Note: Outline Planning Application (OPA) Site Boundary

The following report was produced prior to the finalisation of the application site boundary. The final application site boundary is shown on Figure 1.1 in ES Appendix 1.1. Therefore, references within the report to the site boundary do not reflect the site area and site boundary submitted with the OPA.

The reports were correct at the time of preparation, and all information within the Environmental Statement assessment reflects the latest relevant information.

GEOPHYSICAL SURVEY REPORT

GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Former Lympne Airfield
Otterpool Park
Kent

Client
Oxford Archaeology
For
Arcadis

Survey Report
12992

Date
July 2018

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GEOPHYSICAL SURVEY REPORT

Project name:
Former Lympne Airfield
Otterpool Park,
Kent

SUMO Job reference:
12992

Client:
Oxford Archaeology
For:
Arcadis

Survey date:
18 – 25 June 2018

Report date:
5 July 2018

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1 SUMMARY OF RESULTS

A geophysical survey on the site of the former Lympne Airfield, Kent, detected a number of archaeological features including a past field system and several former field boundaries. Numerous anomalies are of uncertain origin, and could be due to archaeological, agricultural, natural or more recent causes. Evidence of the former airfield was recorded in the form of magnetic disturbance and ferrous responses, some of which correlate to known features.

2 INTRODUCTION

2.1 Background synopsis

The work was commissioned by Oxford Archaeology via Arcadis who acting on behalf of Folkestone & Hythe District Council and Cozumel Estates. It was undertaken prior to an outline planning application for a new garden settlement – Otterpool Park – to accommodate up to 8,500 homes(use class C2 and C3) and use class D1, D2, A1, A2, A3, A4, B1a, B1b, B2, C1 development with related highways, green and blue infrastructure (access, appearance, landscaping, layout and scale matters to be reserved).

2.2 Site details

NGR / Postcode	TR 115 352 / CT21 4LY
Location	The site is located immediately west of the village of Lympne, Kent, on the site of the former Lympne Airport. It is bounded to the south by Aldington Road, to the west by Lympne and to the east by residential properties.
HER/SMR	Kent
District / Parish	Shepway DC / Lympne CP
Topography	Flat
Current Land Use	Pasture. Several areas were overgrown, accounting for gaps in the data, including a north-west to south-east strip *c.*30m wide separating Areas 1 and 2 on the line of the former runway.
Geology	Solid: Hythe Formation – sandstone and (subequal/subordinate) limestone. Superficial: none recorded (BGS 2018).
Soils	Malling (571c) association soils: well drained non-calcareous fine loamy soils over limestone at variable depths. Some deep well drained coarse loamy soils and similar fine loamy over clayey soils. Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Occassional shallower calcareous soils over limestone (SSEW 1983).
Archaeology	The site comprises the southern part of the former Lympne Airfield. At the southern end of Otterpool Lane, the HER records Frankish interments, a medieval hollow way, buildings and a moated site. Aldington Road is a Roman road and borders the sit to the south (Arcadis 2017). A geophysical survey in 2017 identified ring ditches, ditched enclosures and tracks, field systems and possible settlements north, north-west and north-east of the site (SUMO 2017).
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	29 ha

2.3 Aims and Objectives

To locate and characterise any anomalies of possible archaeological interest within the study area.

3 METHODS, PROCESSING & PRESENTATION

3.1 Standards & Guidance

This report and all fieldwork have been conducted in accordance with the latest guidance documents issued by Historic England (EH 2008) (then English Heritage), the Chartered Institute for Archaeologists (CIfA 2014) and the European Archaeological Council (EAC 2016).

3.2 Survey methods

Detailed magnetic survey was chosen as an efficient and effective method of locating archaeological anomalies.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1.0m	0.25m

More information regarding this technique is included in Appendices A and B.

3.3 Data Processing

The following basic processing steps have been carried out on the data used in this report:

De-stripe; de-stagger; interpolate.

3.4 Presentation of results and interpretation

The presentation of the results includes a 'minimally processed data' and a 'processed data' greyscale plot. Magnetic anomalies are identified, interpreted and plotted onto the 'Interpretation' drawings.

When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated and the local conditions at the site (geology, pedology, topography etc.). Anomalies are categorised by their potential origin. Where responses can be related to other existing evidence, the anomalies will be given specific categories, such as: *Abbey Wall* or *Roman Road*. Where the interpretation is based largely on the geophysical data, levels of confidence are implied, for example: *Probable*, or *Possible Archaeology*. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification *Possible*.

4 RESULTS

The survey has been divided into two survey areas (Areas 1 and 2) and specific anomalies have been given numerical labels [1] [2] *etc*. *which appear in the text below, as well as on the Interpretation Figures.*

4.1 ***Probable and Possible Archaeology***

4.1.1 A number of ditch-like anomalies concentrated in the south of Area 1 were detected; the absence of pit-like anomalies or increased magnetic response suggests a former field system as opposed to settlement. Pairs of parallel anomalies [1] and [2] may represent trackways, and they appear to define the north-western and south-eastern extents of the main complex. The general orientation of the system is south-west / north-east, and it can be seen extending into the zone of magnetic disturbance in the extreme south of Area 1 (see 4.4.1 below). Where the responses are weaker and/or partially masked by the disturbance they have been classified as *Possible Archaeology*.

