SUFFOLK ARCHAEOLOGY

• A HISTORY OF EXPERTISE •

Land at Norton Road,
Thurston, Suffolk

Client:
Pigeon Capital Management 2 Ltd
& Mr Peter Hay

Date:
December 2016

THS 031
Archaeological Assessment and Geophysical Survey Report
SACIC Report No. 2016/101
Author: Timothy Schofield HND BSc MCIfA

Land at Norton Road, Thurston, Suffolk
THS 031

Archaeological Assessment & Geophysical Survey Report

SACIC Report No. 2016/101

Author: Timothy Schofield

Illustrator: Timothy Schofield

Editor: Richenda Goffin

Report Date: December 2016

HER Information

Site Code:	**THS 031**
Event Number:	**ESF25217**
Site Name:	**Land at Norton Road, Thurston, Suffolk**
Report Number	**2016/101**
Planning Application No:	**Pre-determination**
Date of Fieldwork:	**29th November – 8th December 2016**
Grid Reference:	**TL 9238 6577**
Oasis Reference:	**269578**
Curatorial Officer:	**TBC**
Project Officer:	**Timothy Schofield**
Client/Funding Body:	**Pigeon Capital Management 2 Ltd & Mr Peter Hay**
Client Reference:	**n/a**

Digital report submitted to Archaeological Data Service:
http://ads.ahds.ac.uk/catalogue/library/greylit

Disclaimer

Any opinions expressed in this report about the need for further archaeological work are those of Suffolk Archaeology CIC. Ultimately the need for further work will be determined by the Local Planning Authority and its Archaeological Advisors when a planning application is registered. Suffolk Archaeology CIC cannot accept responsibility for inconvenience caused to the clients should the Planning Authority take a different view to that expressed in the report.

Prepared By: Timothy Schofield
Date: December 2016

Approved By: Rhodri Gardner
Position: Director
Date: December 2016
Signed: R.V.Gardner.

Contents

List of Figures

List of Appendices

Summary

In November and December 2016 Suffolk Archaeology Community Interest Company (SACIC) undertook a detailed fluxgate gradiometer survey on land at Norton Road, Thurston, Suffolk. An arable field comprising *c.*15 hectares of arable land was prospected for anomalies of archaeological derivation.

The detailed fluxgate gradiometer survey recorded a variety of geophysical anomalies, including those indicative of archaeological pits, relic field boundaries and a linear area of magnetic disturbance interpreted as a potential trackway. Anomalies of geological origin were further prospected. The results of this non-intrusive survey do not suggest that the site contains archaeological deposits of major importance, and that should further work be recommended it would be appropriate for it to be carried out as a condition of future planning consent.

1. Introduction

From the 29th November to the 8th December 2016, a detailed fluxgate gradiometer survey covering *c.*15 hectares within a single field to the north of Norton Road, Thurston, Suffolk (Fig.1) was undertaken by Suffolk Archaeology Community Interest Company (SACIC).

The detailed fluxgate gradiometer survey was undertaken as part of an outline planning application. Suffolk Archaeology CIC were commissioned by Mr Anthony Palmer of Pigeon Capital Management 2 Ltd ('Pigeon') on behalf of the landowner Mr Peter Hay, for whom Pigeon act as promoter.

Figure 1. Location map
Contains Ordnance Survey data © Crown copyright and database right 2016
(Site boundary depicted in red)

2. Geology and topography

The site is located on the northeastern edge of Thurston within one arable field that comprised a total area of *c.*15 hectares, bounded to the north by a trackway, to the west by Meadow Lane, to the south by Norton Road and to the east by fields and farmhouses. Situated adjacent to a tributary of the Black Bourn river on a northeastern facing site at a height of 54m AOD in the southwestern corner, sloping down to 38m AOD in the northeastern corner. The land has been set aside to agricultural practice over the last few centuries and is currently under arable cultivation.

The bedrock geology in the north and east is described as Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk and Culver Chalk Formations, sedimentary bedrock formed 71 to 94 million years ago in warm chalk seas during the Cretaceous period. In

the southwest of the site the bedrock geology is described as Crag Group sand, formed 0 to 5 million years ago in the shallow seas of the Quaternary and Neogene periods (BGS, 2016).

Superficial geology (Fig. 3) in the southwestern and central portion of the site is described as glacial till deposits of Lowestoft Formation Diamicton (purple and cyan shading) formed up to 3 million years ago in the Quaternary period. A broad lens of coversand (magenta shading) deposited during the same epoch is recorded in the centre of the site. In the north-eastern corner of the northern area superficial river deposits of head clay, silt, sand and gravel (brown shading) and alluvial clay, silt sand and gravel (yellow shading) have been recorded (BGS, 2016).

3. Archaeology and historical background

The following archaeological background is taken from a recent archaeological desk-based assessment prepared by CgMs Consulting Ltd (THS 020, Flitcroft, 2016) for a site immediately to the south of the current survey area. A Neolithic ditch was recorded during archaeological monitoring (THS 011) 1km to the west of site. Approximately 600m to the northeast, near Skeleton Plantation, a Bronze Age cinerary collared urn was recovered (THS 003). A 2km stretch of the former Roman Road (THS 007) lies 900m to the northwest. The possible location of the fire-destroyed 13th century Old Netherhall (THS 010) lies to the north of Lady Greene's plantation, immediately adjacent to the northeast of the survey area. Pernal Green (THS 009), a medieval common surrounded by housing and associated fishing ponds is located 900m to the northeast. The medieval parish church of St Peter (THS 006) is located 750m to the southeast of the site. A post mill (THS 008) located on a mound dating to the 16th century is recorded on Mill Lane 1km to the northwest of the survey area along with a contemporary gallows mound.

4. Methodology

Instrument type

A Bartington DualGRAD 601-2 fluxgate gradiometer was employed to undertake the detailed geophysical survey; the weather, ground and geological soil conditions were found to be suitable.

Instrument calibration and settings

One hour was allocated to allow the instruments' sensors to reach optimum operating temperature before the survey commenced each day. The weather was sunny and cold with periods of ground frost. Instrument sampling intervals were set to 0.25m along 1m traverses (four readings per metre).

Survey grid layout

The detailed survey was undertaken within 20m grids (Fig. 3, blue grid), orientated east to west and geolocated employing a Leica Viva GS08+ Smart Rover RTK GLONASS/GPS, allowing an accuracy of +/- 0.01m. Data were converted to National Grid Transformation OSTN15.

Data capture

Detailed fluxgate gradiometer survey data points were recorded on an internal data logger that were downloaded and checked for quality at midday and in the evening, allowing grids to be re-surveyed if necessary. A pro-forma survey sheet was completed to allow data composites to be created. Data were filed in unique project folders and backed-up onto an external storage device and then a remote server in the evening.

Data software, processing and presentation

The site had a relatively high magnetic background allowing good quality raw survey data to be collected with minimal data processing required. Datasets were composited and processed using DW Consulting's Terrasurveyor v.3.0.31.0; the raw grid files, composite and raster graphic plots will be stored and archived in this format. Minimal processing algorithms were undertaken on the raw (Figs. 3a and 5a) and processed datasets (Figs. 4b, 4c, 5b and 5c); schedules are presented in Appendix 1.

Data composites were exported as raster images into AutoCAD, interpretation plans based on the combined results of the raw, processed and xy trace plots (Figs. 4a – 4c and 5a – 5c) have been produced (Figs. 4d and 5d). A combined processed magnetometer greyscale and interpretation plot has also been produced at a smaller scale enabling the entire survey area to be viewed (Figs. 6 and 7).

Survey grid restoration

Three virtual survey grid stations were placed on survey grid nodes along the baselines of the field in order to allow the location of the grid and the geophysical anomalies to be accurately retargeted (Fig. 3).

5. Results and discussion

The fluxgate gradiometer survey located a fairly narrow range of anomalies (Figs. 4d, 5d and 7). Areas of magnetic disturbance (grey shading) caused by ferrous material relating to agricultural practices, field boundary furniture and services were prospected across the survey area. Isolated dipolar responses (grey spots) were numerous and are likely to be caused by buried ferrous objects present within the topsoil horizon. Due to the large area (*c.*15 hectares) the results have been split up and displayed into southern and northern areas, (Figs. 4a – 4d, 5a – 5d); this allows the data to be presented at a suitable scale (1:1000).

Southern Area (Figs. 4a – 4d)

Figures 4a – 4d illustrate data collected on the higher ground in the southern part of the site that at the time of survey was covered in low cropped stubble. Weak narrow parallel negative anomalies delineate the location of extant wheel ruts caused by heavy farm vehicles and 4x4 trucks (Figs. 4a – 4c). Areas of magnetic disturbance (grey shading) located on the periphery of the survey area record ferrous material present within the field boundaries. Seven centrally recorded areas of magnetic disturbance within the dataset are indicative of large buried ferrous objects.

One dipolar linear anomaly (blue shading) recorded on the western boundary, orientated approximately east to west, is likely to delineate the location of a ferrous service run. The positive response is likely to be caused by the material of the conduit

and the associated negative response to its north by trench backfill deposits that have a comparatively low magnetic susceptibility.

Narrow positive polygonal and linear anomalies (green lines) indicative of geological patterned ground have been recorded in the northeastern part of the southern area, all of which are situated on the side of the slope. Broad positive anomalies (green shading) of probable geological origin have further been recorded. These responses are likely to show evidence of sub-glacial infilling of underlying chalk hollows with Lowestoft Diamicton deposits during the last glaciation.

Seven positive discrete anomalies (orange shading) indicative of archaeological pits have been recorded across the survey area, six of which form a broad cluster, centre-east of the southern area. Two of these potential archaeological pits also appear to 'cutting' a broad geological linear anomaly, indicating that they are later in date.

Two adjoining positive linear anomalies (magenta shading) located in the south-western corner, orientated east to west and north to south, delineate a relic field boundary that is not present on any of the Ordnance Survey maps, therefore it may have been backfilled before the survey of the First Edition map of 1884. A third positive linear anomaly located on the northern boundary of the southern area, orientated east to west, delineates the location of the now removed field boundary, last depicted on the 1952 Ordnance Survey map (Fig. 3).

Northern Area (Figs. 5a – 5d)

The smaller northern area is located on lower lying ground adjacent to a tributary of the Black Bourn river; at the time of the survey it was set aside to a young crop. Broad areas of magnetic disturbance (grey shading) on the southern limit of the field record the presence of ferrous material within the former field boundary that bisects the northern and southern areas.

The broad curvilinear area of magnetic disturbance (grey shading) is of particular note. Located towards the northern end of the dataset, it follows the route of a relic footpath depicted on the 1884 Ordnance Survey map (Fig. 3). This response is particularly ferruginous in nature and may prove to belong to a more substantial construction, for

example a metalled track surface.

Narrow positive linear and polygonal anomalies (green lines) similar to those recorded in the southern area were also prospected on the down slope of the northern area. These are likely to have been caused by glacial coversands infilling polygonal hollows present within the brecciated chalk horizon below the topsoil, forming polygonal patterned ground. Broader linear and curvilinear anomalies (green shading) record the locations of glacially infilled chalk hollows containing the more magnetic Lowestoft Diamicton.

Seven positive discrete anomalies (orange shading) have been recorded in the northern field that are potentially archaeological pits; these have been recorded across a widespread area with no apparent clustering.

Four positive linear anomalies (magenta shading) were prospected in the northern field, all orientated approximately east to west, three of which correspond well with the locations of relic field boundaries recorded on the 1884 - 1991 Ordnance Survey maps (Fig. 3). The north-western most linear anomaly is not depicted on the historic cartographic sources.

6. Conclusion

The geophysical survey results indicate that a low degree of archaeological activity is present within the survey area, a fairly narrow range of anomalies were recorded. Those with the greatest archaeological potential being the discrete positive anomalies, linear positive anomalies and the linear area of magnetic disturbance in the northern area. The background search also revealed that no known archaeological sites are recorded within the boundary. Evaluation trenching, carried out as a condition of a future application, to target both the blank areas and the full range of geophysical anomalies recorded, would be a proportional next stage of intrusive archaeological investigation.

7. Archive deposition

The paper and digital archive will be kept at the SACIC office in Needham Market, before deposition in the Suffolk County Council Stores in Bury St Edmunds.

