magnitude surveys

# Geophysical Survey Report

# of

# Sunnica Energy Farm

# Mildenhall, Suffolk

**For**

**Sunnica Ltd**

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# Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 1150ha area of land at the proposed Sunnica Energy Farm which crosses the Suffolk and Cambridgeshire border. A fluxgate gradiometer survey was successfully completed across c.950ha of the site. Archaeological activity has been identified in the form of at least seven distinct settlement areas covering in total approximately 23ha, multiple potential new barrows, a possible henge, and former field systems which pre-date any recorded on available historic maps. The settlements have suggested dates from later prehistory into the medieval period, and notably include a c. 6ha suspected Romano British productive complex. Dissolution and subsequent infilling of bedrock imperfections has produced a widespread variation in geomorphology, influencing settlement and other anthropogenic activity within the survey area. Anomalies related to the historical agricultural use of the landscape have been detected, including anomalies which correspond with recorded medieval furlong boundaries, ridge and furrow ploughing regimes, more recent historic field boundaries recorded on historic maps, and field drains. The modern use of the landscape has also impacted the data with modern ploughing trends, extant field boundaries and temporary fencing all present within the dataset. Significant ferrous and debris anomalies relate to underground services, an area covered in possible “green waste”, a former section of WW2 airfield, and the former route of the Cambridge and Mildenhall Branch railway.

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# 1. Introduction

1.1. Magnitude Surveys Ltd (MS) was commissioned by Sunnica Ltd to undertake a geophysical survey on a c.1150ha area of land across both Cambridgeshire and Suffolk. The survey area was located c.4km northeast of Newmarket (Cambridgeshire) and c.1.8km south west of Mildenhall (Suffolk).

1.2. The geophysical survey comprised hand-pulled, quad-towed, cart-mounted and hand-carried GNSS-positioned fluxgate gradiometer survey.

1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David et al., 2008), the Chartered Institute for Archaeologists (CIfA, 2014) and the European Archaeological Council (Schmidt et al., 2015).

1.4. It was conducted in line with a WSI produced by MS (2019) and approved by the county archaeologists of Suffolk and Cambridgeshire.

1.5. The survey commenced on 7 October 2019 and the surveyable extent was completed on 16 March 2020, a further 217ha remains to be surveyed at a later date.

# 2. Quality Assurance

2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society of Archaeological Prospection).

2.2. The directors of MS are involved in the cutting edge of research and the development of guidance/policy. Specifically, Dr. Chrys Harris is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr. Kayt Armstrong is the Editor of ISAP News, and is the UK Management Committee representative for the COST Action SAGA; Dr. Paul Johnson has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.

2.3. All MS managers have relevant degree qualifications to archaeology or geophysics. All MS field and office staff have relevant archaeology or geophysics degrees and/or field experience.

# 3. Objectives

3.1. The objective of this geophysical survey was to assess the subsurface archaeological potential of the survey area.

3.2. To assess the presence/ absence of potential archaeological anomalies that might be present.

# 4. Archaeological Background

4.1. The following archaeological background takes into account information taken from a desk-based assessment (DBA) of the site at the Sunnica Energy farm. Information has been collated from a Heritage gateway search and a previous DBA produced by AECOM for the Sunnica Energy farm east site (AECOM, 2019). This report looks to assess the archaeological potential for the survey area(s) and a wider 1km study area surrounding both the Sunnica west and east sites (See 1.1).

4.2. A flint axe, pottery sherds and bone fragments, possibly dating to the Neolithic have been recovered from the Sunnica east site. Crop marks thought to date to the same time period have been identified in the immediate vicinity of the survey area close to Swales Tumuli.

4.3. Evidence of prehistoric settlement activity is noted to the north of the study area. An excavation at Foxburrow Plantation identified Iron Age field systems, paddocks, buildings, hut circle, ring ditch, ditch and pit features. Further to the south, along the northern boundary of the A14 (eastbound), inside the survey area, an excavation conducted prior to the construction of the bypass identified an early Bronze Age inhumation cemetery with evidence of Bronze Age cremations. Several minor pit and ditch features have been identified c.360m outside the survey area at Bay Farm– offering a possible Iron-Age context to the Sunnica Energy Farm site. A hoard of Iceni staters and a gold stater of Cunobelin have also been recovered in Freckenham.

4.4. Two scheduled monuments within the Sunnica east site are identified: Chalk Hill bowl barrow and Lumber Hill bowl barrow. Several smaller, isolated finds were also identified in the form of worked flints and bronze awl. Contained within and adjacent to the Sunnica west site, immediately north of the A14, are several further scheduled monuments comprised of four bowl barrows, forming part of the Chippenham barrow cemetery; Hilly Plantation bowl barrow and The Rockery bowl barrow. West of the A11, an excavation at Dane Hill Farm uncovered several prehistoric sites of uncertain dates, including a Bronze Age Barrow and evidence of a Medieval Moat.

4.5. Numerous different surface scatters have been recovered from c 1100m south of the Sunnica east site with a number of brooch type finds relating to the Roman era among these. Further examples include a scatter of fragments south of Freckenham indicative of hypocaust tile, and a hoard of 600 bronze coins has been recovered in the north western portion of the Sunnica east site.

4.6. Medieval activity within the site and wider search area is confined to a number of find spots and stray finds. A Saxon pin and Saxon bronze book fitting were both identified within the eastern portion of the Sunnica site. A Saxon brooch, pin and pottery scatter have been recovered along with metal working related finds and Anglo-Saxon coins within the immediate vicinity of the site. Later medieval activity includes a silver coin scatter and pottery scatter within the eastern portion of the Sunnica Energy Farm.

# 5. Methodology

## 5.1. Data Collection

5.1.1. Geophysical prospection comprised the magnetic method as described in the following table.

5.1.2. Table of survey strategies:

| Method | Instrument | Traverse Interval | Sample Interval |
|---|---|---|---|
| Magnetic | Bartington Instruments Grad-13 Digital Three-Axis Gradiometer | 1m | 200Hz reprojected to 0.125m |

5.1.3. The magnetic data were collected using MS' bespoke hand-pulled and quad-towed cart system, and hand-carried array. All three configurations of the equipment are GNSS-positioned.

5.1.3.1. MS' cart and hand-carried system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

5.1.3.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

5.1.3.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

## 5.2. Data Processing

5.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to Historic England's standards for "raw or minimally processed data" (see sect 4.2 in David et al., 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen et al. (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

## 5.3. Data Visualisation and Interpretation

5.3.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the upper and/or lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plots (found in the relevant map book). XY trace plots visualise the magnitude and form of the geophysical response, aiding in anomaly interpretation.

5.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historic maps, LiDAR data, and soil and geology maps. Google Earth (2019) was consulted as well, to compare the results with recent land usages.

5.3.3. Geodetic position of results - All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

# 6. Qualification of Results

6.1. Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek feedback on their reports as well as reports of further work in order to constantly improve our knowledge and service.

## 6.2. General Statements

6.2.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.

6.2.2. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures along the edges of the field have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure the response of any weaker underlying features, should they be present, often over a greater footprint than the structure they are being caused by.

6.2.3. **Ferrous (Spike)** – Discrete ferrous-like, dipolar anomalies are likely to be the result of isolated modern metallic debris on or near the ground surface.

6.2.4. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentrated deposition of discrete, dipolar ferrous anomalies and other highly magnetic material.

6.2.5. **Natural – Various classes, see below** - Variations in the natural soils and sediments across the survey area reflect different soil and landscape formation processes and are a complex product of parent geology, superficial geology and local soil formation. Though almost the whole survey area is underlain by various chalk types, the resulting background data textures are varied. Changes in superficial overburden, topography and morphology all play a part in shaping the landscape. These specific landscape features influence the shape, form and strength of natural anomalies through transportation, deposition and dissolution processes. Two different main background patterns have been identified at Sunnica, and they appear to relate to the local landforms and resulting flows of water and precipitates across and through the surface. In the interpretation, three classes of Natural anomaly have been used. The characteristics of each are as follows:

6.2.5.1. **Natural (General)** – This class has been used to described anomalies that typically appear as bands of relatively enhanced response and are usually more visible in the total field data than the gradient. In this landscape, they are interpreted as largely relating to variations in the superficial geology (sands, gravels etc) created at the time of their deposition. The sorting and fining of sediments under fluvial influence creates bands and

pockets of sediments that are relatively magnetically enhanced compared to their immediate surroundings. These bands also have different resistances to erosion, and so commonly influence the local topography as well. Finally, they may appear in conjunction with the two other predominant background patterns where there are bands of superficial material present in areas where the processes that produce the other two patterns are active. There may also be locations where these bands are a result of colluvial hill washing of sediments from further uphill and deposition in the lower parts of the site, and accumulation of the finer textured material in the deeper parts of the soils and sub-soils.

6.2.5.2. **Natural (Dissolution)** – This class has been used to describe a background pattern to the data characterised by broad curving and circular changes in magnetic strength. These patterns vary in scale across the site from tens to hundreds of meters, but they are uniformly broad and gentle, with a diffuse macular appearance, with only occasional abrupt changes in intensity. As suggested by the name of the class, these anomalies are interpreted as being produced by dissolution processes affecting the chalk. These anomalies and the subsurface variations causing them are the product of slow-moving water within the subsurface, with a low or non-existent flow rate. This means lower lying areas of flat ground may be subject to percolation and stagnation of nutrient/ acid rich precipitates creating large scale dissolution formations such as 'dissolution sinkholes' in the surface of the bedrock. These processes are more likely to occur in areas without superficial geology, and where the soils are thinner and are well drained.

6.2.5.3. **Natural (Infill)** – This class has been used to describe a background pattern to the data characterised by strong linear positive anomalies, frequently running with the local slope. In some areas, they can appear to have a striped effect difficult to distinguish from ridge and furrow, whereas in other the effect can look like braided formations, or a geometric pattern. As implied by the class name, these anomalies are interpreted as being the product of finer grained material that is more magnetically enhanced, accumulating in cracks and fissures. These fissures may be within the immediate subsurface or at the surface, such as rills, or they may be at the surface of the bedrock and relate more to faulting patterns within the chalk, or, for example, periglacial cracking (ice wedges). Generally speaking, the straighter and less braided areas correspond with steeper slopes, and so are interpreted as being related to higher flow velocities, whereas the more braided and geometric areas associate with more gentle slopes and are related to lower velocities. Where the velocities slow sufficiently, the pattern shifts to the 'Natural (Dissolution)' pattern described above. Where this pattern has been difficult to distinguish from ridge and furrow, the classification has been made on the overall appearance of the pattern and whether or not it ends at a boundary anomaly (or the projected line of one), or where the pattern transitions into another natural type. In the case of the former, ridge and furrow is more likely, and in the case of the latter, then a natural explanation of the anomalies is more likely.

6.2.6. **Undetermined** – Anomalies are classified as Undetermined when the anomaly origin is ambiguous through the geophysical results and there is no supporting or correlative evidence to warrant a more certain classification. These anomalies are likely to be the

result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally not ferrous in nature.

6.2.7. **Ridge and Furrow** – Ridge and furrow cultivation has a characteristic appearance in magnetic results as alternating bands of enhanced and less enhanced material at regular spacings of 2m up to 20m, though more usually within a 3m to 7m range. The enhanced bands, generally associated with the furrows, of these are all drawn as this can help in the analysis of field patterns and sometimes help to ascribe a relative date to the system.

6.2.8. **Agricultural (Trend)** – Modern ploughing is more typically seen as weaker more narrowly spaced linear trends in the texture of the data, though this varies depending on the local soil properties and type of agriculture engaged in. In many cases, a sample of the modern ploughing trend will be drawn, rather than all of the lines, as this allows other anomalies of greater interest that underlie the ploughing to be clearly seen. At other locations, more of the modern ploughing might be drawn, where this is helpful to the interpretation of the landscape, rather than hindering it. Linear anomalies that follow the shape of the modern field edge are indicative of repeated tractor movement in these locations and are often evident as narrow negative anomalies.

6.2.9. **Agricultural (Strong/ Weak)** – Generally agricultural activity has unique signatures both in terms of anomaly types and patterns of occurrence that makes it straightforward to classify. Field boundaries are a type of historical agricultural feature and are identifiable in the results where old field divisions have been removed to amalgamate fields, but left behind filled ditches and other subsurface remains, such as ferrous/debris material, drains or services. Where anomalies collocate with field boundaries shown on historic maps, these have been classified as ‘Agricultural’, unless there is a strong reason to suggest otherwise which is discussed in the relevant results section. Other anomalies of similar character that align with mapped boundaries or continue them but where no boundary is shown on the earliest maps are usually also classified as ‘Agricultural’, unless there is a strong reason to suggest otherwise which is discussed in the relevant results section.

# 7. Reporting Zone A

## 7.1. Geographic Background

7.1.1. Zone A is located c. 1.5km southeast from Isleham (Figure A1). Survey was undertaken across six fields covering an area of c. 130ha. The area was predominantly under arable conditions with three areas of cereal stubble and three of young crops. Zone A is bounded by further fields to the north, Lee Brook to the east, Freckenham to the south and Isleham to the west (Figure A1).

7.1.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Arable field, with cereal stubble, that sloped downwards towards the southeast from the centre of the area. | Bounded to the north by trees, to the east by hedgerow and a drainage ditch. The field continued to the west and southwest. A derelict farm shed, and an area of hard standing were located just beyond the western corner. |
| 2 | Arable field, with cereal, stubble that sloped down to the south. | Bounded to the north, west and southeast by trees and hedgerow. Bounded by Beck Lane to the northeast. The field continued to the south and southwest. |
| 3 | Arable field, with cereal stubble which sloped downwards from the southwest to the northeast. This slope was interrupted near the northeast boundary by a small ridge that ran approximately north-northwest to south-southeast. | Bounded by intermittent hedgerow to the southwest and the field continued on all other sides. A derelict farm shed, and an area of hard standing were located just beyond the southern corner of the survey area. A second derelict farm building was present on the boundary of survey area at the western corner. |
| 4 | Flat, arable field under young crop. Several areas of waterlogged ground and deep tractor ruts were present adjacent to the northern boundary which prevented a small area from being surveyed. | Bounded to the east by Lee Brook and hedgerow, to the south by grass banks and hedgerow, and by a track to the north. The west boundary was demarcated by a change in land use. A residential property and farmyard were located along the northeast boundary with a telegraph line running from the farm across the survey area northeast to southwest. A flow gauging station for the stream was located in the northeast corner of the area. A dirt track cut across the centre of the survey area in a north-south orientation. |
| 5 | Flat, arable field under young crop. | Bounded by a grass bank to the north, a hedgerow and stream to the east and a hedge to the west. The field continued to the south. |
| 7 | Flat, drilled field, recently sown. | The field continued to the north, bounded by a shallow bank to the east and south, bound to the southwest and west by a bank and trees. |

7.1.3. The underlying geology comprises of Zig Zag chalk formation across the majority of Zone A with a small inlet of Holywell Nodular Chalk Formation to the northwest of Area 2 and New Pit Chalk Formation (undifferentiated) along the eastern boundaries of Areas 3 and 7. No superficial geology has been recorded in the zone except for along the eastern border. A stretch of peat lies in Area 3 that becomes alluvium to the south, this alluvium band extends into Area 1 (British Geological Survey, 2019).

7.1.4. The soils consist of freely draining lime-rich loamy soils that covers the entirety of the zone, with the exception of a stretch of shallow lime-rich soils over chalk or limestone recorded in the north-northeast of Area 1 and east of Areas 3 and 7 (Soilscapes, 2019).

## 7.2. Results

### 7.2.1. Summary

7.2.1.1. Reporting Zone A is located to the southeast of the village of Isleham, to the west of Lee Brook (Figure A1). Variations in the geological background throughout Zone A (Figures A2 & A6) conform with local topographic changes producing clear examples of both the 'dissolution' type pattern and the 'infill' type pattern described in section 6.2.5 above (Figures A2 & A6).

