



LAND AT CHILTON LEYS FARM, CHILTON LEYS, ONEHOUSE, SUFFOLK

DETAILED MAGNETOMETER SURVEY



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March 2014



**LAND AT CHILTON LEYS FARM,
CHILTON LEYS, ONEHOUSE, SUFFOLK**

DETAILED MAGNETOMETER SURVEY

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Site Code	ONS 009	NGR	TM 0292 5966
Planning Ref.	-	OASIS	britanni1-172681
Approved By	Martin Brook	DATE	March 2014



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ABSTRACT

Detailed fluxgate gradiometer survey was undertaken by Britannia Archaeology Ltd over two separate paddocks on 27th February 2014. A fairly wide range of anomalies were recorded within them, some of which have archaeological potential.

The northern paddock contained one area of magnetic disturbance that potentially relates to demolition rubble material. Three weak positive linear trends, two of which are present on a similar alignment to a backfilled field boundary and the third that is potentially a land drain or service run were recorded. One positive discrete anomaly could be the remains of a former rubbish pit however a geological origin cannot be ruled out.

Anomalies recorded in the southern paddock include four areas of magnetic disturbance that may demarcate the location of demolition rubble material. A dipolar discrete anomaly interpreted as a potential former burnt pit. Two weak positive linear trends have also been recorded and interpreted as land drains or service runs.

No anomalies indicative of a return related to the possible moat are present in the southern paddock, it is therefore surmised that if this feature exists; it may be present in the garden of Chilton Leys Farm or potentially under the existing boundary. Outbuildings associated with moated sites are commonly present on the outside of the earthwork and therefore the areas of magnetic disturbance recorded during the magnetometer survey may prove to be evidence of these former structures.



1.0 INTRODUCTION

On Thursday 27th February 2014 Britannia Archaeology Ltd undertook detailed magnetometer survey over c.1 hectare of land in two separate paddocks given over to pastureland at Chilton Leys Farm, Chilton Leys, Onehouse, Suffolk (NGR TM 0292 5966).

This survey was commissioned by Mr John Dadge of Barker Storey Matthews on behalf of the landowner Mr Piers Morgan in advance of a proposed new housing development. This report will support a planning application for the proposed development of the site, which will involve:

- construction of five residential properties in the northern paddock on approximately 0.61h of land;
- construction of one residential property in the southern paddock on approximately 0.41h of land;
- construction of an internal access route to the northern paddock.

2.0 SITE DESCRIPTION

The site is located in an area dominated by agricultural activity over two separate paddocks that are currently given over to pasture at a height of 50m AOD. An area of woodland immediately south of the northern paddock and east of Chilton Leys Farmhouse is in the development area but was not suitable for survey.

The Bedrock geology is described as Crag Group Sand, a sedimentary bedrock formed approximately 0 to 5 million years ago in the Quaternary and Neogene Periods when the local environment was dominated by shallow seas depositing mainly siliciclastic sediments of mud, silt, sand and gravel (BGS, 2014).

The superficial geology is classified as Lowestoft Formation Sand and Gravel, deposits formed up to 2 million years ago in the Quaternary Period when the local environment was dominated by ice age conditions with glaciers scouring the landscape depositing moraines of till with outwash sand and gravel from seasonal and post glacial meltwaters (BGS, 2014).

3.0 PLANNING POLICIES

The archaeological investigation was carried out on the recommendation of the local planning authority, following guidance laid down by the *National Planning and Policy Framework* (NPPF, DCLD 2012) which replaces *Planning Policy Statement 5: Planning for the Historic Environment* (PPS5, DCLG 2010). The relevant local planning policy is the *Mid Suffolk District Local Plan*; (1998) which is due to be replaced with the *Mid Suffolk District Local Development Framework* in the near future.



3.1 National Planning Policy Framework (NPPF, DCLG March 2012)

The NPPF recognises that 'heritage assets' are an irreplaceable resource and planning authorities should conserve them in a manner appropriate to their significance when considering development. It requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. The key areas for consideration are:

- The significance of the heritage asset and its setting in relation to the proposed development;
- The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance;
- Significance (of the heritage asset) can be harmed or lost through alteration or destruction, or development within its setting. As heritage assets are irreplaceable, any harm or loss should require clear and convincing justification;
- Local planning authorities should not permit loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred;
- Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.

3.2 Mid Suffolk Local Plan (1998).

The local plan for Mid Suffolk deals with the development on archaeological sites in policy HB14, this states the following:

- Where there is an overriding case for preservation, planning permission for development that would affect an archaeological site or setting will be refused.
- Having taking archaeological advice, the district planning authority may decide that development can take place subject to either satisfactory measures to preserve the archaeological remains in situ or for the site to be excavated and the findings recorded. In appropriate cases the district planning authority will expect a legally binding agreement to be concluded or will impose a planning agreement to be concluded or will impose a planning condition requiring the developer to make appropriate and satisfactory provision for the excavation and recording of the archaeological remains.

In section 2.2.3 of the Local Plan the Heritage and Listed Building objectives are:-

- To maintain or enhance the quality of Mid Suffolk's heritage, particularly through safeguarding its Conservation Areas and Listed Buildings.
- To protect ancient monuments and their settings.
- To give protection to parks and gardens of historic or landscape importance.
- To control change in ways that will protect the character of towns and villages and their settings.
- To give protection to archaeological sites and to ensure they are properly investigated and recorded if such sites are disturbed by development.



4.0 ARCHAEOLOGICAL BACKGROUND

A desk-based assessment was undertaken by Britannia Archaeology Ltd in March 2014 (Brook, M.), the findings are summarised below.

4.1 Prehistoric (750000BC – 43AD)

Suffolk in general has a rich record of prehistoric activity and archaeological sites. Fertile land and an abundance of natural resources means that the area has always been an attractive location for settlement. While the wider landscape contains evidence of limited prehistoric activity, there is no record of any such activity on the assessment site. Given these results, there is a **low** potential for the presence of prehistoric features or finds.

4.2 Romano-British (43AD – c. 410AD)

The Romano-British period marked a significant change in development for the wider area with *Camulodunum* (Colchester) becoming the Roman Capital of Britannia. Onehouse is located approximately 30km north of *Camulodunum* but close to *Combetovium* (Coddensham) where four Roman roads converge. Onehouse itself sits between two Roman roads, the north-south road was the main route from the Iceni capital *Venta Icenorum* (Caister St. Edmund) to *Londinium* (London) via Colchester (now the A140, A14 and A12), the east-west road (no longer extant) runs from the Fort at *Combetovium* through Long Melford and joined the *Via Devana* before running to *Duroliponte* (Cambridge) (Antonine *Iter V & IX*).

Much of Britain remained virtually unchanged after the Roman invasion of 43 AD; however East Anglia experienced significant development both in settlements and villa buildings as well as road construction.

There is no direct evidence for Roman activity on the site and limited evidence for more Roman activity in the area. While there were Roman bricks and tile recorded in the field walking exercise at Land off Union Road, Onehouse, Stowmarket (ONS 007) these were relatively sparse. In contrast to the eastern side of Stowmarket where significant Roman remains have been found at Cedars Park along to *Combetovium* (Coddensham) the location of a Roman fort.

