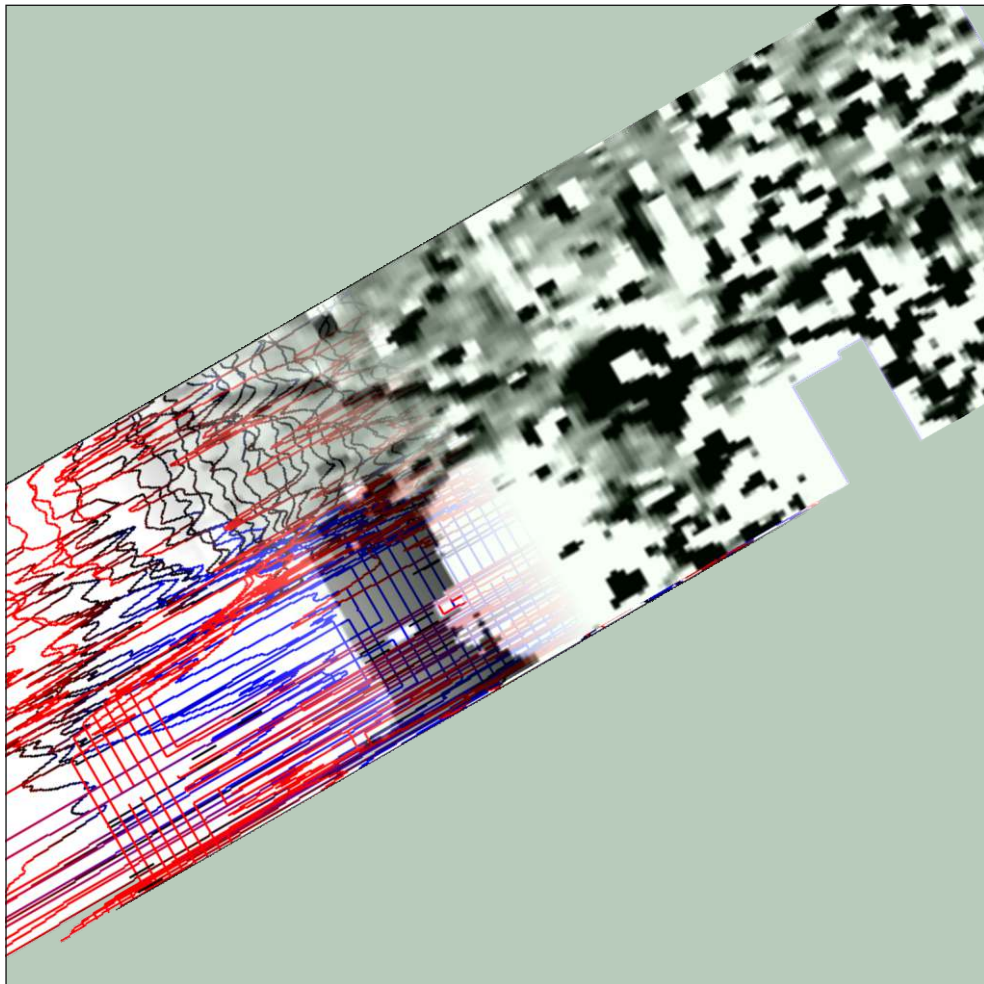




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# Southern Strategic Support Main Barrow Gurney to Cheddar, North Somerset and Somerset

Detailed Gradiometer Survey Report  
Volume 1



Ref: 110762.02  
April 2016



**Southern Strategic Support Main  
Barrow Gurney to Cheddar, North Somerset and Somerset**

**Detailed Gradiometer Survey Report**

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# Southern Strategic Support Main Barrow Gurney to Cheddar, North Somerset and Somerset

## Detailed Gradiometer Survey Report

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# **Southern Strategic Support Main Barrow Gurney to Cheddar, North Somerset and Somerset**

## **Detailed Gradiometer Survey Report**

### **Summary**

Wessex Archaeology was appointed to undertake a detailed gradiometer survey over land between Barrow Gurney and Cheddar as part of the Southern Strategic Support Main. The project was commissioned by Black and Veatch Ltd on behalf of Bristol Water with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features alongside noting any detectable geological changes along the route. This work was undertaken as part of an ongoing programme of archaeological works being undertaken ahead of the development to improve the security of the water supply across the areas of southern Bristol, Weston-Super-Mare, Cheddar, Burnham and Glastonbury.

The survey area covers an area of approximately 70 ha of agricultural and developed land stretching from Cheddar at the southernmost point to Burrow Gurney and Long Ashton at the northernmost point, with a section heading west from Sandford to Banwell. The geophysical survey was undertaken between 1<sup>st</sup> February and 11th March 2016. The detailed gradiometer survey has demonstrated the presence of a number of anomalies of potential archaeological interest in both the north and south sections.

The anomalies identified as being of possible archaeological interest are primarily pit- and ditch-like features. These have been identified across the length of the linear scheme and may represent enclosure ditches, banks pits and/or post holes. Alongside these former field boundaries, areas of increased magnetic response, superficial geology and historic agricultural trends were also detected.



# **Southern Strategic Support Main Barrow Gurney to Cheddar, North Somerset and Somerset**

## **Detailed Gradiometer Survey Report**

### **Acknowledgements**

Wessex Archaeology would like to thank Black and Veatch Ltd. for commissioning the geophysical survey along the proposed route of the Southern Strategic Support Scheme. The assistance of Caroline Jewell is gratefully acknowledged in this regard.

The fieldwork was undertaken by Jen Smith, Nick Crabb, Diana Chard, Becky Hall, Stew Wareing, Chris Hirst, Garreth Davey, Jack Laverick, Adam Fraser, Callum Bruce and Owen Watts. Alistair Salisbury, Elizabeth Richley, Garreth Davey and Nick Crabb processed and interpreted the geophysical data. Jen Smith and Elizabeth Richley wrote the report. The geophysical work was quality controlled by Elizabeth Richley and Lucy Learmonth. Illustrations were prepared by Kitty Foster. The project was managed on behalf of Wessex Archaeology by Grace Corbett.



# Southern Strategic Support Main Barrow Gurney to Cheddar, North Somerset and Somerset

## Detailed Gradiometer Survey Report

### 1 INTRODUCTION

#### 1.1 Project background

- 1.1.1 Wessex Archaeology was commissioned by Black and Veatch Ltd on behalf of Bristol Water to carry out a geophysical survey on land along the proposed Southern Strategic Support Main, which runs from Barrow Gurney, North Somerset to Cheddar, Somerset (hereafter “the Scheme”, from NGR 354018, 168389 to 345171, 153347) (**Figure 1**). The survey forms part of an ongoing programme of archaeological works.
- 1.1.2 The Southern Strategic Support Main is a major infrastructure project to improve the security of the water supply across the areas of southern Bristol, Weston-super-Mare, Cheddar, Burnham and Glastonbury. An archaeological desk based assessment (DBA) and an archaeological watching brief for the Scheme have been undertaken (WA 2015, 2016a).
- 1.1.3 The aim of the geophysical survey was to establish the presence/absence, extent and character of detectable archaeological remains within the survey area.
- 1.1.4 This report presents a brief description of the methodology followed, the detailed survey results and the archaeological interpretation of the geophysical data. A Written Scheme of Investigation (WSI) was produced by Wessex Archaeology ahead of the survey detailing the intended survey methodology (WA 2016b).

#### 1.2 Site location and topography

- 1.2.1 The corridor for geophysical investigation occupies an area of 73 ha of agricultural land; with 43 compound areas totalling 15 ha. A number of these compound areas overlap with the corridor area resulting in a total area of 85 ha.
- 1.2.2 The relative height of the route varies along the entire length with some parts being relatively flat whilst others had an incline. The relatively flat areas are between approximately 5-10 m above ordnance datum (aOD) whilst the steeper parts of the route reach heights of approximately 80 m aOD.
- Burrow Gurney and Long Ashton*
- 1.2.3 The northernmost point of the Scheme lies just to the north-east of the village of Barrow Gurney and around 4.7 km to the south-west of Bristol, at the Barrow Treatment works (NGR 354018, 168389). This part of the route and Study Area lies within the parishes of Burrow Gurney and Long Ashton.
- 1.2.4 Along this part of the Site the route is largely rural. After exiting the Barrow Treatment Works, the route passes north-westwards through a number of agricultural fields, crosses





Wildcountry Lane, runs to the south of Whistlewind Farm, to the south of Crossgrove Wood and to the north of St Katherine's Farm before crossing the River Land Yeo.

*Flax Bourton and Backwell*

- 1.2.5 The next section of the route lies within Flax Bourton parish, passing to the south of the village and to the north of Breach Hill Wood and Bourton Combe Wood. The pipeline route also crosses Barrow Street (B3130), a small watercourse and Bourton Combe lane.
- 1.2.6 The Scheme then runs in a south-westerly course through the parish of Backwell, crossing Backwell Hill Road and running along Church Lane before passing through fields and crossing Hill Side Road just to the south-east of the residential estate.

