

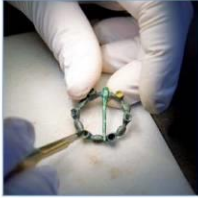
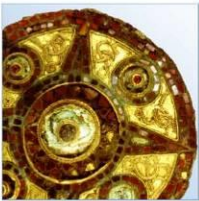
# North Petherton, Somerset

## Archaeological Geophysical Survey

National Grid Reference: ST 29440 32392

AOC Project No: 51773

Date: July 2017



ARCHAEOLOGY

HERITAGE

CONSERVATION

# North Petherton, Somerset

## Archaeological Geophysical Survey

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**National Grid Reference (NGR):** ST 29440 32392  
**AOC Project No:** 51773  
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**Date of survey:** 14<sup>th</sup>-17<sup>th</sup> July 2017

This document has been prepared in accordance with AOC standard operating procedures.

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**Report Stage:** Final Draft Rev 2 **Date:** 11<sup>th</sup> August 2017

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## Non-Technical Summary

AOC Archaeology Group was commissioned by WYG Planning and Environment to undertake an archaeological geophysical (gradiometer) survey to investigate the potential for buried archaeological remains on a proposed development at North Petherton, Somerset (centred at ST 29440 32392). A total of 12 hectares were surveyed and the results of the survey have identified the following.

The results of the survey identified a plethora of discrete linear, curvilinear, rectilinear trends and discrete pit like anomalies. These anomalies are only weak and tentative and this has made interpretation difficult. They may or may not be archaeological in origin and only further intrusive investigation will resolve this query.

The likelihood is that if these are not archaeological then they will be of a natural geological origin. However if they are found to be archaeological they may well form part of an earlier set of historic field systems and settlement, possibly prehistoric in date.

Also detected were a number of agricultural trends of former field boundaries visible on First edition Ordnance Survey Mapping of the site.

A number of areas of magnetic disturbance resulting from the effects of modern services or magnetic objects such as buildings, pylons and modern fencing were also recorded.

## 1 Introduction

- 1.1 AOC Archaeology Group was commissioned by WYG Planning and Environment to undertake an archaeological geophysical survey of the proposed development of fields at North Petherton, Somerset, as part of a wider scheme of archaeological assessment in advance of the proposed development of the site.
- 1.2 The survey was carried out to provide information on the extent and significance of potential buried archaeological remains within the proposed development site.

## 2 Site Location and Description

- 2.1 The proposed development site is located to the south of Staffland Farm, located on the west side of the M5 and the east side of Newton Road, North Petherton, Somerset, centred at approximately ST 29440 32392 (see Figure 1).
- 2.2 The survey area covers an area of approximately 12 hectares (ha) across five irregular enclosed fields. The survey area slopes down slightly towards the east between approximately 35m and 26m aOD (above Ordnance Datum).
- 2.3 The recorded bedrock geology within the survey area consists of Lotter Sandstone Formation-Sandstone to the Southwest and Mercia Mudstone group – Mudstone and Halite-Stone to the northeast (BGS 2017). These are overlain by slightly acid loamy and clayey soils with impeded drainage (Soilscapes 2017).

## 3 Archaeological Background

- 3.1 The archaeological background below is drawn from the archaeological appraisal of the site by WYG, undertaken in 2017 (WYG 2017). All references to figures, plates and tables listed in this section can be found in the desk-based assessment. The below is only meant to be a brief over view and if more detail is required please refer directly to the archaeological appraisal produced by WYG.

### Designated sites

- 3.2 There are no World Heritage Sites, Scheduled Monuments, Listed Buildings, Conservation Areas or Registered Parks and Gardens or Battlefields within the development site.
- 3.3 There are 27 Listed Buildings located within the 1km study area surrounding the proposed development site. All of these are Grade II listed, apart from the Church of St Mary the Virgin, which is Grade I listed (Listed entry 1058924) and on the Heritage at Risk Register.
- 3.4 An associated 15th-century churchyard cross is Grade II\* listed (List entry 1344990) and also a Scheduled Monument (SM 1015455). These are all located to the north of the site within the historic core of North Petherton, with the exception of two late 18th-century houses on Newton Road, directly opposite the western boundary of the proposed development area (List entries 1060168 & 1344677). The Listed Buildings are considered within the separate Built Heritage Assessment prepared by WYG and are not dealt with further in this report.

### Non-Designated Sites

- 3.5 The Historic Environment Record holds details for 65 monument records within the study area; of these 27 are records of Listed Buildings within and around North Petherton. The Historic Environment Record also holds details for 12 archaeological events within the study area.
- 3.6 No undesignated heritage assets are recorded within the bounds of the proposed development area.

## Prehistoric

- 3.7 Later prehistoric flint flakes have been identified during ploughing in the south-east of the study area (HER 11773). In addition, cropmarks of the two rectilinear enclosures of potential later prehistoric date have been identified immediately east and north east of the application site on the other side of the M5 motorway (HER 26952 and 26953). The former of the two enclosures is potentially associated with pits.
- 3.8 There are no recorded remains of prehistoric date within the proposed development area itself.

## Roman

- 3.9 The two potential later prehistoric enclosures mentioned in the section above may also be of Romano-British date (HER 26952 and 26953). Romano-British material has been reported from an evaluation on the north border of the study area (HER 28772) and a ditch, pit and cobbled surface associated with 3<sup>rd</sup>-century Romano-British pottery was identified immediately north-east of the application site during rescue works (HER 10619). In addition, a hoard of 4<sup>th</sup>-century roman coins has been reported near Impens Farm in the far east of the study area (HER 28370).
- 3.10 An excavation by the Bridgwater and District Archaeological society on the north side of north newton in 1970 reported a 3<sup>rd</sup>-century Romano-British settlement, with some evidence for occupation in the 2<sup>nd</sup> century (HER 3024). More detailed rescue excavation at Pascoe's Orchard, immediately adjacent to the site of the reported settlement, identified 2<sup>nd</sup> to 3<sup>rd</sup>-century grey wares, Samian ware and a 3<sup>rd</sup>-century coin in a ditch associated with stakeholes (HER 10605).
- 3.11 There are no known remains of Roman period activity within the proposed development area.

## Medieval

- 3.12 The only recorded evidence of early medieval activity in the study area in the modern era comes from excavations surrounding St Mary's church in North Petherton (HER 10599). These revealed pits, postholes, gullies and beam-slots dating between the 10<sup>th</sup> and 12<sup>th</sup> centuries. These were accompanied by a lime-burning pit, presumably constructed during the construction of an earlier church on the site of the present edifice.
- 3.13 No known Medieval remains are recorded within the proposed development.

## Post-medieval

- 3.14 North Petherton was the site of a skirmish in 1644 during the civil war.
- 3.15 Enclosure in the surrounding area was well advanced by the end of the 17<sup>th</sup> century, including parts of Petherton Park. The apportionments on the earliest known tithe maps were split between 2 landowners, Gardner and Acreman in the south of the site, and the remainder was held by Anna Gatcombe and leased to Robert Gadd, who maintained a mixed agricultural regime.

