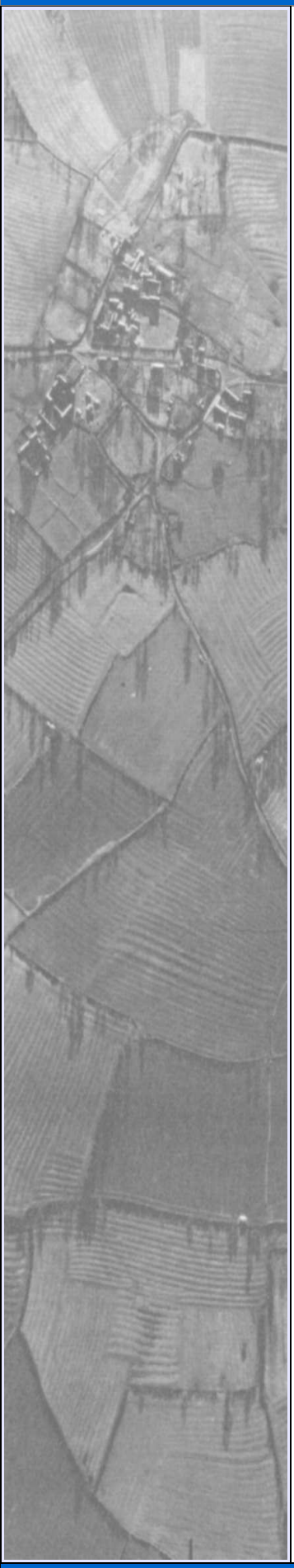

Bullimore Farm
Shepton Mallet
Additional Survey

MAGNETOMETER SURVEY REPORT

for

Mr Neil Edwards

David Sabin and Kerry Donaldson

March 2016

Ref. no. 653

Somerset HER PRN: 34781

ARCHAEOLOGICAL SURVEYS LTD

Bullimore Farm
Shepton Mallet
Additional Survey

Magnetometer Survey Report

for

Mr Neil Edwards

Fieldwork by David Sabin (Hons) MCIfA
Report by Kerry Donaldson BSc (Hons)
Report checked by David Sabin
Primary archive location - Archaeological Surveys Ltd, Yatesbury, Wiltshire

Survey dates – **8th, 9th, 12th December 2011 and 2nd & 3rd February 2012 and 7th & 8th March 2016**

Ordnance Survey Grid Reference – **ST 62960 42175**

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SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd within three fields at Bullimore Farm, Shepton Mallet. The results of a previous survey, carried out in 2011/2012, have been incorporated into this report in order to outline the archaeological potential of the site as a whole. Part of the survey area lies within the scheduled Romano-British linear village at Fosse Lane, Shepton Mallet (No.1011635) and a Section 42 licence was granted by Historic England in order for the survey to take place within the scheduled area. Part of the site has been outlined for a potential commercial/industrial development, and the survey was conducted over this zone, as well as an area to the east in order to ascertain the extent of any archaeological features both within and adjacent to the development area.

In the northern part of the site, Area 1 lies within the scheduled area and the results demonstrate the presence of a large number of linear ditches, rectilinear enclosures and pits or areas of burning, that appear on two slightly different orientations relating to the Roman settlement. There is also evidence for at least one former Roman building and possibly a second to the south.

Within Area 2, the archaeological features also include linear ditches, enclosures and pits, with different orientations, but the majority of the features associated with the Roman settlement lie within the scheduled area. However, there are many outside of it that may relate to cut, ditch-like and pit-like features but the morphology and weak response of the anomalies prevents confident interpretation. In the eastern part of the site are a number of linear and rectilinear anomalies that appear to form a series of rectangular enclosures, and while these may have some archaeological potential, they are oriented parallel with modern and formerly mapped land boundaries and their date is uncertain.

Area 3 lies in the southern part of the site and only the northern edge is within the scheduled area. At least one positive linear anomaly appears to extend towards the archaeological features to the north, and although several others may relate to cut features, their morphology and weak response prevents interpretation. A zone of what appears to be shallow geology can also be seen in the south eastern part of the site. In Areas 2 and 3 there are a number of field boundaries removed during the 20th century and the infilled Somerset and Dorset Joint Railway cutting that is associated with very strongly magnetic debris that may have obscured some weaker anomalies.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Michael Goff (Agricultural Planning, Design & Project Management), on behalf of Mr Neil Edwards, to undertake a magnetometer survey of an area of land at Bullimore Farm, Shepton Mallet. The survey would provide information on the archaeological potential of land likely to be disturbed by a proposed industrial development, comprising B1 (business/office use), B2 (general industrial) and B8 (storage or distribution) categories, which is currently at the pre-planning stage.

1.1.2 Part of the site lies within Scheduled Monument No. 1011635, *an area of the Romano-British linear village at Fosse Lane, Shepton Mallet,* and much of it has previously been subject to a geophysical survey by Archaeological Surveys Ltd in 2012. This was carried out with licence under Section 42 of the 1979 Ancient Monuments and Archaeological Areas Act (as amended by the National Heritage Act 1983) within the scheduled area. A second Section 42 licence was granted by Historic England for surveying a small section (0.7ha) in the northern part of the scheduled area for the current survey. The geophysical survey has been carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2016) issued to Historic England as part of the Section 42 licence application and to Steve Membery, archaeologist for Somerset County Council. A Somerset HER PRN 34781 has also been issued for the work.

1.1.3 Although the previous geophysical survey has already been reported on (Archaeological Surveys, 2012) the results of the former survey have been combined with the current survey and are included within this report.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies to establish the presence/absence, extent, condition, character, quality and date of any archaeological deposits within the proposed development area and its immediate vicinity. The methodology is considered an efficient and effective approach to archaeological prospection.

1.2.2 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation;* and Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Chartered Institute for Archaeologists (2014) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3 Site location, description and survey conditions

1.3.1 The site is located at Bullimore Farm, to the south of Shepton Mallet in Somerset. It is centred on Ordnance Survey National Grid Reference (OS NGR) ST 67960 42175, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 13.5ha within three pasture fields. Approximately 7ha was surveyed in 2011/12 with a further 6.5ha surveyed in March 2016. The proposed development area covers 11.2ha.

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Weather conditions during the survey were fine.

