GEOPHYSICAL SURVEY REPORT

STRATASCAN™

SUMO Survey Services

SUMO Group Member

Project name:

Land North of Pulley Lane, Bayston Hill, Shropshire

Client:

GH Davies Farms Ltd

November 2015

Job ref:

J8122

Report author:

Thomas Richardson MSc ACIfA

GEOPHYSICAL SURVEY REPORT

Project name:
Land North of Pulley Lane, Bayston Hill, Shropshire
Client:
GH Davies Farms Ltd

Job ref:
J8122

Field team:
Robert Knight BA (Hons)
Edward Cox MSc

Techniques:
Gradiometry
Ground Penetrating Radar

Project manager:
Simon Haddrell BEng(Hons) AMBCS PCIfA

Survey date:
29th October 2015

Report written By:
Thomas Richardson MSc ACIfA

Site centred at:
SJ 483 098

CAD illustrations by:
Thomas Richardson MSc ACIfA

Post code:
SY3 9NU

Checked by:
David Elks MSc ACIfA

TABLE OF CONTENTS

LIST OF FIGURES

1 SUMMARY OF RESULTS

Detailed gradiometry and ground penetrating radar (GPR) surveys were conducted over approximately 1.5 hectares of agricultural land and a construction compound. The surveys have not identified any anomalies of probable archaeological origin. A small number of possible archaeological anomalies are present in the south-west of the site, however these could equally be natural in origin. The detection of a former field boundary suggests that the area has a recent agricultural past. The remaining anomalies are natural or modern in origin, relating to ferrous objects and fencing.

2 INTRODUCTION

2.1 Background synopsis

Stratascan were commissioned to undertake a geophysical survey of an area outlined for residential development. A gradiometry survey was conducted over the agricultural land on the site, whilst GPR was employed over a small construction compound. This survey forms part of an archaeological investigation being undertaken by GH Davies Farms Ltd.

2.2 Site location

The site is located to the north of Pulley Lane, Shrewsbury, Shropshire at OS ref. SJ 483 098.

2.3 Description of site

The survey area is approximately 1.5 hectares, comprising 1.3 hectares of grassland and a 0.2 hectare construction compound. The site lies on a gentle north facing slope, with a number of obstructions caused by cabins and overgrown vegetation within the construction compound.

2.4 Geology and soils

The underlying geology is Halesowen Formation – Mudstone, Siltstone and Sandstone (British Geological Survey website). The drift geology across the north of the site is Alluvium – Clay, Silt, Sand and Gravel, River Terrace Deposits 2 – Sand and Gravel across the centre, and Devensian Glaciofluvial Sheet Deposits – Sand and Gravel in the south (British Geological Survey website).

The overlying soils are unsurveyed due to the urban environment of the area (Soil Survey of England and Wales, Sheet 3 Midland and Western England).

2.5 Site history and archaeological potential

Extract from 'Consultee Comments for Planning Application 14/05655/OUT' (Shropshire Council 2015a):

The projected line of the Roman road from Wroxeter to Forden Gaer (HER PRN 00098; Margary 64) crosses the southern end of the proposed development site. It is also located c.450m W of the former Roman roadside settlement (HER PRN 00002) near/under the A5/ A49 roundabout at Meole Brace. Whilst an archaeological field evaluation on the adjacent affordable housing site (ref. 13/03793/FUL) did not find any evidence of the road, this is likely to have been due to the intensity of medieval ploughing. The evaluation did, however, find remains of a likely Roman building in the south-western corner of the site, within are area of public open space. It is possible that, due to localised variations in ground conditions, remains of the road may exist on the currently proposed development site, and also that other Roman buildings/ structures may also be present. On present information, the proposed development site is therefore deemed to have high archaeological potential.

Evidence of the Roman Road was identified by a previous survey conducted by Stratascan (2009) at Bayston Hill. The projected route from the previous survey is shown on Figs. 02-05 and aligns with a section of the road identified during excavation at Meole Brace (HER number 08096) (Shropshire Council 2015b).

2.6 Survey objectives

The objective of the survey was to locate any features of possible archaeological origin in order that they may be assessed prior to development.

2.7 Survey methods

This report and all fieldwork have been conducted in accordance with both the English Heritage guidelines outlined in the document: *Geophysical Survey in Archaeological Field Evaluation, 2008* and with the Chartered Institute for Archaeologists document *Standard and Guidance for Archaeological Geophysical Survey.*

Due to the potential for Roman activity and the amount of ferrous objects within the construction compound, combined detailed magnetic and GPR surveys (gradiometry) were used as an efficient and effective method of locating archaeological anomalies. More information regarding these techniques is included in Appendix A.

2.8 Processing, presentation and interpretation of results

2.8.1 Processing

Gradiometer

Processing is performed using specialist software. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves 'flattening' the background levels with respect to adjacent traverses and adjacent grids. Once the basic processing has flattened the background it is then possible to carry out further processing which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following schedule shows the basic processing carried out on all minimally processed gradiometer data used in this report:

1. *Destripe* (Removes striping effects caused by zero-point discrepancies between different sensors and walking directions)

2. *Destagger* (Removes zigzag effects caused by inconsistent walking speeds on sloping, uneven or overgrown terrain)

GPR

Manual abstraction

Each radargram has been studied and those anomalies thought to be significant were noted and classified as detailed below. Inevitably some simplification has been made to classify the diversity of responses found in radargrams. This abstraction is then employed as the primary source for producing the interpretation plot, but is not itself reproduced in the report.

i. Strong and weak discrete reflector.

These may be a mix of different types of reflectors but their limits can be clearly defined. Their inclusion as a separate category has been considered justified in order to emphasise anomalous returns which may be from archaeological targets and would not otherwise be highlighted in the analysis.

ii. Complex reflectors.

These would generally indicate a confused or complex structure to the subsurface. An occurrence of such returns, particularly where the natural soils or rocks are homogeneous, would suggest artificial disturbances. These are subdivided into both strong and weak giving an indication of the extent of change of velocity across the interface, which in turn may be associated with a marked change in material or moisture content.

iii. Point diffractions.

These may be formed by a discrete object such as a stone or a linear feature such as a small diameter pipeline being crossed by the radar traverse (see also the second sentence in iv. below)

iv. Convex reflectors and broad crested diffractions.

A convex reflector can be formed by a convex shaped buried interface such as a vault or very large diameter pipeline or culvert. A broad crested diffraction as opposed to a point diffraction can be formed by (for example) a large diameter pipe or a narrow wall generating a hybrid of a point diffraction and convex reflector where the central section is a reflection off the top of the target and the edges/sides forming diffractions.

v. Planar returns.

These may be formed by a floor or some other interface parallel with the surface. These are subdivided into both strong and weak giving an indication of the extent of change of velocity across the interface which in turn may be associated with a marked change in material or moisture content.

vi. Inclined events.

These may be a planar feature but not parallel with the survey surface. However, similar responses can be caused by extraneous reflections. For example, an "air-wave" caused by a strong reflection from an above ground object would produce a linear dipping anomaly and does not relate to any sub-surface feature. Normally this is not a problem as the antennae used are shielded, but under some circumstances these effects can become noticeable.

vii. Conductive surface.

The radiowave transmitted from the antenna has its waveform modulated by the ground surface. If this ground surface or layers close to the surface are particularly conductive a 'ground coupled wavetrain' is generated which can produce a complex wave pattern affecting part or all of the scan and so can obscure the weaker returns from targets lower down in the ground.

viii. A category for *"focused ringing"* has been included as this type of anomaly can indicate the presence of an air void. This is created by the signal resonating within the void, but with a characteristic domed shape due to the "velocity pull-up effect".