*Brockley, Cleeve and Yatton*

- 1.2.7 As the route passes into Brockley parish it crosses the Main Road (A370) and runs to the north of the village crossing Brockley Lane and St Nicholas Way.
- 1.2.8 The Scheme then passes through the northern part of the parish of Cleeve before turning south and incorporating small section of the eastern side of Yatton parish. The route continues to run to the north-west of the A370 passing to the north-west of Cleeve and the south-east of Claverham, crossing Littlewood Lane, Meetinghouse Lane and Bishops Road, before turning south and joining the A370 at the junction with Blind Lane.

*Congresbury and Churchill*

- 1.2.9 The next section of the route passes southwards through Congresbury parish before passing over the Churchill Rhyne and into Churchill parish. This part of the route lies within the area known as the Somerset Levels and Moors. This is 'a landscape of rivers and wetlands, artificially drained, irrigated and modified to allow productive farming' (WA 2015).
- 1.2.10 The route breaks off from the line of the A370 to the north of Rhodyate Cottage and passes to the east of Congresbury, crossing Wrington Road, the River Yeo, Stock Lane (B3133), Brinsea Lane and passing immediately to the east of Brinsea. The route then traverses a watercourse before passing immediately to the east of Brinsea Road Farm and crossing Brinsea Batch just to the south of Honeyhall Lane. It then proceeds to the south-west across Churchill Rhyne, Common Lane and Sandmead Rhyne.

*Banwell, Winscombe and Sandford*

- 1.2.11 The route then extends into Winscombe and Sandford parish crossing Nye Road and passing to the north of Sandford and Mead Farm. At Westleigh Farm the route divides with one section proceeding south-westerly over Towerhead Brook and into Barnwell parish. This passes to the north of Towerbrook Farm, crosses Eastermead Lane before joining an existing main in Church Street. The other section of the route traverses southwards over Towerhead Road (A368) into Banwell parish, passing to the west of Sandford Batch.
- 1.2.12 The Scheme then crosses back into the Winscombe and Sandford parish crossing the Lox Yeo River and joining Banwell Road (A371) just to the north of Nut Tree Farm. The route then heads to the south-west crossing The Lynch and travelling southwards alongside Yadley Way and Yadley Lane. At the southern edge of the parish the route crosses Winscombe Hill just to the west of Stone Cottage.



*Compton Bishop, Axbridge and Cheddar*

- 1.2.13 After travelling through the parish of Compton Bishop the route heads to the south-west to cross into Axbridge parish and to join the A371. The pipeline follows the course of this road westwards through Axbridge itself until the junction with Cheddar Road where it turns once again to the south-east and crosses over Ellenge Stream and into the parish of Cheddar. Here the scheme runs parallel to the route of the dismantled railway before re-entering the line of the former railway and terminating just to the north-west of the village.

**1.3 Soils and geology**

*Burrow Gurney and Long Ashton*

- 1.3.1 The solid geology within this part of the Site comprises the Charmouth Mudstone Formation with areas of the Rugby Limestone Member and the Saltford Shale Member just to the north of the village before passing through an area of the Mercia Mudstone Group around the crossing point with the River Land Yeo (British Geological Survey). No superficial deposits are recorded (BGS 2016).

- 1.3.2 The soils underlying this part of the Scheme are likely to consist of typical calcareous pelosols of the 411a (Evesham 1) association and of stagnogleyic argillic brown soils of the 572c (Hodnet) association (SSEW SE Sheet 5-2 1983).

*Flax Bourton and Backwell*

- 1.3.3 The underlying geology of this section of the route is the Mercia Mudstone Group with no superficial deposits recorded (BGS 2016).

- 1.3.4 The soils underlying this part of the Scheme are likely to consist of stagnogleyic argillic brown soils of the 572c (Hodnet) association and of brown rankers of the 313c (Crwbin) association (SSEW SE Sheet 5-2 1983).

*Brockley, Cleeve and Yatton*

- 1.3.5 The underlying geology of this section of the route is the Mercia Mudstone Group with superficial deposits of Head record (BGS 2016).

- 1.3.6 The soils underlying this part of the Scheme are likely to consist of stagnogleyic argillic brown soils of the 572d (Whimble 1) association and of brown rankers of the 313c (Crwbin) association (SSEW SE Sheet 5-2 1983).

*Congresbury and Churchill*

- 1.3.7 The underlying geology of this section of the route is the Mercia Mudstone Group with tidal flat deposits record, but there are also localised areas of the Arden Sandstone Formation as the underlying geology, i.e. the area of Four Winds Farm and Brinsea Road Farm, with no superficial deposits recorded (BGS 2016).

- 1.3.8 The soils underlying this part of the Scheme are likely to consist of stagnogleyic argillic brown soils of the 572d (Whimble 1) association, the typical stagnogley soils of the 711c (Brockhurst 2) association and of pelo-alluvial grey solis of the 813e (Compton) association (SSEW SE Sheet 5-2 1983).

*Banwell, Winscombe and Sandford*

- 1.3.9 The underlying geology of this section of the route is the Mercia Mudstone Group with superficial deposits of Head and an area of tidal flat deposits reflecting the boundary between the Somerset Levels and Moors and the Mendip Hills (BGS 2016).



- 1.3.10 The soils underlying this part of the Scheme are likely to consist of stagnogleyic argillic brown soils of the 572d (Whimple 1) association and of brown rankers of the 313c (Crwbin) association (SSEW SE Sheet 5-2 1983).

*Compton Bishop, Axbridge and Cheddar*

- 1.3.11 The underlying geology of this section of the route is limestone and mudstone of the Avon Group followed by the Black Rock Limestone Subgroup which mark the ridgeline of the Mendip Hills. Hereafter the underlying geology of the route is once more the Mercia Mudstone Group with superficial deposits of Head recorded (BGS 2015).
- 1.3.12 The soils underlying this part of the Scheme are likely to consist of brown rankers of the 313c (Crwbin) association and of stagnogleyic argillic brown soils of the 572d (Whimple 1) association (SSEW SE Sheet 5-2 1983).
- 1.3.13 Soils derived from the geological parent materials discussed above along the length of the scheme have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey. There is, however, the possibility that the superficial deposits of alluvium, head and tidal flat deposits which, consist of clay, silt, sand and gravel may impede the ability of the gradiometer to detect archaeological deposits. Such material can, depending upon the thickness of the deposit, mask the presence of archaeological deposits.

#### 1.4 **Archaeological background**

- 1.4.1 An Archaeological DBA undertaken by Wessex Archaeology (2015) examined the potential for the survival of buried archaeological remains along the development area and within a 500 m buffer Study Area. This DBA used information provided by the Somerset Historic Environment Record (SHER), the North Somerset Historic Environment Record (NSHER) and the National Heritage List for England (NHLE). National heritage datasets including Images of England, Archaeological Data Service (ADS), OASIS, PastScape, Viewfinder, NMR Excavation Index (now the National Record of the Historic Environment (NRHE)) and Parks and Gardens UK were also used. The following background is summarised from the DBA (WA 2015) and Watching Brief Report (WA 2016a).
- 1.4.2 The DBA established the potential for the presence of buried archaeological remains, with particular areas with a high potential for Romano-British, Iron Age, medieval and post-medieval remains identified. A moderate potential for remains from other periods and within other areas has also been identified. For a number of the periods and sections of the route the full archaeological potential was not apparent, often due to a scarcity of intrusive archaeological investigations. The potential for palaeoenvironmental material has also been identified where the route passes through areas of the Somerset Levels and Moors (WA 2015).
- 1.4.3 There are ten Scheduled Monuments located within a 1 km radius of the Scheme but only seven within the 500 m buffer Study Area of the DBA. Within the Study Area there are three Iron Age hillforts known as Taps Combe Camp (NHLE 1007909), Cadbury Hillfort (NHLE 1011258) and Banwell Camp (NHLE 1008031). These monumental structures may have had a range of functions in addition to defensive and may have become a focus for later activity.
- 1.4.4 Also located at Banwell are the remains of a Romano-British villa and bath house (NHLE 1013434) that was possibly abandoned in the mid-4<sup>th</sup> century. Recent investigations in the area during work on the Banwell to Hutton Water Main uncovered a ditched enclosure



within which was a small Roman cemetery and a Roman military camp overlying earlier prehistoric activity and exploitation of the former marshland (Border Archaeology 2012). Just beyond the southern edge of the Study Area, within Cheddar Conservation Area, lies the Scheduled site of a Roman settlement, Saxon royal palace and medieval royal residence (NHLE 1017290).