1.4 Site history and archaeological potential

1.4.1 Part of the site lies within scheduled monument number 1011635, *an area of the Romano-British linear village at Fosse Lane, Shepton Mallet.* The monument includes part of a Romano-British linear village lying alongside the Fosse Way and earlier underlying archaeological features. Following the discovery of the site in 1988, exploratory excavations identified a settlement lying on both sides of the Roman road, three associated cemeteries and underlying archaeological remains of Neolithic and Iron Age date. The settlement, dating to between the first and fourth centuries AD, included stone and timber-framed structures fronting the Fosse Way with yards to the rear, streets running off at right angles to the main road, field boundaries and areas of industrial activity. Industry appears to have been an important function of the settlement and discoveries have included metal smelting ovens, traces of iron ore residues and slag and raw materials such as lead ingots. The three cemeteries appear to exhibit changes in religious belief and burial practices. Two of the cemeteries include burials orientated north-south and are thought to be pagan; the third, with burials orientated east-west, is interpreted as Christian. The village may have been founded on an earlier settlement of Iron Age date. Excluded from the scheduling are all modern structures including the Showerings warehouse, the modern road surfaces of Fosse Lane, the service roads, the former railway embankment and the modern embankment east of the Showerings warehouse but the ground beneath all these features is included.

1.4.2 Previous geophysical surveys have been undertaken within the site, with a number of archaeological features including ditches and pits located primarily within the scheduled area with weaker features beyond (GSB, 1991), (Archaeological Surveys, 2012).

1.5 Geology and soils

1.5.1 The underlying solid geology across the site is from the Langport Member, Blue Lias Formation and Charmouth Mudstone Formation (BGS, 2016).

1.5.2 The overlying soil across the survey area is from the Evesham 1 association and is a typical calcareous pelosol. It consists of a slowly permeable,

calcareous clayey soil (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry carried out over similar geology and soil has produced good results. The site is, therefore, considered suitable for magnetic survey.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic thermoremnance are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.

2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce magnetic anomalies that can be mapped by magnetic prospection.

2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to 10^{-9} Tesla (T).

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using both a SENSYS MAGNETO®MXPDA 5 channel cart-based system in 2016 and a Bartington Grad 601-2 in 2011/2012.

2.2.2 The cart-based system has 5 fluxgate gradiometers spaced 0.5m apart with readings recorded at 20 Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. The system is linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged PDA computer system.

2.2.3 Data are collected along a series of parallel survey transects wherever possible. The length of each transect is variable and relates to the size of the survey area and other factors including ground conditions. A visual display

allows accurate placing of transects and helps maintain the correct separation between adjacent traverses. Cart data are not collected within fixed grids and data points are considered to be random even though the data are collected in a systematic manner covering all accessible areas (Aspinall, Gaffney and Schmidt, 2009).

2.2.4 The Bartington Grad 601-2 gradiometer effectively measures a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally.

2.2.5 The instrument is extremely sensitive and is able to measure magnetic variation to 0.01nanoTesla (nT), with an effective resolution of 0.03nT. The data are limited to ±100nT when surveying with the highest sensitivity. All readings are saved to an integral data logger for analysis and presentation.

2.2.6 Both instruments are operated according to the manufacturer's instructions with consideration given to the local conditions. The Bartington Grad 601-2 requires an adjustment procedure prior to collection of data in order to balance the sensors and remove the effects of the Earth's magnetic field; further adjustment is required during the survey due to instrument drift often associated with temperature change. The Sensys cart-based system does not require adjustment or zeroing in the field as offsets are corrected during data processing.

2.2.7 The Grad 601-2 data were collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids (900m²) giving 3600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 2008).

2.2.8 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS. The GPS is used in conjunction with Leica's SmartNet service, where positional corrections are sent via a mobile telephone link. Positional accuracy of around 10 – 20mm is possible using the system. The instrument is regularly checked against the ETRS89 reference framework using Ordnance Survey ground marker C1ST7784 (Horton).

2.3 Data processing and presentation

2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared using SENSYS MAGNETO®DLMGPS software. Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display using TerraSurveyor.

2.3.2 The cart data are collected between limits of ±10000nT and clipped for display. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track. A zero median traverse function is required in order to remove fixed offset values present within the sensors which do not undergo a zeroing procedure in the field. The approach ensures

that the gradiometer sensors are very accurately aligned and fixed to the vertical magnetic field and are not influenced by localised magnetic fields or disturbed by vibration. Although a zero median traverse algorithm can remove anomalies aligned with the survey tracks, in practice this rarely occurs due to the use of long traverses, high resolution measurement and variability within the magnetic susceptibility of long linear features.

2.3.3 Magnetometry data downloaded from the Grad 601-2 data logger are analysed and processed using TerraSurveyor. The software allows greyscale plots to be produced for presentation and display. Survey grids are assembled to form an overall composite of data (composite file) creating a dataset of the complete survey area. Data are destriped using a zero median traverse algorithm, destaggered to correct for small positional errors and clipped to enhance the contrast of weak anomalies.

2.3.4 Appendix C contains metadata concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on any processes, such as clipping, carried out on the data.

2.3.5 The main form of data display prepared for this report is the greyscale plot (.tif file). Greyscale plots derived from the Sensys cart data are saved as .tif files with associated world files (.tfw) allowing automatic georeferencing (OSGB36) with GIS and CAD software. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2014 creating a .dwg file format. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method, etc.

2.3.7 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within each survey area. Where further interpretation is possible, or where a number of possible origins should be considered, more subjective discussion is set out in Section 4.

2.3.8 A digital archive is produced with this report, see Appendix D below. The main archive is held at the offices of Archaeological Surveys Ltd.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out over a total of three survey areas covering approximately 13.5ha, with 6.5ha being carried out at this time and 7ha carried out in 2011/12.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative responses of archaeological potential, positive and negative anomalies of an uncertain origin, anomalies associated with land management, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines.

3.1.3 Anomalies located within each survey area have been numbered and are described below with subsequent discussion in Section 4.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset.

3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics for each survey area.