8. Acknowledgements

The fieldwork was carried out by Tim Schofield and Ed Palka and directed by Tim Schofield.

Project management was undertaken by Rhodri Gardner.

The report illustrations were created by Tim Schofield and the report was edited by Richenda Goffin.

9. Bibliography

Ayala, G., et al, 2004, *Geoarchaeology; Using Earth Sciences to Understand the Archaeological Record.* English Heritage.

Bateman, M. D., et al, 2014, *The Evolution of Periglacial Patterned Ground in East Anglia, UK*. Journal of Quaternary Science, vol. 29, Issue 4, 301-400.

Brown, N., and Glazebrook, J, (eds), 2000, *Research and Archaeology: A Framework for the Eastern Counties, 2. Research Agenda and Strategy.* East Anglian Archaeology Occasional Paper No. 8.

Chartered Institute for Archaeologists, 2014, *Standard and Guidance for Archaeological Geophysical Survey.*

Clark, A. J., 1996, *Seeing Beneath the Soil, Prospecting Methods in Archaeology.* BT Batsford Ltd. London.

David, A., *et al*, 2014, *Geophysical Survey in Archaeological Field Evaluation*. Historic England.

Filtcroft, M., 2016, *Archaeological Desk-based Assessment, Norton Road, Thurston, Suffolk*. CgMs Consulting Ltd.

Gaffney, C., Gater. J., and Ovenden, S., 2002, *The Use of Geophysical Techniques in Archaeological Evaluations.* IFA Technical Paper No.6.

Gaffney, C., and Gater. J., 2003, *Revealing the Buried Past, Geophysics for Archaeologists.* Tempus Publishing Ltd.

Historic England, 2015, *Management of Research in the Historic Environment (MoRPHE)*.

Gurney, D., 2003, *Standards for Field Archaeology in the East of England.* East Anglian Archaeology Occasional Paper 14.

Medlycott, M. (ed), 2011, *Research and Archaeology Revisited: A revised framework for the East of England.* East Anglian Archaeology Occasional Paper 24.

Schmidt, A., 2001, *Geophysical Data in Archaeology: A Guide to good Practice.* Archaeology Data Service. Oxbow books.

Schmidt, A., et al, 2015, *EAC Guidelines for the use of Geophysics in Archaeology; Questions to ask and Points to Consider*. EAC Guidelines 2.

SCCAS, 2010, *Deposition of Archaeological Archives in Suffolk.*

SCCAS, 2011, *Requirements for a Geophysical Survey*.

Witten, A. J., 2006, *Handbook of Geophysics and Archaeology.* Equinox Publishing Ltd. London.

Websites

British Geological Survey, 2016, http://mapapps.bgs.ac.uk/geologyofbritain/home.html

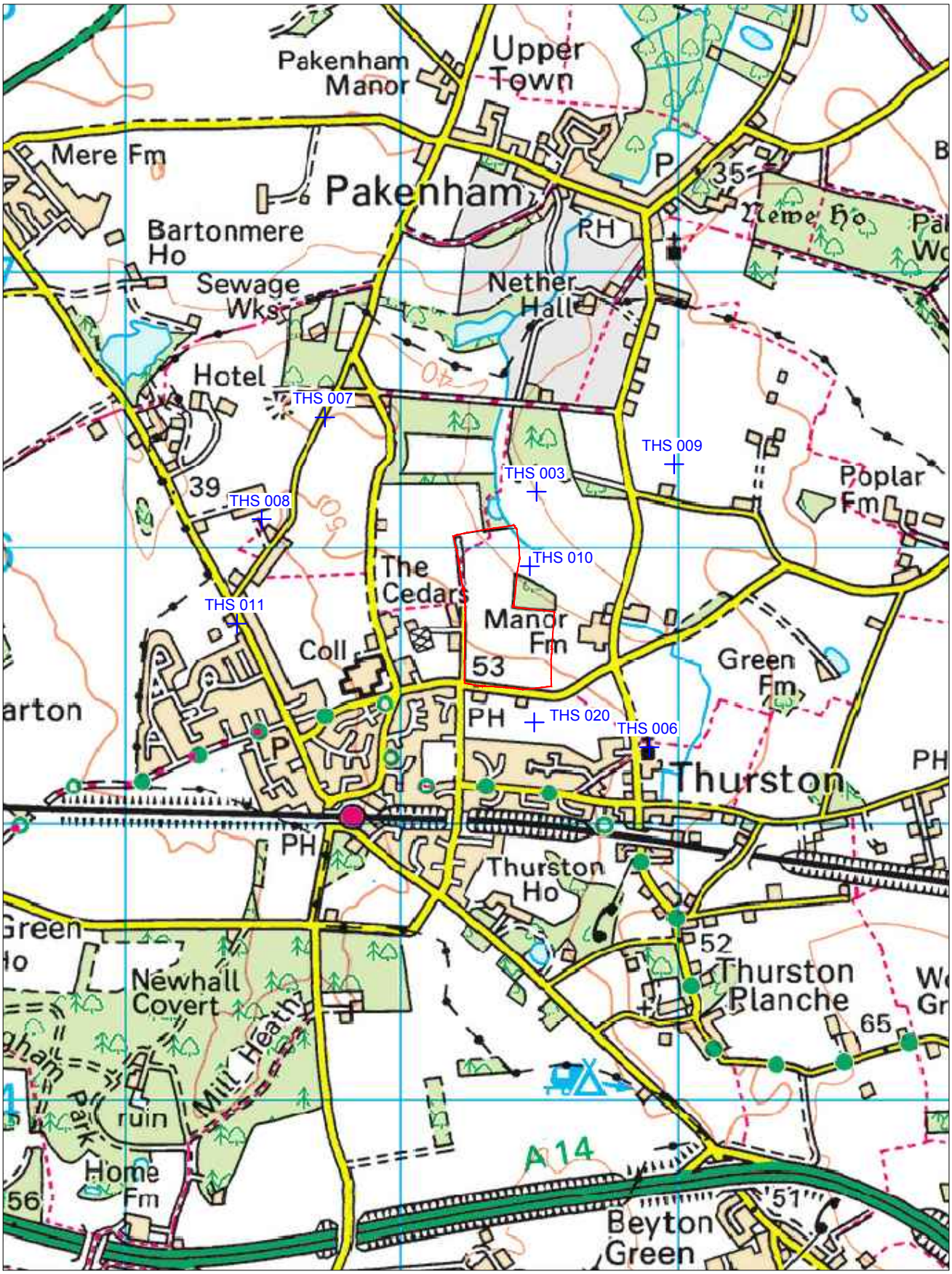


Figure 2. Plan showing HER monument data

Survey Station	Easting	Northing
STN 01	592246.312	266033.140
STN 02	592246.312	265513.140
STN 03	592546.312	265513.140

Geology	
	Alluvium, clay, silt, sand and gravel
	Head, clay, silt, sand and gravel
	No superficial geology recorded
	Lowestoft Formation Diamicton superficial geology above Lewes Nodular Chalk bedrock
	Cover sand
	Lowestoft Formation Diamicton superficial geology above Crag Group Sand bedrock
Digitised Historic Cartographs	
	1884 Ordnance Survey Map Features
	1994 Ordnance Survey Map Feature