4.2 ***Uncertain***

4.2.1 A possible three-sided enclosure [3] approximately 60m by 40m in size was identified in Area 2. It is somewhat fragmented and the northern and southern components are straight and parallel, suggesting a relatively recent origin possibly related to the airfield. As an archaeological provenance cannot be wholly dismissed it has been classed as *Uncertain Origin.*

4.2.2 A sub-rectangular anomaly [4] in Area 2 may represent an enclosure of size 50m by 30m. However, it is poorly defined, magnetically weak and barely visible above the background; it may simply be chance alignments of natural or agricultural trends. It is therefore categorised as *Uncertain Origin.*

4.2.3 A band of up to three linear anomalies [5] traverses Area 2 from north to south, curving beyond the survey area at the northern and south-eastern boundaries; it is visible on online satellite imagery of 1960 and 1990 but does not correlate to any former field boundaries shown on available historic mapping. The responses are magnetically strong which together with the regular form of the anomaly suggests a relatively recent provenance, possibly services of some kind or a metalled trackway.

4.2.4 Parallel linear anomalies [6] form a curvilinear “L” shape. Several other pairs of short parallel linear anomalies have been detected, notably [7] adjacent to the eastern boundary. An archaeological provenance is possible, but the geometrical precision and lack of a recognisable archaeological form suggest a modern orgin, probably airfield – related, such as a dispersal pen (a WWII position for parking and maintaining aircraft, a number of which would be distributed around an airfield to minimise losses in the event of an air raid). Magnetically weaker examples of paired trends appear throughout the dataset and may represent relatively recent ploughing, and all have been classified as *Uncertain Origin.*

4.2.5 A band of barely perceptible increased magnetic response [8] would normally be interpreted as being of natural origin, but it is very straight and is bounded by a pair of negative trends. A similar band of increased magnetic response [9] is visible south-east of [8]. In this context the most plausible explanation is former airfield activity.

4.2.6 Some isolated trends and weak pit-like anomalies have been identified, but an agricultural, modern (e.g. airfield – related) or possibly natural origin is considered more likely than an archaeological one. Given the context, some of the pit-like anomalies may simply be more deeper buried ferrous debris

4.3 ***Former Field Boundary***

4.3.1 An "L" shaped chain of irregular dipolar anomalies and magnetic disturbance [10] was detected and correlates with a former field boundary shown on the 1873 OS map; it is also visible on online satellite imagery of 2017. A short length of a former boundary [11] was also identified in the north of Area 1.

4.3.2 The 1873 OS map depicts a boundary traversing the site approximately west – east. It is visible in the data in Area 1 [12] but in Area 2 the magnetic response [13] along the line of the feature is more characteristic of a pipe or service trench, probably laid alongside a boundary later removed.

4.4 ***Modern***

4.4.1 A zone of magnetic disturbance and ferrous responses approximately 120m wide was recorded in the south of the survey area adjacent to Aldington Road. This is attributable to a number of airfield buildings, mostly hangars, visible in this location on a photograph dated to the 1930s (Plate 1). The buildings are absent from a photograph dated 1927 and linear anomalies are visible within the disturbance; dipolar chains are due to pipes or services, whilst others could represent foundations. A car park occupied the extreme south-west corner of the site and is shown on the 1971-74 OS map.

Plate 1: Lympne Airfield in the 1930s http://www.ukairfieldguide.net/airfields/Lympne
Aldington road is top of picture

4.4.2 Numerous ferrous responses throughout the dataset are likely to be due to former airfield installations such as lights, although there is little direct correlation between the anomalies and the location of lights on OS mapping; they were presumably repositioned or replaced at a later date. Other responses may be due to bomb strikes or crash sites from World War Two (WWII). The ferrous anomaly [14] represents the location of the airfleld “wind tee” depicted on the 1961 OS map; the linear anomaly [15] is the service /cable running to it.

4.4.3 The location of an airport taxiway recorded on OS mapping fom 1971 is indicated by parallel trends flanked by areas of magnetic disturbance [16], probably rubble from the taxiway. Parallel trends also flank a strip of magnetic disturbance [17] and is also assumed to be a former hardstanding or similar airfield feature. The Kent HER records WWII dispersal pens in the vicinity, which could not only account for the anomaly but also the areas of dense vegetation which have caused small gaps in the data [18] and [19].

4.4.4 The diagonal gap in the data [20] is due to overgrown vegetation on the line of the former concrete runway.

4.4.5 Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris (or brick / tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

5 DATA APPRAISAL & CONFIDENCE ASSESSMENT

5.1 Historic England guidelines (EH 2008) Table 4 states that the average magnetic response on sandstone is poor, but good on limestone. The technique has been successful in this survey as shown by the ditch-like anomalies detected; some are visible in the area of magnetic disturbance in the south of the site caused by former airfield buildings, demonstrating that archaeological cut features have survived. However, it is also possible that some remains have been destroyed by the later activity, and any magnetically weaker anomalies, if present, will have been masked by the disturbance and ferrous responses.