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with archaeological potential AS-ABST MAG POS LINEAR ARCHAEOLOGY AS-ABST MAG POS DISCRETE ARCHAEOLOGY AS-ABST MAG NEG STRUCTURAL ARCHAEOLOGY 	Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc..Negative anomalies indicate material with a low magnetic susceptibility, with rectilinear anomalies indicating possible structural remains.
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN AS-ABST MAG POS UNCERTAIN 	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low

	magnetic susceptibility such as stone and subsoil.
Anomalies relating to land management AS-ABST MAG BOUNDARY 	Anomalies are mainly linear and may be indicative of the magnetically enhanced fill of cut features (i.e. ditches). The anomalies may be long and/or form rectilinear elements and they may relate to topographic features or be visible on early mapping. Associated agricultural anomalies (e.g. headlands, plough marks and former ridge and furrow) may support the interpretation.
Anomalies with an agricultural origin AS-ABST MAG AGRICULTURAL 	The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to modern ploughing.
Anomalies associated with magnetic debris AS-ABST MAG DEBRIS  AS-ABST MAG STRONG DIPOLAR	Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. It often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, or hearths and may therefore be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a modern origin AS-ABST MAG DISTURBANCE  AS-ABST MAG SERVICE 	The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically and with hysteresis adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.
Anomalies with a natural origin AS-ABST MAG NATURAL FEATURES AS-ABST MAG NATURAL FEATURES	Naturally formed magnetic anomalies are are caused by localised variability in the magnetic susceptibility of soils, subsoils and other drift or solid geologies. Anomalies may be amorphous, linear or curvilinear and may appear 'fluvial' or discrete; the latter are almost impossible to distinguished from pit-like anomalies with an anthropogenic origin. Fluvial, glacial and periglacial processes may be responsible for their formation within drift material and subsoil.

Table 1: List and description of interpretation categories

3.4 List of anomalies - Area 1

Area centred on OS NGR 363125 142405, see Figs 06 & 07.

Anomalies of archaeological potential

(1) – The survey area lies within the scheduled monument and contains a number of positive linear and rectilinear anomalies with a north-north-east to south-south-west and west-north-west to east-south-east orientation. A large number of discrete positive responses are associated with them. The anomalies relate to cut linear ditches, enclosures and pits associated with the Romano-British settlement.

(2) – Positive linear anomalies aligned almost east-west also appear to relate to ditches association with the Romano-British settlement, but on a different orientation.

(3) – In the north-western part of the survey area is a negative rectilinear anomaly, with dimensions of 9.5m by 7m. This relates to former structural remains, 1.2m thick, with evidence of internal walling and also strongly positive responses (>50nT) that may relate to burnt material. It is generally parallel with anomalies (1).

(4) – Located 50m south-west of (3) and oriented parallel with anomaly (2) is a possible rectilinear response. It is not as clear as anomaly (3) and appears to be cut by a linear ditch, but it is possible that it relates to another former structure.

Anomalies with an uncertain origin

(5) – Negative linear anomalies located towards the north-eastern corner of the survey area. This type of response may indicate the surface of a trackway and an association with the archaeology is possible.

(6) – The survey area contains a number of negative linear anomalies. Many appear within the vicinity of the archaeological features and an association is possible.

(7) – Parallel, weakly positive linear anomalies appear parallel with some archaeological features, although many are perpendicular or parallel with extant field boundaries. An association with (11) is also possible.

(8) – Weakly positive linear anomalies in the southern part of the survey area appear parallel with anomaly (2). They may relate to linear ditches, but their date is uncertain.

Anomalies associated with land management

(9) – Extending across the survey area is a line of strong dipolar responses. This relates to a removed 20th century field boundary.

Anomalies with an agricultural origin

(10) – A series of positive linear anomalies are parallel with and adjacent to the southern field boundary and appear to relate to former agricultural activity.

Anomalies with a modern origin

(11) – A short, multiple dipolar, linear anomaly relates to a buried service or pipe.

3.5 List of anomalies - Area 2

Area centred on OS NGR 362970 142240, see Figs 08 & 09.

Anomalies of archaeological potential

(12) – A group of positive linear anomalies form a rectilinear enclosure with other linear anomalies both within and beyond its limits. There are pit-like anomalies or discrete areas of magnetic enhancement and also a negative linear anomaly which is a response to material of low magnetic susceptibility, such as stone. The orientation of the anomalies is generally north to south and east to west. Levels of enhancement peak at around 7nT, although the majority of the readings are <3nT.

(13) – A positive linear anomaly extends from the western edge of anomaly group (12) for 75m in a southerly direction where it appears to join another positive linear anomaly to form a "T" shape. It is possible that it extends into Area 3 to the south as anomaly (25).

(14) – Positive linear anomalies extending from the north western corner of the survey area towards the south east. They appear to be directly associated with anomaly group (12), possibly indicating boundary ditch features or trackway ditches.

(15) – Positive linear anomalies located close to the northern edge of the survey area. The orientation of these anomalies is different to anomalies (12) to (14), they are parallel with the adjacent Fosse Way (north-north-east to south-south-west) and also anomalies (1) seen with in Area 1, 300m to the north-east.

Anomalies with an uncertain origin

(16) – Weakly positive and negative linear and rectilinear anomalies and positive discrete anomalies located between anomalies (12), (13) and (14). The positive anomalies may indicate ditch-like and pit-like features, and the negative responses material with low magnetic susceptibility, such as stone. However, a cautious approach has been adopted with the interpretation of these features. Their low magnitude and lack of coherent morphology, together with the fact that they are parallel with modern and relatively recently removed field boundaries, suggests that although they may have archaeological potential, this is not certain.

(17) – Weakly positive linear anomalies and discrete responses located within the northern part of the survey area may relate to anomalies located to the east beyond the dismantled railway line. It is possible that they relate to cut features and they are generally parallel with (18) and an association is possible. However it is possible that they relate to field boundary ditches and pits and their archaeological potential should be considered.

(18) – The eastern part of the survey area contains a number of positive linear and rectilinear anomalies oriented north-north-west to south-south-east and west-north-

west to east-south-east. They appear to relate to land divisions, with some evidence for them continuing partially into Area 3 to the south, although they are parallel with modern and formerly mapped field boundaries.

(19) – Weakly positive linear anomalies to the south of anomalies (17) and in the vicinity of anomalies (18). It is possible that they relate to cut, ditch-like features.