## 4 Aims

- 4.1 The aim of the geophysical survey was to identify any potential archaeological anomalies that would enhance the current understanding of the archaeological resource within the proposed survey area.
- 4.2 Specifically the aims of the gradiometer survey were;
- To locate, record and characterise any surviving sub-surface archaeological remains within the survey area
  - To help determine the next stage of works as per the client's instruction

- To provide an assessment of the potential significance of any identified archaeological remains in a local, regional and (if relevant) national context
- To produce a comprehensive site archive and report.

## 5 Methodology

- 5.1 All geophysical survey work was carried out in accordance with recommended good practice specified in guideline documents published by English Heritage – now Historic England (David *et al.* 2008) and the Chartered Institute for Archaeologists *Standard and Guidance for archaeological geophysical survey* (2014).
- 5.2 Parameters were selected that were suitable for the prospective aims of the survey and in accordance with recommended professional good practice (David *et al.* 2008, 8).
- 5.3 The gradiometer survey was carried out using Bartington Grad601-2 fluxgate gradiometers (see Appendices 2 and 3). Data was collected on an east-west alignment using zig-zag traverses, with a sample interval of 0.25m and a traverse interval of 1m. A total of 172 full or partial 30m by 30m grids were surveyed within the specified area, totalling an area of approximately 12ha.
- 5.4 Attention was taken to avoid metal obstacles present within the survey area during data collection using gradiometers. Gradiometer survey is affected by ‘above-ground noise’ such as metal objects, and avoiding these improves the overall data quality and results obtained.
- 5.5 The gradiometer data were downloaded using Bartington Grad601 PC Software v313 and processed using Geoscan Geoplot v3.0 / v4.0. The details of these processes can be found in Appendices 4 and 5. Data processing, storage and documentation were carried out in accordance with the good practice specifications detailed in the guidelines issued by the Archaeology Data Service (Schmidt and Ernenwein, 2009).
- 5.6 Interpretations of the data were created as layers in AutoCAD LT 2009 / GIS and the technical terminology used to describe the identified features can be found in Appendix 6.

## 6 Results and Interpretation

- 6.1 The gradiometer survey results have been visualised as greyscale plots, with the minimally processed data plotted at -1nT to 2nT in Figure 3. The processed data is also plotted at -1nT to 2nT and can be seen in Figure 4. An interpretation of the data can be seen in Figure 5 and an individual characterisation of the identified anomalies follows this in Appendix 1.
- 6.2 The results of the survey will be discussed below; due to the size of the survey area it has been split up in to five separate survey areas which correspond with the five separate fields. The discussion of the results will be discussed area by area accordingly. The conclusion will then discuss all of the results as a whole across all of the areas.

### Archaeology

- 6.3 No responses indicating definitive archaeological remains have been located in any of the five survey areas.

### Area 1

#### Discrete linear trends

- 6.4 A number of discrete linear trends have been identified throughout all the survey areas; all of which potentially could have archaeological origins.

- 6.5 In Area 1 a number of discrete linear, curvilinear and rectilinear trends have been recorded in the survey area differing in their magnetic strength and character (**P1-3**). These trends comprise increased signals compared to the background values, however poor patterning of these response values and weaker strength makes interpretation difficult and more tentative.
- 6.6 A number of rectilinear trends are visible in the west of the dataset, appearing to run west to east across the area and continuing on in to Area 2 (**P1**). These trends are much stronger and clearer on the greyscale images and XY trace plots than others observed, and are suggestive of possibly more significant settlement evidence. Alternatively the alignment of these anomalies appears to follow through in to Area 2 to the south and might form part of an older field division which was taken out prior to cartographic records being made of the area. The reason for the good magnetic signal of the anomaly is unclear and it might be that this field has experienced less intensive agricultural ploughing which has led to less truncation of the features compared to other areas. Alternatively it could be that its positioning is topographically slightly higher, meaning that it is underneath less overburden compared to other areas surveyed.
- 6.7 In the central part of the survey area, a number of less well defined trends have been observed that are rectilinear in shape (**P2**). Although not as clearly defined as other linear trends in the dataset, they are visible on the XY plots and in the greyscale images. These are potentially archaeological as although they have similar responses to field drains they do not form a recognisable pattern, nor do they appear elsewhere in the area in a similar form which would be expected of drainage patterns. Therefore it is felt that these are potentially weaker responses of an archaeological origin.
- 6.8 The final trends in this area are in the east and reflective of possible curvilinear trends related to agricultural origins rather than archaeological (**P3**). The first anomaly is a straight north-west south-east orientated linear trend which is possibly related to former field boundaries. The second trend in the centre of the dataset is a curvilinear anomaly, appearing to run from the field entrance through into Area 2 in the south. It is possible that this anomaly is related to historic movement in and out of the field rather than archaeology. However neither of these trends can be definitively argued and therefore we must assume that an archaeological potential is present.

#### **Discrete Pit like anomalies**

- 6.9 Within Area 1, three anomalies which are likely to relate to discrete pits have been identified (**P15**). Anomalies such as these consist of an increase in magnetic values with a patterning on the XY trace plot that is suggestive of buried remains, such as the infill of a pit, but is isolated in its location and association with other features.

#### **Non-archaeology**

##### **Magnetic Disturbance**

- 6.10 A number of areas of magnetic noise have been detected in the results (**P22**). These are located along all the survey boundaries and in particular the eastern boundary. These areas of disturbance are a result of fencing around the field edges and some large farm sheds in the east of the survey area close to the survey boundary. Areas of modern disturbance are characterised by significant increases or decreases in values compared with background readings.

##### **Isolated dipolar anomalies**

- 6.11 Across Area 1 a large quantity of isolated dipolar anomalies (iron spikes) are visible in the data. These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

## Area 2

### Discrete linear trends

- 6.12 Within Area 2 a number of discrete linear, curvilinear and rectilinear trends have been recorded with differing strengths and character (**P4-6**). Again these trends comprise increased signals compared to the background values however poor patterning of these response values and weaker strength makes interpretation difficult and more tentative. The anomalies have the potential to be of an archaeological origin.
- 6.13 A number of linear and rectilinear trends have been located in the northwest of the area (**P4**) and are potentially linked to those observed in the west of Area 1 (**P1**). As previously discussed these potentially could be of an archaeological origin and could be evidence of former settlement. However they also appear to be orientated towards the boundary in the north-east of Area 2 and therefore they might be suggested to represent a former field boundary. No evidence of this however is visible on any available historic mapping.
- 6.14 The second discrete linear trend is located in the central part of Area 2, running in a north-west to south-east direction (**P5**). This linear is intercepted by a former later field division and possibly continues beyond this division, however only further investigation would prove this theory. It is not clear from the results what this linear anomaly represents, though it may well be one of many linear trends which denote an earlier set of field divisions beneath the more recently mapped divisions across the site.
- 6.15 Further discrete rectilinear and linear trends are located to the other side of a former field division which cuts across trend **P5** (**P6**). These discrete trends differ as they appear to form a small rectilinear shape. The weak and tentative nature of these anomalies means that it's difficult to interpret the shape. The author is reluctant to go as far as to describe this as a possible small enclosure, although it would appear to resemble one in part. Further investigation is required to ascertain the nature of the anomaly.