6 CONCLUSION

6.1 A past field system has been identified in the south-west of the survey area. The complex of ditches extends into an area of magnetic disturbance caused by former airfield facilities.

6.2 Numerous anomalies are of uncertain origin, several of which may be of archaeological interest, but a more recent provenance is equally possible. Others may be airfield-related or services.

6.3 Former field boundaries were detected, one of which is now represented by a pipe or service.

6.4 A number of anomalies that can be attributed to the former airfield were located, including a zone of magnetic disturbance with some internal anomalies, the location of the wind tee and service, possible hardstandings, a taxiway and numerous ferrous responses.

7 REFERENCES

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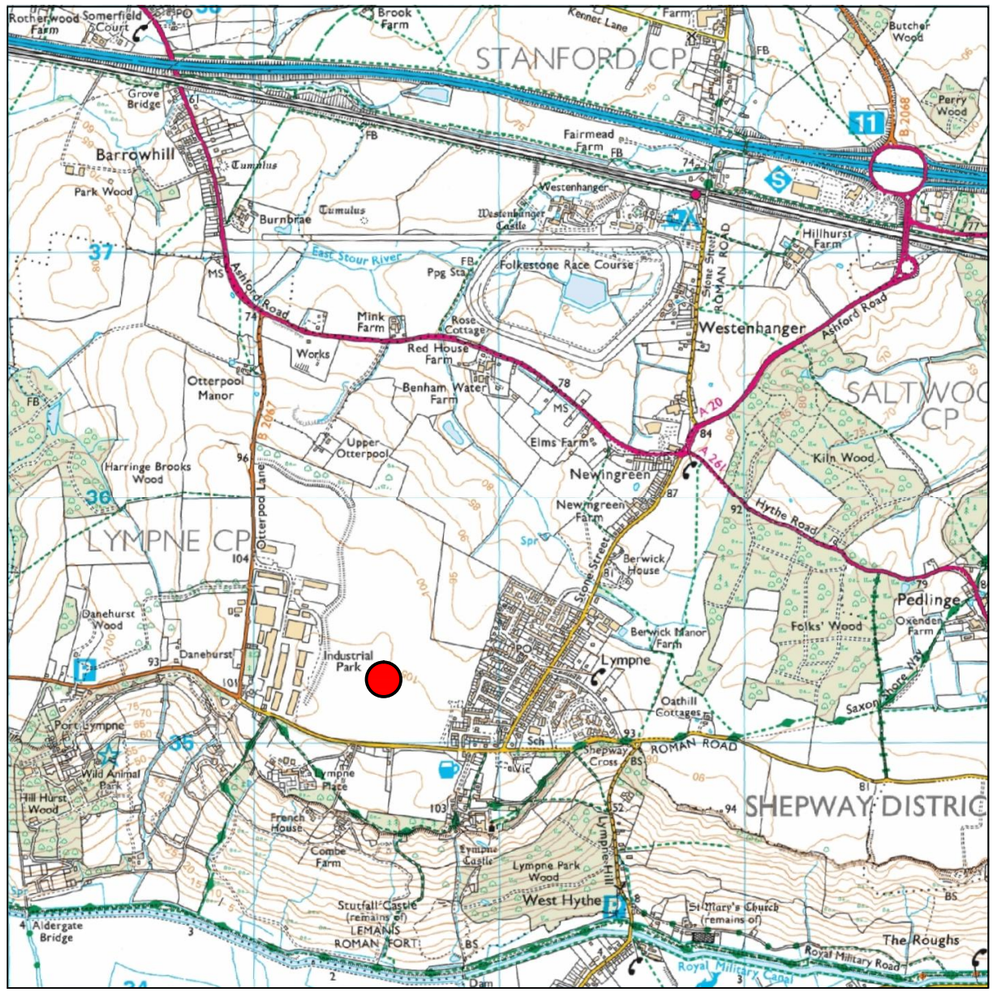

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Site Location

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Site Location Diagram

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield, Otterpool Park, Kent

Scale:
0 metres 1250
1:25000 @ A3

Fig No:
01

Area 1

Area 2

N

Magnetometer Survey Area
showing 30m grids

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Location of Survey Areas

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield,
Otterpool Park, Kent

Scale:
0 metres 125
1:2500 @ A3

Fig No:
02

N

2
nT
-1

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Magnetometer Survey
Greyscale Plots (-1nT to 2nT)

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield,
Otterpool Park, Kent

Scale:
0 metres 125
1:2500 @ A3

Fig No:
03

Area 1

Area 2

N

8
nT
-2

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Magnetometer Survey
Greyscale Plots (-2nT to 8nT)

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield,
Otterpool Park, Kent

Scale:
0 metres 125
1:2500 @ A3

Fig No:
04

Area 1

Area 2

N

KEY

	Probable Archaeology (discrete anomaly / trend)
	Possible Archaeology (trend)
	Former Field Boundary (conjectural)
	Uncertain Origin (discrete anomaly / trend)
	Uncertain Origin (increased response)
	Airfield Related Anomaly (discrete / trend)
	Airfield Related Anomaly (possible pipe mine)
	Pipe / Service
	Magnetic Disturbance
	Ferrous