7.2.1.2. In the centre of Zone A, a large-scale (over 5.5ha), multi-phase complex has been detected, comprising linear and rectilinear anomalies creating orthogonal formations (Figures A12 & A16). Within the limits of the complex, a findspot is recorded (MCB16206) which notes Roman pottery as well as Post Medieval coins. Further find spots that record Roman, Early Medieval and Medieval artefacts are located in close proximity (See Section 4). Straight trackways to the north, south, and west extend from a complex of rectilinear anomalies interpreted as a large productive site such as a villa or a farmstead. The trackways, as well as the cellular structure of the archaeological complex, are highly suggestive of an origin in the Roman period. The complex appears to have multiple phases, with linear features truncating or intersecting each other. These linear anomalies share orientation and scale suggesting that the complex could have increased or decreased in size during its existence (Figure A12). Multiple linear anomalies have been identified within the trackways, orientated in the same direction, which could also suggest that the trackways similarly had a multiphase existence (Figure A12 & A16). The presence of a ring ditch within one of the larger rectilinear enclosures in the north suggests a prolonged occupation, with multiple phases of activity predating the Roman period (Figure A12). Outside the main area of activity, c.140m east, a large circular feature with a 50m diameter has been identified; a circular feature of this size likely relates to a hengiform monument (Figure A24). C.245m south-west of the main area of activity, another possible and smaller partial ring ditch has been detected. Further south, in Area 4, a further smaller ring ditch has also been detected (Figure A20).

7.2.1.3. In the northeast quadrant of Zone A, numerous linear anomalies have been identified, some of which appear to form a regular, large field system (Figures A8, A36). These probable former fields are located on a downward slope; it is possible

the location of this agricultural activity was chosen based upon the natural drainage of surface water and high groundwater content allowing for an easily accessible water source. Moving south, the linear anomalies become more fragmented with weaker magnetic signals, however, these weak anomalies share a similar orientation with the more defined field systems in the north. Further linear anomalies have been detected overlapping and truncating the fragmented anomalies in multiple orientations, this likely indicates multiphase activity (Figures A8, A28). None of the anomalies classified as "Probable" or "Possible" archaeology correspond with any former field boundaries recorded on available historic maps, or align with them, which suggests the field systems identified predate available maps.

7.2.1.4. In the centre of Zone A, a section of the former Cambridge and Mildenhall Branch railway has been detected. The varying strength and type of magnetic signal along the length of the former railway indicates that removal was more complete in the east, where only debris material remains, than to the west, where broad ferrous anomalies have been detected (Figure A27). Two former field boundaries recorded to the north and south of the railway line and can be clearly seen on historic mapping (Figure A9).

7.2.1.5. Ploughing trends and drainage features associated with modern agricultural activity were identified across the majority of Zone A (Figure A5 & A9). The recent plough trends exhibit a stronger magnetic enhancement over the multi-phase complex. This effect is likely caused by the plough dragging the enhanced material produced by habitation activity.

### 7.2.2. Interpretation of Magnetic Results – Specific Anomalies

7.2.2.1. **Probable Archaeology (Large-Scale Roman Complex) –** Within Area 2, a series of rectilinear anomalies, [**2a**], together form a large-scale complex (Figure A2, A4, A12 & A16). The size of the complex measures 5.6 ha in total and the anomalies generally exhibit a strong, positive magnetic signal indicative of ditches infilled with an enhanced backfill, likely caused by occupation activity which enriches the soils (Figures A2 & A3). Linear anomalies intersect or truncate at perpendicular angles to create orthogonal formations. The complex is organised in a cellular grid formation with the majority of the cells occupying the eastern side of the complex, following a northwest to southeast orientation (Figure A12). Further cellular formations have been identified in the western part of [**2a**], however these have a weaker magnetic enhancement, which could indicate this area was less intensely used, or existed for a shorter period. The phasing of the complex is difficult to ascertain yet it appears that the structure may have been extended multiple times over its duration. This possible development is visible in the centre of the complex at [**2b**] where a broad ditch-type anomaly divides the north and southern halves of the complex, possibly indicating this was once an outer boundary (Figures A10 & A12). Further, less expansive additions are visible in the north of the complex at [**2c**] (Figures A10 & A12) and in the south at [**2d**] (Figures A14 & A16). The uniform cellular nature of the complex, [**2a**], is indicative of a Roman period singular large

habitation and production site, such as a villa, with development phases, rather than typical settlement patterns with individual dwellings as might be expected with later prehistoric or post-Roman settlements.

7.2.2.2. **Probable Archaeology (Rectilinear enclosures)** – Two rectangular enclosures adjoin [**2a**] immediately to the west [**2e** & **2f**] (Figures A4 & A12). The linear anomalies which form these enclosures are very similar to those forming [**2a**], with continuous positive magnetic signals, yet the magnetic enhancement of these anomalies is slightly weaker (Figure A10). The slight change in magnetic enhancement could be related to a reduction of habitation effect (i.e. that these are further from the focus of settlement activity). Both enclosures [**2e** & **2f**] contain a number of internal features, yet they do not share the cellular formation identified within [**2a**]. The northern of the enclosures, [**2e**], measures c.160 x c.60m; while the southern, [**2f**], measures c.150m x c.120m; together these form an area covering 2.7ha adjoining the cellular complex (Figure A12). The less compact internal features of these enclosures suggest a different usage, possibly related to production activity or stock enclosures.

7.2.2.3. **Probable Archaeology (Ring Ditch) –** A circular anomaly has been identified which is contained within enclosure [**2e**] (Figure A12). The magnetic signal of [**2g**] is of a similar level of magnetic enhancement as the large complex [**2a**] (Figure A11). Despite these similarities, the curved form of [**2g**] is indicative of a ring ditch, c.17m in diameter. This is typical of late prehistoric settlement and so is potentially older than the main complex at [**2a**] or the enclosure at [**2e**]. However, it seems to have been, respected by the subsequent large-scale occupation which occurred around it. This hints at a continuity of occupation between the iron age and roman periods and underlines the potential for this complex to reflect a Romano-British high-status productive settlement.

7.2.2.4. **Probable Archaeology (Rectilinear enclosures)** - Further west within Area 2, an additional rectangular enclosure [**2h**] has been detected (Figure A12). This enclosure is separated from [**2e**] by only 8m, and comprises strongly enhanced outer boundaries to the north, east and west (Figure A10). The western edge of [**2e**] which runs parallel to the boundary of [**2h**] shares a similar level of strong enhancement when compared to [**2e**]'s other boundaries (Figure A10). It is possible the greater level of enhancement of these specific boundaries could indicate the deposition of more enhanced materials into the ditch backfill, perhaps related to burnt or fired material. The enclosure [**2h**] measures c.75m in length and an c.60m in width, however, southern boundary is unclear. The organisation and size of this enclosure appears to differ from the main complex [**2a**]; but all three smaller enclosures [**2e**, **2f** & **2h**] share orientation with the main complex as well as that of trackway [**2j**] suggesting likely contemporality (Figure A4).

7.2.2.5. **Probable Archaeology (Trackway) –** To the north of [**2h**], two parallel weakly positive linear anomalies have been identified, [**2i**] (Figure A12). Similar in magnetic signal to those in the south (see section 7.2.2.6), [**2i**] is suggestive of ditches flanking a trackway. The anomalies at [**2i**] extend to the north and the west,

appearing to continue beyond the bounds of the surveyed area. This trackway measures c.14m in width leading north, and c.21m in width leading west.

7.2.2.6. **Probable Archaeology (Trackway)** – To the immediate south of the large-scale complex [**2a**] and enclosure [**2f**], two parallel strong positive linear anomalies have been identified, [**2j**], leading south from the complex (Figure A4 & A16). These linear anomalies are indicative of the flanking ditches of a trackway, due to the length and continuous nature of the magnetic signal (Figure A14). Measuring 23m in width and c.240m in length, the probable trackway lies on the same overall orientation as the complex [**2a**]. The linear features extend and intersect with two weakly positive curvilinear anomalies [**2k, 4a** & **1a**] which follow southwest to east alignment (Figure A4). The reduction in magnetic signal of this second possible trackway again likely relates to a reduction of the habitation effect. The curvilinear probable trackway, [**2k, 4a** & **1a**], extends into Area 4, and Area 1 and appears to continue beyond the surveyed area to the west, which could indicate that the trackways are part of an extended route network.

7.2.2.7. **Probable Archaeology (Zone) –** Within Area 2, around and within the large complex at [**2a**], and the smaller enclosures at [**2e** & **2f**], is an area of altered magnetic background, with generally stronger and sharper anomalies [**2l**] (Figure A12 & A16). This is marked as an 'archaeological zone' and is focused on an area where no superficial geology is recorded. The shallow soils in this area would have made the ground drier and therefore more desirable for habitation. The lack of superficial geology and the free draining nature of the soils indicate that the enhancement exhibited here [**2l**] is likely anthropogenic (related to the occupation) rather than natural in origin. This is a common effect on settlement sites with a long duration, or intense occupation, and is a result of the habitation effect, whereby the same anthropogenically enhanced material that concentrates in ditches and pits is pervasive enough in the topsoil in the occupation area that it produces a markedly different background texture.

7.2.2.8. **Probable Archaeology (Ring Ditches) –** Only c.50m south of enclosure [**2f**], **t**wo semi-circular anomalies have been identified [**2m**], located in the west of Area 2 (Figure A16). Despite the partial nature of these curvilinear anomalies an archaeological origin is considered highly probable, given the similarity of the magnetic signals between these and the archaeological anomalies in close proximity. These curvilinear anomalies fall between two complete ring ditches, [**2g**] c.230m north (see section 7.2.2.3), and [**4b**] a ring ditch of c.22m diameter in Area 4, c.400m to the south (Figures A12 & A20).

7.2.2.9. **Probable Archaeology (Hengiform Circular Enclosure) –** Also within Area 2, **c.**460m east of [**2m**], a ring ditch on a larger scale than seen elsewhere in the wider landscape has been detected, [**2n**] (Figure A24). The size of [**2n**], c.50m in diameter, is unusually large for a typical late prehistoric ring ditch, which may indicate that this was some form of hengiform monument. None of the later, potentially Roman, features appear to intersect or have any clear relationship with the possible hengiform monument; the closest trackway, [**2k**], runs c.40m to the south (Figure

A24). A potential field system with a very weak magnetic signal appears to end c.25m to the northeast, in Area 1, [**1b**]. Despite the later archaeological anomalies appearing to respect the boundaries of [**2n**], an ephemeral curvilinear anomaly has been detected curving through the northern half of the circular feature (Figure A23 & A24). The origin of the curvilinear anomaly is unclear, but an archaeological provenance is considered likely.

7.2.2.10. **Probable/ Possible Archaeology (Field System) –** In the south of Area 2, and east across Area 1 a number of linear anomalies on a north to south alignment have been detected [**2o** & **1b**] (Figure A24). These anomalies have weak magnetic signals (Figure A22) typical of ditch-features with only slightly enhanced backfill, as might be expected of field systems on the outskirts of a large area of occupation. However, in Area 2 the anomalies [**2o**] follow the alignment of modern ploughing regimes which prevents a more confident archaeological interpretation.

7.2.2.11. **Probable/Possible Archaeology (Field System) –** In the northeast of Zone A, in Area 7, three large enclosures abutting the current eastern field boundary have been detected, [**7a**] (Figure A36). These enclosures extend south into the northeast corner of Area 3, [**3a**] (Figure A8). The scale of the enclosures and their alignment are similar to those visible further east on 2nd edition historic maps beyond the boundary of Zone A (Figure A9). It is probable that the anomalies detected within Areas 7 and 3 are extensions of a former field system, of unknown date, that predates available historic maps, hence the "Probable Archaeology" classification, which may have persisted through time. South and west of the former field system numerous further weak linear anomalies on varying orientations have been identified, [**3b**] (Figures A27 & A28). It is possible that the anomalies at [**3b**] represent further extensions of former field systems, however, the overlapping nature and various orientations of the anomalies suggest multiphase activity. Set somewhat separate to [**3b**], c.90m west of the majority of the anomalies, a linear anomaly with a c.90 degree return has been identified [**3c**] (Figure A28). The magnetic signal of [**3c**] is more enhanced than the surrounding possible field systems and is on a similar level of enhancement to the complex [**2a**] situated c.130m to the west in Area 2 (Figure A8 & A6). It is not clear from the magnetic data what the provenance of [**3c**] is, and whether it is related to the possible former field systems or the large probable Romano-British complex.

7.2.2.12. **Agricultural/ Probable Archaeology (Former Field Boundary) –** In Area 1, in the east of Zone A, a number of linear anomalies have been identified which correspond with former field boundaries recorded on the 2nd edition OS map (Figure A5). One of these anomalies, [**1c**], has been classified as "Probable Archaeology" as it appears to form the terminus for the trackway [**1a**] (Figure A24), as well as corresponding with the location of an historic former field boundary (Figure A5). It is possible that anomaly [**1c**] represents a feature which has been used and re-used, which would explain its relatively enhanced magnetic signature (Figure A23). To the north of **[1c]** two anomalies, [**1d**], loosely correspond with former field boundaries on the 2nd edition OS map, as does [**3d**], a rectilinear

anomaly in Area 3 (Figures A4 & A5). The magnetic signal of [**3d**] is weaker than that of [**1d**] (Figures A24, A28), suggesting that they involve differing deposition processes and/or durations.

7.2.2.13. **Extraction –** In the west of Area 2 and 7, and close to the centre of Area 1, four broad anomalies have been identified [**2p, 7b & 1e**], interpreted as possible extraction (Figure A12, A20, A24 & A32). On a smaller scale, two anomalies of potential extraction origin have also been identified within the archaeological anomalies of [**3b**] (Figure 28). The anomalies are located on chalk bedrock and could indicate chalk pits or similar. Although there is no evidence for extraction on the 2nd Edition OS Maps (Figure A5), they could potentially represent older, unmapped extraction activity. Further possible extraction activity has been identified in the northeast of Area 3, within anomaly [**3b**] (Figure A28).

7.2.2.14. **Drainage Features –** In the southwestern corner of Area 2, a series of parallel, weak positive linear anomalies have been identified, [**2q**] (Figure A20). These linear anomalies are situated between 9-25m separation, running in a sub north-south orientation. The location of these anomalies at the bottom of the slope in Area 2 (see section 7.1.2), may indicate that these are drainage features preventing water build-up in this lowest section of the landscape.

# 8. Reporting Zone B

## 8.1. Geographic Background

8.1.1. Zone B is located c.1.9km southwest of West Row and covers an area of c.107ha (Figure B1). Survey was undertaken across two fields under arable cultivation. Zone B is bounded by River Lark to the north, Lee Brook to the west, further fields to the east and Beck Road to the south (Figure B1). A total of c.63.6ha were not able to be surveyed due to heavy furrows, waterlogging, overgrown vegetation and to the presence of pigs. A further 7.5ha of land within Area 3 was unable to be surveyed due to waterlogging.

8.1.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Arable land under a young cereal crop, with a gentle slope down to the north along the eastern boundary. | The area was bounded to the north, east and south by hedgerow and trees; the field continued to the west. A trackway ran along the eastern boundary, and a wooden gate was present in the southeast corner. A telegraph pole was present in the northeast corner, with overhead cables running on a northwest to southeast alignment. |
| 2 | Partially dismantled pig paddocks. Stripe of grassland along the eastern boundary of the field. Muddy, boggy and waterlogged throughout. | Bounded to the north by a trackway and to the east and south by a hedgerow; the field continued to the west. Two telegraph poles were located in the centre of the survey area, with overhead cables running on a roughly east to west alignment.<br>Disused electric fencing and iron poles were still present intermittently throughout the survey area. A small area in the southeast of the field was unable to be surveyed due to an active pig paddock and farm equipment being present. |
| 3 | Flat, arable field. Heavily furrowed. | Bounded to the north by a trackway and to the west and south by a hedgerow. The field continued to the east. One telegraph pole was present in the centre-west of the survey area, on the same east-west alignment of the telegraph poles located in Area 2. Most of Area 3 was unsurveyable due to the field being cultivated with deep furrows. |

8.1.3. The underlying geology comprises chalk from the West Melbury Chalk formation in the northern unsurveyed fields of the zone, and chalk from the Zig Zag Chalk formation in Areas 1, 2 & 3. Superficial deposits consist in clay, silt, sand and gravel for the entire extent of Zone B except for the southern half of Area 1 where no superficial deposits are recorded (British Geological Survey, 2019).