(20) – In the north-eastern corner of the survey area are a number of positive linear and discrete responses. They may be associated with anomalies (17) but their origin is uncertain.

Anomalies associated with land management

(21) – Magnetic debris and disturbance is associated with formerly mapped field boundaries.

Anomalies associated with magnetic debris

(22) – A broad linear zone of magnetic debris extends across the central part of the survey area with a north-south orientation. This is a response to ferrous material, probably used within the infill of the Somerset and Dorset Joint Railway line that crossed the site between 1874 and 1966. Its cutting was infilled by 1992.

(23) – All the survey areas contain several strong discrete dipolar anomalies that relate to ferrous objects within the topsoil.

Anomalies with a modern origin

(24) – A strongly magnetic dipolar linear anomaly lies close to the western field boundary and is a response to a buried service or pipeline. It also extends southwards into Area 3 where it is parallel with the western field boundary.

3.6 List of anomalies - Area 3

Area centred on OS NGR 362945 142080, see Figs 08 & 09.

Anomalies of archaeological potential

(25) – A positive linear anomaly extends from the northern edge of the survey area in a south south easterly direction for approximately 100m. The response ends at a linear series of strong dipolar anomalies which may have obscured or truncated the feature in the southern part of the survey area. The position and orientation of anomaly (25) may suggest that it is an extension of anomaly (13) seen in Area 2 to the north.

(26) – A possible suggestion of a weakly positive linear anomaly. It has a similar orientation to, and may be a southern extension of, anomaly (14).

Anomalies with an uncertain origin

(27) – Two parallel positive linear anomalies, flanking a negative linear anomaly, are located to the south of anomaly (26) and may indicate ditch-like features flanking material with low magnetic susceptibility, such as subsoil or stone. Other positive linear anomalies extend eastwards from them. It is parallel with the former railway cutting (42) and an association is possible. However an association with anomalies (28) is also possible.

(28) – Weakly positive curvilinear and linear anomalies may relate to cut features forming an enclosure. It is possible that it has an association with anomalies (27); however, the extent and relationship with other anomalies is not clear, partly due to the weak response, and also due to possible obscuring by the strong magnetic debris used to fill in the railway cutting (42).

(29) – Discrete positive anomalies located close to the western edge of the survey area. These anomalies are 10-20nT which indicates that they may relate to pit-like features containing strongly magnetically enhanced material, or to magnetically thermoremnant features, possibly indicating areas of burning.

(30) – Fragmented positive curvilinear anomalies located in the northern half of the survey area.

(31) – The survey area contains several weakly positive, discrete anomalies which may indicate pit-like features.

(32) – Weak, broadly linear or curvilinear anomaly is a response to weakly magnetically enhanced material.

(33) – Positive linear anomalies with a general west-north-west to east-south-east orientation may relate to agricultural activity, possibly indicating former ridge and furrow.

(34) – The survey area contains several positive and some negative linear anomalies. The positive anomalies may relate to ditch-like features; however, their origin is uncertain.

(35) – An irregularly shaped positive linear anomaly is located in the eastern part of the survey area. It is not clear if it relates to a cut feature, or a naturally formed feature.

(36) – A fragmented positive linear anomaly in the eastern part of the survey area may relate to a cut feature.

(37) – Towards the eastern edge of the survey area are a number of discrete positive responses. They appear within a zone that contains natural features; however, it is not possible to determine if they have a natural or anthropogenic origin.

Anomalies associated with land management

(38) – The survey area contains many positive linear anomalies, oriented almost east-west and north-south, that relate to former field boundaries, the majority being removed in the 1960s.

Anomalies with an agricultural origin

(39) – A series of linear anomalies, oriented east-west and parallel with the removed field boundaries, relate to former agricultural activity.

(40) – A series of parallel negative linear anomalies are located close to the northern edge of the survey area. They are likely to relate to agricultural activity, possibly indicating land drains.

Anomalies associated with magnetic debris

(41) – A linear zone of magnetic disturbance is associated with multiple strong dipolar anomalies. It is possible that this is associated with a former field boundary, although none is mapped between 1887 and 1992.

(42) – A broad linear zone of strongly magnetic debris and associated magnetic disturbance is associated with ferrous material used to infill a railway cutting.

Anomalies associated with natural features

(43) – In the central part of the eastern half of the survey area is a group of positive and negative linear, rectilinear and discrete anomalies. These appear to relate to natural features, with increased depth of soil within joint and cracks (positive anomalies) and shallow geology (negative anomalies).

(44) – Towards the eastern edge of the survey area is a zone of magnetic enhancement. This appears to relate to a naturally formed feature, such as through the process of colluviation.

4 DISCUSSION

4.1.1 The detailed magnetometer survey located a number of geophysical anomalies within the northern part of Area 1 that indicate the presence of ditches, pits and enclosures associated with the Romano-British linear settlement within the scheduled area. The survey has also revealed the presence of two possible buildings also associated with the settlement.

4.1.2 In Area 2, also within the scheduled area, are further positive linear, rectilinear and discrete anomalies. Some are not parallel or orthogonal with the Fosse

Way, which may indicate that they pre-date it, or that there are minor Roman roads linking to the Fosse upon which settlement features are orientated.

4.1.3 A group of weakly positive linear, rectilinear and discrete anomalies appear to be associated with several negative linear and rectilinear anomalies (16) in the western part of Area 2. Although it is possible that they relate to magnetically enhanced material within cut features or areas of burning and material with a low magnetic susceptibility such as stone, their weak and fragmented response prevents confident interpretation.

4.1.4 The eastern half of Area 2 contains numerous weakly positive linear, rectilinear and discrete anomalies that appear to relate to ditch-like and pit-like features (18). They are parallel with anomalies (16) and extend into the northern part of Area 3. However, due to their weak response, and the fact that they are also parallel with modern and relatively recently removed field boundaries, their origin is uncertain.

4.1.5 Area 3 contains a positive linear anomaly (25), that appears on a similar orientation to anomaly (13) within Area 2 to the north and may indicate a southerly extension of this linear ditch. Linear anomaly (26) is very weak, although its position and orientation may indicate that it is a south-easterly extension of anomaly (14).

