between September 2023 and December 2024. The methodology was approved by the Archaeological Licensing Section of the National Monuments Service (NMS) and Consent to use a Detection Device under Section 2 (2) of the *National Monuments (Amendment) Act, 1987*, was issued to James Bonsall by the Minister for Housing, Local Government and Heritage: Consent No. 23R).

1.4 Topography, Soils and Geology

The scope of the geophysical survey project was 54 areas spread out along the length of the project. The landscape of the survey areas comprised flat, undulating and steep sloping fields with the drainage across the study areas ranging from well-drained to poorly drained. The geological composition of the sites are complex and can include two or more types within a single survey area (

Table 2, Figures 4—6).

The bedrock geology (Figure 4) across the study areas comprises of the Ballyhoge Formation bedrock comprising of Dark grey slates with siltstone laminae within Survey area GS-01 – GS-05 and GS-07 to GS-08. The Newtown Formation bedrock comprising of Grey-green greywackes & slates in GS-06, majority of GS-13 – GS-25. The Polldarrig Formation bedrock comprising of Dark grey mudstones with thin quartzites within GS-10. The Cullentra Formation bedrock comprising Grey-green metagreywackes & slates within GS-26 – GS-28. The Shelmaliere Formation bedrock comprising of White, purple quartzites with slates within GS-30. The Cullenstown Formation bedrock comprising Grey-green metagreywacke & slate within GS-31 – GS-34. The Ballymartin Formation bedrock comprising Limestone & dark-grey calcareous shale within majority of GS-35. The Duncormick Formation bedrock comprising red, grey conglomerates & sandstones within the southeastern corner of GS-35. The Ballysteen Formation bedrock comprising Dark muddy limestone, shale within the western half of GS-36. The Ballysteen Formation Dolomitised bedrock comprising dark-grey muddy limestone within the eastern half of GS-36, far western end of GS-37 and northwestern corner of GS-38. The Wexford Formation bedrock comprising Pale grey limestones, often dolomitised in majority of GS-37 and majority of GS-38. The Wexford Formation Dolomitised comprising pale grey limestone within GS-39 – GS-41, half of GS-42, northwest corner of GS-43. The Ballycogly Group bedrock comprising Mylonites with metasedimentary enclaves within majority of GS-45 – GS-47 and GS-48 northwestern part of GS-48. The Greenore Point Group Foliated bedrock comprising amphibolites with minor schists, majority of GS-48, GS-49, GS-50 and majority GS-51. The Ballybro Formation bedrock comprising Buff & green slate, siltstone, greywacke within northeast of GS-51, GS-52 – GS-53, and northwest corner of GS-58. Greenore Point Group bedrock comprising Foliated amphibolites with minor schists within the majority of GS-58 and GS-59 to GS-63 (GSI 2024).

The quaternary deposits (Figure 5) across the study areas consists of till derived from Lower Palaeozoic shales with GS-01 – GS-06, majority of GS-07 – GS-08, GS-10 – GS-16, GS-17 – GS-19, GS-20 – GS-25, majority GS-26, GS-27 – GS-30. Till derived from quartzites, GS-31 – GS-34, majority of GS-35, GS-36 – GS-37, majority of GS-38. Till derived from Cambrian sandstones and shales within the south end of GS-38, GS-39 – GS-43, GS-46 – GS-51, majority of GS-52, western half of GS-53, majority of GS-58, majority of GS-59, GS-60, western half of GS-61 and GS-62 – GS-63. Lastly alluvium deposits reside in smaller areas within GS-07 - GS-08, GS-17 – GS-19, eastern edge of GS-35, eastern end of GS-52, the western edge of GS-53, northeastern end of GS-59 and the northeastern half of GS-61. Bedrock outcrop or subcrop in the north end of GS-26, eastern half of GS-53 (GSI 2024).

Soils (Figure 8) across the study areas consist of Sandy stoneless drift GS-01 – GS-03, GS-05 – GS-06 and the southeast corner of GS-10. Poor-draining, Fine loamy drift with siliceous stones, majority of GS-04, majority of GS-07 – GS-10, majority of GS-17, GS-20 – GS-25. Majority of GS-30, GS-31 – GS-36. Imperfectly-draining, fine loamy drift with siliceous stones within majority of GS-13 – GS-16, north corner of GS-17, majority of GS-18, GS-26 – GS-28 and northeast corner of GS-30. Well-draining, Coarse loamy drift with siliceous stones GS-37 – GS-43. Poor-draining, river alluvium across the majority of GS-45 – GS-46. Other-draining, Tidal marsh located across the western corner of GS-47. Poor-draining, Fine loamy over clayey calcareous Irish Sea till majority of GS-47, GS-48 – GS-51, majority of GS-52 – GS-53, GS-58, majority of GS-59, GS-60, western half of GS-61 and GS-62 – GS-63 (GSI 2024).

Table 2: Geology and Soils at the Geophysical Survey Areas

GS Area No	Methodology	Bedrock	Quaternary	Soil
GS-01	Magnetometry	Ballyhoge Formation, Dark grey slates with siltstone laminae.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-02	Magnetometry	Ballyhoge Formation, dark grey slates with siltstone laminae.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-03	Magnetometry	Ballyhoge Formation, Dark grey slates with siltstone laminae.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-04	Magnetometry	Ballyhoge Formation, Dark grey slates with siltstone laminae.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-05	Magnetometry	Ballyhoge Formation, Dark grey slates with siltstone laminae.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-06	Magnetometry	Newtown Formation, Grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-07	Magnetometry	Ballyhoge Formation, dark grey slates with siltstone laminae	Till derived from Lower Palaeozoic shales.	Deep poorly drained mineral.
GS-08	Magnetometry and EMI ER _a	Ballyhoge Formation, dark grey slates with siltstone laminae.	Till derived from Lower Palaeozoic shales and alluvium in the NE.	Deep poorly drained mineral and alluviums in the NE.
GS-10	Magnetometry	Polldarrig Formation, dark grey mudstones with thin quartzites.	Till derived from Lower Palaeozoic shales.	Southeast: Deep poorly drained mineral; northwest: Deep well drained mineral.
GS-13	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-14	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-15	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-16	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-17	Magnetometry and EMI ER _a	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales and alluvium along E edge.	Deep poorly drained mineral, alluvial deposits on E edge.
GS-18	Magnetometry and EMI ER _a	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales and alluvium along W edge.	Deep poorly drained mineral, alluvial deposits along W edge.
GS-19	Magnetometry and EMI ER _a	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales and alluvium on W edge.	Deep poorly drained mineral, alluvial deposits on W edge.
GS-20	Magnetometry and EMI ER _a	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep poorly drained mineral.
GS-21	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales and alluvium through the centre.	Deep poorly drained mineral.

GS Area No	Methodology	Bedrock	Quaternary	Soil
GS-23	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep poorly drained mineral.
GS-24	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep poorly drained mineral.
GS-25	Magnetometry	Newtown Formation, grey-green greywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep poorly drained mineral.
GS-26	Magnetometry and EMI ER _a	Cullentra Formation, grey-green metagreywackes & slates.	Till derived from Lower Palaeozoic shales, and a 30m wide band of bedrock outcrop or subcrop running along the northern end of the survey area.	Deep well drained mineral.
GS-27	Magnetometry and EMI ER _a	Cullentra Formation, grey-green metagreywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-28	Magnetometry and EMI ER _a	Cullentra Formation, grey-green metagreywackes & slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-30	Magnetometry	Shalmaliere Formation, white, purple quartzites with slates.	Till derived from Lower Palaeozoic shales.	Deep well drained mineral.
GS-31	Magnetometry and EMI ER _a	Cullenstown Formation, grey-green metagreywacke & slate.	Till derived from quartzites.	Deep poorly drained mineral.
GS-32	Magnetometry and EMI ER _a	Cullenstown Formation, grey-green metagreywacke & slate.	Till derived from quartzites.	Deep poorly drained mineral.
GS-33	Magnetometry and EMI ER _a	Cullenstown Formation, grey-green metagreywacke & slate.	Till derived from quartzites.	Deep poorly drained mineral.
GS-34	Magnetometry and EMI ER _a	Cullenstown Formation, grey-green metagreywacke & slate.	Till derived from quartzites.	Deep poorly drained mineral.
GS-35	Magnetometry	Ballymartin Formation: limestone & dark-grey calcareous shale	Till derived from quartzites, with alluvium along the eastern edge.	Deep poorly drained mineral.
GS-36	Magnetometry	Ballysteen Formation, east side: dolomitised dark-grey muddy limestone, west side: dark muddy limestone, shale.	Till derived from quartzites.	Deep poorly drained mineral.
GS-37	Magnetometry	Wexford Formation, pale grey limestones, often dolomitised, with a small section of Ballysteen Formation, dolomitised dark-grey muddy limestone along the western side.	Till derived from quartzites.	Deep well drained mineral.
GS-38	Magnetometry	Wexford Formation, pale grey limestones, often dolomitised, with a small section of Ballysteen Formation, dolomitised dark-grey muddy limestone in the NW corner.	Till derived from quartzites.	Deep well drained mineral.
GS-39	Magnetometry	Wexford Formation, dolomitised pale grey limestone.	Till derived from Cambrian sandstones and shales.	Deep well drained mineral.

GS Area No	Methodology	Bedrock	Quaternary	Soil
GS-40	Magnetometry	Wexford Formation, dolomitised pale grey limestone.	Till derived from Cambrian sandstones and shales.	Deep well drained mineral.
GS-41	Magnetometry	Wexford Formation, dolomitised pale grey limestone.	Till derived from Cambrian sandstones and shales.	Deep well drained mineral.
GS-42	Magnetometry	Wexford Formation, NW: dolomitised pale grey limestone; SE: Pale grey limestones, often dolomitised.	Till derived from Cambrian sandstones and shales.	Deep well drained mineral.
GS-43	Magnetometry	Wexford Formation, NW: dolomitised pale grey limestone; SE: Pale grey limestones, often dolomitised.	Till derived from Cambrian sandstones and shales.	Deep well drained mineral.
GS-45	Magnetometry and EMI ER _a	Ballycogly Group, mylonites with metasedimentary enclaves.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-46	Magnetometry and EMI ER _a	Ballycogly Group, mylonites with metasedimentary enclaves.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-47	Magnetometry and EMI ER _a	Ballycogly Group, mylonites with metasedimentary enclaves.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-48	Magnetometry and EMI ER _a	Western side: Ballycogly Group, mylonites with metasedimentary enclaves; eastern side: Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-49	Magnetometry and EMI ER _a	Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-50	Magnetometry and EMI ER _a	Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-51	Magnetometry and EMI ER _a	Mostly Greenore Point Group, foliated amphibolites with minor schists, small area of Ballybro Formation, buff & green slate, siltstone, greywacke on the NE side.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-52	Magnetometry and EMI ER _a	Ballybro Formation, buff & green slate, siltstone, greywacke.	Till derived from Cambrian sandstones and shales, and a 45m wide band of alluvium across the eastern side.	Deep poorly drained mineral, and a 45m wide band of alluvium across the eastern side.
GS-53	Magnetometry and EMI ER _a	Ballybro Formation, buff & green slate, siltstone, greywacke.	West side: Till derived from Cambrian sandstones and shales; east side: Bedrock outcrop or subcrop.	NW: Deep poorly drained mineral; SE: deep well drained mineral; NE: surface water

GS Area No	Methodology	Bedrock	Quaternary	Soil
				Gleys / Ground water Gleys Shallow.
GS-58	Magnetometry and EMI ER _a	Mostly Greenore Point Group, foliated amphibolites with minor schists, with a small area of Ballybro Formation, buff & green slate, siltstone, greywacke on western side.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-59	Magnetometry and EMI ER _a	Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales, crossed by alluvium, with a small band of Irish Sea Till derived from Limestones along the NE edge.	Deep poorly drained mineral, crossed by alluvium.
GS-60	Magnetometry and EMI ER _a	Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-61	Magnetometry and EMI ER _a	Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales, crossed by alluvium.	Deep poorly drained mineral, crossed by alluvium.
GS-62	Magnetometry and EMI ER _a	Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.
GS-63	Magnetometry and EMI ER _a	Greenore Point Group, foliated amphibolites with minor schists.	Till derived from Cambrian sandstones and shales.	Deep poorly drained mineral.

1.5 Aims and Objectives

The aim of the archaeological geophysical survey was to identify potential archaeological remains.

This aim was achieved using the following objectives:

- Identify any geophysical anomalies of possible archaeological origin within the specified survey area.
- Accurately locate these anomalies and present the findings in map form.
- Describe the anomalies and discuss their likely provenance in a written report.
- Incorporate all the above into a report for the Client.
- Preparation and submission of archives of the project data and reports.

2 Archaeological and Historical Background

2.1 Recorded Monuments

There are 25 recorded archaeological monuments in the Sites and Monuments Record (SMR) that are either located in the Geophysical Survey areas or have a Zone of Notifications (ZoN) that the Geophysical Survey areas traverse through (Table 3). There are six Ringfort – raths (WX032-003----; WX032-029----; WX032-060----; WX042-080----; WX042-085----; WX048-115----), five Enclosures (WX048-114----; WX048-116003-; WX048-116004-; WX048-116005-; WX048-116006-), three Churches (WX042-032001-; WX048-002001-; WX048-006001-), three Graveyards (WX042-032002-; WX048-002002-; WX048-006006-), two Fonts (WX042-032003-; WX048-002003-), one Fulacht fia (WX026-092----), one Field system (WX048-116001-), one Ring-ditch (WX048-116002-), one Castle - tower house (WX042-005----), one Windmill (WX048-001002-), one Ritual site - holy well (WX048-003---).

In Churchtown, three notable archaeological sites occur at GS-53, including a Church (WX048-006001-), Graveyard (WX048-006006-), and Enclosure (WX048-114----). A variety of medieval and possibly earlier sites are spread across the contiguous townlands of Yoletown, Ballybrennan Big, and Ballybrennan Little (encompassing GS-45—51). These include a Field system (WX048-116001-), Ring-ditches (WX048-116002- and WX048-116006-), and Enclosures (WX048-116003-, WX048-116004-, and WX048-116005-, WX048-002003-) a Windmill (WX048-001002-), Church (WX048-002001-), Graveyard (WX048-002002-) and a holy well (WX048-003----).

Table 3: Recorded archaeological sites within or adjacent to the geophysical survey areas.

SMR No.	Classification	Townland	GS Area	Location
WX026-092----	Fulacht fia	Scurlocks bush	GS-01; GS-02; GS-03	Adjacent to GS areas
WX026-093----	Fulacht fia	Scurlocks bush	GS-01; GS-02; GS-03	Adjacent to GS areas
WX032-003----	Ringfort – rath	Coolnaboy	GS-05	ZoN within GS area
WX032-029----	Ringfort – rath	Garrycleary	GS-13	Within GS area
WX032-060----	Ringfort – rath	Whitefort (Shelmaliere East By., Artramond Ed)	GS-10	Adjacent to GS area
WX042-005----	Castle - tower house	Clonard Great	GS-31; GS-32; GS-33	Adjacent to GS area
WX042-032001-	Church	Kilmacree	GS-39; GS-40	With GS-39, adjacent to GS-40
WX042-032002-	Graveyard	Kilmacree	GS-39; GS-40	With GS-39, adjacent to GS-40
WX042-032003-	Font	Kilmacree	GS-39; GS-40	With GS-39, adjacent to GS-40
WX042-080----	Ringfort – rath	Rowestown (Shelmaliere West By.)	GS-37	ZoN within GS area
WX042-085----	Ringfort – rath	Coolpeach, Rowestown (Forth By.)	GS-37	ZoN within GS area
WX048-001002-	Windmill	Ballybrennan Big	GS-47	Adjacent to GS area

SMR No.	Classification	Townland	GS Area	Location
WX048-002001-	Church	Ballybrennan Big	GS-47	Adjacent to GS area
WX048-002002-	Graveyard	Ballybrennan Big	GS-47	Adjacent to GS area
WX048-002003-	Font	Ballybrennan Big	GS-47	Adjacent to GS area
WX048-003----	Ritual site - holy well	Ballybrennan Little	GS-47	Adjacent to GS area
WX048-006001-	Church	Churchtown (Rosslare Par., Kilsoran Ed)	GS-53	Adjacent to GS area
WX048-006006-	Graveyard	Churchtown (Rosslare Par., Kilsoran Ed)	GS-53	Adjacent to GS area
WX048-114----	Enclosure	Ballybrennan Big	GS-47; GS-48	Adjacent to GS areas
WX048-115----	Ringfort – rath	Ballybrennan Big	GS-48; GS-49; GS-50	Adjacent to GS areas -48 and 49, ZoN located within GS-50
WX048-116001-	Field system	Yoletown (Forth By., Rosslare Ed)	GS-51	ZoN within GS area
WX048-116002-	Ring-ditch	Yoletown (Forth By., Rosslare Ed)	GS-51	ZoN within GS area
WX048-116003-	Enclosure	Yoletown (Forth By., Rosslare Ed)	GS-51	ZoN within GS area
WX048-116004-	Enclosure	Yoletown (Forth By., Rosslare Ed)	GS-51	ZoN within GS area
WX048-116005-	Enclosure	Yoletown (Forth By., Rosslare Ed)	GS-51	ZoN within GS area
WX048-116006-	Ring-ditch	Yoletown (Forth By., Rosslare Ed)	GS-51	ZoN within GS area

2.2 Geophysical Survey Area selection

The 54 geophysical survey areas were selected on the basis of proximity to known SMR sites, either documented in the SMR or identified in LiDAR assessment (Davis 2021), and areas of archaeological potential (AAP), identified on the basis of local topography and slope aspect Table 4).

Table 4: Justification for Geophysical Survey.