Despite the presence of Roman archaeology on the eastern side of Stowmarket and beyond, the potential for Roman finds or features on the assessment site is **low**.

4.3 Anglo-Saxon (early medieval) (c.410AD – 1066AD)

The withdrawal of Roman authority in Britain in the early 5th Century AD and the dominance of the Anglo-Saxons in the south and east of England led to significant changes in settlement distribution. Many of the Roman settlements, such as Colchester, waned in significance and new settlements were established, settlement patterns persisting throughout Iron Age and Roman Britain did not necessarily continue into the Anglo-Saxon period. There is no direct evidence for Anglo-Saxon activity on the site and



limited evidence for more substantial settlement activity in the wider area, consequently there is a **low** potential for Anglo-Saxon finds and features.

4.4 Medieval (1066 AD – 1540 AD)

An entry in the Domesday Book (1086AD) records the village at Onehouse in the Stow Hundred and County of Suffolk with a total population of 36 households (very large) comprising eight smallholders and four slaves. The total tax was assessed at 2.1 geld units which was of a moderate amount, the village had two lord's plough teams and one men's plough teams, 12 acres of meadow, woodland with six pigs, one church with 0.02 church lands, six cattle, 30 pigs and 87 sheep, 22 goats and one cob. Lord Ranulf Peverel had replaced the Saxon Lord Ketil Alder after the 1066 conquest, (Morris, J. 1985). Onehouse appears to have prospered more than the surrounding area after the Conquest with a significant rise in livestock and value.

One of the 16 SHER records returned for this period identifies the possibility of medieval activity on the assessment site (ONS 006). The wording is ambiguous, referring to two L – shaped arms of a possible former moat on the eastside of a range of buildings that form Chilton Leys, but it is unclear whether these relate to the two arms of the single existing feature, or if they refer to the existing feature together with another part which has since been filled and covered. It appears on a map by Hodkinson produced in 1787 however only the single existing feature with two arms is recorded. This is still the case today, where the northern and eastern arm of the possible moat remains but if any return did exist it has been backfilled. The act of only partially moating the site might have more to do with the desires of the economy and at least a show of defence (Taylor, C. 1978), many moated sites are simply enclosures surrounded by a ditch upon which the house and related structures stood (Taylor, C. 1978).

Domestic farming activity related to the local lords and their estates was predominant here in the medieval period. The majority of lords in Suffolk were moderately wealthy local farmers, although a few might seek favour and advancement in the retinues of lay aristocrats (Bailey, M. 2007). This is evidenced by two large manor houses that are known in the area. The fact that there are three moated sites in close proximity to each other is a scaled down model of what was happening in the rest of Suffolk where over 850 known moated sites are located (Dymond, D. & Martin, E. 1988).

The presence of the possible moat, eight medieval SHER records and multiple listed buildings in the area reveals that the potential for finding archaeology of a medieval date is **moderate to high**.

4.5 Post-medieval and modern (1540AD – Present) (Figs. 2 & 3)

Onehouse and Stowmarket are reasonably well-documented, especially in cartographic sources, towards the latter half of the post-medieval period. More prominent towns in the wider area began a long period of decline in the early post-medieval period with trade in wool and other cloth types, upon which the local economy relied, being superseded by continental styles (Jones, W. 1984). The decline continued well into the



late 19th century with a series of poor harvests in the 1870s severely damaging the already struggling farming industry.

The earliest maps of the area show the village of Onehouse but in very little detail, only illustrating rough locations in relation to surrounding towns and villages. Saxon's Map of Suffolk dating to 1575, records pictorial representations of the towns and villages and scales the size to match population and importance. The larger town of Stowmarket is clearly identifiable and recorded with the smaller Onehouse located to its west. Similarly John Blaeu's map of 1645 depicts Onehouse as a much smaller settlement than Stowmarket.

The size of the village has altered little since the medieval period; however significant redevelopment took place in the late 16th and 17th century with 11 of the 18 listed buildings dating from this period. This significant development coincides with the end of prosperity of the larger wool and textile towns. The fact that so many buildings have survived is partly due to the high quality construction techniques used by the builders and demonstrates significant investment the village.

Nine buildings are listed within the village of Onehouse, all but one of which are located along on or just off forest road but lie at least 400m east of the assessment site. The most notable building is former rectory named The Grange and located on Forest Road, the main part of the structure is of late 16th century date with a mid-16th century core and 18th century remodelling.

The 18th century saw a steady increase in the number of buildings in the area. John Kirby's map from 1736 is more detailed than the John Blaeu map from 1645, showing roads and the basic layout of the larger settlements; however pictorial representations are still used for the smaller settlements. Onehouse is identified with a small church and large manor house. Chilton is also marked on Kirby's map and may provide a *terminus post quem* for the hamlet before it is absorbed by the expanding town of Stowmarket.

Stow Lodge Hospital formally the Stow Union Workhouse (279932) is located 500m south-east of the assessment site and was built in 1781. This House of Industry was a red brick building, had a slated roof and modillioned wooden eave cornices, and stood three storeys high. It was taken over by the new Stow Poor Law Union in 1835, this operated between 1835 and 1930 as the Stow Union Workhouse and catered for the parishes of the Stow hundred (Whitehand, R. 2012). The capacity of the workhouse is cited as 500 but in the 1881 census there were 138 inmates recorded (Whitehand, R. 2012). Like the Hundred house at Samford, Stow had a large U-shaped main building, (Higginbotham, P. 2014) which can be seen on Hodkinson's 1787 map. Eventually the workhouse became Stow Lodge Hospital which subsequently closed in 1991. The site has now been converted to residential use. Even though this building is unlikely to have had a direct impact on Chilton Leys Farm it would have certainly been visible from the assessment site and would have had a resounding impact on the local area, both socially and economically.

By the mid-19th century the population of Onehouse was only a tenth of the size of Stowmarket. The 1841 census records the population of Onehouse as 303 while the



population of Stowmarket was 3043, (White, W. 1844). This coincides with the reliance on agriculture and industry in the wider landscape and fits with the main period of use for the Stow Union Workhouse.

Development of the area in the late post-medieval and modern periods is well documented in 19th century cartographic sources. No Enclosure Map was found for either Onehouse or Stowmarket, however the Tithe Map dated to 1846 and clearly identifies the assessment site to the north and south of Chilton Leys. It shows that the modern field boundaries are part of two large plots of land. The Tithe map is split between Onehouse and Stowmarket and all the plots were owned by Lady Jane Seymour Hotham and farmed by the tenant, John Green Jr, who presumably resided in Chilton Leys Farm.

The First Edition Ordnance Survey Map dated 1884 offers far more detail than earlier maps and the assessment site is clearly identifiable to the north and south of Chilton Leys. Little appears to have changed since the production of the Tithe map with the exception of one field boundary in the northern paddock bisecting the current boundary from the north-west to southern boundary.

The revised Ordnance Survey of 1953 shows an outbuilding located in the northern field. This building was not on the 1929 auction plan and does not appear on the subsequent 1991 Ordnance Survey map. It is likely that this was a non-permanent outbuilding constructed from wood or other light materials that was only standing for a limited amount of time.