2.8.2 Presentation of results and interpretation

The presentation of the data for each site involves a print-out of the minimally processed gradiometry data both as a greyscale plot and a colour plot showing extreme magnetic values. Magnetic anomalies have been identified and plotted onto the 'Abstraction and Interpretation of Anomalies' drawing for the site. Example radargrams are shown of Fig. 06, with identified anomalies plotted onto the 'Abstraction and Interpretation of Anomalies' drawing.

3 RESULTS

3.1 Gradiometer

The detailed magnetic gradiometer survey conducted at Pulley Lane has identified a number of anomalies that have been characterised as being of a *possible* archaeological origin.

The difference between *probable* and *possible* archaeological origin is a confidence rating. Features identified within the dataset that form recognisable archaeological patterns or seem to be related to a deliberate historical act have been interpreted as being of a probable archaeological origin.

Features of possible archaeological origin tend to be more amorphous anomalies which may have similar magnetic attributes in terms of strength or polarity but are difficult to classify as being archaeological or natural.

The following list of numbered anomalies refers to numerical labels on the interpretation plots.

3.1.1 Probable Archaeology

No probable archaeology has been identified within the survey area.

3.1.2 Possible Archaeology

1 Negative linear anomalies in the west of the site. These are indicative of former bank or earthwork features, and may be of archaeological, agricultural, or natural origin.

2 A small positive linear anomaly in the south of the site. This is indicative of a former cut feature, and may be of archaeological or natural origin.

3 A small, discrete, positive anomaly in the south of the site. This is indicative of a small former cut feature, such as a backfilled pit, and may be of archaeological or natural origin.

3.1.3 Medieval/Post-Medieval Agriculture

4 A weak linear anomaly running through the centre of the site. This is related to a former field boundary present on available OS mapping 1887-1954

3.1.4 Other Anomalies

5 Areas of magnetic variation across the north of the site. These anomalies are likely to be geological or pedological in origin.

6 Areas of magnetic disturbance are the result of substantial nearby ferrous metal objects such as fences and underground services. These effects can mask weaker archaeological anomalies, but on this site have not affected a significant proportion of the area.

7 A number of magnetic 'spikes' (strong focussed values with associated antipolar response) indicate ferrous metal objects. These are likely to be modern rubbish.

3.2 GPR

The GPR survey conducted at Pulley Lane has not identified any anomalies of archaeological origin. The following list of numbered anomalies refers to numerical labels on the interpretation plots.

3.2.1 Other Anomalies

8 An area of strong planar responses seen at a depth of 0.15m within the compound area. This is most likely related to an area of modern compacted ground, possibly formed during the laying of the hardstanding in the area.

4 DATA APPRAISAL & CONFIDENCE ASSESSMENT

Mudstone geologies, such as those at Pulley Lane, can give variable responses to magnetic survey, whilst the alluvium and river terrace deposit drift geologies have the potential to mask weaker archaeological anomalies. The detection of possible archaeological anomalies and a former field boundary suggest that the survey has been effective. However, given the high archaeological potential for the area the possibility that weak anomalies are being masked cannot be completely discounted.

The GPR survey shows a generally quiet background to the site, with a band of stronger responses at approximately 0.15m deep. This provides favourable conditions for the detection of archaeological features. The survey appears to have been effective down to a depth of approximately 1.75m.

5 CONCLUSION

The surveys at Pulley Lane have not identified any anomalies of probable archaeological origin. A small number of possible archaeological anomalies are present in the south-west of the site, however these could equally be natural in origin. There is no evidence of the Roman Road thought to run through the site, or any other associated activity. The detection of a former field boundary suggests that the area has a recent agricultural past. The remaining anomalies are modern or natural in origin. The modern anomalies relate to ferrous objects and fencing.

6 REFERENCES

British Geological Survey South Sheet, 1977. *Geological Survey Ten Mile Map, South Sheet First Edition* (*Quaternary).* Institute of Geological Sciences.

British Geological Survey, 2001. *Geological Survey Ten Mile Map, South Sheet, Fourth Edition (Solid)*. British Geological Society.

British Geological Survey, n.d., *website*: (http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps) Geology of Britain viewer.

Chartered Institute For Archaeologists. *Standard and Guidance for Archaeological Geophysical Survey.* http://www.archaeologists.net/sites/default/files/nodefiles/Geophysics2010.pdf

English Heritage, 2008. *Geophysical Survey in Archaeological Field Evaluation.*

Shropshire Council, 2015a. *Consultee Comments for Planning Application 14/05655/OUT*

Shropshire Council, 2015b. *Shropshire Historic Environment Record.* Available from: www.heritagegateway.org.uk [Accessed on 16/11/2015]

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 3 Midland and Western England*.

Stratascan, 2009. *J2609 Geophysical Survey – Bayston Hill, Shropshire*

APPENDIX A – METHODOLOGY & SURVEY EQUIPMENT

Gradiometry

Grid locations

The location of the survey grids has been plotted together with the referencing information. Grids were set out using a Leica 705auto Total Station and referenced to suitable topographic features around the perimeter of the site or a Leica Smart Rover RTK GPS.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. A SmartNet RTK GPS uses Ordnance Survey's network of over 100 fixed base stations to give an accuracy of around 0.01m.

Survey equipment and gradiometer configuration

Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.2 nanoTeslas (nT) in an overall field strength of 48,000nT, can be accurately detected using an appropriate instrument.

The mapping of the anomaly in a systematic manner will allow an estimate of the type of material present beneath the surface. Strong magnetic anomalies will be generated by buried iron-based objects or by kilns or hearths. More subtle anomalies such as pits and ditches can be seen if they contain more humic material which is normally rich in magnetic iron oxides when compared with the subsoil.

To illustrate this point, the cutting and subsequent silting or backfilling of a ditch may result in a larger volume of weakly magnetic material being accumulated in the trench compared to the undisturbed subsoil. A weak magnetic anomaly should therefore appear in plan along the line of the ditch.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. The instrument consists of two fluxgates very accurately aligned to nullify the effects of the Earth's magnetic field. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame. Each gradiometer has a 1m separation between the sensing elements so enhancing the response to weak anomalies.

Sampling interval

Readings were taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid.

Depth of scan and resolution

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m, though strongly magnetic objects may be visible at greater depths. The collection of data at 0.25m centres provides an optimum methodology for the task balancing cost and time with resolution.

Data capture

The readings are logged consecutively into the data logger which in turn is daily down- loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

GPR

Grid locations

The location of the survey traverses has been plotted in Figure 02 together with the referencing information. Traverses were carried out perpendicular to the expected course of the medieval ditch. Traverses were set out using a Trimble GPS system.

Survey equipment and configuration

Two of the main advantages of radar are its ability to give information of depth as well as work through a variety of surfaces, even in cluttered environments which normally prevent other geophysical techniques being used.

A short pulse of energy is emitted into the ground and echoes are returned from the interfaces between different materials in the ground. The amplitude of these returns depends on the change in velocity of the radar wave as it crosses these interfaces. A measure of these velocities is given by the dielectric constant of that material. The travel times are recorded for each return on the radargram and an approximate conversion made to depth by calculating or assuming an average dielectric constant (see below).

Drier materials such as sand, gravel and rocks, i.e. materials which are less conductive (or more resistant), will permit the survey of deeper sections than wetter materials such as clays which are more conductive (or less resistant). Penetration can be increased by using longer wavelengths (lower frequencies) but at the expense of resolution.

As the antennae emit a "cone" shaped pulse of energy an offset target showing a perpendicular face to the radar wave will be "seen" before the antenna passes over it. A resultant characteristic *diffraction* pattern is thus built up in the shape of a hyperbola. A classic target generating such a diffraction is a pipeline when the antenna is travelling across the line of the pipe. However it should be pointed out that if the interface between the target and its surrounds does not result in a marked change in velocity then only a weak hyperbola will be seen, if at all.