8.1.4. Zone B is comprised of three types of soils. Fen peat soils are recorded along the northern end of the zone, while the centre-west of the zone comprises shallow lime-rich soils. Freely draining slightly acid but base-rich soils are recorded over the rest of Zone B (including Areas 1, 2 & 3) (Soilscapes, 2019).

## 8.2. Results

### 8.2.1. Summary

8.2.1.1. Zone B is located immediately south of the River Lark and southeast and southwest of the villages of Isleham and West Row respectively. It is located east of Lee Brook, north of Beck Road and further fields are located immediately east. Zone B exhibits a generally quiet magnetic background, probably due to past waterlogging inhibiting the magnetic enhancement of the soils. Historically, land use in fenland areas was limited by waterlogging without the implementation of field drainage, suggesting it was unsuitable for settlement or arable cultivation in periods of the past. Furthermore, the wet conditions can impact the formation of magnetic enhancement related to human activity; so even if the fenland was exploited in some way (or settled, during drier periods), it is unlikely that features associated with this activity would achieve detectable magnetic contrasts with the surrounding soils and sediments. This explains the relative absence of archaeological anomalies in this zone, in contrast with others within the wider site. Caution should be exercised however, as it is very difficult to state with certainty whether this non-detection results from an absence of features, or from an absence of contrast within archaeological features in this wet part of the landscape. In the northwest of the zone, a group of sinuous curved anomalies have been interpreted as being related to the deposition and transportation of fine-grained alluvial superficial material. The rest of the background patterns are a muted version of the anomaly types described in 6.2.5 above (Figures B2 & B10).

8.2.1.2. In the southwest of Zone B, a circular ditch-like anomaly c.30m in diameter was identified (Figures B3, B8). Although the line of the former Cambridge and Mildenhall Branch railway cuts directly through the middle of this circular anomaly (Figure B8), the form and magnetic signal of the anomaly likely indicate a ring ditch. This ring ditch represents one of the many ring ditches identified within the landscape of the broader whole site. It has similar dimensions to the bowl barrows recorded at the A11/ A14 junction to the south (SM 1015246), and at Chalk Hill to the east (SM 1018097).

8.2.1.3. A broad ferrous anomaly detected in the south of Zone B corresponds with the location of the aforementioned railway, which may have impeded the detection of weaker anomalies (Figures B3, B8). The varying strength and type of the magnetic signal along the length of the former railway indicates the removal of the trackway was more complete in its western and eastern extent than in the central section, where it appears more strongly ferrous.

8.2.1.4. Agricultural activity is evident in the form of ploughing trends and drains (Figure B3). Modern activity is evident in the form of magnetic disturbance and agricultural

trends related to dismantled and extant pig paddocks across the centre-south and southeast of Zone B (Figures B3 & B11). Magnetic disturbance is also present in the southeast of the zone due to a parked tractor, and at the perimeter of the fields due to fencing.

8.2.1.5. Anomalies classified as "Undetermined" have been identified throughout the zone. The magnetic signals of these undetermined anomalies are generally ephemeral, and may relate to natural or agricultural processes, however, an archaeological origin cannot be entirely ruled out (Figures B8, B12).

### 8.2.2. Interpretation of Magnetic Results – Specific Anomalies

8.2.2.1. **Archaeology Probable (Weak)** – In the southeast of Area 1, a weak positive circular anomaly [**1a**] has been identified (Figures B3 & B7). Being cut by the former Cambridge and Mildenhall Branch railway, it is not possible to view the full extent of the anomaly; nevertheless, it appears to be c.30m in diameter. The anomaly has been interpreted as a probable ring ditch, as it shares characteristics with many similar anomalies detected in the wider environs of the site. [**1a**] has similar dimensions to the bowl barrows recorded at the A11/ A14 junction to the south (SM 1015246) (Zone F, [**12a**] and [**13a**] in Figure F12), and at Chalk Hill to the east (SM 1018097) (Zone D, [**8a**] and [**8b**] in Figure D8).

8.2.2.2. **Magnetic Disturbance and Ferrous/Debris (Spread)** – Crossing through the south of Areas 1 and 2 is a broad ferrous anomaly [**1b**, **2a**] running on a northwest to southeast alignment (Figures B2, B3, B6, B7, B10 & B11). This is characterised by ferrous-type anomalies of varying strengths and signal types, all of which fall within a consistent band crossing both survey areas. This linear band is strongly dipolar in the southeast of Area 1 but the magnetic enhancement decreases in the southwest of Area 1 suggesting a reduction in the ferrous content. In Area 2 the band of anomalies comprises a higher concentration of small ferrous anomalies indicating the presence of a spread of debris, as well as large discrete strongly negative anomalies. This anomaly corresponds with the former Cambridge and Mildenhall Branch railway recorded on historic maps (Figure B5). The variety of the magnetic signal within the band of anomalies [**1b**, **2a**] likely reflects the differences in how thoroughly the railway was dismantled along its extent.

# 9. Reporting Zone C

## 9.1. Geographic Background

9.1.1. Zone C is located c.700m to the southwest of Worlington (Figure C1) and covers an area of c.199ha. Survey was undertaken across 18 fields under arable use and one field under pasture use. Zone C is bounded by B1102 to the north, by fields to the east, by Heath Farm to the south and by further fields and Rectory Farm to the west (Figure C1). It was not possible to survey c.21.2ha due to the presence of horses and pigs; c.0.4ha in Areas 5 and 20 could not be surveyed due to waterlogging and overgrown vegetation and a further c.0.2ha in Area 11 could not be surveyed due to pig pens present.

9.1.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Arable field under short cereal crop with a gentle slope to the southeast in the east of the survey area. | Bounded on all sides by trees and hedgerow with a trackway present in the northeast corner, along with a metal gate. |
| 2 | Arable field under short cereal crop with a gentle slope down to the southeast, and a further gentle slope down to the northwest in the southeast of the survey area. | Bounded on all sides by trees and hedgerow, with a trackway running along the southeast boundary, and metal gates in the north and south corners. |
| 3 | Arable field under recently harvested crop, with an area of overgrowth and weeds in the north, a sugar beet crop in the centre and a young cereal crop in the south. The area in the north was generally flat, with a gentle slope down to the south in the sugar beet and a gentle slope down to the west in the south. | Bounded by trees and hedgerow to the north, northeast and west, with a barbed wire fence to the east and by trees and hedgerow to the south. A trackway ran along the eastern boundary and across the north of the survey area running northeast to southwest. A mound of earth and a pheasant pen and bird feeders were present in the north, with debris and farming equipment present in the northeast corner. Several pylons and overhead cables were present along the western and southern boundaries, with the cables crossing the southwest corner. |
| 4 | Flat, arable field under young rye grass crop with undifferentiated plants | Bounded by hedgerow on all four sides. An overhead power cable ran along the northeast boundary parallel to Elms Road. The overhead wires extended to the southeast boundary over the field. |
| 5 | Flat, arable field formerly used for pig pasture but recently ploughed. | Bounded by trees to the north, east and south, a hedgerow to the west, and the field continued to the southeast. There was a large hay pile in the southwest part of the survey area, and stacked metal pig huts in the northeast corner of the survey area. |
| 6 | Flat, arable field under seeded grass. | Bounded on three sides (north, east and west) by trees and hedgerow and to the south by a large metal fence. Parallel to the northern boundary |

| | | |
|---|---|---|
| | | was a worn dirt track, that ran northeast-southwest. |
| 7 | Undulating arable field under wheat stubble. | Bounded by trees and hedgerow on all four sides. |
| 8 | Flat, arable field under young rye grass. | Bounded on all sides by trees, banks and hedgerow. An electric fence divided the north and southern halves of the field. |
| 9 | Flat, ploughed arable field. | Bounded by a farm track to the north, south and west, and a hedgerow to the east. |
| 10 | Flat, ploughed arable field. | Bounded by hedgerow to the southwest and the field continued on all other sides. |
| 11 | Flat, ploughed arable field. | Bounded by hedgerow to the west and south, the field continued to the north and bound by a pig pen to the west. Telegraph lines ran along the hedgerow on the western boundary. A 0.2ha section in the southeast was overlapped by a pig pen and could not be surveyed. |
| 12 | Flat, arable field of young crop. | Bounded to the northeast by hedgerow, which separated the area from Elms Road. Bounded to the northwest by a farm track, by trees to the southwest and by wire fencing to the east. |
| 13 | Flat, arable field with cover crop. | Bounded by trees to the northeast, hedgerow to the southwest, trees and wire fencing to the southeast and wire fencing to the northwest. The north-western fencing separated the area from a large reservoir with c.10m high banks. |
| 14 | Undulating arable field, consisting of short stubble. | Bounded on all sides by trees and hedgerow. |
| 15 | Flat, arable field under harvested sugar beet. | The field continued to the south and east and was bounded by a farm track to the north and west. |
| 16 | Flat, arable field under harvested sugar beet. | The field continued on all sides. A farm track ran along the western boundary. |
| 17 | Flat, undifferentiated grassland. | Bounded by a track on all sides and also by a bank and trees along the eastern and southern boundaries. Stacks of hay bales were located in the north-western corner of the field alongside a mound of earth and a water valve. |
| 18 | Flat, pasture and grassland used for horse paddocks and chicken runs. | Bounded by a trackway to the south, by a electric fence to the west and east. The field continued to the north. The field was subdivided into paddocks and individual chicken runs by electric fencing. Farm debris and chicken coops were present in the centre-west of the survey area. It was not possible to survey a c.0.09ha section in the west of the survey area due to the presence of horses. |
| 19 | Mixed grassland and arable with a slight slope up to the north. | Bounded on the south, east and west by hedgerow and trees. The field continued to the north. A trackway bisected the survey area roughly north to south. There was one small |

| | | |
|---|---|---|
| | | unsurveyable section in the northwest due to the presence of a pile of manure. |
| 20 | Flat, arable, scored and ploughed with grassed section along the south-eastern boundary. Plough and scoring ran northeast to southwest across the majority of the survey area. In the southern end of the survey area, the ploughing ran northwest-southeast. | Bounded by trees to the west and south, by trees and wire fencing to the southeast and by a trackway and bank with trees to the north. The field continued to the east. It was not possible to survey three small sections (c.0.07) in the southeast of the survey area due to waterlogged ground conditions. |

9.1.3. The underlying geology comprises chalk of the Holywell nodular formation and New Pit formation (undifferentiated) over the majority of Zone C, however Areas 9,15,17,18,19 and the eastern half of Area 20 in the north and centre of Zone C are also underlain by chalk of the Zig Zag formation. A band of Melbourn rock member chalk separates the Zig Zag and Holywell formations. Superficial geology recorded in Areas 18,6,17,1,5,2,8, in the centre and south of Zone C, and in Areas 18,15, in the western half of Area 19 and northern half of Area 3, consists of river terrace deposits with sand and gravel (British Geological Survey, 2019).

9.1.4. In Areas 14,7,20,17 and in the western portions of Areas 16 and 15, clay, silt, sand and gravel superficial deposits are recorded. Bands of superficial deposits of blown sand are found across the north-eastern edge of Areas 7 and 8. No superficial geology is recorded in the southern portion of Area 3 and in Areas 9,10,16, western portion of Area 20, Area 2, 4 and western portions of Areas 6 and 13 (British Geological Survey, 2019).

9.1.5. Zone C is comprised of three types of soils. In Areas 18,15 and in northern halves of Areas 3 and 9, freely draining sandy Breckland soils are recorded. The southern halves of Area 3 and 9, the western half of Area 17 and Areas 10,16 and 17 are characterised by freely draining slightly acid but base-rich soils. This same type of soil is recorded in the south and southwest of Zone C, specifically in the western halves of Areas 2 and 6 and in Areas 4 and 13. The centre of Zone C, including Areas 20,7,14,2,8,5,1,12 and the northernmost part of Area 6, is comprised of freely draining slightly acid sandy soils (Soilscapes, 2019).

## 9.2. Results

### 9.2.1. Summary

9.2.1.1. Reporting Zone C is located to the east of Freckenham, southwest of Worthington, and northwest of Red Lodge. Historic mapping of the survey area identifies widespread fenland in the surrounding area (Figures C5, C9, C13). Historically, land use in fenland areas was limited by waterlogging without the implementation of field drainage, suggesting it was unsuitable for settlement or arable cultivation in periods of the past. Furthermore, the wet conditions can impact the formation of magnetic enhancement related to human activity; so even if the fenland was exploited in some way (or settled, during drier periods), it is unlikely that features associated with this activity would achieve detectable magnetic contrasts with the

surrounding soils and sediments. This explains the relative absence of archaeological anomalies in this zone, in contrast with others within the wider site. Caution should be exercised however, as it is very difficult to state with certainty whether this non-detection results from an absence of features, or from an absence of contrast within archaeological features in this wet part of the landscape. Numerous distinctive bands of strongly enhanced material have been identified across the northern and central sections of Zone C and have been marked as "Natural (Dissolution)" (Figures C6, C8; C10, C12). Contours suggest water flow during seasonal flooding of higher fenland to the east of Zone C has influenced the deposition and erosion of a range of surface materials within the southwest of the zone. In this section, both dissolution of the bedrock (Natural (Dissolution)"; Figures C2, C4) and deposition of less permeable material producing irregular shapes ("Natural (Infill)", Figures C2, C4) have been recorded, in line with the classifications described in section 6.2.5 above.

9.2.1.2. A long, linear anomaly has been detected crossing five of the fields surveyed in the centre and south of Zone C, to the east of Rectory Farm (Figures C4, C8). This feature follows a northeast to southwest alignment for c.730m, before turning north and continuing for a further c.650m. The continuous positive magnetic signal of this anomaly is characteristic of a ditch filled with more enhanced sediments, and likely relates to some form of past landscape organisation. No corresponding feature has been recorded on historic maps, and it does not follow the alignment of any former or current field boundaries. The limits of this long, linear feature have not been defined by this survey, and it appears to carry on past the bounds of the zone. Similar linear anomalies have been identified in the western half of Zone E (Figure E4) and in the northeast of Zone F (Figure F16).

9.2.1.3. Further detected anthropogenic activity is limited to weak modern ploughing trends and some drainage features (Figures C4, C8, C12). Further agricultural activity is evident in the form of tractor tracks around the edges of a number of the fields.

9.2.1.4. In addition, three large buried services have been detected in the northern and central parts of Zone C (Figures C4, C8, C12). These produce the broad magnetic halos that may obscure weaker underlying signals, if any are present (Figures C3, C7, C11). A smaller service was detected in the south of the zone, leading to a reservoir visible on satellite imagery. Magnetic disturbance from an extant electric fence has also been detected in the centre-east of Zone C.

9.2.1.5. Several undetermined anomalies have been detected across Zone C. Though the magnetic signals of these anomalies are ambiguous in nature, some of them may relate to possible archaeological activity; however, a natural origin is considered equally as likely (Figures C4, C8, C12). Several faint linear anomalies categorised as "Undetermined" have also been identified throughout the zone, the origins of which are uncertain; they may result from deliberate drainage or natural hill wash (Figures C8 and C12).

