Norwich Western Link

Environmental Statement Chapter 8: Cultural Heritage

Appendix 2: Geophysical Survey Report (Magnitude Surveys 2021) Part 1 of 3

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Contents

1 Introduction

1.1.1 Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 107ha area of land following the proposed route of the Norwich Western Link Road. A fluxgate gradiometer survey was successfully completed across c. 102.32ha, with the remainder unable to be surveyed due to unsafe ground conditions and overgrown vegetation. Across the length of the survey area, both probably and possible archaeological activity has been identified, including possible enclosures with internal features. Anomalies classified as undetermined have also been identified across the survey area, and while they are more likely to be agricultural or natural in origin, an archaeological origin cannot be ruled out. Agricultural activity has been identified in the form of modern ploughing trends, former mapped and unmapped field boundaries and pre-mechanised arable cultivation. Natural variations have been identified in areas with superficial sand and gravel deposits. Modern disturbance is generally limited to the edges of the survey areas, surrounding buried or overhead services and pylons.

1.1.2 We have included a summary of key information shown in this document in an accessible format. However, some users may not be able to access all technical details. If you require this document in a more accessible format please contact norwichwesternlink@norfolk.gov.uk

Geophysical Survey Report

Norwich Western Link

For

NPS Property Consultants Ltd

On Behalf Of

Norfolk County Council

HER Event Numbers: CNF48395 & ENF149516

OASIS ID: magnitud1-502265

Magnitude Surveys Ref: MSTG746

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Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 107ha area of land following the proposed route of the Norwich Western Link Road. A fluxgate gradiometer survey was successfully completed across c. 102.32ha, with the remainder unable to be surveyed due to unsafe ground conditions and overgrown vegetation. Across the length of the survey area, both probable and possible archaeological activity has been identified, including possible enclosures with internal features. Anomalies possibly relating to burnt/fired material have also been identified. Anomalies classified as undetermined have also been identified across the survey area, and while they are more likely to be agricultural or natural in origin, an archaeological origin cannot be ruled out. Agricultural activity has been identified in the form of modern ploughing trends, former mapped and unmapped field boundaries and pre-mechanised arable cultivation. Natural variations have been identified in areas with superficial sand and gravel deposits. Modern disturbance is generally limited to the edges of the survey areas, surrounding buried or overhead services and pylons.

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1. Introduction

1.1. Magnitude Surveys Ltd (MS) was commissioned by NPS Property Consultants Ltd on behalf of Norfolk County Council to undertake a geophysical survey over a c. 107ha area of land following the proposed route of the Norwich Western Link Road (North: TG 14806 15604. South: TG 10040 12271).

1.2. The geophysical survey comprised hand-pulled/quad-towed, cart-mounted and hand-carried GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to its ability to detect a range of different features. The technique is particularly suited for detecting fired or magnetically enhanced features, such as ditches, pits, kilns, sunken featured buildings (SFBs) and industrial activity (David *et al*., 2008).

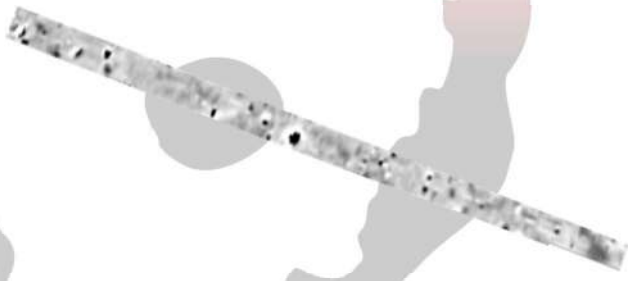
1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David *et al*., 2008), the Chartered Institute for Archaeologists (CIfA, 2020) and the European Archaeological Council (Schmidt *et al.,* 2015).

1.4. It was conducted in line with a WSI produced by WSP (Riggott, 2020).

1.5. The survey commenced on 23/11/2020 and was completed on 17/03/2021.

1.6. A duplicate traverse was surveyed during survey to provide evidence of consistency and reliability of magnetometry data within the survey area.

Traverse 89:



Traverse 91 (duplicate of 89):

2. Quality Assurance

2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society of Archaeological Prospection).

2.2. The directors of MS are involved in cutting edge research and the development of guidance/policy. Specifically, Dr Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CIfA and is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr Kayt Armstrong has a PhD in archaeological geophysics from Bournemouth University, is a Member of CIfA, the Editor of ISAP News, and is the UK Management Committee representative for the COST Action SAGA; Dr Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London, has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.

2.3. All MS managers, field and office staff have degree qualifications relevant to archaeology or geophysics and/or field experience.

3. Objectives

3.1. The aim of the geophysical survey was to clarify the archaeological potential of the survey area in order to inform the forthcoming Planning Application and to inform the scope for further site-based surveys (i.e. trial trenching).

4. Geographic Background

4.1. The survey area consists of a c. 6.5km road scheme between a point on the A1067, c. 960m north from Ringland in the north and a point on the A47, c. 570m northwest from Honingham in the south (Figure 1). A gradiometer survey was undertaken across 27 fields of both arable cultivation and pasture. The survey area was bounded to the north by arable fields and woodland, to the east by woodland, to the southeast by Taverham and Round Wood, to the south by Ringland, and to the southwest by the A47. The River Wensum cut through the survey area, between Areas 3 and 5 (Figure 2). An area totalling 4.68ha was not surveyed due to unsafe ground conditions and overgrown vegetation.

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	The area consisted of an arable field covered by stubble which sloped steeply down from the east to west.	The area was bounded to the east by a hedge and ditch, and to the south by fencing, with no physical boundary to the north and west.
2	The area consisted of a grass field, with a slope down to the south.	The area was bounded to the west by a ditch and hedge, with no physical boundary to the north, east and south. Areas of young trees were present in the west.
3	The area consisted of an arable cereal crop field, with a gentle slope down to the northwest.	The area was bounded to the north, northeast, south and west by fencing, with no physical boundary to the east. Hay bales were present in the north and centre of the area, and a borehole cover was present in the southeast.

4	The area consisted of an arable field covered by stubble which sloped steeply down from the east to west.	The area was bounded by a fence and hedgerows to the south and west, with no physical boundary to the north and east.
5	The area consisted of a ploughed field with deep furrows, and a grass area to the north. The area sloped down to the northwest in the south, and down to the southeast in the northwest.	The area was bounded to the north by trees, and to the northeast by hedges and a metal fence, with no physical boundary to the east, south and southwest. Boreholes covers were present in the north and northwest.
6	The area consisted of an arable field with young crop, with a grass area to the northeast, sloping down to the northeast.	The area was bounded to the north, east, south and southwest by trees, with no physical boundary to the west.
7	The area consisted of an arable field covered by immature crops. The field sloped gently down from the northwest to southeast.	The area was bounded to the north and south by hedges and a fence, and to the west by hedges, with no physical boundary to the east.
8	The area consisted of a ploughed field, with a slope down to the north, and to the northwest.	The area was bounded to the north by a road and grass verge, to the southwest by trees, and to the west by a dirt track, with no physical boundary to the southeast and east. Pylons and overhead cables were present along the northern boundary, running east to west. A borehole was present in the south of the area.
9	The area consisted of a ploughed field, with a gentle slope down to the north.	The area was unbounded on all sides.
10	The area consisted of a gently undulating arable field covered by immature crops.	The area was bounded to the south by trees and hedges and to the east by woodland and a grass verge, with no physical boundary to the north and west.
11	The area consisted of a ploughed arable field, with a gentle slope sown to the northeast.	The area was bounded to the northeast, south and west by hedges, with no physical boundary to the north. Overhead cables ran northeast to southwest in the west of the area. An area of overgrown vegetation was located on the western boundary and was unable to be surveyed.
12	The area consisted of a flat cultivated arable field. The majority of this area was not surveyed due to very soft ground.	The area was bounded to the north and northeast by hedges, and to the south by a grass verge and a road, with no physical boundary to the east.
13	The area consisted of several small paddocks covered by pasture.	The area was bounded by a mixture of wooden and wire fencing in all directions. The area was divided into several paddocks separated by wooden fencing. There was no physical boundary in the south.