N

STN 01 STN 02 STN 03

Lady Greene's Plantation

MEADOW LANE

IVYWORTH ROAD

RYLANDS CLOSE

NORTON ROAD

El Sub Sta

GP

2 65 800

592 300

0 100m

Figure 3. Survey grid, georeferencing, & geology plot

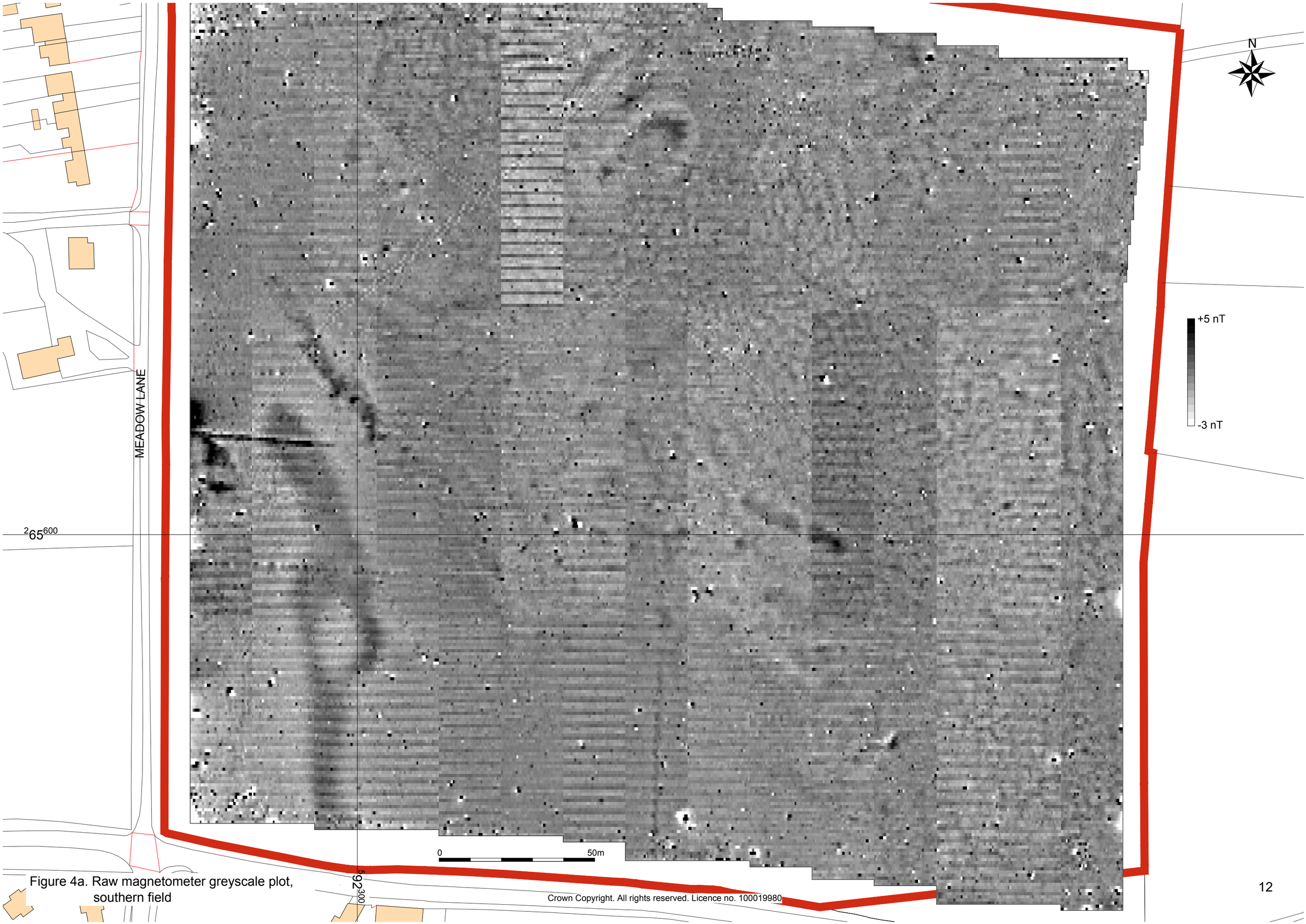


Figure 4a. Raw magnetometer greyscale plot, southern field

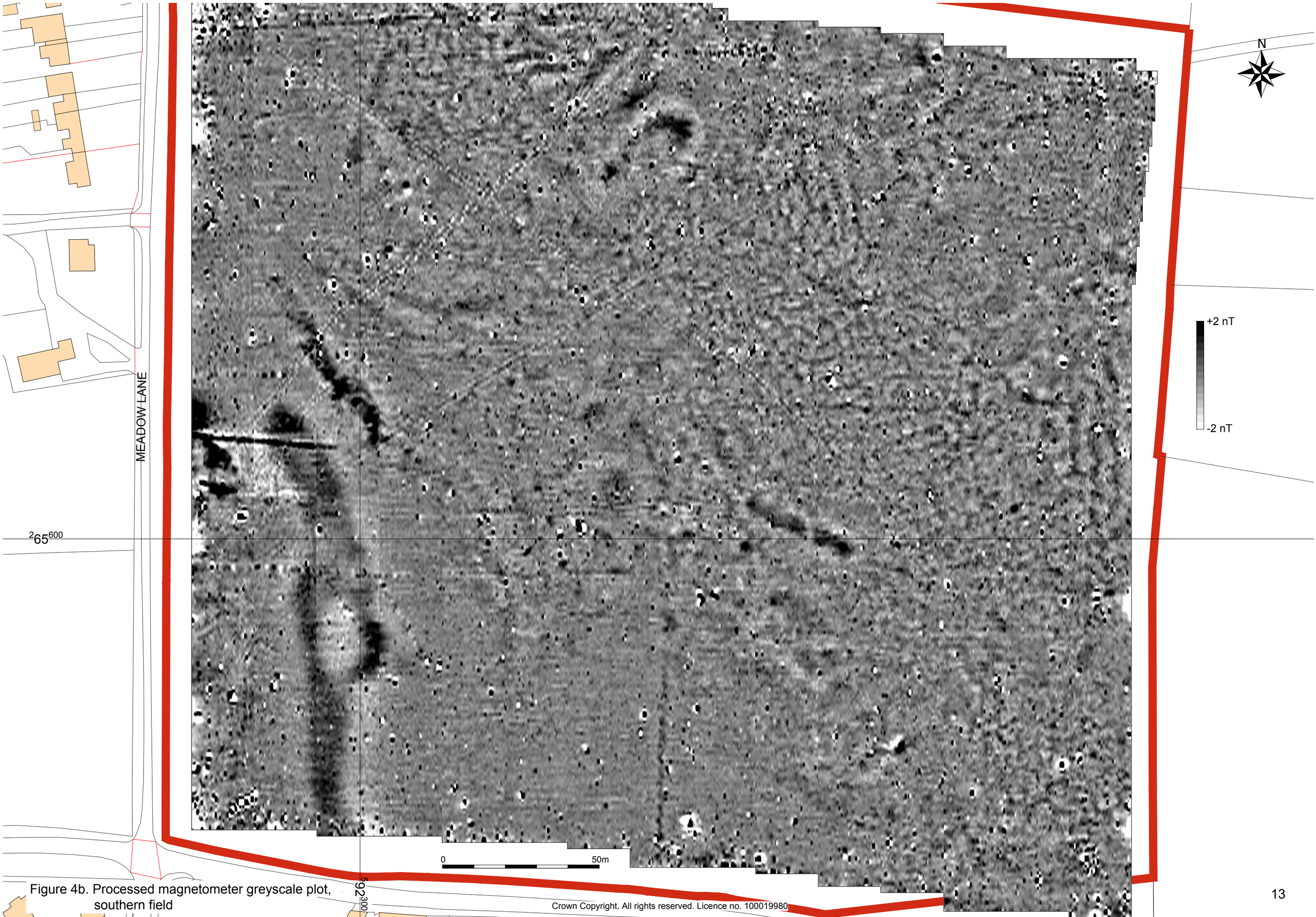


Figure 4b. Processed magnetometer greyscale plot, southern field

MEADOW LANE

N

Scale Interval	25nT/cm

0 50m

Figure 4c. Processed magnetometer xy trace plot, southern field

MEADOW LANE

265600

592300

N

Positive linear, relic field boundary	
Positive discrete, archaeological pit	
Broad positive, geology	
Narrow positive polygons, geological patterned ground	
Dipolar linear, modern service	
Magnetic disturbance, ferrous material	
Isolated dipolar, ferrous spike	

0 50m

Figure 4d. Interpretation plot of magnetometer anomalies, southern field

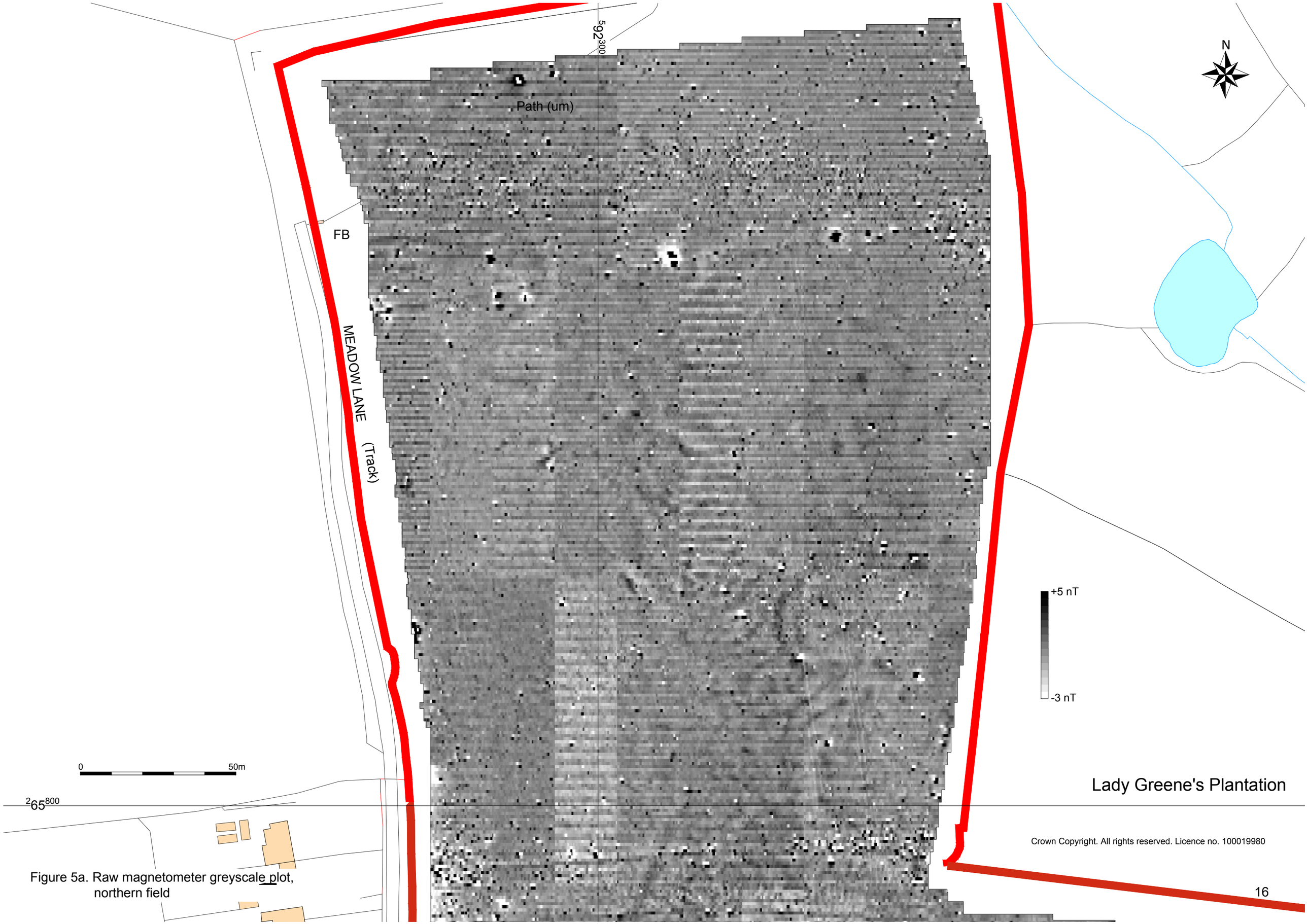


Figure 5a. Raw magnetometer greyscale plot, northern field

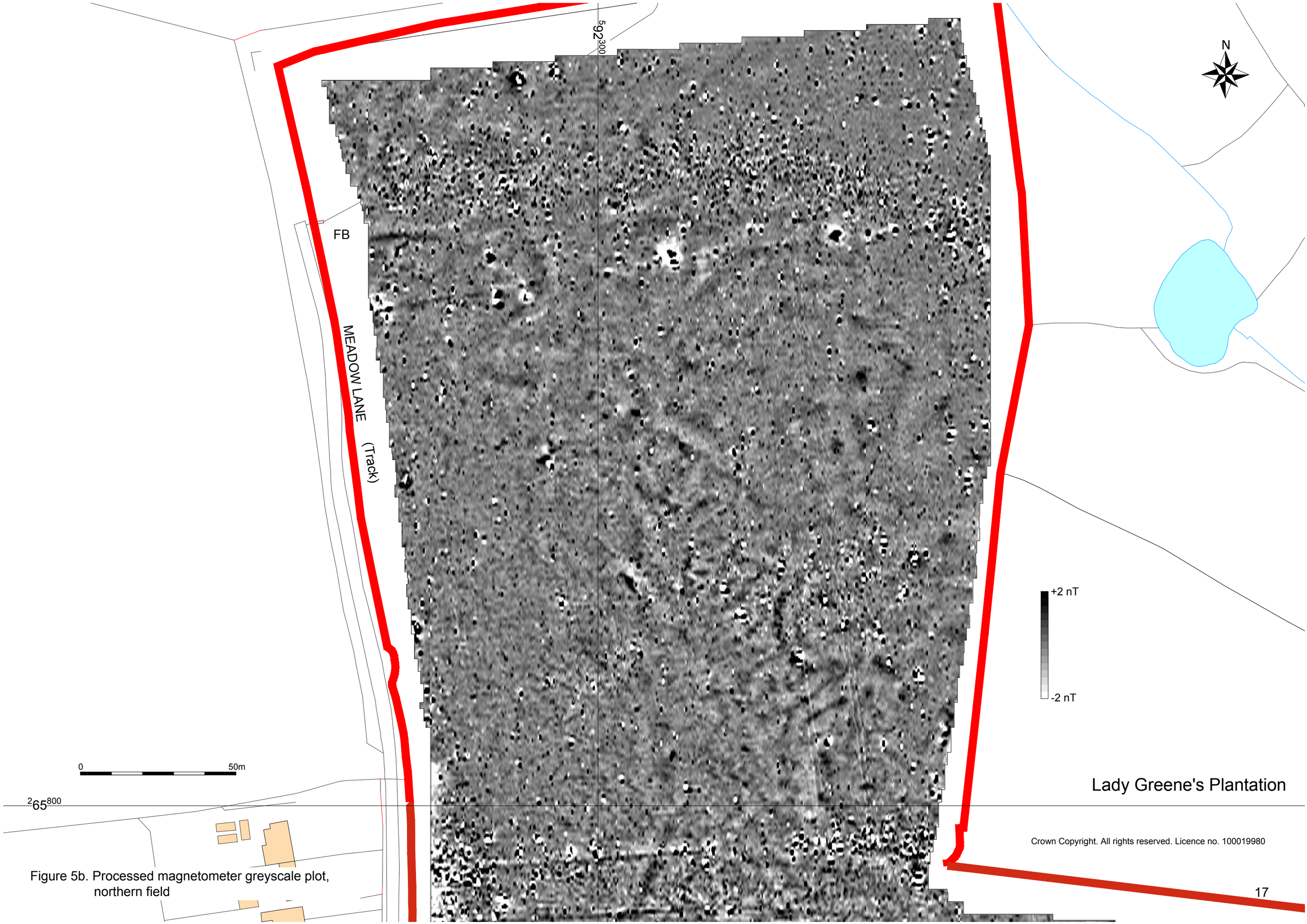


Figure 5b. Processed magnetometer greyscale plot, northern field

Figure 5c. Processed magnetometer xy trace plot, northern field

Positive linear, relic field boundary	
Positive discrete, archaeological pit	
Broad positive, geology	
Narrow positive, geological patterned ground	
Dipolar linear, modern service	
Magnetic disturbance, ferrous material	
Isolated dipolar, ferrous spike	

Path (um)

FB

MEADOW LANE (Track)

5 92 300

N

0 50m

2 65 800

Lady Greene's Plantation

Figure 5d. Interpretation plot of magnetometer anomalies, northern field

+2 nT

-2 nT

N

FB

MEADOW LANE (Track)

Lady Greene's Plantation

MEADOW LANE

RYLANDS CLOSE

265800

592300

Figure 6. Combined processed magnetometer greyscale plot

20 0 100m

Positive linear, relic field boundary	
Positive discrete, archaeological pit	
Broad positive, geology	
Narrow positive, geological patterned ground	
Dipolar linear, modern service	
Magnetic disturbance, ferrous material	
Isolated dipolar, ferrous spike	