The potential for post-medieval and modern features is **moderate** due to the associated structures relating to existing buildings which have undergone redevelopment. It should be noted that some residual modern finds will be present due to manuring. Of further interest are the in-filled field boundary ditches present on the Tithe Map and subsequent OS Maps, that may also be preserved and backfilled with post-medieval and modern material up until the 1970's.

5.0 PROJECT AIMS

Field survey by means of geophysical prospection was required of the development area to enable the archaeological resource, both in quality and extent, to be accurately quantified.

6.0 METHODOLOGY

6.1 Instrument Type Justification

Britannia Archaeology Ltd employed a Bartington Dual Grad 601-2 fluxgate gradiometer to undertake the survey, because of its high sensitivity and rapid ground coverage. The surveyors noted that the superficial geology carried a relatively low magnetically susceptible background signature.



6.2 Instrument Calibration

One hour was allowed in the morning for the magnetometers sensors to settle before the start of the first grid. The instrument was zeroed after every three grids to minimise the effect of sensor drift. An area with a relatively low magnetic reading was chosen to calibrate the instrument in each field; this same point was used to zero the sensors throughout the surveys providing a common zero point. The overhead conditions were predominantly overcast with outbreaks of sunshine. Sensor drift was noted throughout the survey which caused the characteristic parallel traverse 'striping' in the raw dataset (Figure 3) especially during outbreaks of sunshine. Ground conditions were found to be suitable despite the recent rainfall.

6.3 Sampling Interval and Grid Size

The sampling interval was set at 0.25m along 1m traverse intervals, providing 4 readings a metre, the magnetometer survey was undertaken on 20 x 20m grids.

6.4 Survey Grid Location

The survey grid was set out to the Ordnance Survey OSGB36 datum to an accuracy of ± 0.1 m employing a Leica Viva Glonass Smart Rover GS08 differential global positioning system (DGPS). Data were then converted to the National Grid Transformation OSTN02 and the instrument was regularly tested using stations with known ETRS89 coordinates. The grids were positioned on a NNW-SSE alignment (Figure 2).

6.5 Data Capture

Instrument readings were recorded on an internal data logger that were downloaded to a laptop at lunchtime and then also at the end of the day. The grid order was recorded on a BA pro-forma to aid in the creation of the data composites. Data were filed in job specific folders. These data composites were checked for quality on site by BA, allowing grids to be re-surveyed if necessary. The data were backed up onto an external storage device in the office and finally a remote server at the end of the day. A five metre exclusion zone was left between the boundaries and the survey area to reduce the amount of field boundary magnetic disturbance, which slightly reduced the area available.

6.6 Data Presentation and Processing

Data are presented in both raw and processed data plots in greyscale format (Figures 3 and 4). An XY trace plot of the processed data has also been included (Figure 5).

The raw data is presented with no processing, and was clipped to produce uniform greyscale plots, processed data schedules are also displayed below.

Southern Paddock Raw Data:

Data Clipping: 1 standard deviation.



Display Clipping: 3 standard deviations.

Southern Paddock Processed Data:

De-spike: X diameter = 3, Y diameter = 3, Threshold = 1, centre value=mean, replace with = mean;

De-stripe: Median Traverse: All;

Data Clipping: 1 standard deviation;

Display Clipping: 3 standard deviations.

Northern Paddock Raw Data:

Data Clipping: 1 standard deviation.

Display Clipping: 3 standard deviations.

Northern Paddock Processed Data:

De-spike: X diameter = 3, Y diameter = 3, Threshold = 1, centre value=mean, replace with = mean;

De-stripe: Median Traverse: All;

Data Clipping: 1 standard deviation;

Display Clipping: 3 standard deviations.

An interpretation plan characterising the anomalies recorded can be found at Figure 6, drawing together the evidence collated from both greyscale and XY trace plots (Figures 3, 4 and 5). All figures are tied into the National Grid and printed at an appropriate scale.

6.7 Software

Raw data were downloaded using DW Consulting's Archeosurveyor v2.0 and will be stored in this format as raw data. The software used to process the data and produce the composites was also DW Consulting's Archeosurveyor v2.0. Datasets were exported into AutoCAD and placed onto the local survey grid. Interpretation plots were then produced using AutoCAD.

6.8 Grid Restoration

Britannia Archaeology Ltd re-used two survey stations that were employed during the topographic survey in the northern paddock and illustrated in Figure 2. No stations were positioned in the southern paddock however the grids can be relocated using the geo-referenced stations printed in Figure 2; these can also enable the accurate targeting of geophysical anomalies.



7.0 RESULTS & DISCUSSION

Two separate fields were surveyed; the first is located to the north of the barn and the second to the south of Chilton Leys Farm. The datasets from each survey will be discussed separately below.

7.1 Northern Paddock (Figures 3 – 6)

Isolated dipolar ('iron spike') responses were most numerous within the dataset and were probably caused by the introduction of modern ferrous cultural debris into the topsoil during manuring and through loss, rather than resulting from the presence of buried archaeological artefacts. These responses (yellow hatched circles) seem to be fairly evenly spaced throughout the field with no apparent concentration.

One large area of magnetic disturbance (yellow hatching) was recorded in the south-western corner of the paddock and is likely to be caused by the close proximity of the nearby barn. The dipolar readings (speckled data) recorded further to the north however are more indicative of the remains of hardcore building rubble, potentially from a previous standing structure, although no obvious cause for these readings was witnessed in the vicinity during the survey.

Three weak positive linear trends (blue lines) were recorded in the northern paddock, the first runs parallel to the western boundary (orientated NNW-SSE), the second is shorter in length and is located 3m to its east on a similar alignment. A ditch recorded in a similar location on the 1846 to 1853 Ordnance Survey Maps is a likely source for both of these trends. The third and weakest positive linear anomaly is located closer to the centre of the plot, it is orientated NW-SE and has been interpreted as a service run or land drain.

One discrete anomaly recorded in the north-eastern corner of the northern paddock is indicative of a rubbish pit of potential archaeological origin, however a geological origin cannot be ruled out.

There is evidence in the cartographic record for a small structure in the northern paddock. Appearing on the revised Ordnance Survey 1953, a small building can clearly be seen near the centre of the field. The survey has not picked up any evidence of this structure in the field suggesting that it was only temporary in nature and made of light materials.

7.2 Southern Paddock (Figures 3 – 6)

Dummy readings (magenta hatching) were recorded in an area unsuitable for survey due to the presence of an extant rubbish heap.

Isolated dipolar ('iron spike') responses were once again most numerous throughout the dataset (yellow hatched circles), they were fairly evenly spaced with no apparent concentration.



Four areas of magnetic disturbance (yellow hatched areas) were recorded on the northern periphery of the survey area. The first is located in the north-western corner and is sub-rectangular in plan. It is possible that this relates to demolition rubble from a previous standing building or equally from material laid to increase traction in the gated entrance. Demolition rubble may also be the cause of three similar areas of magnetic disturbance recorded on the northern and north-eastern boundary, however magnetic noise from the boundary cannot be ruled out.