- 1.4.5 The remaining Scheduled Monuments within the 500 m Study Area are a medieval boundary earthwork (NHLE 1015495), which still marks the boundary between Winscombe and Sandford parish and Axbridge parish, and a medieval churchyard cross which lies within the churchyard of St. Andrew's Church in Backwell (NHLE 1016202).
- 1.4.6 Outside the Study Area, immediately to the west of Long Ashton lie the Scheduled remains of an Iron Age and Romano-British town (NHLE 1011978). This settlement was Romanised c. 50–80 AD and became a thriving commercial agricultural centre until it was abandoned, possibly in the mid-6th century and certainly by the 8th century. There are also two further Scheduled hillforts which are situated in the wider area near Cleeve (NHLE 1011263 and 1011264).
- 1.4.7 There have been six Conservation Areas identified by the DBA of which the Scheme passes through Backwell Farleigh Conservation Area and Backwell Church Town Conservation Area. At the point that the Scheme joins the existing main in Banwell it also enters the Banwell Conservation Area.
- 1.4.8 Barrow Court (NHLE 1000562) is a Grade II Registered Park and Garden, the form and design of which largely date from the late 18th century, although a deer park is known to have been established here in the medieval period. The house was originally the location of a Benedictine nunnery and though lying outside the Study Area, within the Registered Park and Garden there are a number of Grade II\* and Grade II Listed Buildings relating to the property. These include the house itself (NHLE 1311901), the medieval parish church, which also functioned as the manor house chapel (NHLE 1311925) and a number of garden features (NHLE 112169, 1129170, 1129172 and 1129173).
- 1.4.9 Within the Study Area, three Grade I listed buildings, 14 Grade II listed buildings and 197 Grade II\* listed buildings are recorded and a number of these are located directly adjacent to the route of the Scheme. Medieval and post-medieval records are predominantly occupied by the buildings associated with the rural landscape, comprising numerous houses, farmsteads, barns and parish churches dating from the 12th to 19th centuries. Three areas of Ancient Woodland have also been identified as parts of the Scheme either pass through or run adjacent to them (ID 1418515, 1109423 and 1109405).
- 1.4.10 There are no World Heritage Sites or Registered Battlefields within the Study Area.

#### *Burrow Gurney and Long Ashton*

- 1.4.11 This area encompasses the first 2.2 km of the Scheme and from the available data sources it can be seen that the area through which this Scheme runs was most likely used for agricultural purposes from at least the medieval period. There is limited prehistoric evidence in the surrounding area, though this does not preclude the presence of archaeological remains dating to the prehistoric period being located along the length of the Scheme. An Iron Age and Romano-British settlement (NHLE 1011978, already discussed) is located within 1 km of the Scheme, therefore the presence of associated features cannot be discounted.



- 1.4.12 Evidence for the exploitation of the River Land Yeo can be seen through the presence of a number of mills, one of which is located in close proximity to the Scheme.

*Flax Bourton and Backwell*

- 1.4.13 This section of the Scheme traverses agricultural land to the south of Flax Bourton and Backwell, with approximately 750 m of the route located within the highway through the medieval centre of Backwell.

- 1.4.14 Some prehistoric activity is known from the surrounding area, particularly relating to Iron Age hillforts (e.g. MNS348), and the presence of features of this period along the route of the Scheme cannot be discounted.

- 1.4.15 The majority of the Scheme runs through land which was the agricultural hinterland of these settlements since at least the medieval period. Although part of the Scheme is located within the highway which will have resulted in disturbance to potential archaeological deposits, the level of disturbance cannot currently be confirmed.

*Brockley, Cleeve and Yatton*

- 1.4.16 The section of the Scheme traverses previously undisturbed agricultural land to the north of the villages of Brockley and Cleve and south of Yatton. Evidence for prehistoric activity is higher in this area, with a number of hillforts (i.e. NHLE 1007909, 1011263 and 1011264) and settlement evidence found to the south of the Scheme, along the ridge of high ground to the south of the Scheme. There is also more evidence for Romano-British activity in this area, with evidence found both to the north and south of the Scheme.

- 1.4.17 The location of a spitfire aircraft crash site in 1943 is recorded in the area of Chelvey Farm, c.100 m south of the Scheme, resulting in the death of Flight Lieutenant Johnson (MNS5053). The recorded location lies just south of the route and any remains related to this would be protected under the *Protection of Military Remains Act 1986*.

- 1.4.18 As with the previous areas, the landscape likely formed the agricultural hinterland of the surrounding villages, all of which are listed in the Domesday Survey of 1086.

*Congresbury and Churchill*

- 1.4.19 The majority of the route in this area traverses greenfield agricultural land, with a small 500 m section located within the highway to the north of Congresbury. As with the previous area, evidence for prehistoric and Romano-British occupation of the landscape is greater, with Cadbury Hillfort (NHLE 1011258) containing evidence for Neolithic, Bronze Age and Iron Age settlement. North of the hillfort a Romano-British cemetery has also been identified. There is potential of lowland Iron Age settlement to be located in the landscape surrounding this and other hillforts in the area.

- 1.4.20 Evidence for the Romano-British occupation of the landscape is scattered across this area in the form of pottery sherds and kilns at Venus Street, Congresbury (MNS1689, MNS5205, MNS5204, MNS5203 and MNS394). A mound to the south of the River Yeo is purported to contain Roman pottery. This may indicate the presence of a kiln site in the vicinity.

*Banwell, Winscombe and Sandford*

- 1.4.21 The prevalence of Iron Age and Romano-British occupation sites continues in this area, with a number of Scheduled Monuments (already discussed NHLE 1008031 and 1013434), including an Iron Age hillfort and Romano-British villa and bath house, located





within 500 m of the Scheme, all directly surrounding Banwell. Evidence for prehistoric and Romano-British activity to the north and south of Winscombe and Sandford is less well represented in the available evidence however this does not preclude its presence in the area.

- 1.4.22 With Banwell and Winscombe both listed in the Domesday Book the surrounding area was most likely the agricultural hinterland.

*Compton Bishop, Axbridge and Cheddar*

- 1.4.23 Early evidence for human occupation has been found in and around Cheddar in the form of a Palaeolithic hand axe (NSHER #12492). In the wider landscape nationally important Palaeolithic and Mesolithic remains have been identified at Cheddar Gorge, which is considered one of the most important early prehistoric sites in the southwest.
- 1.4.24 Other prehistoric remains include Bronze Age tools to the south of the existing reservoir. In this area considerable evidence for Later Prehistoric and Iron Age activity was revealed during archaeological investigations. This occupation was shown to continue in to the Romano-British period and indicated that the landscape through which the Scheme runs was heavily utilised during these periods (WA 2013a).
- 1.4.25 Axbridge and Cheddar were both Anglo-Saxon settlements, with Axbridge being the location of a mint in the 10th century. The Anglo-Saxon settlement at Axbridge is thought to have been focussed 150 m south of the Scheme while the Saxon palace complex at Cheddar was located 500 m southeast of the Scheme (NSHER #11408 and NHLE 1017290).
- 1.4.26 The majority of the Scheme is located along the line of a former railway (MNS3580, 12963), part of which is now an existing highway. The potential for archaeological remains in this area is considered to be low due to the likely level of previous disturbance; however, the presence of archaeological features cannot be fully discounted at the present time. There is higher potential for the detection of archaeological features where the Scheme enters greenfield areas to the west of the A38 and where it runs parallel to the former railway to the north east of Cheddar reservoir. Here Romano-British burials have been found directly adjacent to the Scheme, as have a number of currently undated enclosures to the north of Kings Wood.

*Previous Works*

- 1.4.27 Several archaeological investigations and assessments have occurred within the Study Area although there has been no substantial work along the proposed route itself. Most of the archaeological investigations have been relatively small scale and particularly focused within the villages and towns. Areas of significant archaeological investigations include work on the Banwell to Hutton Water Main (Border Archaeology 2012), geophysical survey adjacent to the route near Sandford Batch (SANHS, 2006) and investigations (both geophysical and intrusive works) undertaken near Cheddar in connection with a proposed new reservoir (WA 2013a, WA 2013b).
- 1.4.28 Although the report for the geophysical survey undertaken in 2006 was unavailable at the time of writing, a number of online sources (SANHS, 2006) and the HER record states that the features found are consistent of circular enclosures with indications of being round houses. These two large circular ditch-like features were reported as being 28 m and 25 m in diameter. Several overlapping circular features were also evident. It is thought that the identified remains may form part of a larger settlement which may extend approximately 200 m to the west, potentially extending in to the route of the Scheme.



*Map Regression*

- 1.4.29 The map regression exercise undertaken as part of the DBA indicated that the route of the Scheme and its surrounding areas have been in use predominately as agricultural land from at least the 11th century to present as many of the towns and villages along the route are mentioned in the Domesday book of 1086, however internal boundaries have changed over time.



## 2 METHODOLOGY

### 2.1 Introduction

2.1.1 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between the 1st February and 11th March 2016. Field conditions at the time of the survey were moderate to poor, with wet conditions throughout the period of survey.

2.1.2 The survey was planned to be mainly undertaken using a gradiometer cart system, with smaller survey areas infilled using gradiometers using the hand-held method (see section 2.2 and 2.3). However, due to equipment failure the majority of the survey was undertaken using the hand-held method. This adversely affected the schedule for survey completion but the positioning and data quality continued to comply with the WSI (WA 2016b) and exceeded the requirements of Historic England (English Heritage 2008).

### 2.2 Method (Cart System)

2.2.1 Bartington Grad-01-1000L gradiometers with a vertical separation of 1 m between sensors were utilised. These were mounted on a non-magnetic cart which enables the simultaneous collection of two or more transects of data. The program MLgrad601 was used to acquire and record the survey data from the array of Grad601 probes with a GPS system providing real time locational data for each data point.

2.2.2 Data were collected at sub 0.25 m intervals, using four gradiometers spaced at 1 m intervals on the cart with an effective sensitivity of 0.03 nT in accordance with Historic England guidelines (English Heritage 2008). The navigation display mode on MLgrad601 provides real time positioning allowing coverage to be viewed and enabling full site coverage without the need to set up individual grid nodes across the site. However, in order to ensure survey accuracy, the boundaries of the survey extent were established where necessary using a GPS.