GS Area No	Methodology	Justification for Geophysical Survey
GS-01	Magnetometry	14m east of fulacht fia WX026-093----; 25m south of fulacht fia WX026-092----; extension of area to include area of high potential identified in the LiDAR assessment
GS-02	Magnetometry	14m east of fulacht fia WX026-093----; 25m south of fulacht fia WX026-092----; extension of area to include two identified LiDAR ID 1 (enclosure) and 25 (enclosure) in area of high potential identified in the LiDAR assessment
GS-03	Magnetometry	14m east of fulacht fia WX026-093----; 25m south of fulacht fia WX026-092----; extension of area to include two identified LiDAR ID 1 (enclosure) and 25 (enclosure) in area of high potential identified in the LiDAR assessment
GS-04	Magnetometry	LiDAR feature 3.2 (possible enclosure) identified on southern edge.
GS-05	Magnetometry	15m west of from ringfort - rath WX032-003----; extended to field boundary to include ZoN and approach to Martingale stream AAP; includes Area of High Potential identified in LiDAR report.
GS-06	Magnetometry	Taking in wider area on approach to Martingale stream AAP; SW area is at or near LiDAR ID 60 (enclosure)

GS Area No	Methodology	Justification for Geophysical Survey
GS-07	Magnetometry	Taking in a wider area approaching bridge over Knockduff stream AAP.
GS-08	Magnetometry and EMI ER _a	Taking in a wider area of a south-facing slope, approaching bridge over Knockduff stream AAP.
GS-10	Magnetometry	Narrow area 33m east of WX032-060---- (ringfort - rath) - also recorded as LiDAR ID 4. Historic mapping, OS six-inch & 25-inch suggests that former N11 alignment is partly located within proposed survey area.
GS-13	Magnetometry	Impact on WX032-029---- (Ringfort - rath), survey area extended to cover all of the monument.
GS-14	Magnetometry	Wide area crossing confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds.
GS-15	Magnetometry	Wide area crossing confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds.
GS-16	Magnetometry	Wide area crossing confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds. Survey area incorporates three ponds depicted on the OS six-inch 1st ed.
GS-17	Magnetometry and EMI ER _a	Crosses the confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds.
GS-18	Magnetometry and EMI ER _a	Crosses the confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds.
GS-19	Magnetometry and EMI ER _a	Crosses the confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds.
GS-20	Magnetometry and EMI ER _a	Crosses the confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds.
GS-21	Magnetometry	Wide area crossing confluence of Kyle Middle and Mountanna streams, AAP due to potential burnt mounds.
GS-23	Magnetometry	Approach to Newcastle Upper stream AAP, terrace overlooking River Slaney - potential for Bronze Age burials.
GS-24	Magnetometry	Approach to Newcastle Upper stream AAP, terrace overlooking River Slaney - potential for Bronze Age burials.
GS-25	Magnetometry	Approach to Newcastle Upper stream AAP, terrace overlooking River Slaney - potential for Bronze Age burials.
GS-26	Magnetometry and EMI ER _a	High potential AAP due to River Slaney, terrace overlooking River Slaney - potential for Bronze Age burials. Within boundary of Cullentra House demesne depicted on OS six-inch 1st ed.
GS-27	Magnetometry and EMI ER _a	Terrace overlooking River Slaney - potential for Bronze Age burials. WX037-026---- (castle - unclassified) located 70m to the west. Cullentra House NIAH 15703726 and Desmesne Gardens located immediately east.
GS-28	Magnetometry and EMI ER _a	Terrace overlooking River Slaney - potential for Bronze Age burials. WX037-026---- (castle - unclassified) located 70m to the west. Cullentra House NIAH 15703726 and Desmesne Gardens located immediately east.
GS-30	Magnetometry	Temporary acquisition of lands here.
GS-31	Magnetometry and EMI ER _a	Within boundary of Clonard Great demesne depicted on OS six-inch 1st ed. Junction taking in AAP between Whitemill stream and Newbay stream. WX042-005---- (Castle - towerhouse) ZoN is located 19m to the S.
GS-32	Magnetometry and EMI ER _a	Within boundary of Clonard Great demesne depicted on OS six-inch 1st ed. Junction taking in AAP of Whitemill stream. WX042-005---- (Castle - towerhouse) ZoN is located 23m to the SW.
GS-33	Magnetometry and EMI ER _a	Within boundary of Clonard Great demesne depicted on OS six-inch 1st ed. Junction taking in AAP of Whitemill stream. WX042-005---- (Castle - towerhouse) ZoN is located 190m to the SW.

GS Area No	Methodology	Justification for Geophysical Survey
GS-34	Magnetometry and EMI ER _a	Within boundary of Clonard Great demesne depicted on OS six-inch 1st ed. LiDAR ID 61, probable ringfort, 86m south. Junction taking in AAP of Whitemill stream.
GS-35	Magnetometry	Located between AAP for Kerlog and Rathaspick stream.
GS-36	Magnetometry	Taking in a wider area of the field for proposed roundabout/junction, which approaches AAP for Drinagh stream. Includes location of settlement/farm depicted on historic OS mapping
GS-37	Magnetometry	Identified in the LiDAR assessment as an area of high potential. Area has been widened to take in archaeological sites. Route passes through the ZoN of two ringfort - raths WX042-080----; WX042-085----. Also located 173m NE of ZoN for WX042-019----.
GS-38	Magnetometry	Identified in the LiDAR assessment as an area of high potential. Area has been widened to take in archaeological sites. Route passes through the ZoN of WX042-085---- (ringfort - rath); and passing 50m east of ZoN for WX042-019---- (concentric enclosure).
GS-39	Magnetometry	Falls within ZoN for WX042-032001- (church 'in ruins'), WX042-032002- (font) and WX042-032003- (graveyard). On the historic OS 25-inch mapping indicates that N part of survey area is depicted as marshy land.
GS-40	Magnetometry	WX042-032001- (church 'in ruins'), WX042-032002- (font) and WX042-032003- (graveyard), located 160m to west.
GS-41	Magnetometry	LiDAR ID 23 located 30m to the west, on approach to AAP of Ballyfinoge Great stream and south-facing slope.
GS-42	Magnetometry	On approach to Ballyfinoge Great stream AAP.
GS-43	Magnetometry	On approach to Ballyfinoge Great stream AAP.
GS-45	Magnetometry and EMI ER _a	Passing through ZoN for graveyard, church and font, WX048-002001- (church 'in ruins'), WX048-002002- (graveyard), WX048-002003- (font); approaching Whitehouse stream, near the confluence of Whitehouse/Common streams AAP.
GS-46	Magnetometry and EMI ER _a	Passing through ZoN for graveyard, church and font, WX048-002001- (church 'in ruins'), WX048-002002- (graveyard), WX048-002003- (font); approaching Whitehouse stream AAP. Located 136m NW of ZoN for WX048-003---- (ritual site – holy well).
GS-47	Magnetometry and EMI ER _a	Adjacent to WX048-001002- (windmill), 43m S of WX048-001-001-, lies in ZoN of WX048-003---- (ritual site -holy well). Located 50m east of ZoN for graveyard, church and font, WX048-002001- (church 'in ruins'), WX048-002002- (graveyard), WX048-002003- (font); and 64m north of ZoN for WX048-114---- (enclosure).
GS-48	Magnetometry and EMI ER _a	Scheme passes ZoN of WX048-114---- (enclosure) 12m to the south, ZoN for WX048-115---- (ringfort - rath) located 84m to E. Advocate for surveying entire field based on larger medieval and earlier landscape to the east.
GS-49	Magnetometry and EMI ER _a	10m south of WX048-115---- (ringfort - rath).
GS-50	Magnetometry and EMI ER _a	Passing through ZoN of Ringfort - rath WX048-115----. Survey to be extended given high potential to east and west.
GS-51	Magnetometry and EMI ER _a	Passes through ZoN for WX048-116001- (field system), WX048-116002- (ring-ditch), WX048-116003- (enclosure), WX048-116004- (enclosure), WX048-116005- (enclosure) and WX048-116006- (ring-ditch).
GS-52	Magnetometry and EMI ER _a	High potential AAP for Ballybrennan Little stream and ZoN for sites 24m to the west WX048-116001- (field system), WX048-116002- (ring-ditch), WX048-116003- (enclosure), WX048-116004- (enclosure), WX048-116005- (enclosure) and WX048-116006- (ring-ditch).

GS Area No	Methodology	Justification for Geophysical Survey
GS-53	Magnetometry and EMI ER _a	ZoN for WX048-006001- (church) and WX048-006006- (graveyard) is 16m north of alignment, approaching Milltown stream AAP.
GS-58	Magnetometry and EMI ER _a	AAP for Grange Big stream.
GS-59	Magnetometry and EMI ER _a	AAP for Grange Big stream.
GS-60	Magnetometry and EMI ER _a	AAP for Grange Big stream.
GS-61	Magnetometry and EMI ER _a	AAP for Grange Big stream.
GS-62	Magnetometry and EMI ER _a	AAP for Grange Big stream. Suspected prehistoric settlement remains identified during archaeological monitoring of wastewater treatment plant (SMR WX048-155). 61m north of alignment. Proposed junction at eastern end.
GS-63	Magnetometry and EMI ER _a	AAP for Grange Big stream. Suspected prehistoric settlement remains identified during archaeological monitoring of wastewater treatment plant (SMR WX048-155). 61m north of alignment. Proposed junction at eastern end.

3 Methodology

3.1 Personnel

The geophysical survey was directed by Dr James Bonsall under Detection Device Consent 23R0451, issued by the NMS. The survey was carried out by Liamóg Roche (Archaeological Geophysical Remote Sensing Director), Marcin Leszczynski and Jeff O'Neill (Archaeological Geophysical Supervisors), Alan Danaher and Finn Melia (Geophysical Assistants).

3.2 Survey Areas

The investigation focused on 63 proposed survey areas (designated GS-01 to GS-63, with an aggregate area of a Study Area of 146.72ha, comprising 146.72ha of magnetometry, and 79.53ha of EMI Apparent Electrical Resistivity (ER_a) survey (Table 5). 10 of the proposed areas measuring, 15.56ha, were unsurveyable due to dense vegetation or standing crop, and in one instance, poaching (surface water), while six areas were not surveyed due to access restrictions. The actual areas surveyed had an aggregate of 130ha, comprising 130ha of magnetometry, and 71.89ha of ER_a .

Table 5: Geophysical Survey Area status

GS Area No	Methodology	Townland	Status	Area Surveyed (Ha)
GS-01	Magnetometry	Scurlocks bush	Surveyed	0.56
GS-02	Magnetometry	Scurlocks bush	Surveyed	1.37
GS-03	Magnetometry	Scurlocks bush	Surveyed	0.16
GS-04	Magnetometry	Coolnaboy	Surveyed	2.79
GS-05	Magnetometry	Coolnaboy	Surveyed	3.43
GS-06	Magnetometry	Theoil	Surveyed	4.34
GS-07	Magnetometry	Tinnahask	Surveyed	1.30
GS-08	Magnetometry and EMI ER_a	Whitefort	Surveyed	0.30
GS-09	Magnetometry and EMI ER_a	Whitefort	Not Surveyed	0
GS-10	Magnetometry	Whitefort	Surveyed	2.60
GS-11	Magnetometry	Garrycleary	Not Surveyed	0
GS-12	Magnetometry	Garrycleary	Not Surveyed	0
GS-13	Magnetometry	Garrycleary	Surveyed	3.88
GS-14	Magnetometry	Kyle Upper	Surveyed	3.22
GS-15	Magnetometry	Garrywilliam	Surveyed	0.72
GS-16	Magnetometry	Garrywilliam	Surveyed	0.89
GS-17	Magnetometry and EMI ER_a	Kereight	Surveyed	1.44

GS Area No	Methodology	Townland	Status	Area Surveyed (Ha)
GS-18	Magnetometry and EMI ER _a	Kereight	Surveyed	1.27
GS-19	Magnetometry and EMI ER _a	Kereight	Surveyed	0.50
GS-20	Magnetometry and EMI ER _a	Kereight	Surveyed	4.33
GS-21	Magnetometry	Kavanaghspark	Surveyed	0.63
GS-22	Magnetometry	Newcastle Lower	Not Surveyed	0
GS-23	Magnetometry	Killowen	Surveyed	1.73
GS-24	Magnetometry	Killowen	Surveyed	1.60
GS-25	Magnetometry	Killowen	Surveyed	0.82
GS-26	Magnetometry and EMI ER _a	Cullentra	Surveyed	0.62
GS-27	Magnetometry and EMI ER _a	Cullentra	Surveyed	0.62
GS-28	Magnetometry and EMI ER _a	Cullentra	Surveyed	1.95
GS-29	Magnetometry	Newtown	Not Surveyed	0
GS-30	Magnetometry	Newtown	Surveyed	1.88
GS-31	Magnetometry and EMI ER _a	Clonard Great	Surveyed	0.60
GS-32	Magnetometry and EMI ER _a	Clonard Great	Surveyed	1.83
GS-33	Magnetometry and EMI ER _a	Clonard Great	Surveyed	1.42
GS-34	Magnetometry and EMI ER _a	Clonard Great	Surveyed	0.54
GS-35	Magnetometry	Sinnottstown	Surveyed	1.11
GS-36	Magnetometry	Sinnottstown	Surveyed	8.28
GS-37	Magnetometry	Rowestown	Surveyed	4.74
GS-38	Magnetometry	Coolpeach	Surveyed	4.92
GS-39	Magnetometry	Kilmacree	Surveyed	1.86
GS-40	Magnetometry	Kilmacree	Surveyed	1.66
GS-41	Magnetometry	Kilmacree	Surveyed	2.55
GS-42	Magnetometry	Stephenstown	Surveyed	0.93
GS-43	Magnetometry	Stephenstown	Surveyed	0.16
GS-44	Magnetometry and EMI ER _a a	Loughard	Not Surveyed	0
GS-45	Magnetometry and EMI ER _a	Ballybrennan Big	Surveyed	3.83
GS-46	Magnetometry and EMI ER _a	Ballybrennan Big	Surveyed	1.36
GS-47	Magnetometry and EMI ER _a	Ballybrennan Big	Surveyed	11.64
GS-48	Magnetometry and EMI ER _a	Ballybrennan Big	Surveyed	6.24
GS-49	Magnetometry and EMI ER _a	Ballybrennan Big	Surveyed	0.98

GS Area No	Methodology	Townland	Status	Area Surveyed (Ha)
GS-50	Magnetometry and EMI ER _a	Ballybrennan Big	Surveyed	3.54
GS-51	Magnetometry and EMI ER _a	Yoletown	Surveyed	7.44
GS-52	Magnetometry and EMI ER _a	Yoletown	Surveyed	3.29
GS-53	Magnetometry and EMI ER _a	Churchtown	Surveyed	7.3
GS-54	Magnetometry and EMI ER _a a	Maytown	Not Surveyed	0
GS-55	Magnetometry and EMI ER _a a	Maytown	Not Surveyed	0
GS-56	Magnetometry and EMI ER _a a	Maytown	Not Surveyed	0
GS-57	Magnetometry and EMI ER _a a	Maytown	Not Surveyed	0
GS-58	Magnetometry and EMI ER _a	Ballydrane	Surveyed	1.43
GS-59	Magnetometry and EMI ER _a	Hayesland	Surveyed	2.48
GS-60	Magnetometry and EMI ER _a	Hayesland	Surveyed	1.22
GS-61	Magnetometry and EMI ER _a	Hayesland	Surveyed	0.54
GS-62	Magnetometry and EMI ER _a	Ballygerry	Surveyed	5.46
GS-63	Magnetometry and EMI ER _a	Ballygerry	Surveyed	0.19

3.3 Magnetometry Survey

The survey employed a detailed magnetometer survey, recording the vertical magnetic gradient i.e. a fluxgate magnetometer. This technique measures variations in the magnetic properties of the soils. It is widely used in archaeological geophysical prospection due to its ability to detect and map a broad range of subsurface archaeological remains, including ditches and pits and burnt or fired features associated with metalworking and pottery production (Aspinall *et al.* 2008).

3.3.1 Data Capture

The survey recorded the vertical magnetic gradient, i.e., a fluxgate magnetometer. Five Sensys FGM650 fluxgate gradiometer probes were mounted on a Sensys MAGNETO MX PDA 5 Channel cart system; each probe was spaced 0.5m apart. Three cart systems were used across the study areas. The magnetometer data were acquired gridlessly with Sensys MonMX Lite Software, connected to a Carlson BRX7 GNSS Smart Antenna RTK GPS, achieving a spatial resolution of 0.1m accuracy. Data were collected at ten times per second along the lines.

3.3.2 Data Processing

The magnetometry and GPS data were processed through Geoserver followed by DLMGPS 4.01-12 and finalised in Sensys MAGNETO 3.01-14. MAGNETO software was used for trace correction and equalisation.

3.3.3 Data Visualisation

The data were brought in to QGIS as a GeoTIFF for display and interpretation as greyscale images.

3.4 EMI Apparent Electrical Resistivity Survey

Electrical Resistivity data were collected using an electromagnetic induction (EMI) device, acquired as quadrature (apparent electrical conductivity) data and converted to apparent electrical resistivity data. The application of this method is particularly useful to understand anomalies at depth, in areas of weakly magnetic contrast (such as gleys, clays, alluvium and peat) where magnetometry performs poorly, and to help delineate anomalies created by stone (including near surface geology, and humanly-constructed walls or structures), which magnetometry is typically unable to do.

3.4.1 Data Capture

The EMI data were acquired using a GF Instruments CMD Mini-Explorer (Bonsall *et al.* 2013). The instrument collected quadrature (later referred to here as apparent electrical conductivity) data as apparent electrical conductivity (or EC_a) data, which are the reciprocal of apparent electrical resistivity data. Thus, a high conductivity anomaly, such as that caused by a ditch, will produce a comparable low resistance anomaly.

The horizontal coplanar (HCP) configuration (in the vertical dipole orientation or the 'full depth' range) was (as opposed to the half depth range offered by the horizontal dipole orientation ('Low') option). The depth range for the vertical dipole (recording data from three levels simultaneously), is 0.5m, 1.0m and 1.8m below the sensor (the horizontal depth range is 0.25m, 0.5m and 0.9m). The dipole centre distance for each level is 0.32m (Level 1), 0.71m (Level 2) and 1.18m (Level 3). Quadrature data were acquired in mS/m to a resolution of 0.1 mS/m.

The CMD Mini-Explorer was mounted on a cart and acquired data gridlessly connected to a Carlson BRX7 GNSS Smart Antenna RTK GPS, achieving a spatial resolution of 0.1m accuracy. The data were collected along traverses spaced 0.5m apart, with data collected every 0.3 seconds along the traverse. The data were collected in continuous mode by a time-based sample trigger connected via blue-tooth to the instrument and the RTK GPS. The data were stored in an automatic data logger and downloaded to a field computer.

3.4.2 Data Processing

The quadrature data were automatically converted from apparent electrical conductivity (EC_a) to apparent electrical resistivity (ER_a), measured in ohm/m by GF Instruments' CMD Data Transfer download software. ER_a data were gridded in Surfer to a spatial resolution of 0.5m x 0.25m.

3.4.3 Data Visualisation

The data were brought into QGIS as a GeoTIFF for display and interpretation as greyscale images. The data presented here are from the deepest data set, representing a depth of investigation of up to 1.8m. The analysis of archaeological features using HCP conductivity derived data is somewhat complicated due to a signal polarity change. The polarity shift in HCP occurs at depths greater than 1m. This means that the polarity of data from HCP Level 3 at a depth of investigation of 1.8m, is reversed, i.e. low resistance anomalies appear high and vice versa. It is worth noting that this polarity change is an inherent characteristic of HCP coils and has been well-documented over the last 25 years by various studies (Tabbagh 1986; Linford 1998; Simpson *et al.* 2009). Despite this potential confusion, the polarity shift does not hinder the ability to differentiate between anomalous contrasts and background responses, and all the datasets presented still reveal clear archaeological features.

3.5 Data Management, Processing, and Interpretation

This project used QGIS (Version 3.22.14) as a Geographical Information System (GIS) to manage the project. QGIS is an open-source GIS which can be used to create, edit, visualise, analyse and publish geospatial information.¹ This project used the long-term release version of the software (3.18.1) as the basic platform to access, view and analyse the geophysical visualisations produced in Surfer. QGIS also enabled comparisons of the visualisations with other relevant geospatial databases, record the analysis through digitising the morphology and magnitude of anomalies identified, and output a table catalogue of this analysis and corresponding maps.

For the purposes of this project, the following datasets were also accessed and/or downloaded:

- Tailte Éireann historical maps and orthographic photographs of the Study Areas, viewed online;²
- Sites and Monuments Record (SMR) point and polygon vectors as a Web Map Service (WMS);³

¹ QGIS. Quantum GIS v3.18.1. <https://www.qgis.org/en/site/>

² Accessed from <https://maps.archaeology.ie/HistoricEnvironment/>

³ SMR data (version date: 23/08/2023)) accessed from <https://data.gov.ie/dataset/national-monuments-service-archaeological-survey-of-ireland>

- Rivers and lakes as a WMS (downloaded from <https://gis.epa.ie/GetData>);
- National soils database as a vector layer (downloaded from <https://gis.epa.ie/GetData/Download>);
- Townlands vector layer.⁴
- Lidar-derived visualisations prepared by Dr Steve Davis were also provided (Davis 2021).

