MALMAYNES HALL SOLAR PARK
ST MARY HOO, MEDWAY

Report on Archaeological Geophysical Surveys 2013-14

Report by:

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24 June 2014 (revised 30 October 2014)

MALMAYNES HALL SOLAR PARK
ST MARY HOO, MEDWAY

Report on Archaeological Geophysical Surveys 2013 and 2014

Introduction

The geophysical surveys described in this report were undertaken as part of an archaeological field evaluation of a proposed solar power site at Malmaynes Hall Farm on the Hoo Peninsula in north Kent. The surveys were commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford, on behalf of Wessex Solar Energy by CgMs Consulting Ltd of Cheltenham. Fieldwork for the parts of the survey area which were accessible at that time was done between 11-15 November 2013. One of the fields within the proposed survey area was under a standing crop of kale, and could not then be surveyed. This field (field 4 as numbered on the enclosed plans) was subsequently surveyed on 8-9 October 2014. The present report is based on the initial report on this project (dated 24 June 2014), but has been expanded to include the data and findings from field 4.

The Site

Some initial notes on site conditions were included in the Written Scheme of Investigation prepared in advance of the project, and submitted to CgMs in November 2013 [1]. The following comments are reproduced in part from this document.

Survey coverage

The site is an area of arable farmland located between St Mary Hoo and Lower Stoke in the Medway local authority area in north Kent. The area to be surveyed is centred approximately at NGR TQ817761. The total area which was proposed for investigation at the time of the original fieldwork (as indicated by red cross hatching on the location plan; figure 1) amounts to c. 35.5ha. Reasonably complete coverage was achieved (with the exception of the kale crop in field 4), but with small gaps in heavily rutted parts of field 3. The area finally surveyed in 2013 (as indicated by blue cross hatching in figure 1) was 25.7ha. The additional area surveyed in 2014 (excluding the area planted for cover in the north east of field 4) was 6.54ha.

The extent of the proposed development has been revised since the 2013 survey, and it is currently to cover the area as indicated approximately by a green outline in figure 1. The areas surveyed in fields 7-8 therefore lie outside the present site boundaries.

Topography and geology

The underlying geology of the site is silty and sandy clay of the Eocene Thames Group (London Clay). The site appears to be free of drift deposits, and is at an elevation of c. 20-

30m AOD (rising from south to north). It is therefore above the level of nearby marshland (where variable alluvial deposits can give rise to strong natural magnetic anomalies), and conditions should not present any unusual difficulties for a magnetometer survey. Clay soils may not be strongly responsive to a magnetometer survey, and so it is likely (as is usual) that settlement or industrial remains (if present) would be more readily detectable than earthwork features or infilled ditches which lack magnetically enhanced fill.

Magnetic susceptibility readings taken at the site during the course of the survey varied within a range 4-22 (x 10^{-5} SI), and showed a uniform increase from the low lying ground to the south in field 6 to the higher ground in field 3 to the north. The readings are no higher than would be expected on a clay soil, but across much of the site are comparable to those seen at numerous sites where productive magnetometer surveys have been undertaken.

Archaeological background

We have not been told of any previously identified archaeological findings in the vicinity of the site, and none are marked on the plan (supplied by CgMs, and showing HER data) which is used as the background to the survey location plan (figure 1). The survey was therefore undertaken as a reconnaissance exercise to test for evidence of any previously unrecorded archaeological sites or features which may be present.

Survey Procedure

The site was investigated by means of a recorded magnetometer survey. Readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and are plotted at 25cm intervals along each transect. The results of the survey are presented at 1:2000 scale as a grey scale plot (figures 2-3), and as a graphical (x-y trace) plot at 1:1500 (figures 4-6). Comparison of these alternative presentations allows the detected magnetic anomalies to be examined in plan and profile respectively. An interpretation of the findings is shown superimposed on figures 4-6 (which permits the interpreted outlines to be compared with the underlying data), and is reproduced separately to provide a summary of the findings (figures 7-8).

The graphical plots show the magnetometer readings after minimal pre-processing which includes adjustment for irregularities in line spacing caused by variations in the instrument zero setting, and slight linear smoothing. Additional 2D low pass filtering has been applied to the grey scale plots to adjust background noise levels.

Colour coding has been used in the interpretation to distinguish different effects. The interpretation is intended to be schematic and illustrative, and not to reproduce the detail of the grey scale plots.

Features as marked include magnetic anomalies which may show characteristics to be expected from features of potential archaeological significance (in red). Stronger (perhaps recent) disturbances are in brown. Cultivation markings are shown as green broken lines, and some of the more conspicuous ferrous objects (identifiable as narrow spikes in the graphical

plots) are outlined in light blue. Broad or irregular magnetic anomalies of possibly natural origin are outlined in a light green/brown.

Survey location

The survey grid was set out and tied to the OS grid using a GPS system (with VRS differential correction to give accuracy to c. 10cm). The plans are therefore geo-referenced, and OS co-ordinates of map locations can be read from the AutoCAD version of the plans, which can be supplied with this report.

Results

The survey has detected numerous magnetic features and disturbances, including magnetic anomalies which may indicate locations where further investigation is most likely to be productive. Much of the magnetic activity does, however, appear to be of recent or natural origin, and there are few (if any) individual findings which can be claimed unambiguously to be of archaeological significance.

Fields within the survey areas have been numbered arbitrarily (1-8) for identification in the survey plans. We comment on the findings in the same sequence.

Fields 1-3

Findings as marked in fields 1-2 (now combined) are limited to narrow north-south linear cultivation markings which probably relate to current ploughing (as indicated by green broken lines). There are also groups of broad irregular magnetic anomalies, of which some of the more distinct examples are labelled A and B in figure 7. Magnetic anomalies of this kind are commonly seen on silt or clay soils, or in wetland conditions, and appear to represent naturally silted hollows in the subsoil, or variations in the depth or composition of near-surface silt deposits.