2.2.3 All GPS position data was collected using a Leica Viva Instrument with rover and base station to record NMEA stream data which is precise to approximately 0.02 m and therefore exceeds Historic England recommendations (English Heritage 2008).

2.2.4 Data from the survey was subject to minimal data correction processes. These comprise a spline interpolation of 0.3 m to grid the data, and a smoothing function to remove any small scale spiking (generally caused by internal system noise).

### 2.3 Method (Hand-Held System)

2.3.1 Individual survey grid nodes were established at 30 m x 30 m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02 m and therefore exceeds Historic England recommendations (2008).

2.3.2 The detailed gradiometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1 m between sensors. Data were collected at 0.25 m intervals along transects spaced 1 m apart with an effective sensitivity of 0.03 nT, in accordance with Historic England guidelines (English Heritage 2008). Data were collected in the zigzag method.

2.3.3 Data from the survey was subject to minimal data correction processes. These comprise a zero mean traverse function ( $\pm 5$  nT thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations





in traverse position due to varying ground cover and topography. These two steps were applied throughout the survey area, with no interpolation applied.

- 2.4 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.



### 3 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

#### 3.1 Introduction

3.1.1 The detailed gradiometer survey has identified magnetic anomalies throughout the Scheme, along with areas of increased magnetic response and a large amount of ferrous. Results are presented as a series of greyscale plots, XY plots and archaeological interpretations at a scale of 1:2000 (**Figures 3 to 131**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image and  $\pm 25$  nT at 25 nT per cm for the XY trace plots. **Figure 2** shows the location of each figure referenced in the following interpretation.

3.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (**Figures 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 80, 83, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 122, 125, 128** and **131**). Full definitions of the interpretation terms used in this report are provided in **Appendix 1**.

3.1.3 Numerous ferrous anomalies are visible throughout the dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.

3.1.4 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be present than have been identified through geophysical survey.

3.1.5 Gradiometer survey may not detect all services present on Site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g. CAT and Genny) should be used to confirm the location of buried services before any trenches are opened.

3.1.6 Due to the size and scope of this survey, the interpretation of the dataset is further sub-divided by field numbers (as provided by Bristol Water) within the previously defined sections of the Scheme. A separate summary of modern services and geological interpretations has been compiled (Sections 3.3 and 3.4) but are still referred to in the archaeological interpretations where relevant.

#### 3.2 Gradiometer survey results and interpretation

##### 3.3 Compton Bishop, Axbridge and Cheddar

*Fields B066A, B066 and B057E (Figures 3-8)*

3.3.1 The southernmost fields of the Scheme show large amounts of ferrous and areas of increased magnetic response. In B066 (**Figures 3-5**), at **4000, 4001** and **4002 (Figure 5)**, a number of positive magnetic anomalies have been interpreted as possible archaeology. These are difficult to interpret as a particular type of feature due to the large amount of surrounding ferrous anomalies. It is possible these represent cut features such as pits, postholes, or short segments of ditch.

3.3.2 In B057 (**Figures 6-8**), the northern most of these fields, a former field boundary has been interpreted at **4003 (Figure 8)**. Linear striations in the data such as at **4004** display regular interval in the same alignment as the former boundary and are thought to be derived from ploughing.



- 3.3.3 A modern service has been identified at **4005** on a north-north-west to south-south-east alignment.

*Fields B055D, B055C, B055B, B055A and B054E (Figures 9-11)*

- 3.3.4 Several positive, sub-circular anomalies have been identified such as at **4006**, which vary in diameter from 0.8 m to 3 m. These are too small and isolated with no common orientation to be able to identify with certainty. They have been interpreted as possible archaeology and may relate to small, discrete pit or posthole features.

- 3.3.5 Several different orientations of linear features have been identified which relate to plough marks and suggest variations in agricultural practices over the years. The DBA (WA 2015) has shown this area to have a potential for medieval activity as such there is the potential for agricultural features from the medieval through to the modern periods.

- 3.3.6 A modern service has been identified in the gradiometer survey at **4007**.

*Fields B047 and B046 (Figures 12-14)*

- 3.3.7 The northernmost fields show a number of linear features thought to largely derive from modern agricultural activity. At **4008** and at **4009**, two weakly positive linear features have been identified. **4008** is composed of two perpendicular linear responses measuring 0.5 – 1nT the longest of which extends for c. 74 m on a south-west to north-east alignment, the shorter of the two is approximately 22 m in length and extends west from the first part. **4009** measures approximately 28 m by 2.5 m with magnetic values of 1-2 nT. These have been interpreted as possible archaeology but may represent former field boundaries as they are roughly perpendicular to current field boundaries. Historic mapping does not indicate the presence of field boundaries between 1886 and the present however these may relate to much older land divisions. Medieval field boundaries and trackways have been recorded in this area on the Somerset HER and the features identified in the geophysical survey may be related.

- 3.3.8 In close proximity to **4009**, small scale sub-circular anomalies have been identified as possible archaeology. These are approximately 20 m to the north-east and may denote a continuation of **4009** but due to their discrete nature it is unclear if these are related. **4010** denotes a further potential former field boundary; the variation in its reading from the linear responses identified at **4008** and **4009** suggest it is from another period of land use.

#### 3.4 **Banwell, Winscombe and Sandford**

*Fields B024, B024B, C, D, E and B023 (Figures 15-17)*

- 3.4.1 At **4011**, three linear responses have been identified measuring 1-2 nT, each have a similar width of approximately 1 m and vary in length from 30 m to 10 m. Two lie roughly east to west whilst the third lies on a north-west to south-east alignment. These may relate to archaeological features, such as ditches, but given the agricultural context of the area may relate to historical agricultural practices.

- 3.4.2 The data for B024 and B023 is dominated by the presence of strong ferrous readings that may mask underlying archaeological features. The strong ferrous responses in these two areas are largely the result of modern services. **4012** to **4014** have been identified traversing the survey area from the north-west to the south-east.

*Fields B023, B020, B019 and B018 (Figures 18-20)*



- 3.4.3 Three positive magnetic responses of 2-4 nT have been identified at **4015** along the eastern survey extent may represent possible archaeology. The full size of these anomalies cannot be fully realised from this data alone. An outcropping of superficial geology, on either side of Lox Yeo River, has been identified at **4016** and is likely to relate to this watercourse.
- 3.4.4 An area of ferrous at **4017** is thought to relate to a possible farmstead that is noted on the 1840 tithe map. Traces of a building platform were noted during the walkover survey (WA 2015).  
*Fields B018, B018A and B017 (Figures 21-23)*
- 3.4.5 A curvi-linear response has been identified at **4018**. This curves from the western survey extent to the southeast. It is likely that this continues beyond the survey extents and has a width of approximately 10 m. Historic mapping (OS 1886) and aerial photography (Google Earth 2016) show no features in this area, however immediately north of this field at Cemetery Field, Sandford Batch, a geophysical survey identified a number of banks and ditches of possible prehistoric origin (WA 2015b). It is possible that this feature represents a bank or ditch that is related to the settlement however given its isolation a clear relationship is uncertain and it has been interpreted as possible archaeology.  
*Fields B013 and B012 (Figures 24-26)*
- 3.4.6 An alignment of positive magnetic sub-circular responses has been identified at **4019**. These appear to exist on a northeast to southwest alignment which may indicate a relationship however further investigation would be required to corroborate this. Numerous linear responses have also been identified that are likely related to agricultural practices.
- 3.4.7 A modern service has been identified to the southwest of this area at **4020** and another at **4021** to the northeast.  
*Fields B011, B010 B006, b006A and B006B (Figures 27-29)*
- 3.4.8 The data demonstrates several agricultural features alongside two parallel curvi-linear trends at **4022**.
- 3.4.9 The DBA has identified that this area has the potential for Roman, medieval and modern activity, with a Romano-British site to the north, a medieval coin scatter to the immediate west and a medieval mill to the east. However, much of this area is dominated by the ferrous responses caused by the modern service identified at **4023** which will mask weaker archaeological responses.
- 3.4.10 Superficial geological trends have been identified at **4024**, this area is recorded as being of the Mercia Mudstone Group which is often characterised by dunes, loess and evaporites which may explain the forms seen in the gradiometer data.  
*Fields B006, B006A, B005B, B003, B002, B001, A004, A005 and A006 (Figures 30-32)*
- 3.4.11 It is possible to identify ridge and furrow agricultural responses at **4026**, which have been identified in the DBA (WA 2015). These have been recorded as negative linear responses with regular intervals of c. 10 m. A series of dipolar linear responses have been identified at **4027**. These are thought to be drainage channels or grips from modern agricultural practices.
- 3.4.12 Two linear positive linear responses of 1-2 nT show areas of superficial geology at **4028**.



- 3.4.13 The modern service identified in the Section 3.2.17 at **4023** and **4024** can be identified continuing into these fields at **4025**.

*Fields A006, A007, A010, A011, A011A and A012 (Figures 33-35)*

- 3.4.14 At **4029** and **4030**, three linear positive responses of 1-2 nT on two alignments. **4029** is on a roughly south to north alignment and curves to the west at its northern extent whereas **4030** comprises two parallel linear responses on a roughly east to west alignment. These are considered to be of possible archaeological interest and may relate to ditches. Several faint linear responses have also been identified that are thought to be of agricultural origin. Given the density of Romano-British and prehistoric remains in the surrounding area, including the scheduled Banwell Camp to the south, scheduled Roman villa to the west and the possible Roman marching camp identified to the west during the laying of the Banwell to Hutton pipeline, the features identified on the geophysical survey in these fields may be of prehistoric or Romano-British date.