The Ground Penetrating Impulse Radars used was a 400MHz system manufactured by Geophysical Survey Systems Inc. (GSSI). 1m parallel traverses were used to record the data.

Sampling interval

Readings were taken at 0.05m intervals with traverse intervals of 1m.

Depth of scan and resolution

The average velocity of the radar pulse was determined by hyperbola fitting and calculated to be 0.083m/ns. With range settings of 50nsec this equates to a maximum depth of scan of 2.05m, but it must be remembered that this figure could vary by ± 10% or more..

Under ideal circumstances the minimum size of a vertical feature seen by a 200MHz (relatively low frequency) antenna in a damp soil would be 0.1m (i.e. this antenna has a wavelength in damp soil of about 0.4m and the vertical resolution is one quarter of this wavelength). It is interesting to compare this with the 400MHz antenna, which has a wavelength in the same material of 0.2m giving a theoretical resolution of 0.05m. A 900MHz antenna would give 0.09m and 0.02m respectively.

Data capture

Data is displayed on a monitor as well as being recorded onto an internal hard disk. The data is later downloaded into a computer for processing.

APPENDIX B – BASIC PRINCIPLES OF MAGNETIC SURVEY

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock.

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

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

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

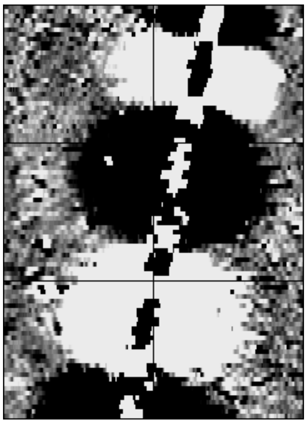
Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement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

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

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

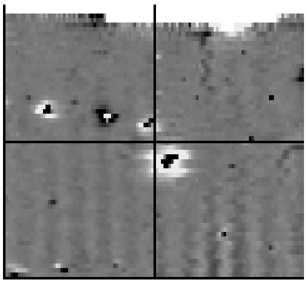
APPENDIX C – GLOSSARY OF MAGNETIC ANOMALIES

Bipolar



A bipolar anomaly is one that is composed of both a positive response and a negative response. It can be made up of any number of positive responses and negative responses. For example a pipeline consisting of alternating positive and negative anomalies is said to be bipolar. See also dipolar which has only one area of each polarity. The interpretation of the anomaly will depend on the magnitude of the magnetic field strength. A weak response may be caused by a clay field drain while a strong response will probably be caused by a metallic service.

Dipolar

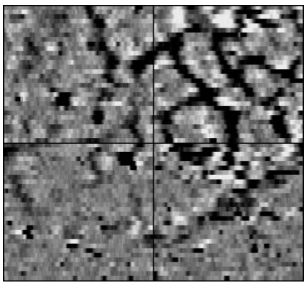


This consists of a single positive anomaly with an associated negative response. There should be no separation between the two polarities of response. These responses will be created by a single feature. The interpretation of the anomaly will depend on the magnitude of the magnetic measurements. A very strong anomaly is likely to be caused by a ferrous object.

Positive anomaly with associated negative response

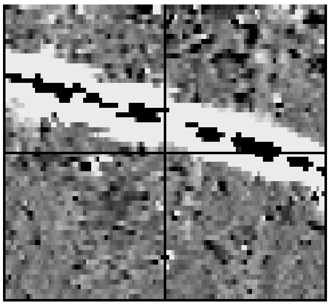
See bipolar and dipolar.

Positive linear



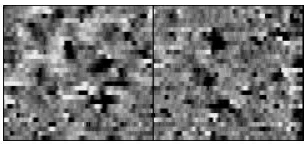
A linear response which is entirely positive in polarity. These are usually related to in-filled cut features where the fill material is magnetically enhanced compared to the surrounding matrix. They can be caused by ditches of an archaeological origin, but also former field boundaries, ploughing activity and some may even have a natural origin.

Positive linear anomaly with associated negative response



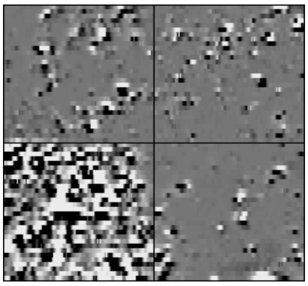
A positive linear anomaly which has a negative anomaly located adjacently. This will be caused by a single feature. In the example shown this is likely to be a single length of wire/cable probably relating to a modern service. Magnetically weaker responses may relate to earthwork style features and field boundaries.

Positive point/area



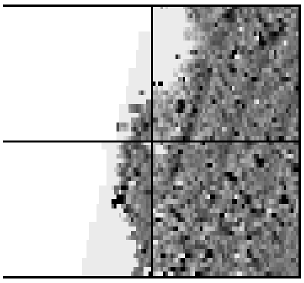
These are generally spatially small responses, perhaps covering just 3 or 4 reading nodes. They are entirely positive in polarity. Similar to positive linear anomalies they are generally caused by in-filled cut features. These include pits of an archaeological origin, possible tree bowls or other naturally occurring depressions in the ground.

Magnetic debris



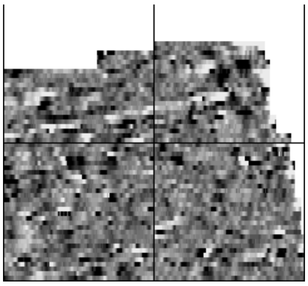
Magnetic debris consists of numerous dipolar responses spread over an area. If the amplitude of response is low (+/-3nT) then the origin is likely to represent general ground disturbance with no clear cause, it may be related to something as simple as an area of dug or mixed earth. A stronger anomaly (+/-250nT) is more indicative of a spread of ferrous debris. Moderately strong anomalies may be the result of a spread of thermoremanent material such as bricks or ash.

Magnetic disturbance



Magnetic disturbance is high amplitude and can be composed of either a bipolar anomaly, or a single polarity response. It is essentially associated with magnetic interference from modern ferrous structures such as fencing, vehicles or buildings, and as a result is commonly found around the perimeter of a site near to boundary fences.

Negative linear

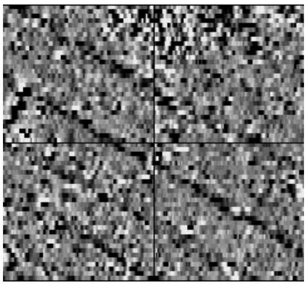


A linear response which is entirely negative in polarity. These are generally caused by earthen banks where material with a lower magnetic magnitude relative to the background top soil is built up. See also ploughing activity.

Negative point/area

Opposite to positive point anomalies these responses may be caused by raised areas or earthen banks. These could be of an archaeological origin or may have a natural origin.

Ploughing activity



Ploughing activity can often be visualised by a series of parallel linear anomalies. These can be of either positive polarity or negative polarity depending on site specifics. It can be difficult to distinguish between ancient ploughing and more modern ploughing. Clues such as the separation of each linear, straightness, strength of response and cross cutting relationships can be used to aid this, although none of these can be guaranteed to differentiate between different phases of activity.

Polarity

Term used to describe the measurement of the magnetic response. An anomaly can have a positive polarity (values above 0nT) and/or a negative polarity (values below 0nT).