One dipolar discrete anomaly (light blue hatching) was recorded in the northern half of the paddock, this area of potential thermoremanent magnetisation is indicative of a burnt pit, however large buried ferrous objects can also cause similar readings.

Two very weak parallel anomalies orientated north-west to south-east were recorded within close proximity to the south-western boundary and have been interpreted as service runs or land drains.

8.0 CONCLUSION

A fairly wide range of anomalies have been recorded in both fields, some of which have an archaeological potential. Further investigation of these anomalies will enable the hypotheses given in this report to be put to the test. It would be prudent to further evaluate the areas of magnetic disturbance present within both datasets, to ascertain whether an archaeological origin can be assigned. The dipolar discrete anomaly in the southern paddock and the positive discrete anomaly located in the northern paddock and the linear trends are also worthy of further archaeological investigation. Some of the quieter areas of magnetic susceptibility may also be worth targeting to reveal if features have not been recorded by the magnetometer due to poor contrast between the fill and surrounding geology.

No anomalies indicative of any kind of exant return for the possible moat are present in the southern paddock, it is therefore surmised that if it exists, this feature may be present in the garden of Chilton Leys Farm or potentially under the existing boundary. Outbuildings associated with moated sites are commonly present on the outside of the earthwork (Brook, M. 2014), the areas of magnetic disturbance recorded during the magnetometer survey may prove to be evidence of these previous structures if indeed the feature is a moat.

9.0 PROJECT ARCHIVE AND DEPOSITION

A full archive will be prepared for all work undertaken in accordance with guidance from the *Selection, Retention and Dispersion of Archaeological Collections*, Archaeological Society for Museum Archaeologists, 1993. Arrangements will be made for the archive to be deposited with the relevant museum/HER Office.



10.0 ACKNOWLEDGEMENTS

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Saxon's Map of Suffolk, 1575

John Blaeu, 1645

John Kirby, 1736

Hodskinson, 1787

Tithe Map, 1846

Ordnance Survey 1st Edition, 1884

Ordnance Survey 2nd Edition, 1904

Chilton Leys Farm Map (Auction), 1929

Ordnance Survey Provisional Revised Edition, 1953

Ordnance Survey Map, 1991



APPENDIX 1 – METADATA SHEETS

North Paddock Raw Data

Filename	Chilton 1 Raw.xcp
Description	
Instrument Type	Grad 601-2 (Gradiometer)
Units	nT
Surveyed by	TPS on 2/27/2014
Assembled by	TPS on 2/27/2014
Direction of 1st Traverse	90 deg
Collection Method	ZigZag
Sensors	2 @ 1.00 m spacing.
Dummy Value	32702.00
Dimensions	
Composite Size (readings)	400 x 100
Survey Size (meters)	100.00m x 100.00 m
Grid Size	20.00 m x 20.00 m
X Interval	0.25 m
Y Interval	1.00 m
Stats	
Max	5.48
Min	-5.07
Std Dev	1.83
Mean	0.16
Median	-0.04
Composite Area	1.00 ha
Surveyed Area	0.41 ha
Program	
Name	ArcheoSurveyor
Version	2.5.16.0

North Paddock Processed Data

Filename	Chilton 1 Pro.xcp
Description	
Instrument Type	Grad 601-2 (Gradiometer)
Units	nT
Surveyed by	TPS on 2/27/2014
Assembled by	TPS on 2/27/2014
Direction of 1st Traverse	90 deg
Collection Method	ZigZag
Sensors	2 @ 1.00 m spacing.
Dummy Value	32702.00
Dimensions	
Composite Size (readings)	400 x 100
Survey Size (meters)	100.00m x 100.00 m
Grid Size	20.00 m x 20.00 m
X Interval	0.25 m
Y Interval	1.00 m
Stats	
Max	3.72
Min	-3.96
Std Dev	1.18
Mean	-0.02
Median	0.00
Composite Area	1.00 ha
Surveyed Area	0.41 ha
Program	



Name	ArcheoSurveyor
Version	2.5.16.0

Source Grids: 14	
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6	Col:1 Row:2 grids\06.xgd
7	Col:2 Row:0 grids\07.xgd
8	Col:2 Row:1 grids\08.xgd
9	Col:2 Row:2 grids\09.xgd
10	Col:3 Row:0 grids\10.xgd
11	Col:3 Row:1 grids\11.xgd
12	Col:3 Row:2 grids\12.xgd
13	Col:4 Row:0 grids\13.xgd
14	Col:4 Row:1 grids\14.xgd

South Paddock Raw Data

Filename	Chilton 2 Raw.xcp
Description	
Instrument Type	Grad 601-2 (Gradiometer)
Units	nT
Surveyed by	MCA on 2/27/2014
Assembled by	TPS on 2/27/2014
Direction of 1st Traverse	90 deg
Collection Method	ZigZag
Sensors	2 @ 1.00 m spacing.
Dummy Value	32702.00
Dimensions	
Composite Size (readings)	240 x 140
Survey Size (meters)	60.00m x 140.00 m
Grid Size	20.00 m x 20.00 m
X Interval	0.25 m
Y Interval	1.00 m
Stats	
Max	4.37
Min	-3.52
Std Dev	1.50
Mean	0.38
Median	0.44
Composite Area	0.84 ha
Surveyed Area	0.34 ha
Program	
Name	ArcheoSurveyor
Version	2.5.16.0



South Paddock Processed Data

Filename	Chilton 2 Pro.xcp
Description	
Instrument Type	Grad 601-2 (Gradiometer)
Units	nT
Surveyed by	MCA on 2/27/2014
Assembled by	TPS on 2/27/2014
Direction of 1st Traverse	90 deg
Collection Method	ZigZag
Sensors	2 @ 1.00 m spacing.
Dummy Value	32702.00
Dimensions	
Composite Size (readings)	240 x 140
Survey Size (meters)	60.00m x 140.00 m
Grid Size	20.00 m x 20.00 m
X Interval	0.25 m
Y Interval	1.00 m
Stats	
Max	2.00
Min	-1.89
Std Dev	0.78
Mean	0.02
Median	0.00
Composite Area	0.84 ha
Surveyed Area	0.34 ha
Program	
Name	ArcheoSurveyor
Version	2.5.16.0

Source Grids: 13

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7	Col:0	Row:6	grids\21.xgd
8	Col:1	Row:0	grids\22.xgd
9	Col:1	Row:1	grids\23.xgd
10	Col:1	Row:2	grids\24.xgd
11	Col:1	Row:3	grids\25.xgd
12	Col:2	Row:0	grids\26.xgd
13	Col:2	Row:1	grids\27.xgd



APPENDIX 2 – TECHNICAL DETAILS

Magnetometer Survey

The magnetometer differs from the 'active' magnetic susceptibility meter by being a 'passive' instrument. Rather than injecting a signal into the ground it detects slight variations in the Earth's magnetic field caused by cultural and natural disturbance (Clark).

Thermoremanent magnetism is produced when a material containing iron oxides is strongly heated. Clay for example has a high iron oxide content that in a natural state is weakly magnetic, when heated these weakly magnetic compounds become highly magnetic oxides that a magnetometer can detect.