- 3.4.15 South-east of **4030**, a modern service can be identified at **4031** that cuts across the field on an east to west alignment. This is likely to be the same modern service as that identified at **4032** in **Figures 36 to 38**.

*Fields A011A, A012, A013, A015, A016 and A017 (Figures 36-38)*

- 3.4.16 Following the Scheme west there are no features identified as being of archaeological significance. Several ferrous responses have been identified that are considered to be modern in provenance alongside agricultural trends and plough marks. However, highly significant archaeological remains were identified at the western end of this area and directly to the north during the laying of the Banwell to Hutton pipeline (Border Archaeology 2016). Archaeological remains were discovered at depths in excess of 1 m below ground level and as such any similar remains within the route of the SSSM may not have been detected by the geophysical survey.

- 3.4.17 A further modern service has been identified at the western extent of the Scheme at **4033**.

*Fields B003, B002, B001, B000, C000, C001, C002A C003 and C005 (Figures 39-41)*

- 3.4.18 A positive linear response at **4034** is thought to be of archaeological origin. This feature has magnetic values of 1-2 nT and measures c. 40 m by 1.8 m. It is likely to continue beyond the survey extents to the west and may continue in the area of ferrous responses to the east. A post-medieval house is listed in the DBA (WA 2015) c. 180 m north-east, this linear feature may be associated. A further positive linear responses measuring 1-2 nT at **4035** has been identified on a north-east to south-west alignment. This is approximately 30 m by 3 m and has been interpreted as possible archaeology and may represent a ditch-like feature.

- 3.4.19 Large areas of ferrous and increased magnetic response have been identified across the Scheme. Areas such as at **4036** may be associated with areas of burning or dumps of modern debris

- 3.4.20 At **4037**, a linear response with similar magnetic properties to those seen at **4027** (**Figure 35**), has can be seen. Due to its similarity of readings it is thought to represent further drainage or grips. **4038** indicates furthers evidence of ridge and furrow farming practices in this area on a differing alignment to those seen at **4026** (**Figure 32**).

*Fields C005, C007, C008, C009 and C010 (Figures 42-44)*



3.4.21 A similar response to that seen at **4035 (Figure 41)** has been identified in this data at **4039**. This shows a linear positive magnetic response of 1.5 nT that extends from the southern survey extent on a south-east to north-west alignment with the approximate dimensions of 2 m by 28 m. Post-medieval activity is noted in this area in the DBA (WA 2015) in the form of a historic farmstead and it is likely that this linear feature may relate to activity from this period. Linear trends and plough marks have also been identified and are thought to post-medieval to modern in provenance.

### 3.5 **Congresbury and Churchill**

*Fields C016, C018 and C019 (Figures 45-47)*

3.5.1 At **4040** a linear positive magnetic response has been identified that lies on a north-north-west to south-south-east alignment. It is possible this relates to a former ditch or bank feature, this area has been cultivated since at least the medieval period where it was part of a tithe apportionment (WA 2015). This feature is considered to be of medieval or later provenance. West of **4040**, several linear trends and plough marks on a number of different alignments have been identified that correspond to the agricultural heritage of this land.

*Fields C021, C022, C024 C025 and C026 (Figures 48-50)*

3.5.2 **4041** lies immediately to the south of a possible extraction pit that was identified through walkover survey and map regression in the DBA (WA 2015). This linear response has the approximate dimensions of 2.5 m x 30 m and lies on a north-east to south-west alignment and turns to the north-west at its southernmost extent. It is possible that this feature is associated with the extraction pit and may be a ditch or track way leading up to it. A linear trend may suggest that this feature extends further to the north-west.

3.5.3 Two small positive responses have been identified at **4042**, these appear to show a pair of parallel curvilinear ditches with the approximate dimensions of 8.5 m by 1.5 m. The proximity of these to a water course may suggest a possible association. **4043** denotes a series of negative magnetic responses that are similar to the ridge and furrow features seen to the south at **4027 (Figure 32)**. The walkover survey suggested the presence of drainage or grips in this area. It is plausible that ridge and furrow and drainage features may show similar responses given the nature of the deposits that may have infilled them. The superficial deposits are recorded as tidal flat deposits of clay, silt, sand and gravel that can give negative contrasts.

*Fields C026, C027, C028, C029, C030, C030A, C031, C032 and C033 (Figures 51-53)*

3.5.4 The data shown in these fields reveal no responses considered to be of archaeological interest. Across the fields numerous linear trends, ploughing trends and ferrous responses have been identified. Post-medieval farm steads and settlements are noted in the DBA to the north of these fields and as such linear ploughing trends are thought to be associated with post-medieval to modern day farming activities.

*Fields C036, C037, C038, C039 and C040 (Figures 54-56)*

3.5.5 At **4044**, a weak positive magnetic rectilinear response has been identified that measures 13 m by 8 m with the magnetic readings around 0.5 nT. Within 220 m south-east of the data collected in this area a Neolithic-Bronze Age flint scatter and a concentrated scatter of Romano-British pottery thought to be suggestive of a settlement are recorded, whilst to the north there is a post-medieval farm.





3.5.6 To the north-east two roughly square strong ferrous anomalies have been interpreted as possible archaeology at **4045** and **4046**. These appear to be linked with a linear trend and show similar dimensions and magnetic properties (7.5 m by 10 m and measuring in excess of +5 nT). Historic mapping from 1886 to the modern day (OS 1886) and aerial imagery (Google Earth 2016) show no coincident features, and the DBA (WA 2015) has not highlighted anything of note within the vicinity of these features. As such it is not possible to provide a secure interpretation of these responses. North of these features are a number of small, sub-circular responses that have been seen in sections of the Scheme to the south. These are thought to be of a similar origin and relate to possible postholes or pits.

3.5.7 Further responses in this area relate to ploughing and agricultural trends alongside numerous ferrous responses.

*Fields C044, C045 and C052 (Figures 57-59)*

3.5.8 Two linear positive responses have been identified in this area, the southernmost is considerably weaker than that seen at **4047** which is categorised by its high ferrous type response. Research undertaken as part of the DBA (WA 2015) has suggested the presence of a shrunken settlement in this area (MNS1555). It is possible that these linear features are related due to their similar north-west-west to south-east-east orientation.

3.5.9 An outcropping of superficial geology has been identified at **4048**; this is likely a result of a thinning of superficial deposits allowing the sedimentary bedrock to be detected through gradiometer survey.

*Fields C053, C055, C056, C057 and C058 (Figures 60-62)*

3.5.10 These fields show several linear agricultural and ploughing trends alongside strong ferrous responses. Nothing of likely or possible archaeological interest has been identified in this area. Further drainage or grips have been identified in the DBA and these can be seen as negative linear responses in the gradiometer data.

*Fields C058, C059, C066A, C066B and C066D (Figures 63-65)*

3.5.11 A strong, positive linear anomaly can be seen to the immediate south-east of the Venus Street at **4049**. This displays magnetic properties of +6 nT and measures approximately 28 m by 2 m. This is considered to be of possible archaeological origin. There is no complementary evidence at this location identified in the DBA or aerial photography. In the 1886 OS County series mapping a field boundary can be seen and as such it is potentially related, further investigation would be needed to validate this (OS 1886).

3.5.12 A series of faint, negative (-1 nT) responses have been identified at **4050**, their regular shape and form suggests they may be of possible archaeological interest. The longest section measures 33 m by 2 m with the two shorter segments respectively 17 m by 2 m and 6 m by 2 m. However, given the lack of context for these features it is not possible to give them a definite interpretation.

3.5.13 At **4051** the characteristic, regular negative linear responses of drainage or grips have been identified. Several ferrous responses have been found across the area, approximately 100 m away from the Scheme a waster tip of 3rd to 4th century greyware was excavated in 1966 (MNS394). It is possible the some of the ferrous responses relate to ceramic remains. No kiln type features have been identified in this area, however, given the high number of Romano-British sites and features excavated in and round Venus



Street, as recorded on the HER, related features may be located along the route in this area.

*Fields C066D, C066N, C066P and C066Q (Figures 66-68)*

- 3.5.14 At **4052** an outcropping of superficial geology has been identified. This may be however in part due to the removal of clay for ceramic productions. This area is characterised by several ferrous responses that may relate to ceramic material and the linear striations of drainage or grip features. Large amounts of Iron Age, Roman and medieval pottery have been recovered from this area throughout the last century.
- 3.5.15 **4053** indicates a possible archaeological response measuring between 2-5 nT, this lies within an area of superficial geology and appears to have a rectangular form at its southern extent and extends north for c.13 m.
- 3.5.16 Paleochannels are noted in this area to the west of the Scheme (MNS 3802), it is possible that the geological features seen in the gradiometer data are associated formations.

*Fields C070E, C070F and C075 (Figures 69-71)*

- 3.5.17 This area continues to show numerous of ferrous responses that may relate to ceramic material or modern debris. At **4054**, curvilinear responses can be seen on the northwestern survey extent and measures 1 nT. This appears to continue beyond the survey extent and may represent an enclosure ditch.
- 3.5.18 The northernmost field in this area shows strong striations and ferrous responses that are thought to relate to drainage or grips. At **4055**, there is a former field boundary that can be identified in historic mapping (OS 1886).