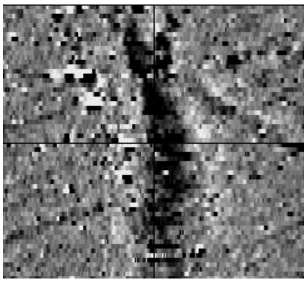
Strength of response

The amplitude of a magnetic response is an important factor in assigning an interpretation to a particular anomaly. For example a positive anomaly covering a 10m^2 area may have values up to around 3000nT, in which case it is likely to be caused by modern magnetic interference. However, the same size and shaped anomaly but with values up to only 4nT may have a natural origin. Colour plots are used to show the amplitude of response.

Thermoremanent response

A feature which has been subject to heat may result in it acquiring a magnetic field. This can be anything up to approximately +/-100 nT in value. These features include clay fired drains, brick, bonfires, kilns, hearths and even pottery. If the heat application has occurred in situ (e.g. a kiln) then the response is likely to be bipolar compared to if the heated objects have been disturbed and moved relative to each other, in which case they are more likely to take an irregular form and may display a debris style response (e.g. ash).

Weak background variations

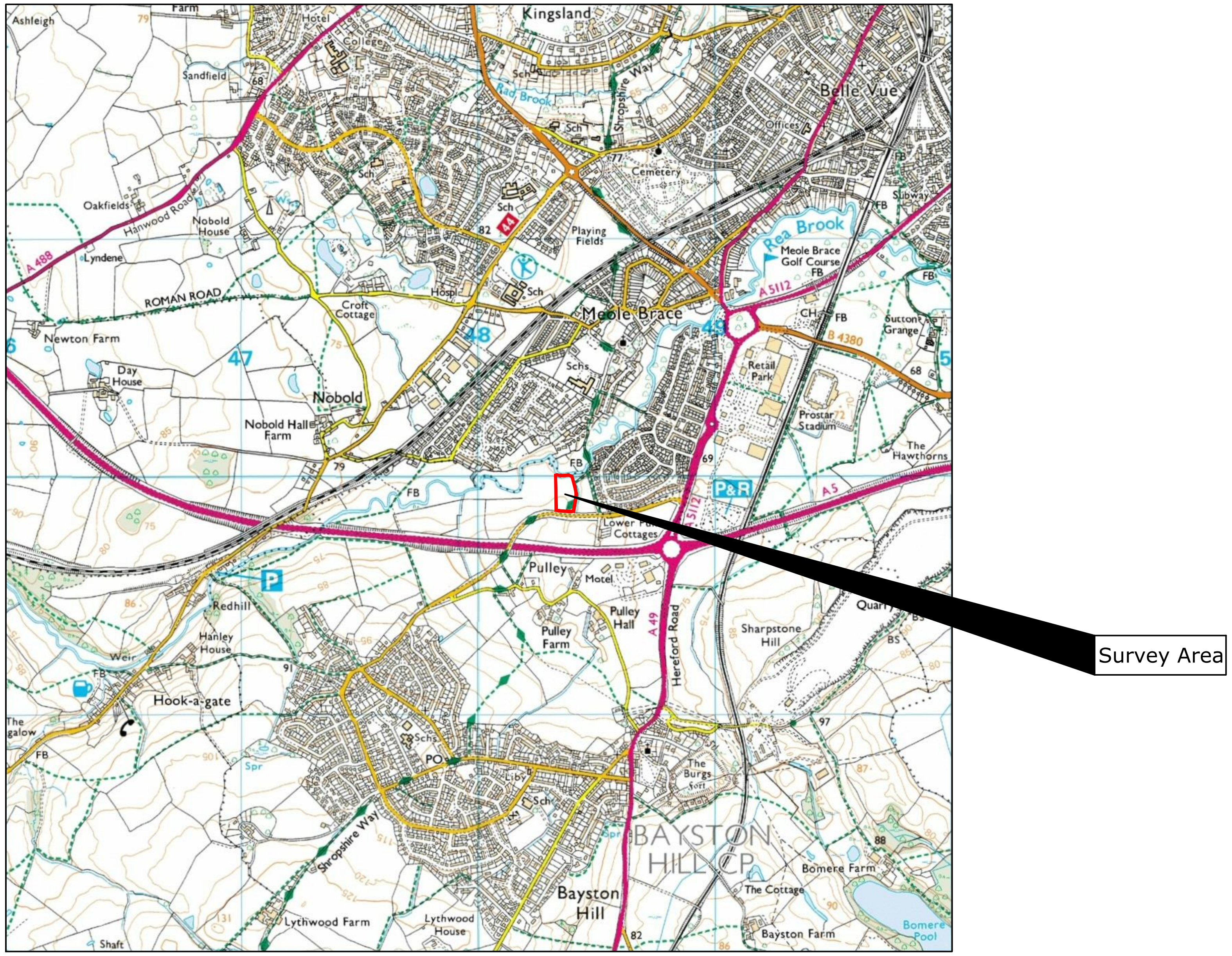


Weakly magnetic wide scale variations within the data can sometimes be seen within sites. These usually have no specific structure but can often appear curvy and sinuous in form. They are likely to be the result of natural features, such as soil creep, dried up (or seasonal) streams. They can also be caused by changes in the underlying geology or soil type which may contain unpredictable distributions of magnetic minerals, and are usually apparent in several locations across a site.