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

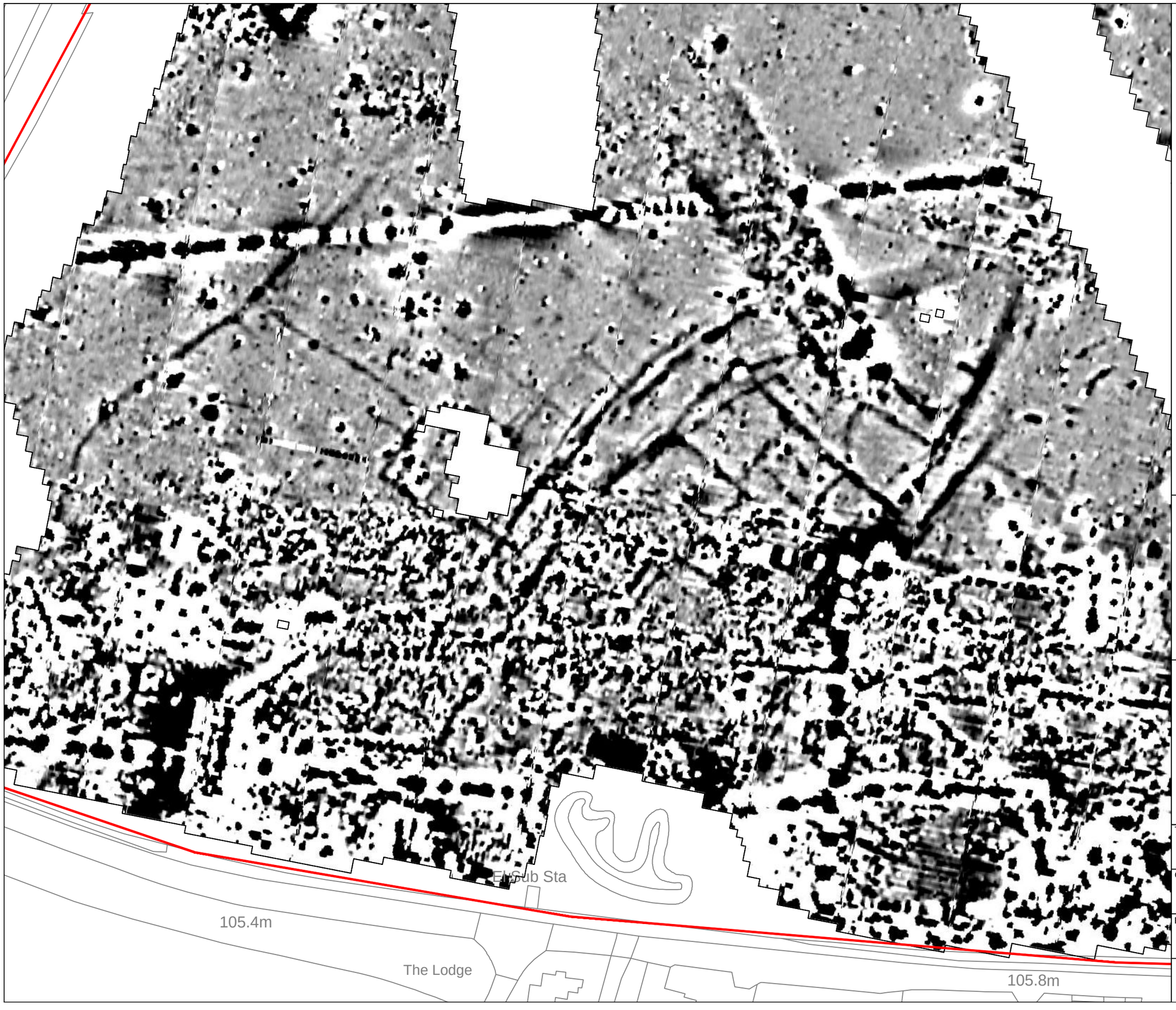
Title: Magnetometer Survey Interpretation

Client: Oxford Archaeology

Project: 12992 Former Lympne Airfield, Otterpool Park, Kent

Scale: 0 metres 125
1:2500 @ A3

Fig No: 05



sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Magnetometer Survey [Area 1 South]
Greyscale Plot