*Fields C075, C078, C079 and C080 (Figures 72-74)*

- 3.5.19 Lying immediately to the north of Wrington Road at **4057** is a small, rectangular response that has been identified as possible archaeology. This response displays strong magnetic properties in excess of +10 nT at certain points of the feature and has the approximate dimensions of 8 m by 6 m. A quarry is recorded in close proximity (MNS7895; WA 2015) which may possibly suggest that this response is related.
- 3.5.20 Across this area are a number of diverse alignments of linear responses. Some of these are similar to those seen in fields to the south and are considered to relate to drainage or grip features. Other features may relate to historic farming practices, the DBA (2015) has recorded pre-medieval field systems in this area. There is, therefore the possibility that some of these trends relate to these earlier cultivations of the land.
- 3.5.21 Several areas of superficial geology have been recorded in this area, such as at **4058** and **4059**. Numerous strong ferrous responses have been identified that may relate to settlement activity as identified during the walkover survey (WA 2015; WA Ref:7008) or modern debris.
- 3.5.22 A modern service has been identified at **4056**, to the south of Wrington Lane.

*Fields C082, C083, C084A, C085D, C085E and C085N (Figures 75-77)*

- 3.5.23 Further geological responses have been identified in this area such as at **4060**.





- 3.5.24 A series of linear responses can be seen at **4061**, **4062**, **4063**, and **4064**. **4061** is markedly different to the responses seen at **4062** to **4064** with magnetic values of 0.5 nT compared to 2-3 nT for the responses at **4062** to **4064**. The weaker properties of **4061** may indicate the difference in component materials from **4062** which may suggest that these potential features are not related despite their physical relationship and corresponding perpendicular orientations. The responses at **4063** and **4064** lie on a similar alignment and are thought to form the same feature the total length of these features is c. 56 m with a width of c. 3 m. It is unclear if **4062** is interrelated to these given the area of increased magnetic response at **4066** and **4067**, which dissect these linear responses. This area is located close to Cadbury Hillfort, a scheduled monument dating to the Iron Age which was occupied in to the Romano-British period.
- 3.5.25 **4066** and **4067** denote a clear alignment of increased magnetic response that suggests a former trackway or path. This can be seen to continue into the field to the immediate north for a short length.
- 3.5.26 A curvi-linear positive magnetic response can be seen at **4065** measuring approximately 2 m by 30 m with magnetic values between 2 nT and 10 nT. This feature may extend further west outside of the survey corridor and further east however, the presence of a modern service at **4066** masks any potential underlying features.
- 3.5.27 Further linear responses have been identified at **4069** and **4070**, these show short segments (c. 2 m x 6 m) of possible ditch features. These lie on a similar alignment and may be related to one another.
- 3.5.28 Strong geological trends have been identified in this area such as at **4071**, the DBA has identified an old quarry to the west of this area 160 m first depicted on the 1903 OS map (OS 1903). The siting of which may be related to the proximity of the bedrock to the surface.
- 3.5.29 In addition to previously identified **4066** but following the western edge of the northernmost field of this area, **4072** is also identified as a modern service.

*Fields C085N, C085L, and C085M (Figures 78-80)*

- 3.5.30 The southernmost field in this survey shows the modern service previously identified (**Figure 77**; **4072**) and also details a further modern service cutting across the field on a south-east to north-east alignment (**4073**).
- 3.5.31 The central field in is dominated by geological responses (**4074** and **4078**), but also shows two further modern services at **4075** and **4076** on similar north-east to south-west alignments. Given their clear separation, they are not considered to relate to the same service.
- 3.5.32 At **4077** a small ditch-like response has been identified measuring 2 nT with approximate dimensions of 2 m x 8 m. This feature may continue beyond the survey extents, what can be seen is too small and isolated to be further interpreted. Undated enclosure cropmarks have been identified in the DBA (WA 2015; MNS1327) to the northeast however it is unclear if these are related.
- 3.5.33 The northernmost field is noted as having the name "Quarry Pits" however no complementary evidence for this name has been identified in the dataset. Several ferrous responses and agricultural trends have however been identified.



*Fields C089, C090, C091 and C091A (Figures 81-83)*

- 3.5.34 Two faint, parallel curvilinear trends have been identified at **4079**. These show similar properties and are thought to relate to agricultural activity. Immediately to the east of **4079** are two bands of increased magnetic responses at **4080** and **4081**. Historic mapping shows a Waterworks and Pump House at this location therefore buried remains of this building may be causing these increased magnetic responses. A further small area of increased magnetic responses can be seen at **4083**, it is unclear if this is related to those seen at **4080** to **4081** and may relate to dump of rubbish.
- 3.5.35 Drainage channels on two different alignments can be seen at **4082** creating a “chevron” pattern in the gradiometer data.

*Field C091A, C096 and C097 (Figures 84-86)*

- 3.5.36 This field shows further drainage channels, alongside numerous ferrous responses and other agricultural trends. A modern service can be seen in the north-east of the field (**4084**).

*Fields C102, C103, C104, c105, C106, C107, C108 and C111 (Figures 87-89)*

- 3.5.37 The southernmost field in this figure shows three linear responses of possible archaeological interest. At **4085** two possible ditch features displaying positive magnetic properties of 1-2 nT can be seen on a north-west to south-east alignment. Lying to the east of these is **4086**, a further linear response that displays weaker positive magnetic properties (0.5 nT) and lies on a slightly different alignment (north-north-west to south-south-east). Approximately 16 m south of the southern extent of **4086**, a scatter of Roman pottery was identified alongside a 20 m spread of stone identified as a potential trackway. It is therefore possible that **4086** is related.
- 3.5.38 At **4087** a further linear response has been identified with similar properties to **4086** (0.5-1 nT). This extends for c. 40 m on a south-west to north-east alignment. There is no clear indication that these relate to similar features. It is likely that **4086** relates to a ditch associated with agricultural activity.
- 3.5.39 An outcropping of geological responses can be seen at **4088** and may be related to the palaeochannels seen in aerial photography across this area (Google Earth 2016). A spread of increased magnetic response can be seen at **4089** and crosses the survey area from north to south. This is likely to relate to a spread of debris.

*Fields C107, C108, C111, C111A, C112, C113 and C117 (Figures 90-92)*

- 3.5.40 Linear striations at **4090** appear to denote geological formations. Aerial imagery (Google Earth 2016) shows palaeochannels to the south, it is plausible that these formations may be related.
- 3.5.41 A modern service has been identified at **4091**. Several linear agricultural trends have been identified perpendicular to this service.

## 3.6 Brockley, Cleeve and Yatton

*Fields C117, C119A, C121 and C122 (Figures 93-95)*

- 3.6.1 At **4092**, a fragmented linear feature can be seen extending from north to south across the survey extent. It is possible that this feature extends beyond to both the north and south. Weak, positive magnetic responses at **4093** have been interpreted as possible



archaeology, however their form and orientation makes them difficult to further interpret. It is likely they represent ditches and may be related to agricultural activity given the context of the area. The DBA references that a number of multi-period finds were recovered by a metal detectorist in this field (WA 2016) as such responses may data from any time between the prehistoric and modern period.

- 3.6.2 Further linear responses have been identified to the east of this area at **4094** and **4095**. **4094** curves from the south towards the north-east extent of the field with a width of c. 4 m and length of 15 m. There is no evidence of this feature in the field to the immediate east however, an area of geological responses may be masking the detection of further archaeological features. At **4095** a weakly positive curvi-linear response can be seen that crosses **4092**. This feature is approximately 4 m in width and 60 m in length measuring between 0.5 and 1 nT and may represent an enclosure of unknown date.
- 3.6.3 Superficial geological responses continue to show in the gradiometer alongside the negative responses that are characteristic of drainage channels.
- 3.6.4 At **4096** a modern service cuts across the survey area on a south-west to north-east alignment. Several linear trends and ferrous responses have also been identified in across this area alongside a number of geological responses. A further modern service has been identified crossing the site on a south-east to north-west alignment at **4097**.

*Fields C122, C124, C125, C127 and C129 (Figures 96-98)*

- 3.6.5 Two linear responses surrounded by strong ferrous responses have been noted at **4098** and **4099** with similar dimensions (11 m by 2 m) and measuring between +2 nT and + 5 nT. It is unclear what these represent, some buildings are located close to this area on a plan dating to 1768, however, it is not clear if these features are related to these buildings. At **4100** a linear alignment of ferrous responses extents from south-west to north-east. A post-medieval storm drain is known (WA 2016) to exist in this area and it is possible that these responses represent the location of this drain.
- 3.6.6 A modern service cuts across at **4101** on an east-south-east to west-north-west alignment.

### 3.7 **Flax Burton and Backwell**

*Fields C138, C139, C141, C142, C143 and C144 (Figures 99-101)*

- 3.7.1 A small positive magnetic response of 1.5 nT is located at **4102**, this is thought to relate to historic agricultural activity. Linear striations across the area, such as at **4103** are representative of the subsurface geology and show the variation in formations.
- 3.7.2 Two clearly defined linear responses can be seen at **4104** and **4105**. **4104** has strong positive magnetic properties of 2-3 nT and has a halo of negative responses around it. Historic mapping (OS 1886) shows a former field boundary at this location. **4105** has different magnetic attributes to **4104** and measures approximately 1-2 nT. This extends for approximately 12 m north-west from the southern survey extent and its provenance is unknown.