Path (um)

FB

MEADOW LANE (Track)

Lady Greene's Plantation

MEADOW LANE

RYLANDS CLOSE

265800

592800

N

21

0 100m

Figure 7. Combined interpretation plot of magnetometer anomalies

NOR

Appendix 1. Metadata sheets

Grids

Source Grids: 357
1 Col:0 Row:1 grids\316.xgd
2 Col:0 Row:2 grids\317.xgd
3 Col:0 Row:3 grids\318.xgd
4 Col:1 Row:1 grids\319.xgd
5 Col:1 Row:2 grids\320.xgd
6 Col:1 Row:3 grids\321.xgd
7 Col:1 Row:4 grids\266.xgd
8 Col:1 Row:5 grids\267.xgd
9 Col:1 Row:6 grids\268.xgd
10 Col:1 Row:7 grids\269.xgd
11 Col:1 Row:8 grids\270.xgd
12 Col:1 Row:9 grids\218.xgd
13 Col:1 Row:10 grids\219.xgd
14 Col:1 Row:11 grids\220.xgd
15 Col:2 Row:0 grids\322.xgd
16 Col:2 Row:1 grids\323.xgd
17 Col:2 Row:2 grids\324.xgd
18 Col:2 Row:3 grids\325.xgd
19 Col:2 Row:4 grids\271.xgd
20 Col:2 Row:5 grids\272.xgd
21 Col:2 Row:6 grids\273.xgd
22 Col:2 Row:7 grids\274.xgd
23 Col:2 Row:8 grids\275.xgd
24 Col:2 Row:9 grids\221.xgd
25 Col:2 Row:10 grids\222.xgd
26 Col:2 Row:11 grids\223.xgd
27 Col:2 Row:12 grids\224.xgd
28 Col:2 Row:13 grids\225.xgd
29 Col:2 Row:14 grids\141.xgd
30 Col:2 Row:15 grids\142.xgd
31 Col:2 Row:16 grids\143.xgd
32 Col:2 Row:17 grids\144.xgd
33 Col:2 Row:18 grids\145.xgd
34 Col:2 Row:19 grids\66.xgd
35 Col:2 Row:20 grids\67.xgd
36 Col:2 Row:21 grids\68.xgd
37 Col:2 Row:22 grids\69.xgd
38 Col:2 Row:23 grids\70.xgd
39 Col:2 Row:24 grids\01.xgd
40 Col:2 Row:25 grids\02.xgd
41 Col:2 Row:26 grids\03.xgd
42 Col:2 Row:27 grids\04.xgd
43 Col:3 Row:0 grids\326.xgd
44 Col:3 Row:1 grids\327.xgd

45	Col:3	Row:2	grids\328.xgd
46	Col:3	Row:3	grids\329.xgd
47	Col:3	Row:4	grids\276.xgd
48	Col:3	Row:5	grids\277.xgd
49	Col:3	Row:6	grids\278.xgd
50	Col:3	Row:7	grids\279.xgd
51	Col:3	Row:8	grids\280.xgd
52	Col:3	Row:9	grids\226.xgd
53	Col:3	Row:10	grids\227.xgd
54	Col:3	Row:11	grids\228.xgd
55	Col:3	Row:12	grids\229.xgd
56	Col:3	Row:13	grids\230.xgd
57	Col:3	Row:14	grids\146.xgd
58	Col:3	Row:15	grids\147.xgd
59	Col:3	Row:16	grids\148.xgd
60	Col:3	Row:17	grids\149.xgd
61	Col:3	Row:18	grids\150.xgd
62	Col:3	Row:19	grids\71.xgd
63	Col:3	Row:20	grids\72.xgd
64	Col:3	Row:21	grids\73.xgd
65	Col:3	Row:22	grids\74.xgd
66	Col:3	Row:23	grids\75.xgd
67	Col:3	Row:24	grids\05.xgd
68	Col:3	Row:25	grids\06.xgd
69	Col:3	Row:26	grids\07.xgd
70	Col:3	Row:27	grids\08.xgd
71	Col:4	Row:0	grids\330.xgd
72	Col:4	Row:1	grids\331.xgd
73	Col:4	Row:2	grids\332.xgd
74	Col:4	Row:3	grids\333.xgd
75	Col:4	Row:4	grids\281.xgd
76	Col:4	Row:5	grids\282.xgd
77	Col:4	Row:6	grids\283.xgd
78	Col:4	Row:7	grids\284.xgd
79	Col:4	Row:8	grids\285.xgd
80	Col:4	Row:9	grids\231.xgd
81	Col:4	Row:10	grids\232.xgd
82	Col:4	Row:11	grids\233.xgd
83	Col:4	Row:12	grids\234.xgd
84	Col:4	Row:13	grids\235.xgd
85	Col:4	Row:14	grids\151.xgd
86	Col:4	Row:15	grids\152.xgd
87	Col:4	Row:16	grids\153.xgd
88	Col:4	Row:17	grids\154.xgd
89	Col:4	Row:18	grids\155.xgd
90	Col:4	Row:19	grids\76.xgd
91	Col:4	Row:20	grids\77.xgd
92	Col:4	Row:21	grids\78.xgd
93	Col:4	Row:22	grids\79.xgd
94	Col:4	Row:23	grids\80.xgd

95 Col:4 Row:24 grids\09.xgd
96 Col:4 Row:25 grids\10.xgd
97 Col:4 Row:26 grids\11.xgd
98 Col:4 Row:27 grids\12.xgd
99 Col:5 Row:0 grids\334.xgd
100 Col:5 Row:1 grids\335.xgd
101 Col:5 Row:2 grids\336.xgd
102 Col:5 Row:3 grids\337.xgd
103 Col:5 Row:4 grids\286.xgd
104 Col:5 Row:5 grids\287.xgd
105 Col:5 Row:6 grids\288.xgd
106 Col:5 Row:7 grids\289.xgd
107 Col:5 Row:8 grids\290.xgd
108 Col:5 Row:9 grids\236.xgd
109 Col:5 Row:10 grids\237.xgd
110 Col:5 Row:11 grids\238.xgd
111 Col:5 Row:12 grids\239.xgd
112 Col:5 Row:13 grids\240.xgd
113 Col:5 Row:14 grids\156.xgd
114 Col:5 Row:15 grids\157.xgd
115 Col:5 Row:16 grids\158.xgd
116 Col:5 Row:17 grids\159.xgd
117 Col:5 Row:18 grids\160.xgd
118 Col:5 Row:19 grids\81.xgd
119 Col:5 Row:20 grids\82.xgd
120 Col:5 Row:21 grids\83.xgd
121 Col:5 Row:22 grids\84.xgd
122 Col:5 Row:23 grids\85.xgd
123 Col:5 Row:24 grids\13.xgd
124 Col:5 Row:25 grids\14.xgd
125 Col:5 Row:26 grids\15.xgd
126 Col:5 Row:27 grids\16.xgd
127 Col:6 Row:0 grids\338.xgd
128 Col:6 Row:1 grids\339.xgd
129 Col:6 Row:2 grids\340.xgd
130 Col:6 Row:3 grids\341.xgd
131 Col:6 Row:4 grids\291.xgd
132 Col:6 Row:5 grids\292.xgd
133 Col:6 Row:6 grids\293.xgd
134 Col:6 Row:7 grids\294.xgd
135 Col:6 Row:8 grids\295.xgd
136 Col:6 Row:9 grids\241.xgd
137 Col:6 Row:10 grids\242.xgd
138 Col:6 Row:11 grids\243.xgd
139 Col:6 Row:12 grids\244.xgd
140 Col:6 Row:13 grids\245.xgd
141 Col:6 Row:14 grids\161.xgd
142 Col:6 Row:15 grids\162.xgd
143 Col:6 Row:16 grids\163.xgd
144 Col:6 Row:17 grids\164.xgd

145 Col:6 Row:18 grids\165.xgd
146 Col:6 Row:19 grids\86.xgd
147 Col:6 Row:20 grids\87.xgd
148 Col:6 Row:21 grids\88.xgd
149 Col:6 Row:22 grids\89.xgd
150 Col:6 Row:23 grids\90.xgd
151 Col:6 Row:24 grids\25.xgd
152 Col:6 Row:25 grids\26.xgd
153 Col:6 Row:26 grids\27.xgd
154 Col:6 Row:27 grids\28.xgd
155 Col:7 Row:0 grids\342.xgd
156 Col:7 Row:1 grids\343.xgd
157 Col:7 Row:2 grids\344.xgd
158 Col:7 Row:3 grids\345.xgd
159 Col:7 Row:4 grids\296.xgd
160 Col:7 Row:5 grids\297.xgd
161 Col:7 Row:6 grids\298.xgd
162 Col:7 Row:7 grids\299.xgd
163 Col:7 Row:8 grids\300.xgd
164 Col:7 Row:9 grids\246.xgd
165 Col:7 Row:10 grids\247.xgd
166 Col:7 Row:11 grids\248.xgd
167 Col:7 Row:12 grids\249.xgd
168 Col:7 Row:13 grids\250.xgd
169 Col:7 Row:14 grids\166.xgd
170 Col:7 Row:15 grids\167.xgd
171 Col:7 Row:16 grids\168.xgd
172 Col:7 Row:17 grids\169.xgd
173 Col:7 Row:18 grids\170.xgd
174 Col:7 Row:19 grids\91.xgd
175 Col:7 Row:20 grids\92.xgd
176 Col:7 Row:21 grids\93.xgd
177 Col:7 Row:22 grids\94.xgd
178 Col:7 Row:23 grids\95.xgd
179 Col:7 Row:24 grids\17.xgd
180 Col:7 Row:25 grids\18.xgd
181 Col:7 Row:26 grids\19.xgd
182 Col:7 Row:27 grids\20.xgd
183 Col:8 Row:0 grids\346.xgd
184 Col:8 Row:1 grids\347.xgd
185 Col:8 Row:2 grids\348.xgd
186 Col:8 Row:3 grids\349.xgd
187 Col:8 Row:4 grids\301.xgd
188 Col:8 Row:5 grids\302.xgd
189 Col:8 Row:6 grids\303.xgd
190 Col:8 Row:7 grids\304.xgd
191 Col:8 Row:8 grids\305.xgd
192 Col:8 Row:9 grids\251.xgd
193 Col:8 Row:10 grids\252.xgd
194 Col:8 Row:11 grids\253.xgd

195 Col:8 Row:12 grids\254.xgd
196 Col:8 Row:13 grids\255.xgd
197 Col:8 Row:14 grids\171.xgd
198 Col:8 Row:15 grids\172.xgd
199 Col:8 Row:16 grids\173.xgd
200 Col:8 Row:17 grids\174.xgd
201 Col:8 Row:18 grids\175.xgd
202 Col:8 Row:19 grids\96.xgd
203 Col:8 Row:20 grids\97.xgd
204 Col:8 Row:21 grids\98.xgd
205 Col:8 Row:22 grids\99.xgd
206 Col:8 Row:23 grids\100.xgd
207 Col:8 Row:24 grids\21.xgd
208 Col:8 Row:25 grids\22.xgd
209 Col:8 Row:26 grids\23.xgd
210 Col:8 Row:27 grids\24.xgd
211 Col:9 Row:0 grids\350.xgd
212 Col:9 Row:1 grids\351.xgd
213 Col:9 Row:2 grids\352.xgd
214 Col:9 Row:3 grids\353.xgd
215 Col:9 Row:4 grids\306.xgd
216 Col:9 Row:5 grids\307.xgd
217 Col:9 Row:6 grids\308.xgd
218 Col:9 Row:7 grids\309.xgd
219 Col:9 Row:8 grids\310.xgd
220 Col:9 Row:9 grids\256.xgd
221 Col:9 Row:10 grids\257.xgd
222 Col:9 Row:11 grids\258.xgd
223 Col:9 Row:12 grids\259.xgd
224 Col:9 Row:13 grids\260.xgd
225 Col:9 Row:14 grids\176.xgd
226 Col:9 Row:15 grids\177.xgd
227 Col:9 Row:16 grids\178.xgd
228 Col:9 Row:17 grids\179.xgd
229 Col:9 Row:18 grids\180.xgd
230 Col:9 Row:19 grids\101.xgd
231 Col:9 Row:20 grids\102.xgd
232 Col:9 Row:21 grids\103.xgd
233 Col:9 Row:22 grids\104.xgd
234 Col:9 Row:23 grids\105.xgd
235 Col:9 Row:24 grids\29.xgd
236 Col:9 Row:25 grids\30.xgd
237 Col:9 Row:26 grids\31.xgd
238 Col:9 Row:27 grids\32.xgd
239 Col:10 Row:0 grids\354.xgd
240 Col:10 Row:1 grids\355.xgd
241 Col:10 Row:2 grids\356.xgd
242 Col:10 Row:3 grids\357.xgd
243 Col:10 Row:4 grids\311.xgd
244 Col:10 Row:5 grids\312.xgd