A linear sequence of disturbances (C) at the south of field 2 is likely to represent a land drain. It continues the alignment of a much broader spread of disturbed readings (D) in field 3. These could represent a ditch or trench infilled with rubble or similar modern debris. Some of the fill has perhaps been spread across the surrounding area by ploughing.

Field 4

The survey in field 4 (done in 2014) detected one distinct linear feature (outlined in red at M). The location and orientation of this feature suggest it indicates the line of a former field boundary. Various weakly detected land drains appear to converge on M, which probably therefore represents an infilled ditch.

The irregular linear sequence of magnetic anomalies (N) at the east of the field continues the alignment of the similar disturbances (E) seen in field 5. They appear here to be rather more distinct and continuous than in field 5, but could perhaps represent a natural hollow or

palaeochannel. Alternatively (and speculatively) the feature could perhaps relate to the possible cultivation pattern seen in field 5, as noted below.

The other main finding is a group (O) of broad weak magnetic anomalies of the kind seen at A, B and elsewhere in fields 1-2. These again are likely to be natural. There appear to be stronger and probably recent disturbances (as seen at various other locations in the survey) near N in the south eastern corner of the field. A pipe was detected next to the track at the east of the field.

Field 5

Features visible here include a weak and irregular diagonal linear marking at E. This is difficult to categorise, and could perhaps be a more extended version of the natural magnetic anomalies seen at A and B. It does, however, align with the indistinct linear markings which are indicated in green in the southern half of the field. These do not align with the present field boundaries, and appear to terminate part way across the field. It is perhaps therefore possible that the green (cultivation ?) markings and linear feature E could together relate to a cultivation system which pre-dates the modern field plan, but the evidence is highly inconclusive.

Two short but relatively distinct linear features (F and G) in the north-east of field 5 are indicted in red in case they represent ditches of archaeological relevance. They do not form any clear or coherent plan of a kind which would suggest the presence of an ancient ditched enclosure.

Two possible circular features are marked in red at H. They are indistinct, but could perhaps (on the basis of their plan) be interpreted as the eroded remains of small ring ditches or hut circles. They are not clearly associated with any other nearby findings of a kind which would suggest the presence here of a settlement site.

The magnetic anomalies outlined in brown around J have erratic but subdued profiles (as seen in the graphical plot, figure 5). This suggests the presence of items of recent or strongly magnetic debris buried at some depth in a trench (rather than near-surface ferrous objects of the kind indicated in blue), but it is difficult to offer any more specific interpretation.

Fields 6-8

Findings in field 6 include a gas pipe (blue), and various (perhaps associated) recent disturbances in the south-eastern corner of the field, together with possible land drains (K).

There is a possibly similar group of drains and other recent disturbances around L in field 7. Cultivation markings in fields 7-8 appear to align with current field boundaries.

Conclusions

The survey has not produced any findings of conclusive or unambiguous archaeological significance, but the possibility remains that faint traces of archaeological features could have survived the intensive modern cultivation in field 5.

This interpretation remains uncertain, but the possibility that the findings as noted in field 5 could represent traces of an earlier cultivation pattern or field system superimposed on hut circles or settlement remains (at H) cannot be entirely excluded on the survey evidence alone.

No comparable findings are identifiable in other parts of the survey. A former field boundary was detected in field 4 in the 2014 survey.