The following vector layers were generated for the project:

- Centroids for each anomaly were created for establishing ITM coordinates.
- Polygons for each identified geophysical anomaly.
- Polygons for narrow geophysical anomalies.

The dimensions of individual anomalies were calculated in QGIS using the measure tools. All anomalies are defined by polygons. The geophysical visualisations for the survey areas are included in Figures 7-56 (magnetometry data) and Figures 107-133 (EMI ER_a data). The interpretations are in Figures 57-106 (magnetometry interpretation) and Figures 134-160 (EMI ER_a interpretation). GS-51 was not available for survey until August 2024 and the results for that area are presented as the final images of this report, in Figures 161-162 (magnetometry data), 163-164 (magnetometry interpretation), 165-166 (EMI ER_a data) and 167-168 (EMI ER_a interpretation).

3.6 Standards

The geophysical survey and report follow the recommendations outlined by relevant best practice guidance documents as a minimum standard (Bonsall *et al.* 2014; David *et al.* 2008; Gaffney *et al.* 2002; Schmidt *et al.* 2015). Geophysical data, shapefiles, figures and the text have been archived following the recommendations of the Archaeology Data Service (Schmidt & Ernenwein 2011). Raw geophysical data and GIS shapefiles are available in the archive.

3.7 Constraints

The constraints consisted of powerlines disturbing data, brambles and wet ground (that could not be traversed through). Traffic, travelling along both sides of the N11 road and other adjacent roads, have created strongly magnetic anomalies on the edges of the data, as have fence lines along the edges of the fields surveyed.

⁴ Vector layer downloaded from www.townlands.ie; townland names confirmed against the OS townlands list from <https://data.gov.ie/dataset/townland>.

4 Results and Interpretation: N11/N25 Oilgate to Rosslare Harbour Scheme

The magnetometry and resistivity surveys performed well across most of the survey areas, showing clear and coherent contrasts for archaeological features such as pits, ditches and potential areas of burning. Some areas contained strongly magnetic geology which impacted on the archaeological interpretation of the magnetometry data (GS-58-60, GS-62), and areas of variable backgrounds that resulted in poor contrasts (GS-31-35), resulting in no clear or coherent means of discriminating between geological and archaeological sources. The Greenore Point Group of bedrock geology located in the southeastern end of the scheme has impacted GS-58-60 and GS-62. The geology is comprised of foliated amphibolites with minor schists, a strongly contrasting magnetic geology. Strongly magnetic linear and curvilinear anomalies encountered at GS-58-60 could represent either geological or archaeological sources due to this geology, but on balance are felt to be geological. The EMI ER_a data were unaffected by the strongly magnetic geologies in those survey areas.

The magnetometry data (Figures 7-56 and 161-2), and the magnetometer interpretation (Figures 57-106 and 163-164), along with the resistivity data (Figures 107-133 and 167-168) and the resistivity interpretation (Figure 134-160 and 167-168) should be cross-referenced with the description (below) for a discussion of the anomalies.

Across the survey areas are several dipolar anomalies, indicating ferrous remains. These are likely to represent modern iron discarded in the topsoil, and in many cases where widespread clusters occur, these reflect what we suspect are imported soils or disturbed ground. Widespread areas of interference, mostly generated by fence lines or passing traffic were also noted across many of the survey areas. Of the remaining anomalies, many represent commonly identified archaeological features such as pits, isolated points of burning or linear/curvilinear boundary features or drainage ditches.

A narrative of the most significant known or potential archaeological sites identified in each survey area is given below. The most coherent anomalies identified have been numbered in the interpretation figures and can be found below in

Table 6 (magnetometry) and Table 7 (resistivity). These should be cross-referenced with the interpretation plots.

4.1 GS-01

This survey area was extremely wet and disturbed by cattle which may have contributed to some responses being masked (Figure 7 and 57). There was a large area of interference, possibly reflecting imported soils/foundational material at the northern end of the survey area. GS-01 contains two potential archaeological sites; a possible enclosing element (1-1) and a large area of burning (1-2), which might represent a potential burnt mound. There are no indications of any association with fulacht fia WX026-092----, located approximately 25m north of GS-01, which was previously excavated, however the ZoN of which continues into the northern section of GS-01, and falls within an area of widespread interference. There is no trace of the field boundary that is depicted extending across GS-01 from southeast-northwest on the first edition six-inch map (Co. Wexford, sheet 26, surveyed in 1839).

4.2 GS-02

This survey area contains several linear and curvilinear anomalies (Figures 8 and 58), one of which (2-3) is a known historical field boundary from the first-edition six-inch OS map (Co. Wexford, sheet 26, surveyed 1839), and others may represent boundary features that pre-date the OS mapping or may be associated with drainage. There are no indications of LiDAR ID 1 (enclosure) or 25 (enclosure) identified in the LiDAR assessment (Davis 2021), however the lack of a magnetic contrast can be expected for some subtle topographical expressions.

4.3 GS-03

This survey area contains a possible large area of burning (3-1), measuring 20m x 16m, comprising several irregular shaped anomalies (Figure 8 and 58). These suggest the presence of a burnt mound complex, an interpretation that might be strengthened by the presence of fulacht fia WX026-093----, fully excavated in advance of construction of the M11 Gorey to Enniscorthy project, located 30m to the northwest. There are no indications of LiDAR ID 1 (enclosure) or 25 (enclosure) identified in the LiDAR assessment (Davis 2021), however the lack of a magnetic contrast can be expected for some subtle topographical expressions.

4.4 GS-04

This survey area contains no known or potential archaeological sites. It consists of several linear and curvilinear anomalies, one of which (4-1) is a known historical field boundary from the first-edition six-inch Ordnance Survey (OS) map (Co. Wexford, sheet 32, surveyed 1839), and others may represent

boundary features that pre-date the OS mapping or may be associated with drainage (Figures 9-10 and 59-60). A possible area of burning or kiln was identified as 4-2. There are no indications of LiDAR feature 3.2 (possible enclosure) identified on southern edge in the LiDAR assessment (Davis 2021), other than a small grouping of possible pits, south of 4-6. However, the lack of a magnetic contrast can be expected for some subtle topographical expressions.

4.5 GS-05

This survey area contains the southwestern edge of the ZoN for WX032-003---- Ringfort – rath, the upstanding ringfort is located approximately 40 m E of the survey area boundary and otherwise no known or potential archaeological sites (Figure 11 and 61). A field boundary, 5-15, is depicted extending across GS-05 from southeast-northwest on the first edition six-inch map (Co. Wexford, sheet 26, surveyed in 1839). There are no anomalies associated with the ringfort, though there are some potential archaeological anomalies present within this survey area. There are two possible curvilinear anomalies one to the west of the survey area and another more central. There is also one linear running northeast-southwest. There are several broad anomalies that are likely to be natural trends caused by geology.

4.6 GS-06

This survey area includes strong natural geological responses, as well as interference along a north-south alignment in the eastern half of the survey area, due to overhead pylon wires (Figures 12 and 62). The topography of the survey area was undulating.

Historical mapping indicates the presence of structures at the southern end of the survey area, present on the OS first-edition six-inch (Co. Wexford, sheet 32, surveyed 1839), 25-inch (Co. Wexford, sheet 32, plan2 and 6, surveyed 1903) and revised six-inch (Cassini, surveyed 1921) OS. Some of these have been identified in the magnetometry as 6-1 through to 6-7, with 6-4 being a notable area of imported or destroyed and spread-out material. These are related to a farmstead/collection of structures.

6-8 represents an in-filled pond, depicted on the first-edition six-inch map.

4.7 GS-07

An enclosing element, 9m x 8m, occurs near the southern end of the survey area 7-5, and may continue beyond the survey area to the south (Figures 13 and 63). This occurs as a high resistance curvilinear anomaly running into the southern boundary of the survey. 7-3 and 7-7 are also curvilinear type anomalies that may be similar in nature to anomaly 7.5. They may be associated with other linear ditches (likely to be field boundaries) and pits in the area. Linear ditch 7-1 and 7-2 (likely the same feature, but with a less coherent signal at the northern end) is similar to the location of a field

boundary marked on the first-edition six-inch and, 25-inch OS maps but does not match it completely. Anomalies 7-4 and 7-6 are perpendicular to 7-1/7-2, and while they may be related, they are not depicted on any editions of the historic OS mapping.

Other anomalies include possible areas of burning in the far southwest corner (7-11 and 7-12) and southeast corner (7-8 through to 7-10), although these could be modern bonfires in the corner of the fields.

A band of interference runs along a north-south alignment in the eastern half of the survey area, due to overhead pylon wires.

4.8 GS-08

4.8.1 *Magnetometry Survey*

GS-08 contains an area of strong magnetism in the northwest corner, 8-1, that may reflect modern disturbance in the corner of the field or potential areas of burning that might reflect burnt mound deposits (Figures 13 and 63). There are suggestions of a weak and narrow enclosing element, 8-2, however this is not a coherent feature and is broken in several places – it may simply represent a geological anomaly rather than an anthropogenic one. Weakly magnetic possible enclosing or arcuate elements were mapped as 8-3 and 8-4.

4.8.2 *Resistivity Survey*

The ER_a survey was carried out in two portions as a central part of the field was too wet for an assessment (Figures 107 and 134). No significant archaeological sites were identified. A small zone of high resistivity, 8-1E, could represent near surface stone (natural or a humanly-constructed feature).

4.9 GS-10

GS-10 contains Ringfort – rath WX032-060---, which was mapped as 10-2, with a projected diameter of 43m (Figures 14 and 64). This appears as a large circular enclosure anomaly in the data, in the central western area of the survey. It continues beyond the western edge of the survey area and may continue into the field.

There was a high level of interference within the data due to power lines particularly in the east of the survey area running north-south disturbing the data readings, as well as natural geological variations.

Within the survey area there were four field boundaries, which are all present on the historic mapping first-edition six-inch (Co. Wexford, sheet 32, surveyed 1839), 25-inch map (Co. Wexford, sheet 32, plan 10, surveyed 1921) and 1931 Cassini map. There is a large pentagonal feature, 10-1, located in the northwest of the survey area. This may be an enclosing feature, measuring externally 37m across.

4.10 GS-13

This survey area contains two potential enclosures, several historic field boundaries, a small enclosing element of archaeological significance to the east end of the survey area and some minor linear and curvilinear anomalies (Figures 15 and 65). A possible ring-ditch was identified (13-1, measuring 10.5m x 9m). A ringfort – rath WX032-029---- (13-7, measuring 37m in diameter) was mapped. Part of 13-7 was strongly positive and was marked as a separate internal feature, 13-6. There is a large rectilinear anomaly to the east of this anomaly measuring 33m x 10m. This may be an extension to the enclosure. To the north there is a linear feature measuring 60m. It may be a ditch feature running northwest-southeast. Possible enclosure (13-12, measuring 44m x 26m) was identified, the centre of this feature contains numerous high contrast isolated responses and may relate to a pond feature marked on the 25-inch OS map (Co. Wexford, sheet 32, plan 14, surveyed 1903). There is a very faint area of enhancement located in the south of the survey area, measuring 15m x 13m. This may be a potential enclosing anomaly or D-shaped enclosure.

Multiple historic field boundaries correspond to a collection of buildings beyond the survey area to the southeast. These are not depicted on the first edition six-inch (surveyed 1839), but are depicted on the 25-inch (sheet 32, plans 14 and 15, surveyed 1903) and revised six-inch maps.

13-14 is a faint area of enhancement representing a sub-circular enclosing anomaly. This feature is located in the east of the survey area and may be indicative of a ring-ditch or enclosing structure. Its diameter is 27m.

4.11 GS-14

The majority of the anomalies of archaeological potential are within the southern portion of GS-14 (Figures 16 and 66). Several linears within the southern end indicate pre-OS ditch-like anomalies that appear to cross each other towards the southeast corner of the survey area. The 1st ed. six-inch (sheet 37, surveyed 1839) depicts a slightly sinuous stream running roughly north-south through the southern part of GS-14, this may be represented in the data by the southeast-northwest part of 14-2. There are three potential enclosures in the centre of the survey area. 14-4 is the smallest of these, a sub-circular anomaly, measuring 6m in diameter. 14-8 is a complete sub-circular anomaly that is 18m in diameter, this may be a potential ring-ditch or enclosure feature. 14-9 is a penannular sub-circular anomaly with an opening to the north, it measures 14m in diameter. There are a number of potential pits/post-hole type anomalies in the northwest of the survey area, such as 14-6 and 14-7. To the south of these there are three linear anomalies 14-13-15. These linear anomalies may represent potential ditches. Those curvilinears appear to be within an area of potential burning suggesting, a fulacht fiadh or a metalworking area. Other enclosing elements are less clear such as area of enhancement 14-3

which is extremely faint and may be linked to geology. A historic field boundary runs through the middle of the survey area however this boundary does not appear on the magnetometry data.

4.12 GS-15

This survey area contains several potential areas of burning along the western portion of the survey area (Figures 17 and 67). The area was noted to be very wet at the time of the survey and contained modern dumped materials, thus the potential areas of burning could also reflect modern buried material. A pond is depicted in the southwest corner of GS-15 on the first edition six-inch map (sheet 32, surveyed 1839). This may account for the modern debris and the some of the anomalies observed in the magnetometry data.

4.13 GS-16

16-1 through to 16-4 are highly magnetic anomalies in the northwest corner of the survey area (Figures 17 and 67). These features may indicate an area of high intensity burning, such as a kiln, pits or a burnt mound. A series of ponds are depicted in the northwest corner of GS-16 on the first edition six-inch map (sheet 32, surveyed 1839). They may account for some of the anomalies observed in the magnetometry data.

4.14 GS-17

4.14.1 *Magnetometry Survey*

17-1 through to 17-3 represent three positive linear anomalies (Figures 18 and 68). They correspond to three historic field boundaries that are present on the first-edition six-inch (Co. Wexford, sheet 39, surveyed 1839) OS, the 25-inch Co. Wexford, sheet 37, plan 2, surveyed 1903 OS and the 1941 Cassini map. 17-6 is a rectilinear enclosing anomaly, measuring 33m x 29m in the centre of the survey area. there is a small enclosure type anomaly in the northwest corner of this anomaly, numbered 17-5, it has a diameter of 11m. both of these are very faint anomalies. This feature is a possible enclosing rectilinear feature. 17-7 is a peninsular sub-circular anomaly appearing in the southwest of the survey area. This anomaly is very faint and has been marked as an area of investigation rather than potential archaeology. It measures 26m in diameter.

4.14.2 *Resistivity Survey*

17-1E represents a possible geological feature, including a potential palaeochannel (Figures 108 and 135).

4.15 GS-18

4.15.1 Magnetometry Survey

18-1 is a positive curvilinear enclosing anomaly along the northern border of the survey area (Figures 18 and 68). This feature consists of two circles enclosing each other in a 'figure of eight' shape. Both of these circles open in the centre of this joining, facing west. This feature may represent an enclosure type feature.

There are two field boundaries, 18-3 and 18-4, located in the southeast of the survey area. These are positive linear anomalies are present on the first-edition six-inch, Co. Wexford, sheet 39, surveyed 18397 OS, the 1903 25-inch sheet 39, plan 3 OS and the 1941 Cassini map.

4.15.2 Resistivity Survey

Anomaly 18-1E represents a natural variation, possibly near surface stone (Figures 108 and 135).

4.16 GS-19

4.16.1 Magnetometry Survey

This survey area consists of several ferrous responses in the centre of the survey area (Figures 18 and 68). These features may represent modern or older ferrous debris. They coincide with the location of a junction between two field boundaries depicted on all editions of the historic mapping.

4.16.2 Resistivity Survey

Anomalies 19-1E and 19-2E represent natural variations, likely to be near surface stone (Figures 108 and 135).

4.17 GS-20

4.17.1 Magnetometry Survey

The imagery of GS-20 is split across Figures 19 and 69 (GS-20 north) and Figures 20 and 70 (GS-20 south), given the large size of the survey area. The northwest portion of the survey area was too wet to survey. There are two historic field boundaries that appear on all historic mapping located within this survey area, 20-7 and 20-24.

20-1 is a curvilinear enclosing weakly positive annular anomaly. It may represent a ring-ditch measuring in 17m diameter.

20-3 is a curvilinear anomaly in the northwest corner of the survey area. This is a positive anomaly that may be a portion of a ring-ditch/enclosing feature that extends beyond the survey area.

20-6 is a curvilinear enclosing anomaly, measuring 16m in diameter and 14m in width. It may represent a possible ring-ditch or hut-site feature. The entrance to this anomaly is facing northeast.

20-33 is a curvilinear enclosing anomaly, measuring 11m in diameter. It may represent a possible ring-ditch or hut-site feature. The entrance to this anomaly is facing north.

There are numerous positive linear anomalies present in this survey area, potentially associated with these curvilinear anomalies. 20-4 is the largest of these measuring 71m and running in a northwestern-southeastern direction. This begins in the northern section of the survey areas beginning at the southeast of 20-26, a potential natural feature or archaeological enclosure.

There are two other linear anomalies running north-south from the south of anomaly 20-26, they run parallel to each other and are 35m and 34m in length respectively.

There is a potential enclosure located in the northeast of the survey area. This is a curvilinear anomaly that is located on the edge of the survey area and may continue into the next field. The extent visible in the data is 20m in length and 2m in width.

In the centre of the survey area there is another curvilinear anomaly 20-10, measuring 6m in diameter. There are two linears leading off this in an east-west direction.

There are two rectilinear anomalies in the centre of the survey area, 20-09 and 20-23. 20-09 is the larger of the two measuring 108m in length and 2.5m in width. This is just north of 20-23, measuring, 83m in length and 2m in width.

4.17.2 Resistivity Survey

The imagery of GS-20 is split across Figures 109 and 136 (GS-20 north) and Figures 110 and 137 (GS-20 south), given the large size of the survey area. The EMI ER_a identified some broad anomalies that are likely to represent possible ditches. In general, the width of an anomaly recorded by EMI ER_a surveys are much wider than the actual target feature, and the width depicted should not be seen as an indicator of actual feature width.

4.18 GS-21

There is a possible burnt deposit/mound, which is located in the northwest corner of the survey area, however it is also very close to an area of interference and is difficult to assess (anomalies 21-4 through to 21-7), (Figures 20 and 70).

There is also a possible enclosure (21-3) located at the south of the survey area, which lies just to the north of an area of interference.

4.19 GS-23

There is a potentially enclosing penannular anomaly located in the southeast of the survey area (Figures 21 and 71). This anomaly, 23-1 has a diameter of 15.5m, the opening of which is located in the north of the anomaly. There is a potential area of burning located in the west of the survey area, 23-7. This is an oval shaped anomaly and may potentially represent a large area of burning or a potential kiln type feature. There is another large area of burning present in this survey area, 23-6. This may also represent a potential kiln type feature. This is located in the northwest of the survey area and is also keyhole shaped. There are also two potential track like anomalies. The first of consists of two linear anomalies, which run northeast-southwest across the centre of the survey area, 23-2 and 23-3, measuring 91m and 55m in length respectively. The second potential tracklike anomaly runs north-south in the southwestern section of the survey area. This feature consists of two anomalies, 23-4 and 23-5, and are 34m in length each.