OS 100km square = SJ

N

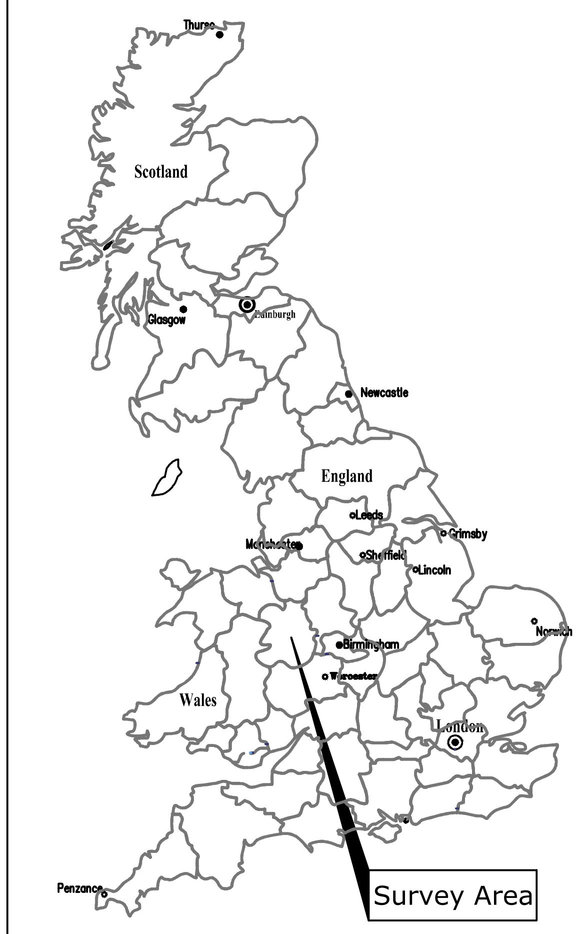
12
11
10
09
08



46 47 48 49 50

Amendments

Issue No.	Date	Description
-	-	-
-	-	-



Site centred on NGR SJ 483 098

Client
GH DAVIES FARMS LTD

Project Title Job No. J8122
LAND NORTH OF PULLEY LANE, BAYSTON HILL, SHROPSHIRE

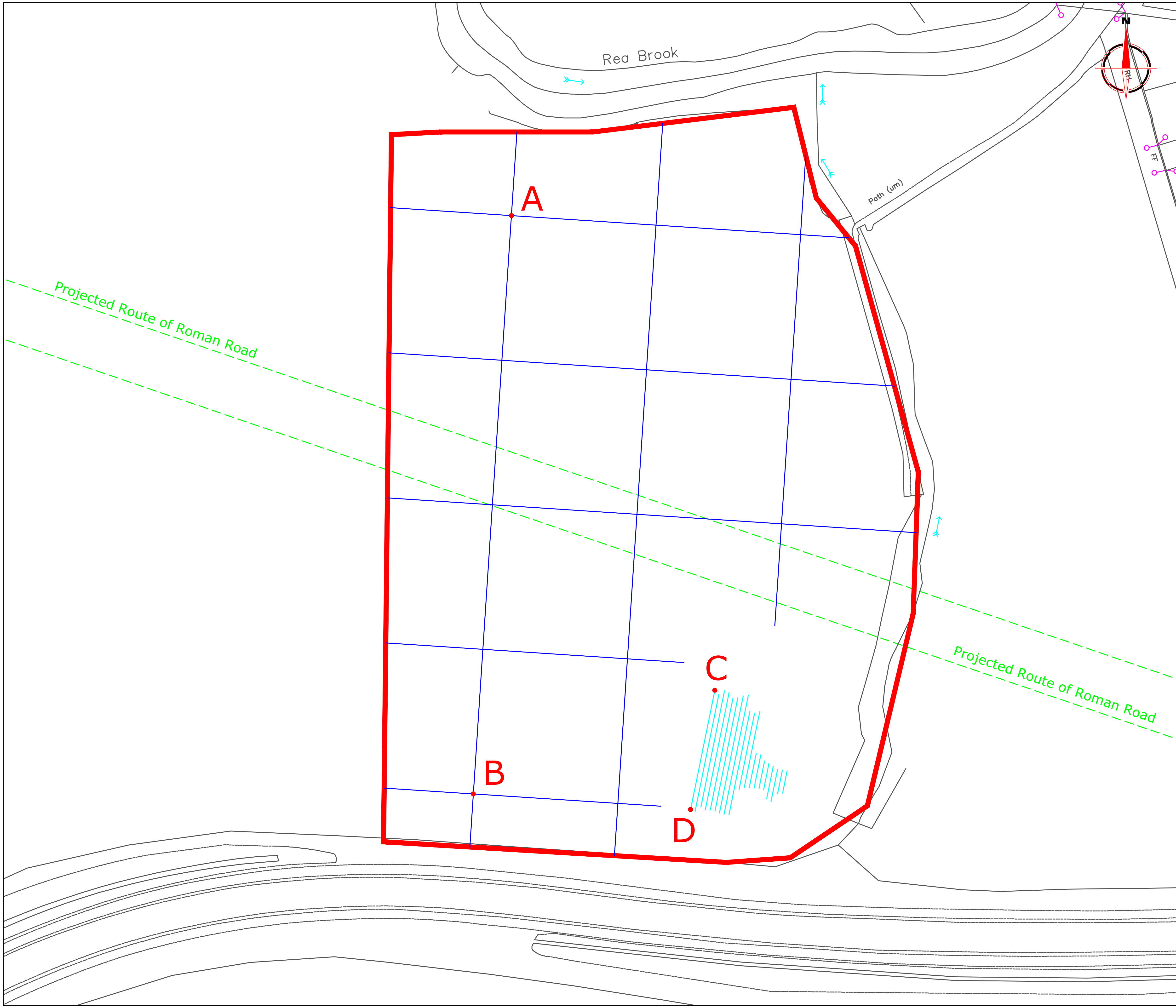
Subject
LOCATION PLAN OF SURVEY AREA

STRATASCAN TM
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

EUROPEAN GPR ASSOCIATION
SUMO GROUP MEMBER
ISO 9001 certified
ISO 14001 certified

Scale 1:25000
0m 500 1000m

Plot	Checked by	Issue No.
A3	DGE	01
Survey date	**Drawn by**	**Figure No.**
OCT 15	TR	01



Amendments

Issue No.	Date	Description
-	-	-
-	-	-

KEY

(blue line)	Gradiometry grid
(cyan line)	Radar traverse

OS GRID REFERENCES

A	348339.67, 309979.99
B	348331.78, 309860.25
C	348381.78, 309881.72
D	348376.77, 309857.03

Client
GH DAVIES FARMS LTD

Project Title — Job No. J8122
LAND NORTH OF PULLEY LANE, BAYSTON HILL, SHROPSHIRE

Subject
LOCATION OF SURVEY GRIDS AND REFERENCING

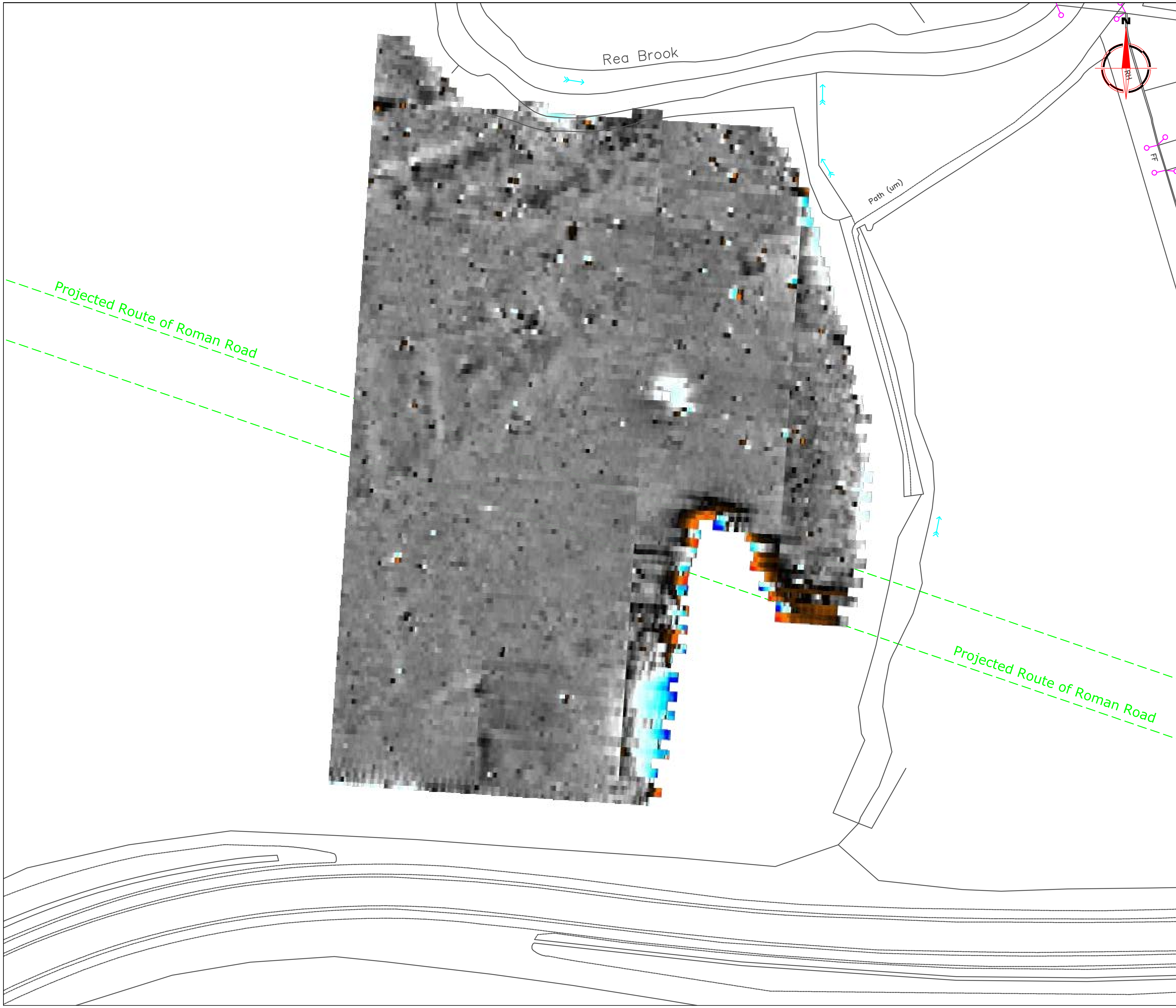
STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:750 (0m, 5, 15, 30m)