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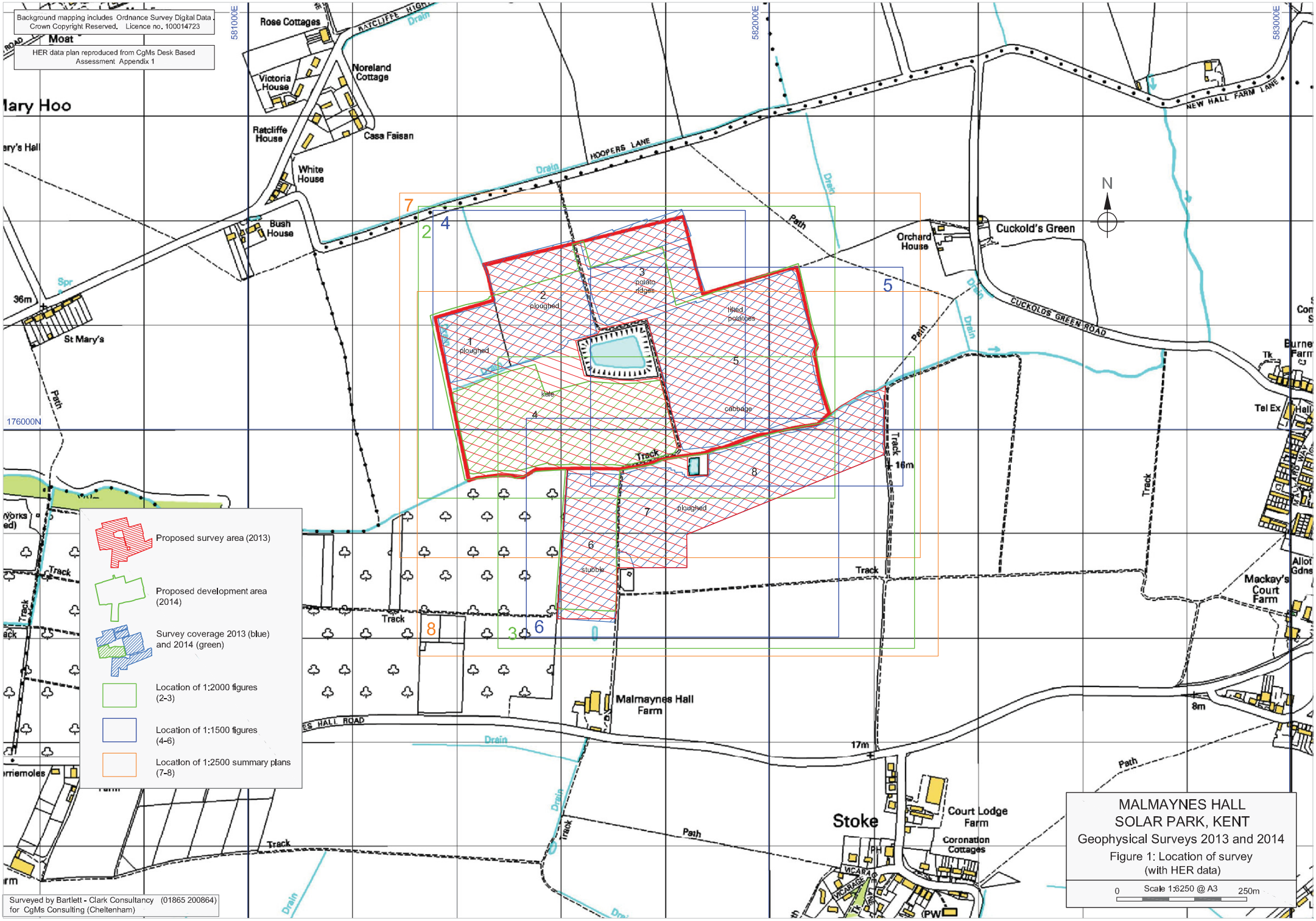
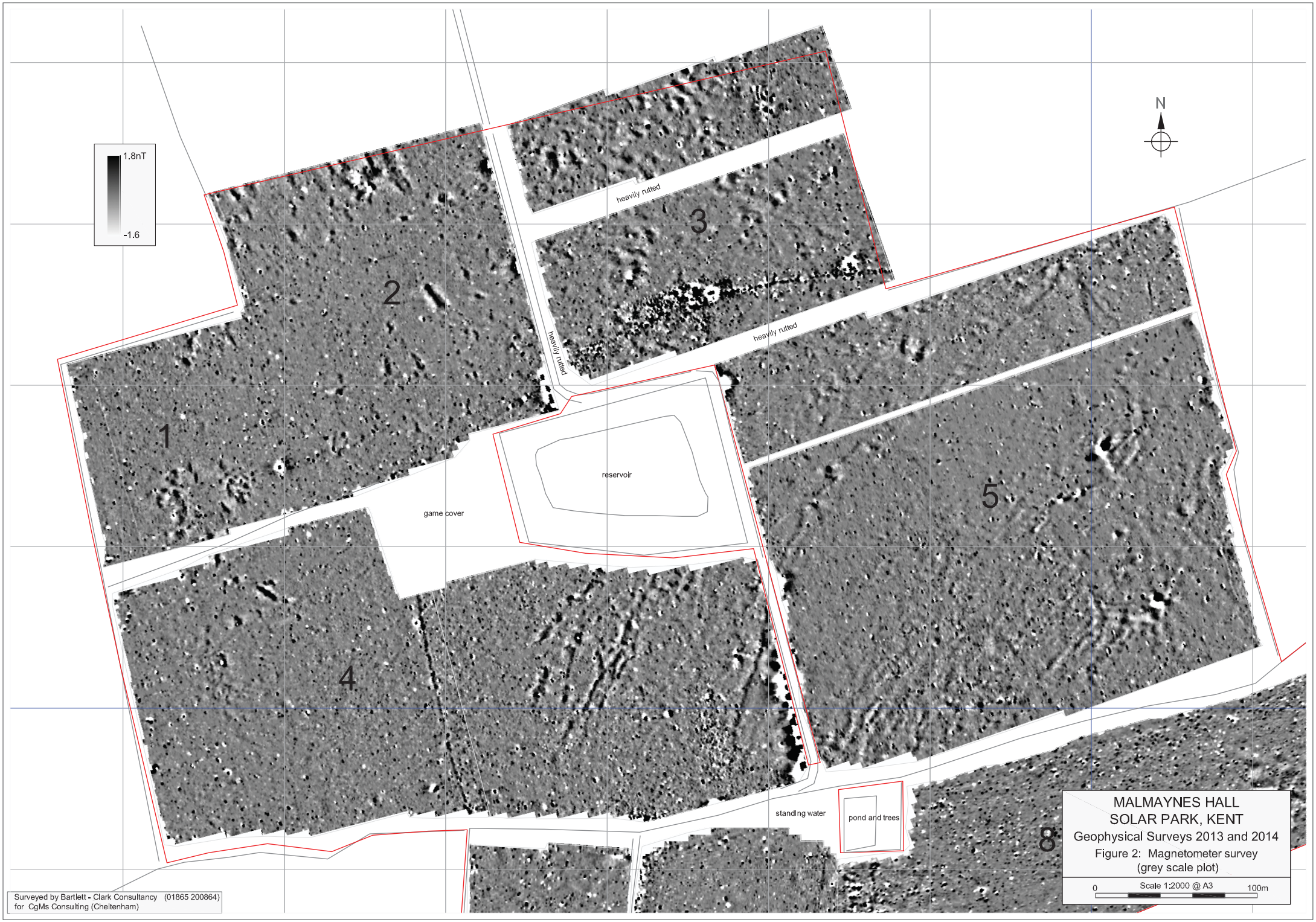
The fieldwork for the 2013 survey was done by P. Cottrell, R. Organ, C. Oatley and P. Heykoop. Field 4 was surveyed in 2014 by P. Cottrell and C. Matthews.