### 9.2.2. Interpretation of Magnetic Results – Specific Anomalies

9.2.2.1. **Archaeology Possible (Weak)** – Crossing five areas in the centre and south of Zone C is a long linear anomaly with a weak, positive magnetic signal **[4a, 6a, 12a, 1a, 8a]** (Figures C3, C7 and C14-C17). This linear anomaly measures a total of c.1.3km in length and may extend further beyond the bounds of the survey area. Approximately midway along the anomaly (in Area 12), a sharp shift in orientation has been recorded. The southern portion of the anomaly **[4a, 6a, 12a]** follows a southwest-northeast alignment, whereas its central portion **[1a, 8a]** shifts to being north-south orientated. Linear positive anomalies of this type are characteristic of ditches with enhanced fills. It has been categorised as "Archaeology Possible" due to the lack or corresponding features recorded on historic maps and current field boundaries. A lack of clear archaeological context in the surrounding areas prevented a confident "Archaeological Probable" classification. However, it is likely that this anomaly represents an early land division of unknown date and may be part of a larger system of landscape management which is not evident by examining Zone C in isolation. Zones E and F contain similar large-scale anomalies interpreted as boundary ditches or land divisions of some sort (see sections 11.2.2.3 and 12.2.2.7).

9.2.2.2. **Archaeology Possible (Weak) –** Two weakly positive linear anomalies, **[2a]**, located in the centre-west of Zone C (Area 2) have been identified abutting at an approximate 90-degree angle (Figures C18-C21). Although the shape formed by these anomalies may be indicative of an anthropogenic origin, the diffuse edges of the anomalies is more typical of anomalies of a natural origin instead.

9.2.2.3. **Magnetic Disturbance –** A series of discrete negative anomalies **[8b]** following a northwest to southeast alignment have been identified in Area 8, in the centre-south of Zone C (Figures C14-C17). The alignment extends for c.200m and each anomaly measures between 2 and 3m in diameter. The magnetic signal of these anomalies is unusual; however, they correspond with an extant electric fence present at the time of survey.

9.2.2.4. **Undetermined** – An almost square strong positive anomaly [**20a**] has been identified in the centre-south of Area 20 (Figures C6-C8). This shows a dipolar magnetic signal and measures c. 16mx33m. Given its proximity to broad anomalies natural in origin, [**20a**] may relate to natural processes as well; however, considered its angular shape, an archaeological origin cannot be entirely ruled out.

# 10. Reporting Zone D

## 10.1. Geographic Background

10.1.1. Zone D is located c.1.3km southeast of Worlington (Figure D1) and covers an area of 113.11ha. Survey was undertaken across eight fields, seven of which were under arable cultivation and one was undifferentiated grassland. Zone D is bounded by Golf Links Road to the north, the A11 to the east, and further fields to the south and west (Figure D1). It was not possible to survey c.0.37ha in Area 4 due to crop cover; c.0.61 ha in Area 6, as it was being used as an environmental set a side area and contained various ferrous obstacles, and c. 0.41 hectares in Area 7 due to large tractor ruts and multiple mounds of manure.

10.1.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Arable field with maize stubble sloping down towards the north. | Bounded on all sides by trees and hedgerow. |
| 2 | Arable field and sloped down to the north. | Bounded to the north, east and west by trees and hedgerow. A farm track ran along the southern boundary. Two large piles of sugar beet were located in the southern end of the field, rendering some small sections unsurveyable. |
| 3 | Fallow arable land that sloped down towards the southwest. The north of the area was covered by waist high scrub. The northernmost area was covered in large piles of manure that made sections unsurveyable. A thin strip of non-harvested maize was located along the western boundary of the field, and was also unsurveyable. | Bounded to the north, west and east by trees. The area was bound to the south by wooden fencing which separated the area from Newmarket Road. An extant barrow was located along the eastern boundary. Power lines ran across the area running from the south to the north parallel to the west boundary, and then turning to the east across the centre of the area to the eastern boundary. |
| 4 | Two, flat, ploughed fields with potato and maize stubble rests on surface, a few unharvested standing lines of maize were still present in the eastern and north-western edges boundaries and prevented survey.<br>The field was raised along the southeast boundary of the area and sloped down towards the west, centre and north of the field.<br>A concrete track ran north to south along the extent of the area, dividing the larger rectangular field in the east of | Bounded to the north by Golf Link Road, separated by hedgerow. On the west boundary of the field a small area was fenced off by metal fencing. Three boreholes were present near the centre of the field, aligned east-west. The extension of the field to the east was bounded to the south by a metal fence. |

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|---|---|---|
| | the survey area from the small square field to the west. | |
| 5 | Flat, undifferentiated grassland. Close to the perimeter of the north and south edges were deep tractor ruts, which prevented survey in some places. | Bounded on all sides by hedgerow and trees. The western edge borders Newmarket Road. |
| 6 | Flat, arable field consisting of young crop. | Bounded to the east by a farm track, and on all other sides by trees and hedgerow. A strip of unharvested maize crop and environmental set-aside near the southern boundary prevented survey in that area. |
| 7 | Flat, arable ploughed field. The south-eastern corner of the area was unsurveyable due to large tractor ruts and multiple mounds of manure. Standing water and boggy ground surrounded the tractor ruts. | Bounded on all sides by hedgerow and trees. |
| 8 | Arable field under fresh plough with a slope down to the north. | Bounded to the west and south by trees. The area was bound to the north by hedgerow which separated the area from Golf Links Road. The area was bound to the east by trees and hedgerow which separated the area from Newmarket Road and the A11. |

10.1.3. The underlying geology comprises chalk of the Holywell Nodular formation (undifferentiated) over the majority of Zone D; however, Area 1 as well as the eastern part of Areas 5 and 7 comprises chalk of the Zig Zag Formation. A narrow band of Melbourn rock member chalk separates the Zig Zag and Holywell formations. No superficial geology is recorded in the majority of Zone D (Areas 4, 7 and 8), with superficial deposits along the edges of the survey area. Superficial deposits of sands and gravels have been identified in the southeast of Zone D in Area 3. Along the north of Zone D in the northern edges of Areas 5 and 6 comprise river terrace deposits: sand and gravel. On the western boundary of Zone D along the southwest corner of Areas 1 and western edge of Area 2 are superficial deposits of clay, silt, sand and gravel (British Geological Survey, 2019).

10.1.4. The soils consist of freely draining lime-rich loamy soils across the majority of Zone D, with freely draining slightly sandy soils in Area 1. (Soilscapes, 2019).

## 10.2. Results

### 10.2.1. Summary

10.2.1.1. Reporting Zone D is located immediately west of the A11 and south of the Royal Worlington and Newmarket Golf Club, which is at the south-eastern end of the village of Worlington. Reporting Zone D has a variable magnetic background resulting from natural and anthropogenic processes. Within the most south eastern portion of the survey area within Zone D, a good example of the patterns resulting from water flow in the subsurface been identified (Figures D2 & D6), as outlined in section 6.2.5 above. Freely draining soils have allowed for the percolation of precipitates through to the bedrock interface, producing further variations in the depth of the soil-rock interface and further associated patterning.

10.2.1.2. Several modern services have been detected within this zone; the most obvious of which is evident running across the northern part of the site and produces a broad magnetic halo (Figure D3). Areas of former tree plantations contribute to a noisier background localised to the southwestern part of the zone (Figure D5).

10.2.1.3. The scheduled monument 'Bowl Barrow on Chalk Hill' (SM 1018097) is present within Area 3, located at the top of a hill within this area ([**3a**], Figure D8). While the monument itself could not be surveyed due to vegetation and the steeply sloping sides of the mound, the field, including the area immediately around the monument, was successfully surveyed. 660m north, and 630m north-northwest of the recorded Bowl Barrow two further ring ditch anomalies have been detected measuring c.25m and c.28m in diameter respectively ([**8a**] and [**8b**], Figure D8). These ring ditches may be part of a wider cluster of the bowl barrow monuments, as the scheduled monument listing suggests that the recorded barrow was the only visible survivor of a cluster of four barrows.

10.2.1.4. Two long linear anomalies were detected on a northeast-southwest orientation in Area 1 ([**1a**] and [**1b**], Figure D4). As no corresponding feature has been recorded on historic maps, they have been interpreted as having a possible archaeological origin.

10.2.1.5. Two partial inner and outer rings, with a further central anomaly with a strong signature, were identified in Area 7 ([**7a**], Figure D4). This set of anomalies, which appears to extend beyond the southern boundary of the field, is suggestive of a further ring ditch, possibly with a central feature and an inner ditch.

### 10.2.2. Interpretation of Magnetic Results – Specific Anomalies

10.2.2.1. **Possible Archaeology (Ditch Surrounding Bronze Age Round Barrow) -** A strong semi-circular anomaly [**3a**] measuring c.22m across, was identified towards the south of Area 3 (Figure D12). The anomaly curves around the southern extent of the scheduled monument 'Bowl Barrow on Chalk Hill' (SM 1018097), with the anomaly appearing to continue into the scheduled area. While the monument itself could not be surveyed due to vegetation and the steeply sloping sides, the area immediately surrounding it could be, and the resulting anomaly has been interpreted as a possible ditch associated with the barrow.

10.2.2.2. **Probable Archaeology (Ring Ditches) –** Located towards the northwest and northeast of Area 8 are two circular anomalies with a strong positive magnetic signal characteristic of ring ditches [**8a** and **8b**] (Figure D16). In the northwest of Area 8, **[8a]** has been identified close to the location of a ring ditch of unknown date identified by aerial photos in 1956 date listed on the Suffolk HER (MSF10199); **[8a]** has a diameter of approximately 30m. Both the HER listing and the detected ring ditch have diameters of c.30m. The HER location is offset by 24m from the detected anomaly but given the date (and thus the implied accuracy) of the HER observation this anomaly almost certainly relates to the same feature. In the northeast corner of Area 8, [**8b**] has a similar diameter, c.30m, though there is no accompanying record on the Suffolk HER. The two ring ditches identified in the geophysical data may be part of a wider cluster of bowl barrow monuments, connected with the scheduled monument 'Bowl Barrow on Chalk Hill' (SM 1018097) located in Area 3 ([**3a**], Figure D12). The scheduling entry of this monument suggests that that barrow was the only visible survivor of a cluster of four barrows. A further three discrete anomalies [**3b**], located immediately north of [**3a**], may be related to the same scheduled barrow (Figure D12).

10.2.2.3. **Possible Archaeology –** A semi-circular anomaly measuring c.35m across was identified at the southeast corner of Area 7 [**7a**] (Figure D20). The anomaly is fragmented and varies from strongly to weakly positive along its circumference, with a strong discrete anomaly within the centre of the partial ring. Also located within the ring are two other weak curvilinear anomalies, which appear to be slightly offset from the centre of the ring. The anomalies may be part of another ring ditch; however, the discontinuous nature of the anomalies may suggest another form of monument.

10.2.2.4. **Possible Archaeology –** A linear anomaly with a strong magnetic signal identified running in a northeast-southwest alignment across the southern part of Area 1 [**1a**] (Figure D24). The anomaly appears to be a ditch measuring c.220m in length. A second linear anomaly with similar characteristics **[1b]** is located immediately to the north with a slightly different orientation and a weaker magnetic signal. [**1b**] is approximately 300m in length. **[1a]** and **[1b]** are along the contours of the slope, rather than up and down it, and are therefore unlikely to be the result of field drains, nor are they aligned with any extant or historically recorded field systems. They have therefore been classified as possible archaeology. A similar but weaker curvilinear anomaly was identified in Area 4 [**4a**] (Figure D32). In Area 1, however, further weak linear anomalies were identified but as these may instead relate to agricultural activity they have been categorised as undetermined anomalies.

10.2.2.5. **Ridge and Furrow –** Several groups of long narrow parallel linear and curvilinear anomalies were identified in the southern half of the survey area in Areas 2, and 8, and across the centre of Area 1 (Figures D4 & D8). These have a spacing of approximately 8 to 10 metres and are therefore consistent with medieval or post-medieval ridge and furrow ploughing regimes.

10.2.2.6. **Agriculture (Strong/Weak) –** A conglomeration of strong magnetic responses lie within an oval shape located in the northwest section of Area 2 [**2a**] (Figure D28); the oval shape measures 50m in its north-west alignment and 37m west-east. It aligns with a former small unfenced area of deciduous wood and marshland shown on the 2nd edition OS map (Figure D5); these anomalies are therefore likely to be related to ground disturbance and in-filling related to tree removal. A strong curvilinear anomaly is recorded immediately to the south of the oval spread and appears to follow the southern boundary of the wood (as marked on the OS map). The anomaly may represent a former ditched boundary to the wood.

10.2.2.7. **Extraction –** A series of four large (between 8m and 30m diameter), amorphous discrete positive anomalies **[8c]** were identified running in line along the north eastern boundary of Area 8 (Figures D15, D16). Similar anomalies are present c.300m to the west near the centre of the northern boundary, and c. 250m to the south (Figures D15, D16). The 2nd edition OS maps clearly shows localised chalk extraction around this part of the survey area (Figure D9). A main chalk pit is marked on what is now the opposite side of the A11 to the south eastern tip of Area 8 and northeast of Area 3, and smaller extraction pits are marked sporadically across Chalk Hill. This supports the identification of such anomalies as possible extraction.

10.2.2.8. **Undetermined** – Located throughout Zone D, several discrete anomalies have been identified that return a positive magnetic signal, but with a negative response in the centre (as an example, see Figures D8-D10). This type of magnetic signal, with dipolar characteristics, usually suggests a ferrous origin. However, the signal is a-typical, being inverted when compared to a characteristic ferrous anomaly. Another possible origin of dipolar signals is an anomaly comprising burnt or fired material. Due to the unusual response of these anomalies, and the fact that they do appear to cluster to a degree, they have been categorised as “Undetermined” because they could represent anthropogenic activity. In addition, weakly positive linear anomalies have been detected (Figures D4, D8) which have also been classified as “Undetermined”. These linear anomalies may relate to natural or agricultural processes; however, an archaeological origin cannot be entirely ruled out.

# 11. Reporting Zone E

## 11.1. Geographic Background

11.1.1. Zone E is bisected by the A11 and is located c.1.3km west of Kennett (Figure E1) and covers an area of 135.59ha. Survey was undertaken across eight fields under arable cultivation. Zone E is bounded by the B1085 to the north, fields to the east, the A14 to the south and La Hogue Road to the west; the A11 bisects the Zone on a north to south alignment (Figure E1).

11.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Arable field under mature crop, gently sloped down to the north. | Bounded by a ditch to the north, woodland and a ditch to the east and the field continued to the south. The area was bounded by a hedgerow to the west which separated the area from the A11. |
| 2 | Flat, arable field, recently sown. The ground along the north of the area was very churned. | Bounded to the north and south by hedgerow, to the east and west by trees. The hedgerow to the north separated the area from the B1805. An aerial mast was noted in the north-eastern corner. |
| 3 | Arable field, recently ploughed in the east, and potato ridges in the west. Slopes were present down to the southeast in the south and east, and down to the northeast in the northeast of the field. An unsurveyable set-aside area was present in the south. | Bounded to the northeast, south and west by trees, and to the northwest and west by a track and further arable fields, and a piece of farming equipment was present in the field in the north. Bird feeders were present along the northern boundary, and a wooden structure present in the southeast corner. |
| 4 | Arable field, under a young OSR crop. A gentle slope up to the northeast is present in the southwest corner of the survey area. Set aside crops were present on the eastern and south-eastern boundaries. | Bounded to the north, east, south and west by trees and hedgerow, with the field continuing beyond the survey area to the southwest. A metal gate was present on the northern boundary, with bird pens, feeders and The field was crossed northwest to southeast by an overhead power line in the north-eastern corner. A mobile phone mast sat just outside the survey area in the north-western corner. A farm track ran along the northern boundary. |
| 5 | Flat, arable field under OSR crop. A small section of abandoned crop ran along the central eastern boundary. | Bounded to the north by trees and hedgerow and to the east and the north by trees. The area was separated from La Hogue Road on the western and southern boundaries by these hedgerows. |

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| 6 | Arable field under turnip crop that sloped gently down to the southwest. | Bounded to the north by trees and hedgerow, separating the area from Dane Hill Road. Bounded by a ditch to the southwest. The field continued beyond the survey area to the east and south. Power lines ran across the area in both an east-west and north-south orientation. |
| 7 | Flat, arable field under young OSR crop that sloped gently down to the south. | Bounded by hedgerow to the south and west which separated the area from Norwich Road and the A14 respectively. Bounded by woodland to the north and northeast. Bounded by temporary electric fencing to the east. |
| 8 | Flat, arable field under young sugar beet crop. | Bounded by trees to the north and south, by temporary electric fencing to the west with the field continuing to the east beyond the survey area. |

11.2.1. The underlying geology in all areas comprises undifferentiated Cretaceous chalk of the Holywell Nodular Chalk Formation and the New Pit Chalk Formation (British Geological Survey, 2019). The underlying superficial deposits consist of quaternary river terrace deposits in the north of the zone (Areas 1, 2, 3, 4, 5, 6 and 7), a band of head relating to subaerial slopes in the south (Area 7) and a thin band of diamicton from the Lowestoft Formation across the centre of the zone (Areas 1, 3, 4, 6 and 7).