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield,
Otterpool Park, Kent

Scale:
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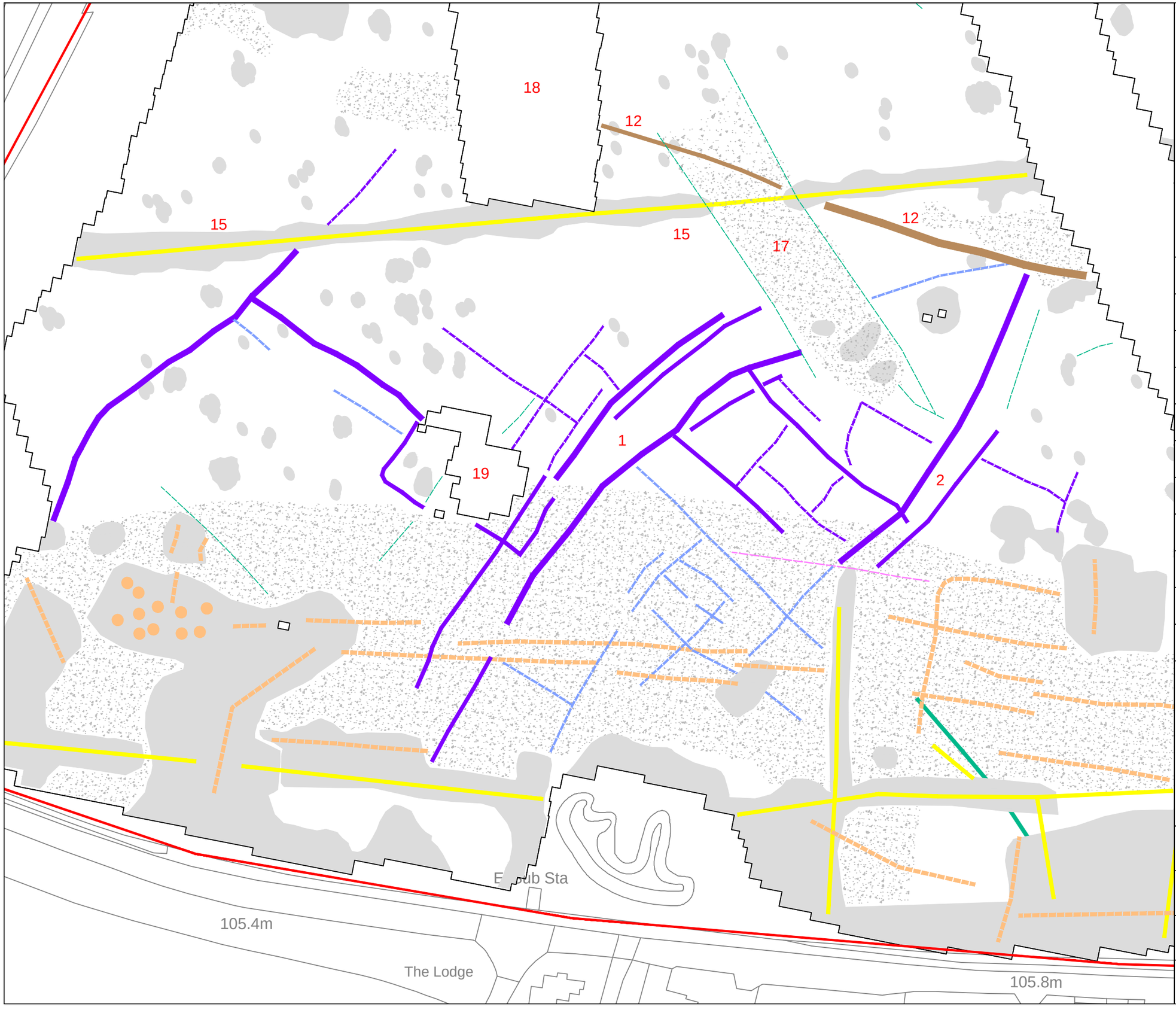
1:1000 @ A3

Fig No:
06



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KEY

	Probable Archaeology (discrete anomaly / trend)
	Possible Archaeology (trend)
	Former Field Boundary (conjectural)
	Uncertain Origin (discrete anomaly / trend)
	Uncertain Origin (increased response)
	Airfield Related Anomaly (discrete / trend)
	Airfield Related Anomaly (possible pipe mine)
	Pipe / Service
	Magnetic Disturbance
	Ferrous

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

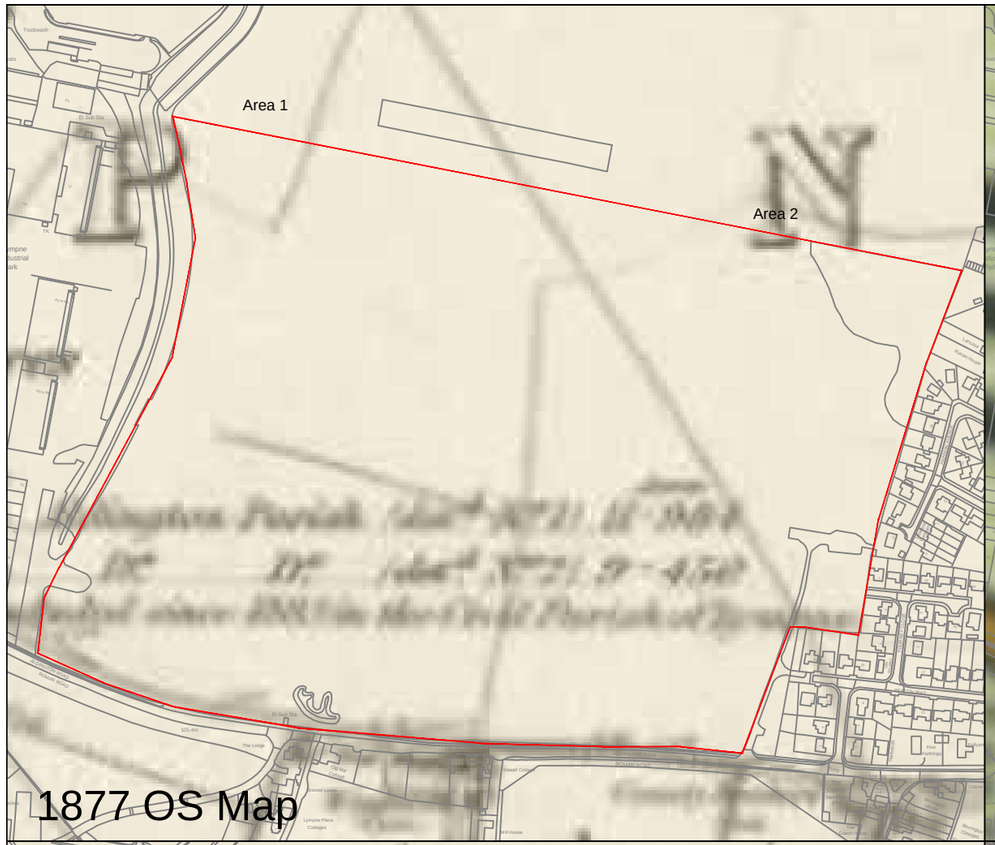
Title: Magnetometer Survey [Area 1 South] Interpretation