Reference

[1] *Malmaynes Hall Solar Park, Medway; Written Scheme of Investigation for Archaeological Geophysical Survey.* Document submitted to CgMs by Bartlett Clark Consultancy; 7 November 2013.


Background mapping includes Ordnance Survey Digital Data. Crown Copyright Reserved. Licence no. 100014723
HER data plan reproduced from CgMs Desk Based Assessment Appendix 1
581000E
582000E
583000E
176000N
Rose Cottages
Moat
Victoria House
Noreland Cottage
Ratcliffe House
Casa Faisan
White House
Bush House
HOOPERS LANE
NEW HALL FARM LANE
Orchard House
Cuckold's Green
CUCKOLDS GREEN ROAD
St Mary's
36m
Path
Drain
Track
16m
17m
8m
N
1 ploughed
2 ploughed
3 potato ridges
lifted potatoes
4 kale
5
cabbage
6 stubble
7 ploughed
8
Malmaynes Hall Farm
Mackay's Court Farm
Stoke
Court Lodge Farm
Coronation Cottages
VICARAGE
PH
(PW)
Proposed survey area (2013)
Proposed development area (2014)
Survey coverage 2013 (blue) and 2014 (green)
Location of 1:2000 figures (2-3)
Location of 1:1500 figures (4-6)
Location of 1:2500 summary plans (7-8)
Surveyed by Bartlett - Clark Consultancy (01865 200864) for CgMs Consulting (Cheltenham)
MALMAYNES HALL SOLAR PARK, KENT
Geophysical Surveys 2013 and 2014
Figure 1: Location of survey (with HER data)
Scale 1:6250 @ A3
0
250m