4.20 GS-24

There is a historic field boundary located in the north corner of the survey area running east-west, 24-1 (Figures 22 and 72). This boundary is present on the 1906 Co. Wexford, sheet 37, plan 6 and the 1937 Cassini map. 24-2 is a large curvilinear anomaly located in the north of the survey area, it runs in a north-south direction. It is 39m in length.

4.21 GS-25

There is a weakly contrasting possible enclosure feature located in the south of the survey area, 25-2, 36m in diameter, however the underlying geology may also be responsible for creating this anomaly (Figures 22 and 72).

4.22 GS-26

4.22.1 Magnetometry Survey

The full area of GS-26 could not be surveyed due to a pylon at the northern end and trees at the southern end (Figures 23 and 73). GS-26 does not contain any features that may be of an archaeological nature, however there is a large amount of interference which covers the western half of the survey area. This is due to overhead powerlines, which continue through GS-27 and GS-28.

4.22.2 Resistivity Survey

The full area of GS-26 could not be surveyed due to a pylon at the northern end and trees at the southern end (Figures 111 and 138). GS-26 does not contain any features that may be of an archaeological nature.

4.23 GS-27

4.23.1 Magnetometry Survey

The full area of GS-27 could not be surveyed due trees (Figures 23 and 73). There is a large amount of interference which covers the western half of the survey area. This is due to overhead powerlines, which continue through GS-26 and GS-28. There are features present in the rest of the survey area, however. There is a small enclosing feature that may be a hut site, with what may be burnt deposit in the centre (27-1).

4.23.2 Resistivity Survey

The full area of GS-27 could not be surveyed due trees (Figures 111 and 138). GS-27 does not contain any features that may be of an archaeological nature.

4.24 GS-28

4.24.1 Magnetometry Survey

There is a large amount of interference which covers the western half of the survey area (Figures 23 and 73). This is due to overhead powerlines, which continue through GS-26 and GS-27. There are multiple possible archaeological features located in the survey area. There are weakly contrasting areas of magnetic enhancement that may or may not represent possible enclosing features, 28-1 (13m diameter), 28-2 (17m diameter) and 28-6 (14m diameter). There is a large feature consisting of multiple anomalies, 28-3 through to 28-5. It contains multiple positive curvilinear features within an area of enhancement and these could represent areas of burning.

To the east of the survey area there a large possible pit, possibly associated with Cullentra House/landscaping. There are four ferrous responses suggesting iron posts (with a fifth to the north in GS-27), aligned in a linear direction from south-southwest to north-northeast. This is likely to represent the remains of a boundary feature, possibly associated with Cullentra House.

4.24.2 Resistivity Survey

28-1E is a possible ditch or enclosing anomaly, it does not relate to any similar features in the magnetometry data (Figures 111 and 138).

4.25 GS-30

It should be noted that due to the presence of farm buildings and farm machinery part of GS-30 along the western boundary could not be surveyed (Figures 24 and 74). GS-30 contains of a large amount of interference along the western boundary of the survey area. This is due to a large amount of farm machinery and ancillary structures. There are a few small areas of possible archaeological features.

There are two positive curvilinear anomalies located in the southeast of the survey area (30-1 and 30-2). There is a large amount of ferrous material in the centre of the survey area. This may represent the remains of a ploughed out archaeological feature or modern debris spread (identified as an area of enhancement, 30-3). There are also three possible archaeological features in the northeast (30-4 through to 30-6), which may represent possible ditches.

4.26 GS-31

4.26.1 *Magnetometry Survey*

GS-31 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 25 and 75). GS-31 contains a large amount of interference due to overhead powerlines and a pylon along the eastern edge of the survey area. An area of enhancement may represent an enclosing feature, 31-1 (38m diameter).

4.26.2 *Resistivity Survey*

GS-31 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 112 and 139). 31-1E precisely matches the location of magnetometry anomaly 31-1 (an area of magnetic enhancement), adding further weight to its interpretation as a possible enclosure feature.

4.27 GS-32

4.27.1 *Magnetometry Survey*

GS-32 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 26 and 76). GS-32 contains two very weakly contrasting anomalies that may represent geology or enclosure features. The larger of the two, 32-2 is oval-shaped, split across two paddocks that form GS-32 (the paddocks were separated by an electric fence which created a linear band of interference) measuring 56m x 44m. The second possible enclosure/geological anomaly, 32-3, is a sub-circular positive anomaly measuring 21m x 18m.

4.27.2 *Resistivity Survey*

GS-32 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 113 and 140). 32-1E matches the northern half of magnetometer anomaly 32-3, adding further weight to its interpretation as a possible enclosure feature.

32-2E and 32-3E matches the location of magnetometer anomaly 32-2, adding further weight to its interpretation as a possible enclosure feature.

4.28 GS-33

4.28.1 Magnetometry Survey

GS-33 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 27 and 77). GS-33 contains of a large amount of interference that covers the eastern and southeastern portion of the survey area due to overhead powerlines running the length of the site and across into GS-34. This interference has caused some disruption in the data. The background responses are variable here and while potential archaeology has been identified, the anomalies could have a geological origin. There are two possible enclosures/geological anomalies, 33-1 (13m diameter) and 33-2 (34m x 20m).

4.28.2 Resistivity Survey

GS-33 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 114 and 141). GS-33 does not contain any features that may be of an archaeological nature.

4.29 GS-34

4.29.1 Magnetometry Survey

GS-34 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 27 and 77). GS-34 contains of a large amount of interference that covers the western and southwestern portion of the survey area, caused by overhead powerlines running the length of the site and across into GS-33. There is a large ring-shaped area of enhancement in the centre of the survey area that may represent a possible enclosing element or geological anomaly, 34-1 (48m x 33m). There is also a pipe running the length of the survey area along the north limit of the field.

4.29.2 Resistivity Survey

GS-34 is located within the former demesne of Clonard Great House, and there may be the potential for demesne landscape features (Figures 114 and 141). GS-34 does not contain any features that may be of an archaeological nature. A pipe is prominent along the northern edge.

4.30 GS-35

GS-35 contains a possible enclosure/geological anomaly identified as an area enhancement in the centre of the survey area, 35-1 (Figures 28 and 78). An argument for an archaeological interpretation for 35-1 is enforced by a possible ditch or drainage ditch, also identified as a weakly magnetic linear band of magnetic enhancement, 35-4, which appears to lead from 35-1. There is a large amount of

interference at the northern and northeastern portion of the survey area. This is due to overhead powerlines running the length of the site.

4.31 GS-36

The imagery for this site can be seen in Figures 29 and 79 (GS-36 west), and Figures 30 and 80 (GS-36 east). There are at least two phases of field boundaries evident in the magnetometry data at GS-36. The latest is the field system depicted on the historic OS mapping (Co. Wexford, six-inch sheet 42, 1st ed surveyed 1839, revised edition 1922-23 and 25-inch sheet 42, plan 8, surveyed 1903) i.e. 36-1, 36-2, 36-3, 36-4, 36-5, 36-6, 36-7, 36-8, 36-9 & 36-10. The other linear anomalies are presumably associated drainage or with one or two earlier field systems. Curvilinear anomaly 36-23 (18m x 13m) may represent a possible enclosing element, located adjacent to two historical field boundaries.

There is an area of multiple isolated ferrous responses in the southeast of the survey area which coincides with a boggy area depicted on historical OS mapping, and could suggest attempts at land improvement, however it could also represent naturally occurring iron pan, or areas of isolated burning.

4.32 GS-37

The imagery for this site can be seen in Figures 31 and 81 (GS-37 west), and Figures 32 and 82 (GS-37 east), as well as Figure 169 for an overview of both GS-37 and GS-38. GS-37 (and GS-38 to the south) contain a large number of archaeological features in and amongst a general overprint of field systems.

Ringfort – rath WX042-085---- is located across GS-37 (the northern half identified as 37-3) and GS-38 (the southern half identified as 38-1). The same feature appears differently in the magnetometry data across the two fields due to historical landuse differences, for example more/less intensive ploughing regimes, drainage and fertiliser etc. 37-3 and 38-1 are located across the centre of GS-37 and GS-38, with several radial spokes emanating from it or across it. One of these, 37-18, is present on the historical first edition OS mapping. The Ringfort – rath is subcircular, measuring 69m x 65m.

To the northwest of Ringfort – rath WX042-085---- 37-3 and 38-1, two more enclosures can be seen, 37-4 (25m x 32m) and 37-6 (47m x 39m), which represents Ringfort – rath WX042-080----, along with a weaker anomaly suggesting a possible enclosure, 37-38 (85m x 54m). Each of those are located across or adjacent to anomalies 37-12, 37-20 (a field boundary marked on the historical first edition, 25-inch and six-inch Cassini OS maps) and 37-21. In turn, 37-12 appears to form a 26m x 70m rectilinear enclosure with 37-11 and 37-10. That enclosure appears to contain two c-shaped ring-ditches, 37-1 and 37-2, each measuring 8m in diameter, with a third ring-ditch, 37-5, 9m diameter, located just outside the rectilinear enclosure.

Within 12-90m of Ringfort – rath WX042-085---- 37-3 and 38-1, there are a number of weakly magnetic anomalies that may represent subcircular enclosing elements or geology: 37-28 (18m diameter), 37-33 (23m diameter), 37-34 (9m diameter), 37-24 (21m diameter), 37-25 (7m diameter) and 37-27 (11m diameter).

4.33 GS-38

GS-38 (and GS-37 to the north) contain a large number of archaeological features in and amongst a general overprint of field systems (see Figures 33 and 83, as well as Figure 169 for an overview of GS-37 and GS-38). Ringfort – rath WX042-085---- is located across GS-37 (the northern half identified as 37-3) and GS-38 (the southern half identified as 38-1). 38-26 is located inside Ringfort – rath WX042-085---- 37-3 and 38-1, and may represent a subcircular enclosing element or geology, measuring 28m x 16m.

To the southwest of Ringfort – rath WX042-085---- 37-3 and 38-1, is 38-2, a previously unrecorded c-shaped enclosure measuring 68m in diameter. Located to the southeast of 38-2 is a broken ring-ditch, 38-3 and 38-4, measuring 11m in diameter.

38-24 (17m diameter) is a weakly magnetic anomaly that may represent a subcircular enclosing element or geology. It is located 20m southwest of Ringfort – rath WX042-085---- 37-3 and 38-1.

Located 113-230m south of Ringfort – rath WX042-085---- 37-3 and 38-1, are a number of weakly magnetic anomalies that may represent subcircular enclosing elements or geology: 38-8 (17m diameter), 38-11 (26m x 38m), 38-13 (28m x 17m) and 38-17 (30m x 32m).

At the southern end of GS-38, there are a number of linear anomalies that cross the survey area. One of these (38-19) is a field boundary, marked on the historical 25-inch and six-inch Cassini OS maps. The remaining anomalies (38-9, 38-10, 38-12, 38-14, 38-18, 38-20 and 38-21), may represent earlier boundary features, drainage ditches or geological trends.

4.34 GS-39

There are two historic field boundaries in this survey area, 39-11 and 39-12 (Figures 34 and 84). They meet perpendicular to each other with. The southern field boundary, 39-11, running east-west across the width of the survey area. The second boundary, 39-12, runs north-south in the northwest of the survey area. These boundaries are depicted on all of the historic mapping (first-edition six-inch surveyed 1839, the OS 25-inch survey, Co. Wexford, sheet 42, plan 16, surveyed 1903, and 1937 Cassini

map). A church and graveyard (WX042-032001-, WX042-003-) are located just outside the survey area to the west. It is unclear if the anomalies west of 39-12, are associated with the church and graveyard.

There is a weak curvilinear anomaly located in the western corner of the survey area, 39-1. 39-1 and 39-6 intersect. 39-6 is sub-rectangular in shape and may be a structure associated with the church and graveyard. There is another sub-rectangular positive anomaly within the same area, 39-10. This feature intersects 39-1 and is orientated along the same direction as this feature.

Ditches identified as 39-4 and 39-5 continue northwest and north-northwest beyond the survey area and may be associated with the church and graveyard located 75-95m to the west. 39-5 may continue further southeast as the less coherent signal 39-18, where the magnetic response is very weak. However, a similarly weakly magnetic signal is also found in the same area for 39-17 and 39-3 – both of which might represent enclosures or a geological trend. Further ditches and possible field systems that might be associated with the church and graveyard can be seen in the southwest corner of the survey area as 39-14 and 39-15.

4.35 GS-40

In the centre of the survey area is a ring-ditch or more likely a hut site, 40-1, with an 8m diameter and an opening facing east-southeast (Figures 35 and 85).

There is a large curvilinear positive anomaly running across the centre of the survey area, 40-2. This feature is a possible ditch and has a series of other ditch-like anomalies associated with it, none of which correlate with field boundaries depicted on the historic OS mapping.

40-7 (18m x 10m) is a strong positive rectilinear anomaly. This enclosing element is three sided, abutting against an extant field boundary in the northwest corner of the survey area. Directly to the north of this there is another rectilinear feature, 40-8 (12m x 8m), with a less coherent signal than 40-7. This feature may be the foundations of a structure or stone-filled ditch/gully/slot trench, given the shape of the anomaly.

4.36 GS-41

There are several ditches suggesting potential field systems across GS-41, with 41-13 being the strongest and curving around in a slight arc, could suggest part of an enclosing element (Figures 36 and 86). Some potential enclosing elements have a weakly magnetic signal and could also represent natural geological anomalies, 41-1 41-2, 41-3, 41-7, 41-8 and 41-24.

41-19 is a highly magnetic curvilinear anomaly in the southeast of the survey area. This response is typical for an area of burning but could also represent dumped ferrous material in the corner of the field.

4.37 GS-42

In survey area GS-42, a small number of anomalies were identified, including three linear features likely indicating pre-OS field boundaries, a weakly magnetic possible enclosing element, 42-3 (10m diameter), and a field boundary documented on OS historical maps (Figures 37 and 87).

There is a historic field boundary depicted on both the six-inch (1st ed. 1839) and 25-inch (1903) surveys in the centre of the survey area, 42-1. It appears as a positive linear anomaly and runs east-west across the field. This boundary is depicted on all of the historic mapping (first-edition six-inch 1839, 1903 25-inch map and 1937 Cassini map). To the south of this are 42-2 and 42-4, two ditches which pre-date the historical OS mapping.

4.38 GS-43

No anomalies of archaeological significance or potential archaeological significance were identified in the data (Figures 37 and 87).

4.39 GS-45

4.39.1 *Magnetometry Survey*

The imagery for this site can be seen in Figures 38 and 88 (GS-45 west), and Figures 39 and 89 (GS-45 east). GS-45 is located immediately southwest of a Church 'in ruins', Graveyard and a Font (WX048-002001-; WX048-002002-; WX048-002003-). Numerous archaeological and potential archaeological anomalies have been identified in the data from the surveyed area. Notably there are two large concentric curvilinear features in the southeast of the survey area – the inner ditch 45-2, and the central ditch 45-3 are strong and coherent signals, whereas the outer ditch, 45-4 is much weaker and less coherent. Together, these three concentric ditches form the northwest sector of a potentially circular enclosure, with radii of 19m, 43m and 80m respectively. The concentric ditches are likely to continue beyond the survey area to the south (where they would be cut by the current road) and east (into woodland located to the south of the church and graveyard). 45-30 represents a small section of the field where topsoil had been removed at the time of survey, and has a general level of disturbance, in this area the expected continuation of 45-2 and 45-3 are not visible, suggesting that they may have been removed or covered by an imported deposit in that area.

A variety of other linear or rectilinear elements can be seen across the remainder of the site, including an L-shaped ditch 45-9 (the two arms of the ditch measure 18m and 15m in length) and 45-10 (21m x 12m), and 45-19, a rectilinear enclosing element, measuring 16m x 10m.

45-12 is a 13m diameter ring-ditch that appears to be penannular, with an entrance to south. 45-11 is a 11m diameter ring-ditch which comprises an incomplete arc.

Two much weaker anomalies may represent possible ring-ditches or geology: 45-33 (14m x 11m) is annular and 45-28 (13m in diameter) is penannular.

There is a large area of disturbance evident in the magnetometry data south of anomaly 45-34. Whilst the available area to survey this anomaly was very narrow, the 4m wide anomaly correlates with the location of a pond/sand-pit depicted on the 1st ed. six-inch (Co. Wexford, sheet 48) surveyed 1839.

4.39.2 Resistivity Survey

The imagery for this site can be seen in Figures 115 and 142 (GS-45 west), and Figures 116 and 143 (GS-45 east). Other than natural variations, the only potential archaeological feature identified is a possible ditch, 45-1E, which occurs in an area of disturbed soil, described above in the magnetometry data. This feature was not visible in the magnetometry data. The feature may cross magnetometry anomalies 45-2 and 45-3, if they continued in to the topsoil stripped area.

4.40 GS-46

4.40.1 Magnetometry Survey

GS-46 is located immediately west and northwest of a Church 'in ruins', Graveyard and a Font (WX048-002001-; WX048-002002-; WX048-002003-) Figures 39 and 89. GS-46 contains several historic field boundaries and potential archaeological anomalies, including a large irregularly shaped anomaly indicating a possible area of burning 46-1. 46-9 and 46-10 are depicted on first edition OS (surveyed 1839). 46-8 is depicted on the 25-inch (Co. Wexford sheet 48, plan 1, surveyed 1903). There are some weakly magnetic curvilinear anomalies which suggests potential enclosing elements or geology: 46-5 (21m diameter), 46-6 (17m x 22m), and 46-7 (9m diameter), located to the northwest of the church and graveyard.

4.40.2 Resistivity Survey

46-1E represents a change of use on the eastern side of the field, as denoted by a higher resistance response (Figures 116 and 143). The western edge of this is defined by magnetometry anomaly 46-10, a former field boundary.

4.41 GS-47

4.41.1 Magnetometry Survey

The imagery for this site can be seen in Figures 40 and 90 (GS-47 west), Figures 41 and 91 (GS-47 central) and Figures 42 and 92 (GS-47 east). GS-47 lies immediately south of a Windmill WX048-001002-, 78m south of a castle – unclassified WX048-001001, 22m north of WX048-003 holy well, 128m east of WX048-002 church and graveyard and 120m north of WX048-114 enclosure. The western and central portions of the survey area are covered by a general network of boundaries suggesting possible field systems, representing a palimpsest of archaeological deposits. The signal of these deposits varies and becomes weaker further to the east – further archaeological deposits may be located in the eastern part of GS-47, but the magnetic signal fails to contrast sufficiently to identify them. Those features that are visible in the eastern side of GS-47 - 47-55 (possible rectangular enclosure, 26m x 20m) and 47-91 (possible enclosure, 43m diameter) - are very weakly contrasting compared to the archaeological deposits found in the western side of GS-47. To the north of 47-91 is a very weak and incoherent oval-shaped trend that again could be an archaeological feature or a geological feature. 47-57 and 47-59 correlate to buildings and associated structures depicted on the first edition OS six-inch, sheet 48 (surveyed 1839).

Across the western side, the following archaeological sites were clearly and coherently identified:

- 47-12, ring-ditch, 10m diameter, incomplete or C-shaped.
- 47-13, ring-ditch, 8m diameter
- 47-17, ring-ditch, 12m diameter penannular, entrance to south-east, with a possible pit, 47-18, at its centre
- 47-24 and 47-25, enclosure, 23m diameter, enclosing a central ring-ditch 47-31 and 47-32
- 47-93, rectangular enclosure beneath pylon interference, 24m x 33m
- 47-94, a spread of ferrous responses - potential for buried ferrous remains (including possible grave goods/markers) or isolated metal spreads

Two weakly magnetic anomalies may represent ditches or geology: 47-48 (41m x 28m oval shaped), and 47-88 (21m x 14m oval shaped).

