

**THE VALE OF
GLAMORGAN COUNCIL**

TOWN AND COUNTRY PLANNING ACT 1990

APPROVED

SUBJECT TO COMPLIANCE WITH CONDITIONS (IF ANY)

**Land to the North
of the Railway
Line (West),
Rhoose**

**Archaeological
and Heritage
Baseline**

Prepared by:
**The Environmental
Dimension
Partnership (EDP)**

On behalf of:
Taylor Wimpey Plc.

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edp
THE
ENVIRONMENTAL
DIMENSION
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Contents

Non-Technical Summary

Section 1	Introduction	1
Section 2	Methodology	3
Section 3	Planning Guidance	5
Section 4	Existing Information.....	9
Section 5	Conclusions	21
Section 6	Bibliography.....	23

Appendices

Appendix EDP 1	Consultation response from Glamorgan-Gwent Archaeological Trust
Appendix EDP 2	Geophysical Survey Report

Plans

Plan EDP 1	Known Designated Heritage Assets (EDP2127/02a 24 January 2014 GC/MM)
Plan EDP 2	Known Undesignated Heritage Assets (EP2127/03a 24 January 2014 GC/MM)
Plan EDP 3	Extracts from: a) First Edition Ordnance Survey Map, 1885 b) Second Edition Ordnance Survey Map, 1900 (EDP2127/15a 07 February 2014 TB/MM)

For EDP use

Report no.	H_EDP2127_03a
Author	Matthew Morgan
2 nd Read	Andrew Crutchley
Formatted	Audrey Vuvi
Proofed	Christina Hinder
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Non Technical Summary

- S1 This archaeological and heritage assessment has been prepared by the Environmental Dimension Partnership (EDP), on behalf of Taylor Wimpey Plc., to inform planning proposals for a housing development on land to the north of the Vale of Glamorgan Railway Line, Rhoose, Glamorgan.
- S2 This archaeological and heritage assessment concludes that the application site does not contain any designated assets, where there would be a presumption in favour of their physical preservation *in situ* and against development.
- S3 One scheduled monument, three listed buildings and two conservation areas are located in the wider 1.5km study area. This assessment concludes that the development will have no impacts on the setting of any of these designated assets, apart from Rhoose Conservation Area, which may potentially experience some localised visual impacts restricted to its south east corner. This is not considered to be a significant effect and could be dealt with through the detailed masterplan process.
- S4 There are no previously recorded undesignated heritage assets within the site. It is considered that the site is situated within historic farmland that has most likely been exploited from the late prehistoric period onwards. It is therefore considered to have a low/moderate potential to contain hitherto unrecorded deposits dating from the prehistoric and Roman periods, and a moderate potential for deposits from the medieval period onwards. If present, these deposits will probably be of 'low' value remains; i.e. ploughsoils and field boundaries; with a 'low risk' for settlement activity.
- S5 A holloway, probably dating to the broad post-medieval period, was noted during the site walkover and is also marked on historic maps. Due to its orientation toward Rhoose, it is believed to most likely be connected with this village. Although worth noting within this assessment, the impacted partial remains of this previously unrecorded asset are considered to be of negligible value.
- S6 A 'scan and sample' geophysical survey has previously been conducted across the site and adjoining farmland. Although it employed a now largely defunct methodology, it is notable that only one area of the site, measuring c.0.36ha, produced sufficiently strong magnetic signals to warrant further (detailed) investigation. This only identified three linear anomalies, which may relate to buried archaeology, and some further signals which may be related to modern farming practices.
- S7 The proposed development will lead to the removal of any archaeological remains present on site. However, this assessment concludes that the site is unlikely to contain any remains of greater than 'low' importance. The impact of this development could be mitigated through a phased programme of archaeological investigation, secured by condition, to preserve any remains present by record ahead of or during construction.

This assessment alone should be sufficient to address planning requirements and secure a positive determination for the planning application.

- S8 Initial consultation with Judith Doyle (Glamorgan-Gwent Archaeological Trust) has established that she has no objections to the proposed development and that there is no requirement for further pre-determination archaeological work (see **Appendix EDP 1**).

Section 1

Introduction

- 1.1 This report has been prepared by the Environmental Dimension Partnership (EDP), on behalf of Taylor Wimpey Plc., and presents the results of an archaeological and heritage baseline study of land to the north of the Vale of Glamorgan Railway Line, Rhoose, Vale of Glamorgan.
- 1.2 This archaeological and heritage baseline has been prepared to inform development proposals for the site, which will be subject to the submission of an outline application for the construction of c.350 dwellings.
- 1.3 The aim of this assessment is to consider the available historical and archaeological resources for the application site and to establish its likely potential in accordance with the requirements of National Planning Policy.

Location and Boundaries

- 1.4 The site is located in the east of the town of Rhoose, c.12km south west of Cardiff. The site comprises seven fields, a modern bungalow and garden, and a trackway, totalling c.12.9ha. The current land use of the fields is rough pasture. The site is bordered to the north and north east by Porthkerry Road and modern houses, to the east by farmland, to the south by the Vale of Glamorgan railway, and to the west by modern residential dwellings.
- 1.5 The site is centred on National Grid Reference (NGR) 306720,166370 and its location and layout are shown on **Plan EDP 1**.

Geology and Topography

- 1.6 The underlying geology of the site consists of limestone and mudstone of the Porthkerry Member. There are no superficial deposits recorded (www.bgs.ac.uk).
- 1.7 The site slopes gently downwards from c.63m above Ordnance Datum (aOD) in the north to c.47m aOD in the south.