14	The area consisted of a ploughed arable field with a gentle slope down to the southeast.	The area was bounded to the north and northeast by a road and a grass verge, and to the northwest by trees. There was no physical boundaries to the south and east.
15	The area consisted of a flat arable field covered by sugar beet crop.	The area was bounded by hedgerows to the north, south and west, no physical boundary to the north. A line of overhead cables crossed the field from north to south.
16	The area consisted of a flat cultivated arable field.	The area was bounded to the north by a hedge, and to the west and southwest by a road, with no physical boundary to the east and south. Pylons and overhead cables were present running north to south in the centre of the area. An area of soft ground to the southeast was not able to be surveyed.
17	The area consisted of a flat arable field covered by stubble.	The area was bounded to the south, east and west by hedgerows, with no physical boundary to the north. A pylon was present on the eastern boundary, and overhead cables ran north to south across the centre of the area.
18	The area consisted of a flat arable field covered by immature crops.	The area was bounded to the north by hedgerows, and to the south and east by trees, with no physical boundary to the west. Two small sections were not surveyed due to dense vegetation and boggy ground.
19	The area consisted of an arable cereal crop field, with gentle slopes to the east and west in the northeast of the area.	The area was bounded to the north by trees, and to the south by a dirt track and a hedge, with no physical boundary to the east and west.
20	The area consisted of an arable cereal crop field, with gentle slopes down to the south.	The area was bounded to the south by trees, with no physical boundary to the north, east and west.
21	The area consisted of a grass field, with slopes down to the north, northeast and south.	The area was bounded to the east and west by metal fences and hedges, with no physical boundary to the north, northeast, southeast and south. Depressions were present in the centre of the field, and a metal gate was present on the western boundary.
22	The area consisted of an arable cereal crop field, with a gentle slope down to the east.	The area was bounded to the north by farm equipment, to the east and south by hedges, and to the west by trees, with no physical boundary to the northeast and northwest. An area in the north was unable to be surveyed due to tall vegetation.
23	The area consisted of an arable cereal crop field, with a slope down to the east.	The area was bounded to the north, east and south by a hedge, with no physical boundary to the southeast and west. An area of boggy ground was present in the southwest corner and was unable to be surveyed.
24	The area consisted of a flat arable cereal crop field.	The area was bounded to the north and west by hedges, with no physical boundary to the east.

25	The area consisted of an arable cereal crop field, with a gentle slope down to the north.	The area was bounded to the north, east and west by hedges, with no physical boundary to the south. Tracks, consisting of uneven and rough ground crossed the area and were not able to be surveyed.
26	The area consisted of an arable cereal crop field, with a gentle slope down to the southeast.	The area was bounded to the east and west by hedges, and to the south by a track and trees, with no physical boundary to the north, northeast, southwest and northwest. In the east of the area a track consisting of uneven and rough ground was present and could not be surveyed. A borehole was located on the southern boundary.
27	The area consisted of an arable cereal crop field, with a gentle slope down to the south.	The area was bounded to the north and east by hedges, with no physical boundary to the northeast, south and west.

4.3. The underlying geology comprises chalk of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation. The superficial deposits consist of sand and gravel of the Sheringham Cliffs Formation across much of the survey area, with bands of river terrace deposits in Area 3, head (clay silt, sand and gravel) in Areas 5, 7 and 9, along with a band of alluvium in Area 7. Areas 13, 25, 26 and 27, the north of Area 11, northwest of Area 18, and the west of Area 22, 23, 24 were comprised of diamicton of the Lowestoft Formation (British Geological Survey, 2021).

4.4. The soils consist of freely draining slightly acid sandy soils across Areas 1 to 21, with slightly acid loamy and clayey soils with impeded drainage in the north of Areas 11, 13 and 18, the northeast of Area 15, the west of Area 21, and across all of Areas 11 to 27 (Soilscapes, 2021).

5. Archaeological Background

5.1. The following is a summary of a written scheme of investigation produced by WSP (Riggott, 2020) for Norfolk County Council.

5.2. Evidence for activity from the Prehistoric period has been identified in the form of cropmarks indicating a farmstead (MNF55833), a rectilinear enclosure (MNF55834) and a ditch (MNF60160). These are dated from the early Iron Age to Roman period and recorded in the central section of the route, along with findspots of prehistoric flint flakes (MNF18044) recorded in the northern section of the route.

5.3. Medieval activity has been recorded throughout the length of the corridor in the form of cropmarks possibly dating to the later Medieval period (MNF55842, MNF55845 and MNF60261).

5.4. Post-Medieval activity has been noted in the southern part of the survey area, in the form of the 18th century Honingham landscape park, partially situated within Areas 19 to 27. Further activity is noted between Areas 13 to 27 where infrastructure related to the World War II British/American Attlebridge airfield is known to be present.

6. Methodology

6.1. Magnetometer surveys are generally the most cost effective and suitable geophysical technique for the detection of archaeology in England. Therefore, a magnetometer survey should be the preferred geophysical technique unless its use is precluded by any specific survey objectives or the site environment. For this site, no factors precluded the recommendation of a standard magnetometer survey. Geophysical survey therefore comprised the magnetic method as described in the following section.

6.2. Data Collection

6.2.1. Geophysical prospection comprised the magnetic method as described in the following table.

6.2.2. Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Magnetic	Bartington Instruments Grad-13 Digital Three-Axis Gradiometer	1m	200Hz reprojected to 0.125m

6.2.3. The magnetic data were collected using MS' bespoke hand-pulled/quad-towed cart system and hand-carried GNSS-positioned system.

6.2.3.1. MS' cart and hand-carried system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.2.3.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

6.2.3.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

6.3. Data Processing

6.3.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.*, 2015: 33 and Section IV.2 in David *et al.,* 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen *et al.* (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

6.4. Data Visualisation and Interpretation

6.4.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images of the gradient and total field at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figures 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77 & 80). XY trace plots visualise the magnitude and form of the geophysical response, aiding anomaly interpretation.

6.4.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historical maps, LiDAR data, and soil and geology maps. Google Earth (2021) was also consulted, to compare the results with recent land use.

6.4.3. Geodetic position of results – All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

7. Results

7.1. Qualification

7.1.1. Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible, an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek feedback on their reports, as well as reports from further work, in order to constantly improve our knowledge and service.