### Agricultural

#### Linear Trend (field boundary)

- 6.16 Two linear trends relating to old field boundaries have been located within Area 2 (**P19** and **P20**).
- 6.17 The first of these is a strong positive response which runs north to south through the area (**P19**) and is related to a former field boundary and track located on First edition Ordnance Survey Mapping for Somerset from 1888 (old-maps, 2017).
- 6.18 The second positive linear trend representing a former field boundary runs roughly east-west (**P20**) and terminates when it reaches the other former field boundary and track **P19**. This old field boundary is also depicted on the same First edition Ordnance Survey Mapping of the area.

### Non-archaeology

#### Magnetic Disturbance

- 6.19 A number of areas of magnetic noise have been detected in the data for Area 2 (**P23-P26**). Areas of modern disturbance are characterised by significant increases or decreases in values compared with background readings.
- 6.20 The first of these is related to a large possible modern service which runs through the area and continues through into both Areas 3 and 5 (**P23**).
- 6.21 Along the southern boundary of the area a further large area of magnetic disturbance is recorded which is related to a pylon located to the south of the field boundary (**P24**).

- 6.22 Another telegraph pole within the area has also been partially detected in the data and is also seen as an area of magnetic disturbance (**P25**).
- 6.23 Along many of the field boundaries in Area 2 there are a number of magnetic disturbances related to modern fencing, particularly in the north-east where a gate has added to the response seen in the data (**P26**).

#### **Isolated dipolar anomalies**

- 6.24 Across Area 2 a large quantity of isolated dipolar anomalies (iron spikes) are visible in the dataset. These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

#### **Area 3**

##### **Discrete linear trends**

- 6.25 Two discrete linear anomalies have been observed in the dataset for Area 3 which may or may not be of an archaeological origin (**P7**). The faint trends run in a north-west to south-east direction with a possible rectilinear shaping. These anomalies would appear to be a continuation from those in Areas 1 and 2 and it may well be that this is part of a wider landscape feature, possibly representing underlying former field systems.

##### **Non-archaeology**

##### **Magnetic Disturbance**

- 6.26 A number of areas of magnetic disturbance have been detected in the results of this area (**P23, P27** and **P28**).
- 6.27 As mentioned in Area 2, a large possible modern service runs through Area 3 and continues into Area 5 (**P23**).
- 6.28 A second possible modern service is detected running from the north-west to south-east of the area. This is likely to be a water pipe which runs from the main farm buildings through to a cattle water trough in Area 4 (**P27**).
- 6.29 An area of magnetic disturbance is observed in the dataset, located around the field edges and in particular the north-west where the response relates to large farm sheds adjacent to the survey area (**P28**). The sheds were given some distance during survey, however the buildings still had some impact on the data in this location.

#### **Isolated dipolar anomalies**

- 6.30 Across Area 3 within the data set are a large quantity of isolated dipolar anomalies (iron spikes). These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

#### **Area 4**

##### **Discrete linear trends**

- 6.31 A number of discrete trends have been identified in the data from Area 4 (**P8-10**). Area 4 is however located on lower ground, suggesting that it may be susceptible to natural geological variations and some of these trends could, following intrusive investigations, be found to be of a natural geological origin rather than an archaeological one.



- 6.32 Two discrete linear trends are located in the centre of Area 4 and may or may not be of an archaeological origin (**P8**). These trends cross the dataset for upwards of 90m, one running roughly north-south through the data and the second running roughly west-east. The trends would appear to be a continuation from those observed in Areas 1, 2 and 3 and it may well be that these are part of a wider landscape feature, such as an older field system as previously discussed.
- 6.33 Several discrete curvilinear trends are visible in the north-east of Area 4 and these have the potential to be archaeological in origin (**P9**). Unlike **P8** these would appear to be on a slightly different alignment. It is unclear if these are related to previous settlement, however a number of pit like anomalies are also located close by, giving the area the potential to be archaeological in nature.
- 6.34 Close by to the south-east of these anomalies, a rectilinear trend is observed in the dataset which could be tentatively described as being a potential enclosure (**P10**). Again however the location of this coupled with the weak responses means that this is not a confident prediction and the author would stress that alternative natural causes could be as likely. Further investigation would be required to ascertain the origin of the anomaly.

#### **Discrete Pit like anomalies**

- 6.35 Within Area 4 there are several discrete pit-like anomalies which have been identified in the dataset (**P16**). Two have been located close to the southern boundary of the area, with a second group located in the north east. These may or may not be of an archaeological origin, but the low lying nature of Area 4 would most likely suggest these to be of a natural geological origin. Anomalies such as these consist of an increase in magnetic values with a patterning on the XY trace plot that is suggestive of buried remains, such as the infill of a pit, but is isolated in its location and association with other features.

#### **Non-archaeology**

##### **Magnetic Disturbance**

- 6.36 A number of areas of magnetic disturbance have been detected in the results of this area (**P29-31**).
- 6.37 The first of these relates to an area of disturbance in the south of the dataset, likely to represent a service/drain of some type. Interestingly it appears to only run a short distance before stopping in the central part of the field (**P29**).
- 6.38 The second area of disturbance relates to an area in the south-west of Area 4 which was close to a building located on the other side of the boundary, most likely causing the disturbance seen in the dataset (**P30**).
- 6.39 Along the boundaries surrounding the survey area, magnetic disturbance from the modern boundary fencing is visible, as well as disturbance from a water trough in the centre of the northern boundary and a gate in the north-eastern field corner (**P31**).

#### **Isolated dipolar anomalies**

- 6.40 Across Area 4 within the data set are a large quantity of isolated dipolar anomalies (iron spikes). These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

#### **Area 5**

##### **Discrete linear trends**

- 6.41 A number of discrete trends have been interpreted in the data from Area 5 (**P11-14**).

- 6.42 The first set of trends are located in the south and east of Area 5 and would appear to continue into Area 4 to the south (**P11**). These trends don't form any sort of obvious pattern, however they do run north and join with a second set of discrete trends.
- 6.43 These trends run north-west to south-east, north-east to south-west, north-south and west-east across the centre of the area (**P12**). They are suggestive of earlier former field systems that may be of a prehistoric date.
- 6.44 In turn these run north and join with a number of curvilinear and linear trends in the north and east of Area 5, appearing to form a large D-shaped enclosure on the slope of the higher ground in the field (**P13**). This enclosure, unlike other trends nearby, is more visible in the data and coupled with the prominent location would be more suggestive of an archaeological origin rather than natural. There doesn't however appear to be any sign of any definitive settlement evidence within the enclosure itself, however a number of tentative pit like anomalies are located in the survey area which may be related and could be archaeological in origin.
- 6.45 A further discrete linear trend orientated north-west to south-east is located in the north-west of Area 5 and again potentially could be of an archaeological origin (**P14**).