11.2.2. The soils consist of freely draining, slightly acid sandy soils in the north of the zone (Areas 2, 4 and 6) and freely draining, slightly acid but base-rich soils throughout the rest of the areas (Soilscapes, 2019).

## 11.3. Results

### 11.3.1. Summary

11.3.1.1. Reporting Zone E is bisected by the A11 and is located c.1.3km east of Chippenham and c.910m west of Kennet. In the northwest corner of Zone E, evidence of archaeological activity has been identified. Although this area is adjacent to an area of fenland (similar to Zone C) and would thus presumably have been wet, or prone to flooding in the past, evidence of possible settlement activity has been identified in the form of a concentration of small enclosures with other associated anomalies. These are located uphill from the former marshy landscape. Further east within the same field, linear ditch-like features have been detected which respect local topography towards the fenland. Features like this are suggestive of attempts to manage seasonal flooding/ wetting, using long drainage ditches, to divert water away from the smaller enclosures, or to separate grazing in the marshes from other agricultural activity (Figure E5).

11.3.1.2. Crossing the northern end of the zone east to west, broad bands of strongly enhanced natural deposits have been identified (Figures E2, E4), as well as in the southern-most area (Figures E10, E12). With limited topographic variation throughout this zone it is likely these anomalies are caused by fine grained

sediments preferentially deposited within imperfections or dissolution features in the surface of the shallow bedrock, as described in section 6.2.5 above. Compared to other parts of the zone, there is a higher density of Neolithic finds in these fields (CHER10230, CHER10229, CHER10261, CHER07919, CHER10228), which also suggests an erosive environment exposing material for detection at the surface.

11.3.1.3. Similar to the long linear anomaly identified in Zone C ([**4a, 6a, 12a, 1a, 8a**], Figures C3, C7), a further positive linear anomaly has been identified in the western half of Zone E (Figure E4). This anomaly runs 218m in a northeast to southwest alignment before turning north and extending a further 216m. Again, this survey has not defined the full extent of the anomaly as it appears to extend beyond the survey extent. In this case, a linear anomaly on the same alignment is present c.260m southwest in the northeast field of Zone F (Figure F16). Establishing a clear connection between the two anomalies is not possible due to the un-surveyed field between them, but a projected course of the ditches suggests a correlation. Historic maps show no corresponding feature for either of the anomalies, so these have been interpreted as being archaeological in origin.

11.3.1.4. An area of short linear positive anomalies forming possible enclosures appears to be contained within a rectilinear boundary covering a 1.7ha area (Figure E4). These are located c. 360m to the west of the long, linear ditch anomaly. The boundary surrounding the area is incomplete but has a possible double ditch element to its southwestern extent. A smaller potential enclosure measuring c. 34m x 33m was identified inside or potentially abutting the ditch of the outer enclosure. Within this area, multiple fragmentary linear and curvilinear anomalies are visible, along with discrete positive anomalies which may be pits. The strongly contrasting magnetic background here means that it is difficult to suggest a date for this settlement area, as the anomalies of archaeological interest cannot be clearly distinguished.

11.3.1.5. In the eastern and southern areas, two former extraction pits were identified, along with the infill material from a former pond. The detected anomalies correspond to locations identified on 2$^{nd}$ edition OS mapping (Figures E9 & E13).

11.3.1.6. Trends relating to modern ploughing have been detected across the zone, with further agricultural activity in the form of drainage features detected in one of the eastern areas (Figure E8).

11.3.1.7. In addition to the anomalies of possible archaeological origin, Zone E contains two sections of buried service, which produce broad magnetic halos that obscure any weaker underlying signals. A smaller service was also detected in the north-western edge of the zone. In the southern area of Zone E, a notable wide band of magnetic material was detected running through the centre of the area, oriented north-south (Figure E12). This is most likely related to the spreading of modern green waste material across this section of the field, which suggests at one time this large southern field was further subdivided. Around the edges of a number of

the fields, weak and closely spaced linear trends follow the route of the current boundary; these are indicative of repeated tractor movements.

### 11.3.2. Interpretation of Magnetic Results – Specific Anomalies

11.3.2.1. **Archaeology Probable (Strong/Weak)** – In the northwest of Area 2, a group of magnetically enhanced linear anomalies covering an area of approximately 1.7ha [**2a**] have been identified that appear to define a large rectilinear enclosure (Figure E16). This outer enclosure measures c. 150m x 100m, abutting the western perimeter of the survey area, and may well extend beyond it. The southwestern boundary appears to have a second parallel ditch. A group of anomalies sharing similar characteristics have been detected c.300m southwest of this [**2a**] in Zone F (see section 12.2.2.12). Within enclosure [**2a**], further anomalies interpreted as ditches and discrete pit-like anomalies have also been detected. Interpretation of the internal features of [**2a**] has been complicated by the geological formations detected which cover a large portion of Area 2 and are of a similar or stronger enhancement thus masking the archaeology. The most distinct feature within the enclosure is a smaller rectangular enclosure [**2b**], located in the east of the larger enclosure, which measures c. 33m x 34m.

11.3.2.2. **Archaeology Possible (Strong/ Weak)** - In the northwest of Area 2, a group of strong and weak fragmented linear anomalies have been identified [**2f**] (Figure E16). These anomalies lie immediately north of [**2a**] and south of a service line, this position, and a slight change in alignment to the anomalies at [**2a**] render their archaeological provenance less certain, hence the "Archaeology Possible" classification.

11.3.2.3. **Archaeology Probable/ Possible (Weak)** – In the eastern end of Area 2, two 200m-long linear anomalies [**2c**] have been identified (Figure E20). They propagate from the northern and southern boundaries to almost meet in the centre of the field. The linear ditch-type anomalies have been categorised as "Archaeology Probable" because they have not been identified on historic maps and do not respect modern or historic boundaries. It is possible that these anomalies reflect a larger system of landscape management which is not evident by examining Zone E in isolation; Zone C and Zone F contains similar large-scale ditch-like anomalies (see sections 9.2.2.1 and 12.2.2.7 respectively), one of which, in Zone F, is located only c.260m southwest of the southernmost extent of [**2c**] and follows a similar alignment. In Area 7, anomalies have been identified on a similar scale to [**2c**], however these anomalies, [**7a**], have much weaker magnetic signals and have been classified as "Archaeology Possible" due to the complications posed by the underlying geology (Figure 32). Those in Area 7 extend c. 400m and c. 150m, forming a 'T' shape indicative of land division features.

11.3.2.4. **Archaeology Possible (Strong/Weak)** –In the north of Area 6, weak linear and curvilinear anomalies have been identified [**6a**] (Figure E24). What has been detected does not have a diagnostic shape because proximity to the field boundary and the fragmentary nature of the anomalies has limited interpretation. As such,

these may relate to enclosures of archaeologically significant date, or they may have more recent agricultural origins.

11.3.2.5. **Ferrous/Debris (Spread)** – In the northern end of Area 1, a concentration of strongly dipolar anomalies was detected at the location of a former pond [**1a**], identified on 2nd edition OS maps (Figure E9). The dipolar anomalies indicate that the former pond has been backfilled with a mixed material with either a high ferrous content or perhaps using ceramic building materials.

11.3.2.6. **Extraction** – Along the western boundary of Area 1, the west of Area 2 and in the west of Area 7, two further concentrations of strongly dipolar anomalies were detected [**1b, 2e** & **7b**] (Figures E20, E24 & E28). These anomalies correspond with the locations of extraction activity identified on 2nd edition OS maps, with **7b** labelled as an 'Old Sand Pit' (Figures E9 & E13). These anomalies are very similar in magnetic signal to those identified in Area 1 [**1a**] indicating that both the extraction pits and the pond were backfilled with a similar mixed material.

11.3.2.7. **Undetermined** – Located throughout Zone E, several discrete anomalies have been identified that return a positive magnetic signal, but with a negative response in the centre (as an example, see Area 1, Figures E23-25). This type of magnetic signal, with dipolar characteristics, usually suggests a ferrous origin. However, the signal is a-typical, being inverted when compared to a characteristic ferrous anomaly. Another possible origin of dipolar signals is an anomaly comprising burnt or fired material. Due to the unusual response of these anomalies, and the fact that they do appear to cluster to a degree, they have been categorised as "Undetermined" because they could represent anthropogenic activity. In addition, weakly positive linear anomalies have been detected (Figures E8, E12) which have also been classified as "Undetermined". These linear anomalies may relate to natural or agricultural processes; however, an archaeological origin cannot be entirely ruled out.

# 12. Reporting Zone F

## 12.1. Geographic Background

12.1.1. Zone F is located c.0.5km east of Snailwell (Figure F1) and covers an area of 304.1ha. Survey was undertaken across seventeen fields, eight of which were under arable cultivation, with a further three left fallow. Six were pasture or undifferentiated grassland at the time of survey. Zone F is bounded by further fields to the north, La Hogue Road to the east, the A11 and A14 to the south and by a farm track to the west (Figure F1).

12.1.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Flat, arable field with short cereal crop. | Bounded on all sides by trees and hedgerow, with occasional breaks for access to other adjoining fields. Overhead electrical lines and respective telegraph poles ran across the area in a northeast-southwest orientation. A bird scarer was located in the field close to the eastern end of the field. |
| 2 | Flat, fallow area of arable land. | Bounded to the northeast and northwest by hedgerow and to the southeast and southwest by dirt trackways. Overhead electrical lines and respective telegraph poles ran across the area in a north-south orientation. |
| 3 | Arable field under short cereal stubble that sloped gently down to the southwest at the southern end of the area, and gently down to the northeast in the northeast of the area. | Bounded by trees and hedgerow to the north, northeast, southeast and southwest. A change in crop from stubble to plough demarked a field boundary to the south. |
| 4 | Flat, arable field with young wheat crop. | Bounded by hedgerow to the north and west, with a farm track forming the eastern boundary. A bird scarer was located in the field close to the north-western boundary. |
| 5 | Pasture grassland. A small ridge ran across the centre of the field in a northwest to southeast orientation. | Bounded by metal fencing on all sides. |
| 6 | Flat, arable field consisting of fallow stubble. | Bounded on all sides by hedgerow. A track ran along the south-eastern boundary of the area. Powerlines ran inside the hedgerow on the south-eastern boundary. The area was separated from La Hogue Road to the northeast by the hedgerow-lined boundary. |
| 7 | Flat, pasture grassland. | Bounded by metal fencing on all sides. |
| 8 | Flat, pasture grassland. A slight ridge ran across the field in a northwest-southeast orientation. | Bounded by metal fencing on all sides. A metal trailer and two feeding troughs were located in the north-western end of the field. |

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| 9 | Pasture grassland with a slight slope down to south corner. | Bounded by metal fencing on all sides. Four large metal feeders were located in the western corner. |
| 10 | Flat, pasture grassland. | Bounded by a farm track to the southwest and hedgerow/trees on all other boundaries. |
| 11 | Arable field consisting of low, newly seeded cereal crop. The field gently sloped down towards the south. A small square in the southwest corner was unsurveyable due to high crop. | Bounded by a hedgerow to the northeast and trees to the west. The area was separated from the A11 by wooden fencing along the southern boundary. A metallic bird scarer was situated along the western boundary. A small weather station was located along the south boundary. |
| 12 | Flat, pasture grassland, with grazing sheep within an electric fence line to the west of the area. Two small areas of overgrown grass and weeds were located along the northern and eastern perimeters. | Bounded by woodland to the northeast and northwest, wooden fencing to the south, a hedgerow to the west, and a farm track to the east. Farm outbuildings with large wood stacks were located towards the northeast corner of the area. |
| 13 | Fallow arable land, with the southeast and southwest part of the field left as undifferentiated grassland. Deep tractor ruts ran along the southwest boundary, making the very edge of the field unsurveyable. | Bounded to the northeast, northwest and southeast by hedgerow. It was bounded by wooden fencing to the southwest, separating the area from the A11. A large metal barn and fertiliser storage tank were present in the northwest corner. |
| 14 | Arable field of harvested potato crop in the northwest and southeast of the field with the central area recently sown. The southwest corner of the field was ploughed northwest to southeast in contrast to the rest of the field. Areas in the centre of the field were unsurveyable due to deep ruts and boggy conditions. | Bounded to the northeast by a track and treeline, to the southeast by a farm track and hedgerow/trees, to the southwest by a hedgerow, a copse and a further field and the northwest by hedgerow/ trees. |
| 15 | Arable field that had been freshly sown. | Bounded by hedgerow to the east, hedgerow and fencing to the north, trees and a ditch to the west, and a copse of trees to the south. A short grass track ran along the southern and western boundary, with patches of longer grass along the western track. |
| 17 | Arable field of harvested potato crop. The entrance into the field on the western end of the field was unsurveyable due to deep ruts holding water. The north end was unsurveyable for the | Bounded on all sides by hedgerow. The field was crossed on the eastern edge by a telephone line running roughly north to south. |

| | | |
|---|---|---|
| | same reason. Multiple areas of the field were deemed unsurveyable due to deep ruts holding water including a large area towards the southern end of the field. | |
| 18 | Flat, arable field under young crop. | The field continued to the northwest where a change in ground cover demarked a field boundary. The remainder of the area was bounded by hedgerow and trees. |

12.1.3. The underlying geology comprises chalk of the Holywell Nodular Chalk Formation and New Pit Chalk Formation. Superficial deposits of river terrace sands and gravels have been identified in the northeast and north edge of the western extent of Zone F (Areas 1, 2, 5, 6, 7, 9, 10, 12, 14, 15, 16, 17, 20, 21, 22), and in the northern tip of Area 6, diamicton of the Lowestoft formation is recorded. No superficial geology is recorded within Areas 8, 11 and 18 (British Geological Survey, 2019).

12.1.4. There is freely draining slightly acid but base-rich soil across the majority of Zone F, with shallow lime-rich soils over chalk or limestone recorded across the central part of Area 11, southern part of Area 14 and the southwest and southeast edges of Area 12 (Soilscapes, 2019).

## 12.2. Results

### 12.2.1. Summary

12.2.1.1. Reporting Zone F comprises land immediately north of the A11 and A14, and to the east of Snailwell. The results within this zone are relatively complex, due to the presence of anthropogenic activity and various different geologies related to geomorphological processes, which have had impacts on each other. In historic maps of the area, the exploitation of the natural environment is evident from the record of plantations, farms and extraction pits within the immediate vicinity. The former RAF Snailwell was located, in part, in the southern extent of the zone. Concentrated areas of ferrous and debris spread correspond with features associated with RAF Snailwell and demolished farms recorded on historic OS maps. The scheduled Chippenham Barrow Cemetery (MCB8995) extends into the northeast part of the zone as well (Figure F1), with 4 scheduled areas associated with four round barrows within Area 13.