1.8nT
-1.6
N
1
2
3
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8
heavily rutted
heavily rutted
heavily rutted
reservoir
game cover
standing water
pond and trees
MALMAYNES HALL
SOLAR PARK, KENT
Geophysical Surveys 2013 and 2014
Figure 2: Magnetometer survey
(grey scale plot)
0
Scale 1:2000 @ A3
100m
Surveyed by Bartlett - Clark Consultancy (01865 200864)
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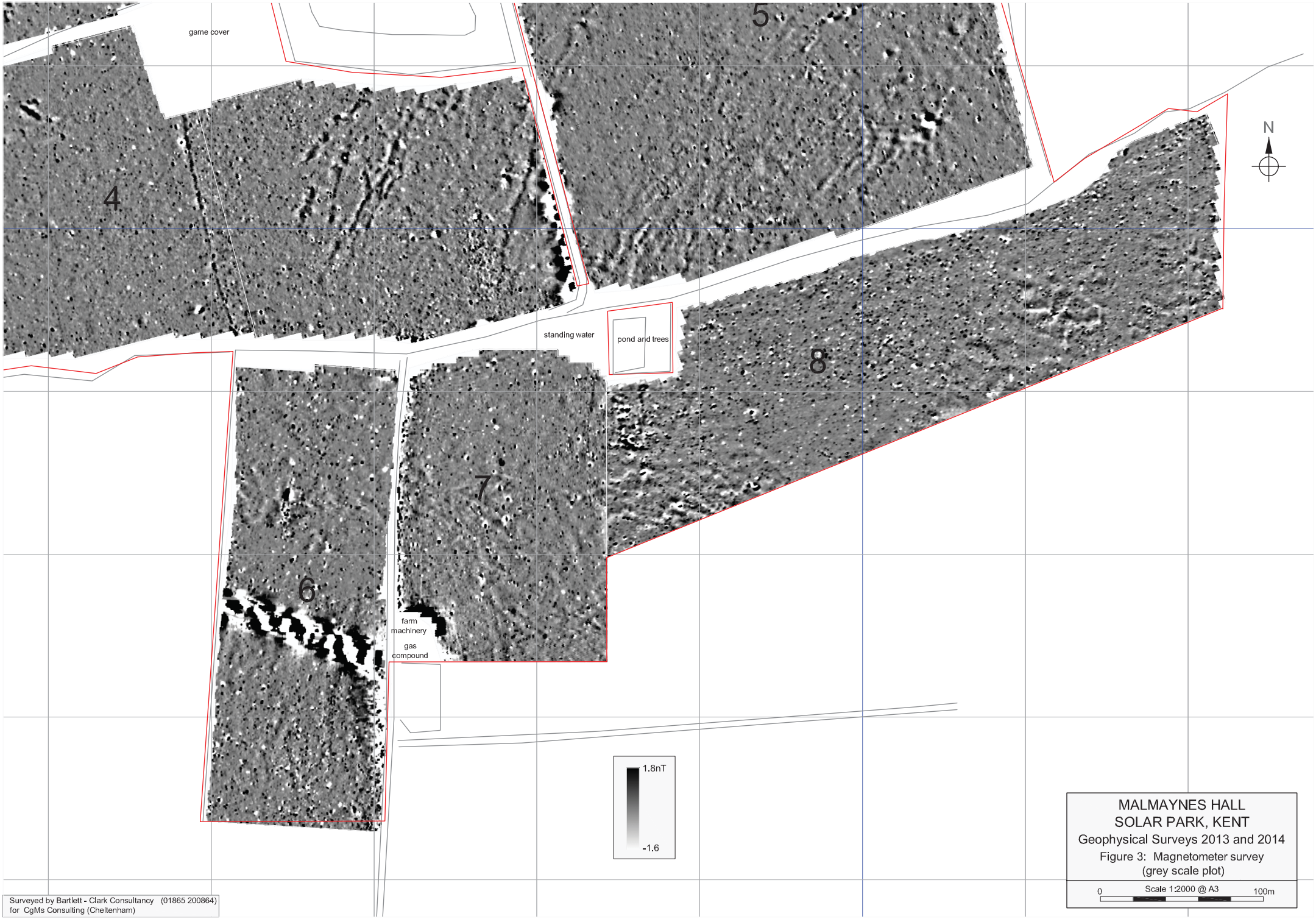
game cover
4
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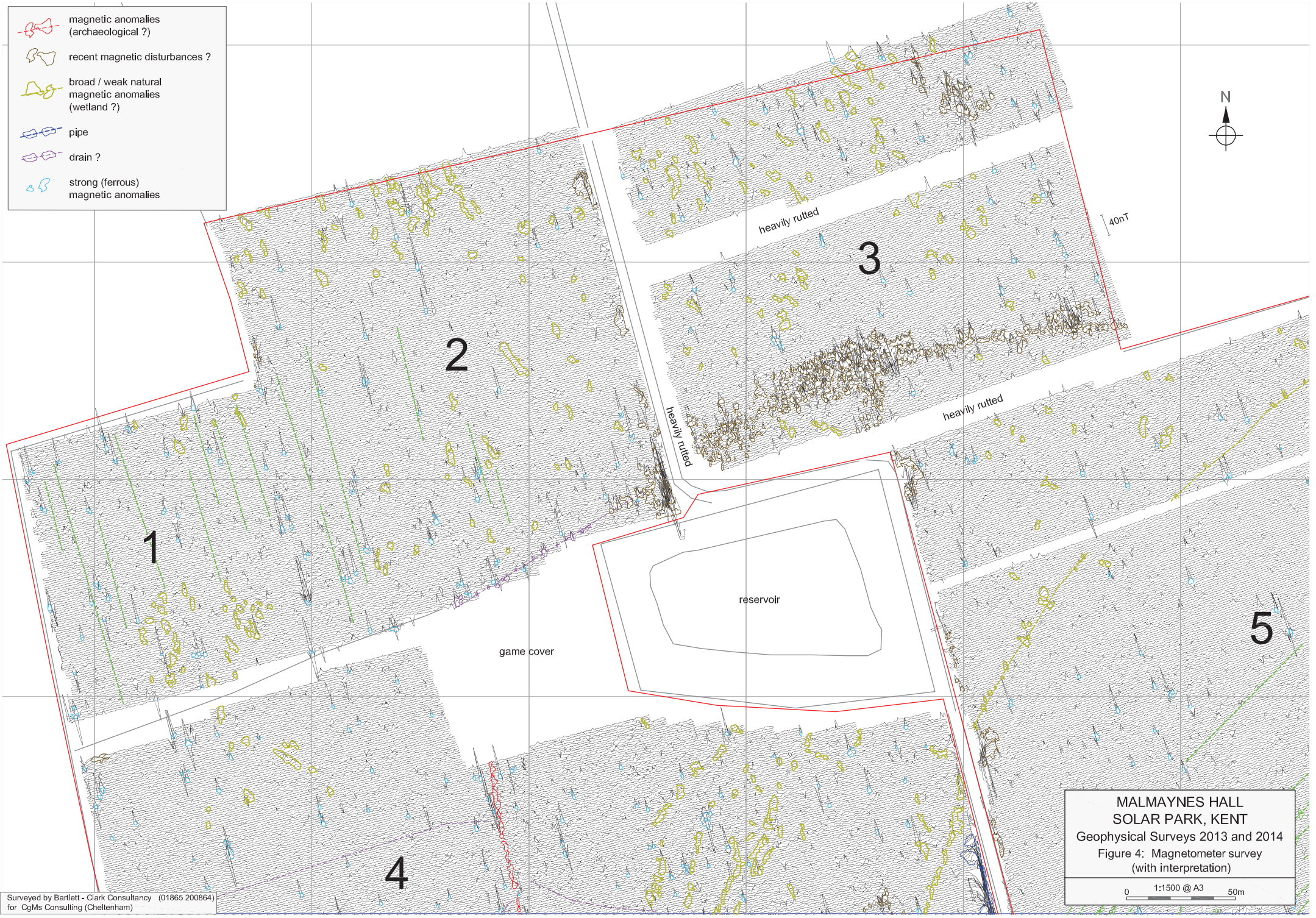
7
6
standing water
pond and trees
farm
machinery
gas
compound
N
1.8nT
-1.6
MALMAYNES HALL
SOLAR PARK, KENT
Geophysical Surveys 2013 and 2014
Figure 3: Magnetometer survey
(grey scale plot)
0
Scale 1:2000 @ A3
100m
Surveyed by Bartlett - Clark Consultancy (01865 200864)
for CgMs Consulting (Cheltenham)