#### **Discrete Pit like anomalies**

- 6.46 The data from Area 5 contains six discrete pit like anomalies which are located throughout the area (**P17**). These may or may not be archaeological in origin and it is likely that this will be dependent upon whether the discrete linear trends in the area are found to be archaeological. If they are it is likely that these discrete pit like anomalies are related, however they may also relate to geological changes.

#### **Unclear Origin**

- 6.47 A linear trend of an unclear origin has been located within Area 5, which is thought to be of a modern date due to its magnetic strength (**P18**). The anomaly is similar to the possible service noted in Area 4, however it does not appear to run to a definitive point and appears to terminate close to the large possible service **P23**. Due to the unclear nature of the response, it alternatively could also be of an archaeological origin, but this is less likely compared to other anomalies on site. Anomalies of an Unclear origin are composed of a weak or different change in magnetic values. Coupled with poor patterning, the anomaly is difficult to interpret and it is unclear whether it has an archaeological origin.

#### **Agricultural**

##### **Linear Trend (field boundary)**

- 6.48 A linear trend of another former field boundary has been located running north-west to south-east in the north-east corner of Area 5 (**P21**). First edition Ordnance Survey Mapping of the area has been able to confirm the anomaly as representing a previous field division (old-maps, 2017). This isolated linear anomaly in this case is represented as a positive magnetic trend.

#### **Non-archaeology**

##### **Magnetic Disturbance**

- 6.49 A number of areas of magnetic disturbance have been detected in the results in this area (**P32-34**).
- 6.50 The first of these relates to an area of disturbance located in the north-east of the area (**P32**) and is depicted on historic ordnance survey mapping as being a pond feature (old-maps, 2017). It is likely that this pond was filled in and the material which was used was much more magnetically enhanced or contained material with magnetic properties; hence its presence in the data as an area of modern disturbance.

- 6.51 The second area of disturbance is noted in the north-west of Area 5 and reflects the location of a number of animal feeding troughs (**P33**). Although these were avoided during data collection, the size of these has led to an area of magnetic disturbance being recorded in the data.
- 6.52 Along the boundaries surrounding the field, magnetic disturbance from modern boundary fencing has been recorded as well as other spurious magnetic responses (**P34**). Areas of modern disturbance are characterised by significant increases or decreases in values compared with background readings.

#### **Isolated dipolar anomalies**

- 6.53 Across Area 5 a large quantity of isolated dipolar anomalies (iron spikes) are visible in the dataset. These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

## **7 Conclusion**

- 7.1 The gradiometer survey has not identified any anomalies or features of a definitive archaeological nature.
- 7.2 Across the whole survey area a large number of discrete linear, curvilinear and rectilinear trends have been located, as well as possible pits in Areas 1, 4 and 5 but due to their poor strength and patterning only a tentative interpretation could be formed as to their origin.
- 7.3 It is possible that many of these trends are related to earlier field divisions, possibly of a prehistoric date, which may be associated with the discrete pits. However only intrusive investigation would clarify this theory and confirm whether these anomalies relate to former settlement activity. Likewise these features may be related to natural geological variations.
- 7.4 A number of trends relating to former field boundaries were identified and their positioning confirmed on historic First edition Ordnance Survey Mapping of the area.
- 7.5 Several areas of magnetic disturbance of a likely modern date were also detected throughout the survey areas, relating to a mixture of possible modern services, magnetic objects such as buildings or pylons and modern boundary fencing located around the field extents.

## **8 Statement of Indemnity**

- 8.1 Although the results and interpretation detailed in this report have been produced as accurately as possible, it should be noted that the conclusions offered are a subjective assessment of collected data sets.
- 8.2 The success of a geophysical survey in identifying archaeological remains can be heavily influenced by several factors, including geology, seasonality, field conditions and the properties of the features being detected. Therefore the geophysical interpretation may only reveal certain archaeological features and not produce a complete plan of all of the archaeological remains within a survey area.

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Plate 1. Survey Area 1 looking west from the eastern boundary



Plate 2. Survey Area 2 looking north-east from the south west boundary





Plate 3. Survey Area 3 looking north-west from the south eastern corner



Plate 4. Survey Area 4 looking east from the western boundary



Plate 5. Survey Area 5 looking south from the northern boundary down the slope towards Area 4



LAND OFF NEWTON ROAD, NORTH PETHERTON  
(AOC PROJECT NO. 51773)