4.1.6 Close to the south-western corner of Area 3 are a group of relatively strongly enhanced pit-like anomalies (29). The strength of these anomalies suggests they contain moderately enhanced material, possibly associated with areas of burning. They do appear to be bounded by a linear anomaly and may relate to archaeological features; however, their origin is uncertain.

4.1.7 Area 3 also contains a possible enclosure feature (28) in the eastern part of the survey area, although the weak response and location of the infilled railway cutting prevents confident interpretation. A number of linear, discrete and rectilinear anomalies in the eastern part of Area 3 appear to relate to a band of shallow geology.

4.1.8 The interpretation of many of the anomalies has been hindered by the fact that many are parallel with the modern and relatively recently removed field boundaries. The majority of the anomalies have an almost east-west, or an east-north-east to west-south-west, and a north-south or south-south-east to north-north-west orientation, as do the modern field boundaries. Many of the anomalies that have been classified as uncertain in origin may well relate to cut features with an archaeological origin; however, it is not possible to determine if these are prehistoric or Roman features, or if they relate to medieval, post-medieval or modern activities and agricultural practices.

5 CONCLUSION

5.1.1 The detailed magnetometer survey was carried out partly within the scheduled monument of '*an area of the Romano-British linear village at Fosse Lane, Shepton Mallet',* and within land immediately to the south and east of it at Bullimore Farm. In the northern part of the site, within the scheduled area, the survey revealed a large number of linear ditches, rectilinear enclosures and pits or areas of burning as well as a former building with possibly a second building to the south of it.

5.1.2 Within Area 2 to the south-west, also within the scheduled area are a number of ditches, pits and enclosures with archaeological potential. These anomalies may define the southern extent of Romano-British and prehistoric features located to the north of the site. Several negative linear anomalies could be consistent with former structural remains, although this interpretation is tentative.

5.1.3 Beyond the scheduled area, linear anomalies extending south and south-east from the north-western part of Area 2 and into Area 3 may be associated with ditches forming ancient boundaries and/or trackways. The general orientation of features of archaeological potential appears to reflect the orientation of these southerly and south-easterly extensions; however, a small number of anomalies in the north-western corner also reflect the orientation of the Fosse Way. It is unclear as to whether the difference in the orientations represents different phases and periods of activity, or whether features are merely orientated on other lesser Roman tracks that link to the Fosse immediately north of the surveyed area.

5.1.4 Within the eastern half of Area 2, and just within the northern part of Area 3, are a series of linear and rectilinear features, that may relate to former land divisions. Although they are parallel with a small number of the archaeological features they are generally parallel with the modern and recently removed field boundaries.

5.1.5 Many linear and discrete positive anomalies of uncertain origin were located in all of the survey areas. Further interpretation from the geophysical data is impossible as the anomalies are generally weak and fragmented and they do not have any distinct morphological characteristics that would allow further comment on their archaeological potential. Many anomalies do appear to be related to former agricultural activity and removed field boundaries, and it is possible that many of the anomalies of uncertain origin are also agricultural in nature.

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Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

Appendix B – data processing notes

Clipping

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between ±5nT and ±1nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Zero (destripe) Median/Mean Traverse

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise differences between the baseline value of gradiometer sensors.

De-stagger

Compensates for small positional errors within data collection by shifting the position of the readings along each traverse by a specified amount. Data lost at the end of each traverse are extrapolated from adjacent value in the same row.

Deslope

Corrects for striping and distortion caused by metal objects/services etc.. The process calculates a curve based on a polynomial best fit mathematical function for each traverse. This curve is then subtracted from the actual data.

Edge Match

Calculates the mean of the 2 lines (rows or columns) of data either side of the edge to match. It then subtracts the difference between the means from all datapoints in the selected area.

FFT (Fast Fourier Transform) spectral filtering

A mathematical process used to determine the frequency components of a traverse. Repetitive features, such as plough marks, produce characteristic spectral zones that can be suppressed allowing greyscale images to appear clearer.

Appendix C – survey and data information

Area 1 – Sensys data

Filename: J653-mag-Area1-proc.xcp
Description: Imported as Composite from: J653-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 363055.674324256, 142491.79087475 m
Southeast corner: 363185.574324256, 142328.29087475 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 328300

Dimensions
Composite Size (readings): 866 x 1090
Survey Size (meters): 130 m x 164 m
Grid Size: 130 m x 164 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 5.53
Min: -5.50
Std Dev: 2.34
Mean: 0.05
Median: 0.02
Composite Area: 2.1239 ha
Surveyed Area: 1.0951 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.29.1
Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -5.00 to 5.00 nT

Area 2 – Sensys data

COMPOSITE
Filename: J653-mag-Area2-proc.xcp
Description: Imported as Composite from: J653-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGb36
Northwest corner: 362981.709739977, 142330.071435059 m
Southeast corner: 363159.009739977, 142177.071435059 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 573100

Dimensions
Composite Size (readings): 1182 x 1020
Survey Size (meters): 177 m x 153 m
Grid Size: 177 m x 153 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 3.32
Min: -3.30
Std Dev: 0.92
Mean: 0.02
Median: -0.01
Composite Area: 2.7127 ha
Surveyed Area: 1.7502 ha

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 3 – Sensys data

COMPOSITE
Filename: J653-mag-Area3-proc.xcp
Description: Imported as Composite from: J653-mag-Area3.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 362925.855987701, 142208.600119232 m
Southeast corner: 363155.805987701, 141980.900119232 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 1007300

Dimensions
Composite Size (readings): 1533 x 1518
Survey Size (meters): 230 m x 228 m
Grid Size: 230 m x 228 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 3.32
Min: -3.30
Std Dev: 1.17
Mean: 0.01
Median: 0.01
Composite Area: 5.236 ha
Surveyed Area: 3.2278 ha

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 2 - Bartington raw data

COMPOSITE
Filename: J386-Area2-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 03/02/2012
Assembled by: on 03/02/2012
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