magnetic anomalies (archaeological ?)
recent magnetic disturbances ?
broad / weak natural magnetic anomalies (wetland ?)
pipe
drain ?
strong (ferrous) magnetic anomalies
N
40nT
heavily rutted
heavily rutted
heavily rutted
1
2
3
4
5
reservoir
game cover
MALMAYNES HALL
SOLAR PARK, KENT
Geophysical Surveys 2013 and 2014
Figure 4: Magnetometer survey (with interpretation)
0
1:1500 @ A3
50m
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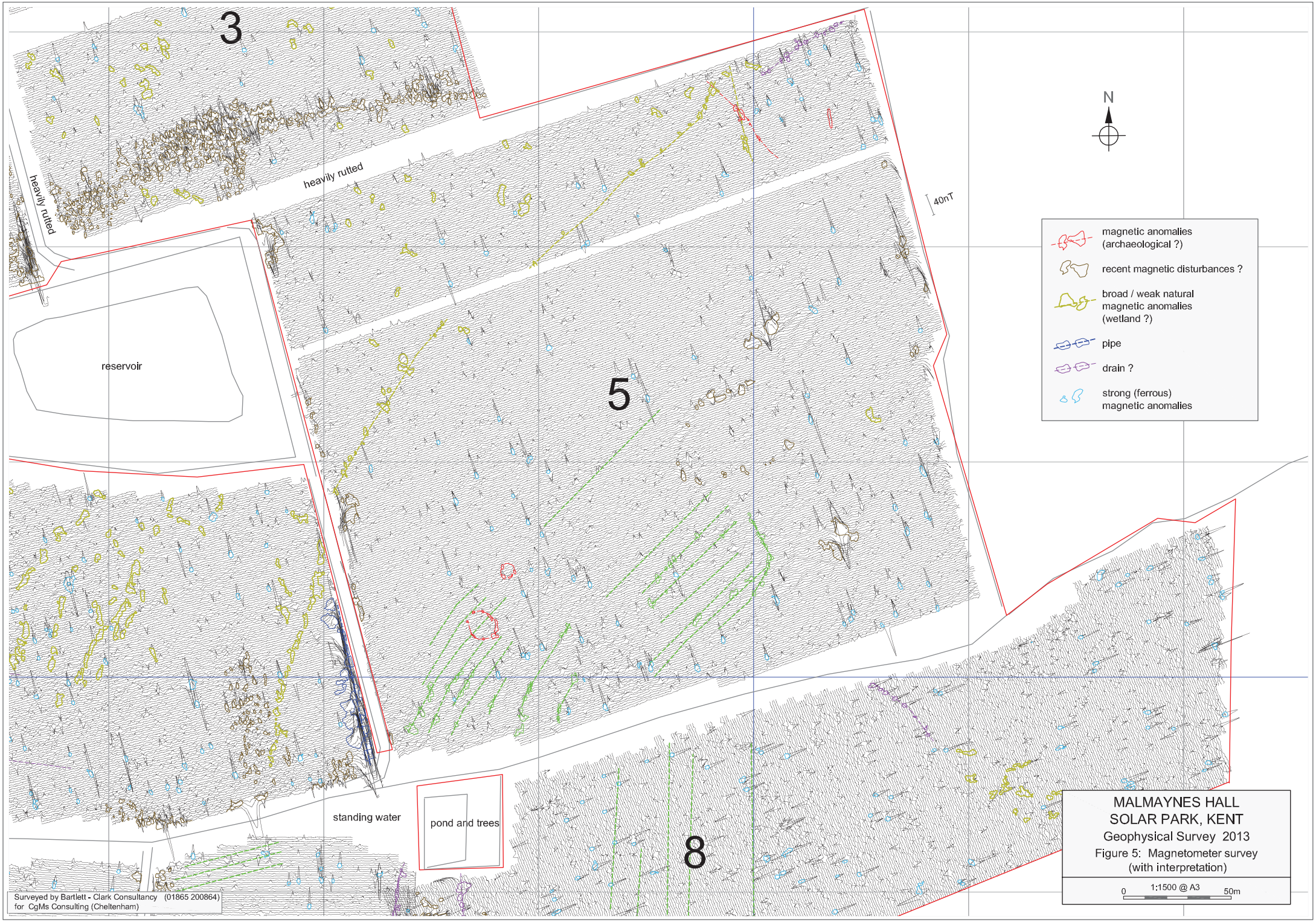
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heavily rutted
reservoir
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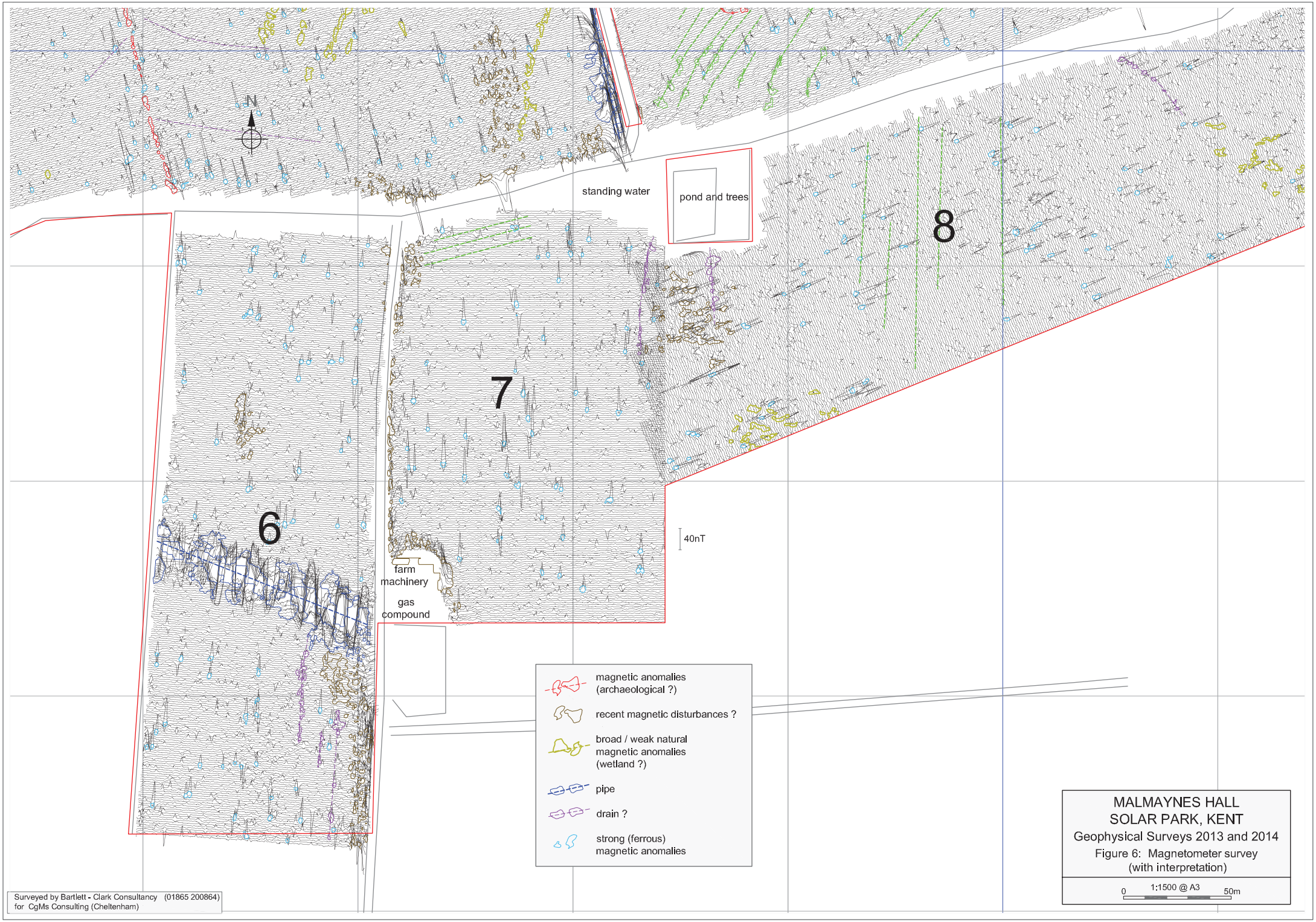
magnetic anomalies (archaeological ?)
recent magnetic disturbances ?
broad / weak natural magnetic anomalies (wetland ?)
pipe
drain ?
strong (ferrous) magnetic anomalies
standing water
pond and trees
8
MALMAYNES HALL
SOLAR PARK, KENT
Geophysical Survey 2013
Figure 5: Magnetometer survey (with interpretation)
0
1:1500 @ A3