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Section 2 Methodology

- 2.1 This report has been produced in accordance with the *Standard and Guidance for Historic Environment Desk-Based Assessment*, issued by the Institute for Archaeologists (IfA, 2012). These guidelines provide a national standard for the completion of desk-based assessments.
- 2.2 Its preparation has also taken into account local best practice guidance issued by the Glamorgan-Gwent Archaeological Trust (GGAT). In combination with IfA (2012), these guidelines provide a national and local standard for the completion of desk-based archaeological and heritage assessments.
- 2.3 The assessment involved consultation of readily available archaeological and historical information from documentary and cartographic sources. The major repositories of information comprised:
- Records of known archaeological sites, monuments and findspots, within the application site and its wider vicinity, maintained by GGAT;
 - Coflein, the database for the National Monuments Records of Wales (NMRW);
 - Aerial photographs held by the Central Register for Aerial Photography for Wales (CRAPW);
 - Historic maps from the Glamorgan Archives; and
 - Records made during a site visit in January 2014.
- 2.4 Information on the locations, nature and importance of designated historic assets, such as scheduled monuments and listed buildings, both within the application site and in the areas surrounding its redline boundary, was gathered through consultation with the GGAT HER and the NMRW's 'Coflein' website.
- 2.5 Once the information had been collected, collated and plotted on base maps, each of the designated historic assets was visited during the course of a walkover survey completed in January 2014, where the aim was to define their setting and assess their potential sensitivity to change in order to inform the masterplanning process.
- 2.6 The assessment process was undertaken with regard to the guidance set out in English Heritage (2011) *The Setting of Heritage Assets*, which presents a robust methodology for the assessment of these issues, in the conservation and management of the historic environment, in the absence of any specific guidance from Cadw.

- 2.7 This report provides a synthesis of relevant information for the site and wider study area and thereafter concludes with an assessment of its likely archaeological potential, made with regard to current best practice guidelines. It also considers the constraint posed by designated historic assets and their settings.

Section 3 Planning Guidance

National Planning Policy

- 3.1 This section sets out the relevant planning policy context, to the form of development proposed, at the national and local levels.

National Planning Policy

- 3.2 The most relevant planning guidance, concerning archaeology in Wales, is set out in *Welsh Office Circular 60/96* and *Planning Policy Wales Sixth Edition*, which was adopted February 2014 (WG 2014). At Paragraph 6.5.1, this plan recognises that:

“The desirability of preserving an ancient monument and its setting is a material consideration in determining a planning application, whether that monument is scheduled or unscheduled. Where nationally important archaeological remains, whether scheduled or not, and their settings are likely to be affected by proposed development, there should be a presumption in favour of their physical preservation in situ. In cases involving lesser archaeological remains, local planning authorities will need to weigh the relative importance of archaeology against other factors, including the need for the proposed development”.

- 3.3 Paragraph 6.5.2 then adds that:

“The needs of archaeology and development can be reconciled, and potential conflict very much reduced, if developers discuss their proposals for development with the local planning authority at an early stage. Archaeological assessments commissioned by developers (sometimes as part of a wider Environmental Impact Assessment) can help to provide information on the archaeological sensitivity of a site before submitting a planning application. If important remains are thought to exist at a development site, the planning authority should request the prospective developer to arrange for an archaeological field evaluation to be carried out before any decision on the planning application is taken¹⁶. The results of any assessment and/or field evaluation should be provided as part of a planning application. If this information is not provided, authorities should consider whether it is appropriate to direct the applicant to supply further information, or whether to refuse permission for inadequately documented proposals”.

- 3.4 As far as ‘cultural heritage resources’ are concerned, Paragraph 6.5.9 states that:

“Where a development proposal affects a listed building or its setting, the primary material consideration is the statutory requirement to have special regard to the

desirability of preserving the building, or its setting, or any features of special architectural or historic interest which it possesses”.

- 3.5 Finally, Paragraph 6.5.17 addresses conservation areas and notes the following:

“Should any proposed development conflict with the objective of preserving or enhancing the character or appearance of a conservation area, or its setting, there will be a strong presumption against the grant of planning permission. In exceptional cases the presumption may be overridden in favour of development deemed desirable on the grounds of some other public interest. The Courts have held that the objective of preservation can be achieved either by development which makes a positive contribution to an area’s character or appearance, or by development which leaves character and appearance unharmed”.

- 3.6 The most relevant planning guidance, concerning conservation areas, listed buildings and historic parks and gardens in Wales, is set out in *Welsh Office Circular 61/96 Planning and the Historic Environment: Historic Buildings and Conservation Areas*, as amended by *Welsh Office Circular 1/98 Planning and the Historic Environment: Directions by the Secretary of State for Wales* (WO 1996, 1998). The former circular includes sections on preserving the settings of listed buildings and procedural advice for development within conservation areas.

Local Planning Policy

- 3.7 The Vale of Glamorgan Adopted Unitary Development Plan 1996 - 2011 constitutes the development plan for the local authority.
- 3.8 Policy ENV 17, which concerns the protection of the built and historic environment, states that *“The environmental qualities of the built and historic environment will be protected. Development which has a detrimental effect on the special character, appearance or setting of:*
- (i) a building or group of buildings, structures or site of architectural or historic interest, including listed buildings and conservations areas;*
 - (ii) Scheduled Ancient Monuments and sites of archaeological and/or historic interest; and*
 - (iii) Designed landscapes, parks or gardens of historic, cultural or aesthetic importance will not be permitted.”*
- 3.9 Policy ENV 18 of the adopted UDP addresses field evaluation and states that, where development *“...is likely to affect a known or suspected site of archaeological significance, an archaeological evaluation should be carried out at the earliest*

opportunity and may be required before the proposal is determined. Detailed plans would need to reflect the conclusions of the evaluation”.