Plot	Checked by	Issue No.
A3	DGE	01

Survey date	Drawn by	Figure No.
OCT 15	TR	02



Issue No.	Date	Description
-	-	-
-	-	-

Plotting parameters

Maximum +100nT (red)
Minimum -100nT (blue)

+100nT
+25nT
+3nT
-3nT
-25nT
-100nT

Client
GH DAVIES FARMS LTD

Project Title — Job No. J8122
LAND NORTH OF PULLEY LANE, BAYSTON HILL, SHROPSHIRE

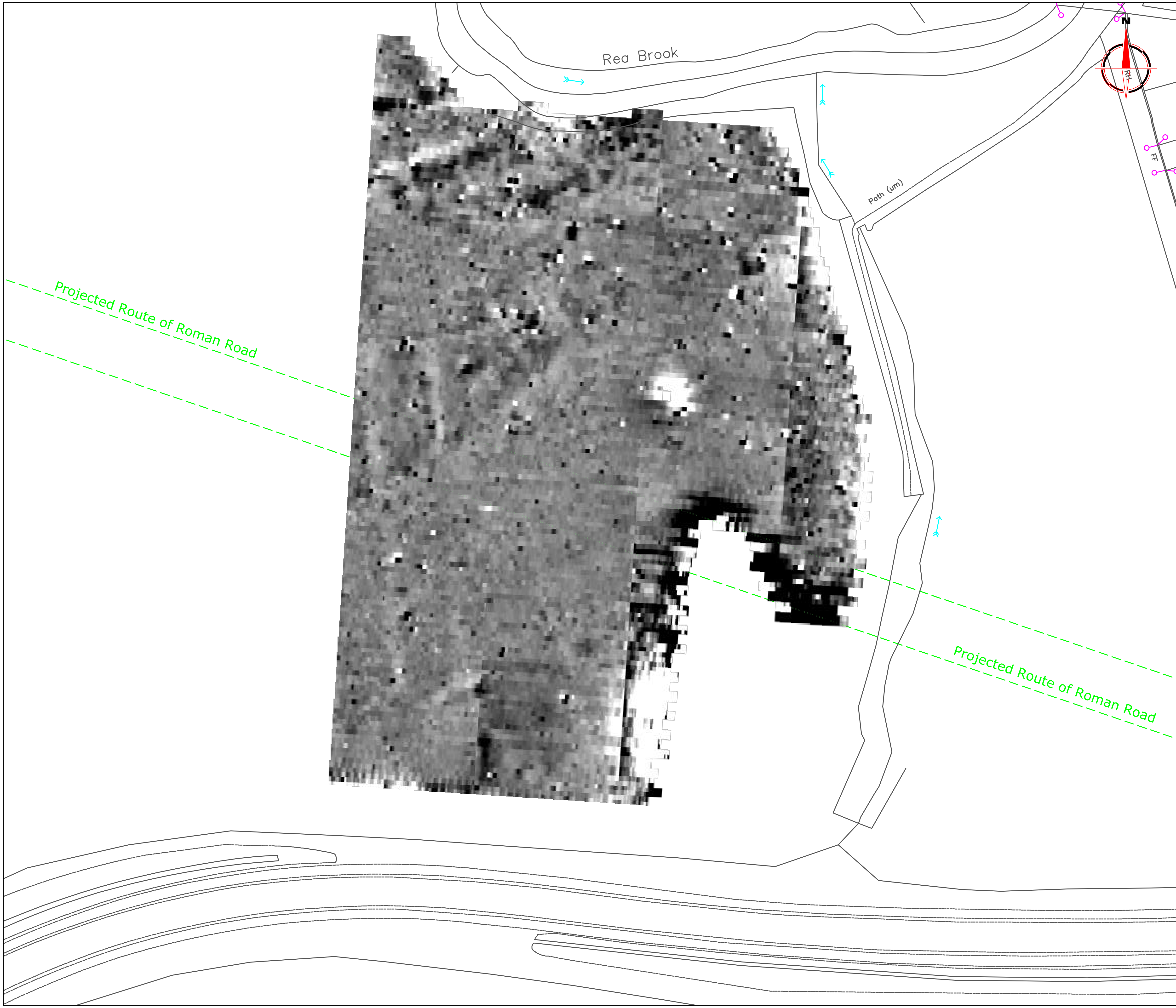
Subject
COLOUR PLOT OF GRADIOMETER DATA SHOWING EXTREME VALUES

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:750 (0m 5 15 30m)

Plot	Checked by	Issue No.
A3	DGE	01
Survey date	**Drawn by**	**Figure No.**
OCT 15	TR	03



Amendments

Issue No.	Date	Description
-	-	-
-	-	-

Plotting parameters

Maximum +2nT (black)
Minimum -2nT (white)

Zero
Mean
-2nT +2nT

+2nT
-2nT

Client
GH DAVIES FARMS LTD

Project Title
Job No. J8122
LAND NORTH OF PULLEY LANE, BAYSTON HILL, SHROPSHIRE

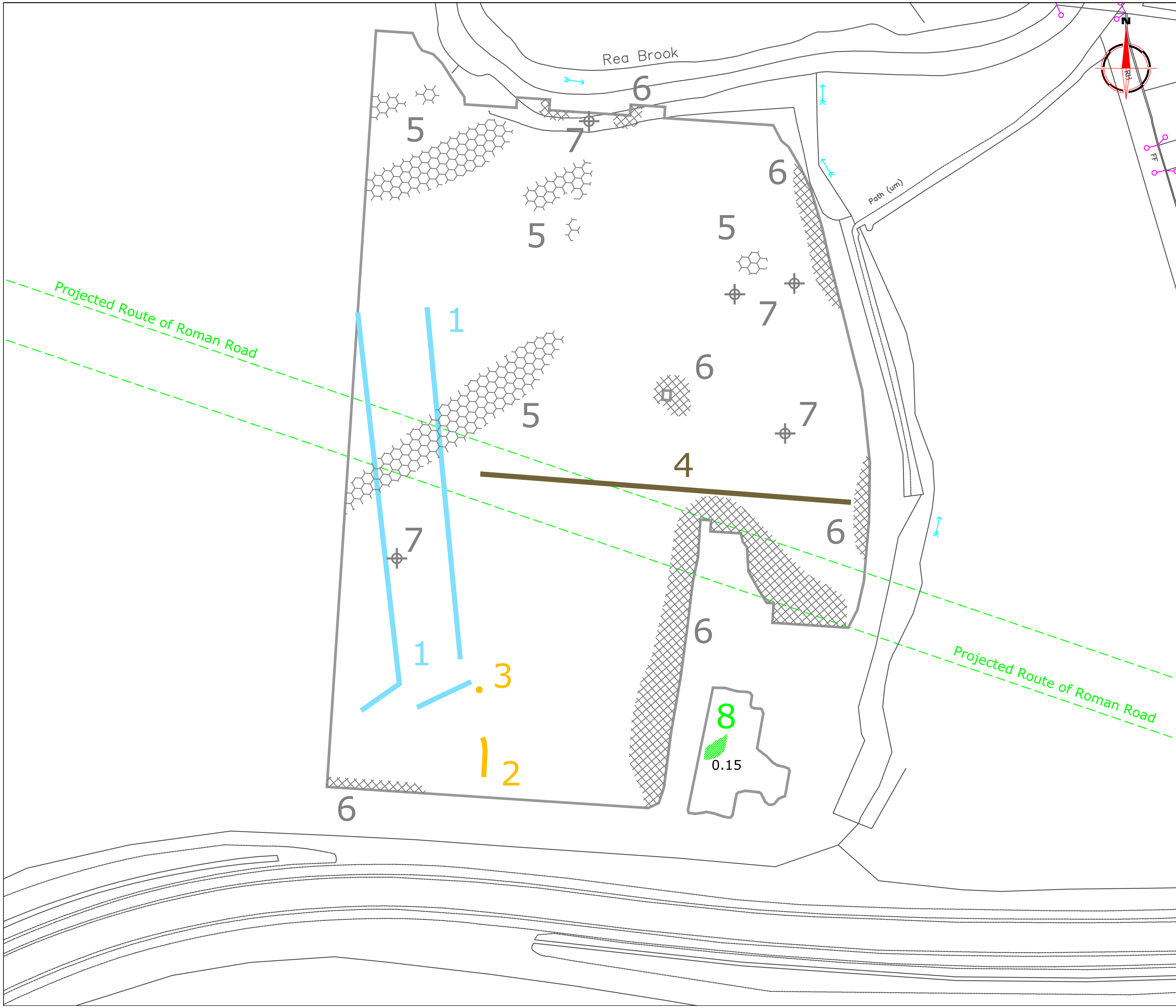
Subject
PLOT OF MINIMALLY PROCESSED GRADIOMETER DATA