7.2. Discussion

7.2.1. The geophysical results are presented in combination with combined historical maps and satellite imagery (Figures 5, 8, 11, 14, 17, 20 & 23).

7.2.2. A fluxgate gradiometer survey was undertaken over c. 102.32ha of the survey area, with the remainder unable to be surveyed due to unsafe ground conditions and overgrown vegetation. The geophysical survey has responded well to the environment of the majority of the survey area, revealing several areas of probable and possible archaeological activity. However, it should be noted that some of the survey areas provide a limited context for interpretation, due to their small size, and it was therefore not possible to provide a definitive interpretation of all the anomalies detected. Anomalies of an agricultural origin were also identified, in the form of both modern ploughing and historical agricultural practices such as pre-mechanised arable cultivation, along with mapped and unmapped former field boundaries.

7.2.3. The impact of modern activity on the survey area is generally limited to field edges and where they abut roads. However, further areas of magnetic disturbance have been identified in the south of Area 27 surrounding a buried service, and in the north of Area 13, due to the presence of small paddocks divided with metal fencing. While the overall impact of the magnetic interference has been minimal, it should be noted that where present, it will have obscured any weaker archaeological or other anomalies that may be present.

7.2.4. Variations relating to superficial geology have been identified across the survey area and are more visible in the total field data. It is possible that some of these anomalies have an anthropogenic origin, as they can be difficult to distinguish in the magnetic results from those produced by natural processes. It should therefore be noted that there is potential for anomalies of archaeological origin to be obscured where this strongly mottled geological background is present. Within Area 9, a series of broadly parallel anomalies were identified, and the slope within the survey area suggests that they are related to sediment transportation and near surface colluvial processes

associated with the watercourse to the northeast. Further, more strongly enhanced and broader anomalies have been identified that appear to correspond with the local topography and highlight similar colluvial accumulations of surface sediment at either the top or bottom of the slopes.

7.2.5. Archaeological activity has been detected across the length of the survey area. In the north of the survey area a possible rectilinear enclosure was identified along the southwestern boundary of Area 3 (Figure 4), with further possible enclosures extending out to the east. Sub-circular anomalies were also recorded within the possible enclosure, potentially indicating internal features relating to the main enclosure. A further series of linear anomalies were identified in Area 6 (Figure 7), with the anomalies in the centre of the area possibly forming part of a large rectilinear enclosure.

7.2.6. In the centre of the survey area, two areas of archaeology were identified. In the north of Area 10, two possible enclosures were identified (Figure 10), running into the edge of the survey area, along with some possible associated features. As with many of the anomalies identified, due to the confines of the survey area, it is not possible to ascertain the extent of this activity or provide a more definitive interpretation. Across Area 20 (Figure 16), a probable enclosure was identified, again running into the edge of the survey area. To the east of this, a series of linear and curvilinear anomalies were identified. These have a similar form to the probable enclosure, but they are weaker, and do not appear to form shapes or patterns that would allow for confident interpretation, and as such have been classified as possible, rather than probable archaeology.

7.2.7. In the south of the survey area, a large area of anomalies of possible archaeological origin were identified (Figure 19). These occupy much of the centre of Area 22 and extend down into Area 23. These anomalies are similar in morphology to the possible archaeology in Area 20. There is a possibility that some of these anomalies may be agricultural in origin, especially in Area 23, where the agricultural trends appear to respect the orientation of the archaeology and run in line with it. A spread of discrete anomalies is present within Area 22. These differ in magnetic signal to the general geological background of the rest of the survey area and could represent enhanced material in the topsoil related to the archaeological anomalies within the same area.

7.2.8. Across the survey area, evidence for agricultural utilisation of the landscape is seen in the form of mapped former field boundaries, along with a possible set of unmapped divisions (Figures 5, 11, 13, 17). Two areas of pre-mechanised arable cultivation have also been identified in Areas 6 and 11. Parallel linear anomalies have been identified across the survey area that collocate with modern ploughing noted at the time of survey and visible on satellite imagery (Figures 5, 8, 11, 14, 17, 20, 23). Other linear trends have also been identified and could indicate earlier ploughing regimes, or other agricultural features such as drainage systems. They have been classified as agricultural as their exact origin cannot be determined.

7.2.9. Anomalies of an undetermined origin have been detected across the survey area (Figures 4, 7, 10, 13, 16, 19 & 22). These anomalies include a variety of magnetic signals

and morphology, differing in size, shape and orientation. While many of these are likely to be agricultural or natural in origin, it is not possible to rule out an archaeological origin for any of these anomalies. This is due to the presence of possible archaeological anomalies throughout the survey area, and due to the limited context provided by some of the narrower survey areas. In the southwest of Area 5, a series of parallel linear anomalies were detected, and could possibly be a trackway. However, due to the presence of the natural variations around these anomalies, it is equally likely that they may be natural in origin and have therefore been classified as Undetermined.

7.3. Interpretation

7.3.1. General Statements

7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.

7.3.1.2. **Ferrous (Spike)** – Discrete dipolar anomalies are likely to be the result of isolated pieces of modern ferrous debris on or near the ground surface.

7.3.1.3. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentration of multiple discrete, dipolar anomalies usually resulting from highly magnetic material such as rubble containing ceramic building materials and ferrous rubbish.

7.3.1.4. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures, typically including fencing, pylons, vehicles and service pipes, have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure weaker anomalies relating to nearby features, should they be present, often over a greater footprint than the structure causing them.

7.3.1.5. **Undetermined** – Anomalies are classified as Undetermined when the origin of the geophysical anomaly is ambiguous and there is no supporting contextual evidence to justify a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally distinct from those caused by ferrous sources.

7.3.2. Magnetic Results - Specific Anomalies

7.3.2.1. **Archaeology Possible (Area 3)** – In the northwest of Area 3, a series of weak linear anomalies have been identified [**3a**], with areas of stronger enhancement along the lengths, beside the southwestern boundary of the survey area (Figure 28). These anomalies appear to form a possible sub rectilinear enclosure, measuring c. 33m by c. 34m, along with possible further, smaller enclosures extending out to the southeast. However, these anomalies likely continue beyond the survey area, and so the full extent of them cannot be known. Strong, discrete anomalies have been identified within the sub rectilinear enclosure, measuring between c. 4.9m and c. 1.3m wide, and possibly indicate internal features relating to the enclosure.

7.3.2.2. **Archaeology Possible (Area 6)** – Across the west of Area 6, a series of weak linear and curvilinear anomalies [**6a**] have been identified (Figure 37). Areas of stronger enhancement have been noted along the lengths of these anomalies. The morphology of these anomalies is characteristic of cut anthropogenic features. In the centre of Area 6, two of the anomalies appear to form returns, and it is possible that they are part of a rectilinear enclosure, the measurable extents being c. 100m by c. 72m. However, it is difficult to be certain, due to the weak magnetic signal of these anomalies and the shape of the survey area, and they could equally be caused by post-Medieval unmapped field boundaries or recent agricultural activity.

7.3.2.3. **Archaeology Possible (Area 10)** – Along the north-western boundary of Area 10, two sets of weak anomalies [**10a**] have been identified (Figure 49), both of which appear to form possible edges of enclosures extending beyond the field boundary. The similarity of the magnetic signal and form of these anomalies suggests a possible shared origin, although the confines of the survey area limit further interpretation.