- 3.10 Finally, Policy ENV19 states that *“Where development is permitted which affects a site of archaeological importance mitigation measures will be required to ensure the preservation on site or adequate recording prior to disturbance”.*
- 3.11 The *Vale of Glamorgan Local Development Plan (LDP) 2011-2026* is currently in the process of consultation. Although not yet adopted, the following relevant policies are contained within the Plan.

“POLICY SP10 – BUILT AND NATURAL ENVIRONMENT

Development proposals must protect and where appropriate enhance the rich and diverse built and natural environment and heritage of the Vale of Glamorgan including:

- 1. The historic qualities of individual buildings or conservation areas;*
- 2. Historic landscapes, parks and gardens;*
- 3. Special landscape areas;*
- 4. The Glamorgan Heritage Coast;*
- 5. Sites designated for their local, national and European nature conservation importance; and*
- 6. Important archaeological and geological features*

Policy MD 9: Historic Environment

Development proposals must protect the qualities of the built and historic environment of the Vale of Glamorgan specifically:

- 1. Within conservation areas, development proposals must preserve or enhance the character or appearance of the area; and*
 - 2. For listed and locally listed buildings, development proposals must preserve or enhance the building, its setting and any features of significance it possesses...”*
- 3.12 The National and Local Planning policies set out above have been considered in the preparation of this assessment.

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Section 4 Existing Information

Introduction

- 4.1 The site does not contain any designated assets, such as scheduled monuments, registered parks and gardens, listed buildings, registered battlefields or conservation areas, where there would be a presumption in favour of their physical preservation.
- 4.2 However, the wider study area includes one scheduled monument, a total of three Grade II listed buildings and two conservation areas.
- 4.3 There are no undesignated heritage assets recorded within the site, but there are a number distributed within the study area, as recorded on the GGAT HER – the local archaeological database. These span the Neolithic to modern periods.

Designated Assets

- 4.4 There are no designated heritage assets within the site, but there are six within the study area, as detailed below. Their positions are illustrated on **Plan EDP 1**.
- 4.5 There are no registered parks and gardens or registered battlefields. One scheduled monument, three Grade II listed buildings and two conservation areas are located within the wider study area.
- 4.6 The single scheduled monument designates the extent of Porthkerry Bulwarks, a large multivallate Iron Age hillfort (**00523s**), located c.930m east of the site. Intrusive and non-intrusive investigations within the defences have recorded stone hut circles and rectangular buildings occupied in the Iron Age and Roman periods.
- 4.7 The three Grade II listed buildings within the study area are as follows:
- Upper Porthkerry Farm (**01483s**);
 - Lower Porthkerry Farm (**19576**); and
 - Rhoose Council School (**13428**).
- 4.8 The two conservation areas designate the historic cores of the settlements of Rhoose, adjacent to the north west tip of the site, and Porthkerry, c.1.02km north east of the site.

- 4.9 The potential nature and significance of possible impacts on the setting of the Rhoose Conservation Area are considered below (see **Site Walkover**). The settings of the remaining designated assets will not be affected by the form of development proposed within the site due to the presence of Cardiff Airport and the Vale of Glamorgan railway, both of which provide effective visual barriers to the south, east and north east, and the modern housing within Rhoose itself. Therefore, they will not be considered further in this report.

Undesignated Heritage Assets

Prehistoric (c.500,000 BC – AD 43)

- 4.10 There are no known prehistoric heritage assets identified within the site on the GGAT HER, but eight have been identified in the wider study area.
- 4.11 The earliest identified human habitation of Wales dates to 25,000 years ago. In this early prehistoric period inhabitants subsisted by hunting and gathering in small groups, probably based on familial structures (Lynch et. al. 2000, 1 & 22). There is no confirmed archaeology from this earliest period within the study area.
- 4.12 The Neolithic marks a departure from this nomadic lifestyle, with the appearance of individual farmsteads in lowland locations, such as on the Glamorgan coast, alongside an increase in woodland clearance (ibid. 42 & 48). Possibly linked to this activity, the oldest dated archaeology from within the study area is a Neolithic axehead (**02517s**), which was recovered from the River Weycock c.1.124km north east of the site. This may alternatively be a ritual deposition or accidental loss.
- 4.13 The Bronze Age and Iron Age witnessed a continuation and intensification in the farming and settlement of these fertile lowland zones (ibid. 122 & 171-2).
- 4.14 As mentioned above, the significant prehistoric settlement in the area is the Porthkerry Bulwarks (**00523s**), which is an Iron Age hillfort located c.930m east of the site.
- 4.15 A geophysical survey conducted c.505m east of the site located evidence for a probable Roman settlement (**03295s**) which overlay earlier activity, possibly dating to the Iron Age. All other prehistoric archaeology recorded in the wider study area is dated only to the broad and non-specific prehistoric period.
- 4.16 A possible prehistoric field system/enclosure, which is overlain by a later Roman field system (**03038s, 03587s**), was recorded c.1.045km north west of the site. During limited excavation, this earlier field system/enclosure was found to contain both Iron Age and Roman pottery suggesting continuity of occupation.