Dimensions
Composite Size (readings): 1200 x 210
Survey Size (meters): 300 m x 210 m
Grid Size: 30 m x 30 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 7.49
Mean: -1.67
Median: -0.59
Composite Area: 6.3 ha
Surveyed Area: 3.1171 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 48
1 Col:0 Row:0 grids\28.xgd
2 Col:0 Row:1 grids\29.xgd
3 Col:1 Row:0 grids\30.xgd
4 Col:1 Row:1 grids\31.xgd
5 Col:1 Row:2 grids\32.xgd
6 Col:1 Row:3 grids\01.xgd
7 Col:2 Row:0 grids\33.xgd
8 Col:2 Row:1 grids\34.xgd
9 Col:2 Row:2 grids\35.xgd
10 Col:2 Row:3 grids\02.xgd
11 Col:2 Row:4 grids\03.xgd
12 Col:3 Row:0 grids\36.xgd
13 Col:3 Row:1 grids\37.xgd
14 Col:3 Row:2 grids\38.xgd
15 Col:3 Row:3 grids\04.xgd
16 Col:3 Row:4 grids\05.xgd
17 Col:3 Row:5 grids\06.xgd
18 Col:3 Row:6 grids\07.xgd
19 Col:4 Row:0 grids\39.xgd

20 Col:4 Row:1 grids\40.xgd
21 Col:4 Row:2 grids\41.xgd
22 Col:4 Row:3 grids\08.xgd
23 Col:4 Row:4 grids\09.xgd
24 Col:4 Row:5 grids\10.xgd
25 Col:4 Row:6 grids\11.xgd
26 Col:5 Row:0 grids\42.xgd
27 Col:5 Row:1 grids\43.xgd
28 Col:5 Row:2 grids\44.xgd
29 Col:5 Row:3 grids\12.xgd
30 Col:5 Row:4 grids\13.xgd
31 Col:5 Row:5 grids\14.xgd
32 Col:5 Row:6 grids\15.xgd
33 Col:6 Row:0 grids\45.xgd
34 Col:6 Row:1 grids\46.xgd
35 Col:6 Row:2 grids\47.xgd
36 Col:6 Row:3 grids\16.xgd
37 Col:6 Row:4 grids\17.xgd
38 Col:6 Row:5 grids\18.xgd
39 Col:6 Row:6 grids\19.xgd
40 Col:7 Row:2 grids\48.xgd
41 Col:7 Row:3 grids\20.xgd
42 Col:7 Row:4 grids\21.xgd
43 Col:7 Row:5 grids\22.xgd
44 Col:7 Row:6 grids\23.xgd
45 Col:8 Row:4 grids\24.xgd
46 Col:8 Row:5 grids\25.xgd
47 Col:8 Row:6 grids\26.xgd
48 Col:9 Row:6 grids\27.xgd

Area 2 -Bartington processed data

COMPOSITE
Filename: J386-Area2-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.41
Mean: -0.26
Median: -0.08
Composite Area: 6.3 ha
Surveyed Area: 3.1171 ha

Processes: 24
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: 34.xgd 35.xgd 02.xgd 37.xgd 38.xgd 04.xgd 40.xgd 41.xgd 08.xgd 43.xgd 44.xgd 12.xgd
4 DeStripe Mean Traverse: Grids: 31.xgd 32.xgd Threshold: 1 SDs
5 DeStripe Mean Traverse: Grids: 33.xgd Threshold: 0.5 SDs
6 DeStripe Mean Traverse: Grids: 36.xgd Threshold: 1 SDs
7 DeStripe Mean Traverse: Grids: 39.xgd Threshold: 0.5 SDs
8 DeStripe Mean Traverse: Grids: 42.xgd Threshold: 0.5 SDs
9 DeStripe Median Traverse: Grids: 46.xgd
10 DeStripe Median Traverse: Grids: 47.xgd
11 DeStripe Mean Traverse: Grids: 16.xgd Threshold: 0.5 SDs
12 DeStripe Mean Traverse: Grids: 03.xgd Threshold: 0.5 SDs
13 DeStripe Mean Traverse: Grids: 05.xgd Threshold: 0.5 SDs
14 DeStripe Mean Traverse: Grids: 09.xgd Threshold: 0.5 SDs
15 DeStripe Median Traverse: Grids: 14.xgd 15.xgd 18.xgd 19.xgd 22.xgd 23.xgd 25.xgd 26.xgd
16 DeStripe Mean Traverse: Grids: 06.xgd 07.xgd 10.xgd 11.xgd Threshold: 0.5 SDs
17 DeStripe Mean Traverse: Grids: 13.xgd 17.xgd Threshold: 0.5 SDs
18 DeStripe Mean Traverse: Grids: 20.xgd Threshold: 1 SDs
19 DeStripe Mean Traverse: Grids: 21.xgd Threshold: 0.5 SDs
20 DeStripe Mean Traverse: Grids: 24.xgd Threshold: 0.5 SDs
21 DeStripe Mean Traverse: Grids: 27.xgd Threshold: 0.25 SDs
22 Clip from -3.00 to 3.00 nT
23 Edge Match (Area: Top 30, Left 120, Bottom 59, Right 239) to Right edge
24 Clip from -3.00 to 3.00 nT

Area 3 - Bartington raw data

COMPOSITE
Filename: J386-mag-Area3-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 12/12/2011
Assembled by: on 12/12/2011
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