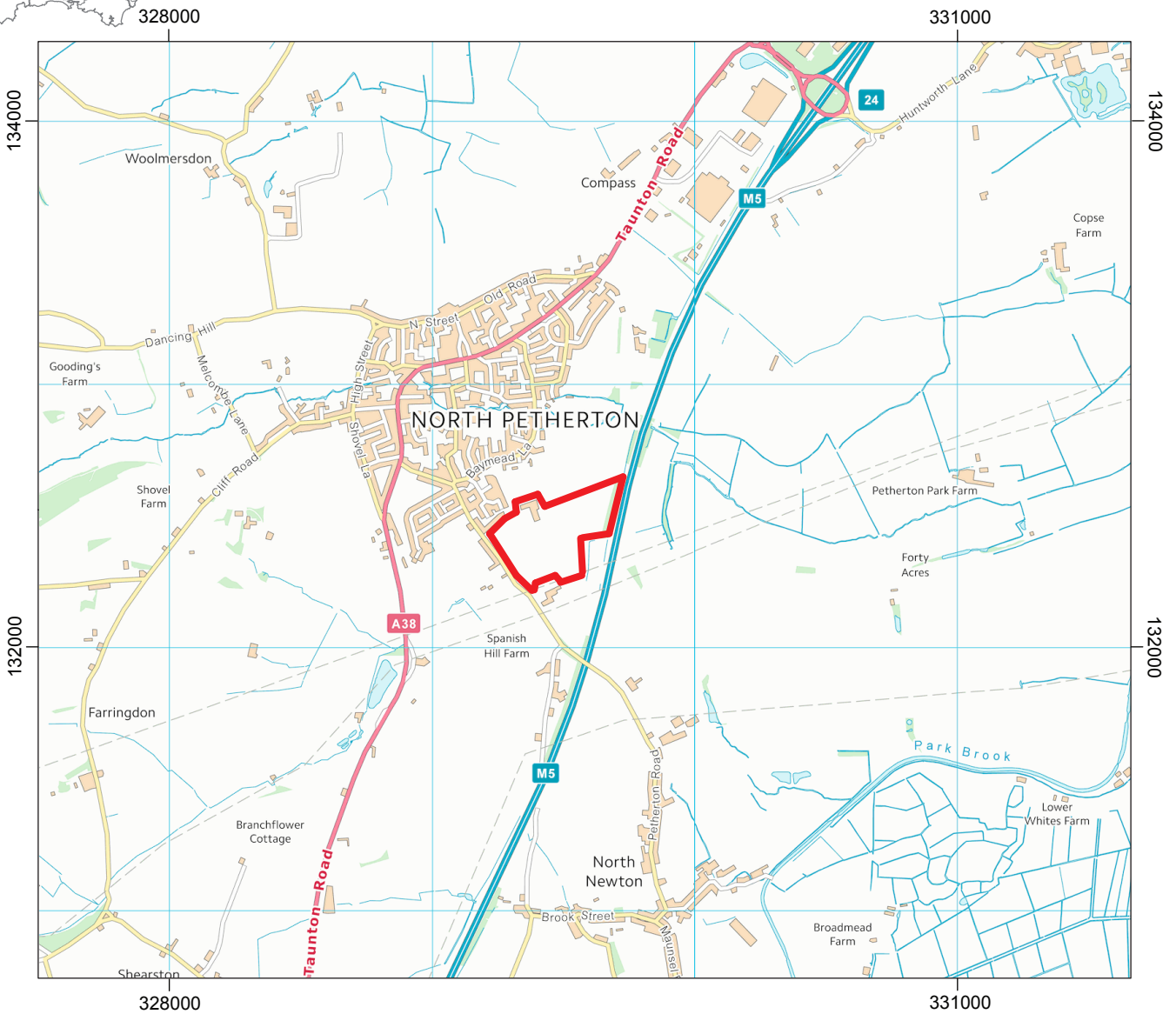
Figure  
**1**



Site location



Based on data provided by the Ordnance Survey with the permission of the Controller of Her Majesty's Stationery Office.  
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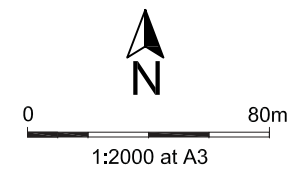




Location of Survey Areas

Figure  
2

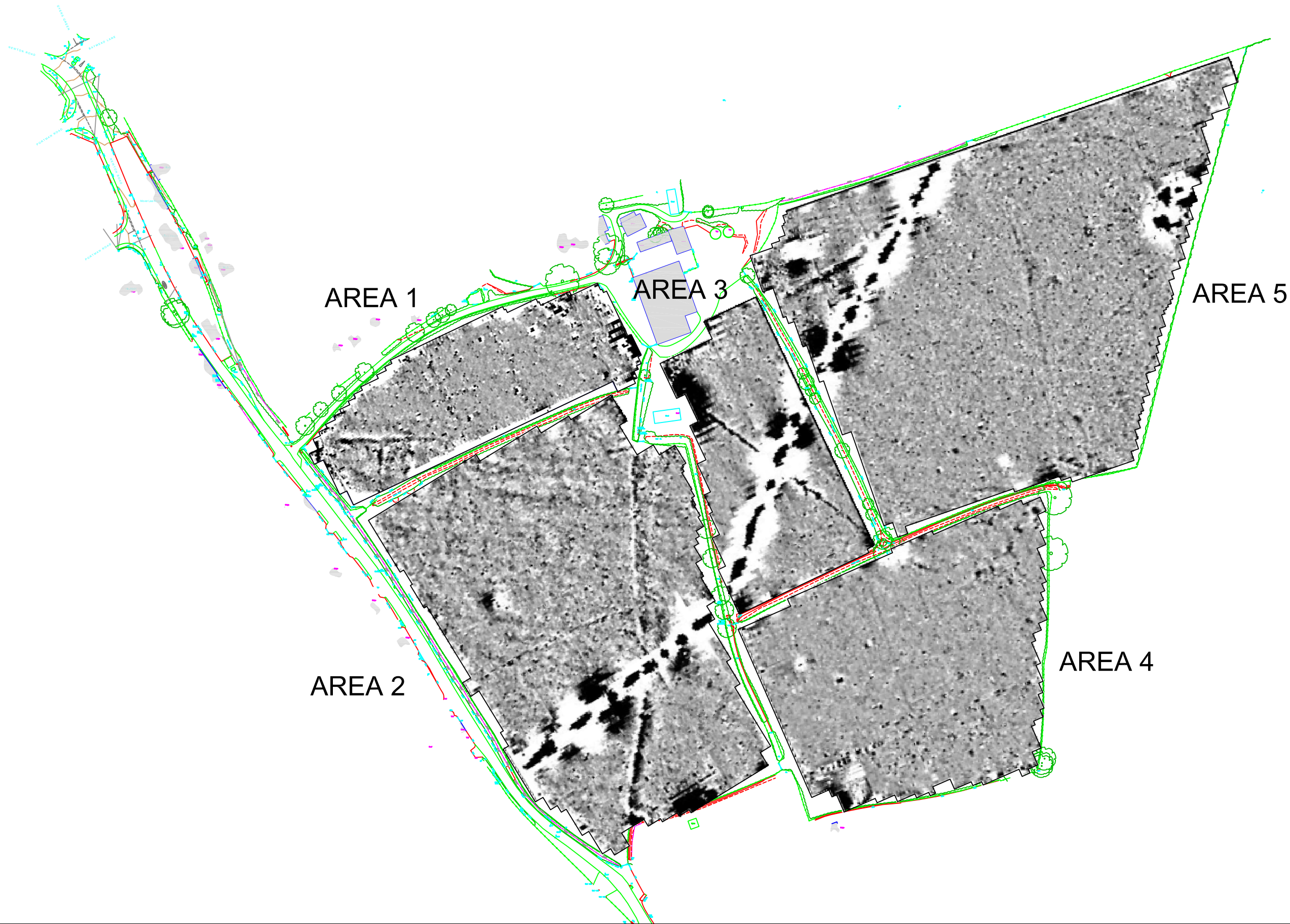
- Areas Surveyed
- Areas Not Surveyed



Project Title: North Petherton, Somerset		
Project No: 51773		
Drawing Title: Figure 2		
Location of Survey Areas		
V1/51773/GEO/F2/04.08.17		
Drawn by: KT	Checked by: JL	Approved by: JL
04/08/2017	04/08/2017	04/08/2017

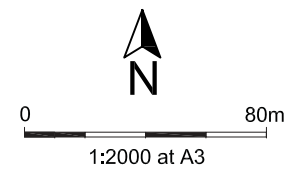
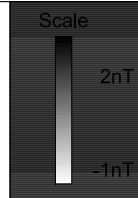