7.3.2.4. **Archaeology Probable and Possible (Area 20)** – In the west of Area 20, a weak linear anomaly with some stronger enhancement along its length has been identified [**20a**] (Figure 67) and is suggestive of a cut anthropogenic feature. This anomaly appears to form a return and is likely to continue outside the survey area. It could relate to an enclosure or former field division, but a more definitive interpretation is not possible due to the lack of context provided by its position on the edge of the survey area. Immediately to the east of this anomaly, a series of weaker linear and curvilinear anomalies have been identified [**20b**]. They share a similar alignment when compared to anomaly [**20a**], but due to the weaker magnetic signal and the lack of a more coherent shape, they have been classified as Possible Archaeology. It is possible that these may be agricultural in origin and relate to earlier unmapped field divisions.

7.3.2.5. **Archaeology Possible & Spread (Areas 22 & 23)** – Across Area 22 and the centre of Area 23, a series of weak linear and curvilinear anomalies [**22a & 23a**] have been identified (Figures 70 & 73). A spread of discrete anomalies distinct from the geological background has also been identified and could possibly relate to magnetically enhanced material of archaeological origin, either in the topsoil or as the fill of small discrete cut features such as pits. Areas of stronger enhancement have been identified along the length of some of the linear anomalies, and some of the anomalies appear more diffuse. The anomalies in the centre of Area 22 appear to form possible enclosures or former boundary ditches, although it is difficult to be certain as the anomalies are very weak in places and discontinuous, possibly due to being truncated by later ploughing. In the centre of Area 23, several anomalies appear to form a return and could be a continuation of the same field system/enclosures identified in Area 22. However, the agricultural trends running north to south appear to respect the

alignment of several of these anomalies, potentially indicating that they simply reflect more strongly enhanced ploughing. The anomalies have been classified as Possible Archaeology, due to their morphology, which suggests an anthropogenic origin when compared to the natural anomalies surrounding them. However, an agricultural or natural origin cannot be ruled out.

7.3.2.6. **Possible Burnt/Fired** – Across several of the survey areas (Areas 3, 8, 20, 22, 23, 25, 26 & 27), multiple strong positive anomalies with an inverse dipolar magnetic signal have been identified, which is most explicit in the XYs (Figures 32, 47, 68, 71, 74, 77 & 80). It is possible that these anomalies relate to material which has been magnetically enhanced by burning or firing activities, such as kilns, ovens or waste burning. It should be noted that those responses close to anomalies of probable archaeological origin have an increased chance of also being archaeological in origin.

7.3.2.7. **Undetermined (Area 5)** – In the south of Area 5 [**5a**], parallel linear anomalies have been detected, running on an approximately northwest to southeast orientation (Figure 34). These anomalies have been categorised as undetermined, as while their form could possibly be indicative of a trackway, the lack of any further context in the surrounding areas, and the strength of local natural variations makes it difficult to distinguish between these anomalies and those of a more certain natural origin which surround them.

7.3.2.8. **Undetermined (Area 9)** – Covering much of the northern half of Area 9 are numerous linear and discrete positive anomalies of undetermined origin. These anomalies are notable because of their stronger magnetic signal and different alignment compared to the natural anomalies immediately to the south. However, partly due to the narrow extent the survey area has within Area 9, these anomalies lack any pattern or magnetic signal that would allow for a clear interpretation. As such while an archaeological origin is possible, they could equally be caused by natural variations or modern agricultural activity.

7.3.2.9. **Pre-Mechanised Arable Cultivation** – Agricultural activity in the form of pre-mechanised arable cultivation has been identified in Areas 6 and 11 (Figures 37 & 55). These anomalies are characterised by broadly parallel linear and curvilinear anomalies, with a weak positive magnetic signal. Both of these regimes have been recorded running on an approximately northeast to southwest orientation.

7.3.2.10. **Agricultural (Strong/Weak)** – Across the survey area in Areas 2, 10, 13, 15, 17 and 18 (Figures 4, 10, 13 & 16), numerous linear anomalies have been identified, the majority of which have a weak magnetic signal. Most of these anomalies collocate with the position of field boundaries visible on 2nd Edition OS Maps (Figures 5, 11, 14 7 17). The exception are the two weak parallel linear anomalies identified in the south of Area 13. These anomalies are likely to be related to unmapped former field boundaries. These anomalies are parallel to a fence visible in the satellite imagery (Figure 14) and likely reflect the shifting

position of one of these boundaries. However, other agricultural origins should also be considered as an explanation, such as drainage regimes.

7.3.2.11. **Agricultural (Trends)** – Across much of the survey area, weak linear anomalies have been identified which are characteristic of recent ploughing activity. These trends can be seen running parallel to each other and usually collocate with the direction of ploughing seen in satellite images or noted at the time of survey. This category has also been used for other broadly parallel linear anomalies which are consistent with agricultural activity but which do not match the current agricultural regime. These anomalies could therefore be related to pre-mechanised arable cultivation, drains or other modern agricultural activity.

7.3.2.12. **Natural** – Across the south of Area 9 several broadly parallel anomalies have been identified (Figure 40). Their morphology and the local topography suggests these anomalies relate to sediment transportation and near surface colluvial processes. These trends likely originate from the small-scale erosion from surface flows during heavy rainfall or up-slope saturation – known as rills, impacting finer grained sediments (Section 4.3). Other more enhanced and broader anomalies corresponding with the local topography may highlight similar colluvial accumulations of surface sediment at either the top or bottom of the slopes (Figures 4, 7, 10, 13, 16, 19 & 22). More discrete, positively enhanced natural features likely correspond to sedimentary clasts within the superficial deposits, contrasting with the relatively quiet chalk bedrock. These clasts correspond to areas of superficial sands and gravels and head (clay, silts and sand) (see section 4.2). It is possible that some of these anomalies have an anthropogenic origin, as discrete enhanced anomalies like these can be difficult to classify in the magnetic results as archaeological pits present in a similar manner. It should therefore be noted that there is potential for anomalies of archaeological origin to be obscured where this geological background is present.

7.3.2.13. **Services** – In the south of Area 27, a strong linear anomaly has been identified, running approximately north to south. The magnetic signal and appearance of this anomaly is indicative of an underground service.

8. Conclusions

8.1. A fluxgate gradiometer has been successfully undertaken across c. 102.32ha of the survey area, with the remainder unable to be surveyed due to unsafe ground conditions and overgrown vegetation. The survey detected a range of different anomalies of archaeological and agricultural origin, along with anomalies of an undetermined origin. The background enhancement of the superficial deposits of alluvium, sands and gravels which cover much of the survey corridor have contributed to some difficulty in differentiating between anomalies of natural and anthropogenic origin. Modern interference is mostly limited to the edges of the survey areas, and around services and pylons. The narrow width of some of the survey areas has made it difficult to be certain about some of the anomalies origins.

8.2. Probable and possible archaeology has been identified along the length of the survey area, including several enclosures and their associated internal features. As many of these archaeological anomalies diagnostic characteristics of form or anomaly type, they have been classified as possible archaeology, as their morphology is such that an archaeological origin is likely, but there could be other explanations. Discrete anomalies that have possibly been caused by burnt or fired material have also been identified along the survey area, although it is possible that these have a more recent origin.