245 Col:10 Row:6 grids\313.xgd
246 Col:10 Row:7 grids\314.xgd
247 Col:10 Row:8 grids\315.xgd
248 Col:10 Row:9 grids\261.xgd
249 Col:10 Row:10 grids\262.xgd
250 Col:10 Row:11 grids\263.xgd
251 Col:10 Row:12 grids\264.xgd
252 Col:10 Row:13 grids\265.xgd
253 Col:10 Row:14 grids\181.xgd
254 Col:10 Row:15 grids\182.xgd
255 Col:10 Row:16 grids\183.xgd
256 Col:10 Row:17 grids\184.xgd
257 Col:10 Row:18 grids\185.xgd
258 Col:10 Row:19 grids\106.xgd
259 Col:10 Row:20 grids\107.xgd
260 Col:10 Row:21 grids\108.xgd
261 Col:10 Row:22 grids\109.xgd
262 Col:10 Row:23 grids\110.xgd
263 Col:10 Row:24 grids\33.xgd
264 Col:10 Row:25 grids\34.xgd
265 Col:10 Row:26 grids\35.xgd
266 Col:10 Row:27 grids\36.xgd
267 Col:11 Row:14 grids\186.xgd
268 Col:11 Row:15 grids\187.xgd
269 Col:11 Row:16 grids\188.xgd
270 Col:11 Row:17 grids\189.xgd
271 Col:11 Row:18 grids\190.xgd
272 Col:11 Row:19 grids\111.xgd
273 Col:11 Row:20 grids\112.xgd
274 Col:11 Row:21 grids\113.xgd
275 Col:11 Row:22 grids\114.xgd
276 Col:11 Row:23 grids\115.xgd
277 Col:11 Row:24 grids\37.xgd
278 Col:11 Row:25 grids\38.xgd
279 Col:11 Row:26 grids\39.xgd
280 Col:11 Row:27 grids\40.xgd
281 Col:12 Row:14 grids\191.xgd
282 Col:12 Row:15 grids\192.xgd
283 Col:12 Row:16 grids\193.xgd
284 Col:12 Row:17 grids\194.xgd
285 Col:12 Row:18 grids\195.xgd
286 Col:12 Row:19 grids\116.xgd
287 Col:12 Row:20 grids\117.xgd
288 Col:12 Row:21 grids\118.xgd
289 Col:12 Row:22 grids\119.xgd
290 Col:12 Row:23 grids\120.xgd
291 Col:12 Row:24 grids\41.xgd
292 Col:12 Row:25 grids\42.xgd
293 Col:12 Row:26 grids\43.xgd
294 Col:12 Row:27 grids\44.xgd

295 Col:12 Row:28 grids\45.xgd
296 Col:13 Row:14 grids\196.xgd
297 Col:13 Row:15 grids\197.xgd
298 Col:13 Row:16 grids\198.xgd
299 Col:13 Row:17 grids\199.xgd
300 Col:13 Row:18 grids\200.xgd
301 Col:13 Row:19 grids\121.xgd
302 Col:13 Row:20 grids\122.xgd
303 Col:13 Row:21 grids\123.xgd
304 Col:13 Row:22 grids\124.xgd
305 Col:13 Row:23 grids\125.xgd
306 Col:13 Row:24 grids\46.xgd
307 Col:13 Row:25 grids\47.xgd
308 Col:13 Row:26 grids\48.xgd
309 Col:13 Row:27 grids\49.xgd
310 Col:13 Row:28 grids\50.xgd
311 Col:14 Row:14 grids\201.xgd
312 Col:14 Row:15 grids\202.xgd
313 Col:14 Row:16 grids\203.xgd
314 Col:14 Row:17 grids\204.xgd
315 Col:14 Row:18 grids\205.xgd
316 Col:14 Row:19 grids\126.xgd
317 Col:14 Row:20 grids\127.xgd
318 Col:14 Row:21 grids\128.xgd
319 Col:14 Row:22 grids\129.xgd
320 Col:14 Row:23 grids\130.xgd
321 Col:14 Row:24 grids\51.xgd
322 Col:14 Row:25 grids\52.xgd
323 Col:14 Row:26 grids\53.xgd
324 Col:14 Row:27 grids\54.xgd
325 Col:14 Row:28 grids\55.xgd
326 Col:15 Row:15 grids\206.xgd
327 Col:15 Row:16 grids\207.xgd
328 Col:15 Row:17 grids\208.xgd
329 Col:15 Row:18 grids\209.xgd
330 Col:15 Row:19 grids\131.xgd
331 Col:15 Row:20 grids\132.xgd
332 Col:15 Row:21 grids\133.xgd
333 Col:15 Row:22 grids\134.xgd
334 Col:15 Row:23 grids\135.xgd
335 Col:15 Row:24 grids\56.xgd
336 Col:15 Row:25 grids\57.xgd
337 Col:15 Row:26 grids\58.xgd
338 Col:15 Row:27 grids\59.xgd
339 Col:15 Row:28 grids\60.xgd
340 Col:16 Row:15 grids\210.xgd
341 Col:16 Row:16 grids\211.xgd
342 Col:16 Row:17 grids\212.xgd
343 Col:16 Row:18 grids\213.xgd
344 Col:16 Row:19 grids\136.xgd

345 Col:16 Row:20 grids\137.xgd
346 Col:16 Row:21 grids\138.xgd
347 Col:16 Row:22 grids\139.xgd
348 Col:16 Row:23 grids\140.xgd
349 Col:16 Row:24 grids\61.xgd
350 Col:16 Row:25 grids\62.xgd
351 Col:16 Row:26 grids\63.xgd
352 Col:16 Row:27 grids\64.xgd
353 Col:16 Row:28 grids\65.xgd
354 Col:17 Row:15 grids\214.xgd
355 Col:17 Row:16 grids\215.xgd
356 Col:17 Row:17 grids\216.xgd
357 Col:17 Row:18 grids\217.xgd

Raw Data

Filename	Thurston R.xcp
Description	
Instrument Type	Bartington (Gradiometer)
Units	nT
Direction of 1st Traverse	90 deg
Collection Method	ZigZag
Sensors	2 @ 1.00 m spacing.
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	1440 x 580
Survey Size (meters)	360 m x 580 m
Grid Size	20 m x 20 m
X Interval	0.25 m
Y Interval	1 m
Stats	
Max	5.00
Min	-3.00
Std Dev	0.82
Mean	0.41
Median	0.04
Composite Area	20.88 ha
Surveyed Area	20.88 ha
Program	
Name	TerraSurveyor
Version	3.0.31.0

Raw data presentation

Clip from -3.00 to 5.00 nT.

Processed Data

Filename	Thurston P.xcp
Description	
Instrument Type	Bartington (Gradiometer)
Units	nT
Direction of 1st Traverse	90 deg
Collection Method	ZigZag
Sensors	2 @ 1.00 m spacing.
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	2880 x 1160
Survey Size (meters)	360 m x 580 m
Grid Size	20 m x 20 m
X Interval	0.25 m
Y Interval	1 m
Stats	
Max	2.00
Min	-2.00
Std Dev	0.53
Mean	0.02
Median	0.00
Composite Area	20.88 ha
Surveyed Area	20.88 ha
Program	
Name	TerraSurveyor
Version	3.0.31.0

Processed data presentation

Destripe median sensors all.

Clip from -2.00 to 2.00 nT.

Interpolate: X & Y Doubled.

Appendix 2. Technical data

Detailed magnetometer survey

Detailed magnetometer survey is the most commonly employed archaeological geophysical prospection method in Britain; sensitive sensors can cost-effectively cover large areas of ground, rapidly recording anomalies that are indicative of cultural settlement activity. These anomalies can then be further investigated by field archaeologists to quantify a form and function. The magnetometer is a passive instrument that detects both permanent thermoremanent and temporary magnetic responses.

Thermoremanent Magnetism

When a material containing iron oxides, for example clay, is heated above the Curie point, weakly magnetic compounds transform in to highly magnetic oxides that can be detected by the sensors of a magnetometer (Clark, 1996). For instance, the iron oxide haematite has a Curie temperature of 675 Celsius and magnetite 565 Celsius. Once these temperatures are reached, the oxides become demagnetised, on cooling their magnetic properties become permanently re-magnetised and align in the direction of the Earth's magnetic field (Gaffney and Gater, 2003). Over time the direction of the Earth's magnetic field changes allowing these directional differences to be detected by the magnetometer.

Strongly heated features such as hearths, kilns or furnaces frequently reach the Curie temperature and become permanently magnetised. These permanent magnetic responses are some of the strongest cultural features that can be recorded.

Temporary Magnetism

Magnetic susceptibility is the ease with which a magnetic field can pass through a material, therefore the higher the material's magnetic susceptibility, the stronger the induced magnetic field will be. Temporary magnetisation occurs within material that is magnetically susceptible, this material acquires its own local magnetic field that combines with the Earth's magnetic field causing an anomaly to stand out from the background noise (Clark, 1996). These anomalies are subtler in nature, being derived from material that has been magnetically enhanced by cultural activity which has become concentrated into features over time. Anomalies that have temporary

magnetisation include backfilled pits, ditches, field systems, occupation areas, land drains, remnant and existing field boundaries (David *et al*, 2014).

The key to a successful survey is having good contrast between the magnetic susceptibility of an archaeological feature with the surrounding superficial deposits. If there is no discernible difference between the two mediums it may be unlikely that the magnetometer will successfully prospect the feature. Archaeological features can also be masked by high magnetically susceptible topsoil, or deep overlying subsoil and colluvial deposits.

Ferrous anomalies

Ferrous objects are a common source of permanent magnetism, usually isolated with a strong dipolar signature. Some of these responses may have an archaeological derivation, however they are probably more indicative of modern iron objects introduced through manuring or lost within the topsoil.

Bartington DualGRAD 601-2 Fluxgate Gradiometers

Fluxgate gradiometers are the most commonly employed class of instrument in the UK. Two 1m sensitive sensors are affixed to a frame mounted 1m apart in a vertical plane and harnessed to the trunk of a geophysical surveyor or attached to a cart. Each sensor contains two fluxgate magnetometers with a 1m vertical separation. The sensor above records the Earth's magnetic field (magnetic background) while the sensor below records the local magnetic field. The two sensors need aligning before recording can begin and a zero station is located in an area with low magnetic variation for this purpose. After the sensors have been aligned, the survey can begin. When differences in the magnetic field strength occur between the two vertical magnetometers within each sensor, a positive or negative reading is recorded that is relative to the magnetic background of the zero station. Positive anomalies include pits, ditches and agricultural furrows. Negative anomalies commonly prospected include earthwork embankments, land drains and geological features.

Sensors are normally mounted to a height of 0.30m above the surface, and can detect to a depth of between one and two metres below the ground. The first survey traverse is commonly undertaken in an east to west direction.

Magnetic Anomalies

Isolated dipolar responses

Isolated dipolar responses are commonly recorded throughout a dataset and are usually indicative of modern ferrous material deposited within the topsoil horizon. In some instances, the anomalies may be of an archaeological derivation. They are isolated, strong and dipolar in character.

Areas of magnetic disturbance

These anomalies are usually caused by building demolition rubble, ferrous boundaries, slag waste dumps, modern buried rubbish, pylons and services. Strong and dipolar in character, they are commonly recorded over a wide area.