Minimally processed Gradiometer survey results - Greyscale plot - Overall view

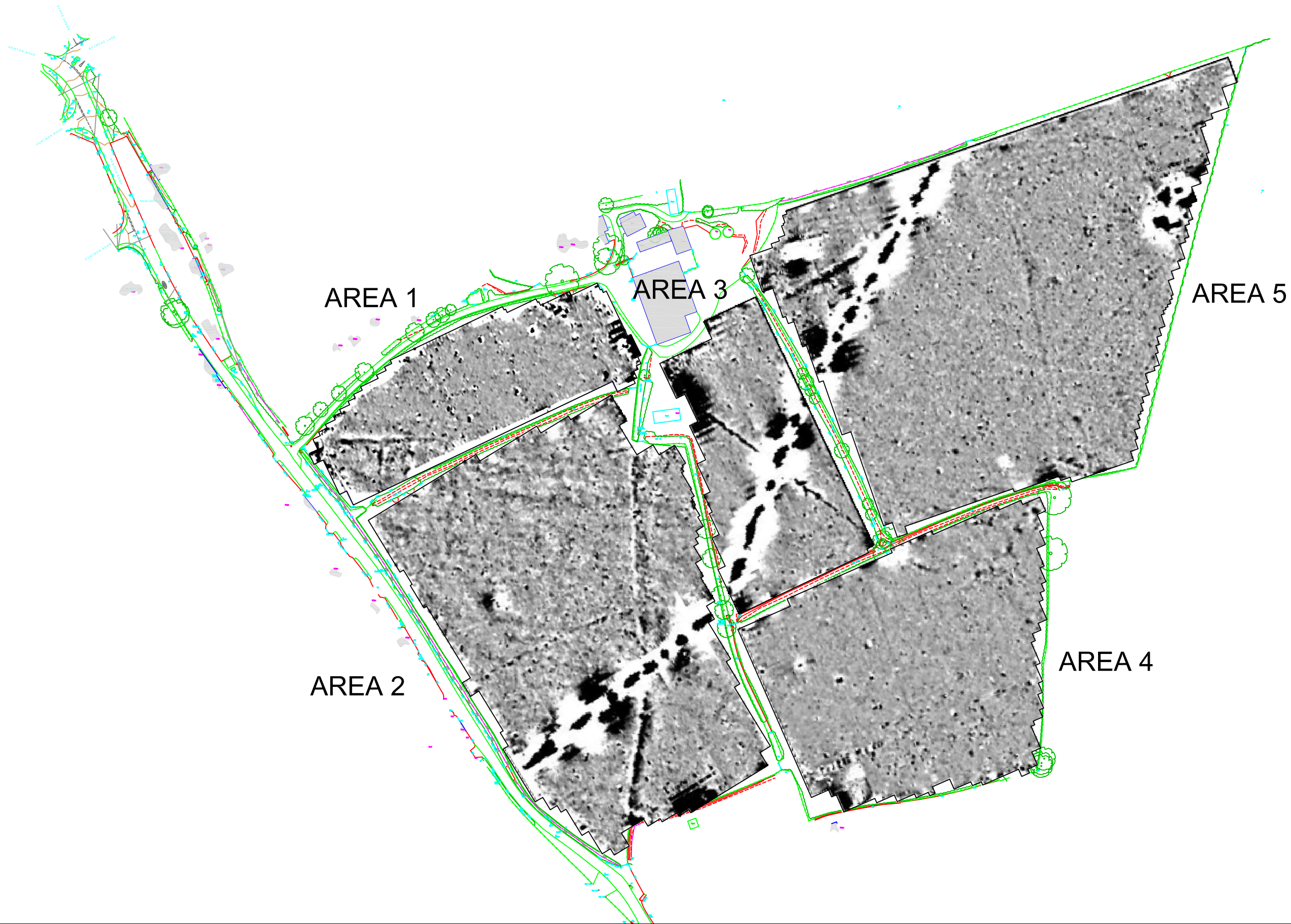
Figure  
3



Project Title: North Petherton, Somerset		
Project No: 51773		
Drawing Title: Figure 3		
Minimally processed gradiometer survey results - overall		
V1/51773/GEO/F3/04.08.17		
Drawn by: KT	Checked by: JL	Approved by: JL
04/08/2017	04/08/2017	04/08/2017

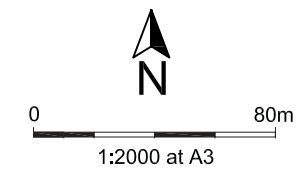
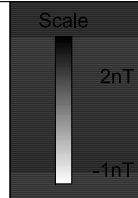






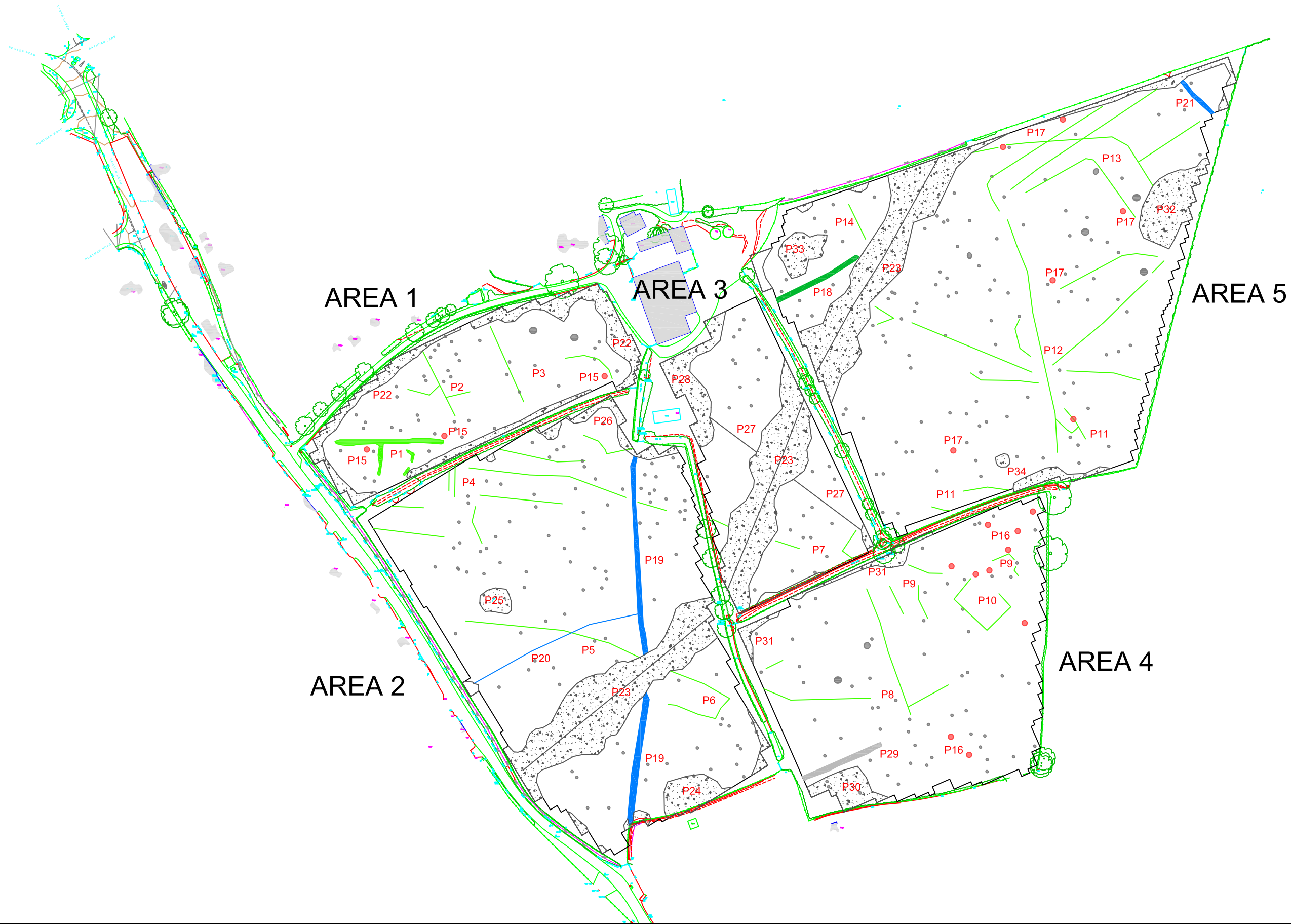
Processed Gradiometer survey results - Greyscale plot