The demagnetisation of iron oxides occurs above a temperature known as the Curie point; for example haematite has a Curie point of 675 Celsius and magnetite 565C. At the time of cooling the iron oxides become permanently re-magnetised with their magnetic properties re-aligned in the direction of the Earth's magnetic field (Gaffney and Gater). The direction of the Earth's magnetic field shifts over time and these subtle alignment differences can be recorded. Kilns, hearths, baked clay and ovens can reach Curie point temperatures, and are the strongest responses apart from large iron objects that can be detected. Other cultural anomalies that can be prospected include occupation areas, pits, ditches, furnaces, sunken feature buildings, ridge and furrow field systems and ritual activity (David, 2011). Commonly recorded anomalies include modern ferrous service pipes, field drainage pipes, removed field boundaries, perimeter fences and field boundaries.

Fluxgate Gradiometers

Fluxgate gradiometers are sensitive instruments that utilise two sensors placed in a vertical plane, spaced 1 metre apart. The sensor above reads the Earth's magnetic (background) response while the sensor below records the local magnetic field. Both sensors are carefully adjusted to read zero before survey commences at a 'zeroing' point, selected for its relatively 'quiet' magnetic background reading. When differences in the magnetic field strength occur between the two sensors a positive or negative reading is logged. Positive anomalies have a positive magnetic value and conversely negative anomalies have a negative magnetic value relative to the site's magnetic background. Examples of positive magnetic anomalies include hearths, kilns, baked clay, areas of burning, ferrous material, ditches, sunken feature buildings, furrows, ferrous service pipes, perimeter fences and field boundaries. Negative magnetic anomalies include earthwork embankments, plastic water pipes and geological features.

The instruments are usually held approximately 0.30m to 0.50m above the ground surface and can detect to a depth of between 1-2metres. Best practice dictates that the optimal direction of traverse in Britain is east to west.



Magnetic Anomalies

Linear trends

Linear trends can be both positive and negative magnetic responses. If they are broad, relatively weak or negative in nature they may be of agricultural or geological origin, for example periglacial channels, land drains or ploughing furrows. If the responses are strong positive trends they are more likely to be of archaeological origin. Archaeological settlement ditches tend to be rich in highly magnetic iron oxides that accumulate in them via anthropogenic activity and humic backfills. Conversely surviving banks will be negative in nature, the material is derived from subsoil deposits that is less likely to be positively magnetic. Curvilinear trends can also be recorded and are indicative of archaeological structures such as drip-gullies.

Discrete anomalies

Discrete anomalies appear as increased positive responses present within a localised area. They are caused by a general increase in the amount of magnetic iron oxides present within the humic back-fill of for example a rubbish pit.

'Iron spike' anomalies

These strong isolated dipolar responses are usually caused by ferrous material present in the topsoil horizon. They can have an archaeological origin but are usually introduced into the topsoil during manuring.

Areas of magnetic disturbance

An area of magnetic disturbance is usually associated with material that has been fired. For example areas of burning, demolition (brick) rubble or slag waste spreads. They can also be caused by ferrous material, e.g. close proximity to barbwire or metal fences and field boundaries, buried services, pylons and modern rubbish deposits.



APPENDIX 3 – OASIS FORM

OASIS ID: britanni1-172681

Project details

Project name	Land at Chilton Leys Farm, Chilton Leys, Onehouse, Suffolk; Detailed Magnetometer Survey
Short description of the project	Detailed fluxgate gradiometer survey was undertaken by Britannia Archaeology Ltd over two separate paddocks on 27th February 2014. A fairly wide range of anomalies were recorded within them, some of which have archaeological potential. The northern paddock contained one area of magnetic disturbance that potentially relates to demolition rubble material. Three weak positive linear trends, two of which are present on a similar alignment to a backfilled field boundary and the third that is potentially a land drain or service run were recorded. One positive discrete anomaly could be the remains of a former rubbish pit however a geological origin cannot be ruled out. Anomalies recorded in the southern paddock include four areas of magnetic disturbance that may demarcate the location of demolition rubble material. A dipolar discrete anomaly interpreted as a potential former burnt pit. Two weak positive linear trends have also been recorded and interpreted as land drains or service runs. No anomalies indicative of a return related to the possible moat are present in the southern paddock, it is therefore surmised that if this feature exists; it may be present in the garden of Chilton Leys Farm or potentially under the existing boundary. Outbuildings associated with moated sites are commonly present on the outside of the earthwork and therefore the areas of magnetic disturbance recorded during the magnetometer survey may prove to be evidence of these former structures. Start: 27-02-2014 End: 27-02-2014
Project dates	
Previous/future work	No / Yes
Any associated project reference codes	P1053 - Contracting Unit No. R1049 - Contracting Unit No. ONS 009 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 4 - Regularly improved
Monument type	NONE None
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Small-scale (e.g. single house, etc.)
Prompt	National Planning Policy Framework – NPPF
Position in the planning process	Pre-application
Solid geology	(other) Crag Group Sand
Drift geology	(other) Lowestoft Formation Sand and Gravel
Techniques	Magnetometry
Project location	
Country	England
Site location	SUFFOLK MID SUFFOLK ONEHOUSE Chilton Leys Farm, Chilton Leys, Onehouse, Suffolk
Study area	1.00 Hectares
Site coordinates	TM 0292 5966 52.1972691954 0.969531106686 52 11 50 N 000 58 10 E Point
Height OD / Depth	Min: 50.00m Max: 50.00m
Project creators	
Name of Organisation	Britannia Archaeology Ltd



Project brief originator Local Planning Authority (with/without advice from County/District Archaeologist)

Project design originator Timothy Schofield

Project director /manager Martin Brook

Project supervisor Timothy Schofield

Type of sponsor/ funding body Landowner

Name of sponsor/ funding body Mr Piers Morgan

Project archives

Physical Archive Exists? No

Digital Archive recipient Suffolk HER

Digital Contents "Survey"

Digital Media available "Geophysics", "Images raster / digital photography", "Images vector", "Survey", "Text"

Paper Archive recipient Suffolk HER

Paper Contents "Survey"

Paper Media available "Map", "Report", "Survey ", "Unpublished Text"

Project bibliography 1

Publication type Grey literature (unpublished document/manuscript)

Title Land at Chilton Leys Farm, Chilton Leys, Onehouse, Suffolk; Detailed Magnetometer Survey