Client: Oxford Archaeology

Project: 12992 Former Lympne Airfield, Otterpool Park, Kent

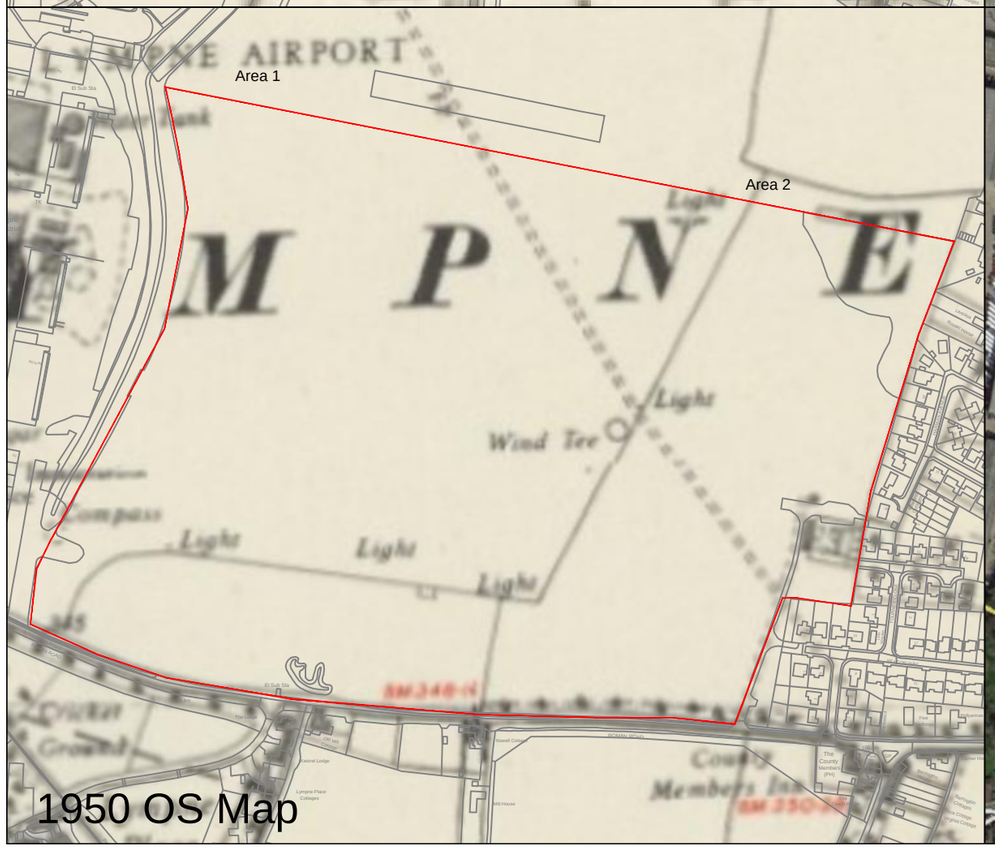
Scale: 0 metres 50
1:1000 @ A3

Fig No: 07

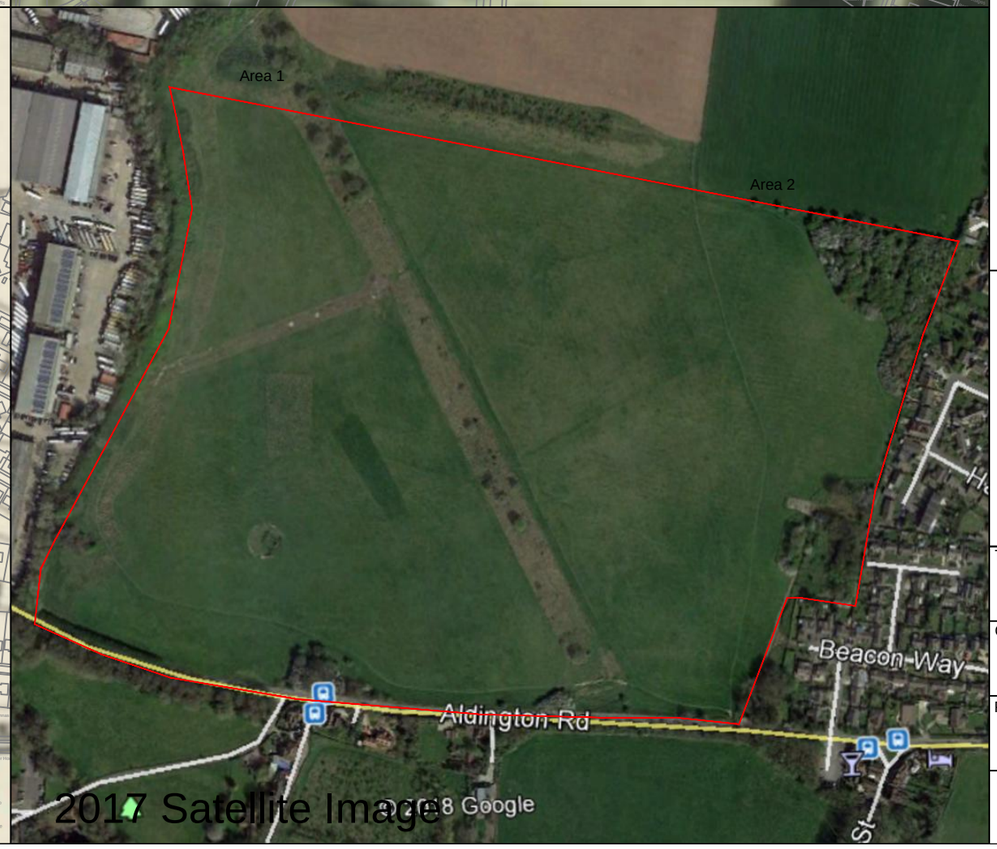


1877 OS Map

1940-47 Bartholomew Map



1950 OS Map



2017 Satellite Image

N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Magnetometer Survey