*Fields C146, C147, C148, and C149 (Figures 102-104)*

- 3.7.3 Drainage channels can be seen across this area with regular intervals between them and on similar alignments. A modern service can be seen crossing two fields at **4106** and



**4107** with both segments considered to be from the same service. A further service can be seen at **4108**.

3.7.4 **4109** denotes a linear positive response of 1-2 nT that extends from the south-eastern to the north-western survey extents with the approximate dimensions of 31 m by 2 m. Historic mapping shows no former field boundaries in this area as such this has been interpreted as possible archaeology and may relate to a ditch.

3.7.5 Geological responses have been identified at **4110**.

*Fields C152 and C153 (Figures 105-107)*

3.7.6 Possibly the most interesting responses in this area are those at **4111** measuring 2-5 nT, these appear to show a rectilinear feature with a further parallel linear feature to the east of 12 m by 12 m with a width of 2 m. Given the context of the area and the medieval settlement to the east these are thought to be of possible archaeological interest and may have a relationship with the previously identified settlement features.

3.7.7 A cluster of pit or posthole type responses measuring 2-3 nT at **4112** and **4113** measuring between 2 m and 5 m have also been interpreted as possible archaeology and may have a relationship to the neighbouring medieval settlement.

3.7.8 Strong positive striations at **4114** are a result of geological formations beneath the surface. Historic mapping (OS 1932) shows that there were brickworks in this area, so the strong positive readings may relate to industrial activity e.g. burning/firing in the vicinity (WA 2015).

*Fields C153 and C153B (Figures 108-110)*

3.7.9 The strong positive responses attributed to ferrous and the geology seen in the fields immediately south of these (**Figures 105 to 107**) continue across these fields with no responses of likely or possible archaeological interest identified.

*Fields C164, C166, C170, C171 and C172 (Figures 111-113)*

3.7.10 Two linear responses at **4115** at thought to relate to a former field boundary that is present on historic mapping (OS 1932).

3.7.11 A linear feature extends for approximately 30 m from an area of ferrous to the north-east at **4116** with a further linear response on the same alignment at **4117**. A linear trend appears to link these two responses together and it is probable that they are segments of the same feature. These may be indicative of a ditch or trackway.

3.7.12 At **4118**, superficial geological responses have been identified. Further drainage channels can be seen at **4119** on a north-east to south-west alignment.

*Fields C175B, C177, C178, C180 and C180A (Figures 114-116)*

3.7.13 The fields in this figure are largely categorised by superficial geology, numerous ferrous responses and agricultural trends and plough marks.

3.7.14 At **4120** a modern service can be seen on the edge of the survey extent.

*Fields C180, C181, C182, C184 and C185 (Figures 117-119)*



3.7.15 At **4122** an area of increased magnetic response has been identified and at **4121** a positive ditch anomaly on a north-east to south-west alignment.

3.7.16 **4123** identifies a further area of increased magnetic responses.

### 3.8 Barrow Gurney and Long Ashton

*Fields C185, C186 C191A, C, D, and E (Figures 120-122)*

3.8.1 The similarity in amplitude between the north-east to south-west orientated linear features at **4124** and those seen in earlier fields suggests that they are further drainage channels. The walkover survey (WA 2016) identified possible ridge and furrow formations across this field on a north-west to south-east alignment; these however, have not been identified in the gradiometer survey.

3.8.2 At **4125** a former field boundary has been identified, visible in historic mapping (OS 1885). The current trackway that cuts across this field is clearly defined in the data as a negative response bordered by two positive linear responses at **4126**.

3.8.3 Superficial geological deposits are apparent in the south-east of this area at **4127** and two services are visible in the south-east at **4128**; the larger of the two on a south-south-east to north-north-west alignment and the second on a south-east to north-west alignment. Numerous agricultural trends and ferrous responses are also visible in this area.

*Fields C191, C191A and C, C192, C194 and C194B (Figures 123-125)*

3.8.4 An area of increased magnetic responses at **4129** may relate to a former field boundary that is present in historic mapping (OS 1885). To the east of **4129** a modern service crosses the survey area on a north-south alignment at **4130**.

3.8.5 A small rectilinear feature has been identified at **4131** this is formed of two responses of 2-6 nT and has been interpreted as possible archaeology. Given the isolation and lack of contextual information it is difficult to further interpret this potential feature.

3.8.6 A further modern service at **4132** dissects a band of superficial geology that runs west to east through the survey area at **4133**.

*Fields C194C and C194D (Figures 126-128)*

3.8.7 In the western extent of this area a cluster of possible pits or postholes and a possible ditch feature have been identified at **4134**. These exist in an area where the superficial geology is near the surface. The linear feature within this collection of responses is just off a north to south alignment and appears to extend beyond the extents of the survey area. It is difficult to provide further interpretation for these features as it is only possible to see a small proportion of them. The DBA has noted strip lynchetts (WA 2015, MNS 5051) to the north but the alignment is unknown; it is possible that this linear feature at **4134** may be associated.

3.8.8 Linear striations at **4135** are associated with the geology of this area and show the variation in formation of the Mercia mudstone bedrock. Strong ferrous responses to the east of the geological formation are thought to be related to modern disturbance.

*Fields C201A, C203A and C203C (Figures 129-131)*

3.8.9 The final area covered by gradiometer at the northern extent of the Scheme shows a number of positive sub-circular responses such as at **4136**. These are similar to those



seen in the preceding area at **4134** as well as at other locations along the Scheme. These are interpreted as possible archaeology and may relate to postholes or pits.

- 3.8.10 Drainage features are seen at **4137**, these vary from the majority of drainage features seen across the scheme which shown up as a negative magnetic feature. These show dipolar properties such as those seen at **4125 (Figure 32)**. These are likely to reflect a variation in building and may involve the use of ceramic pipes which would account for the magnetic response.

### 3.9 Gradiometer survey results - Modern services

- 3.9.1 Gradiometer survey may not detect all services present but along the length of the Scheme several modern services have been detected. These can be seen at **4005**, Figure 8, **4007**, Figure 11, **4012** to **4014** Figure 17, **4019** and **4020** Figure 26, **4023** and **4025** Figure 29 and 32, **4031** to **4032** Figure 35, **4033**, Figure 38, **4056** Figure 74, **4066** and **4072** Figure 77, **4073** and **4075-6** Figure 80, **4084** Figure 86, **4091** and **4093** Figure 92, **4097** and **4101** Figure 98, **4106-8** Figure 104, **4120** Figure 116, **4126** Figure 122 and **4132** Figure 125.

### 3.10 Gradiometer survey results – Geology

- 3.10.1 Due to the length of the Scheme (c. 30 km), a number of different geologies are encountered. The variation in land use across such an area will also result in bedrock being closer to the surface in some locations than in other areas; particularly where flooding may result in great levels of overburden or where quarrying may have removed superficial deposits. The known soils and geology of the Scheme are discussed previously in Section 1.3.
- 3.10.2 At a number of locations along the scheme geological responses have been noted in the gradiometer data, with geological responses being more prolific in the mid to north extents of the Scheme. Aerial photography (Google Earth 2016) reveals several paleochannels in the northern part of the Scheme. Geological deposits have been highlight due to their strength of response at **4016** Figure 20, **4021** Figure 29, **4048** Figure 59, **4052-3** Figure 68, **4056** and **4059** Figure 74, **4060**, **4063**, **4069** and **4071** Figure 77, **4074** and **4078** Figure 80, **4087-8** Figure 89, **4090** Figure 92, **4096** Figure 98, **4103** Figure 101, **4110** Figure 104, **4114** Figure 107, **4116** and **4118** Figure 113, **4127** Figure 120, **4133** Figure 125 and **4135** Figure 128.