- 4.17 A second prehistoric field system (**02944s**), with associated pits, covering a c.200m by c.320 m area, was recorded c.1.15km north east of the site, suggesting that activity in this broad period was relatively widespread.
- 4.18 The remaining recorded archaeology relates to unstratified finds of flints and pottery, which themselves are relatively rare within the South Wales landscape and may indicate the presence of further related underlying buried deposits:
- Unstratified prehistoric finds of a flint and possible microliths (**01731s**) were recovered 1.09km north east of the site during an archaeological evaluation; and
 - A flint blade (**02776s**), found at the 'low watermark' on Porthkerry Beach, is recorded c.1.09km south east of the site. The exact location of this find is not recorded, the location included in the GGAT HER being an arbitrary point.
- 4.19 The above information suggests that the site lies within the hinterland of surrounding prehistoric settlement areas, some of which are suggested by unstratified finds. However, there is no indication that previously recorded sites extend to within the boundary or that previously unrecorded archaeology underlies it.
- 4.20 Therefore, the site is considered to have a low/moderate potential for prehistoric archaeology. If present, this will most likely consist of late prehistoric field systems, rather than remains related to settlement.

Romano-British (AD43 – 410)

- 4.21 There are no known Roman heritage assets identified on the GGAT HER within the application site, but there are five identified in the wider study area.
- 4.22 Although the conquest of England was begun in AD43, the conquest of Wales was not completed until the reign of Vespasian (AD69-79). The newly conquered territories of Wales were governed by military authority based on a system of forts and fortresses. The fortress of Caerleon, c.24km east of the application site, was one of only three legionary fortresses in Britain (Walcher, 1998. 29 & 33).
- 4.23 The immediate effect of Roman conquest is barely perceptible in the rural archaeology of the period, as Iron Age farming practices continued uninterrupted (ibid. 33). However, over time, some farmsteads developed into villa-type complexes in lowland areas, such as in the Vale of Glamorgan (Howell, 2006. 80).
- 4.24 A geophysical survey conducted c.505m east of the site located evidence for a probable Roman settlement (**03295s**) in the form of an enclosure and ditches. A fieldwalking exercise recovered finds from this area consisting of a Roman coin and one potsherd.

- 4.25 The possible location of a Romano-British rural settlement or field system (**01449s**) has been suggested by finds of pottery and the recorded remains of shallow bank earthworks noted on aerial photographs. This site is located c.660m east of the site.
- 4.26 A further complex of field systems (**03038s, 03587s**) has been recorded c.1.045km north west of the site. This was recorded from aerial photographs and was seen to consist of a number of rectangular enclosures and pits which overlie an earlier ditched, rectangular enclosure. The earlier enclosure was found to contain Iron Age and Roman material during a partial excavation, suggesting continuation of occupation.
- 4.27 As mentioned above, the Porthkerry Bulwarks Iron Age hillfort (**00523s**), located c.930m east of the site, was found to contain evidence of rectangular structures which were inhabited during the Roman period.
- 4.28 The remaining heritage asset recorded within the study area is the findspot of a single sherd of Roman pottery (**02518s**) which was located c.858m north of the site. Although this is an unstratified find, artefactual material from this period in South Wales is relatively uncommon and therefore may indicate further buried remains.
- 4.29 Similar to the prehistoric period, the site is likely to lie within farmland between areas of settlement. Therefore, it has a low/moderate potential to contain archaeological remains from the Roman period. If present, these will most likely consist of 'low value' remains; i.e. plough soils and field boundaries, rather than settlement evidence.

Early Medieval (AD 410 - 1066)

- 4.30 There are no early medieval heritage assets identified on the GGAT HER within the site and there is only one that has been identified in the wider study area.
- 4.31 A non-extant holy well at Pontugary (**00926s**) is the sole early medieval asset within the study area. It is recorded c.180m south east of the site. This recorded location is likely to be an arbitrary location, the exact location not being recorded.
- 4.32 Early medieval (i.e. 'Dark Age') activity is notoriously difficult to identify in the archaeological record, if not only because of the 'limited' nature of the material culture and its poor survival in ploughzone contexts. As a result, it is impossible to rule out the possibility that early medieval features and deposits could be present within the proposed development site.
- 4.33 Nonetheless, it is considered that this represents only a 'low risk' to the development of the site. The likelihood is that the site continued to be utilised for farming, possibly as grazing land which would leave little to no archaeological evidence. Therefore, the site has a low potential to contain archaeology from this period.

Medieval (AD 1066 – 1485)

- 4.34 There are no known medieval heritage assets identified on the GGAT HER within the site, but there are 11 identified in the wider study area.
- 4.35 The findspot of a battle axe and holy water sprinkler (**02195s**) is located c.125m west of the application site. These finds are thought to relate to Rhoose Castle, which is not individually listed within the GGAT HER.
- 4.36 A hearth and rock-cut floor (**02350s**), dated by associated 12th century pottery, were found during road widening c.135m north of the site.
- 4.37 The possible site of a medieval manor house (**00540s**) is located c.215m west of the site. This may have dated to the 14th century and included a well. This site is recorded as 'Old Castle' on early editions of the Ordnance Survey maps (see **Early Maps**).
- 4.38 The possible site of two medieval chapels (**01437s** and **00517s**) are located c.550m south west and c.720m north west of the site respectively.
- 4.39 The remaining recorded undesignated archaeological finds from this period relate to findspots of pottery. Single sherds of medieval pottery (**03330s**, **03447s** and **03308s**) were recovered from the surface of fields c.505m south west, c.765m north west, and c.890m east of the application site respectively. A collection of 14 sherds of medieval pottery (**03404s**), probably the result of manuring, and two findspots of unspecified amounts of pottery (**01731s** and **02812s**), were also found c.1.067km south west and c.1.09km north east of the site respectively.
- 4.40 It is considered a 'low risk' that settlement activity related to the medieval village of Rhoose, or the manor house to the west, extend into the site. It is most likely that it continued to be farmed during this period. If it was utilised for rough grazing, it is unlikely that this activity left any archaeological trace. Therefore, there is a low/moderate potential for medieval archaeology to be present within the site. If present, it will most likely consist of 'low' value remains; i.e. plough soils and field boundaries, located rather than everywhere for settlement etc.