Historic Maps and Satellite Image

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield,
Otterpool Park, Kent

Scale:
0 metres 250
1:5000 @ A3

Fig No:
08

N

5
nT
-5

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

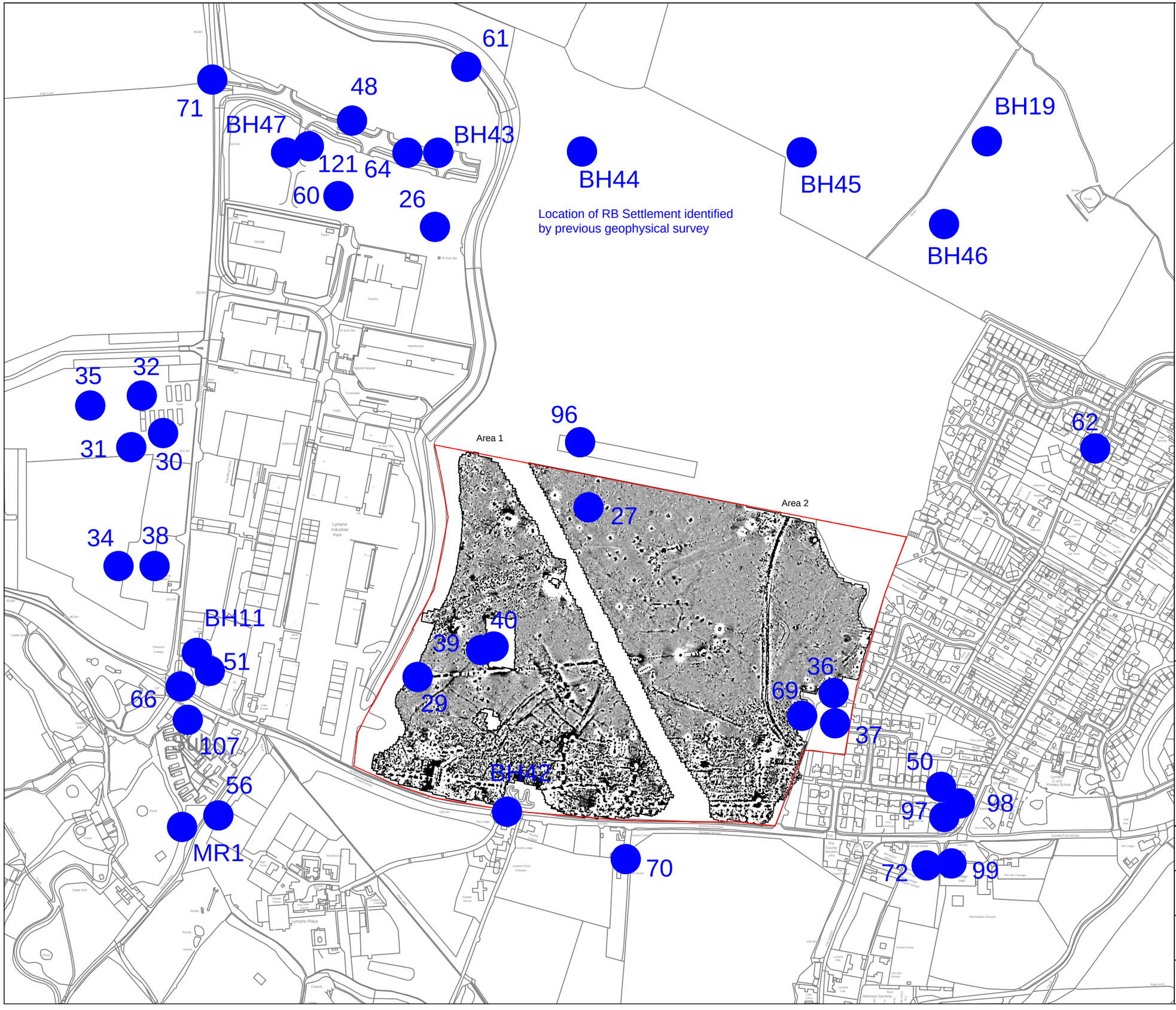
Title:
Magnetometer Survey
Greyscale Plots (Minimally Processed Data)