8.3. Agricultural activity has been detected across the survey area, in the form of both mapped and unmapped former field boundaries, pre-mechanised arable cultivation and evidence of modern ploughing. Other agricultural trends that do not appear to collocate with the ploughing noted on satellite imagery are likely to be either an earlier ploughing regime, or drainage features.

8.4. Undetermined anomalies have been detected throughout the survey area. These anomalies may relate to either natural variations in the superficial deposits, agricultural or archaeological anomalies. Due to the lack of any diagnostic characteristics and lacking further evidence or context, they have been classified as undetermined, although an archaeological origin cannot be ruled out.

9. Tabular summary, by area, of anomalies of potential archaeological interest

Area Number	Headline Interpretation – anomalies of potential archaeological interest only	Potential Date or other relevant information
Area 2	Field Boundaries	Indicated on 2nd Edition OS maps
Area 3	Rectilinear enclosures and possible pits	Potential undated settlement activity
Area 3	Possible burning/firing	Undated; may be recent/historical
Area 5	Parallel linear, other linear and circular anomalies, possible trackway	Possible ring-ditch, if correct likely dates to later prehistory. Trackway and other features belong to a different phase, but the relative sequence cannot be determined from the magnetic data
Area 6	Pre-mechanisation arable cultivation	Broad spacing suggests medieval date
Area 6	linear anomalies possibly forming two rectilinear enclosures	Not possible to suggest a date on the basis of the geophysical results
Area 8	Possible burning/firing	Undated; may be recent/historical
Area 9	linear and discrete positive anomalies in of undetermined origin;	Anomalies are classed as 'undetermined' where there is insufficient evidence in the data to suggest one interpretation is more likely than another: these

		could be pits and ditches of archaeological interest, or could relate to recent agricultural processes or to natural variations in the sub-surface.
Area 10	Semi-circular anomaly, field boundary	Former field boundary depicted on 2nd edition OS; see entry for Area 9 for explanation of 'undetermined' classification. Potential archaeological interest cannot be ruled out for the semi-circular anomaly, but the interpretation is too insecure for speculation about date or function.
Area 10	possible enclosures and semi-circular anomaly	See entry for Area 9 for explanation of 'undetermined' classification. Potential archaeological interest cannot be ruled out for this class, but the interpretation is too insecure for speculation about date or function.
Area 11	Pre-mechanisation arable cultivation	Broad spacing suggests medieval date
Area 13	Field Boundaries	Not depicted on available historical maps.
Area 15	Field Boundaries	Post-medieval field boundary on 2nd edition OS
Area 17	Field Boundaries	Post-medieval field boundary on 2nd edition OS
Area 18	Former field boundary, undetermined linear anomaly.	Post-medieval field boundary on 2nd edition OS and undetermined linear anomaly, which may be of archaeological interest, but is equally likely to be related to natural variations or more recent agricultural activity
Area 20	Possible burning/firing	Undated; may be recent/historical
Area 20	Linear features, part of a possible field system or group of enclosures	Undated
Areas 22 and 23	Possible burning/firing	Undated; may be recent/historical
Areas 22 and 23	Linear and curvilinear anomalies, possible enclosures or former boundary ditches, likely to be of archaeological interest	Suggestive of settlement activity, but without a clear focus/concentration of strong anomalies, and without anomalies of diagnostic morphology, so it is not possible

		to suggest a date from the magnetic survey results.
Area 25	Possible burning/firing	Undated; may be recent/historical
Area 26	Possible burning/firing	Undated; may be recent/historical
Area 27	Possible burning/firing	Undated; may be recent/historical

10. Archiving

10.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.

10.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to any dictated time embargoes.

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12. References

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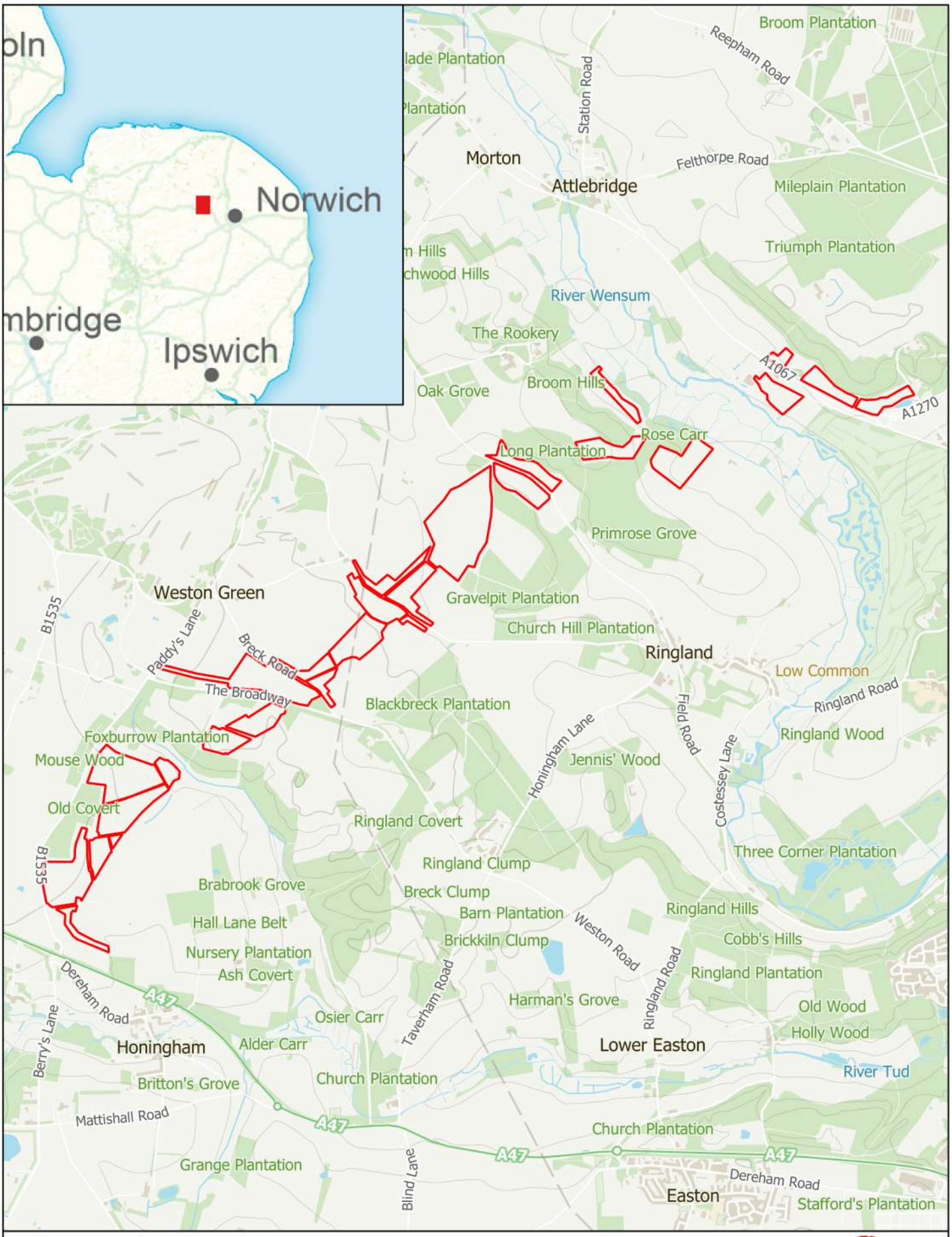
13. Project Metadata