Author(s)/Editor(s) Schofield, T.P

Other bibliographic details R1049

Date 2014

Issuer or publisher Britannia Archaeology Ltd

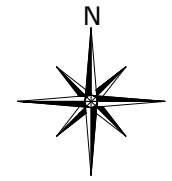
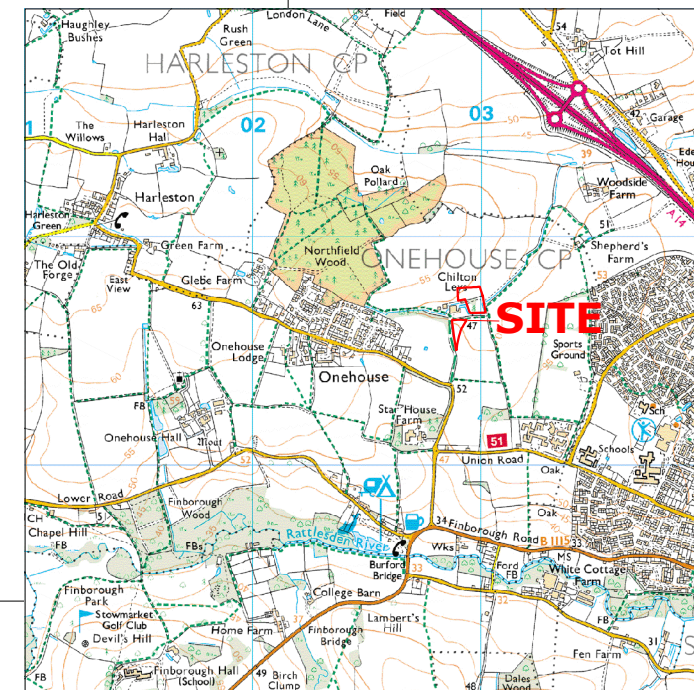
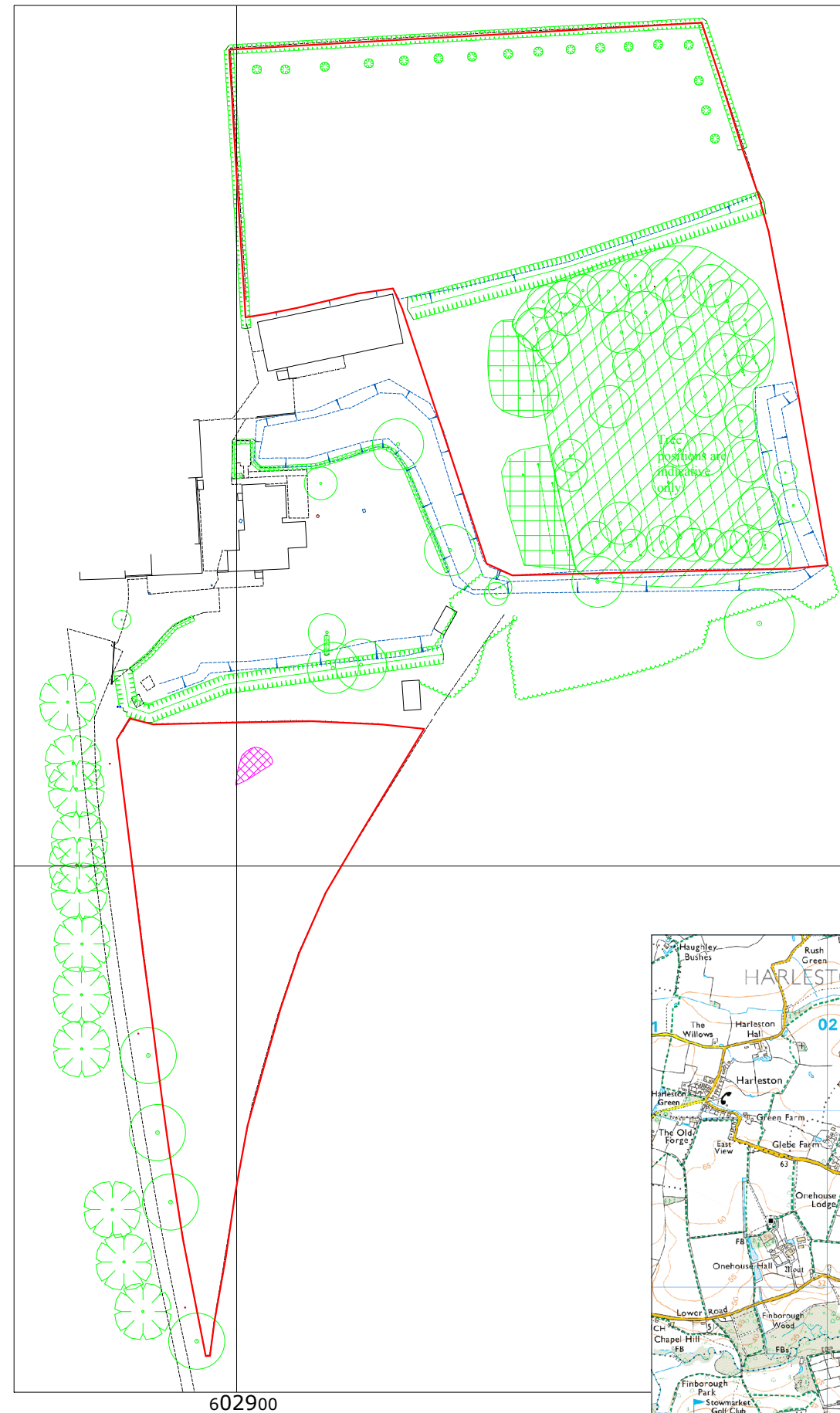
Place of issue or publication Stowmarket

Description A4 bound report with A3 fold-out figures.

URL www.britannia-archaeology.com

Entered by Tim Schofield (tim@britannia-archaeology.com)

Entered on 14 April 2014



	Rubbish Heap; Unsurveyable
	Site Boundaries

NGR: TM 0292 5966	REPORT NUMBER: 1049
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PROJECT:
**CHILTON LEYS FARM, CHILTON LEYS,
ONEHOUSE, SUFFOLK**

CLIENT:	
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DESCRIPTION:
SITE LOCATION PLAN