4.41.2 Resistivity Survey

The imagery for this site can be seen in Figures 117 and 144 (GS-47 west), Figures 118 and 145 (GS-47 central) and Figures 119 and 146 (GS-47 east). A small number of ditches were identified in the data which also match the location of anomalies identified in the magnetometry data. These generally

reflect the overprint of field system ditches, and might indicate that they survive at depth rather than within the top 0.5m suggested by the bulk magnetic signal.

4.42 GS-48

4.42.1 Magnetometry Survey

The imagery for this site can be seen in Figures 43 and 93 (GS-48 west), and Figures 44 and 94 (GS-48 east). GS-48 contains enclosure WX048-114---- which appears in the magnetometry data as a semi-circular band of weakly magnetic enhancement, potentially indicating a ditch or other boundary feature, 48-34 and 48-33, (126m x 70m).

Beyond the confines of 48-34/48-33, the rest of GS-48 has a general overprint of field systems running across the centre, aligned broadly northeast-southwest. The field systems also intersect 48-32. There are at least two phase of field boundaries evident:

- 48-32 is a 19th/20th century boundary depicted on OS historic mapping (first-edition six-inch, sheet 48, 1839, and the 25-inch, sheet 48, plan 1, 1903).
- Pre-1839, a number of linear anomalies may relate to an earlier period: 48-39, 48-52, 48-56, 48-57, 48-58, 48-59, 48-60, 48-61, 48-63, 48-64, 48-71 and 48-72.

Within and around the potential ditch of 48-34/48-33, are a large number of clear and coherent archaeological features, mostly enclosures that largely appear to be conjoined or intersect each other. These have been sub-divided into geographical groups for sake of clear narration:

- In the Southern Group, there are two lines of features:
 - Eastern line-
 - 48-5 penannular oval, 25m x 21m
 - 48-6 annular circular, 14m diameter
 - 48-3 arcuate, 14m length, appears to enclose features, conjoined to south side of 48-1
 - 48-1, 11m diameter, two penannular circles, superimposed of similar form & scale
 - 48-82 penannular/C-shaped oval ring-ditch, 8m diameter, conjoined to south-east side of 48-81,
 - 48-81 penannular (possibly) sub-circular, 12m x 9m
 - Western line-

- 48-80 circular (truncated by N25), ring-ditch, 18m diameter, with internal isolated features
 - 48-7/48-8 possible oval, 20m x 13m, intersects with north side of 48-80
 - 48-79 oval annular, 14m x 11m
 - 48-35 C-shaped area of enhancement, 21m x 19m
 - 48-10, possible burnt timbers / in-situ burning, spread over a 14m x 5m area
- Northern Group:
 - 48-30 possible oval, 23m x 14m
 - 48-68/48-69 possible circular, possible penannular ring-ditch, 20m diameter
 - 48-37 oval penannular, 20m x 14m, intersects with possible entrance to 48-68/48-69,
 - 48-50 circular penannular, ring-ditch, 14m diameter, enclosing a possible pit
 - 48-18 area of enhancement sub-circular penannular, 12m x 9m
 - 48-19 represents a weakly magnetic rectilinear feature that may represent a ditched field boundary, at the northeast corner of the survey area. It measures 22m x 31m.
 - Eastern Group:
 - 48-76 circular penannular, ring-ditch, 15m diameter
 - 48-75 circular penannular, ring-ditch, 12m diameter, enclosed by 48-73 on its northern side. Linear anomalies 48-77 and 48-78 seem to be aligned with the east-facing gap in 48-75 which may indicate elements of an entrance.
 - 48-73 arcuate, 30m length, concentric with 48-75.
 - 48-74, 9m length, to southeast of 48-75, could represent a continuation of 48-73 (its continuation to the west is obscured by the large area of interference)
 - 48-20 U-shaped, 10m x 10m, conjoined to north side of 48-73.

4.42.2 Resistivity Survey

The imagery for this site can be seen in Figures 120 and 147 (GS-48 west), and Figures 121 and 148 (GS-48 east). While many of the anomalies identified in the magnetometry data do not appear in the

resistivity data, the enclosing ditch around enclosure WX048-114----, identified in the magnetometry data as 48-34, has produced a more coherent signal in the resistivity data, as 48-1E, which measures 105m in diameter and continues beyond the survey area to the south, cut presumably by the existing road.

4.43 GS-49

4.43.1 Magnetometry Survey

Survey area GS-49 contains parallel linear anomalies, 49-1 and 49-2, measuring 100m and 149m respectively (Figures 45 and 95). These anomalies suggest the presence of features such as ditches, walls, or potential pre-OS first-edition six-inch survey (1839) field systems. Additionally, a geological anomaly is present, part of a wider pattern across GS-49 and GS-50.

4.43.2 Resistivity Survey

GS-49 does not contain any features that may be of an archaeological nature (Figures 122 and 149).

4.44 GS-50

4.44.1 Magnetometry Survey

The imagery for this site can be seen in Figures 45 and 95 (GS-50 west), and Figures 46 and 96 (GS-50 east). GS-50 contains Ringfort – rath WX048-115----, represented by a group of curvilinear anomalies consistent with the expected remains of a ringfort ditch (50-2, 50-3, 50-4), as well as an internal C-shaped area of weakly magnetic enhancement measuring 10m in diameter (50-17), which might represent a ditch or drip gully. The ringfort is 26m in diameter and has a break at the southeast quadrant, suggesting a possible entrance feature.

A 13m circular penannular enclosure (50-1), contains an internal C-shaped area of weakly magnetic enhancement measuring 8m in diameter (50-18), located to the southeast of the ringfort. Linear anomalies 50-15 and 50-24 appear to be aligned with the east-facing gap in 50-1, they may represent elements of an entrance arrangement.

A series of enclosures and ring-ditches can be seen to the east of the ringfort, largely offset from a curvilinear ditch:

- 50-7, C-shaped ditch, possible ringfort/enclosure, 14m radius, containing possible pits
- 50-8, ring-ditch, 10m diameter
- 50-12, ring-ditch, 9m diameter, with a possible small annexe on its south side
- 50-25, C-shaped ditch, 53m radius

Geological anomalies are also present on the western side of the survey area, part of a wider pattern across GS-49 and GS-50.

4.44.2 Resistivity Survey

The imagery for this site can be seen in Figures 122 and 149 (GS-50 west), and Figures 123 and 150 (GS-50 east). Whilst no discrete archaeological features can be discerned, the general area comprised of enclosure and ditches, as mapped by the magnetometry, is occupied by a broad zone of high resistance, 50-1E. This could indicate compaction or the fact that the sites were located on a slight ridge of near surface stone.

4.45 GS-51

GS-51 includes six SMR sites: WX048-116001- (field system), WX048-116002- (ring-ditch), WX048-116003- (enclosure), WX048-116004- (enclosure), WX048-116005- (enclosure) and WX048-116006- (ring-ditch).

4.45.1 Magnetometry Survey

The imagery for this site can be seen in Figures 161 and 164 (GS-51 west), and Figures 162 and 165 (GS-51 east). The magnetometry survey successfully mapped all six SMR sites, and identified a range of previously unknown archaeological features.

WX048-116001- (field system), was mapped as 51-11, 51-13, 51-14, 51-16, 51-17, 51-19, 51-20, 51-21, 51-22, 51-23, 51-24, 51-30, 51-31, and 51-42, an extensive field system measuring 270m x 225m, with several sub-divisions. None of the field system elements are depicted on the historic OS mapping. It is probable that the identified anomalies represent a number of different phases of enclosure. The magnetometry anomalies are represented by three large sub-rectangular fields:

Field 1 (defined by anomaly 51-30), approx. 0.75 ha

Field 2 (defined by anomalies 51-11, 51-12, 51-21, 51-22, 51-23 and 51-24), approx. 0.9 ha

Field 3 (defined by anomalies 51-11, 51-12, 51-17, 51-19, 51-20 and 51-24), approx. 0.9 ha.

Access between Field 1 & Field 3 is through a gap (< 2 m wide) in the northwest corner of Field 3. Access between Field 2 and Field 3 is through a gap (< 2 m wide) in the southeast corner of Field 2. Field 2 may be accessed from the west, through the gap between the south end of 51-22 and 51-18. These fields appear to be associated with a series of smaller fields/paddocks on their periphery (listed clockwise from the northeast):

- 51-34/51-52/51-53

- 51-25 represents enclosure WX048-116005-
- 51-26 represents enclosure WX048-116004-
- 51-49

Enclosure 51-04 straddles the boundary between Fields 2 & 3, it is accessed from Field 3.

Enclosure 51-10 straddles the boundary of Field 1 in its south-west corner, this may be accessed from outside Field 1, however, as a number of linear anomalies converge in this area it is difficult to be definitive.

Field 1 contains a single curvilinear enclosure: 51-36.

Field 2 contains five curvilinear enclosures: 51-06, 51-03, 51-39 (and 51-40), 51-01 and 51-02 (and 51-46).

Field 3 contains three curvilinear enclosures 51-05, 51-07 and 51-08, it also contains arcuate anomaly 51-45 which is comparable in scale to 51-05, 51-01 and 51-46 and may be part of a fourth enclosure.

An area of magnetic enhancement (51-50) correlates with a pond depicted on the first-edition six-inch OS map surveyed in 1839.

WX048-116002- (ring-ditch) was mapped as 51-04, a 20m diameter ring-ditch with a gap at the northeast quadrant.

WX048-116003- (enclosure) was mapped as 51-02, a 32m by 22m sub-circular enclosure which surrounds 51-46, a circular 13m diameter ring-ditch, with a gap at the northwest quadrant, containing internal pits.

WX048-116004- (enclosure) was mapped as 51-26, an elongated 'c-shaped' anomaly, measuring 47m by 30m, running east-west, with no discernible return on the southern side.

WX048-116005- (enclosure) was mapped as 51-25, an elongated 'c-shaped' anomaly, measuring 33m by 13m, running east-west, with no discernible return on the southern side. It encloses 51-48, a 9m by 13m sub-rectangular 'u-shaped' feature.

It is unclear what WX048-116006- (ring-ditch) may reflect in the geophysical data. It is recorded in the SMR as the faint cropmark of a subcircular enclosure (15m x 12m) defined by a single feature visible on aerial photographs, with an opening at the northeast. There are no magnetometry anomalies located at its exact location. Regardless of this, four probable candidates are located in the nearby vicinity: 51-04, a 20m diameter ring-ditch (containing internal pits), with a gap at the northeast quadrant, located 30m west of the SMR (although this is almost certainly WX048-116002-, see above);

51-05, a 12m diameter ring-ditch, with a gap at the northeast quadrant, located 37m north-northwest of the SMR; 51-07, a 9m diameter ring-ditch, located 30m southwest of the SMR; 51-08, a 9m diameter ring-ditch, with a gap at the east side, located 23m south-southwest of the SMR. A fifth possible candidate has a less coherent signal, 51-56, is a 51m length 'c-shaped' anomaly, is located 12m east of the SMR.

In addition to the SMR sites, multiple ring-ditch features were also identified at GS-51: 51-01, a 13m diameter ring-ditch (containing internal pits), with a gap at the northeast quadrant; 51-03, a 11m diameter ring-ditch (containing internal pits), with a gap at the east side, which in turn is adjacent to 51-39, a 25m diameter ring-ditch, with a gap at the northeast quadrant, which in turn encloses 51-40, a 9m diameter ring-ditch, with a gap at the north-northeast; 51-05, a 12m diameter C-shaped ditch (containing internal pits), with a gap at the northeast quadrant; 51-07, a 9m diameter ring-ditch; 51-08, a 9m diameter ring-ditch, with a gap at the east side ; 51-10, 8m diameter; 51-06, a 14m diameter ring-ditch, with a gap at the east side; 51-07, a 9m diameter ring-ditch; 51-41, a 8m diameter ring-ditch, with a gap at the east side; 51-08, a 9m diameter ring-ditch, with a gap at the east side; and 51-63, a 12m diameter ring-ditch, with a gap at the west side. There are also multiple small pits spread between many of these features, particularly across a broadly triangular shaped area between 51-04, 51-05 and 51-56, an area in which the cropmark ring-ditch (WX048-116006-) is located, to the west of 51-56.

In addition to the anomalies discussed above, there are several weakly magnetic anomalies that may represent archaeology or geology.

- 51-36, a C-shaped anomaly, 6m diameter.
- 51-35, a U-shaped anomaly, 7m x 6m.
- 51-09, a U-shaped anomaly, 11m x 8m.
- 51-45, a semi-circular anomaly, 11m x 7m.
- An Area of Magnetic Enhancement located partly within and south of 51-39, which may represent geology, soil noise or occupational enhancement.

4.45.2 Resistivity Survey

The imagery for this site can be seen in Figures 167 and 170 (GS-51 west), and Figures 168 and 171 (GS-51 east). The data are not as clear as the magnetometry, however an important anomaly is 51-8E, a natural change in responses that may reflect a palaeochannel. This wetter band defines the western extent of the archaeological features identified in the magnetometry and may reflect a natural

boundary feature that delimited the extent of the monuments across GS-51, effectively ‘enclosing’ or ‘containing’ them to the east of 51-8E.

4.46 GS-52

4.46.1 Magnetometry Survey

The imagery for this site can be seen in Figures 47 and 97 (GS-52 west), and Figures 48 and 98 (GS-52 east). Survey area GS-52 features a historical east-west field boundary, several geological anomalies southeast of the survey area, and a potentially significant large enclosure, 52-2, at its centre. Anomaly 52-2 is a very weakly contrasting sub-circular positive anomaly spanning approximately 67m in diameter, potentially representing a ditch or enclosing element, or a geological feature.

4.46.2 Resistivity Survey

The imagery for this site can be seen in Figures 124 and 151 (GS-52 west), and Figures 125 and 152 (GS-52 east). A weakly contrasting anomaly of high resistance has been mapped as 52-1E. It corresponds mostly to the location of magnetometry anomaly 52-2 (the southwest quadrant of the magnetometry anomaly cannot be seen in the resistivity data), adding further support to its interpretation as a large and significant enclosure.

4.47 GS-53

4.47.1 Magnetometry Survey

The imagery for this site can be seen in Figures 49 and 99 (GS-53 west), and Figures 50 and 100 (GS-53 east). Survey area GS-53 contains a significant archaeological remains associated with a Church ‘in ruins’ (WX048-006001-) and graveyard (WX048-006006-). The church and graveyard are contained within a sub-rectangular walled enclosure on the north side of a tillage field that slopes to the south and west, bounded by a stream to the west and a road to the east.

Concentric enclosures

There is evidence of a number of concentric anomalies surrounding the church and graveyard evident in the magnetometer data:

- Inner enclosure
 - 53-21 and 53-49, estimated diameter 68m (internal).
- Middle enclosure
 - 53-1 and 53-2, estimated diameter 85m (internal), though the internal distance from the north end of 53-1 and the SE extremity of 53-2 is approximately 110m.

- Two parallel north-south oriented anomalies 53-2 (east side) and 53-40 approximately 2-3m apart, may represent an entrance into the middle enclosure.
- The northeast end of 53-20 is outside and concentric with a curvilinear field boundary depicted on the first-edition six--inch OS map (surveyed 1839) and the 25-inch map (surveyed 1903). This may represent a section of the middle enclosure to the east of the church and graveyard.
- Outer enclosure
 - 53-11 and the southwest end of 53-20, the south ends of 53-6 and 53-29/53-28, and a number of curvilinear trends in the data may represent an outer enclosure. This would have an internal diameter of approximately 180m.

Internal features

- Inner enclosure
 - None identified as it is largely occupied by the existing graveyard.
- Middle enclosure
 - 53-3 a semi-circular enclosure (approximately 26m diameter) appears to adjoin the outer edge of the Inner enclosure. 53-8 may represent a sub-rectangular enclosure (approximately 30m by 25m) immediately east of 53-3. 53-4 is a sub-circular enclosure (approximately 21m diameter) east of the inner enclosure (53-49).
- Outer enclosure
 - 53-30 is a U-shaped weakly magnetic anomaly (approximately 18m by 17m), that may represent a ditch or geology.
 - A number of linear anomalies such as 53-12, 53-13, 53-29, 53-28 may represent subdivisions of the outer enclosure.

Industrial activity

A number of anomalies located within the middle enclosure south of 53-4 are interpreted as 'Industrial'. These could represent any form of in-situ industrial burning events, including kilns or furnaces.

19th century settlement

A number of structures grouped around a yard are depicted on the first edition six-inch OS map (surveyed 1839) in the northeast corner of the survey area. A number of strong magnetic anomalies

in this area may be related to this settlement activity, potentially indicating the remains of in-situ burning.

Beyond the main enclosure, the contrasts become weaker and it is possible that archaeological deposits continue to the southwest with no magnetic contrast. Magnetic trends and areas of weak magnetic enhancement could hint towards this scenario. To the southeast, a series of field systems were also identified. A series of east-west oriented linear anomalies seem to divide this area into three plots (between 25m and 32m wide) whose long axis are perpendicular to the adjoining road. One plot contains a rectangular anomaly (53-18).

It is possible that the structures depicted on the first edition six-inch OS map at the northeast corner of the survey area is a remnant of what was once a more extensive roadside settlement.

4.47.2 Resistivity Survey

The imagery for this site can be seen in Figures 126 and 153 (GS-53 west), and Figures 127 and 154 (GS-53 east). The discrete anomalies seen in the magnetometry data are not visible in the resistivity data. However, broad zones are identified, which appear to delineate soil moisture, and by inference, possible area-use. A broad high resistance zone 53-1E with a clearly defined edge, corresponds with the main area of activity associated with the enclosures surrounding the church and graveyard. The assessment of 53-1E is based on the nature of the contrast in the data at its boundary and not just its appearance on the plot presented in Figures 126 and 127.

In addition, an oval-shaped area of low resistance, 53-2E, which effectively cuts into the high resistance zone, could indicate another enclosure or differing land use.

4.48 GS-58

4.48.1 Magnetometry Survey

In survey area GS-58, several linear anomalies suggestive of pre-OS field boundaries are observed, along with a faint oval-shaped anomaly (58-5) possibly indicating an enclosing element amidst the linear features (58-1 and 58-2) (Figures 51 and 101). Additionally, a large strongly magnetic anomaly identified as a possible geological anomaly is situated at the centre of the survey area. The linear anomalies (58-1 to 58-6) exhibit positive characteristics typical of ditches with stoney infills or components of pre-OS field systems. Notably, anomaly 58-5 presents as a sub-circular positive anomaly, measuring 17m x 11m, suggesting a potential ditch or wall associated with an enclosing element.

4.48.2 Resistivity Survey

GS-58 does not contain any features that may be of an archaeological nature (Figures 128 and 155).

4.49 GS-59

4.49.1 Magnetometry Survey

There are a wide variety of anomalies in GS-59, all of which are identified as areas of magnetic enhancement (Figures 52 and 102). These could represent either a geological trend or an archaeological source. The exceptions to this are strongly magnetic irregular shaped anomalies 59-9 (13m x 11m) and 59-10 (12m x 8m) which are more suggestive of areas of burning.

4.49.2 Resistivity Survey

Three possible ditches, none of which were identified in the magnetometry data, were mapped as 59-1E through to 59-3E (Figures 129 and 156). The northern part of 59-3E appears to define the southwest boundary of 59-4E, a broad area of low resistance responses indicating high moisture.