12.2.1.2. Where there is background superficial geology within Zone F, it is comprised predominantly of sand and gravel river terrace deposits, which results in the banded 'Natural- General' anomalies as described in section 6.2.5. In areas without superficial deposits, and particularly towards the southern part of the zone, widespread linear patterns (Figure F6) relate to the local landforms and result from the processes associated with 'Natural – Infill' and 'Natural – Dissolution' patterns described in 6.2.5. Drainage and waterlogging of flatter, low laying areas may have influenced the location of settlement within this zone, with areas of archaeology

apparently preferentially occurring on higher-lying river terrace deposits of sand and gravel, suggesting the freely draining nature of these deposits produced a favourable environment.

12.2.1.3. A series of ditches, large rectangular enclosures, and small rectilinear enclosures were detected abutting the field edge immediately south of Foxburrow Plantation and covering an area of approximately 2.5ha (Figure F5). These features occur in the location of undated enclosures recorded in the HER database interpreted from cropmarks (CHER09027).

12.2.1.4. Some of the northwest-southeast aligned ditches appear to extend through the copse between Areas 7 and 3 (a former airstrip during the life of RAF Snailwell) into the field to the south (Area 3, **Error! Reference source not found.**F4), where further multi-phase archaeological activity has been identified. This takes the form of a series of linked rectilinear enclosures, with overlapping features, arranged in two rows either side of a wide (40m - 50m) gap. These enclosures, with associated pits and larger components of a field system cover at least 5ha. A curving band of ferrous/debris spread across the northern, eastern, and western end of the same field is remnant material associated with RAF Snailwell, but beyond this, the impact of the airfield is relatively minimal.

12.2.1.5. There is an apparent continuation of some of the ditches and enclosures in the northern part of the field into the field further south, which abuts the former avenue leading to the pleasure grounds associated with Chippenham Hall (Figure F9). These appear to form or are incorporated within a larger wider field system, which continues into the southern part of Zone F (**Error! Reference source not found.**F8) where a drove or trackway is evident.

12.2.1.6. In the northern-most corner of the zone, a further, smaller series of enclosures was detected (Figure F16). These are situated next to an area of background patterning similar to those identified in the southwest end of the zone discussed above (Figure F8). The similarities in size and form suggests another instance of later Prehistoric settlement activity, covering approximately 1ha.

12.2.1.7. The character of the natural background changes moving into the south and south-eastern parts of Zone F where topography has influenced the deposition and transportation of sediment (**Error! Reference source not found.**F6). A series of parallel, regularly spaced linear anomalies occur on a similar direction to the flow-based background patterning but are indicative of historic agricultural activity, possibly strip fields or widely spaced ridge and furrow. These occur on a different alignment to a potential irregularly shaped enclosure, which is defined by very narrow ditches within the complex geological formations. At the eastern end of this topographically dependant flow-based patterning is a single isolated ring ditch, c. 19m in diameter (Figures F12 & F52). Due to its isolated nature, a funerary origin, as opposed to a domestic one, is suggested. This possible barrow is located 654m to the southwest of a larger barrow, c. 28m in diameter, which is part of the Chippenham barrow cemetery (DCB237) in the north-eastern part of Zone F

(Figures F12 & F56). In the neighbouring field immediately to the northwest, a second isolated ring ditch (c. 13m in diameter) was identified as being another possible barrow situated c. 879m west of the aforementioned larger barrow within the barrow cemetery (Figures F12 & F44).

12.2.1.8. One of the known barrows associated with the scheduled Chippenham barrow cemetery site was detected as a clear circular anomaly with wider ditches than other ring ditches detected elsewhere in the zone (Figures F1, F55 & F56). No further similar anomalies can be correlated with the relative location of the other scheduled barrows. The circular formations to the northwest of the clearly defined barrow are more indicative of the natural transportation and deposition of magnetically enhanced sediments within the soil. Further positive anomalies to the north of the barrow are indicative of ditches, forming possible enclosures abutting a trackway like feature (Figure F56).

12.2.1.9. Two further circular anomalies were detected approximately 860m to the northwest of the Chippenham barrow cemetery in the northern end of Zone F, on an area of fluvially influenced bedrock and superficial geology (**Error! Reference source not found.**F16). The northern of the two circular anomalies measures c. 29m in diameter, which is a similar size to one of the Chippenham barrows to the southeast, which suggests another funerary moment. The southern circular anomaly is larger in size, c. 37m in diameter and appears to be contained within a rectangular enclosure which measures c. 57m x 47m in size. The orientation of the rectangular enclosure occurs on a similar alignment to a curvilinear ditch immediately south. This ditch extends northwest to southeast through the centre of the northern part of Zone F, where it appears to link up to two parallel ditches indicative of a trackway within a field system (Figures F16 & F36). The relative phasing of these features is uncertain, particularly for the enclosed c. 37m diameter circular anomaly, which also has closely associated discrete positive anomalies interpreted as probable pits.

12.2.1.10. The wider landscape also includes further long linear anomalies, only a few of which can be associated with mapped former boundaries. To the north of the former RAF Snailwell, a long negative anomaly was detected that extends on a northwest-southeast alignment (Figure F3). This corresponds with the location and orientation of a broad cropmark identified as medieval furlong boundaries (CHER10286).

12.2.1.11. An isolated ditch on a northwest to southeast alignment was detected in the zone to the west, but is hard to discern from the surrounding fluvial geology (**Error! Reference source not found.**16). It is possible other similar but less extensive features have been detected but due to their similarity to the rill-based anomalies, they might not have been identified in the interpretation. This, and other similar anomalies have been interpreted as large scale land divisions of an uncertain date.

### 12.2.2. Interpretation of Magnetic Results – Specific Anomalies West & Southwest (Figures 18 -33)

12.2.2.1. **Probable/Possible Archaeology (Settlement, Enclosures)** – In the northeast of Areas 7 and 9 [**7a & 9a**] (Figure F20) is a group of linear anomalies that define a series of rectangular enclosures of various sizes, covering approximately 2.5ha. The detected enclosure features range in size from c. 25 x 35m to c. 65m x 95m. These abut the perimeter of the survey area and may well extend beyond it. Weak curvilinear anomalies within the central part of the rectilinear enclosures are suggestive of small ring ditches [**7b**]. The relatively small diameter of c. 14m (compared with the larger ring ditches described below in section 12.2.2.8) are typical of features of late prehistoric settlements, rather than funerary monuments. This, and their association with other anomalies including discrete positive anomalies, interpreted as pits, suggests this complex is a settlement dating to later prehistory or the roman period. As with the anomalies identified in Area 3 (described below, see section 12.2.2.3), the rectangular and linear anomalies overlap each other suggesting that these features represent multiple phases of activity (Figure F19). One northwest-southeast aligned ditch **[7c]** also appears to extend through the copse into Area 3 to the south (Figure 20), suggesting a potential relationship between the two areas of settlement activity. There are also possible relationships with land divisions associated with the plantation that lies to the northeast of this complex of anomalies, and some of the straighter and more sharply defined ditches may be more recent. While there are no mapped features on historic OS maps that correlate with these enclosures, one of the ditches of a smaller rectilinear enclosures occurs in-line with one of the former land divisions associated with the plantation (Figure F5). While this could suggest a potential link between the two, the chronology of these features is difficult to phase. Excavations immediately north at Foxburrow Plantation recorded Iron Age settlement, but the relative period(s) for the larger, more rectangular enclosures is unclear. One of the straighter ditches appears to have a distinct ‘dog leg’, which suggests a possibly more recent origin.

12.2.2.2. **Possible Archaeology** – A long linear, negative anomaly characteristic of an earthwork feature was identified crossing Areas 5 and 8 [**5a & 8a**] (Figure F24). The location of the anomaly (aligned northwest-southeast) correlates with a broad cropmark previously identified as medieval furlong boundaries (CHER10286) and runs for c. 378m. As such it has been characterised as possible archaeology. The cropmark is described as an earthwork feature, which would account for its negative signal in the magnetic results. Cut features (e.g. ditches) generally exhibit a positive signal because the filling material is enhanced compared to the surrounding soil. Banks might conversely appear as a negative, especially if they are made from relatively unenhanced subsoil, which results in a negative contrast with the local topsoil. A sub-rectangular enclosure appears to abut the linear feature. This shows a faint positive magnetic signal and measures approximately

38m by 23 m. The enclosure is not indicative of any particular period therefore it is not possible to infer a date for it, though it relates to the furlong boundary in some way.

12.2.2.3. **Probable/Possible Archaeology (Settlement, Enclosures)** – Located in Area 3 but extending southward into the northeast corner of Area 18 (Figures F28 & F32), are a series of linear and rectilinear anomalies [**3a, 3b, 3c, 3d, 3e & 18a**]. A central group of anomalies **[3a]** is aligned broadly northeast-southwest and forms a series of overlapping rectilinear enclosures that vary considerably in size (from c.8m x 15m to c. 50m x 60m), suggesting multiple phases. Around and within these enclosures are discrete positive anomalies suggestive of pits, though interpretation of these is complicated by the nearby flow-based background patterning, as well as the presence of RAF Snailwell. The anomalies that comprise **[3a]** show a degree of increased enhancement by comparison to other nearby archaeological anomalies, likely as a result of the 'habitation effect' (where long-term occupation causes stronger anthropogenic magnetic enhancement of nearby features). Approximately 60m to the east of **[3a]** is a smaller group of positive linear anomalies **[3b]** that form a large rectilinear enclosure on a slightly different alignment. This enclosure is subdivided into a series of smaller cells. Taken overall, the morphology of the enclosures suggests a date in the Iron Age or Roman period.

12.2.2.4. **Probable/Possible Archaeology (Possible Stock Enclosures) –** To the northeast and southwest of the enclosure groups **[3a, 3b]** and connected to them by a number of linear ditch-like anomalies are several larger enclosures **[3c, 3d, 3e]** (Figures F28 & F32). **[3c]** lies near the western corner of Area 3, measures approximately 50m across, and extends northwest to the survey boundary (Figure F28). It is linked to **[3a]** by a pair of dog-legged linear ditch-like anomalies which run exactly parallel to each other, apparently defining a trackway. On the edge that abuts the trackway, the boundary ditch of **[3c]** forms an in-turned entrance. Two more linear ditch-like anomalies extend southwest from **[3c]** to the field boundary and likely continue beyond it. **[3d]** lies in the southern corner of Area 3 and is comprised of a group of intercutting positive linear ditch-like anomalies that form an enclosure complex that measures approximately 130m by 230m (Figure F28). This enclosure complex lacks visible archaeological anomalies across its centre where the magnetic response is dominated by variations within the superficial geology. **[3d]** encloses a number of magnetically enhanced discrete anomalies; these suggest pit-like features, though given the geological disturbance in this area, a natural origin for these cannot be ruled out. In the northeast corner of Area 3 and extending southeast into Area 18 is a final enclosure group **[3e, 18a]** which is aligned northwest- southeast (Figure F32). Its south-western boundary appears to respect the alignment of the adjacent boundary of **[3b]**.

12.2.2.5. **Possible Archaeology (Ring ditch)** An anomaly **[3f]** within the northernmost cell of **[3b]** is of a similar scale and magnetic strength to the underlying geological anomalies but shows a much greater degree of circularity, suggesting a potential

anthropogenic origin. Given the difficulty of differentiating it from the geological anomalies, it has been classified as 'possible archaeology' (Figure F32).

12.2.2.6. **Ferrous/Debris (Spread)** – Running along the northwest and northeast boundaries of Area 3 is a curvilinear band of concentrated small dipolar anomalies [**3g**] (Figure F32), typically produced by debris containing ferrous or other magnetic material. This band of ferrous debris corresponds with a mapped section of the former airfield of RAF Snailwell and is further confirmed by its clear alignment with aerial photographs of the airfield extent from 1945 (Google Earth 2020). It is likely caused by the remnants of a removed road / taxiway.

### South (Figures F38 – F53)

12.2.2.7. **Probable/Possible Archaeology (Land Divisions)** – Across the majority of Zone F (aside from Areas 4 and 12), evidence for a wider complex of land divisions has been identified (Figures F4, F8, F12 & F16). The linear anomalies, interpreted as boundary ditches, range across the survey area and have been classified as archaeology where corresponding boundaries have not been identified on historic maps, and where they also do not align with or otherwise correspond to extant or historic boundaries. These linear anomalies vary in strength across the zone, with weaker examples identified in the northwest end of Area 1 [**1e**] (Figures F35 & F36). They also extend into the western corner of Area 15 where negative linear anomalies have also been detected [**15a**]. A separate, isolated, larger rectilinear enclosure in Area 11 [**11a**] does not appear to directly connect with the land divisions immediately to the north [**11b**] (Figure F40), which continue into Area 14 to the northeast [**14a**] (Figure F44) as well as Area 18 to the west. In the southern part of Area 18, **[14a]** joins a second linear anomaly to form a trackway **[18b]** that extends to the survey boundary to the southwest (Figure F48). Together, the multiple orientations, the differences in morphology and the varying anomaly strengths suggest a multi-period palimpsest of land divisions and organisational schemes, pointing to long-term agricultural management of the landscape.

12.2.2.8. **Probable Archaeology (Ring Ditch) –** In the southern part of Area 12 there is a positive circular ditch-like anomaly **[12a]** (Figure F52) similar in size and shape to those recorded elsewhere in the survey (see section 12.2.2.8) and to those recorded as part of the Chippenham Barrow Cemetery c. 250m to the northeast. In the southern part of Area 14 is a smaller ring ditch **[14b]** (Figure F44). Unlike other examples in Zone F, **[14b]** presents as a discontinuous anomaly, possibly suggesting a segmented construction.

12.2.2.9. **Undetermined (Strong)** - Located mainly in the northeast of Zone F, with only a few in the south, several discrete anomalies have been identified that return a positive magnetic signal, but with a negative response in the centre. This type of magnetic signal, with dipolar characteristics, usually suggests a ferrous origin. However, the signal is a-typical, being inverted when compared to a characteristic ferrous anomaly. Another possible origin of dipolar signals is an anomaly comprising burnt or fired material. Due to the unusual response of these anomalies, and the fact that they do appear to cluster to a degree, they have been

categorised as undetermined (Figures 52, 56 & 60) because they could represent anthropogenic activity.

## North-East (Figures F34-F37, F54 – F65)

12.2.2.10. **Probable Archaeology (Barrows and Rectilinear Enclosures)** – In the southern end of Area 13, a clear circular anomaly has been identified [**13a**], measuring c. 26m in diameter, and with broader ditches than others identified within Zone F (Figure F56). Unlike the sub-circular geological anomalies in this area, **[13a]** forms a complete ring, and has a consistent width and magnetic strength. The anomaly correlates with the location of one of the barrows associated with the scheduled Chippenham barrow cemetery (MCB8995. In the eastern end of Area 1, two circular ditch-like anomalies have been identified [**1a & 1b**] (Figure F60). These are similar in size to the barrow to the south **[13a**], and the Chippenham barrows (located c. 860m further southeast), and have no apparent entrance, which would suggest these features are similarly funerary in origin. The second circular anomaly **[1b**] is enclosed within a rectilinear enclosure **[1c**] which also contains discrete positive anomalies interpreted as pits. The presence of a ferrous anomaly along the circuit of the ring ditch makes it difficult to discern whether or not it has an 'entrance'. There are no other similar combinations of anomalies in this zone, and so an interpretation is more difficult to arrive it, but it seems likely this is also part of the funerary landscape that encompasses the barrow cemetery. However, the overall relationship and phasing of these features is uncertain. A rectangular enclosure **[1f]** has been identified immediately west of **[1a]**, **[1b]** and **[1c]**. It exhibits a very faint positive magnetic signal, mostly visible in the Total Field data (Figures F14, F16, F 58, F60). It measures c.91m by 40m and appears to have a possible entrance on each of the short sides. The form of this enclosure is not indicative of a particular period; nevertheless, the overlapping of **[1f]** and **[1c]** suggests these are not contemporary.