Figure  
4



Project Title: North Petherton, Somerset		
Project No: 51773		
Drawing Title: Figure 4		
Processed gradiometer survey results		
V1/51773/GEO/F4/04.08.17		
Drawn by: KT	Checked by: JL	Approved by: JL
04/08/2017	04/08/2017	04/08/2017

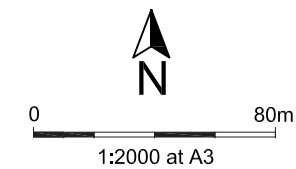




Interpretation of Gradiometer survey results

Figure 5

- |                               |                               |                              |
|-------------------------------|-------------------------------|------------------------------|
| Discrete Trend (Archaeology?) | Old Field Boundary            | Area of Disturbance (Modern) |
| Discrete Pit (Archaeology?)   | Linear Trend (Field Drains)   | Ferrous / Iron Spikes        |
| Trend (Unclear Origin)        | Linear Trend (Modern Service) |                              |



Project Title: North Petherton, Somerset		
Project No: 51773		
Drawing Title: Figure 5		
Interpretation of gradiometer survey results		
V1/51773/GEO/F5/04.08.17		
Drawn by: KT	Checked by: JL	Approved by: JL
04/08/2017	04/08/2017	04/08/2017



## Appendix 1: Characterisation of Identified Anomalies

Gradiometer survey

Site Specific Anomaly Code: **P**

<b>Anomaly</b>	<b>Type of Archaeology</b>
P1	Discrete linear trend
P2	Discrete linear trend
P3	Discrete linear trend
P4	Discrete linear trend
P5	Discrete linear trend
P6	Discrete linear trend
P7	Discrete linear trend
P8	Discrete linear trend
P9	Discrete linear trend
P10	Discrete linear trend
P11	Discrete linear trend
P12	Discrete linear trend
P13	Discrete linear trend
P14	Discrete linear trend
P15	Discrete Pit-like Anomalies
P16	Discrete Pit-like Anomalies
P17	Discrete Pit-like Anomalies
P18	Unclear origin linear trend
P19	Linear Trend (field boundary)
P20	Linear Trend (field boundary)
P21	Linear Trend (field boundary)
P22	Magnetic Disturbance Modern
P23	Magnetic Disturbance Modern
P24	Magnetic Disturbance Modern
P25	Magnetic Disturbance Modern
P26	Magnetic Disturbance Modern
P27	Magnetic Disturbance Modern
P28	Magnetic Disturbance Modern
P29	Magnetic Disturbance Modern
P30	Magnetic Disturbance Modern
P31	Magnetic Disturbance Modern
P32	Magnetic Disturbance Modern
P33	Magnetic Disturbance Modern
P34	Magnetic Disturbance Modern



## Appendix 2: Survey Metadata

Field	Description
Surveying Company	AOC Archaeology
Data collection staff	James Lawton, Sam Dollman
Client	WYG Planning and Environment
Site name	North Petherton
County	Somerset
NGR	ST 29440 32392
Land use/ field condition	Pasture
Duration	14/7/17 - 17/7/17
Weather	Overcast/Sunny
Survey type	Gradiometer Survey
Instrumentation	Trimble GXOR system Bartington Grad 601-2
Area covered	Approx 12 ha (172 full and partial)
Download software	Grad601 PC Software v313
Processing software	Geoplot v3.0 and v4.0
Visualisation software	AutoCAD LT 2009
Geology	Lower Lias Clays (BGS 2017)
Soils	Lime-rich loamy and clayey soils with impeded drainage (Soilscapes 2017)
Scheduled Ancient Monument	No
Known archaeology on site	None
Historical documentation/ mapping on site	None
Report title	North Petherton, Somerset
Project number	51773
Report Author	James Lawton
Report approved by	Graeme Cavers



## Appendix 3: Archaeological Prospection Techniques, Instrumentation and Software Utilised

### Gradiometer survey

Gradiometer surveys measure small changes in the earth's magnetic field. Archaeological materials and activity can be detected by identifying changes to the magnetic values caused by the presence of weakly magnetised iron oxides in the soil (Aspinall *et al.*, 2008, 23; Sharma, 1997, 105). Human habitation often causes alterations to the magnetic properties of the ground (Aspinall *et al.*, 2008, 21). There are two physical transformations that produce a significant contrast between the magnetic properties of archaeological features and the surrounding soil: the enhancement of magnetic susceptibility and thermoremanent magnetization (Aspinall *et al.*, 2008, 21; Heron and Gaffney 1987, 72).

Ditches and pits can be easily detected through gradiometer survey as the top soil is generally suggested to have a greater magnetisation than the subsoil caused by human habitation. Also areas of burning or materials which have been subjected to heat commonly have high magnetic signatures, examples include: hearths, kilns, fired clay and mudbricks (Clark 1996, 65; Lowe and Fogel 2010, 24). It should be noted that negative anomalies can also be useful for characterising archaeological features. If the buried remains are composed of a material with a lower magnetisation compared with the surrounding soil, the surrounding soil will consequently have a greater magnetisation resulting in the feature displaying a negative signature. For example stone materials of a structural nature that are composed of sedimentary rocks are considered non-magnetic and so will appear as negative features within the data set.

Ferrous objects- i.e. iron and its alloys- are strongly magnetic and are typically detected as high-value peaks in gradiometer survey data, though it is not usually possible to determine whether these relate to archaeological or modern objects.

Although gradiometer surveys have been successfully carried out in all areas of the United Kingdom, the effectiveness of the technique is lessened in areas with complex geology, particularly where igneous and metamorphic bedrock is present. All magnetic geophysical surveys must therefore take the effects of background geological and geomorphological conditions into account.

### Gradiometer survey instrumentation

AOC Archaeology's gradiometer surveys are carried out using Bartington Grad601-2 magnetic gradiometers. The Grad601-2 is a high-stability fluxgate magnetic gradient sensor, which uses a 1m sensor separation. The detection resolution is from 0.03 nT/m to 0.1nT/m, depending on the sensor parameters selected, making the Grad601-2 an ideal instrument for prospective survey of large areas as well as detailed surveys of known archaeology. The instrument stores the data collected on an on-board data-logger, which is then downloaded as a series of survey grids for processing.

### Gradiometer survey software

Following the survey, gradiometer data is downloaded from the instrument using Grad601 PC Software v313. Survey grids are then assembled into composites and enhanced using a range of processing techniques using Geoscan Geoplot v3.0 / v4.0 (see Appendix 4 for a summary of the processes used in Geoplot and Appendix 5 for a list of processes used to create final data plots).