50m
Surveyed by Bartlett - Clark Consultancy (01865 200864)
for CgMs Consulting (Cheltenham)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pond and trees
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7
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40nT
farm machinery
gas compound
magnetic anomalies (archaeological ?)
recent magnetic disturbances ?
broad / weak natural magnetic anomalies (wetland ?)
pipe
drain ?
strong (ferrous) magnetic anomalies
MALMAYNES HALL
SOLAR PARK, KENT
Geophysical Surveys 2013 and 2014
Figure 6: Magnetometer survey (with interpretation)
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1:1500 @ A3
50m
Surveyed by Bartlett - Clark Consultancy (01865 200864)
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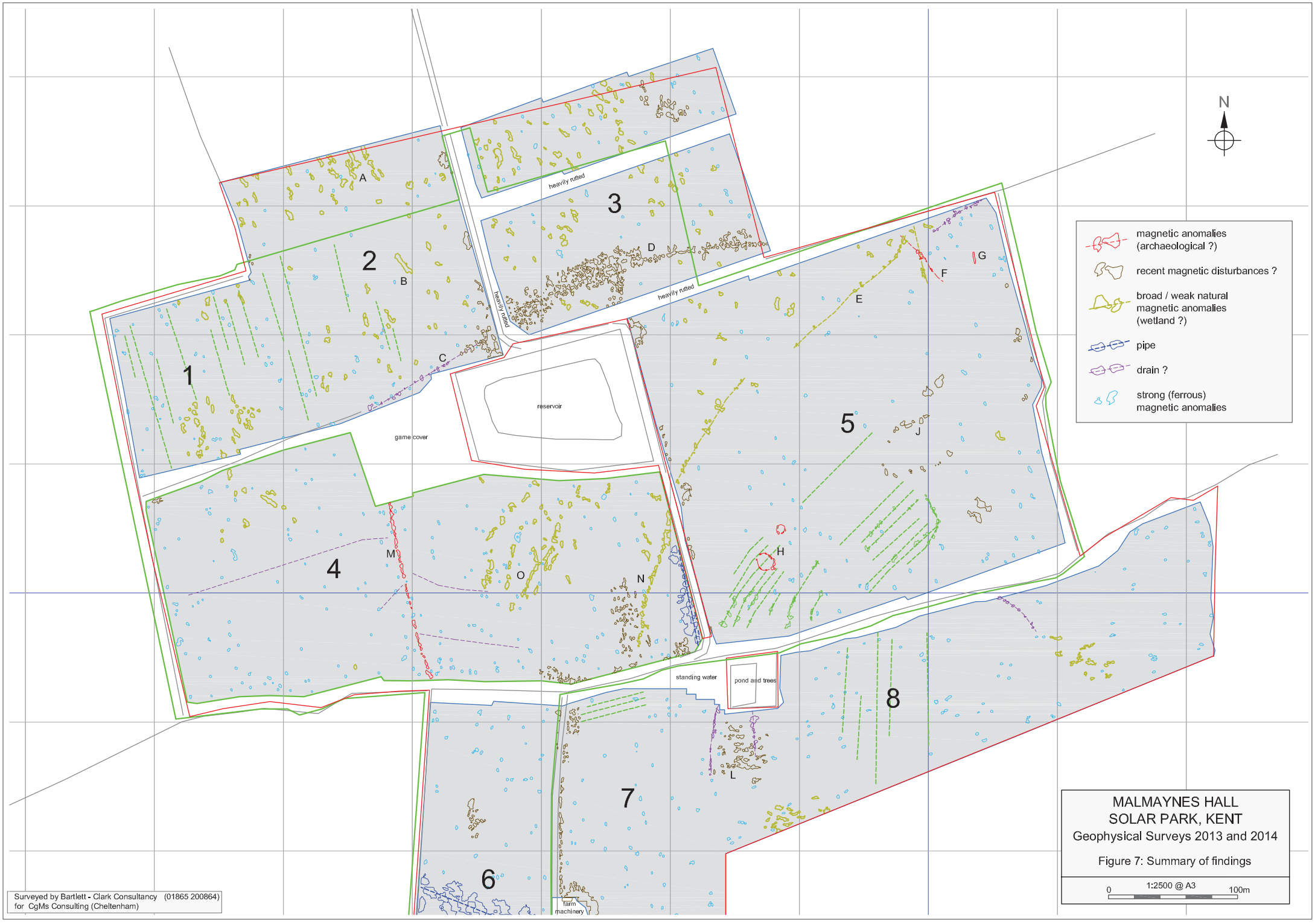
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magnetic anomalies (archaeological ?)
recent magnetic disturbances ?
broad / weak natural magnetic anomalies (wetland ?)