BRITANNIA ARCHAEOLOGY LTD



115 OSPREY DRIVE, STOWMARKET, SUFFOLK
IP14 5UX

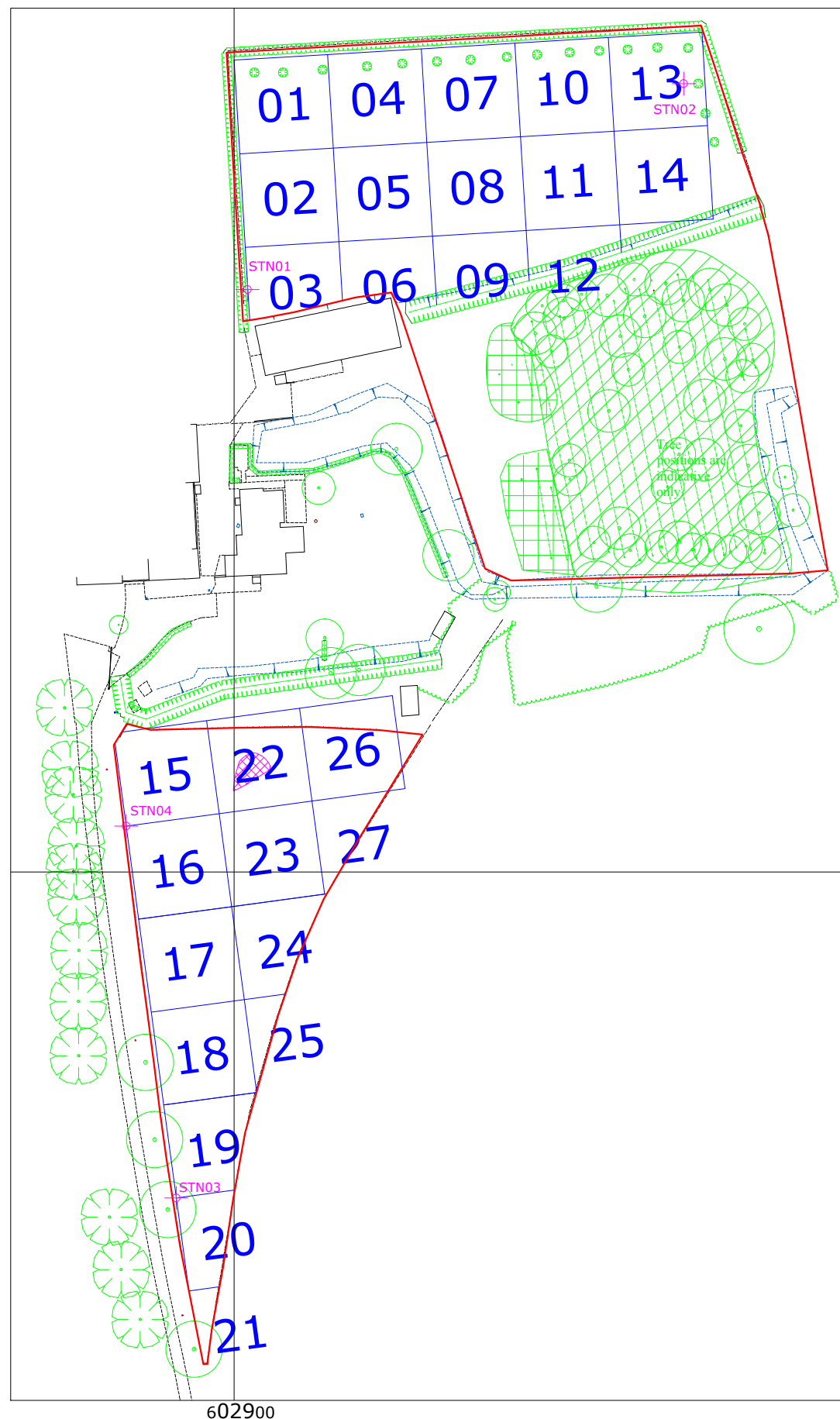
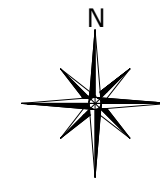
T: 01449 763034
E: info@britannia-archaeology.com
W: www.britannia-archaeology.com

SCALE: 1:1250	
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PLOT: A3	APPROVED: MCA	VERSION: 01
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DATE: MAR 2014	AUTHOR: TPS	FIGURE: 01
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STATION	EASTING	NORTHING
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02	602995.912	259768.158
03	602887.683	259530.509
04	602876.990	259609.791

-  Survey Grid Location
-  Site Boundaries

NGR: **TM 0292 5966** REPORT NUMBER: **1049**

PROJECT:
**CHILTON LEYS FARM, CHILTON LEYS,
ONEHOUSE, SUFFOLK**

CLIENT: 


DESCRIPTION:
**SURVEY GRID & REFERENCING
INFORMATION PLAN**

BRITANNIA ARCHAEOLOGY LTD



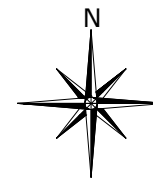
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PLOT: A3	APPROVED: MCA	VERSION: 01
DATE: MAR 2014	AUTHOR: TPS	FIGURE: 02

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 Site Boundaries

NGR: **TM 0292 5966** REPORT NUMBER: **1049**

PROJECT:
**CHILTON LEYS FARM, CHILTON LEYS,
ONEHOUSE, SUFFOLK**

CLIENT: 
bsm.uk.com

DESCRIPTION:
**RAW MAGNETOMETER
GREYSCALE PLOT**

BRITANNIA ARCHAEOLOGY LTD



115 OSPREY DRIVE, STOWMARKET, SUFFOLK
IP14 5UX

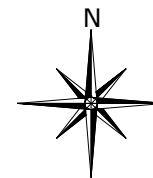
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W: www.britannia-archaeology.com

SCALE: **1:1000** 

PLOT: A3	APPROVED: MCA	VERSION: 01
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DATE: MAR 2014	AUTHOR: TPS	FIGURE: 03
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 Site Boundaries

NGR: **TM 0292 5966** REPORT NUMBER: **1049**

PROJECT:
**CHILTON LEYS FARM, CHILTON LEYS,
ONEHOUSE, SUFFOLK**

CLIENT: 
bism.uk.com

DESCRIPTION:
**PROCESSED MAGNETOMETER
GREYSCALE PLOT**

BRITANNIA ARCHAEOLOGY LTD



115 OSPREY DRIVE, STOWMARKET, SUFFOLK
IP14 5UX

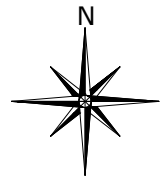
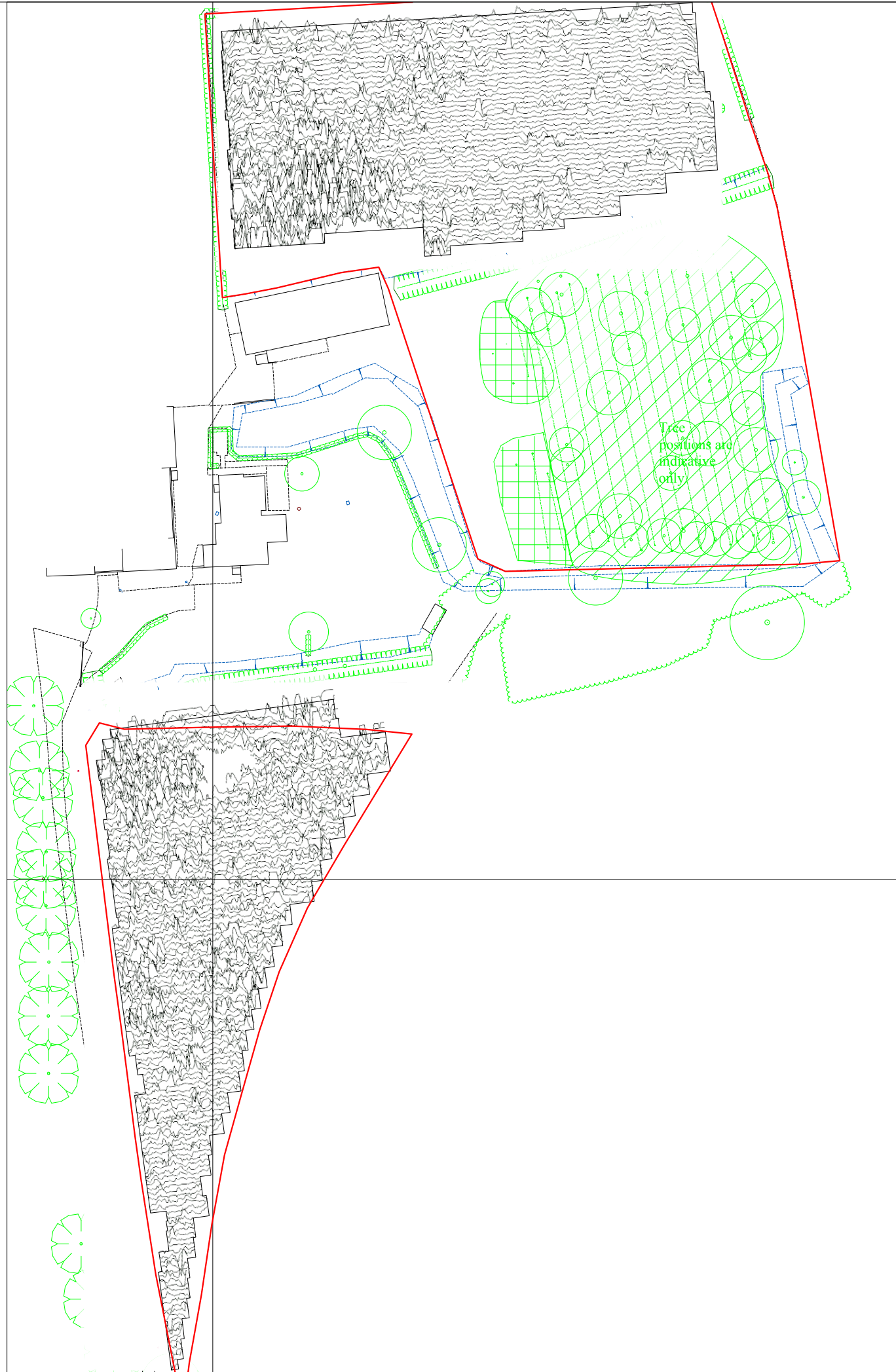
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SCALE: **1:1000** 