Dimensions
Composite Size (readings): 1080 x 210
Survey Size (meters): 270 m x 210 m
Grid Size: 30 m x 30 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 12.99
Mean: -2.50
Median: -0.95
Composite Area: 5.67 ha
Surveyed Area: 3.6681 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 52
1 Col:0 Row:0 grids\32.xgd
2 Col:0 Row:1 grids\33.xgd
3 Col:0 Row:2 grids\34.xgd
4 Col:0 Row:3 grids\31.xgd
5 Col:1 Row:0 grids\35.xgd
6 Col:1 Row:1 grids\36.xgd
7 Col:1 Row:2 grids\37.xgd
8 Col:1 Row:3 grids\27.xgd
9 Col:1 Row:4 grids\28.xgd
10 Col:1 Row:5 grids\29.xgd
11 Col:1 Row:6 grids\30.xgd
12 Col:2 Row:0 grids\38.xgd
13 Col:2 Row:1 grids\39.xgd
14 Col:2 Row:2 grids\40.xgd
15 Col:2 Row:3 grids\23.xgd
16 Col:2 Row:4 grids\24.xgd
17 Col:2 Row:5 grids\25.xgd
18 Col:2 Row:6 grids\26.xgd
19 Col:3 Row:0 grids\41.xgd
20 Col:3 Row:1 grids\42.xgd
21 Col:3 Row:2 grids\43.xgd
22 Col:3 Row:3 grids\19.xgd
23 Col:3 Row:4 grids\20.xgd
24 Col:3 Row:5 grids\21.xgd
25 Col:3 Row:6 grids\22.xgd
26 Col:4 Row:0 grids\44.xgd
27 Col:4 Row:1 grids\45.xgd
28 Col:4 Row:2 grids\46.xgd
29 Col:4 Row:3 grids\15.xgd
30 Col:4 Row:4 grids\16.xgd
31 Col:4 Row:5 grids\17.xgd
32 Col:4 Row:6 grids\18.xgd
33 Col:5 Row:0 grids\47.xgd
34 Col:5 Row:1 grids\48.xgd
35 Col:5 Row:2 grids\49.xgd
36 Col:5 Row:3 grids\11.xgd
37 Col:5 Row:4 grids\12.xgd
38 Col:5 Row:5 grids\13.xgd
39 Col:5 Row:6 grids\14.xgd
40 Col:6 Row:0 grids\50.xgd
41 Col:6 Row:1 grids\51.xgd
42 Col:6 Row:2 grids\52.xgd
43 Col:6 Row:3 07.xgd
44 Col:6 Row:4 08.xgd
45 Col:6 Row:5 09.xgd
46 Col:6 Row:6 10.xgd
47 Col:7 Row:3 03.xgd
48 Col:7 Row:4 04.xgd
49 Col:7 Row:5 05.xgd
50 Col:7 Row:6 06.xgd
51 Col:8 Row:5 01.xgd
52 Col:8 Row:6 02.xgd

Area 3 - Bartington processed data

COMPOSITE
Filename: J386-mag-Area3-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.90

Mean: -0.30
Median: -0.17
Composite Area: 5.67 ha
Surveyed Area: 3.6681 ha

Processes: 6
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: 33.xgd 34.xgd 31.xgd 36.xgd 37.xgd 27.xgd 28.xgd 39.xgd 40.xgd 23.xgd 24.xgd 42.xgd 43.xgd 19.xgd 20.xgd 45.xgd 46.xgd 15.xgd 16.xgd 48.xgd 49.xgd 11.xgd 12.xgd 51.xgd 52.xgd 07.xgd 08.xgd 03.xgd 04.xgd
4 DeStripe Mean Traverse: Grids: 32.xgd 35.xgd 38.xgd 41.xgd 44.xgd 47.xgd 50.xgd Threshold: 0.5 SDs
5 DeStripe Mean Traverse: Grids: 29.xgd 30.xgd 25.xgd 26.xgd 21.xgd 22.xgd 17.xgd 18.xgd 13.xgd 14.xgd 09.xgd 10.xgd 05.xgd 06.xgd 01.xgd 02.xgd Threshold: 0.5 SDs
6 Clip from -3.00 to 3.00 nT

Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at their offices in Wiltshire. Data are backed-up onto an on-site data storage drive and at the earliest opportunity data are copied to CD ROM for storage on-site and off-site.

A hard copy of the report will be sent to Agnieszka Siewicz at the Historic England South West office and electronic (pdf) format to Hugh.beamish@HistoricEngland.org.uk, copied to Paul.Linford@HistoricEngland.org.uk no later than 3 months after the completion of the survey. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS) and a printed copy and PDF sent to the Somerset Historic Environment Record.

Archive contents:

Geophysical data - path: J653 Shepton Mallet\Data				
Path and Filename	**Software**	**Description**	**Date**	**Creator**
shepton1\MX\.prm.dgb.disp shepton2\MX\.prm.dgb.disp shepton3\MX\.prm.dgb.disp	Sensys MXPDA	Proprietary data formats representing magnetometer survey traverses logged to a PDA.	07/03/16 & 08/03/16	D.J.Sabin
shepton1\MX\J653-mag-Area1.asc shepton2\MX\J653-mag-Area2.asc shepton3\MX\J653-mag-Area3.asc	Sensys DLMGPS	ASCII CSV (tab) file representing survey Area 1 in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	10/03/16	D.J.Sabin
Area1\comps\J653-mag-Area1.xcp Area2\comps\J653-mag-Area2.xcp Area3\comps\J653-mag-Area3.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	10/03/16	D.J.Sabin
Area1\comps\J653-mag-Area1-proc.xcp Area2comps\J653-mag-Area2-proc.xcp Area3\comps\J653-mag-Area3-proc.xcp	TerraSurveyor 3.0.23.0	Processed composite data file (zmt and clipping to ±3nT).	10/03/16	D.J.Sabin
Graphic data - path: J653 Shepton Mallet\Data				
Area1\graphics\J653-mag-Area1-proc.tif Area2\graphics\J653-mag-Area2-proc.tif Area3\graphics\J653-mag-Area3-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±3nT.	10/03/16	K.T.Donaldson
Area1\graphics\J653-mag-Area1-proc.tfw Area2\graphics\J653-mag-Area2-proc.tfw Area3graphics\J653-mag-Area3-proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	10/03/16	K.T.Donaldson
CAD data - path: J653 Shepton Mallet\CAD				
J653 version 1.dwg	ProgeCAD 2016	CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format.	25/02/16	K.T.Donaldson
Text data - path: J653 Shepton Mallet\Documentation				
J653 report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	15/03/16	K.T.Donaldson

Appendix E – copyright and intellectual property

Historic England

Historic England Geophysical Survey Database Questionnaire

Survey Details

Name of Site: Bullimore Farm, Shepton Mallet
County: Somerset

NGR Grid Reference (Centre of survey to nearest 100m): ST 362 142

Start Date: 07/03/2016 **End Date:** 08/03/2016

Geology at site (Drift and Solid):
Langport Member, Blue Lias Formation and Charmouth Mudstone Formation (Lower Lias)

Known archaeological Sites/Monuments covered by the survey
(Scheduled Monument No. or National Archaeological Record No. if known)

List entry no: 1011635, *An area of the Romano-British linear village at Fosse Lane,Shepton Mallet*

Archaeological Sites/Monument types detected by survey
(Type and Period if known. "?" where any doubt).