Post-Medieval and Georgian (AD 1485 – 1837)

- 4.41 There are no previously identified heritage assets from these two periods recorded within the application site, but there are 27, representing the majority of the previously recorded archaeology, in the wider study area.
- 4.42 Undesignated historic buildings comprise the bulk of the recorded assets:
- Greystones (**02118s**), a 17th century house, is located c.80m north west;

- The Cottage, Rhoose (**02119s**), is a late 17th century thatched house, c.145m west;
- Bullhouse Farm (**02121s**), a 17th century house, is located c.830m north east;
- A building, which contains elements dating to the 17th century (**01688s**), c.1.045km north west;
- The semi-ruinous remains of a post-medieval building in the hamlet of Nurston (**03448s**), located c.1.18km north west; and
- Church Farm (**01811s**), containing elements dated to the 16th century, c.1.18km east of the site.

4.43 The sites of non-extant historic buildings are also recorded within the study area:

- A now destroyed thatched stable (**01813s**), 16th century cottage (**01814s**) and barn complex (**02753s**) are recorded c.775m north east;
- A series of earthworks (**03429s**), c.830m north east, may represent non-extant post-medieval buildings;
- The site of a now destroyed cottage and garden (**02752s**) was located c.830m north east of the site; and
- A complex of earthworks (**03425s**), possibly representing the remains of a house and enclosure, were recorded c.900m north east.

4.44 The post-medieval settlement of Rhoose is situated c.20m north of the site. A probable holloway (**03316s**) associated with it was recorded c.1.08km north east of the site. The GGAT HER entry **03438s**, identified as being a cattle trail of unknown date, is probably a duplicate of this record.

4.45 Mineral exploitation is represented by the sites of two quarries (**02754s** and **02755s**), which were located c.1.08km and 1.24km north east of the site respectively.

4.46 Industrial structures in the wider study area comprise entirely limekilns. Two such structures (**02691s** and **02758s**), at least one of which is noted on the First Edition Ordnance Survey Map (1879), were located c.505m south west of the site. Other non-extant limekilns (**02647s**, **02649s**, **02759s**, **02757s** and **02646s**) were located c.280m, c.402m, c.415m and c.1.01km north east, and c.595m north west of the site respectively.

4.47 The remaining recorded heritage assets of these periods, within the study area, are findspots of pottery. Single sherds of post-medieval pottery (**03332s** and **03407s**) were

found during fieldwalking c.595m and c.810m south west of the site respectively. Two further groups of pottery, each consisting of two sherds (**03329s** and **03334s**), were found c.235m south east and 450m south west of the site respectively. These finds are probably the result of manuring.

- 4.48 The site is located outside of the post-medieval extent of Rhoose and, as with earlier periods, most likely lay within the hinterland of surrounding settlements. Therefore, there is a moderate potential for the site to contain archaeology from these two periods, albeit most likely of 'low value'; i.e. plough soils and field boundaries.

Victorian and Modern (AD 1837 - Present)

- 4.49 There are no identified undesignated assets from these periods recorded within the site, but there are 12 situated within the wider study area.
- 4.50 A limekiln (**02763s**), noted on the 1920 Edition Ordnance Survey Map, was located c.605m south east. An abandoned quarry (**02760s**), noted on the First Edition Ordnance Survey Map, was located c.955m east of the site. Other quarries (**03430s** and **02756s**) were located c.890m and c.1.02km north east of the site respectively.
- 4.51 The location of a cement works (**02762s** and **01675s**, the latter possibly a duplicate of the former), shown on the Third Edition Ordnance Survey Map (1920), is recorded c.55m south of the site.
- 4.52 Connected with the Vale of Glamorgan railway, which forms the southern boundary of the site, the Rhoose railway station (**02761s**) was located c.405m west of the site on the Second Edition Ordnance Survey Map (1900).
- 4.53 A number of World War II buildings have been recorded by the GGAT HER, most within the complex of RAF Rhoose (**04243s**), which today exists as the modern civilian airport. These consist of:
- A small dispersal hanger (**04244s**) at RAF Rhoose, c.395m north;
 - A concrete base (**02696s**), which may be the remains of a military structure, c.640m south east;
 - The location of non-descript structures (**02768s**) c.780m north east; and
 - A heavy anti-aircraft battery (**02398s**) c.785m east of the site.
- 4.54 The site was situated within farmland throughout both of these periods. Therefore, it has a moderate potential to contain Victorian and modern archaeology, albeit most likely of 'low value'; i.e. plough soils and field boundaries.

Undated

- 4.55 There are no previously identified undated assets within the site recorded in the GGAT HER. However, there are five in the wider study area.
- 4.56 A low mound (**00315s**), measuring roughly 90m by 20m, was recorded in a study of Romano-British settlements in south east Wales (GGAT 2001), c.90m east of the site. This does not appear to have been definitively dated and no explanation of its purpose has been recorded within the GGAT HER. It may, therefore, be the result of activity earlier or later than the Roman period.
- 4.57 A series of earthworks (**03309s**) were recorded c.955m east of the site. These possibly consist of medieval house platforms. A record of similar earthworks (**03424s**) in the same location, probably refers to the same undesignated asset.
- 4.58 A possible house platform (**03426s**) is located c.1.01km north east of the site.
- 4.59 Three small mounds of rubble (**03314s**) are recorded c.1.11km north east of the site. It is not clear what the suspected purpose of these features is.
- 4.60 Due to its proximity, only **00315s** has the possibility to affect the site's archaeological potential. However, as it is as likely, if not more likely, to date to the post-medieval to modern periods as it is to the prehistoric to medieval periods, it is difficult to judge this impact. A previous site walkover by Cotswold Archaeology in 2008 confirmed that there are no above ground remains related to this asset. Therefore, the effect on the site's potential to contain archaeology is negligible.