STRATASCAN TM
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

EUROPEAN GPR ASSOCIATION
SUMO GROUP MEMBER
ISO 9001 certified
ISO 14001 certified

Scale 1:750
0m 5 15 30m

Plot	Checked by	Issue No.
A3	DGE	01
Survey date	**Drawn by**	**Figure No.**
OCT 15	TR	04



Amendments

Issue No.	Date	Description
-	-	-
-	-	-

GRADIOMETER ANOMALIES

PROBABLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - probable cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - probable bank or earthwork of archaeological origin

POSSIBLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - possible cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - possible bank or earthwork of archaeological origin

MEDIEVAL/POST-MEDIEVAL AGRICULTURE

- Linear anomaly - related to a former field boundary present on available mapping

OTHER ANOMALIES

- Magnetic disturbance associated with nearby metal object such as service or field boundary
- Area of amorphous magnetic variation - probable natural (e.g. geological or pedological) origin
- Magnetic spike - probable ferrous object

GPR ANOMALIES

OTHER ANOMALIES

- Area of planar responses, probable modern compacted ground
- 0.1 Depth to top of anomaly in metres

Client

GH DAVIES FARMS LTD

Project Title Job No. J8122

LAND NORTH OF PULLEY LANE, BAYSTON HILL, SHROPSHIRE

Subject

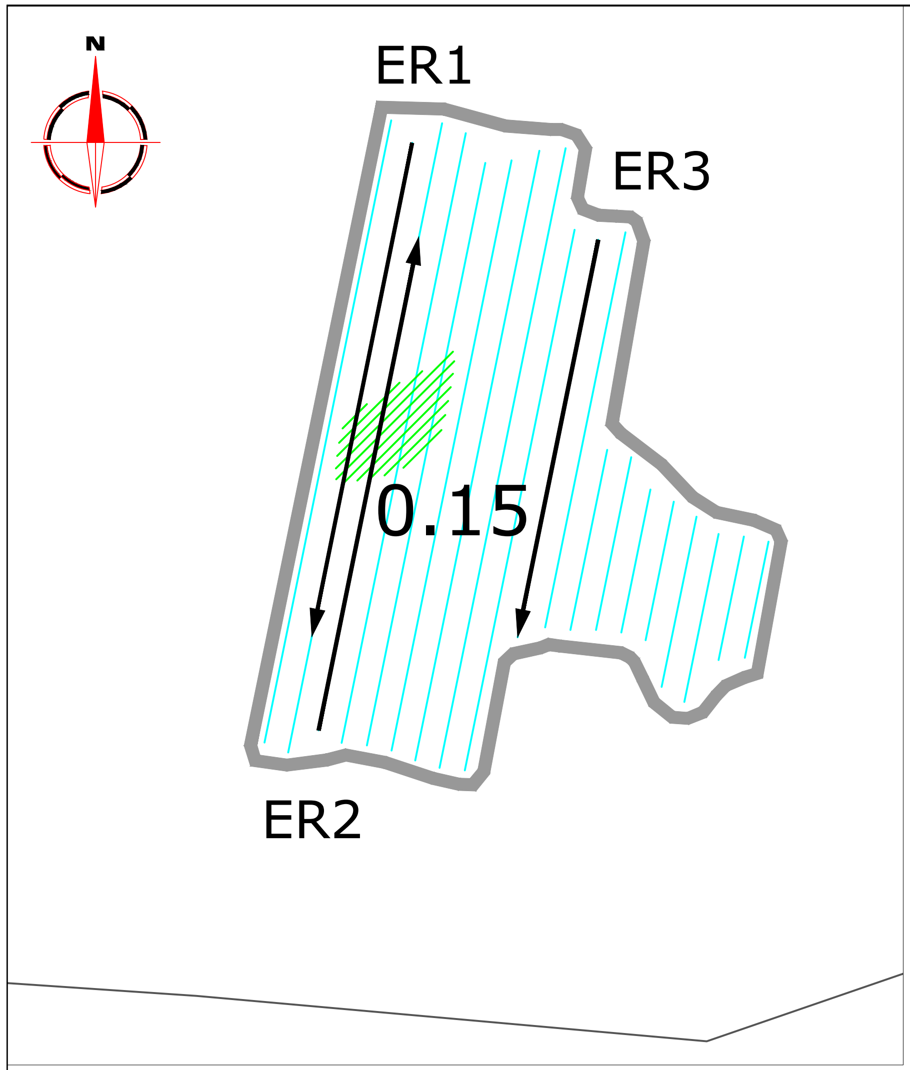
ABSTRACTION AND INTERPRETATION OF GRADIOMETER & GPR ANOMALIES

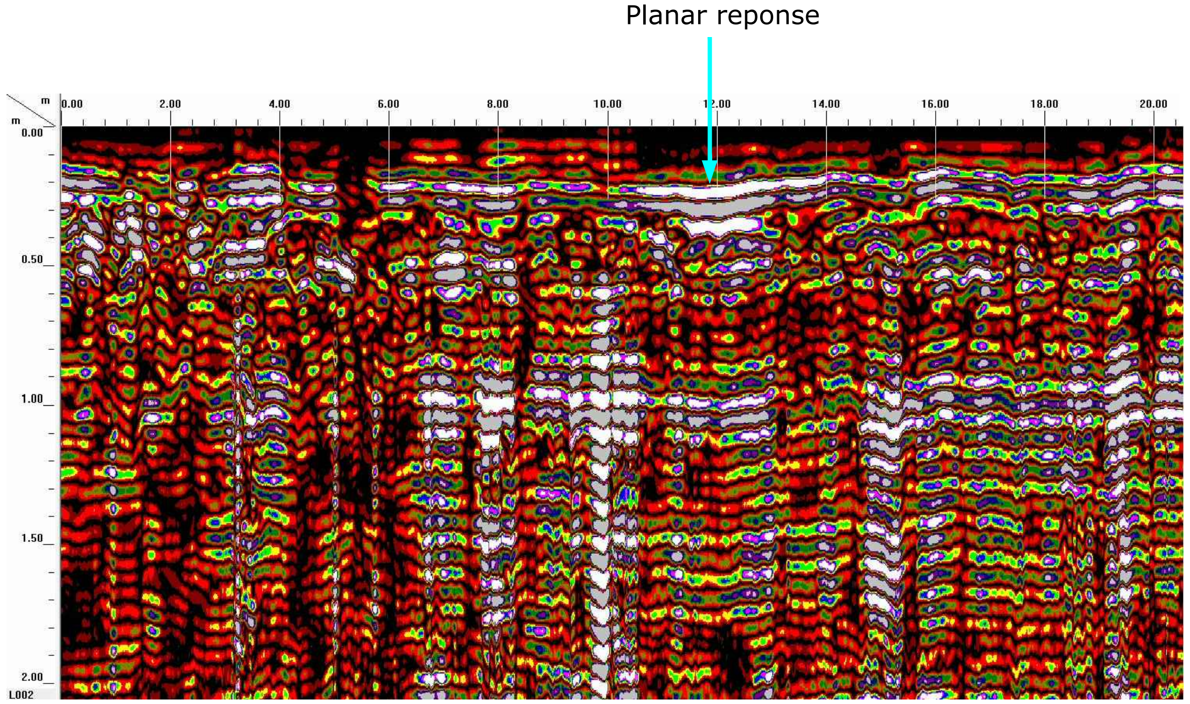
STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING

VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA

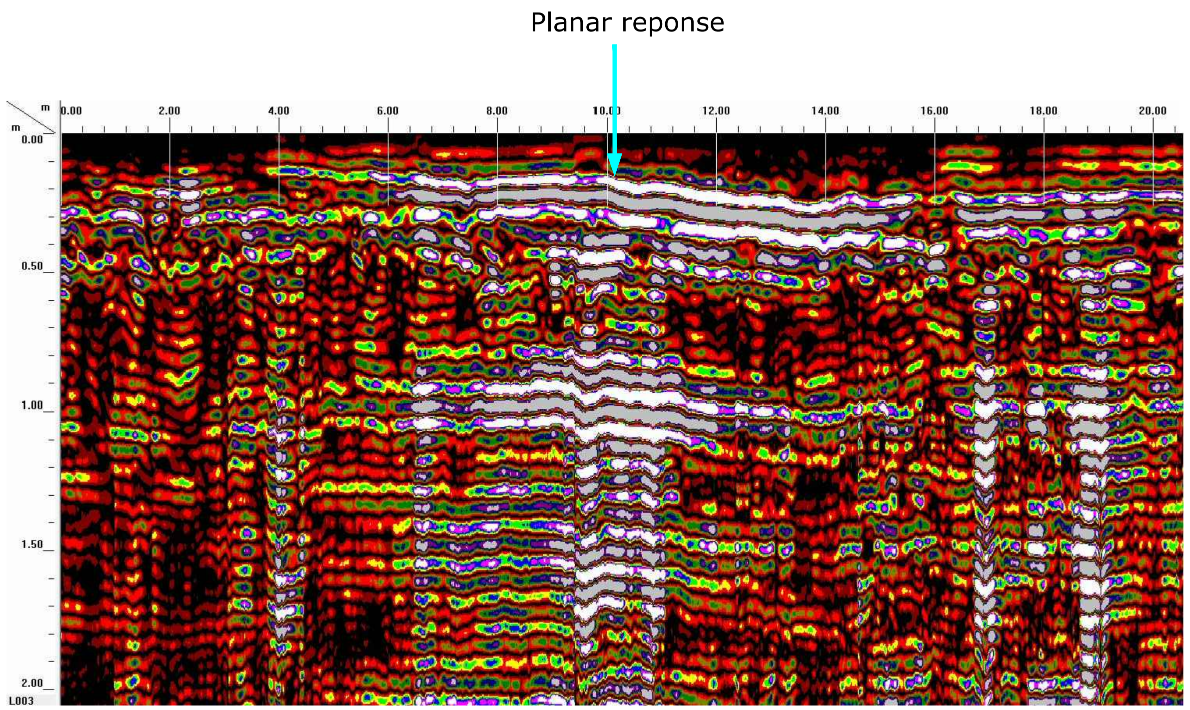
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

Scale	1:750	0m 5 15 30m
Plot: A3	Checked by: DGE	Issue No.: 01
Survey date: OCT 15	Drawn by: TR	Figure No.: 05

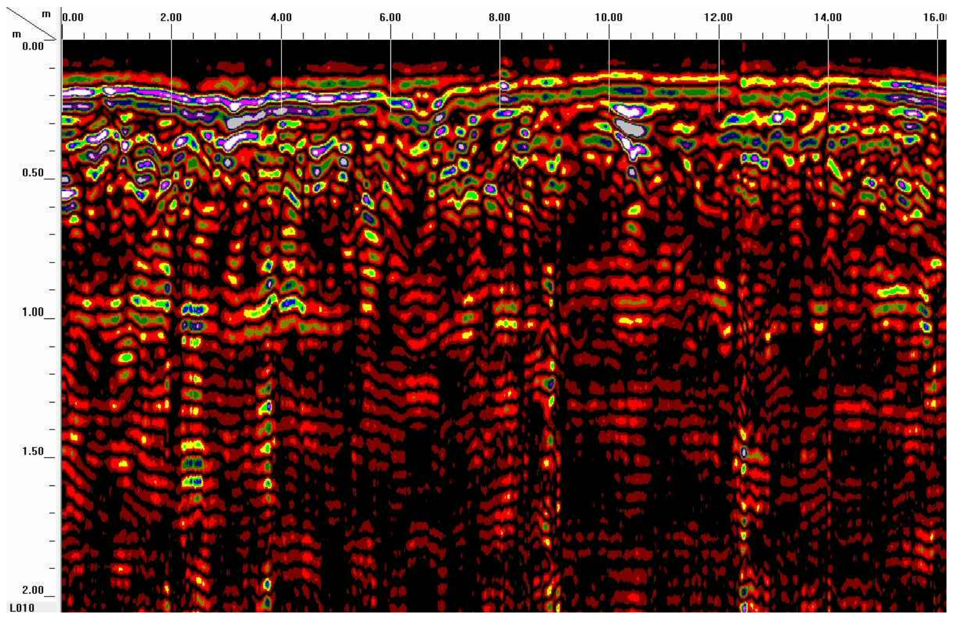




ER1. Strong planar response - probable modern compacted ground



ER2. Strong planar response - probable modern compacted ground



ER3. Generally quiet background

Amendments

Issue No.	Date	Description
-	-	-
-	-	-

GPR ANOMALIES

OTHER ANOMALIES

(green hatching)	Area of planar responses, probable modern compacted ground
0.1	Depth to top of anomaly in metres

Client

GH DAVIES FARMS LTD

Project Title — Job No. J8122

LAND NORTH OF PULLEY LANE, BAYSTON HILL, SHROPSHIRE

Subject

EXAMPLE RADARGRAMS

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:300	0m 2 4 6 8 10m	
Plot A3	Checked by DGE	Issue No. 01
Survey date OCT 15	Drawn by TR	Figure No. 06

Your Survey Partner

For a complete and complementary range of survey services

Survey services you can rely on

Archaeological
As Built Records
BIM Ready 3D Models
Boundary Disputes
CCTV
Geophysical
Laser Scanning
Measured Building
Pipeline Routes
Railway
Retrofit
Setting Out
Statutory Plan Collation
Topographic
Utility Mapping
UXO Detection
Void Detection

STRATASCAN LTD
Vineyard House Upper Hook Road Upton upon Severn
Worcestershire WR8 0SA United Kingdom

T:01684 592266 F: 01684 594142
info@stratascan.co.uk www.stratascan.co.uk

STRATASCAN™