4.50 GS-60

4.50.1 Magnetometry Survey

Similar to GS-59, There are a wide variety of anomalies in GS-60, which could represent either a geological trend or an archaeological source (Figures 53 and 103). The magnetic signals are more coherent in GS-60 than they are in GS-59, and these have been interpreted as possible archaeological features, representing potential ditches.

4.50.2 Resistivity Survey

A natural area of near surface stone was identified as 60-1E, this may be considered to have archaeological potential as it is as an area of dry land in an otherwise poorly drained area (Figures 130 and 157).

4.51 GS-61

4.51.1 Magnetometry Survey

No significant archaeological anomalies were identified in GS-61 (Figures 54 and 104).

4.51.2 Resistivity Survey

No significant archaeological anomalies were identified in GS-61 (Figures 131 and 158).

4.52 GS-62

4.52.1 Magnetometry Survey

The imagery for this site can be seen in Figures 55 and 105 (GS-62 west), and Figures 56 and 106 (GS-62 east). GS-62 is dominated by natural geological anomalies running across the site in a broad northeast-southwest alignment. Irregularly shaped highly magnetic anomalies (62-4, 62-5 and 62-6) indicate potential areas of burning.

Historic field boundaries (62-1 and 62-7) are also present across the survey area. This field system is depicted on both the first edition six-inch (1839) and the 25-inch (1903) OS maps.

Two weakly magnetic anomalies may represent possible archaeology in the form of ditches, or possible geology. 62-8 is a 71m long east-west aligned anomaly with an 11m long hook aligned north-south at the west end. 62-9 is a C-shaped anomaly measuring 11m x 8m.

4.52.2 Resistivity Survey

The imagery for this site can be seen in Figures 132 and 159 (GS-62 west), and Figures 133 and 160 (GS-62 east). A winding curvilinear band of high resistance, 62-1E may represent stony deposits within a palaeochannel, leading down to the sea, immediately to the north of the survey area. A small area of high resistance in the southwest corner, 62-3E, corresponds with the location of magnetometry anomalies 62-4, 62-5 and 62-6 and might represent a mound of stones associated with these areas of burning.

An alignment of metal points, aligned northwest-southeast, mapped as high-contrast isolated responses, spaced at a regular 20m apart and spread across a distance of 140m. These are anomalies of unknown provenance/origin, and are probably modern.

62-4E represents a field system mapped on the historical OS.

4.53 GS-63

4.53.1 Magnetometry Survey

GS-63 is a very small survey area and could be easily over-interpreted. Two faintly contrasting elements can be seen, however they may be geological anomalies rather than archaeological features (Figures 56 and 106).

4.53.2 Resistivity Survey

No significant archaeological anomalies were identified in GS-63 (Figures 133 and 160).

Table 6. N11/N25 Oilgate to Rosslare Harbour Scheme: Magnetometry Interpretation

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-1	01-01	? Archaeology	699284, 633652
GS-1	01-02	? Archaeology	699318, 633666
GS-1	01-03	Area of Enhancement	699302, 633702
GS-1	01-04	? Archaeology	699328, 633682
GS-1	01-05	? Archaeology	700596, 631703
GS-1	01-05	? Archaeology	700590, 631698
GS-1	01-05	Field Boundary	700602, 631840
GS-1	01-05	? Archaeology	700645, 631851
GS-2	02-01	? Archaeology	699285, 633548
GS-2	02-02	? Archaeology	699335, 633569
GS-2	02-03	? Archaeology	699311, 633581
GS-2	02-03	Field Boundary	699332, 633519
GS-2	02-04	? Archaeology	699292, 633585
GS-2	02-05	? Archaeology	699283, 633572
GS-3	03-01	Area of Enhancement	699231, 633522
GS-3	03-01	? Archaeology	699231, 633526
GS-3	03-07	Area of Enhancement	699235, 633491
GS-4	04-01	Field Boundary	699950, 632364
GS-4	04-02	? Archaeology	700069, 632369
GS-4	04-03	? Archaeology	699850, 632388
GS-4	04-04	? Archaeology	700092, 632398
GS-4	04-05	? Archaeology	700011, 632364
GS-4	04-06	? Archaeology	699983, 632353
GS-4	04-07	? Archaeology	700022, 632371
GS-5	05-01	? Archaeology	700641, 631748
GS-5	05-02	? Archaeology	700580, 631724
GS-5	05-03	? Archaeology	700586, 631722
GS-5	05-04	? Archaeology	700586, 631727
GS-5	05-05	? Archaeology	700554, 631713
GS-5	05-06	? Archaeology	700513, 631736
GS-5	05-07	? Archaeology	700509, 631740
GS-5	05-08	? Archaeology	700631, 631731
GS-5	05-09	? Archaeology	700579, 631697
GS-5	05-10	? Archaeology	700537, 631769
GS-5	05-11	? Archaeology	700541, 631755
GS-5	05-12	? Archaeology	700550, 631793
GS-6	06-01	? Archaeology	700639, 631478

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-6	06-02	? Archaeology	700657, 631493
GS-6	06-03	? Archaeology	700668, 631481
GS-6	06-04	Area of Enhancement	700645, 631436
GS-6	06-05	? Archaeology	700649, 631447
GS-6	06-06	? Archaeology	700645, 631435
GS-6	06-07	? Archaeology	700673, 631475
GS-6	06-08	Area of Enhancement	700720, 631546
GS-7	07-01	? Archaeology	700628, 630003
GS-7	07-02	Archaeology	700632, 629935
GS-7	07-03	Archaeology	700637, 629919
GS-7	07-04	? Archaeology	700621, 629958
GS-7	07-05	Archaeology	700622, 629915
GS-7	07-06	? Archaeology	700615, 629933
GS-7	07-07	? Archaeology	700604, 629924
GS-7	07-08	? Archaeology	700707, 629944
GS-7	07-09	? Archaeology	700709, 629936
GS-7	07-10	? Archaeology	700703, 629940
GS-7	07-11	? Archaeology	700597, 629916
GS-7	07-12	? Archaeology	700592, 629916
GS-8	08-01	? Archaeology	700689, 629892
GS-8	08-03	Area of Enhancement	700691, 629882
GS-8	08-04	Area of Enhancement	700681, 629885
GS-10	10-01	? Archaeology	700577, 629196
GS-10	10-02	Archaeology	700580, 629078
GS-10	10-03	Field Boundary	700586, 629176
GS-10	10-04	Field Boundary	700587, 629054
GS-10	10-05	Field Boundary	700612, 629100
GS-10	10-06	Field Boundary	700582, 629014
GS-13	13-01	Archaeology	700970, 627786
GS-13	13-02	Field Boundary	700872, 627762
GS-13	13-03	Field Boundary	700866, 627663
GS-13	13-04	Field Boundary	700905, 627747
GS-13	13-05	Field Boundary	700801, 627810
GS-13	13-06	Archaeology	700802, 627757
GS-13	13-07	Archaeology	700812, 627740
GS-13	13-08	? Archaeology	700845, 627754
GS-13	13-09	? Archaeology	700802, 627788
GS-13	13-10	Area of Enhancement	700847, 627624

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-13	13-11	? Archaeology	700938, 627759
GS-13	13-12	? Archaeology	700808, 627701
GS-13	13-13	Field Boundary	700909, 627666
GS-13	13-14	Area of Enhancement	700895, 627726
GS-13	13-15	? Archaeology	701012, 627768
GS-14	14-01	Area of Enhancement	700893, 626554
GS-14	14-02	? Archaeology	700861, 626569
GS-14	14-03	? Archaeology	700904, 626536
GS-14	14-04	? Archaeology	700868, 626548
GS-14	14-05	? Archaeology	700894, 626535
GS-14	14-06	? Archaeology	700914, 626612
GS-14	14-07	? Archaeology	700917, 626607
GS-14	14-08	? Archaeology	700912, 626627
GS-14	14-09	? Archaeology	700896, 626575
GS-14	14-10	? Archaeology	700850, 626476
GS-14	14-11	? Archaeology	700882, 626525
GS-14	14-12	? Archaeology	700914, 626597
GS-14	14-13	? Archaeology	700884, 626718
GS-14	14-14	? Archaeology	700901, 626738
GS-14	14-15	? Archaeology	700902, 626721
GS-14	14-16	? Archaeology	700910, 626747
GS-14	14-17	? Archaeology	700900, 626757
GS-14	14-18	Area of Enhancement	700928, 626557
GS-15	15-01	? Archaeology	701010, 626700
GS-15	15-02	? Archaeology	701010, 626716
GS-15	15-03	? Archaeology	701000, 626709
GS-15	15-04	? Archaeology	701007, 626704
GS-15	15-05	? Archaeology	701005, 626746
GS-15	15-06	? Archaeology	701013, 626733
GS-15	15-07	? Archaeology	701005, 626722
GS-16	16-01	? Archaeology	700981, 626683
GS-16	16-02	? Archaeology	700989, 626687
GS-16	16-03	? Archaeology	700978, 626676
GS-16	16-04	? Archaeology	700983, 626679
GS-17	17-01	Field Boundary	700803, 626230
GS-17	17-02	Field Boundary	700825, 626254
GS-17	17-03	Field Boundary	700829, 626288
GS-17	17-04	? Archaeology	700847, 626253

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-17	17-05	Area of Enhancement	700824, 626397
GS-17	17-06	Area of Enhancement	700833, 626393
GS-17	17-07	Area of Enhancement	700810, 626261
GS-18	18-01	? Archaeology	700975, 626509
GS-18	18-02	Area of Enhancement	700923, 626484
GS-18	18-03	Field Boundary	700922, 626377
GS-18	18-04	Field Boundary	700928, 626410
GS-20	20-01	? Archaeology	700855, 625983
GS-20	20-02	Area of Enhancement	700896, 625935
GS-20	20-03	? Archaeology	700906, 626152
GS-20	20-04	Archaeology	700890, 626040
GS-20	20-05	? Archaeology	700887, 626014
GS-20	20-06	? Archaeology	700937, 626073
GS-20	20-07	Field Boundary	700869, 625972
GS-20	20-08	Field Boundary	700877, 625884
GS-20	20-09	? Archaeology	700888, 625961
GS-20	20-10	? Archaeology	700909, 625866
GS-20	20-11	? Archaeology	700926, 625867
GS-20	20-12	? Archaeology	700928, 625863
GS-20	20-13	? Archaeology	700932, 625817
GS-20	20-14	? Archaeology	700935, 625805
GS-20	20-15	? Archaeology	700840, 625892
GS-20	20-16	Area of Enhancement	700904, 625911
GS-20	20-17	? Archaeology	700855, 626033
GS-20	20-18	? Archaeology	700857, 626036
GS-20	20-19	Area of Enhancement	700843, 626039
GS-20	20-20	? Archaeology	700876, 625986
GS-20	20-21	Area of Enhancement	700895, 626003
GS-20	20-22	Area of Enhancement	700881, 625998
GS-20	20-23	? Archaeology	700887, 625960
GS-20	20-24	Field Boundary	700952, 626059
GS-20	20-25	Area of Enhancement	700827, 626029
GS-20	20-26	Natural	700860, 626072
GS-20	20-27	? Archaeology	700864, 625839
GS-20	20-28	? Archaeology	700877, 625824
GS-20	20-29	Area of Enhancement	700889, 625832
GS-20	20-30	? Archaeology	700873, 625844
GS-20	20-31	? Archaeology	700874, 625847

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GS-20	20-32	? Archaeology	700876, 625841
GS-20	20-33	? Archaeology	700892, 625812
GS-20	20-34	? Archaeology	700970, 625795
GS-20	20-35	Area of Enhancement	700875, 626110
GS-20	20-36	? Archaeology	700853, 625853
GS-20	20-37	? Archaeology	700849, 626164
GS-21	21-01	? Archaeology	700964, 625716
GS-21	21-02	Field Boundary	700972, 625719
GS-21	21-03	? Archaeology	700913, 625636
GS-21	21-04	Area of Enhancement	700872, 625719
GS-21	21-05	? Archaeology	700870, 625723
GS-21	21-06	? Archaeology	700870, 625716
GS-21	21-07	? Archaeology	700875, 625714
GS-21	21-08	Area of Enhancement	700916, 625684
GS-21	21-09	Area of Enhancement	700912, 625690
GS-23	23-01	? Archaeology	700759, 623876
GS-23	23-02	? Archaeology	700734, 623919
GS-23	23-03	? Archaeology	700749, 623930
GS-23	23-04	? Archaeology	700730, 623849
GS-23	23-05	? Archaeology	700732, 623851
GS-23	23-06	? Archaeology	700700, 624002
GS-23	23-07	? Archaeology	700692, 623933
GS-24	24-01	Field Boundary	700633, 623929
GS-24	24-02	? Archaeology	700594, 623850
GS-25	25-01	Field Boundary	700571, 623751
GS-25	25-02	? Archaeology	700574, 623645
GS-27	27-01	? Archaeology	700461, 622833
GS-27	27-02	Area of Enhancement	700452, 622849
GS-27	27-03	? Archaeology	700510, 622827
GS-27	27-04	Area of Enhancement	700468, 622814
GS-27	27-05	Area of Enhancement	700504, 622786
GS-27	27-06	? Archaeology	700507, 622804
GS-27	27-07	? Archaeology	700489, 622809
GS-28	28-01	Area of Enhancement	700426, 622785
GS-28	28-02	Area of Enhancement	700431, 622744
GS-28	28-03	Area of Enhancement	700446, 622767
GS-28	28-04	? Archaeology	700440, 622766
GS-28	28-05	? Archaeology	700449, 622767

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GS-28	28-06	Area of Enhancement	700504, 622709
GS-28	28-07	? Archaeology	700462, 622755
GS-28	28-08	? Archaeology	700502, 622733
GS-30	30-01	? Archaeology	701127, 621788
GS-30	30-03	Area of Enhancement	701093, 621797
GS-30	30-04	? Archaeology	701099, 621923
GS-30	30-05	? Archaeology	701105, 621912
GS-30	30-06	? Archaeology	701112, 621931
GS-30	30-2	? Archaeology	701135, 621786
GS-31	31-01	Area of Enhancement	702002, 620050
GS-32	32-2	? Archaeology	702106, 620009
GS-32	32-3	? Archaeology	702145, 619996
GS-33	33-1	? Archaeology	702314, 620110
GS-33	33-2	Area of Enhancement	702281, 620093
GS-33	33-3	? Archaeology	702300, 620046
GS-33	33-4	? Archaeology	702329, 620058
GS-33	33-5	Area of Enhancement	702229, 620077
GS-34	34-1	Area of Enhancement	702371, 620166
GS-35	35-1	Area of Enhancement	704049, 618202
GS-35	35-2	Field Boundary	704045, 618164
GS-35	35-3	Field Boundary	704057, 618208
GS-35	35-4	Area of Enhancement	704061, 618244
GS-36	36-1	Field Boundary	704502, 617880
GS-36	36-10	Field Boundary	704652, 617913
GS-36	36-11	Field Boundary	704506, 617802
GS-36	36-12	Archaeology	704463, 617874
GS-36	36-13	Archaeology	704482, 617914
GS-36	36-14	Archaeology	704540, 617913
GS-36	36-15	Archaeology	704601, 617910
GS-36	36-16	? Archaeology	704606, 617913
GS-36	36-17	Archaeology	704499, 617942
GS-36	36-18	? Archaeology	704495, 617943
GS-36	36-19	Archaeology	704518, 617877
GS-36	36-2	Field Boundary	704576, 617857
GS-36	36-20	? Archaeology	704538, 617804
GS-36	36-21	? Archaeology	704568, 617813
GS-36	36-22	? Archaeology	704480, 617834
GS-36	36-23	? Archaeology	704448, 617856

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GS-36	36-3	Field Boundary	704610, 617808
GS-36	36-4	Field Boundary	704700, 617836
GS-36	36-5	Field Boundary	704716, 617889
GS-36	36-6	Field Boundary	704479, 617925
GS-36	36-7	Field Boundary	704554, 617944
GS-36	36-8	Field Boundary	704795, 617861
GS-36	36-9	Field Boundary	704769, 617879
GS-37	37-1	Archaeology	705083, 616878
GS-37	37-10	Archaeology	705145, 616896
GS-37	37-11	Archaeology	705114, 616870
GS-37	37-12	Archaeology	705062, 616890
GS-37	37-13	Archaeology	705137, 616798
GS-37	37-14	? Archaeology	705202, 616839
GS-37	37-15	? Archaeology	705199, 616840
GS-37	37-16	? Archaeology	705223, 616837
GS-37	37-17	? Archaeology	705221, 616872
GS-37	37-18	Archaeology	705152, 616834
GS-37	37-19	Archaeology	705147, 616881
GS-37	37-2	Archaeology	705090, 616886
GS-37	37-20	Archaeology	704998, 616906
GS-37	37-21	Archaeology	704991, 616902
GS-37	37-22	Archaeology	704989, 616881
GS-37	37-23	Archaeology	704996, 616883
GS-37	37-24	Area of Enhancement	705232, 616779
GS-37	37-25	? Archaeology	705180, 616816
GS-37	37-26	Area of Enhancement	705011, 616936
GS-37	37-27	? Archaeology	705156, 616815
GS-37	37-28	Area of Enhancement	705110, 616810
GS-37	37-29	? Archaeology	705160, 616802
GS-37	37-3	Archaeology	705156, 616794
GS-37	37-30	? Archaeology	705059, 616829
GS-37	37-31	? Archaeology	705065, 616833
GS-37	37-32	? Archaeology	705047, 616822
GS-37	37-33	Area of Enhancement	705108, 616831
GS-37	37-34	Area of Enhancement	705117, 616840
GS-37	37-35	? Archaeology	704981, 616978
GS-37	37-36	? Archaeology	705006, 616871
GS-37	37-37	? Archaeology	705024, 617005

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GS-37	37-38	? Archaeology	705041, 616927
GS-37	37-38	? Archaeology	705081, 616819
GS-37	37-39	? Archaeology	705054, 616966
GS-37	37-4	Archaeology	704970, 616912
GS-37	37-40	Area of Enhancement	704969, 616867
GS-37	37-41	Area of Enhancement	705016, 616838
GS-37	37-5	Archaeology	705061, 616923
GS-37	37-6	Archaeology	705014, 616874
GS-37	37-7	Archaeology	705107, 616843
GS-37	37-8	Archaeology	705139, 616859
GS-37	37-9	Archaeology	705137, 616887
GS-38	38-1	Archaeology	705149, 616757
GS-38	38-10	? Archaeology	705143, 616589
GS-38	38-11	? Archaeology	705126, 616516
GS-38	38-12	? Archaeology	705139, 616528
GS-38	38-13	Area of Enhancement	705122, 616541
GS-38	38-14	? Archaeology	705149, 616529
GS-38	38-15	? Archaeology	705207, 616694
GS-38	38-16	? Archaeology	705226, 616715
GS-38	38-17	Area of Enhancement	705145, 616527
GS-38	38-18	? Archaeology	705180, 616612
GS-38	38-19	? Archaeology	705134, 616615
GS-38	38-2	Archaeology	705025, 616725
GS-38	38-20	? Archaeology	705157, 616608
GS-38	38-21	? Archaeology	705172, 616604
GS-38	38-22	Archaeology	705146, 616726
GS-38	38-23	? Archaeology	705024, 616720
GS-38	38-24	Area of Enhancement	705103, 616742
GS-38	38-25	Archaeology	704979, 616789
GS-38	38-26	Area of Enhancement	705159, 616759
GS-38	38-3	? Archaeology	705025, 616673
GS-38	38-4	? Archaeology	705028, 616667
GS-38	38-5	Archaeology	705113, 616675
GS-38	38-6	? Archaeology	705086, 616752
GS-38	38-7	? Archaeology	705169, 616732
GS-38	38-8	Area of Enhancement	705118, 616616
GS-38	38-9	? Archaeology	705133, 616560
GS-39	39-1	? Archaeology	705065, 614720