Previous Archaeological Investigation

- 4.61 The GGAT HER does not record any archaeological works as having been completed within the site. However, there was a previous geophysical survey which was conducted within the site and across an area to the east. The results of this investigation are discussed below (see **Geophysical Survey**). In the wider study area, there are records of two archaeological investigations, ranging from field walking to excavation.
- 4.62 A watching brief, which does not have a GGAT HER number and is instead recorded on **Plan EDP 2** by NGR reference (**ST06206650**), was conducted c.315m west of the site. The limited information available for this monitoring work suggests that no archaeological remains were located.
- 4.63 An archaeological excavation (**E000757**) was conducted c.910m north east of the site. No further information is included within the GGAT HER.
- 4.64 Neither of these investigations alter the potential of the site to contain hitherto unrecorded archaeological remains.

Early Maps

- 4.65 The earliest consulted map depicting the site and its wider vicinity is the *Tenements at Roose in the Parish of Porthkerry* map of 1812 (not reproduced here). The site is depicted as consisting of 10 fields, albeit many of these are only small parts of larger fields. The trackway, which divides the site in two today, is present on this map.
- 4.66 The *Porthkerry Tithe Map* of 1849 (not reproduced here) shows the site as part of one extensive block of land and, apart from the trackway, no internal features or boundaries are depicted. This map appears to be based on the *General Survey of the Romilly Estate* of 1812 (not reproduced here), which also shows the application site as part of one extensive land holding.
- 4.67 The First Edition Ordnance Survey (OS) Map (1885, see **Plan EDP 3a**) depicts the site much the same as the 1812 *Tenements at Roose* map, except for the removal/realignment of some field boundaries in the far west, which reduced the number of fields to nine, one of which appears to have been an orchard. A track is depicted branching roughly south west into the site from the main trackway noted on earlier maps. In the south west corner an area of trees and scrubland is depicted, which roughly conforms to the possible holloway noted during the site walkover.
- 4.68 The Second Edition OS Map (1900, see **Plan EDP 3b**) is the first map to depict the Vale of Glamorgan railway line, which forms the modern southern boundary of the site. A trackway, which crosses the railway line, is depicted in the west of the site near and on the same alignment, but not in the same position, as the possible holloway noted during the site walkover. This is also the first map to depict two small buildings in the north west corner of the site, near to Upper Farm.
- 4.69 The subsequent editions of the OS maps (not reproduced here) show the removal of field boundaries and the conglomeration of existing fields, resulting in the site consisting of the eight fields and length of trackway it does today.

Aerial Photographs

- 4.70 Aerial photographs, which cover the application site and its immediate environs, were identified within the collection maintained by the Central Register of Aerial Photography for Wales in Cardiff.
- 4.71 The available images span the period from January 1942 to March 1995 and add detail to the land use and development sequence shown on those historic maps consulted.
- 4.72 The aerial photographs confirm that the majority of the site was under agricultural use throughout the mid-late 20th century. The earthworks of a possible holloway and raised field, noted during the site walkover (see below), were confirmed, but otherwise no further archaeological remains were noted.

Site Walkover

- 4.73 The site was visited in January 2014 to assess the current ground conditions and topography, as well as to confirm the continuing survival of any known archaeological remains and to identify any hitherto unknown remains of significance.

Designated Assets

- 4.74 Due to the proximity of Rhoose Conservation Area to the site, adjacent to the north west tip, this designated asset was thought to be particularly sensitive to changes resulting from residential development.
- 4.75 It is noted within the conservation area appraisal (VOGC 2009) that a portion of the north west of the site had previously been included within the designated area, but had subsequently been omitted. The justification for the omission of other locations previously included within the area were that, due to modern development, they *'[do] not make a positive contribution to the conservation area'* (ibid. 22).
- 4.76 Although no explanation is given for the area in the north west of the application site, its omission is probably for similar reasons, as there are also modern dwellings and service buildings in and adjacent to the boundary.
- 4.77 The area of land in the north west tip of the site, and between the site and the conservation area, can, therefore, be considered to be of limited significance to the setting of this designated heritage asset.
- 4.78 Furthermore, any impact on the setting of the conservation area is likely to be restricted to the far south east corner due to the natural slope of the site. This corner has views into the farmland in the far north west corner of the site.
- 4.79 Therefore, special consideration should be given to the use of this part of the site, as well as density, storey heights etc, although, as noted above, it is considered that this area is of limited significance to the setting of the conservation area. There is no reason to believe that the effects of the development cannot be dealt with through the detailed masterplan design process.

Undesignated Assets

- 4.80 It was noted that the site is divided by intermittent hedgerows located on top of earth banks. Although medium size stones were noted within and up against these banks, there is no evidence across the majority of the site to suggest that these banks were stone revetted. These banks survive in a poor state of repair, as many have been worn down or removed by *ad hoc* access between the intermittent hedges.
- 4.81 A short stretch of stone wall was noted along a bank in the north west of the site, but the large amount of material required for this structure; compared to a much lower

concentration of stones located against and within the other banks; and its good survival compared to the rest of the site, suggests that this is only a localised construction. It is located next to a field gateway and faces toward the village. Another wall of similar construction, albeit stand-alone and without an accompanying bank, was noted in the far north west corner. These walls are probably contemporaneous and, especially the former, may have been an attempt at aesthetic improvement to farmland within sight of properties at Rhoose, in particular a 19th century farm house which may have been the residence of the tenant farmer.