Linear trends

Linear trends can be either positive or negative magnetic responses depending on the nature of the material present within the feature. If the anomaly is broad and weak, it is more likely to be of geological origin. Stronger positive linear trends are more likely to be of archaeological derivation, caused by settlement activity washing rich humic, charcoal and fired deposits into a feature. Negative linear trends are more commonly associated with bank deposits or land drains, with the less magnetically susceptible superficial deposits deposited at the top of the feature. Curvilinear trends are usually of archaeological origin, commonly interpreted as ring ditches or drip-gullies.

Discrete anomalies

Discrete anomalies can either be positive or negative in nature recorded within a localised area. Those that are positive are more likely to be of an archaeological origin, with negative discrete anomalies more commonly interpreted as natural geological variations.

Thermoremanent responses

These responses are caused by the heating of material containing iron to above the Curie temperature, they are strong and discrete in nature. In Britain high positive readings are recorded to the south of the anomaly with high negative readings recorded to the north.

Appendix 3. OASIS form

OASIS DATA COLLECTION FORM: England

Printable version

OASIS ID: suffolka1-269578

Project details

Project name	Land at Norton Road, Suffolk, Detailed Geophysical Survey
Short description of the project	In November and December 2016 Suffolk Archaeology Community Interest Company (SACIC) undertook a detailed fluxgate gradiometer survey on land at Norton Road, Thurston, Suffolk. An arable field comprising c.15 hectares of arable land was prospected for anomalies of archaeological derivation. The detailed fluxgate gradiometer survey recorded a variety of geophysical anomalies, including those indicative of archaeological pits, relic field boundaries and a linear area of magnetic disturbance interpreted as a potential trackway. Anomalies of geological origin were further prospected.
Project dates	Start: 29-11-2016 End: 08-12-2016
Previous/future work	No / Yes
Any associated project reference codes	THS 031 - Sitecode
Any associated project reference codes	ESF25217 - HER event no.
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 3 - Operations to a depth more than 0.25m
Monument type	POTENTIAL PITS Uncertain
Monument type	POTENTIAL TRACKWAY Uncertain
Monument type	RELIC FIELD BOUNDARIES Uncertain
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Housing estate
Development type	Public building (e.g. school, church, hospital, medical centre, law courts etc.)
Prompt	Outline Application
Position in the planning process	Pre-application
Solid geology	CHALK (INCLUDING RED CHALK)
Solid geology (other)	Crag Group Sand
Drift geology	ALLUVIUM
Drift geology	BLOWN SAND
Drift geology	RIVER TERRACE DEPOSITS

Drift geology	GLACIAL SAND AND GRAVEL
Techniques	Magnetometry

Project location

Country	England
Site location	SUFFOLK MID SUFFOLK THURSTON Land at Norton Road, Suffolk
Study area	15 Hectares
Site coordinates	TL 923 657 52.255335971851 0.817761126807 52 15 19 N 000 49 03 E Point
Height OD / Depth	Min: 38m Max: 54m

Project creators

Name of Organisation	Suffolk Archaeology CIC
Project brief originator	Self (i.e. landowner, developer, etc.)
Project design originator	Tim Schofield
Project director/manager	Rhodri Gardner
Project supervisor	Timothy Schofield
Type of sponsor/funding body	Developer
Name of sponsor/funding body	Pigeon Capital Management 2 Ltd & Mr Peter Hay

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Suffolk HER
Digital Contents	"Survey"
Digital Media available	"Database","GIS","Geophysics","Images raster / digital photography","Images vector","Spreadsheets","Survey","Text"
Paper Archive recipient	Suffolk HER
Paper Contents	"Survey"
Paper Media available	"Map","Survey ","Unpublished Text","Plan","Report"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Land at Norton Road, Thurston, Suffolk
Author(s)/Editor(s)	Schofield, T. P.
Other bibliographic details	Report 2016/101
Date	2016

Issuer or publisher	Suffolk Archaeology CIC
Place of issue or publication	Needham Market
Description	A4 bound report with A3 fold-out figures.
URL	www.suffolkarchaeology.co.uk

Entered by	Tim Schofield (tim.schofield@suffolkarchaeology.co.uk)
Entered on	21 December 2016

OASIS:

Appendix 4. Written scheme of investigation

SUFFOLK ARCHAEOLOGY

• A HISTORY OF EXPERTISE •

Land off Norton Road

Thurston, Suffolk

Client:
Pigeon Investment Management Ltd

Date:
November 2016

Written Scheme of Investigation and Risk Assessment – Geophysical Survey
Author: Timothy Schofield HND BSc MCIfA

Contents

List of Figures

Appendices

Project details

Planning Application No:	TBC
Curatorial Officer:	TBC
Grid Reference:	TL 923 657
Area:	*c.* 15ha
HER Event No/Site Code:	TBC
Oasis Reference:	269578
Project Start date:	29th December 2016
Project Fieldwork Duration:	*c.*8 days
Client/Funding Body:	Pigeon Investment Management Ltd
SACIC Project Manager:	Rhodri Gardner
SACIC Project Officer:	Tim Schofield
SACIC Job Code:	THS NOR 001

1. Introduction

- A geophysical survey is required on land for a proposed development off Norton Road, Thurston, Suffolk (Fig. 1) in accordance with paragraph 128, 129 and 141 of the National Planning Policy Framework.
- The geophysical survey will be undertaken to comply with Suffolk County Council Archaeological Service/Conservation Team (SCCAS/CT) specifications.
- Suffolk Archaeology (SACIC) has been contracted to carry out the project. This document details how the requirements set out in the SCCAS/CT guidelines (SCCAS 2011) will be met, and has been submitted to SCCAS/CT for approval on behalf of the LPA. It provides the basis for measurable standards and will be adhered to in full, unless otherwise agreed with SCCAS/CT.

2. The Site

- The site is located on the northeastern edge of Thurston in a single field comprising an area of *c.*15 hectares, bounded to the north by a trackway, to the west by Meadow Lane, to the south by Norton Road and to the east by fields and farmhouses. It overlooks a tributary of the Black Bourn River on a northeastern facing slope that runs to the east and northeast, at a height of 54m AOD in the southwestern corner to 38m AOD in the northeastern corner. Agricultural practices have been predominant within the local landscape over the last few centuries and the field is currently used for arable cultivation.
- The bedrock geology in the north and east is described as either Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk and Culver Chalk Formations, sedimentary bedrock formed 71 to 94 million years ago in warm chalk seas during the Cretaceous Period. In the southwest the bedrock geology is described as Crag Group sand formed 0 to 5 million years ago in the shallow seas of the Quaternary and Neogene periods (BGS, 2016).
- Superficial geology on the southwestern part of site is described as Coversands, formed up to 3 million years ago in the Quaternary Period, to the north and east lie glacial till deposits of Lowestoft Formation Diamicton that date to the same epoch (BGS, 2016).

3. Archaeological and historical background

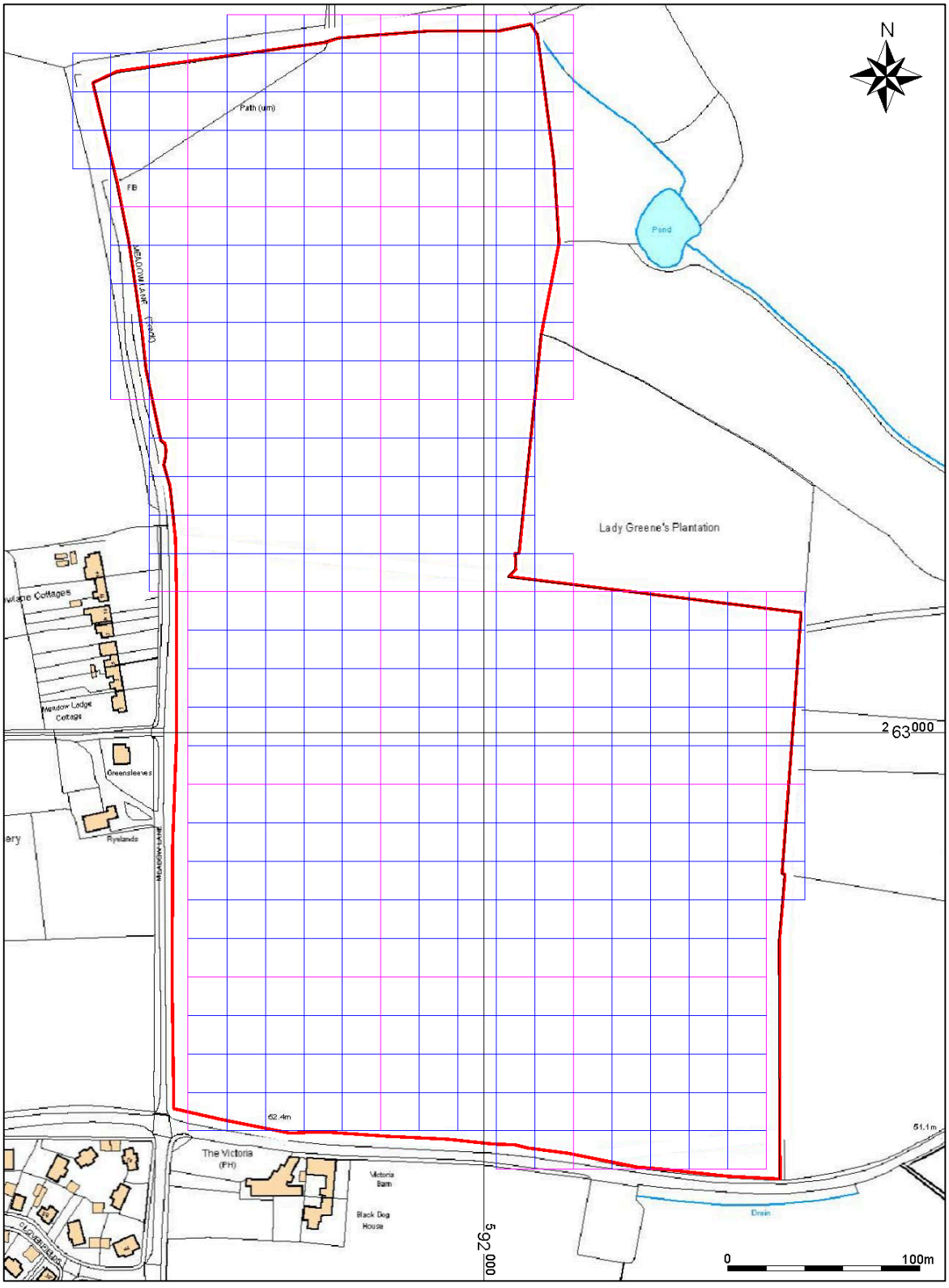
- A Neolithic ditch was recorded during archaeological monitoring, 1km to the west of site.
- A Bronze Age cinerary collared urn was recovered 600m to the northeast of the site near Skeleton Plantation.
- A 2km length of the former Roman Road lies 900m to the northwest.
- The possible location of the fire destroyed 13th century Old Netherhall lies to the north of Lady Greene's plantation, just to the northeast of the survey area.
- The medieval Pernal Green lies 900m to the northeast of site, this is believed to have been a common surrounded by housing with associated fishing ponds.
- A post mill located on a mound dating to the 16th century is recorded on Mill Lane 1km to the northwest of the survey area along with the contemporary Gallows Mound.

Figure 1. Location map

4. Project Objectives

- A non-intrusive geophysical survey is required of the development, followed by targeted trial trench evaluation to enable the archaeological resource, both in quality and extent, to be accurately quantified.

Figure 2. Survey and grid location



5. Geophysical Survey method statement

5.1. Management

- The project will be managed by SACIC Project Officer Tim Schofield in accordance with the principles of *Management of Research Projects in the Historic Environment* (MoRPHE, Historic England 2015).
- SCCAS/CT will be given ten days' notice of the commencement of the fieldwork and arrangements made for SCCAS/CT site visit if required.
- Full details of project staff are given in section 6 below.

5.2. Project preparation

- An event number has been obtained from the SCCAS HER Officer and will be included on all future project documentation.
- An OASIS online record has been initiated and key fields in details, location and creator forms have been completed.
- A pre-site inspection and Risk Assessment for the project have been completed.