pipe
drain ?
strong (ferrous) magnetic anomalies
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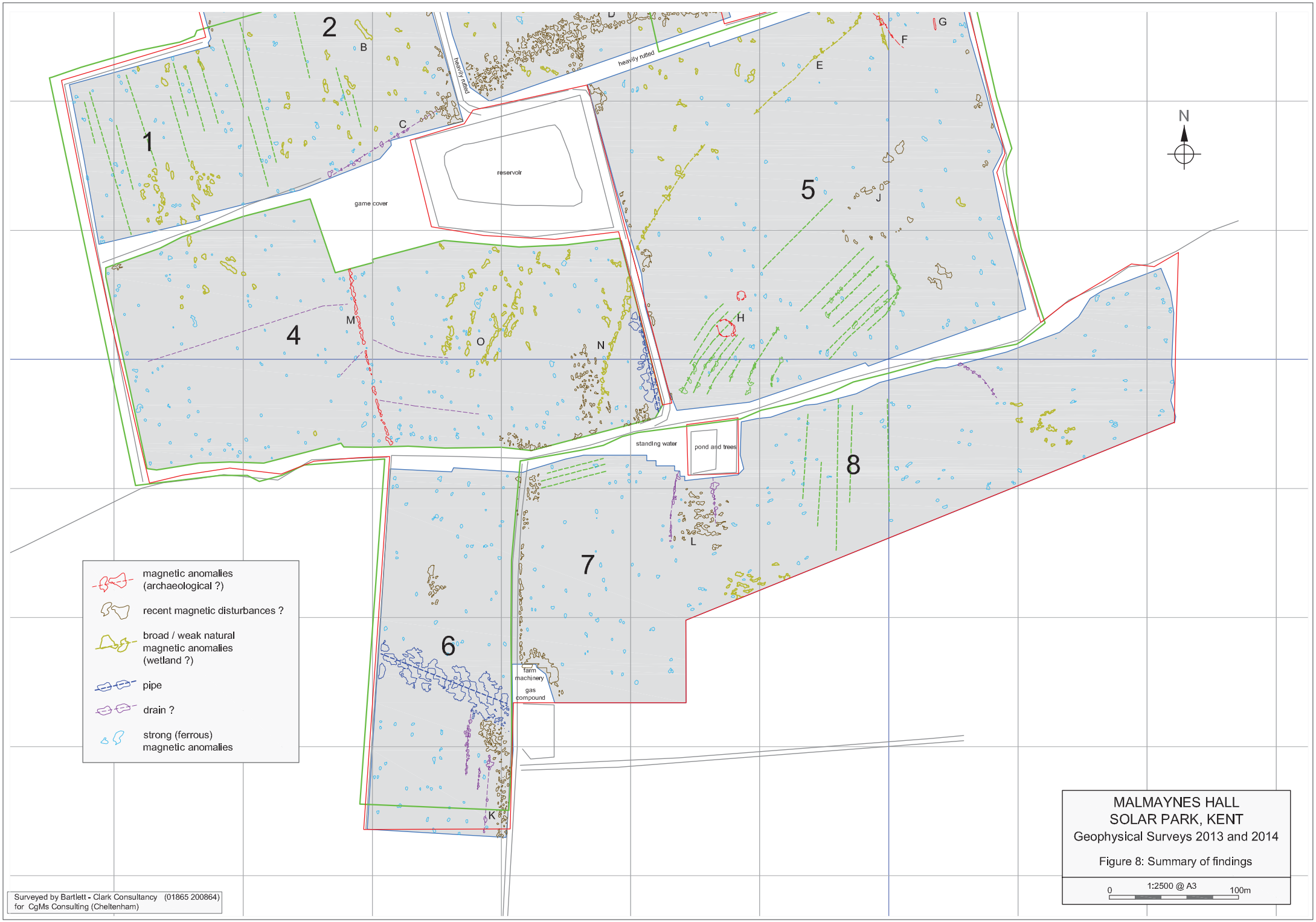
reservoir
game cover
standing water
pond and trees
farm machinery
MALMAYNES HALL
SOLAR PARK, KENT
Geophysical Surveys 2013 and 2014
Figure 7: Summary of findings
0
1:2500 @ A3
100m
Surveyed by Bartlett - Clark Consultancy (01865 200864)
for CgMs Consulting (Cheltenham)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heavily rutted
heavily rutted
reservoir
game cover
standing water
pond and trees
farm machinery
gas compound
N
magnetic anomalies (archaeological ?)
recent magnetic disturbances ?
broad / weak natural magnetic anomalies (wetland ?)
pipe
drain ?
strong (ferrous) magnetic anomalies
MALMAYNES HALL
SOLAR PARK, KENT
Geophysical Surveys 2013 and 2014
Figure 8: Summary of findings
0
1:2500 @ A3
100m
Surveyed by Bartlett - Clark Consultancy (01865 200864)
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