Enclosure – Roman
Ditch - Roman
Building – Roman
Pit – Roman
Settlement – Roman

Surveyor (Organisation, if applicable, otherwise individual responsible for the survey):

David Sabin, Archaeological Surveys Ltd

Name of Client, if any: Mr N Edwards

Purpose of Survey:
To carry out a magnetometer over and additional 6.5ha including 1ha of the scheduled area prior to a planning application for commercial/industrial development. This survey was carried out as an additional survey to a previous 7ha, partly within the scheduled area in 2011/2012. Part of the scheduled area was surveyed in order to determine the extent and relationship between any potential features located within the development area and the adjacent scheduled area.
a) Primary archive, i.e. raw data, electronic archive etc: Archaeological Surveys Ltd, 1 West Nolands, Nolands Road, Yatesbury, Calne, SN11 8YD
b) Full Report: As above with copy to OASIS and HER

Historic England

Technical Details

(Please fill out a separate sheet for each survey technique used)

Type of Survey (Use term from attached list or specify other):

Magnetometry

Area Surveyed, if applicable (In hectares to one decimal place):
6.5ha

Traverse Separation, if regular: 0.5m **Reading/Sample Interval:** 20Hz

Type, Make and model of Instrumentation:

Sensys Magneto MXPDA (multiple fluxgate gradiometers)

For Resistivity Survey:

Probe configuration:

Probe Spacing:

Land use at the time of the survey (Use term/terms from the attached list or specify other):

Grassland

Scheduled area

Survey location

N

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Shepton Mallet
Additional Survey

Map of survey area

Survey location

Site centred on OS NGR
ST 630 422

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

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Geophysical Survey
Bullimore Farm
Shepton Mallet
Additional Survey

Survey area, development area and scheduled area

Proposed development area

Scheduled monument boundary

1 — 2011/2012 survey grid number

N

Area 1

2016 survey area

Area 2

2012 survey area

Area 3

2016 survey area

2016 survey area

2011 survey area

SCALE 1:3000

0m 30 60 90 120 150m

SCALE TRUE AT A3

FIG 02

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Bullimore Farm
Shepton Mallet
Additional Survey

Greyscale plot of raw magnetometer data (Bartington Grad 601-2)

-30nT Area 2 +30nT

-30nT Area 3 +30nT

+30nT

-30nT

Area 2

Area 3

Depot

Fosse Way

FOSSE LANE

ROMAN ROAD

167.6m

166.0m

A 37

A 361

CANNARDS GRAVE ROUNDABOUT

Pond

Manleaze Caravan Park

Spring Cottages

Path

Track

Pond

Belstone

N

SCALE 1:2000

0m 20 40 60 80 100m

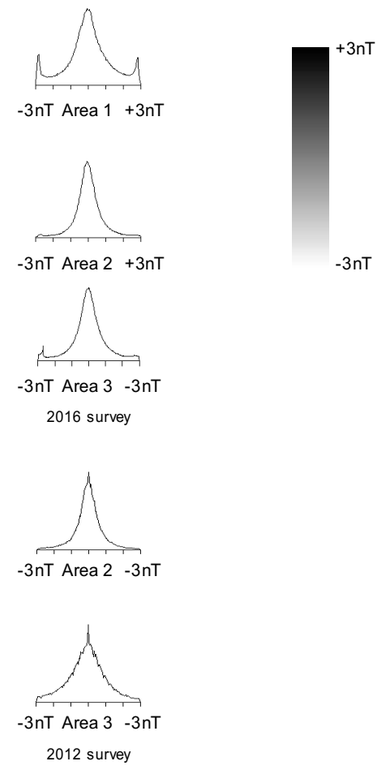
SCALE TRUE AT A3

FIG 03

Archaeological Surveys Ltd

Geophysical Survey
Bullimore Farm
Shepton Mallet
Additional Survey

Greyscale plot of processed magnetometer data



SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 04

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Geophysical Survey
Bullimore Farm
Shepton Mallet
Additional Survey

Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - cut feature of archaeological potential
- Negative linear anomaly - structural remains of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Positive linear anomaly/dipolar response - former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Positive linear anomaly - of natural origin (soil filled joint/crack)
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Positive anomaly - weakly magnetically enhanced material
- Positive anomaly - of natural origin (colluvium?)
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 05

Depot

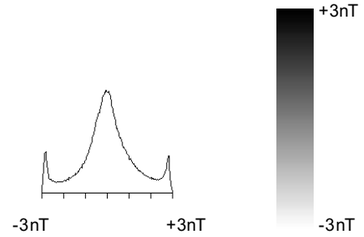
Area 1

N

Archaeological Surveys Ltd

Geophysical Survey
Bullimore Farm
Shepton Mallet
Additional Survey

Greyscale plot of processed magnetometer data - Area 1



SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 06

Depot

Area 1

N

1
2
3
4
5
6
7
8
9
10
11
17
18
19
20
21
22
23

Archaeological Surveys Ltd

Geophysical Survey
Bullimore Farm
Shepton Mallet
Additional Survey

Abstraction and interpretation of magnetometer anomalies - Area 1

- Positive linear anomaly - cut feature of archaeological potential
- Negative linear anomaly - structural remains of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Positive linear anomaly - former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 07

Area 2

A 361

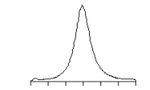
Path

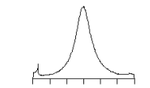
Area 3

Archaeological Surveys Ltd

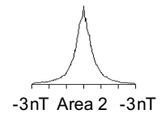
Geophysical Survey
Bullimore Farm
Shepton Mallet
Additional Survey

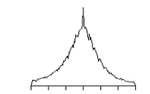
Greyscale plot of processed magnetometer data - Areas 2 & 3





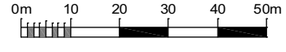
2016 survey





2012 survey

SCALE 1:1250



SCALE TRUE AT A3

FIG 08

Area 2

Area 3

A 361

Path

Archaeological Surveys Ltd

Geophysical Survey
Bullimore Farm
Shepton Mallet
Additional Survey

Abstraction and interpretation of magnetometer anomalies - Areas 2 & 3

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Positive linear anomaly - former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Positive linear anomaly - of natural origin (soil filled joint/crack)
- Discrete positive response - possible pit-like feature
- Positive anomaly - weakly magnetically enhanced material
- Positive anomaly - of natural origin (colluvium?)
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 09