12.2.2.11. **Probable Archaeology (Linear Features and Trackway) –** In the northern half of Area 1 are a series of weak positive linear anomalies **[1d]** that suggest partial rectilinear ditched enclosures (Figure F36). These are somewhat scattered and comparatively weak, and it is therefore difficult to determine whether they are the result of smaller settlement enclosures that have only been partially preserved or detected, or form part of larger land divisions. Some of these linear features **[1e]** run parallel to each other in a southwest to northeast direction towards the settlement enclosures in Area 15 (see 12.2.2.12); these may form part of a trackway associated with the settlement.

12.2.2.12. **Probable/Possible Archaeology (Enclosures)** – At the northern end of Area 15, a further series of rectilinear enclosures [**15b**] and a smaller circular anomaly [**15c**] were detected (Figure F64). The magnetically enhanced ditch-type anomalies are similar to those identified c. 1.8km to the southwest in Area 3 (Figure F32). A small ring ditch measuring c. 9m in diameter [**15c**] is also similar in size to those identified in Area 7 ([**7a**], see section 12.2.2.1, Figure F20) c. 1.8km to the southwest, as well as being located in close proximity to small rectilinear enclosures. This also

suggests a possible domestic origin for these features, with characteristics typical of late prehistoric settlement activity. A number of enhanced discrete, positive anomalies interpreted as pits are present in close association with these enclosures [**15d**] (Figure F64). As is the case elsewhere within the Zone, interpretation of these is complicated by nearby geological and pedological formations (Figure F62). One band [**15d**] of these discrete anomalies extends northwards towards the survey boundary; these are particularly enhanced and could represent archaeological pits, geological dissolution hollows containing magnetically enhanced material from the nearby settlement, or chalk extraction pits of the sort recorded elsewhere within the Zone. Extending eastwards from one of the ditch-like anomalies that make up [**15b**] is a more amorphous group of anomalies [**15e**]. These are more clearly similar to the nearby geological anomalies but follow the same alignment as some of the more clearly archaeological linear features, suggesting that the latter may have made use of existing landscape features.

12.2.2.13. **Undetermined** – Anomalies [**6a**] and [**15f**], which exhibit a very strong positive magnetic signal, have been identified in Areas 6 and 15 (Figures F62-F65). Due to their shapes being a-typical, these have been marked as “Undetermined”. They may be anthropogenic in origin however a natural origin cannot be ruled out.

# 13. Reporting Zone G

## 13.1. Geographic Background

13.1.1. Zone G is located c.1.1km northwest of Snailwell from (NGR: TL 63909 68757) and covers an area of 60.5ha (Figure G1). Survey was undertaken across seven fields, five of which were pasture or undifferentiated grassland, and two were arable at the time of survey. Zone G is bounded by the River Snail to the west, Fordham Road to the south, farm tracks to the east and a small wooded area bordering further fields to the north (Figure G1). It was not possible to survey a c.2.1ha area due to overgrown vegetation in Areas 5 and 6, waterlogging in Areas 1, 3 and 7, and to the presence of young trees in Areas 3 and 4.

13.1.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Flat, pasture grassland. | Bounded by hedgerow and trees to the north, east and west, with a boggy ditch forming the western boundary. A tree and metal trough were located within the survey area. |
| 2 | Flat, pasture grassland. | Bounded by trees to the north, a wire fence to the northwest, and a boggy ditch to the west and southeast. Multiple trees were located in the survey area and earthwork features were noted crossing the field north-south. |
| 3 | Flat, undifferentiated grassland with occasional waterlogged ground. | Bounded by hedgerow and occasional ditches to the south, east and west. The area was bound by trees to the north. The hedgerow to the west separated the area from the Rover Snail. There was a machinery along the western boundary. There were several areas of waterlogged ground that were deemed unsurveyable. |
| 4 | Flat, undifferentiated grassland. | Bounded by a ditch to the southeast and south, trees to the west, with the field continuing to the north. An area of c.1ha along the western boundary was not surveyed due to the presence of young trees. |
| 5 | Generally flat, pasture grassland. Several ridges were noted in the area likely natural gullies. | Bounded by wire fencing and trees to the east, west and north. The area was bounded by widely spaced trees to the south. |
| 6 | Undulating arable field, under a young wheat crop. | Bounded by hedgerow to the northeast and east, a farm track to the south and west, with the field continuing to the northwest. |
| 7 | Flat, arable ploughed field. The plough was occasionally cross cutting, making the survey surface especially bumpy. | Bounded by hedgerow and trees to the east and west, areas of high scrub to the north and south and the field continued to the northwest. |

13.1.3. The underlying geology comprises chalk of the zig zag formation over the majority of Zone G; however, Area 7 to the east of the zone also comprises chalk of the Holywell nodular formation and new pit chalk formation (undifferentiated). A narrow band of Melbourn rock member chalk separates the zig zag and Holywell formations. Superficial geology recorded in Areas 1, 2, 3, 5 and the south of 6 comprise alluvium: clay, silt, sand and gravel. In the northwest of Area 4, and the northern tip of Area 6 peat deposits are recorded. No superficial geology is recorded within Area 7 (British Geological Survey, 2019).

13.1.4. The soils consist shallow lime-rich soils over chalk or limestone over the majority of Zone G, with freely draining slightly acid but base-rich soils across Area G7. Fen peat soils are located in the north of the zone, in the northwest of Area G4, and the northern edges of Areas G6 and G3 (Soilscapes, 2019).

## 13.2. Results

### 13.2.1. Summary

13.2.1.1. Reporting Zone G is located to the north of the village of Snailwell and to the southeast of Fordham Abbey. This area is denoted as Snailwell Fen on historic OS maps and the geophysical results show widespread variations in the geological background of this zone (Figure G2). The western part of the Zone has a quieter background, which corresponds with a band of alluvium recorded by the BGS (2019). To the northeast, this recorded alluvium band changes to peat, but there is no discernible change in the natural background in the magnetic results. However, the survey results have identified a greater density of drains in this part of the zone which suggests waterlogging of this area has been managed to allow for agricultural utilisation, which can be seen in the ridge and furrow and agricultural ploughing trends in this area.

13.2.1.2. A change in the bedrock layer is noted between the eastern and western portions of the survey area, producing a distinctive interface towards the eastern portion of this zone (Figure G2). Typically, the Holywell Nodular Chalk formation (present in the east) is subject to erosional/ depositional processes as a result of it being a relatively thin layer within a much larger chalk formation, making it more susceptible to various erosional/ dissolution processes, especially in areas of shallow overburden. Low lying areas of flat ground may be subject to percolation and stagnation of nutrient/ acid rich precipitates creating large scale dissolution formations such as 'dissolution sinkholes', as described in section 6.2.5 above (Figure G2).

13.2.1.3. On a very slight rise in the centre of Zone G, a complex area of multi-phase late prehistoric to roman period activity was identified, covering approximately 5ha. While numerous intersecting and overlapping features suggests many different phases of activity in this area, the groups of features roughly follow broad orientations: a sub east to west alignment in the centre of the zone and a north to south alignment in the eastern and southern parts of the zone (Figure G4). Given the fen characteristics of the zone immediately north of this complex, it is possible

that these features extend into the fen area, but, thanks to waterlogging inhibiting the magnetic enhancement of the sediments, the features may not have sufficient contrast for detection.

13.2.1.4. The east-west aligned activity towards the centre part of the Zone G is characterised by a concentrated core of settlement activity, which is defined by very strong discrete and linear anomalies, interpreted as pits and ditches. Weaker linear anomalies extending to the north, south, and east define an associated field system or less intensively used features (Figure G20). When considered together, smaller cellular rectilinear enclosures, track/droveways, clusters of strong discrete anomalies, and an obvious enclosed ring ditch together suggest a multi-phase prehistoric/Romano-British settlement. Previous archaeological evaluations of this area identified rectilinear cropmarks interpreted as Early Iron Age to Roman in date (MCB20063). Bronze Age, Iron Age and Roman finds have also been found in (CHER 07435, CHER 07745/A) and around (CHER 07746) this location.

13.2.1.5. One of the most coherent enclosures in this group is defined by a D-shaped enclosure, with a 'wavy' sub-rectilinear enclosure to the north ([**6b**], Figure G20). The eastern edge of the curved boundary is more diffuse in form, which suggests this ditch has been recut. This continued use and reuse would account for the very strong magnetic enhancement of these features. A similar enclosure group is discernible approximately 27m to the north on a different orientation ([**6c**], Figure G20), but these ditches exhibit much weaker enhancement, indicating less intensive habitation activity in this area.

13.2.1.6. The archaeological activity on the north-south alignment is situated more towards the eastern and southern parts of Zone G (Figures G16) and covers c1ha. There is no clear link between the multi-phase prehistoric settlement described above and this group of anomalies, and the size and scale of the enclosure features within this north-south group are slightly smaller. Running along the field edge, is a series of enhanced disjointed anomalies, which if considered holistically is evocative of a series of small enclosures. The morphology of the enclosures is suggestive of medieval croft and tofts, though the more difficult to interpret results make dating less clear. While this interpretation may be supported by the apparent continuation of these anomalies into the field to the west, due to the fragmented nature of these anomalies, it is hard to define specific components. These anomalies appear to be situated around a long ditch-like anomaly that extends into the north-eastern part of the zone. Two different trackways appear to lead into the location of this anomaly cluster. The wider trackway on an east to west orientation appears to be incorporated into one of the possible enclosures, which complicates the phasing of the surrounding features.

13.2.1.7. A service has been identified running approximately east to west across the south of Zone G (Figure G11). The strong overwhelming magnetic response will obscure any weaker underlying signals within the resulting halo.

### 13.2.2. Interpretation of Magnetic Results – Specific Anomalies

13.2.2.1. **Probable Archaeology (Trackway)** – Running along and through the northern and eastern boundaries of Area 7 on an approximately northeast-southwest orientation, a linear anomaly of both strong and weak positive magnetic signal has been identified [**7a**] (Figures G23, G24). This linear anomaly is indicative of a ditch lining a possible former track due to the length and continuous nature of the magnetic signal (Figure G7). The anomalies forming both sections of the track run along a similar route to an unfenced boundary, visible on the 2nd Edition OS Maps (Figure G5), suggesting this track has been in continuous usage with minor alterations as a route from the River Snail up to higher lying land to the north. The course of the track appears to change direction, especially in the north, where it bends to the east. Abutting the track to the east are a series of rectilinear enclosures (Figure G16; see section 13.2.2.3) that likely represent occupation activity along the route of the track.

13.2.2.2. **Probable Archaeology (Trackway) –** In its southern extent, along the eastern boundary of Areas 1 and 5, the track takes the form of two parallel linear anomalies running north to south [**1a & 5a**] (Figure G12). The connection between the linear anomaly [**7a**] and the probable track [**5a**] is obscured by current field boundaries, however the projected route of the visible track would indicate that these anomalies intersect. Between the possible trackway in Areas 1 and 5 and the current boundary of the field is evidence of ridge and furrow running north to south. This track [**1a & 5a**], sits on a clear line of higher ground, with a break of slope immediately to the west of it. The trackway as a whole is interpreted as evidence of a long-lived droveway down to the wetter landscape to the south, perhaps for grazing in water meadows associated with the River Snail.

13.2.2.3. **Probable Archaeology (Enclosures)** – Immediately to the east of the track [**7a**] in Area 7, a series of linear and rectilinear anomalies have been identified [**7b**] (Figure G16). These appear to form a series of enclosures on a roughly north-south alignment but are very fragmentary, possibly due to the ploughing regimes that can be seen across Area 7. Due to the fragmentary nature of these features, it is hard to identify the exact extent of each enclosure, although they appear smaller than the enclosures further west in Area 6. These enclosures [**7b**] appear more sub-rectangular in the centre, but toward the north, south and east they become less well defined, with some pit-like anomalies present to the southeast of these enclosures. Further linear, ditch-like anomalies in the vicinity of these enclosures may be related but are too fragmentary to be confident of their origin, so have been classified as possible archaeology. The size and shape of the enclosures, along with their close association with a trackway, are similar to examples of medieval croft and tofts, although an earlier prehistoric origin cannot be ruled out due to the fragmentary appearance of the features and other potentially prehistoric activity identified in the field to the west.

13.2.2.4. **Probable Archaeology (Track)** – Running eastwards, perpendicular to [**7a**] is a set of three parallel positive linear anomalies [**7d**] (Figure G16), spaced between c. 2m

and c. 4m apart. The parallel and linear nature of these anomalies are characteristic of the flanking ditches of a trackway feature, which appears to be connected to the enclosures [**7b**]. The presence of three ditch-like linear anomalies, rather than two, suggests that the trackway may have originally been narrower, or has shifted location over time. Both of these possibilities indicate multiple phases of use.

13.2.2.5. **Probable Archaeology (Curvilinear Feature) –** Immediately to the east of [**1a & 5a**] is a strong, curvilinear, ditch-type anomaly [**7c**] (Figure G12). It appears to curve towards [**1a** & **5a]**, though the magnetic disturbance caused by an underground service crossing the survey area here has limited interpretation. This anomaly may be geological in origin, because it is within an area of strong geological variations. However, the angle of the curvature of [**7c**] is not in line with other geological variations in the area, and the continuation into Area 5 (with different background patterning) is suggestive of an archaeological provenance. To the immediate south of [**7c**], a discrete strong, positive anomaly has been recorded. It is characteristic of a pit-like feature and appears to lie within the area enclosed by [**7c**].

13.2.2.6. **Probable Archaeology** – Towards the centre of Zone G, centred in Area 6, is a concentration of archaeological activity, indicative of possible multiple phases of occupation, including rectilinear and curvilinear enclosures, and linear features indicative of ditches (Figure G20). A possible trackway [**6a**] appears to run roughly east to west, with further enclosures and features surrounding this. The archaeology extends to the north, south, and east, becoming weaker towards the limits of the detected archaeology (Figure 4).

13.2.2.7. **Probable Archaeology (Settlement, Enclosures)** – In the western part of Area 6 are several large enclosures [**6b, 6c & 6d**] (Figure G20). These enclosures have a similar shape, in particular [**6b & 6c**], which have a distinct 'D' shape. These measure between c. 45m to c. 80m in length and between c. 42m to c. 70m in width. The magnetic signal is stronger in the north of [**6b**] than in the anomalies surrounding it, indicating an intense level of usage and/ or possible prolonged period of habitation in this enclosure as opposed to the surrounding areas. While it is not possible to be certain that these enclosures [**6b & 6c**] are contemporary they do share a similar alignment. There appears to be multiple different phases of activity within this area however, as these sub-rectangular enclosures are intersected by several of the rectilinear enclosures surrounding them.

13.2.2.8. **Probable Archaeology (Rectilinear Enclosures)** – North, south and east of anomalies [**6b, 6c & 6d**] are a series of rectilinear enclosures running on a broadly east-west alignment [**6e & 6f**] (Figure G20). At [**6e**] regularly shaped rectangular enclosures overlap with the D-shaped [**6c**], suggesting complex multiphase settlement in the area. Of the rectilinear enclosures, those with the strongest magnetic signal are focused in the south, around the track [**6a**], indicating the probable foci of the settlement. Away from this trackway on the outer reaches of the settlement area [**6f**], enclosures continue to be detected with weaker magnetic signals, suggesting less intense usage in the east and north. Weak enclosures and linear features [**3a**], extend northwards into Area 3 (Figure G20) and southwards

into Area 5 (Figure G16). These northern enclosures have less evidence of internal activity and may be indicative of field systems and stock enclosures rather than a continuation of the settlement area. The abrupt end of the area of anomalies to the north suggests that activity continued into this area in some form, but that the wetter soils here have prohibited the formation of enhanced fills in the resulting features.

13.2.2.9. **Probable Archaeology (Sub-circular Enclosures)** – In the south of Area 6 three sub-circular anomalies with varying degrees of fragmentation have been identified, [**6g**] (Figure G20), measuring between c. 13m and 17m in diameter. The curved form of the anomalies at [**6g**] are indicative of late prehistoric activity, potentially older than the rectilinear anomalies detected within Zone G.