- 4.82 A field in the north west of the site, adjacent to the conservation area and, in particular, a 19th century farm within this designated area, was noted as being landscaped into a largely level platform approximately c.0.2m higher than the surrounding fields. This platform respects the surrounding field boundaries and is probably of Victorian or modern construction. It could possibly have served as a horse paddock; modern examples are often raised above field levels for the purpose of drainage.
- 4.83 A possible holloway was noted in the south west of the site. This is aligned roughly north north west to south south east, and leads from the direction of the sea to the historic core of Rhoose. It measures c.150m long by c.10m wide, but, as explained below, it was probably originally much longer.
- 4.84 The holloway survives well for c.100m from the edge of the Vale of Glamorgan railway, the embankment of which cuts across it at a right angle. The track surface here is largely level and is fairly consistently sunken c.1.5-2m below the level of surrounding fields. This surface slopes upwards parallel to the natural slope. There are flanking hedges along the top, either side of the holloway.
- 4.85 The north c.50m of the holloway has evidence of attempted backfilling. There are mounds of material which appear to have been dumped historically from the east edge into the bottom of the holloway. The direction of the dumping is paralleled by the fact that the flanking hedge to the east has been removed along this stretch.
- 4.86 The ground is level further north and there is no sign of this holloway, although the slope and depth of the best preserved stretch suggests that this earthwork probably would have extended closer to the village, and the lack of it is probably the result of backfilling and re-landscaping.
- 4.87 These results suggest that the farmland within the site, which was historically divided by hedge-topped banks, has undergone landscaping and 'improvement', probably in the 19th and 20th centuries, possibly connected with its inclusion in the Romilly Estate.
- 4.88 Walls were constructed closest to Rhoose village in the north west, probably for aesthetic reasons, a possible horse paddock was also constructed in this area. A historic holloway, which linked Rhoose to farmland to the south, was partially infilled and re-landscaped to extend the amount of usable land. None of the features noted above are considered significant.

Geophysical Survey

- 4.89 In 2005, a geophysical survey was conducted within the application site and an area of fields to the east, totalling 26ha (see **Appendix EDP 2**). The methodology consisted of a magnetic susceptibility reconnaissance survey over the entire site, with the results identifying target areas for detailed magnetometer survey.
- 4.90 Of the five target areas identified, only one falls within the site boundary. This is situated in the south west corner and totals an area c.0.36ha. Three linear anomalies were recorded, aligned roughly west south west – east north east. Although the origin of these features could not be determined, it is possible that they are the result of earlier agricultural regimes.
- 4.91 The only other features noted within the site were three further linears, which were parallel to existing north west - south east aligned field boundaries and were thought to be the result of farming, and a series of modern disturbances.
- 4.92 Outside of the site boundary, a collection of similar linears of indeterminate origin were noted, most of which could possibly relate to farming or geology. None of these appeared strongly archaeological.
- 4.93 Although the 'scan and sample' methodology utilised for the site is now considered largely defunct, it does suggest that substantial archaeological remains are not present. Anomalies suggesting ephemeral or heavily truncated remains are present, but these do not represent a constraint to the development of the site.

Section 5 Conclusions

- 5.1 This archaeological and heritage assessment concludes that the application site does not contain any scheduled monuments, registered parks and gardens, registered battlefields or listed buildings, where there would be a presumption in favour of their physical preservation *in situ* and against development.
- 5.2 However, one scheduled monument, three listed buildings and two conservation areas are located in the wider 1.5km study area. The presence of modern housing, Cardiff Airport and the Vale of Glamorgan Railway create effective visual barriers around the site, creating an enclosed area, so that there will be no changes, to the settings of these designated assets, with the possible exception of the Rhoose Conservation Area.
- 5.3 Rhoose Conservation Area, which is located adjacent to the north west tip of the site, is considered to be potentially sensitive to changes resulting from the development due to its proximity. Assessment of the conservation area appraisal shows that this Conservation Area once extended further south east, into the north west tip of the site. This was later removed as part of a realignment of the designated area boundaries to exclude areas of new development which no longer '*make a positive contribution to the conservation area*' (VOGC 2009. 22). Therefore, although the area of land in the far north west of the site should be treated sensitively in the detailed masterplan design process, it is of limited significance to the setting of the conservation area, such that there will not be a significant impact.
- 5.4 There are no previously recorded undesignated heritage assets recorded within the site, as listed on the GGAT HER.
- 5.5 The evidence from the GGAT HER suggests the site is situated within a landscape that was well utilised throughout the mid prehistoric-Roman periods. However, there is no evidence to suggest that the site contains archaeology or that any known sites extend into it; therefore it is considered to have a low/moderate potential to contain hitherto unrecorded deposits. If present, these deposits will probably be of 'low' value late prehistoric and Roman agricultural remains; i.e. ploughsoils and field boundaries.
- 5.6 The restricted evidence for early medieval activity in the study area is taken to indicate that the site has a low potential to contain deposits from this period.
- 5.7 Although the site is positioned in proximity to Rhoose, it is considered a 'low risk' that medieval settlement activity extends into the site, including activity associated with Rhoose Castle/manor house (**00540s**). The site was probably located within the farmed hinterland of this settlement and thus has a low/moderate potential to contain archaeological deposits from this period. As with earlier periods, if present these deposits will most likely be of 'low' value; i.e. ploughsoils and field boundaries.