5.3. Fieldwork

- Fieldwork standards will be guided by 'Standards for Field Archaeology in the East of England', EAA Occasional Papers 14, and the Chartered Institute for Archaeology's (CIfA) paper 'Standard and Guidance for archaeological geophysical survey', December 2014.
- The fieldwork will be carried out by members of SACIC led by Project Officer Tim Schofield. The fieldwork team will be drawn from a pool of suitable staff at SACIC.
- The project requires the survey of *c*.15 hectares over the proposed development area (Fig. 2). Minor modifications to the survey area may be made onsite to respect any areas of disturbance/contamination or other obstacles.
- A 5 – 10m exclusion zone around the sites periphery will be kept in order to minimise the amount of magnetic disturbance associated with field boundaries.

Instrument type and set-up

- The site will be surveyed using a Bartington Dual-Grad 601-2 which has high sensor sensitivity combined with rapid ground coverage. Good contrast between the magnetic susceptibility of a feature's fill (charcoal rich or humic deposits providing the best soil medium) and the local magnetic background signature of the superficial deposits will be important in achieving successful survey results.
- Best practice dictates that sensors will be secured on the same side of the instrument until the completion of the survey, and sensor heights equalised to achieve a consistent elevation across the area. The instrument will be switched on and left for at least 20 minutes before the survey of the first grid to allow the sensors to reach a suitable operating temperature.
- A zero station with low magnetic susceptibility shall be prospected within the field to allow the correction of diurnal sensor drift. This unique station will be employed throughout the survey providing a common calibration location.

Sampling interval and grid size

- The 20m survey grid will be set-out using a Leica Viva Glonass Smart Rover GS08+ to the Ordnance Survey OSGB36, converted to the National Grid Transformation OSTN15 datum that has an accuracy of +/- 0.01m. Regular testing of the instruments accuracy will be undertaken employing stations with known ETRS89 coordinates. All raw data recorded by the GPS will be uploaded to the project folder, suitably labelled and kept as part of the project archive.
- A 1m traverse interval and 0.25m sample interval will be utilised.

Data capture and archiving

- A pro-forma survey sheet will be completed each day; unique grid numbers will be allocated to enable a data composite to be created. Instrument readings will be recorded on the internal data logger and downloaded to a laptop at midday and also in the evening, this will allow the data to be checked for quality on site and for grids to be re-surveyed if required.

- Data will be filed in project specific folders separated into daily datasets. The daily datasets will be combined into a single composite on completion of the fieldwork.
- Data will be stored in project specific folders that will be downloaded onto a laptop and then backed-up onto an external server in the evening of each day.
- Metadata sheets will be completed and inserted into the report as an appendix.
- All on-site derived site data will be entered onto a digital (Microsoft Access) SACIC database compatible with the Suffolk HER.

Data processing and presentation

- Raw survey data will be collected to a high standard to enable only minimal processing of the datasets to be required. Typically, these algorithms may comprise de-spike and zero mean sensor. The data will also be clipped at a suitable level to enable the anomalies to be presented with best clarity.
- Raw and processed greyscale plots and xy trace plots of the datasets shall be exported from Terrasurveyor into AutoCAD.
- An interpretation plan based on the combined interpretations of the raw, processed and xy trace plots will be produced using AutoCAD. All figures shall be georeferenced within the National Grid and printed at an appropriate scale.

Software

- The software used to process the data will be DW Consulting's Terrasurveyor v3.0.29.3. Images will be exported from Terrasurveyor into a geo-referenced grid within an AutoCAD drawing. Interpretation plans of the anomalies will then be digitised using AutoCAD.

Outreach

- The site is not currently setup or suitable to accommodate outreach work.

5.4. Report

- The report will be commensurate with the results of the fieldwork and will be consistent with the principles of Management of Research Projects in the Historic Environment (MoRPHE, Historic England, 2015), Geophysical survey in Field Evaluation (Historic England, 2008) and the Standard and Guidance for Archaeological Geophysical Survey (Chartered Institute for Archaeologists, 2014), containing the following:
- The report will contain a summary, description of the project background, site location, survey methodology, detailed description of the nature, location and extent of anomalies, discussion of the anomalies, impact assessment, site potential and possible further work. Scaled raw, processed, xy data plans and an interpretation plan will also be included.
- The report will include a summary in the established format for inclusion in the annual *'Archaeology in Suffolk'* section of the Proceedings of the Suffolk Institute of Archaeology and History.
- A copy of this Written Scheme of Investigation will be included as an appendix in the report.
- Metadata sheet tables will form one of the appendices within the report.
- A technical data sheet will be included as an appendix.
- The report will include a copy of the completed project OASIS form as an appendix.
- An unbound draft copy of the report will be submitted to SCCAS/CT for approval within 6 months of completion of fieldwork.

5.5. Project archive

- On approval of the report a printed and bound copy will be lodged with the Suffolk HER. A digital .pdf file will also be supplied, together with a digital and fully georeferenced vector plan showing the application area and survey location, compatible with MapInfo software.
- The online OASIS form for the project will be completed and a .pdf version of the report uploaded to the OASIS website for online publication by the Archaeological

Data Service. A paper copy of the form will be included in the project archive.

- A second bound copy of the report will be included with the project archive.
- A digital .pdf copy of the approved report will be supplied to the client, together with our final invoice for outstanding fees. Printed and bound copies will be supplied to the client on request.
- The project archive, consisting of all paper and digital records, will be deposited in the SCCAS Archaeological Store at Bury St Edmunds within 6 months of completion of fieldwork. The project archive will be consistent with MoRPHE (Historic England, 2015) and ICON guidelines. The project archive will also meet the requirements of SCCAS (SCCAS 2010).
- All physical site records and paperwork will be labelled and filed appropriately. Digital files will be stored in the relevant SCCAS archive parish folder on the SCC network site.
- The project costing includes a sum to meet SCCAS archive charges. A form transferring ownership of the archive to SCCAS will be completed and included in the project archive.
- If the client, on completion of the project, does not agree to deposit the archive with, and transfer to, SCCAS, they will be expected to either nominate another suitable depository approved by SCCAS.

Bibliography

Ayala, G., et al., 2004, *Geoarchaeology; Using Earth Sciences to Understand the Archaeological Record.* English Heritage.

Brown, N., and Glazebrook, J, (eds), 2000, *Research and Archaeology: A Framework for the Eastern Counties, 2. Research Agenda and Strategy.* East Anglian Archaeology Occasional Paper No. 8.

Chartered Institute for Archaeologists, 2014, *Standard and Guidance for Archaeological Geophysical Survey.*

Clark, A. J., 1996, *Seeing Beneath the Soil, Prospecting Methods in Archaeology.* BT Batsford Ltd. London.

David, A., *et al.*, 2014, *Geophysical Survey in Archaeological Field Evaluation*. Historic England.

Gaffney, C., Gater. J., and Ovenden, S., 2002, *The Use of Geophysical Techniques in Archaeological Evaluations.* IFA Technical Paper No.6.

Gaffney, C., and Gater. J., 2003, *Revealing the Buried Past, Geophysics for Archaeologists.* Tempus Publishing Ltd.

Historic England, 2015, *Management of Research in the Historic Environment (MoRPHE)*.

Gurney, D., 2003, *Standards for Field Archaeology in the East of England.* East Anglian Archaeology Occasional Paper No 14.

Medlycott, M. (Ed)., 2011, *Research and Archaeology Revisited: A revised framework for the East of England.* EAA Occasional Paper 24.

Schmidt, A., 2001, *Geophysical Data in Archaeology: A Guide to good Practice.* Archaeology Data Service. Oxbow books.

Schmidt, A., et al., 2015, *EAC Guidelines for the use of Geophysics in Archaeology; Questions to ask and Points to Consider*. EAC Guidelines 2.

SCCAS, 2010, *Deposition of Archaeological Archives in Suffolk.*

SCCAS, 2011, *Requirements for a Geophysical Survey*.

Witten, A. J., 2006, *Handbook of Geophysics and Archaeology.* Equinox Publishing Ltd. London.

Websites

British Geological Survey, 2016, http://mapapps.bgs.ac.uk/geologyofbritain/home.html

6. Project Staffing

6.1. Management

SACIC Manager	Dr Rhodri Gardner
SACIC Project Manager	Dr Rhodri Gardner
SACIC Finds Dept	Richenda Goffin

6.2. Fieldwork

The fieldwork team will be derived from the following pool of SACIC staff.

Name	Job Title	First Aid	Other skills/qualifications
Tim Schofield	Project Officer	Yes	Geophysical Surveyor
Robert Brooks	Project Officer	Yes	Surveyor
Simon Cass	Project Officer	Yes	Surveyor
Michael Green	Project Officer	Yes	Surveyor
Simon Picard	Project Officer		Surveyor
Preston Boyle	Project Assistant	Yes	
Tim Carter	Project Assistant	Yes	Metal detectorist
Edmund Palka	Project Assistant	No	Geophysical Surveyor

6.3. Report production

The production of the site report, graphics and submission of the project archive will be carried out by Tim Schofield.

Appendix 1. Health and Safety

1. Introduction

The project will be carried out following the SACIC Health and Safety Management System at all times. The SACIC Health and Safety Policy Statement reads as follows:

Suffolk Archaeology Community Interest Company is committed to ensuring the health, safety and welfare of its employees, and it will, so far as is reasonably practicable, establish procedures and systems necessary to implement this commitment and to comply with its statutory obligations on health and safety. Our Personnel are informed of their responsibilities to ensure they take all reasonable precautions, to ensure the safety, health and welfare of those that are likely to be affected by the acts and emissions of our organisations undertakings.

Suffolk Archaeology Community Interest Company understands our duty to identify the significant hazards that may be created by our undertakings and to risk assess these accordingly to ensure that suitable and effective controls are implemented to minimise risk to a suitable level as far as is reasonably practicable.

We also acknowledge our duty, so far as is reasonably practicable:

- *To provide a safe working environment for our workforce, fulfil our statutory commitments and actively manage and supervise health and safety at work;*
- *To identify the risks associated with our business activities and ensure suitable and sufficient control measures are in place.*
- *Ensure regular consultation with our employees on matters which affect their health and Safety.*
- *To ensure that all plant and equipment used by our employees is fit for purpose and adequately maintained.*
- *To provide suitable storage and ensure safe handling of Hazardous substances.*
- *To ensure that all workers are competent to undertake their daily work activities by providing all relevant information and training, consideration will also be given to any employees who do not have English as a first language.*
- *To prevent accidents and cases of work related ill health by ensuring a robust reporting and investigation system is in place.*
- *To liaise and communicate effectively regarding health and safety matters when working on other persons premises.*
- *To ensure that there is an effective system of induction, training, communication and supervision to other persons visiting or working on our premises.*
- *To have access to competent advice, this will be provided by Agility UK (Training and Consultancy) Ltd. Who will assists us in the continuous improvement in our health and safety performance and management through regular review and revision of this policy; and to provide suitable resources required to make this policy and our Health and Safety arrangements effective.*

2. Specific project issues

Introduction

All SACIC staff will be aware that they have a responsibility to:

- Take care of their own health and safety and that of others who may be affected by what they do, or fail to do, at work.
- Follow safe systems of work and other precautions identified in the project risk assessments.
- Report any changes to personal circumstances that may affect their ability to work safely.
- Report potential hazards, incidents and near misses to the Project Officer/supervisor.

A pre-site inspection has been made of the site and applicable SACIC Risk Assessments for the project are included below.

All SACIC staff are experienced in working on a variety of archaeological sites and permanent staff all hold a CSCS (Construction Skills Certification Scheme) card. All staff have been shown the SACIC Health and Safety Manual, copies of which are held at the SACIC office in Needham Market. All staff will read the site WSI and Risk Assessments and receive a site safety induction from the Project Officer prior to starting work. All staff will be issued with appropriate PPE.

From time to time it may be necessary for site visits by other SACIC staff, external specialists, SCCAS/CT staff or other members of the public. All such staff and visitors will be issued with the appropriate PPE and will undergo the required inductions.

Site staff, official visitors and volunteers are all covered by SACIC insurance policies. SACIC also has professional negligence insurance. Copies of these policies are available on request.