## Appendix 4: Summary of Processes used in Geoplot

Process	Effect
Clip	Limits data values to within a specified range
De-spike	Removes exceptionally high readings in the data that can obscure the visibility of archaeological features. In resistivity survey, these can be caused by poor contact of the mobile probes with the ground. In gradiometer survey, these can be caused by highly magnetic items such as buried ferrous objects.
De-stagger	Counteracts the striping effect caused by misalignment of data when collected on a zig-zag traverse pattern.
Edge Match	Counteracts edge effects in grid composites by subtracting the difference between mean values in the two lines either side of the grid edge.
High pass filter	Removes low-frequency, large scale detail in order to remove background trends in the data, such as variations in geology.
Interpolate	Increases the resolution of a survey by interpolating new values between surveyed data points, creating a smoother overall effect.
Low Pass filter	Uses a Gaussian filter to remove high-frequency, small scale detail, typically for smoothing the data.
Periodic Filter	Used to either remove or reduce the appearance of constant and reoccurring features that distort other anomalies, such as plough lines.
Wallis filter	Applies a locally adaptive contrast enhancement filter.
Zero Mean Grid	Resets the mean value of each grid to zero, in order to counteract grid edge discontinuities in composite assemblies.
Zero Mean Traverse	Resets the mean value of each traverse to zero, in order to address the effect of striping in the data and counteract edge effects.

## Appendix 5: Survey Processing Steps

<b>Gradiometer survey</b>	
<b>Process</b>	<b>Extent</b>
Zero Mean Traverse	All LMS =on, threshold -5 to 5
Despike	X=1 Y=1 Thr = 3 Repl = Mean
Clip	Min =-5 Max = 5
Destagger	All grids dir Shift = 2 Line Pattern 34-78 Dual-DS
Low Pass filter	X=1 Y=1 Wt=G
Interpolate	Y, Expand – Expand –SinX/X x2
Raw Palette Scale	Grey55 – Grey08 Min= -1nT Max= 2nT
Palette Scale	Grey55 – Grey08 Min= -1nT Max= 2nT

## Appendix 6: Technical Terminology

Type of Anomaly	Description
<b>Archaeology</b>	
Archaeology - Trend	<p>These are made up of linear / curvilinear / rectilinear anomalies and are either characterised by an increase or decrease in values compared to the magnetic background.</p> <p>This evidence is normally supported by the presence of archaeological remains and is confirmed by other forms of evidence such as HER records and aerial photography.</p>
Archaeology - Area of Disturbance	<p>This is characterised by a general increase and decrease of magnetic responses over a localised area and does not appear as having a linear form. These anomalies do not have the high dipolar response which are manifested in an 'iron spike' anomaly. This anomaly may be supported by the known location of a former building, or other forms of evidence such as HER records and aerial photography.</p>
Archaeology - Pit	<p>An anomaly composed of an increase in magnetic values with a patterning on the XY trace plot that is suggestive of buried remains, such as the infill of a pit.</p> <p>This evidence is normally supported by the presence of archaeological remains and is confirmed by other forms of evidence such as HER records and aerial photography.</p>
<b>Discrete Archaeology</b>	
Archaeology? – Trend	<p>Anomalies of a linear / curvilinear / rectilinear form either composed of an increased or decreased signal compared to magnetic background values.</p> <p>It is possible these anomalies belong to archaeological remains, but poor patterning or weaker response values makes interpretation difficult.</p> <p>Where historical records are present, the anomalies would appear to be weak or inconclusive.</p>
Archaeology? - Area of Disturbance	<p>Anomalies with an increase or decrease in magnetic values compared with the magnetic background over a localised area. Poor patterning or weak signal changes creates difficulty in defining the origin of the anomaly and so interpretation is only tentative. The anomaly lacks definitive records to confirm its origin as being archaeological.</p> <p>Disturbed areas could indicate the presence of buried rubble relating to fallen structures, or instead denote modern material from either quarrying or agricultural activity. On certain geologies these anomalies could be caused by in-filled natural features.</p>
Archaeology? – Pit	<p>An anomaly composed of an increase in magnetic values with a patterning on the XY trace plot that is suggestive of buried remains, such as the infill of a pit, but is isolated in its location and association with other features.</p>
<b>Unclear Origin</b>	
Linear Trend	<p>Anomalies of a linear / curvilinear form which are composed of a weak or different change in magnetic values. Coupled with poor patterning, the anomaly is difficult to interpret and it is unclear whether it has an archaeological origin.</p>
Area of Disturbance	<p>An area of magnetic disturbance which consists of a variety of increased and decreased magnetic values compared with background readings, but lacks sufficient patterning or context for a conclusive interpretation. It is likely that these readings are caused by modern disturbances, but</p>

interpretation is tentative.

### **Agricultural**

Linear Trend (Old Field Boundary)	These isolated long linear anomalies, most often represented as a negative magnetic trend, are likely to relate to former field boundaries. The magnetic signal may appear inconsistent but when the positioning is cross referenced with historic mapping, it is confirmed as a former field boundary.
Linear Trend (Old Field Boundary?)	These isolated long linear anomalies, most often represented as a negative magnetic trend, are likely to relate to former field boundaries. The positioning is not supported by historic mapping, but is often confirmed with adjacent ploughing patterns.
Linear Trend (Ridge and Furrow / Rig and Furrow)	A series of regular linear anomalies either composed of an increased or decreased magnetic response compared to background values. The width between the anomalies is consistent with that of a Ridge and Furrow ploughing regime, which is normally wider than conventional ploughing methods.
Linear Trend (Conventional ploughing)	A series of regular linear anomalies either composed of an increased or decreased magnetic response compared to background values. The regular patterning is likely to denote the presence of ploughing, however isolated trends can occasionally be observed that follow the orientation of ploughing trends seen elsewhere in the area. Anomalies seen adjacent to field edges are representative of headlands caused by ploughing.
Linear Trend (field drainage)	A series of linear anomalies of an indeterminate date, usually with a regular or herringbone patterning and regular spacing. These are likely to represent agricultural activity such as land drainage.
<b>Non- Archaeology</b>	
Geology / Natural	An area of disturbance that is composed of irregular significant increases or decreases in magnetic values compared with background readings and is likely to indicate natural variations in soil composition or geology.
Linear Trend (possible modern service)	Anomalies of a linear form often composed of contrasting high positive and negative values. Such anomalies usually signify a feature with a high level of magnetisation and are likely to belong to modern activity such as pipe lines or modern services.
Disturbed Area (modern disturbance?)	An area of disturbance that is likely to be caused by modern activity and is characterised by significant increases or decreases in magnetic values compared with background readings.
Isolated Dipolar Anomalies / Ferrous (iron spikes)	A response normally caused by ferrous materials on the ground surface or within the top soil, which causes a 'spike' representing a rapid variation in the magnetic response. These are generally not assessed to be archaeological when surveying on rural sites, and generally represent modern material often re-deposited during manuring.



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