MS Job Code	MSTG746
Project Name	Norwich Western Link
Client	NPS Property Consultants Ltd.
Grid Reference	North: TG 14806 15604. South: TG 10040 12271
Survey Techniques	Magnetometry
Survey Size (ha)	107ha (Magnetometry)
Survey Dates	2020-11-23 to 2020-12-03 and 2021-03-08 to 2021-03-17
Project Lead	Julia Cantarano Ingénieur PCIfA
Project Officer	Christian Adams BA MSc
HER Event No	CNF48395, ENF149516
OASIS No	magnitud1-502265
S42 Licence No	N/A
Report Version	1.0

14. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	AL	CA	26 March 2021
0.2	Draft for Director Approval	CA	KA	01 April 2021
1.0	Corrections based on comments from Client	KA/CA	KA/CA	03 September 2021



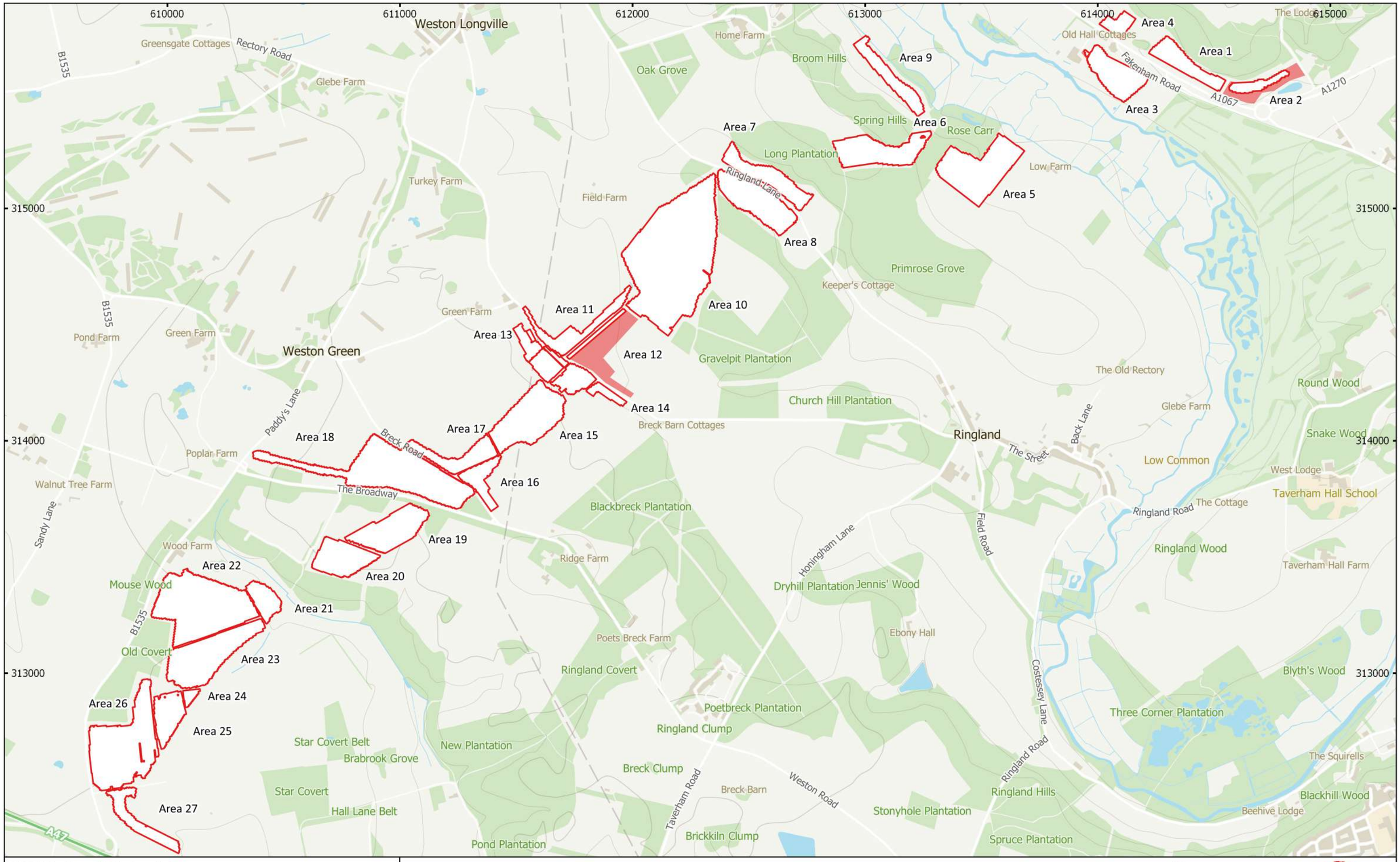
MSTG746 - Norwich Western Link
Figure 1 - Site Location
1:30,000 @ A4

N

0 0.5 1 km

Site Boundary 'Survey Extents'

magnitude surveys



MSTG746 - Norwich Western Link
Figure 2 - Location of Survey Areas
1:15,000 @ A3

Survey Extent
Unsurveyable Extent

N

0 300 600 900 m

magnitude surveys

614100
614400
614700
615000
315900
315900
Area 4
Area 1
Old Hall Cottages
Fakenham Road
The Lodge
315600
315600
Fakenham Road
A1067
Area 2
Area 3
A1270
A1067
A1270
315300
315300

MSTG746 - Norwich Western Link
Figure 3 - Magnetic Total Field (Lower Sensor)(Areas 1, 2, 3 & 4)
1:3,000 @ A3

48,997 nT 49,005

N

0 50 100 150 m

magnitude surveys

614100
614400
614700
615000
315900
315600
315300

Area 4
Area 1
Area 2
Area 3

Old Hall Cottages
Fakenham Road
Fakenham Road
A1067
A1067
A1270
A1270
The Lodge

MSTG746 - Norwich Western Link
Figure 4 - Magnetic Interpretation (Areas 1, 2, 3 & 4)
1:3,000 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Ferrous (Spike)

N
0 50 100 150 m

magnitude surveys

614100 614400 614700 615000

315900 315900

315600 315600

315300 315300

Area 4

Area 1

Area 2

Area 3

Jumper Valley

Hills

Deig

B.M. 40·4

Attlebridge Hill

B.M. 57·1

B.M. 59·6

Crooked Oak

Ford

F.B.