Welfare facilities

Due to the limited nature of the project, it is proposed that SACIC staff will work from their vehicle and use client welfare facilities if available. If not staff will be able to travel to public facilities. Additional facilities, toilet, site accommodation etc., will be provided if the project

is extended. Fresh, clean water for drinking and hand washing is carried in SACIC vehicles. A vehicle will be on site at all times.

First Aid

A member of staff with the First Aiders at Work qualification will be on site at all times. A First Aid kit and a fully charged mobile will also be in vehicle/on site at all times.

Working within School Grounds

SACIC staff and sub-contractors will follow any requirements made by the school, such as sign in procedures.

All SACIC staff have passed an enhanced Criminal Records Bureau check. Other than for access to welfare facilities staff will be working solely within the site and will have limited interaction with the school and pupils. Staff will be informed that they are not to go elsewhere on the school grounds unless authorized.

Site access and security

Access to the site is off High Road and has been agreed with the client and/or landowner. The site is bounded by hedgerows and not open to public access.

Contaminated ground

Details of any ground contamination have/have not been provided by the client. If any such is identified then groundworks will cease until adequate safety and environmental precautions are in place.

Advice will be sought from HSE and relevant authorities if required concerning any of these issues.

Hazardous Substances

No hazardous substances are specifically required in order to undertake the archaeological works.

Underground services

Details of known services have not been provided by the client.

Overhead Powerlines

No overhead powerlines cross the site.

Personal Protective Equipment (PPE)

The following PPE is issued to all site staff as a matter of course. Additional PPE will be provided if deemed necessary.

- Hard Hat (to EN397).
- High Visibility Clothing (EN471 Class 2 or greater).
- Safety Footwear (EN345/EN ISO 20346 or greater – to include additional penetration-resistant midsole).
- Gloves (to EN388).
- Eye Protection (safety glasses to at least EN 166 1F).

SACIC Environment Policy

Suffolk Archaeology is committed to the sustainable management of the local and global environment to support local communities and growth in our local economy. We will strive to reduce our carbon emissions, to protect and enhance the natural and historic environment and to tackle the issues of a changing climate. In delivering our services, we are committed to meeting all relevant regulatory, legislative and other requirements, and to the continual improvement of our environmental performance.

We will endeavour to:

- Prevent environmental pollution and minimise waste.
- Reduce our carbon emissions.
- Continually improve our energy efficiency and reduce our use of resources.
- Reduce the impact of vehicle travel by our employees
- Implement sustainable procurement practices where possible.
- Enhance biodiversity, conserve distinctive landscapes and protect the historic environment.

All existing and new SACIC subcontractors are issued annually with an Environmental Guidance Note For Contractors.

On site the SACIC Project Officer will monitor environmental issues and will alert staff to possible environmental concerns. In the event of spillage or contamination, e.g. from plant or fuel stores, EMS reporting and procedures will be carried out in consultation with the SACIC EMS Officer.

The client and/or landowner has not informed SACIC of any environmental constraints upon the development area.

All rubbish will be bagged and removed either to areas designated by the client or returned to SACIC for disposal.

3. Project Contacts

SACIC

SACIC Manager	Dr Rhodri Gardner	01449 900120
SACIC Project Manager	Dr Rhodri Gardner	01449 900120
SACIC Finds Dept	Richenda Goffin	01449 900129
SACIC H&S	Stuart Boulter	01449 900122
SACIC EMS	Jezz Meredith	01449 900124
SACIC Outreach Officer	Duncan Allan	01449 900126

Emergency services

Local Police	Bury St Edmunds Station, Raingate Street, IP33 2AP	101, 01359 240211
Local GP	-	-
Location of nearest A&E	Hardwick Lane, Bury St Edmunds, IP33 2QZ	01284 701993
Environment Agency	Customer Services Line (8am to 6pm)	03708 506 506
	24 hour Emergency Hotline	0800 807060
Essex and Suffolk Water	24 hour Emergency Hotline	0845 782 0999
National Gas Emergency Service	Gas emergency hotline	0800 111 999
UK Power Networks	East England electricity emergency hotline	0800 783 8838
Anglian Water	24 hour Emergency Hotline	08457 145 145

Client contacts

Client	Pigeon Investment Ltd, Anthony Palmer	01284 766 200
Client Agent		
Site landowner		

Archaeological contacts

Curator		
Consultant		
EH Regional Science Advisor	Dr Zoe Outram	01223 582707

Sub-contractors

Plant hire		
Misc. Equipment hire		
Toilet/facilities hire		

4. Geophysical Technical Information

Detailed magnetometer survey

Detailed magnetometer survey is the most commonly employed archaeological geophysical prospection method in Britain, sensitive sensors can cost-effectively cover large areas of ground, rapidly recording anomalies that are indicative of cultural settlement activity. These anomalies can then be further investigated by field archaeologists to quantify a form and function. The magnetometer is a passive instrument that detects both permanent thermoremanent and temporary magnetic responses.

Thermoremanent Magnetism

When a material containing iron oxides, for example clay, is heated above the Curie point, weakly magnetic compounds transform in to highly magnetic oxides that can be detected by the sensors of a magnetometer (Clark). For instance the iron oxide haematite has a Curie temperature of 675 Celsius and magnetite 565 Celsius. Once these temperatures are reached, the oxides become demagnetised, on cooling their magnetic properties become permanently re-magnetised and align in the direction of the Earth's magnetic field (Gaffney and Gater). Over time the direction of the Earth's magnetic field changes allowing these directional differences to be detected by the magnetometer.

Strongly heated features such as hearths, kilns or furnaces frequently reach the Curie temperature and become permanently magnetised. These permanent magnetic responses are some of the strongest cultural features that can be recorded.

Temporary Magnetism

Magnetic susceptibility is the ease with which a magnetic field can pass through a material, therefore the higher the materials magnetic susceptibility, the stronger the induced magnetic field will be. Temporary magnetisation occurs within material that is magnetically susceptible, this material acquires its own local magnetic field that combine with the Earth's magnetic field causing an anomaly to stand out from the background noise (Clark). These anomalies are more subtle in nature, being derived from material that has been magnetically enhanced by cultural activity and become concentrated into features over time. Anomalies that have temporary magnetisation include backfilled pits,

ditches, field systems, occupation areas, land drains, remnant and existing field boundaries (David, 2011).

The key to a successful survey is having good contrast between the magnetic susceptibility of an archaeological feature with the surrounding superficial deposits. If there is no discernible difference between the two mediums it may be unlikely that the magnetometer will successfully prospect the feature. Archaeological features can also be masked by high magnetically susceptible topsoil, or deep overlying subsoil and colluvial deposits.

Ferrous anomalies

Ferrous objects are a common source of permanent magnetism, usually isolated with a strong dipolar signature. Some of these responses may have an archaeological derivation, however they are probably more indicative of modern iron objects introduced through manuring or lost within the topsoil.

Bartington DualGRAD 601-2 Fluxgate Gradiometers

Fluxgate gradiometers are the most commonly employed class of instrument in the UK. Two 1m sensitive sensors are affixed to a frame mounted 1m apart in a vertical plane and harnessed to the trunk of a geophysical surveyor or attached two a pulled cart. Each sensor contains two fluxgate magnetometers with 1m vertical separation. The sensor above records the Earth's magnetic field (magnetic background) while the sensor below records the local magnetic field. The two sensors need aligning before recording can begin, a zero station is located in an area with low magnetic variation for this purpose. After the sensors have been aligned, the survey can begin. When differences in the magnetic field strength occur between the two vertical magnetometers within each sensor, a positive or negative reading is recorded that is relative to the magnetic background of the zero station. Positive anomalies include pits, ditches and agricultural

furrows. Negative anomalies commonly prospected include earthwork embankments, land drains and geological features.

Sensors are normally mounted to a height of 0.30m above the surface, and can detect to a depth of between one and two metres below the ground. The first survey traverse is commonly undertaken in an east to west direction.

Magnetic Anomalies

Isolated dipolar responses

Isolated dipolar responses are commonly recorded throughout a dataset and are usually indicative of modern ferrous material deposited within the topsoil horizon. In some instances the anomalies may be of an archaeological derivation. They are isolated, strong and dipolar in character.

Areas of magnetic disturbance

These anomalies are usually caused by building demolition rubble, ferrous boundaries, slag waste dumps, modern buried rubbish, pylons and services. Strong and dipolar in character, they are commonly recorded over a wide area.

Linear trends

Linear trends can be either positive or negative magnetic responses depending on the nature of the material present within the feature. If the anomaly is broad and weak, it is more likely to be of geological origin. Stronger positive linear trends are more likely to be of archaeological derivation, caused by settlement activity washing rich humic, charcoal and fired deposits into a feature. Negative linear trends are more commonly associated with bank deposits or land drains, with the less magnetically susceptible superficial

deposits deposited at the top of the feature. Curvilinear trends are usually of archaeological origin, commonly interpreted as ring ditches or drip-gullies.

Discrete anomalies

Discrete anomalies can either be positive or negative in nature recorded within a localised area. Those that are positive are more likely to be of an archaeological origin, with negative discrete anomalies more commonly interpreted as natural geological variations.

Thermoremanent responses

These responses are caused by the heating of material containing iron to above the Curie temperature, they are strong and discrete in nature, in Britain high positive readings are recorded to the south of the feature, and high negative readings are recorded to the north.

SUFFOLK ARCHAEOLOGY

• A HISTORY OF EXPERTISE •

Geophysical Survey Risk Assessments

A pre-site inspection and assessment has been made of the site and the following SACIC Risk Assessments apply to the project and are included below.

SACIC GSRA1	Manual handling and outdoor working
SACIC GSRA2	Use of hand tools and instrumentation

Geophysical Survey Risk Assessment 1 Manual handling and outdoor working

Activity	Location	Hazard	Risks	Persons affected	Initial risk	Control measures	Residual risk	Name	Date	Rescue procedures
Manual handling of survey instruments and working outdoors.	Various.	Extremes of heat, cold and wet weather. Trip hazards.	Hypothermia, heat stroke, sunburn. Minor injuries. Carrying heavy equipment for prolonged periods.	All field staff.	9	All staff provided with appropriate clothing for weather conditions. No staff to work alone in extreme conditions. Regular sweep for trip hazards.	2	T Schofield	23/11/16	First Aid if required. Call emergency services if necessary.

	Likelihood				
Severity	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Initial Risk
Residual Risk

Likelihood	Severity	Risk (likelihood x severity)
1. Highly unlikely	1. Slight inconvenience	1-5 Low
2. May occur but very rarely	2. Minor injury requiring first aid	
3. Does occur but only rarely	3. Medical attention required	6-12 Medium
4. Occurs from time to time	4. Major injury leading to hospitalisation	
5. Likely to occur often	5. Fatality or serious injury leading to disablement	13-25 High

Geophysical Survey Risk Assessment 2 Use of hand tools and survey instruments

Activity	Location	Hazard	Risks	Persons affected	Initial risk	Control measures	Residual risk	Name	Date	Rescue procedures
Surveying, setting out and use of small hand tools and marker canes.	Various.	Splinters from poorly maintained equipment, trip hazards from unused equipment, trip hazards from uneven ground, some heavy lifting, tape winding.	Minor injuries.	All field staff.	8	Ensure all tools in serviceable condition. Careful policing of temporarily unused equipment (e.g. no discarded hand tools, hand tapes pegged down). Ensure all tools and instrumentation carried appropriately.	4	T Schofield	23/11/16	First Aid if required. Call emergency services if necessary.

	Likelihood				
Severity	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Initial Risk
Residual Risk

Likelihood	Severity	Risk (likelihood x severity)
1. Highly unlikely	1. Slight inconvenience	1-5 Low
2. May occur but very rarely	2. Minor injury requiring first aid	
3. Does occur but only rarely	3. Medical attention required	6-12 Medium
4. Occurs from time to time	4. Major injury leading to hospitalisation	
5. Likely to occur often	5. Fatality or serious injury leading to disablement	13-25 High

Suffolk Archaeology CIC
Unit 5 | Plot 11 | Maitland Road | Lion Barn Industrial Estate
Needham Market | Suffolk | IP6 8NZ

Rhodri.Gardner@suffolkarchaeology.co.uk
01449 900120

www.suffolkarchaeology.co.uk

www.facebook.com/SuffolkArchCIC

www.twitter.com/suffolkarchcic