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GS-39	39-10	Area of Enhancement	705072, 614716
GS-39	39-11	Field Boundary	705166, 614724
GS-39	39-12	Field Boundary	705128, 614732
GS-39	39-13	? Archaeology	705119, 614729
GS-39	39-14	? Archaeology	705146, 614669
GS-39	39-15	? Archaeology	705135, 614669
GS-39	39-16	? Archaeology	705122, 614697
GS-39	39-17	Area of Enhancement	705171, 614718
GS-39	39-18	Area of Enhancement	705159, 614691
GS-39	39-2	? Archaeology	705120, 614724
GS-39	39-3	Area of Enhancement	705162, 614694
GS-39	39-4	? Archaeology	705105, 614726
GS-39	39-5	? Archaeology	705100, 614724
GS-39	39-6	Area of Enhancement	705052, 614715
GS-39	39-7	? Archaeology	705197, 614642
GS-39	39-8	Area of Enhancement	705198, 614651
GS-39	39-9	? Archaeology	705174, 614644
GS-40	40-1	Archaeology	705274, 614727
GS-40	40-10	Area of Enhancement	705307, 614711
GS-40	40-2	? Archaeology	705261, 614709
GS-40	40-3	? Archaeology	705296, 614696
GS-40	40-4	? Archaeology	705281, 614696
GS-40	40-5	? Archaeology	705281, 614722
GS-40	40-6	Area of Enhancement	705297, 614715
GS-40	40-7	? Archaeology	705268, 614812
GS-40	40-8	Area of Enhancement	705278, 614830
GS-40	40-9	? Archaeology	705327, 614699
GS-41	41-1	Area of Enhancement	705137, 614290
GS-41	41-10	Archaeology	705175, 614317
GS-41	41-11	Archaeology	705146, 614350
GS-41	41-12	Archaeology	705144, 614406
GS-41	41-13	Archaeology	705169, 614413
GS-41	41-14	? Archaeology	705186, 614442
GS-41	41-15	? Archaeology	705156, 614426
GS-41	41-16	Archaeology	705117, 614377
GS-41	41-17	Archaeology	705103, 614356
GS-41	41-18	? Archaeology	705196, 614247
GS-41	41-19	? Archaeology	705221, 614248

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-41	41-2	? Archaeology	705160, 614288
GS-41	41-20	? Archaeology	705137, 614457
GS-41	41-21	? Archaeology	705132, 614409
GS-41	41-22	? Archaeology	705141, 614378
GS-41	41-23	? Archaeology	705156, 614411
GS-41	41-24	Area of Enhancement	705151, 614288
GS-41	41-3	? Archaeology	705177, 614275
GS-41	41-4	Field Boundary	705146, 614238
GS-41	41-5	Field Boundary	705189, 614266
GS-41	41-6	Field Boundary	705139, 614325
GS-41	41-7	? Archaeology	705119, 614297
GS-41	41-8	? Archaeology	705114, 614287
GS-41	41-9	Archaeology	705135, 614332
GS-42	42-1	Field Boundary	705117, 614166
GS-42	42-2	? Archaeology	705160, 614116
GS-42	42-3	Area of Enhancement	705130, 614124
GS-42	42-4	? Archaeology	705123, 614148
GS-42	42-5	Ferrous	705126, 614159
GS-42	42-6	? Archaeology	705136, 614206
GS-42	42-7	? Archaeology	705121, 614164
GS-42	42-8	? Archaeology	705115, 614160
GS-45	45-1	Field Boundary	706630, 613114
GS-45	45-10	? Archaeology	706518, 613202
GS-45	45-11	? Archaeology	706486, 613191
GS-45	45-12	Archaeology	706472, 613144
GS-45	45-13	? Archaeology	706475, 613186
GS-45	45-14	Area of Enhancement	706483, 613213
GS-45	45-15	? Archaeology	706472, 613161
GS-45	45-16	? Archaeology	706506, 613178
GS-45	45-17	? Archaeology	706463, 613136
GS-45	45-18	? Archaeology	706444, 613196
GS-45	45-19	Archaeology	706443, 613078
GS-45	45-2	Archaeology	706613, 613095
GS-45	45-20	? Archaeology	706428, 613155
GS-45	45-21	? Archaeology	706427, 613146
GS-45	45-22	? Archaeology	706385, 613069
GS-45	45-23	? Archaeology	706429, 613221
GS-45	45-24	? Archaeology	706410, 613184

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GS-45	45-25	? Archaeology	706408, 613111
GS-45	45-26	? Archaeology	706413, 613101
GS-45	45-27	? Archaeology	706397, 613083
GS-45	45-28	Area of Enhancement	706394, 613103
GS-45	45-29	Area of Enhancement	706504, 613124
GS-45	45-3	Archaeology	706601, 613113
GS-45	45-30	Area of Enhancement	706648, 613116
GS-45	45-31	? Archaeology	706538, 613169
GS-45	45-32	Area of Enhancement	706537, 613172
GS-45	45-33	? Archaeology	706410, 613157
GS-45	45-34	Area of Enhancement	706504, 613107
GS-45	45-35	Area of Enhancement	706385, 613078
GS-45	45-36	? Archaeology	706539, 613174
GS-45	45-4	? Archaeology	706583, 613141
GS-45	45-5	? Archaeology	706604, 613153
GS-45	45-6	? Archaeology	706588, 613120
GS-45	45-7	? Archaeology	706593, 613120
GS-45	45-8	? Archaeology	706644, 613082
GS-45	45-9	? Archaeology	706508, 613190
GS-46	46-1	? Archaeology	706615, 613262
GS-46	46-10	Field Boundary	706615, 613258
GS-46	46-2	? Archaeology	706598, 613262
GS-46	46-3	? Archaeology	706596, 613269
GS-46	46-4	? Archaeology	706605, 613285
GS-46	46-5	Area of Enhancement	706656, 613268
GS-46	46-6	Area of Enhancement	706650, 613291
GS-46	46-7	? Archaeology	706648, 613293
GS-46	46-8	Field Boundary	706578, 613267
GS-46	46-9	Field Boundary	706634, 613260
GS-47	47-1	Archaeology	706975, 613250
GS-47	47-10	Archaeology	706966, 613155
GS-47	47-11	Archaeology	706973, 613197
GS-47	47-12	Archaeology	706967, 613197
GS-47	47-13	Archaeology	706952, 613166
GS-47	47-14	Archaeology	706942, 613174
GS-47	47-15	Archaeology	706966, 613184
GS-47	47-16	Archaeology	706974, 613134
GS-47	47-17	Archaeology	706889, 613145

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GS-47	47-18	Archaeology	706890, 613146
GS-47	47-19	Archaeology	706889, 613169
GS-47	47-2	Archaeology	706954, 613243
GS-47	47-20	? Archaeology	706927, 613191
GS-47	47-21	? Archaeology	706939, 613172
GS-47	47-22	Archaeology	706994, 613190
GS-47	47-23	Archaeology	706949, 613084
GS-47	47-24	Archaeology	706968, 613073
GS-47	47-25	Archaeology	706973, 613056
GS-47	47-26	Archaeology	706963, 613083
GS-47	47-27	Archaeology	706909, 613124
GS-47	47-28	Archaeology	706974, 613101
GS-47	47-29	Archaeology	706976, 613088
GS-47	47-3	Archaeology	706959, 613241
GS-47	47-30	Archaeology	706915, 613062
GS-47	47-31	Archaeology	706964, 613066
GS-47	47-32	Archaeology	706969, 613063
GS-47	47-33	Archaeology	706875, 613085
GS-47	47-34	Archaeology	706865, 613089
GS-47	47-35	Archaeology	706827, 613102
GS-47	47-36	Archaeology	706783, 613118
GS-47	47-37	Archaeology	706799, 613185
GS-47	47-38	Archaeology	706827, 613185
GS-47	47-39	Archaeology	706829, 613172
GS-47	47-4	Archaeology	706925, 613252
GS-47	47-40	Archaeology	706848, 613202
GS-47	47-41	Archaeology	706888, 613200
GS-47	47-42	Archaeology	707024, 613176
GS-47	47-43	Archaeology	707021, 613202
GS-47	47-44	Archaeology	707048, 613184
GS-47	47-45	Archaeology	707050, 613149
GS-47	47-46	Archaeology	706828, 613255
GS-47	47-47	Archaeology	706826, 613126
GS-47	47-48	Area of Enhancement	707043, 613048
GS-47	47-49	Archaeology	707059, 613056
GS-47	47-5	Archaeology	706922, 613229
GS-47	47-50	Archaeology	707045, 613089
GS-47	47-51	? Archaeology	707089, 613042

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GS-47	47-52	? Archaeology	707084, 613199
GS-47	47-53	? Archaeology	707121, 613225
GS-47	47-54	Area of Enhancement	707127, 613213
GS-47	47-55	? Archaeology	707222, 613162
GS-47	47-56	? Archaeology	706845, 613245
GS-47	47-57	Area of Enhancement	706816, 613242
GS-47	47-58	? Archaeology	706832, 613243
GS-47	47-59	Area of Enhancement	706850, 613271
GS-47	47-6	Archaeology	706913, 613261
GS-47	47-60	? Archaeology	706929, 613267
GS-47	47-61	? Archaeology	706928, 613257
GS-47	47-62	? Archaeology	706895, 613257
GS-47	47-63	Area of Enhancement	706943, 613254
GS-47	47-64	? Archaeology	706952, 613269
GS-47	47-65	? Archaeology	706815, 613183
GS-47	47-66	? Archaeology	706838, 613191
GS-47	47-67	? Archaeology	706815, 613222
GS-47	47-68	? Archaeology	706918, 613066
GS-47	47-69	? Archaeology	706804, 613184
GS-47	47-7	Archaeology	706933, 613168
GS-47	47-70	Area of Enhancement	706845, 613159
GS-47	47-71	? Archaeology	706840, 613147
GS-47	47-72	? Archaeology	706862, 613154
GS-47	47-73	? Archaeology	706793, 613113
GS-47	47-74	? Archaeology	707114, 613175
GS-47	47-75	? Archaeology	707033, 613117
GS-47	47-76	Archaeology	707016, 613195
GS-47	47-77	? Archaeology	706990, 613101
GS-47	47-78	? Archaeology	706838, 613090
GS-47	47-79	? Archaeology	706836, 613116
GS-47	47-8	Archaeology	706944, 613167
GS-47	47-80	? Archaeology	706829, 613094
GS-47	47-81	Area of Enhancement	706834, 613084
GS-47	47-82	? Archaeology	706808, 613143
GS-47	47-83	? Archaeology	706918, 613201
GS-47	47-84	Area of Enhancement	707096, 613089
GS-47	47-85	? Archaeology	707027, 613041
GS-47	47-86	? Archaeology	707031, 613039

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-47	47-87	? Archaeology	707019, 613052
GS-47	47-88	Area of Enhancement	707148, 613107
GS-47	47-89	? Archaeology	706815, 613217
GS-47	47-9	? Archaeology	706906, 613160
GS-47	47-90	? Archaeology	706834, 613216
GS-47	47-91	? Archaeology	707293, 613052
GS-47	47-93	? Archaeology	707088, 613185
GS-47	47-94	Ferrous	706904, 613187
GS-48	48-1	Archaeology	707389, 612875
GS-48	48-10	Archaeology	707346, 612900
GS-48	48-13	Archaeology	707353, 612901
GS-48	48-15	Archaeology	707368, 612930
GS-48	48-16	? Archaeology	707403, 612876
GS-48	48-17	? Archaeology	707511, 612965
GS-48	48-18	Area of Enhancement	707453, 612992
GS-48	48-19	? Archaeology	707590, 612922
GS-48	48-20	? Archaeology	707522, 612882
GS-48	48-21	Area of Enhancement	707453, 612916
GS-48	48-22	? Archaeology	707474, 612931
GS-48	48-23	? Archaeology	707420, 612868
GS-48	48-24	? Archaeology	707486, 612807
GS-48	48-25	? Archaeology	707485, 612818
GS-48	48-26	Area of Enhancement	707479, 612806
GS-48	48-27	? Archaeology	707520, 612802
GS-48	48-28	Area of Enhancement	707556, 612824
GS-48	48-29	Archaeology	707570, 612832
GS-48	48-3	? Archaeology	707386, 612864
GS-48	48-30	? Archaeology	707355, 612939
GS-48	48-31	Area of Enhancement	707430, 612967
GS-48	48-32	Field Boundary	707423, 612928
GS-48	48-33	? Archaeology	707383, 612909
GS-48	48-34	? Archaeology	707312, 612920
GS-48	48-35	Area of Enhancement	707363, 612901
GS-48	48-37	? Archaeology	707413, 612957
GS-48	48-38	Archaeology	707339, 612930
GS-48	48-39	Archaeology	707361, 612885
GS-48	48-45	Archaeology	707428, 612950
GS-48	48-5	? Archaeology	707414, 612846

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-48	48-50	Archaeology	707460, 612961
GS-48	48-52	Archaeology	707444, 612944
GS-48	48-54	Archaeology	707359, 612922
GS-48	48-56	Archaeology	707436, 612903
GS-48	48-57	Archaeology	707454, 612922
GS-48	48-58	Archaeology	707473, 612943
GS-48	48-59	Archaeology	707509, 612976
GS-48	48-6	? Archaeology	707394, 612848
GS-48	48-60	Archaeology	707500, 612988
GS-48	48-61	Archaeology	707511, 612995
GS-48	48-62	Archaeology	707441, 612928
GS-48	48-63	Archaeology	707478, 612869
GS-48	48-64	Archaeology	707515, 612950
GS-48	48-66	Archaeology	707363, 612949
GS-48	48-68	Archaeology	707393, 612963
GS-48	48-69	Archaeology	707394, 612949
GS-48	48-7	Archaeology	707363, 612878
GS-48	48-70	? Archaeology	707426, 612903
GS-48	48-71	? Archaeology	707423, 612863
GS-48	48-72	Archaeology	707473, 612922
GS-48	48-73	Archaeology	707513, 612877
GS-48	48-74	Archaeology	707517, 612856
GS-48	48-75	Archaeology	707509, 612866
GS-48	48-76	Archaeology	707512, 612846
GS-48	48-77	Archaeology	707524, 612869
GS-48	48-78	Archaeology	707524, 612864
GS-48	48-79	Archaeology	707368, 612891
GS-48	48-8	? Archaeology	707377, 612875
GS-48	48-80	Archaeology	707366, 612866
GS-48	48-81	Archaeology	707381, 612895
GS-48	48-82	Archaeology	707387, 612889
GS-48	48-83	? Archaeology	707539, 612842
GS-49	49-1	? Archaeology	707735, 612855
GS-49	49-2	? Archaeology	707746, 612830
GS-50	50-1	Archaeology	707767, 612897
GS-50	50-10	? Archaeology	707819, 612883
GS-50	50-11	? Archaeology	707852, 612889
GS-50	50-12	Archaeology	707930, 612879

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-50	50-13	? Archaeology	707931, 612873
GS-50	50-14	Area of Enhancement	707826, 612860
GS-50	50-15	? Archaeology	707785, 612894
GS-50	50-16	Field Boundary	707726, 612923
GS-50	50-17	Area of Enhancement	707764, 612923
GS-50	50-18	Area of Enhancement	707767, 612897
GS-50	50-19	? Archaeology	707928, 612917
GS-50	50-2	Archaeology	707759, 612929
GS-50	50-20	? Archaeology	707839, 612883
GS-50	50-21	Area of Enhancement	707854, 612896
GS-50	50-22	Archaeology	707837, 612913
GS-50	50-23	? Archaeology	707778, 612905
GS-50	50-24	? Archaeology	707779, 612899
GS-50	50-25	Archaeology	707888, 612920
GS-50	50-26	Archaeology	707926, 612907
GS-50	50-27	? Archaeology	707942, 612897
GS-50	50-28	Area of Enhancement	707967, 612899
GS-50	50-29	? Archaeology	707829, 612871
GS-50	50-3	Archaeology	707759, 612911
GS-50	50-4	Archaeology	707777, 612915
GS-50	50-5	Archaeology	707814, 612911
GS-50	50-6	Archaeology	707757, 612935
GS-50	50-7	Archaeology	707859, 612923
GS-50	50-8	Archaeology	707838, 612912
GS-50	50-9	Archaeology	707842, 612919
GS-51	51-01	Archaeology	708164, 612806
GS-51	51-02	Archaeology	708151, 612789
GS-51	51-03	Archaeology	708120, 612828
GS-51	51-04	Archaeology	708191, 612799
GS-51	51-05	Archaeology	708223, 612836
GS-51	51-06	Archaeology	708153, 612868
GS-51	51-07	Archaeology	708200, 612781
GS-51	51-08	Archaeology	708211, 612774
GS-51	51-09	Archaeology	708132, 612840
GS-51	51-10	Archaeology	708201, 612885
GS-51	51-11	Archaeology	708199, 612840
GS-51	51-12	Archaeology	708187, 612779
GS-51	51-13	Archaeology	708218, 612861
GS-51	51-14	Archaeology	708201, 612808
GS-51	51-15	Archaeology	708223, 612807

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-51	51-16	Archaeology	708277, 612832
GS-51	51-17	Archaeology	708247, 612784
GS-51	51-18	Archaeology	708112, 612842
GS-51	51-19	Archaeology	708240, 612866
GS-51	51-20	? Archaeology	708281, 612851
GS-51	51-21	Archaeology	708181, 612877
GS-51	51-22	? Archaeology	708128, 612873
GS-51	51-23	Archaeology	708103, 612815
GS-51	51-24	? Archaeology	708191, 612767
GS-51	51-25	? Archaeology	708256, 612747
GS-51	51-26	? Archaeology	708208, 612741
GS-51	51-27	? Archaeology	708260, 612761
GS-51	51-28	? Archaeology	708105, 612878
GS-51	51-29	Archaeology	708184, 612859
GS-51	51-30	? Archaeology	708267, 612897
GS-51	51-31	? Archaeology	708256, 612875
GS-51	51-32	? Archaeology	708209, 612879
GS-51	51-33	? Archaeology	708275, 612896
GS-51	51-34	? Archaeology	708340, 612926
GS-51	51-35	? Archaeology	708346, 612931
GS-51	51-36	? Archaeology	708263, 612930
GS-51	51-37	? Archaeology	708222, 612846
GS-51	51-38	? Archaeology	708218, 612831
GS-51	51-39	? Archaeology	708137, 612818
GS-51	51-40	? Archaeology	708137, 612821
GS-51	51-41	? Archaeology	708200, 612763
GS-51	51-42	? Archaeology	708168, 612905
GS-51	51-43	? Archaeology	708241, 612870
GS-51	51-44	? Archaeology	708222, 612864
GS-51	51-45	? Archaeology	708252, 612826
GS-51	51-46	Archaeology	708153, 612788
GS-51	51-47	? Archaeology	708146, 612846
GS-51	51-48	? Archaeology	708248, 612741
GS-51	51-49	? Archaeology	708138, 612761
GS-51	51-50	Area of Magnetic Enhancement	708116, 612927
GS-51	51-51	? Archaeology	708026, 612818
GS-51	51-52	? Archaeology	708342, 612886
GS-51	51-53	? Archaeology	708360, 612902
GS-51	51-54	? Archaeology	708335, 612836
GS-51	51-55	? Archaeology	708327, 612829
GS-51	51-56	? Archaeology	708261, 612796
GS-51	51-57	? Archaeology	708225, 612788
GS-51	51-58	? Archaeology	708136, 612867