F.P. 33

51

76

50

53

MSTG746 - Norwich Western Link
Figure 5 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Areas 1, 2, 3 & 4)
1:3,000 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Ferrous (Spike)

N

0 50 100 150 m

magnitude surveys

315200
315600
613500
315300
613800
613800
612900
315900
315000
613500
612600
315600
314700
Area 9
Area 5
Area 6
Rose Carr
Spring Hills
Broom Hills
Primrose Grove

MSTG746 - Norwich Western Link
Figure 6 - Magnetic Total Field (Lower Sensor)(Areas 5, 6 & 9)
1:3,000 @ A3

48,997 nT 49,005

N

0 50 100 150 m

magnitude surveys

315200
315600
613500
315300
613800
613800
612900
315900
315000
613500
612600
315600
314700
Area 9
Area 5
Area 6
Rose Carr
Spring Hills
Broom Hills
Primrose Grove

MSTG746 - Norwich Western Link
Figure 7 - Magnetic Interpretation (Areas 5, 6 & 9)
1:3,000 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Ferrous (Spike)

N

0 50 100 150 m

magnitude surveys

315200
315600
613500
315300
613800
613800
315000
613500
314700
612900
315900
612600
315600
Area 9
Area 5
Area 6
Saw Mill
Broom Hills
Spring Hills
Rose Carr
F.B.
Low Farm
B.M. 54·2
Primrose
Grove
50
100

MSTG746 - Norwich Western Link
Figure 8 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Areas 5, 6 & 9)
1:3,000 @ A3

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- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Pre-Mechanised Cultivation (Trend)
- Ferrous (Spike)

N

0 50 100 150 m

magnitude surveys

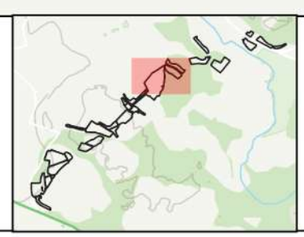
315300
612000
612300
612600
315300
Long Plantation
Area 7
Ringland Lane
Field Farm
315000
315000
Area 8
Area 10
314700
314700
MSTG746 - Norwich Western Link
Figure 9 - Magnetic Total Field (Lower Sensor)(Areas 7, 8 & 10)
1:3,000 @ A3

48,997 nT 49,005
N
0 50 100 150 m
magnitude surveys

611700
315300
612000
612300
612600
315300
315000
315000
314700
314700
Area 7
Long Plantation
Ringland Lane
Field Farm
Area 8
Area 10

MSTG746 - Norwich Western Link
Figure 10 - Magnetic Interpretation (Areas 7, 8 & 10)
1:3,000 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Ferrous (Spike)



N

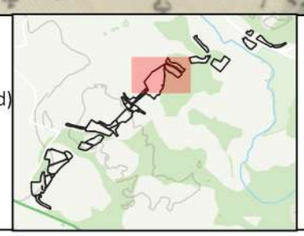
0 50 100 150 m

magnitude surveys

611700
315300
612000
612300
612600
315300
315000
315000
314700
314700
Field Farm
Area 7
Area 8
Area 10
100
100
Lompa Plain
Lompa Plain

MSTG746 - Norwich Western Link
Figure 11 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Areas 7, 8 & 10)
1:3,000 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Pre-Mechanised Cultivation (Trend)
- Ferrous (Spike)



N

0 50 100 150 m

magnitude surveys

611100
611400
611700
612000
314400
314100
Green Farm
Area 11
Area 12
Area 13
Area 14
Area 15
Area 17
Breck Road
Breck Barn Cottages
MSTG746 - Norwich Western Link
Figure 12 - Magnetic Total Field (Lower Sensor)(Areas 11, 12, 14, 14, 15 & 17)
1:3,000 @ A3

48,997 nT 49,005
N
0 50 100 150 m
magnitude surveys

611100
611400
611700
612000
314400
314100
Green Farm
Area 11
Area 12
Area 13
Area 14
Area 15
Area 17
Breck Road
Breck Barn Cottages

MSTG746 - Norwich Western Link
Figure 13 - Magnetic Interpretation (Areas 11, 12, 14, 14, 15 & 17)
1:3,000 @ A3

Agricultural (Strong)
Agricultural (Weak)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)
Agricultural (Trend)
Overhead Cable
Ferrous (Spike)

N
0 50 100 150 m

magnitude surveys

611100
611400
611700
612000
314400
314100
G.P
B.M.158·1
B.M.150·3
△185
134
130
113
Post
B.M. 117·
126
Area 11
Area 12
Area 13
Area 14
Area 15
Area 17

MSTG746 - Norwich Western Link
Figure 14 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Areas 11, 12, 14, 14, 15 & 17)
1:3,000 @ A3

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- Agricultural (Strong)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Overhead Cable
- Pre-Mechanised Cultivation (Trend)
- Ferrous (Spike)

N
0 50 100 150 m

magnitude surveys

610500
610800
611100
611400
313800
313500
Paddy's Lane
The Broadway
Breck Road
Area 15
Area 16
Area 17
Area 18
Area 19
Area 20
Area 21

MSTG746 - Norwich Western Link
Figure 15 - Magnetic Total Field (Lower Sensor)(Areas 15, 16, 17, 18, 19, 20 & 21)
1:3,000 @ A3

48,997 nT 49,005

N

0 50 100 150 m

magnitude surveys

610500
610800
611100
611400
313800
313500
Paddy's Lane
The Broadway
Brick Road
Area 15
Area 16
Area 17
Area 18
Area 19
Area 20
Area 21

MSTG746 - Norwich Western Link
Figure 16 - Magnetic Interpretation (Areas 15, 16, 17, 18, 19, 20 & 21)
1:3,000 @ A3

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Overhead Cable
- Ferrous (Spike)

N
0 50 100 150 m

magnitude surveys

610500 610800 611100 611400

313800 313500

Area 15 Area 16 Area 17 Area 18 Area 19 Area 20 Area 21

△185 178

Honingham Breck Farm

MSTG746 - Norwich Western Link
Figure 17 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Areas 15, 16, 17, 18, 19, 20 & 21)
1:3,000 @ A3

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- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Overhead Cable
- Ferrous (Spike)

N

0 50 100 150 m

magnitude surveys

609600
609900
610200
610500
313200
312900
Area 22
Area 21
Area 20
Area 23
Area 24
Area 25
Area 26
Mouse Wood
Old Covert
B1535

MSTG746 - Norwich Western Link
Figure 18 - Magnetic Total Field (Lower Sensor)(Areas 21, 22, 23, 24, 25 & 26)
1:3,000 @ A3

48,997 nT 49,005

N

0 50 100 150 m

magnitude surveys

609600
609900
610200
610500
313200
312900
Mouse Wood
Old Covert
B1535
Area 20
Area 21
Area 22
Area 23
Area 24
Area 25
Area 26

MSTG746 - Norwich Western Link
Figure 19 - Magnetic Interpretation (Areas 21, 22, 23, 24, 25 & 26)
1:3,000 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Archaeology Possible (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Ferrous (Spike)

N
0 50 100 150 m
magnitude surveys

609600
609900
610200
610500
313200
312900
Area 20
Area 21
Area 22
Area 23
Area 24
Area 25
Area 26
Mouse
Union & R. D. By
Covert
Old
Plantation
B.M.177·0
180
181
Star

MSTG746 - Norwich Western Link
Figure 20 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Areas 21, 22, 23, 24, 25 & 26)
1:3,000 @ A3

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- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Archaeology Possible (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Undetermined (Trend)
- Ferrous (Spike)

N
0 50 100 150 m
magnitude surveys

609600
609900
610200
610500
312600
312300
Area 24
Area 26
Area 25
Area 27
B1535
A47
Berry's Lane
Star Covert

MSTG746 - Norwich Western Link
Figure 21 - Magnetic Total Field (Lower Sensor)(Areas 24, 25, 26 & 27)
1:3,000 @ A3