## 4 CONCLUSION

- 4.1.1 The detailed gradiometer survey has been successful in detecting anomalies of possible archaeological interest along the length of the Scheme.
- 4.1.2 The anomalies of archaeological interest are primarily pit- and ditch-like features that may relate to settlement or agricultural activity along the length of the scheme.
- 4.1.3 Feature **4018 (Figure 23)** to the west of Sandford Batch shows a possible bank or ditch that curves from the west of the survey extent to the south. To the north of this a potential prehistoric settlement identified in geophysical survey ahead of the expansion of the Sandbach Cemetery (WA 2015), though this interpretation has been questioned by the statutory authorities. A series of interconnecting banks and ditches were uncovered of which this feature may be associated.
- 4.1.4 Several rectilinear features have been identified across the site, such as at **4041 (Figure 50)**, **4044 (Figure 56)**, **4111 (Figure 107)**. These appear to show short segments of enclosures.
- 4.1.5 Further linear features have been identified along the length of the Scheme. It is apparent that many of the linear responses detected are only a part of potentially much larger features and although all remain undated some may be related to known archaeological features in the surrounding areas. These include linear features identified at **4008 (Figure 14)** possibly relating to medieval field enclosures, **4029-4030 (Figure 35)** located close to prehistoric and Romano-British remains at Banwell, and **4026 (Figure 32)** which may be ridge and furrow. Feature **4047 (Figure 59)** possibly relates to a shrunken settlement recorded by the HER in the immediate vicinity.
- 4.1.6 Some possible archaeological features were identified to the east of Congresbury (**4050, Figure 65; 4053, Figure 68, 4054, Figure 71**). This area is known to contain Romano-British settlement (as evidenced at Venus Street) and there is a high probability of kilns being located nearby. Although no definitive evidence for kilns was identified in the geophysical survey, the features listed above may be related to Romano-British activity in the area.
- 4.1.7 Features identified to the east of Cadbury Hillfort (**4061-5 and 4069-70, Figure 77**), a scheduled Iron Age hillfort with later Romano-British evidence, have not been definitively dated or interpreted. However their proximity to the scheduled monument and other Romano-British remains in the area may indicate a similar date for these features.
- 4.1.8 Features **4092 and 4094-5 (Figure 98)** are of unknown date and function, however their form indicated possible enclosures.
- 4.1.9 Further undated linear features are recorded at **4011 (Figure 17)**, **4035 (Figure 41)**, **4038-9 (Figure 44)**, **4040 (Figure 47)**, **4042 (Figure 50)**, **4085-7 (Figure 89)**, **4098-9 (Figure 98)**, **4116-7 (Figure 116)** and **4134 (Figure 128)**. All of these features lie on diverse alignments across the Scheme. These represent small segments of possible ditch like features that are isolated within the gradiometer data making interpretation difficult as there are no contextual features that help identify them. Given the context in which these feature exists and the high potential for features from all periods (as identified in the DBA (WA 2015)) there is a good chance they are of archaeological interest. It is not possible to date the response from the gradiometer data alone.



- 4.1.10 Square, strong magnetic responses seen at **4045-6 (Figure 56)** and also at **4057 (Figure 74)** have been interpreted as possible archaeology. These are possible structures given their shape and size likely with fired brick or metallic elements. There is no complementary evidence for these features in aerial photography. The DBA has revealed that in close proximity to **4057** there was a former quarry (MNS7895; WA 2015) as such this feature may be a related structure.
- 4.1.11 Various pit or posthole type features have been interpreted across the Scheme as possible archaeology such as at **4009 (Figure 14)**, **4015 (Figure 20)**, **4019 (Figure 26)**, **4112-4113 (Figure 107)** and **4131 (Figure 125)**.
- 4.1.12 At **4100 (Figure 98)** a linear trend across the field is possible related to a post-medieval storm drain that is known at this location.
- 4.1.13 Former field boundaries have been located at a number of locations along the Scheme such as at **4003 (Figure 8)**, **4049 (Figure 65)** and **4125 (Figure 122)**. Areas of increased magnetic response at locations along the Scheme may also relate to former field boundaries where the demolition of the field division has led to a spread of ferrous material. This may be the case for **4129 (Figure 125)** where historic mapping does show a former field boundary in this approximate location (OS 1885).
- 4.1.14 Potentially two types of drainage have been identified along the length of the Scheme. Dipolar readings such as at **4027 (Figure 32)** and **4137 (Figure 131)** are likely to indicate ceramic of brick line drainage channels whereas the negative responses seen at locations such as **4037 (Figure 41)** and **4082 (Figure 83)** are likely to represent shallow ditches that have been infilled with alluvial sediments. It is difficult to differentiate between this form of drainage ditch and ridge and furrow. Ridge and furrow is identified at **4026** as a series of negative ditches and was interpreted based upon the walkover survey identifying ridge and furrow (WA 2015). The magnetic response is similar for both ridge and furrow and the shallow ditch type drainage channels and the width of the survey corridor restricts the visibility of the anomalies in full. As such it is possible that some drainage ditches may indeed be ridge and furrow and vice versa, ridge and furrow may be drainage channels on further investigation.
- 4.1.15 Frequent ploughing trends are visible across the Scheme on differing alignments. This is likely due to variable boundaries and different farming processes but these are likely to be medieval, post-medieval and modern in provenance.
- 4.1.16 Numerous ferrous responses have been identified, many of these are likely to be of modern in origin however some areas of the Scheme, in particular near **4051 (Figure 65)** ceramic finds may just that some of the ferrous responses are related to pottery production.





## 5 REFERENCES

### 5.1 Bibliography

- Border Archaeology, 2012 *Banwell and Axbridge Briefing Note 28th June 2012*, unpublished note
- Wessex Archaeology, 2013a *Cheddar Reservoir 2, Cheddar, Somerset: Detailed Gradiometer Survey Report*, Unpublished Client Report #86061.01
- Wessex Archaeology, 2013b *Cheddar Reservoir 2, Cheddar, Somerset: Archaeological Evaluation Report*, Unpublished Client Report #86065.05
- Wessex Archaeology 2015 *Archaeological Desk-Based Assessment, Southern Strategic Support Scheme, Barrow Gurney to Cheddar, North Somerset and Somerset*, Unpublished Client Report #110760.01
- Wessex Archaeology 2016a *Archaeological Watching Brief Report, Southern Strategic Support Scheme, Barrow Gurney to Cheddar, North Somerset and Somerset*, Unpublished Client Report #110761.01
- Wessex Archaeology 2016b *Southern Strategic Support Main, Barrow Gurney to Cheddar, Somerset*, Unpublished WSI #110762.01
- English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation. Research and Professional Service Guideline No 1*. Swindon (2nd Edition)

### 5.2 Historic Environment Records/ Archives and Local Studies

- Somerset Historic Environment Record (SHER)
- North Somerset Historic Environment Record (NSHER)
- Somerset Heritage Centre (SHC)

### 5.3 Cartographic and documentary sources

- 1838-1840 Winscombe Tithe Apportionment D\D/Rt/A/195
- 1840 Winscombe Tithe Map D\D/Rt/M/195
- 1885 Ordnance Survey County Series 25 Inch map / 1:2500
- 1886 Ordnance Survey County Series 25 Inch map / 1:2500
- 1903 Ordnance Survey 6 Inch 1:10 500
- Ordnance Survey 1983 *Soil Survey of England and Wales Sheet 5, Soils of South and Southwest England*. Southampton.

### 5.4 Online resources

- <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> British Geological Survey *Geology of Britain Viewer* (January 2016)
- <http://www.google.com/earth/index.html> Google Earth Pro 7.1.5. 2016. [Viewed March 2016].



<http://www.sanhs.org/Documents/151/Archaeology.pdf> Somerset Archaeology and Natural History Society (SANHS)

<http://www.historicengland.org.uk/listing/the-list> - information on designated assets - NHLE

<http://www.nationalarchives.gov.uk/> - documentary resources

<http://www.british-history.ac.uk/> - documentary resources

<http://oasis.ac.uk/england/> - data on sites, find-spots and excavations

<http://www.pastscape.org.uk/> - data on sites, find-spots and excavations

<http://www.magic.gov.uk> – map data and information on designated assets

<http://archaeologydataservice.ac.uk/> - Archaeological Data Service

<http://www.imagesofengland.org.uk/> - Images of England

<https://data.gov.uk/dataset/national-record-of-the-historic-environment> - NRHE

<http://www.parksandgardens.org/> - Parks and Gardens UK

All URLs accessed on 01/04/16



## APPENDIX 1: SURVEY EQUIPMENT AND DATA PROCESSING

### Survey methods and equipment

The magnetic data for this project was acquired using Bartington 601-2 dual magnetic gradiometers mounted on a cart-based system. This instrument has a number of sensor pairs fixed horizontally 1m apart allowing multiple traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation, and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03nT over a  $\pm 100$ nT range, and measurements from each sensor are logged at intervals of 0.25m. All of the data are then relayed to a Leica Viva CS35 tablet, running the MLgrad601 program, which is used to record the survey data from the array of Grad601 probes at a rate of 6Hz. The program also receives measurements from a GPS system, which is fixed to the cart at a measured distance from the sensors, providing real time locational data for each data point.

The cart-based system relies upon accurate GPS location data which is collected using a Leica Viva system with rover and base station. This receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by Historic England (English Heritage 2008) for geophysical surveys.

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125m intervals along traverses spaced up to 0.25m apart exceeding that recommended by Historic England (English Heritage 2008) for characterisation surveys.

### Post-processing

The magnetic data collected during the detail survey are downloaded from the Bartington cart system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

The cart-based system generally requires a lesser amount of post-processing than the handheld Bartington Grad 601-2 fluxgate gradiometer instrument. This is largely because mounting the gradiometers on the cart reduces the occurrence of operator error; caused by inconsistent walking speeds and deviation in traverse position due to varying ground cover and topography.

Typical data and image processing steps may include:

- Smooth – Applying a smooth function removes any small scale spiking or ‘fuzziness’, generally caused by internal system noise. This effectively ‘destripes’ the data and reduces the appearance of dominant anomalous readings;
- Spline interpolation – Gridding the data with splines allows the application of minimum and maximum data values and reduces oscillations for potential fields such as gravity or magnetic.



Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies.
- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.



## APPENDIX 2: GEOPHYSICAL INTERPRETATION

The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural and uncertain origin/geological.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Possible archaeology – used for features which give a response but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.
- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.
- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.
- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.
- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating dipolar (black and white) responses.

The uncertain origin/geological category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative or broad dipolar (positive and negative) anomalies.



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