13.2.2.10. **Archaeological Zone** – Surrounding and within the archaeological anomalies identified in [**6a, 6b, 6c, 6d, 6e, 6f & 6g**] is an associated change in the background pattern and general anomaly intensity [**6h**] (Figure G20), likely related to the occupation activity within the settlement features in the centre of the area. The area of occupation may have been selected for settlement due to its geological position. BGS (2019) shows alluvium superficial geology surrounds the occupation site to the west and south, and peat geology bounds the north. Alluvium and peat are likely wetter ground and less suitable for settlement. The archaeological activity is focused on an area where no superficial geology is recorded; the shallow soils in this area would have made the ground drier and therefore more desirable for habitation. It is likely a combination of this geology and the habitation effect that is producing the altered magnetic background indicated by the 'archaeological zone' classification.

13.2.2.11. **Extraction** – In the southeast corner of Area 6, a broad anomaly showing as a distinctly different texture has been identified [**6j**] and interpreted as possible extraction (Figure G20). Due to this anomaly showing sharp edges and being located northeast of a band of alluvial material (see section 13.1.3, Figure G4), [**6j**] could indicate a sand pit or similar. No evidence for extraction is visible on the 2nd Edition OS Maps (Figure G5), but [**6j**] could potentially represent older, unmapped extraction activity.

13.2.2.12. **Agricultural (Former Field Boundary)** – Across Areas 3 and 6, a strong and weak linear anomaly has been identified running north to south and east to west [**3b & 6i**] (Figures G4 & G20). It is probable that this is one continuous feature, although [**6i**] appears to have a stronger and more continuous signal than [**3b**], perhaps indicating that it has been reused or infilled at some point with more magnetic material. [**3b**] and [**6i**] correlate with historic field boundaries visible in the 2nd Edition OS Mapping (Figure G5).

13.2.2.13. **Drainage Features –** Across Area 4, a series of linear trends can be seen running in various orientations [**4a**] (Figure G24). These are probably related to field drains placed to drain the fenland that can be seen on the 2nd Edition OS Mapping (Figure

G5). Ploughing regimes can be seen over the top of the drainage, indicating a prolonged period of agricultural land use.

# 14. Reporting Zone H (Cable Route)

## 14.1. Geographic Background

14.1.1. Zone H is located c.0.9km northeast of Snailwell (Figure H1) and covers an area of c.11.5ha. Survey was undertaken across three fields under arable cultivation. Zone H is bounded by fields and woodland to the north, east and west (Figure H1). The three fields continued to the south, and Chippenham road runs through the zone separating Area 2 from Area 3.

14.1.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | Arable field under crop stubble. Slight topographic depression in the centre-north of the survey area. Soft and uneven ground conditions with patches of rough/ turned over soil. | Bounded by newly planted trees to the northwest, hedgerow to the north and southeast. The field continued to the south and southwest. A public footpath crossed the centre of the area on a southwest to northeast alignment. |
| 2 | Arable field under crop stubble. Gently sloping up towards southeast. | Bounded by trees and hedgerow to the north, east and southeast. The field continued to the south and southwest. |
| 3 | Pasture field, gently sloping up towards southeast. | Bounded by wire fencing to the north, east and southeast. The field continued to the south and southwest. |

14.1.3. The underlying geology in all areas comprises chalk from the Holywell Nodular chalk formation and from the New Pit chalk formation (British Geological Survey, 2019). A small portion in the centre of Area 1 comprises chalk from the Zig Zag chalk formation. No superficial deposits are recorded for this area.

14.1.4. The soils consist of freely draining slightly acid but base-rich soils across the majority of the zone, with the exception of a small central section of Area 1 which comprises shallow lime-rich soils (Soilscapes, 2019).

## 14.2. Results

### 14.2.1. Summary

14.2.1.1. Reporting Zone H is located southwest of Chippenham and northeast of Snailwell (Figure H1). Zone H exhibits a generally quiet magnetic background, with background variations related to topographic changes which have caused different natural processes to occur. Widespread dissolution, as described in section 6.2.5 above characterises the lowest lying sections of Zone H, in its northern and central areas (Figures H4, H8. Infilling processes are recorded in the south of zone H but

also partly overlapping the dissolution anomalies in the north of the zone (Figures H4, H8, H12).

14.2.1.2. Across Zone H, groups of linear positive anomalies have been identified, in some cases with associated discrete positive anomalies (Figures H3, H4, H12) and interpreted as ditches and pits respectively. The linear ditches follow different orientations and partly intersect each other. No corresponding features have been recorded on historic maps; for this reason, they have been interpreted as having a possible archaeological origin. The limits of the survey area, being long and narrow, preclude a clear and more confident identification of these anomalies. The westernmost of these linear anomalies is also visible on satellite imagery (Google Satellite, 2018), where it appears to be part of a much larger cropmark possibly suggestive of a sub-rectangular enclosure.

14.2.1.3. Weak positive, parallel linear anomalies and an alignment of discrete anomalies correspond with the location of an extant trackway in the centre-north of Zone H (Figures H4, H8). This appears to have been in use for a long period of time as it is also shown on the 2nd edition OS map of the area.

14.2.1.4. Three sets of ridge and furrow trends have been recorded, with an evident variation in signal strength between the two sets in the north and the set in the centre of the zone (Figure H4). The sets in the north follow two opposite directions and are extremely faint in magnetic signal whereas the trends in the centre stand out more due their stronger signal.

14.2.1.5. Agricultural activity is evident in the form of ploughing trends and tractor tracks present throughout the zone (Figure H4). A large buried service has been detected in the centre-south of Zone H. This has produced a broad magnetic halo that may obscure weaker underlying signals, if any are present. Magnetic disturbance is also present at the perimeter of the fields due to fencing.

### 14.2.2. Interpretation of Magnetic Results – Specific Anomalies

14.2.2.1. **Possible Archaeology (Strong/Weak)** – In the south of Area 2 and in the north of Area 3, a set of intersecting linear and discrete anomalies [**2a**], [**2b**] and [**3a**] has been identified (Figures H10-H13). The positive linear anomalies, interpreted as possible enclosure ditches, are variably strong and weak in magnetic signal and run on different orientations. They are concentrated in the southern end of Area 2, with one of them extending southwards into Area 3. The linear anomalies appear as though they may extend beyond the survey boundaries. One of these linear anomalies is also visible as cropmark on satellite imagery (Google Satellite, 2018), where it appears to be part of a larger cropmark possibly suggestive of a sub-rectangular enclosure. Several strong discrete anomalies identified have been interpreted as possible pits [**2b**]. In the north of Area 2, further weakly positive linear anomalies have been detected [**2c**], running parallel to each other and on a north-south alignment (Figures H10-H13). These could be interpreted as trackways however, the limited context which this survey area provides has prevented a

confident interpretation. This group of anomalies lies within a rich archaeological landscape as visible in Zones G and F, respectively to the west and east of Zone H.

14.2.2.2. **Agriculture (Strong/Weak)** – In the centre of Area 1, weak positive linear anomalies and an alignment of discrete anomalies [**1a**] has been identified (Figures H6-H9). These are parallel to each other and run on a northeast to southwest orientation. They correspond with an extant trackway which has been used over a long period of time, also visible on 2nd edition OS mapping.

# 15. Overall Discussion and Conclusions

15.1. A fluxgate gradiometer survey was successfully undertaken across the majority of the site, with c.950ha surveyed out of the total c.1150ha area. Areas which could not be surveyed include 74.6ha of land in Zone B, which could not be surveyed due to poor ground conditions and the presence of pigs, pig pens & pig shelters. A further 19.4ha of land in Zone C could not be surveyed due to the presence of pigs, pig pens & pig shelters, as well as areas where access was denied by the owner of horses. Access had not yet been granted along 113ha of land on the cable route or in the 10ha required for HV connections. This leaves a total of 217ha to revisit at a later date.

15.2. The survey methodology has generally responded well to the environment and reveals different phases of archaeological activity across the solar PV areas. Due to the scale of the Sunnica site the solar PV areas were divided into seven zones, with an additional eighth zone for the section of cable route surveyed (Zones A-H). All eight zones contained anomalies with some archaeological potential, and six zones contained anomalies considered to be of probable archaeological provenance. Due to the dispersed nature of the solar PV areas there is no clear link between the archaeology detected within the different zones, but some of the features identified form several distinct settlement areas, associated field systems, multiple barrows, and a possible henge.

15.3. The habitation areas identified are mainly located in the south of the Sunnica site, present in Zones E, F and G, with one large complex identified in the north, in Zone A. While none of the likely settlements correspond with any scheduled monuments, some occur in the vicinity of other assets listed in the local HER. For example:

15.3.1. In Zone F, northeast of Snailwell, at least three potential settlement areas have been identified. One in the west of the zone (Areas 7 and 9) covers an area of c.2.5ha and is located directly south of a recorded Iron Age settlement. Cropmark enclosures of unknown date have been recorded over the surveyed area. An Iron Age coin was also located to the south of the settlement area. A much larger occupation area, covering c.5ha, has been identified to the southwest, in Area 3; it is unclear whether the two settlements are connected as they follow different orientations despite their close proximity. Also in Zone F, c.1.7km northeast of these settlements in Area 15, a small cluster of anomalies, covering c.1ha, has been identified close to a Roman findspot. It is not clear whether these anomalies are a definitive settlement, due to difficulties interpreting less consistently detected anomalies, however it is considered likely.

15.3.2. In the west of Zone E to the southeast of Low Park Farm, just c.310m north of the small 1ha potential settlement in Zone F, a further cluster of anomalies, here contained within an enclosure, have been identified. A findspot of Roman pottery and Bronze Age worked flint is recorded within the enclosure. Again, these more ephemeral anomalies do not allow for potential dating on the basis of morphology.

15.3.3. In Zone G, northwest of Snailwell, cropmarks have been recorded in the location of anomalies interpreted as settlement activity, as have findspots of Bronze Age, Iron Age and Roman origin. The nature of anomalies detected through the geophysical survey

suggest a settlement in Zone G covering an area of c.6ha. The settlement contains anomalies of rectilinear form, D-shaped enclosures and ring ditches which is indicative of multiphase activity, late-prehistoric to Roman in date.

15.3.4. In Zone A, southeast of the village of Isleham, the survey has identified a large complex of rectilinear anomalies, covering 5.6ha, forming a comprehensive habitation and production site with multiple development phases. The cellular orthogonal form of much of this archaeological complex is indicative of a Roman-period provenance. Within the complex itself a findspot of Roman Pottery and post medieval coins is recorded. Other assets in the vicinity of the complex include multiple Bronze Age, Iron Age and further Roman findspots, and medieval findspots to the south, close to the village of Freckenham. Elements of the complex suggest multiphase activity likely dating from later prehistory, with a ring ditch being incorporated into one of the large outer enclosures.

15.4. Two scheduled monuments were listed within the Sunnica site. One in the south, within Zone F, has been partially detected by the geophysical survey. This scheduled monument (SM 1015246) comprises four bowl barrows, only one of which has been detected, and the position of the detected ring ditch is shifted by c.16m compared to the scheduling. It should be noted that two of these recorded bowl barrows were located on the edges of survey areas and if a similar offset exists, they may have fallen beyond the scope of the investigation. In the north, within Zone D, a single bowl barrow (SM 1018097) is scheduled. While the monument itself could not be surveyed due to poor ground conditions, anomalies of possible archaeological origin were detected around its perimeter.

15.5. Similar anomalies, potentially indicative of further previously unrecorded barrows have been detected across the site, resulting in up to 15 new examples. Four partial or complete ring ditches have been identified in the northwest, within Zone A. All of these are relatively close to the occupation area, with one falling within it. An additional ring ditch in Zone A measures c.50m in diameter which is suggestive of a more substantial feature, possibly a hengiform monument (Area 2). One potential barrow has been identified in the north, within Zone B; this appears to have been cut by a modern service. Two fully complete ring ditches have been identified in isolated positions in the northeast, within Zone D. In the south of the Sunnica site, in Zone F, a further two ring ditches have been detected associated with settlement areas, and four more detected in more isolated positions. However, one of the more isolated ring ditches in Zone F (Area 1) has been fully enclosed within a rectilinear enclosure. To the southwest, in Zone G, two partial ring ditches have been detected on the outer edge of the settlement.

15.6. Further anomalies of probable and possible archaeological origin have been identified in the form of long linear anomalies, often with no clear association with the settlement or funerary activity across the site. These anomalies occur most frequently in the western zones of the Sunnica site and span the north and southern sections, in Zones C, D, E and F. These linear anomalies have been categorised as land divisions which predate available historic maps. In Zone F, Area 15, one of these anomalies corresponds with a cropmark which has been interpreted in the HER as a medieval furlong boundary. The projected route of this anomaly would lead to Zone E, Area 2, where another of the long linear anomalies has been identified within the dataset. Whether each of these linear anomalies, across all four zones, could be

interpreted as furlong boundaries is uncertain, however, the association in Zone F does lend support to these being land divisions of some form.

15.7. The natural background to the survey area has exhibited large scale, varied geological and sedimentological processes, highlighting the influence both topography and the resulting geomorphology have on the underlying landscape. A calcite-rich, chalk bedrock covering the survey area has been widely impacted by variations in precipitate dissolution and infilling of bedrock imperfections. Changes in topography and morphology have influenced flow direction and various percolative processes producing representative features, such as rills and infilled cracks within their respective strata. Further, larger-scale features have been categorised relating to the way this precipitate interacts with the bedrock interface, with variations and thickness of the soil and any superficial deposits influencing the scale and profusion of these features.

15.8. The historic and modern agricultural utilisation of the landscape is evident across the Sunnica site. Numerous ridge and furrow ploughing regimes have been detected, focused mainly in the southwest in Zones F, G and H, and a small number in the northeast in Zone D. Modern ploughing is prevalent across the site, as are anomalies associated with tractor movement along field edges. Field drains have been identified across six of the reporting zones, usually accompanying depressions in the landscape, or associated with wetter local environments such as former fenland. In addition, evidence of former field boundaries has been detected across the north of the Sunnica site in Zones A, C and D as well as in Zone G in the southwest.

15.9. In general, the survey areas have been only minimally impacted by the presence of modern activity, this being mostly restricted to broad ferrous anomalies at the perimeters of fields, related to field boundaries, or where temporary fencing had been in place. However, underground services have been detected across six zones, with the exceptions being those in the north of the Sunnica site (Zones A and B). One field in the southeast, Zone E, has a section of c.11ha covered in a high concentration of small ferrous anomalies likely caused by the spread of “green waste” for agricultural purposes. Other significant ferrous and debris anomalies identified include part of a former WW2 airfield in the southeast of the site (Zone F), and sections of the former Cambridge and Mildenhall Branch railway in the north, crossing Zones A and B.

# 16. Archiving

16.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.

16.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to the any dictated time embargoes.

# 17. Copyright

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# 19. Project Metadata

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|---|---|
| MS Job Code | MSTL551 |
| Project Name | Sunnica Energy Farm, Mildenhall, Suffolk |
| Client | Sunnica Ltd |
| Grid References | Northeast: TL 7122 7432, Southeast: TL 7123 6608, Southwest: TL 6341 6606, Northwest: TL 6341 7433 |
| Survey Techniques | Magnetometry |
| Survey Size (ha) | c.1150ha |
| Survey Dates | 2019-10-07 to 2020-03-16 |
| Project Manager | Dr. Chrys Harris MCIfA, Finnegan Pope-Carter BSc (Hons) MSc FGS |
| Project Officer | Leanne Swinbank BA ACIfA |
| HER Event No | ECB6012 (Cambridgeshire), ESF26878 (Suffolk) |
| OASIS No | N/A |
| S42 Licence No | SL00213006, SL00223015 |
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# 20. Document History

| Version | Comments | Author | Checked By | Date |
|---|---|---|---|---|
| 0.1 | Initial draft for Project Officer to Review | LS, LB, IC, FS, AL | KA, LS | 27 March 2020 |
| 0.2 | Incorporation of Project Manager comments | LS, LB, IC, FS, AL | KA, CH, FPC, PJ | 2 April 2020 |