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-51	51-59	? Archaeology	708136, 612860
GS-51	51-60	? Archaeology	708072, 612813
GS-51	51-61	? Archaeology	708149, 612826
GS-51	51-62	? Archaeology	708255, 612839
GS-51	51-63	? Archaeology	708122, 612773
GS-52	52-1	Field Boundary	708660, 612849
GS-52	52-2	? Archaeology	708577, 612854
GS-52	52-3	Area of Enhancement	708630, 612859
GS-52	52-4	Area of Enhancement	708544, 612832
GS-52	52-5	Area of Enhancement	708690, 612841
GS-52	52-6	Area of Enhancement	708609, 612813
GS-53	53-1	Archaeology	709941, 612879
GS-53	53-11	? Archaeology	709898, 612915
GS-53	53-12	? Archaeology	709901, 612887
GS-53	53-13	Archaeology	709910, 612859
GS-53	53-14	? Archaeology	709903, 612845
GS-53	53-15	Archaeology	709929, 612834
GS-53	53-16	? Archaeology	710060, 612742
GS-53	53-17	Archaeology	710037, 612686
GS-53	53-18	? Archaeology	710071, 612740
GS-53	53-19	? Archaeology	710060, 612747
GS-53	53-2	Archaeology	709953, 612808
GS-53	53-20	Area of Enhancement	709994, 612763
GS-53	53-21	Archaeology	709959, 612867
GS-53	53-22	Archaeology	710030, 612705
GS-53	53-23	Archaeology	710037, 612719
GS-53	53-24	? Archaeology	710067, 612723
GS-53	53-25	? Archaeology	710053, 612694
GS-53	53-26	? Archaeology	709901, 612832
GS-53	53-27	Area of Enhancement	709964, 612763
GS-53	53-28	Archaeology	709933, 612793
GS-53	53-29	Archaeology	709920, 612809
GS-53	53-3	Archaeology	709945, 612829
GS-53	53-30	? Archaeology	709942, 612790
GS-53	53-31	? Archaeology	710016, 612700
GS-53	53-32	? Archaeology	710014, 612716
GS-53	53-33	? Archaeology	710006, 612684
GS-53	53-34	Area of Enhancement	710040, 612691
GS-53	53-35	? Archaeology	710058, 612684

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-53	53-36	? Archaeology	709992, 612768
GS-53	53-37	? Archaeology	710053, 612719
GS-53	53-38	? Archaeology	710058, 612721
GS-53	53-39	? Archaeology	709891, 612887
GS-53	53-4	Archaeology	710034, 612825
GS-53	53-40	Archaeology	709994, 612790
GS-53	53-49	Archaeology	710021, 612831
GS-53	53-5	Archaeology	709949, 612817
GS-53	53-51	? Archaeology	709998, 612723
GS-53	53-52	? Archaeology	710001, 612719
GS-53	53-53	? Archaeology	710075, 612754
GS-53	53-54	? Archaeology	710007, 612781
GS-53	53-56	? Archaeology	709946, 612871
GS-53	53-6	? Archaeology	709883, 612817
GS-53	53-8	Archaeology	709973, 612821
GS-58	58-1	? Archaeology	711167, 612182
GS-58	58-2	? Archaeology	711188, 612165
GS-58	58-3	? Archaeology	711211, 612149
GS-58	58-4	? Archaeology	711227, 612177
GS-58	58-5	Area of Enhancement	711182, 612193
GS-58	58-6	? Archaeology	711197, 612136
GS-59	59-1	Area of Enhancement	711387, 612074
GS-59	59-10	? Archaeology	711417, 612174
GS-59	59-11	Area of Enhancement	711415, 612098
GS-59	59-12	Area of Enhancement	711431, 612119
GS-59	59-13	Area of Enhancement	711438, 612098
GS-59	59-14	Area of Enhancement	711435, 612152
GS-59	59-15	Area of Enhancement	711467, 612131
GS-59	59-16	Area of Enhancement	711415, 612129
GS-59	59-17	Area of Enhancement	711345, 612116
GS-59	59-18	Area of Enhancement	711379, 612116
GS-59	59-19	Area of Enhancement	711372, 612132
GS-59	59-2	Area of Enhancement	711410, 612068
GS-59	59-3	Area of Enhancement	711343, 612076
GS-59	59-4	Area of Enhancement	711335, 612099
GS-59	59-5	Area of Enhancement	711346, 612092
GS-59	59-6	Area of Enhancement	711436, 612068
GS-59	59-7	Area of Enhancement	711385, 612082

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-59	59-8	Area of Enhancement	711310, 612088
GS-59	59-9	? Archaeology	711383, 612184
GS-60	60-1	? Archaeology	711488, 612063
GS-60	60-10	? Archaeology	711482, 612062
GS-60	60-2	? Archaeology	711508, 612086
GS-60	60-3	? Archaeology	711518, 612106
GS-60	60-4	? Archaeology	711528, 612103
GS-60	60-5	? Archaeology	711576, 612106
GS-60	60-6	? Archaeology	711577, 612114
GS-60	60-7	? Archaeology	711550, 612118
GS-60	60-8	? Archaeology	711531, 612123
GS-60	60-9	? Archaeology	711526, 612118
GS-62	62-1	Field Boundary	712209, 612138
GS-62	62-2	Field Boundary	712100, 612023
GS-62	62-3	? Archaeology	712111, 612079
GS-62	62-4	? Archaeology	712041, 612027
GS-62	62-5	? Archaeology	712046, 612024
GS-62	62-6	? Archaeology	712042, 612021
GS-62	62-7	Field Boundary	712145, 612104
GS-62	62-8	? Archaeology	712183, 612119
GS-62	62-9	? Archaeology	712211, 612118
GS-63	63-1	Area of Enhancement	712290, 611955
GS-63	63-2	Area of Enhancement	712283, 611960

Table 7. N11/N25 Oilgate to Rosslare Harbour Scheme: EMI ER_a Interpretation

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-08	8-1E	High Resistivity	700696, 629890
GS-17	17-1E	Natural	700817, 626262
GS-18	18-1E	Natural	700946, 626477
GS-19	19-1E	Natural	700881, 626314
GS-19	19-2E	Natural	700872, 626274
GS-20	20-1E	? Archaeology	700853, 626137
GS-20	20-2E	? Archaeology	700937, 626078
GS-20	20-3E	? Archaeology	700824, 626064
GS-20	20-4E	? Archaeology	700880, 625874
GS-20	20-5E	? Archaeology	700873, 625821
GS-26	26-1E	Natural	700519, 622896
GS-27	27-1E	Natural	700445, 622852
GS-27	27-2E	Natural	700458, 622835
GS-27	27-3E	Natural	700478, 622800
GS-27	27-4E	Natural	700497, 622813
GS-27	27-5E	Natural	700510, 622842
GS-28	28-1E	? Archaeology	700428, 622741
GS-31	31-1E	? Archaeology	702002, 620050
GS-32	32-1E	? Archaeology	702148, 620001
GS-32	32-2E	? Archaeology	702115, 620019
GS-32	32-3E	? Archaeology	702091, 619993
GS-32	32-4E	Area of Enhancement	702132, 620053
GS-32	32-5E	Natural	702175, 620015
GS-33	33-1E	Natural	702236, 620072
GS-33	33-2E	Natural	702324, 620081
GS-45	45-1E	? Archaeology	706650, 613119
GS-45	45-2E	Natural	706624, 613116
GS-45	45-3E	Natural	706411, 613136
GS-45	45-3E	Natural	706452, 613143
GS-46	46-1E	High Resistivity	706637, 613256
GS-47	47-10E	Archaeology	707043, 613047
GS-47	47-11E	? Archaeology	707097, 613152
GS-47	47-12E	Natural	707185, 613206
GS-47	47-13E	Natural	707326, 613066
GS-47	47-1E	? Archaeology	706845, 613245
GS-47	47-2E	? Archaeology	706815, 613183
GS-47	47-3E	? Archaeology	706804, 613184

GS Area	Anomaly	Anomaly Interpretation	ITM Coordinate
GS-47	47-4E	? Archaeology	706793, 613113
GS-47	47-5E	? Archaeology	706829, 613094
GS-47	47-6E	Archaeology	706942, 613174
GS-47	47-7E	Archaeology	706949, 613085
GS-47	47-8E	Archaeology	706972, 613102
GS-47	47-9E	Archaeology	706973, 613134
GS-48	48-1E	Archaeology	707353, 612912
GS-48	48-2E	Field Boundary	707422, 612924
GS-48	48-3E	Natural	707438, 612840
GS-48	48-4E	Natural	707577, 612936
GS-48	48-5E	Natural	707547, 612869
GS-50	50-1E	High Resistivity	707804, 612909
GS-51	51-1E	? Archaeology	708229, 612845
GS-51	51-2E	? Archaeology	708272, 612906
GS-51	51-3E	? Archaeology	708212, 612772
GS-51	51-4E	? Archaeology	708152, 612777
GS-51	51-5E	Area of Enhancement	708224, 612809
GS-51	51-6E	Area of Enhancement	708296, 612781
GS-51	51-7E	Area of Enhancement	708192, 612899
GS-51	51-8E	Natural	708077, 612828
GS-52	52-1E	High Resistivity	708588, 612858
GS-52	52-2E	Field Boundary	708616, 612854
GS-52	52-3E	? Archaeology	708665, 612808
GS-52	52-4E	? Archaeology	708553, 612845
GS-53	53-1E	High Resistivity	709925, 612816
GS-53	53-2E	Low Resistivity	709862, 612830
GS-53	53-3E	High Resistivity	710025, 612816
GS-53	53-4E	Low Resistivity	709807, 612871
GS-58	58-1E	Natural	711256, 612100
GS-58	58-2E	Natural	711262, 612148
GS-59	59-1E	? Archaeology	711375, 612159
GS-59	59-2E	? Archaeology	711314, 612154
GS-59	59-3E	? Archaeology	711361, 612162
GS-59	59-4E	Low Resistivity	711398, 612181
GS-60	60-1E	Natural	711568, 612081
GS-62	62-1E	High Resistivity	712277, 612087
GS-62	62-2E	High Resistivity	712138, 612174
GS-62	62-3E	High Resistivity	712049, 612015
GS-62	62-4E	Field Boundary	712199, 612016

5 Conclusions

The geophysical surveys encountered a wide range of soils, geologies and known archaeological sites. The magnetometry and resistivity surveys identified both cut features clearly, and the magnetometry identified burnt features well, across most geologies. In some cases the geological background heavily impacted the interpretation of magnetometry data, although the EMI ER_a data were unaffected.

In general, the EMI ER_a data did not identify many unique archaeological features that had not been visualised in the magnetometry data, but did provide a much clearer image of weakly contrasting magnetometer anomalies that confirmed the presence of an archaeological site. Without this confirmation, the magnetometer-derived interpretation was less conclusive (Table 8). The EMI ER_a data also verified an absence of archaeology in those areas where the magnetometry could not perform well due to geology consideration.

Table 8. Notable comparisons between magnetometry and EMI ER_a anomalies

GS Area	Magnetometry Anomaly	Magnetometry Interpretation	EMI ER _a Anomaly	EMI ER _a Interpretation
GS-31	31-1	Area of magnetic enhancement	31-1E	?Archaeology
GS-32	32-3	?Archaeology	32-1E	?Archaeology
GS-32	32-2	?Archaeology	32-2E & 32-3E	?Archaeology
GS-48	48-34	Area of magnetic enhancement	48-1E	Archaeology
GS-52	52-2	?Archaeology	52-1E	High Resistance
GS-53	53-1	Archaeology	53-1E	Broad High Resistance Zone
GS-62	62-4, 62-5 & 62-6	?Archaeology	62-3E	Archaeology

Other than commonly identified archaeological features such as pits, isolated points of burning, linear/curvilinear boundary features and drainage ditches, the most significant *known or potential archaeological sites* were:

- GS-01: 1-2 (potential burnt mound/area of burning)
- GS-03: 3-1 (potential burnt mound/area of burning)
- GS-04: 4-2 (potential burnt mound/area of burning)

- GS-07: Multiple anomalies indicating a potential burnt mound complex/areas of burning
- GS-08: 8-1 (potential burnt mound/area of burning)
- GS-10: 10-1 (pentagonal enclosure); 10-2 (Ringfort - rath WX032-060----
- GS-13: 13-6 and 13-7 (Ringfort rath WX032-029----
- GS-15: Multiple anomalies indicating a potential burnt mound complex/areas of burning
- GS-16: 16-1—16-4 (potential burnt mounds/areas of burning)
- GS-23: 23-6 & 23-7 (potential burnt mounds/areas of burning)
- GS-28: Multiple anomalies indicating a potential burnt mound complex/areas of burning
- GS-31: 31-1 & 31-1E (possible enclosure)
- GS-32: 32-2 & 32-2E (possible enclosure); 32-3 & 32-1E (possible enclosure)
- GS-37: 37-6 (Ringfort - rath WX042-080----); 37-1 & 37-2 (ring-ditches); 37-4 (enclosure); 37-38 (possible enclosure); 37-3 (Ringfort - rath WX042-085----
- GS-38: 38-1 (Ringfort - rath WX042-085----); 38-2 (enclosure)
- GS-41: 41-19 (potential burnt mound/area of burning)
- GS-45: 45-2, 45-3 & 45-4 (Concentric enclosures)
- GS-46: 46-1 (potential burnt mound/area of burning)
- GS-47: Field systems and 47-55 (possible rectangular enclosure); 47-91 (possible enclosure); 47-12 (ring-ditch); 47-13 (ring-ditch); 47-17 (ring-ditch); 47-24/47-25 (enclosure); 47-31 (ring-ditch); 47-93 (rectangular enclosure); all located within GS-47 that lies immediately south of a Windmill WX048-001002-, 78m south of a castle – unclassified WX048-001001, 22m north of WX048-003 holy well, 128m east of WX048-002 church and graveyard and 120m north of WX048-114 enclosure.
- GS-48: 48-33, 48-34 & 48-1E (large enclosure surrounding WX048-114----, 125m diameter) and multiple contiguous enclosures
- GS-50: 50-2, 50-3, 50-4 (Ringfort – rath WX048-115----) and multiple enclosures/ring-ditches
- GS-51: 51-30 (field system WX048-116001-); 51-04 (ring-ditch WX048-116002-); 51-02 (enclosure WX048-116003-); 51-26 (enclosure WX048-116004-); 51-25 (enclosure WX048-

116005) and multiple ring-ditch features: 51-01, 51-03, 51-39, 51-40, 51-05, 51-07, 51-08, 51-10, 51-06, 51-07, 51-41, 51-08, and 51-63.

- GS-53: Large-scale ecclesiastical-style enclosures 53-21/53-49 (inner enclosure); 53-1/53-2 and 53-1E (middle enclosure); 53-11 and parts of 53-20/53-6/53-29/53-28 (outer enclosure); 53-3 (semi-circular enclosure); 53-8 (sub-rectangular enclosure); 53-4 (sub-circular enclosure); and field systems surrounding church and graveyard WX048-006006-, WX048-006-001
- GS-59: 59-9 & 59-10 (potential burnt mounds/area of burnings)
- GS-62: 62-4—62-6 (potential burnt mound complex/areas of burning)

The results of this survey were submitted to TII, Mott MacDonald and WCC. Additional copies will be submitted in accordance with the condition attached to the Consent to use a Detection Device, to the NMS and the National Museum of Ireland (NMI).

5.1 Statement of Indemnity

The geophysical properties of subsurface features must contrast sufficiently with the surrounding soils/background variation and 'noise' to enable them to be detected and mapped using geophysical methods. As such, the clarity and definition of buried features can vary considerably, with some having well-defined signatures while others, lying on the threshold of background noise, are only barely visible or not visible at all, in geophysical imagery. A lack of geophysical anomalies cannot be taken to imply a lack of archaeological features.

6 References

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Appendices

Appendix 1: Classification Criteria for Geophysical Anomalies

Magnetometry

Interference

Usually created by ferrous responses from nearby fences, pylons, vehicles or structures, as well as interference derived from overhead powerlines, electrical substations and radio antennae.

Archaeology

Where the signal is clear and coherent, strongly resembling known archaeological morphologies e.g. an enclosure etc.

?Archaeology

As above, but where the signal is less clear and the cause may represent either an archaeological origin or a natural origin (such as that generated by iron pan, a doline or other natural feature that mimics the morphology of an archaeological feature).

Area of Magnetic Enhancement

Broad, diffuse or amorphous spreads of positive magnetic enhancement that are not associated with a discrete feature. These could represent geology, soil noise, or occupationally enhanced soils.

Ferrous

Iron (ferrous) materials, visible in magnetometry data as clear dipolar anomalies. These could relate to any post-Iron Age period, but are mostly associated with modern farming debris and/or green waste.

Field Boundary

A known field boundary, supported by evidence from historical OS maps or aerial photographs.

Natural

An unambiguous response created by geology or soil noise, which can include palaeochannels, igneous dykes, near surface cropping or spreads of glacial material.

Electromagnetic Induction Apparent Electrical Resistivity**Interference**

Usually created by electrical substations and radio antennae.

Archaeology

Where the signal is clear and coherent, strongly resembling known archaeological morphologies e.g. an enclosure etc.

?Archaeology

As above, but where the signal is less clear and the cause may represent either an archaeological origin or a natural origin (such as that generated by iron pan, a doline or other natural feature that mimics the morphology of an archaeological feature).

Area of Enhancement

Broad, diffuse or amorphous spreads of slightly enhanced (either high or low resistivity) responses that are not associated with a discrete feature. These could represent geology, soil noise, or archaeological features.

Ferrous

Iron (ferrous) materials, visible in magnetometry data as clear dipolar anomalies. These could relate to any post-Iron Age period, but are mostly associated with modern farming debris and/or green waste.

Field Boundary

A known field boundary, supported by evidence from historical OS maps or aerial photographs.

High Resistivity

An anomaly that has a higher resistivity than the surrounding soil. This is typically caused by a stoney feature, such as a wall, masonry structure, stone-filled ditch, or embankment. High resistivity can also be caused by near surface geology.

Low Resistivity

An anomaly that has a lower resistivity than the surrounding soil. This is typically caused by a moisture-retaining feature, such as a ditch, gully, pond or pit. Low resistivity can also be caused by naturally occurring wet soils and areas of poor drainage.

Natural

An unambiguous response created by geology or soil noise, which can include palaeochannels, igneous dykes, near surface cropping or spreads of glacial material.

Appendix 2: Geophysical Survey Archive

Digital copies of the geophysical survey archive are held by AMS Ltd, at separate locations to ensure preservation against accidental damage or theft. Digital geophysical data (magnetometry data, EMI data) are held on physical media (external hard disk drive) and a cloud based OneDrive. Digital outputs (report, text, figures and shapefiles) are held on physical media (external hard disk drive) and a cloud based SharePoint.

The Client, Wexford County Council, will be given access to the cloud based data.

A soft copy of the report will be deposited with the Archaeological Licensing Section, National Monuments Service, Department of Housing, Local Government and Heritage, Room G50, Custom House, Dublin 1, transmitted via email or file sharing transfer.

A hard copy will be deposited with the National Museum of Ireland, Kildare Street, Dublin 2.

Figures (see Separate Figure Book)