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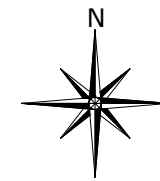
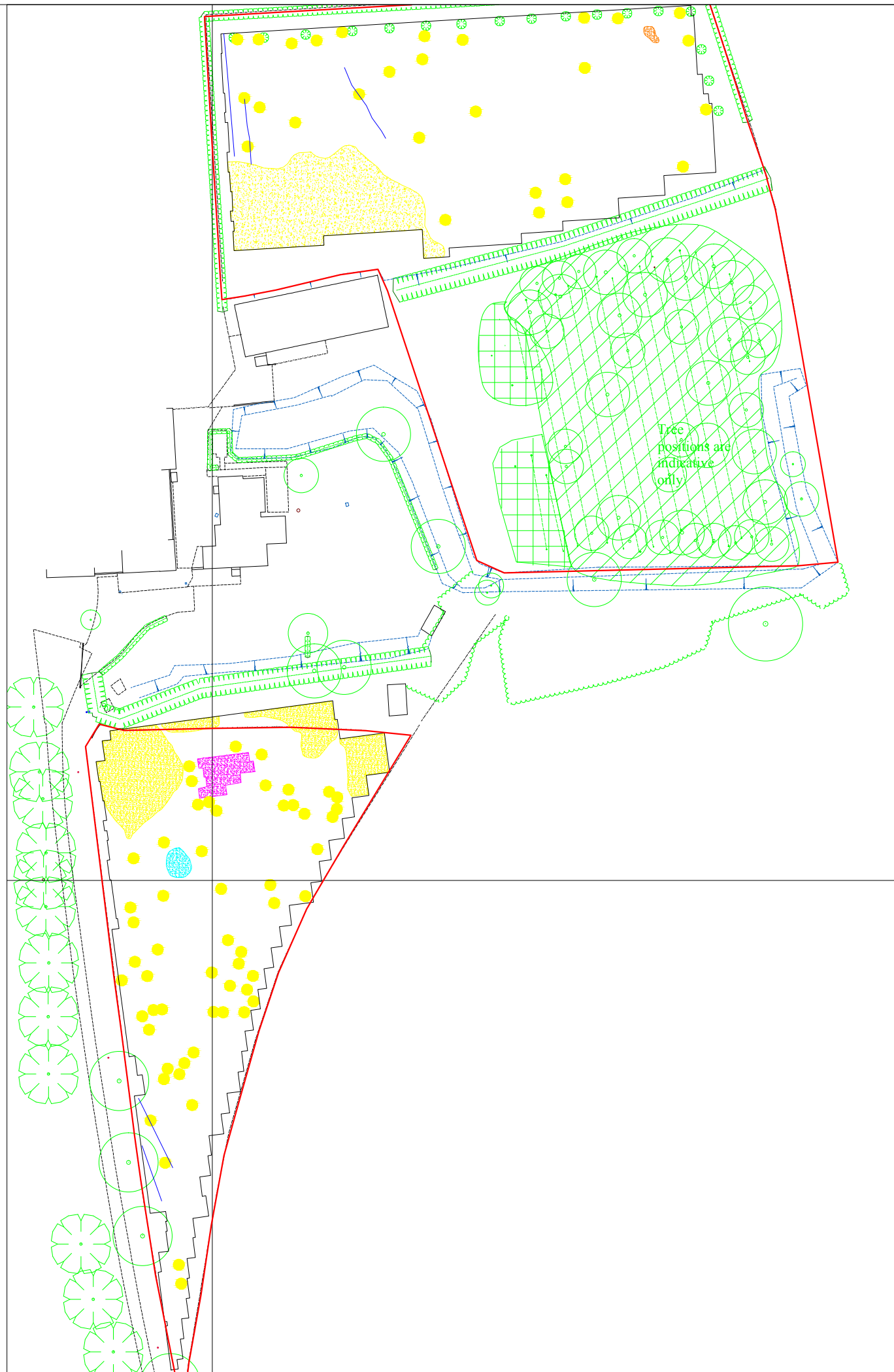
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
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10nT/cm	Scale Interval	
	Site Boundaries	
NGR:	TM 0292 5966	REPORT NUMBER: 1049
PROJECT:	CHILTON LEYS FARM, CHILTON LEYS, ONEHOUSE, SUFFOLK	
CLIENT:		
DESCRIPTION:	PROCESSED MAGNETOMETER XY TRACE PLOT	
BRITANNIA ARCHAEOLOGY LTD  115 OSPREY DRIVE, STOWMARKET, SUFFOLK IP14 5UX T: 01449 763034 E: info@britannia-archaeology.com W: www.britannia-archaeology.com		
SCALE:	0  40m	
1:1000		
PLOT:	APPROVED:	VERSION:
A3	MCA	01
DATE:	AUTHOR:	FIGURE:
MAR 2014	TPS	05

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	Positive Discrete Anomaly, Archaeology?
	Weak Positive Linear Trend, Service Run?
	Dipolar Discrete Anomaly, Area of Burning?
	Area of Magnetic Disturbance
	Isolated Dipolar Response
	'Dummy' Readings, Extant Rubbish Heap
	Site Boundaries

NGR: **TM 0292 5966** REPORT NUMBER: **1049**

PROJECT:
CHILTON LEYS FARM, CHILTON LEYS, ONEHOUSE, SUFFOLK

CLIENT: 

DESCRIPTION:
INTERPRETATION PLOT OF MAGNETOMETER ANOMALIES

BRITANNIA ARCHAEOLOGY LTD



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DATE: MAR 2014	AUTHOR: TPS	FIGURE: 06
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