48,997 nT 49,005

N

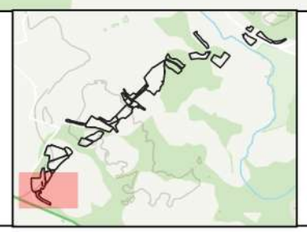
0 50 100 150 m

magnitude surveys

609600
609900
610200
610500
312600
312300
Area 24
Area 25
Area 26
Area 27
B1535
A47
Berry's Lane
Star Covert

MSTG746 - Norwich Western Link
Figure 22 - Magnetic Interpretation (Areas 24, 25, 26 & 27)
1:3,000 @ A3

Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)
Possible Burnt/Fired
Agricultural (Trend)
Undetermined (Trend)
Service
Ferrous (Spike)



N
0 50 100 150 m

magnitude surveys

609600
609900
610200
610500
312600
312300
181
Area 24
Area 26
Area 25
Area 27
B.M.163·2
B.M.129·6
G.P
B.P
Star
Covert

MSTG746 - Norwich Western Link
Figure 23 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Areas 24, 25, 26 & 27)
1:3,000 @ A3

Contains historical maps: Ordnance Survey, 6" 2nd edition c. 1882-1913.
Reproduced with the permission of the National Library of Scotland.
Contains satellite imagery © 2021 Bing Satellite

Magnetic Disturbance
Ferrous/Debris (Spread)
Undetermined (Strong)
Undetermined (Weak)
Possible Burnt/Fired
Agricultural (Trend)
Undetermined (Trend)
Service
Ferrous (Spike)

N
0 50 100 150 m

magnitude surveys

614400

614600

614800

315600

315600

Area 1

Area 2

Fakenham Road

A1067

A1067

A1067

A1270

A1270

315400

315400

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Figure 24 - Magnetic Gradient (Areas 1 & 2)
1:1,500 @ A3

-1 nT 2

N

0 25 50 75 m

magnitude surveys

614400

614600

614800

315600

315600

Area 1

Area 2

Fakenham Road

A1067

A1067

A1067

A1270

A1270

315400

315400

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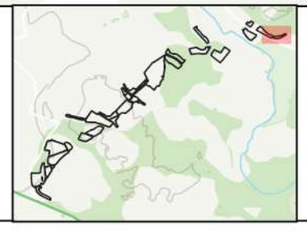
Figure 25 - Magnetic Interpretation (Areas 1 & 2)
1:1,500 @ A3

- Agricultural (Weak)
- Natural (Strong)
- Natural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Ferrous (Spike)



N

0 25 50 75 m

magnitude surveys

614400

614600

614800

Area 1

315600

315600

Fakenham Road

A1067

Area 2

A1270

A1067

A1270

A1067

315400

315400

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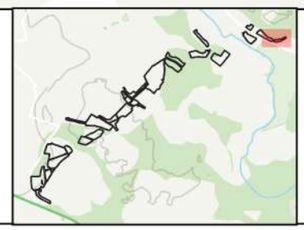
Figure 26 - XY Trace Plot (Areas 1 & 2)
30nT/cm at 1:1,500 @ A3



N

0 25 50 75 m

magnitude surveys

614000
614200
614400
315800
315800
315600
315600
Area 4
Area 3
Area 1
Old Hall Cottages
Fakenham Road
A1067
Fakenham Road

MSTG746 - Norwich Western Link
Figure 27 - Magnetic Gradient (Areas 1, 3 & 4)
1:1,500 @ A3

-1 nT 2

N

0 25 50 75 m

magnitude surveys

614000
614200
614400
315800
315800
315600
315600
Area 4
Area 3
Area 1
3a
Old Hall Cottages
Fakenham Road
A1067
Fakenham Road

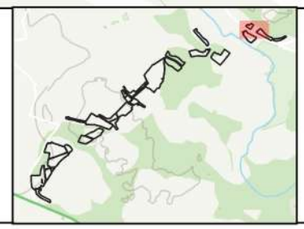
MSTG746 - Norwich Western Link
Figure 28 - Magnetic Interpretation (Areas 1, 3 & 4)
1:1,500 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Natural (Strong)
- Natural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Ferrous (Spike)

N
0 25 50 75 m
magnitude surveys

614000
614200
614400
315800
315800
315600
315600
Area 4
Area 3
Area 1
Old Hall Cottages
Fakenham Road
A1067
Fakenham Road

MSTG746 - Norwich Western Link
Figure 29 - XY Trace Plot (Areas 1, 3 & 4)
30nT/cm at 1:1,500 @ A3



N

0 25 50 75 m

magnitude surveys

614000
614200
614400
315600
315400
Area 3
Area 1
Fakenham Road
A1067

MSTG746 - Norwich Western Link
Figure 30 - Magnetic Gradient (Areas 1 & 3)
1:1,500 @ A3

-1 nT 2

N

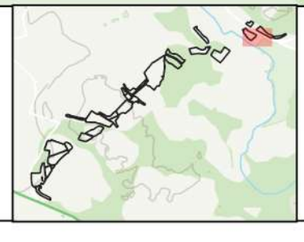
0 25 50 75 m

magnitude surveys

614000
614200
614400
315600
315400
Area 3
Area 1
3a
Fakenham Road
A1067

MSTG746 - Norwich Western Link
Figure 31 - Magnetic Interpretation (Areas 1 & 3)
1:1,500 @ A3

- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Natural (Strong)
- Natural (Weak)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Strong)
- Undetermined (Weak)
- Possible Burnt/Fired
- Agricultural (Trend)
- Ferrous (Spike)



N
0 25 50 75 m

magnitude surveys

614000

614200

614400

Area 3

Area 1

315600

315600

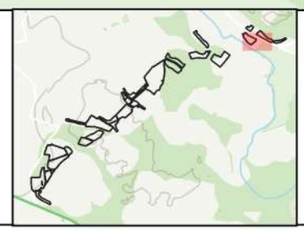
Fakenham Road

A1067

315400

315400

MSTG746 - Norwich Western Link
Figure 32 - XY Trace Plot (Areas 1 & 3)
30nT/cm at 1:1,500 @ A3



N

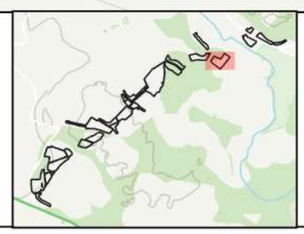
0 25 50 75 m

magnitude surveys

613200
613400
613600
Area 6
Rose Carr
Area 5
315200
315200
315000
315000

MSTG746 - Norwich Western Link
Figure 33 - Magnetic Gradient (Areas 5 & 6)
1:1,500 @ A3

-1 nT 2



N

0 25 50 75 m

magnitude surveys

613200
613400
613600
315200
315000
Area 6
Area 5
Rose Carr
5a

MSTG746 - Norwich Western Link
Figure 34 - Magnetic Interpretation (Areas 5 & 6)
1:1,500 @ A3

- Archaeology Possible (Weak)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Undetermined (Strong)
- Undetermined (Weak)
- Agricultural (Trend)
- Undetermined (Trend)
- Ferrous (Spike)

N
0 25 50 75 m

magnitude surveys