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield,
Otterpool Park, Kent

Scale:
0 metres 125
1:2500 @ A3

Fig No:
09



N

KEY to HER Assets (from Arcadis 2016)

ID	HER Ref	Description
26	TR13NW68	Bronze Age Occupation Site
27	TR13NW70	Lympne Airfield
29	TR13NW73	Aircraft Dispersal Pen (site)
30	TR13NW74	Gas decontamination building
31	TR13NW75	Air raid shelters
32	TR13NW76	Picket Hamilton fort
34	TR13NW78	Site of trenches
35	TR13NW79	Former barracks huts
36	TR13NW80	Site of overblister hangar and trackway
37	TR13NW81	Remains of machine gun range
38	TR13NW83	Bulk fuel installation
39	TR13NW84	Runway
40	TR13NW72	Aircraft dispersal pen
48	TR13NW13	Cropmark and ring ditch
50	TR13NW17	Tranchet Axe
51	TR13NW18	Moat site, bellevue House (medieval)
56	TR13SW2	*c*.6th-7th century Frankish interments
60	TR13NW86	Picket Hamilton fort
61	TR13NW87	Concrete base, likely to be WWII
62	TR13NW144	Gun emplacement
64	TR13NW89	Finds at Link Park
66	TR13NW43	Belle Vue Aisled Barn (medieval)
69	TR13NW82	Remains of ammunition store
70	TR13SW134	Site of windmilland smock mill
71	TR13NW148	11th century bronze stirrup strap mount
72	TR13NW196	Three Iron Age coins
96	MKE69434	Copper alloy brooch (medieval)
97	TR13NW149	Anglo-Saxon gold shilling
98	TR13NW177	Anglo-Saxon silver penny
99	TR13NW150	Anglo-Saxon silver penny
107	TR13NW175	Medieval hollow way, enclosure and buildings
121	MKE97538	Prehistoric ditch and post-holes at Enterprise Way
BH11	MKE88406	Bellevue House (post-medieval)
BH19	MKE88417	Outfarm northwest of Berwick House (post-medieval)
BH42	TR13NW138	Pillbox
BH43	TR13NW139	Pillbox
BH44	TR13NW140	Pillbox
BH45	TR13NW141	Pillbox
BH46	TR13NW143	Pillbox
BH47	TR13NW145	Pillbox
MR1	DKE2293	Crash site of Hawker Typhoon IB

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Non-Designated Assets and Military Remains

Client:
Oxford Archaeology

Project:
12992 Former Lympne Airfield, Otterpool Park, Kent

Scale:
0 metres 250
1:5000 @ A3

Fig No:
10

Appendix A - Technical Information: Magnetometer Survey Method

Grid Positioning

For hand held gradiometers the location of the survey grids has been plotted together with the referencing information. Grids were set out using a Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS GPS system.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. This results in an accuracy of around 0.01m.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1m	0.25m

Instrumentation: Bartington *Grad* 601-2

Bartington instruments operate in a gradiometer configuration which comprises fluxgate sensors mounted vertically, set 1.0m apart. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried, or cart mounted, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method, though strongly magnetic objects may be visible at greater depths. The Bartington instrument can collect two lines of data per traverse with gradiometer units mounted laterally with a separation of 1.0m. The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

Data Processing

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (De-stagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

Display

Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly, all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.

Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall,* etc.) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

Archaeology / Probable Archaeology	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and /or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
Possible Archaeology	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
Industrial / Burnt-Fired	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
Former Field Boundary (probable & possible)	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
Ridge & Furrow	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity.
Agriculture (ploughing)	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
Land Drain	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
Natural	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
Magnetic Disturbance	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
Service	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. pvc) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
Ferrous	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
Uncertain Origin	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of *Possible Archaeology* / *Natural* or (in the case of linear responses) *Possible Archaeology* / *Agriculture*; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

Appendix B - Technical Information: Magnetic Theory

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTeslas (nT) in an overall field strength of 48,000 (nT), can be accurately detected.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

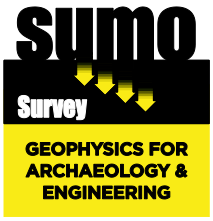
Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns; material such as brick and tile may be magnetised through the same process.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried feature. The difference between the two sensors will relate to the strength of a magnetic field created by this feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity and disturbance from modern services.



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