- 5.8 The application site remained in agricultural use throughout the post-medieval to modern periods and therefore has a moderate potential to contain archaeological deposits, although they will be of 'low' value; i.e. ploughsoils and field boundaries.
- 5.9 A sunken holloway was noted during the site walkover and confirmed by historic map regression. This most likely dates to the broad post-medieval period and, due to its orientation toward Rhoose, existed in connection with this village. Although worth noting within this assessment, the impacted partial remains of this previously unrecorded asset are considered to be of negligible value.
- 5.10 A 'scan and sample' geophysical survey has previously been conducted across the site and adjoining farmland. Although it employed a now largely defunct methodology, it is notable that only one area of the site, measuring c.0.36ha, produced sufficiently strong magnetic signals to warrant a further detailed investigation. This only identified three linear anomalies, which may relate to buried archaeology, and some further signals which may be related to modern farming practices.
- 5.11 The proposed development will lead to the removal of any archaeological remains present on site. However, this assessment concludes that the site is unlikely to contain any remains of greater than 'low' importance. The impact of this development could be mitigated through a phased programme of archaeological investigation, secured by condition, to preserve any remains present by record ahead of or during construction. This assessment alone should be sufficient to address planning requirements and secure a positive determination for the planning application.
- 5.12 Initial consultation with Judith Doyle (Glamorgan-Gwent Archaeological Trust) has established that she has no objections to the proposed development and that there is no requirement for further pre-determination archaeological work (see **Appendix EDP 1**).

Section 6

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General Survey of the Romilly Estate, 1812

Porthkerry Tithe Map, 1849

The First Edition Ordnance Survey Map, 1886

The Second Edition Ordnance Survey Map, 1900

1919 Edition Ordnance Survey Map

1921 Edition Ordnance Survey Map

1938-47 Edition Ordnance Survey Map

1964-65 Edition Ordnance Survey Map

1973 Edition Ordnance Survey Map

1975 Edition Ordnance Survey Map

1982-84 Edition Ordnance Survey Map

1990-95 Edition Ordnance Survey Map

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Appendix EDP 1

Consultation response from Glamorgan-Gwent Archaeological Trust

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Matthew Morgan

From: Judith Doyle <judith@ggat.org.uk>
Sent: 30 April 2014 11:57
To: Matthew Morgan
Subject: RE: Land to the north of the railway line (west), Rhoose

Dear Matt,

Thank you for this. There's only one amendment, to update the Planning Policy Wales which is now Sixth Edition February 2014; there has been no change to the wording in the chapter concerning archaeology. I don't believe that any further pre-determination archaeological work would be necessary or produce any more information, I think a condition would fulfil mitigation requirements.

Best wishes

Judith

Judith Doyle BA MifA
Acting Archaeological Planning Manager
Glamorgan-Gwent Archaeological Trust Ltd
Heathfield House
Heathfield
Swansea
SA1 6EL

Tel 01792-655208
Direct Dial 01792-634222
Fax 01792-474469

e-mail judith@ggat.org.uk
web www.ggat.org.uk

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Swyddfa Gofrestredig fel yr uchod. Cofrestrwyd yng Nghymru, Rhif 1276976. Cwmni Cyfyngedig trwy Warant heb Gyfalaf Cyfrannau. Elusen Gofrestredig, Rhif 505609
Mudiad Archaeolegol Cofrestredig, Sefydliad yr Archaeolegwyr (IFA), Rhif 15

Os nad chi oedd fod derbyn y neges hon, neu os ydych yn weithiwr cyflogedig neu'n asiant yn gyfrifol am anfon y neges, nid yw ei datgelu, ei chopïo, ei dosbarthu na chymryd unrhyw gamau yn ddibynnol ar y neges yn cael eu hawdurdodi, a gall gwneud hyn fod yn anghyfreithlon. Os byddwch yn derbyn y neges hon trwy gamgymeriad, cysylltwch â ni drwy anfon y neges yn ôl atom gan ddileu unrhyw negeseuon neu atodiadau.

Eiddo GGAT yw'r e-bost hwn ynghyd ag unrhyw atodiadau, ac fe'i diogelir dan y gyfraith. Mae'r wybodaeth sydd wedi'i chynnwys, a all fod yn breifat a chyfrinachol, wedi'i bwriadau at ddefnydd y sawl y'u cyfeiriwyd atynt yn unig.

From: Matthew Morgan [<mailto:matthewm@edp-uk.co.uk>]
Sent: 28 April 2014 08:44
To: judith@ggat.org.uk
Cc: Admin
Subject: Land to the north of the railway line (west), Rhoose

Dear Judith,

Please find attached a draft report for this project. I would be grateful if you could review and give me any thoughts you had on its conclusions.

As you will see, this assessment has identified that although the land within the site is situated in an area that has been exploited from the late prehistoric period onwards, there is no evidence to suggest that it contains settlement related activity, with potential for only 'low' value agricultural remains. Further to this, the site immediately adjacent (to the east) was subject to a geophysical survey which did not identify any below ground archaeological remains and, on the basis of these results, no further archaeological work was required by GGAT.

Therefore, it would seem reasonable that no further pre-determination archaeological work should be required on our site and this assessment should be sufficient to positively determine the application. Any further work could be secured by condition. I hope you agree.

Please give me a call if you would like to discuss.
Kind regards

Matt

Matthew Morgan BA (Hons), MA, PIfA
Consultant Archaeologist



The Environmental Dimension Partnership
Tithe Barn, Barnsley Park Estate, Barnsley, Cirencester, Gloucestershire, GL7 5EG
t 01285 740427 f 01285 740848 w www.edp-uk.co.uk

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Appendix EDP 2

Geophysical Survey Report

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ARCHAEOLOGICAL SURVEYS

GEOPHYSICAL SURVEY REPORT

Upper Farm, Rhoose The Vale of Glamorgan

Magnetic Susceptibility and
Magnetometer Survey

for

Cotswold Archaeology

David Sabin and Kerry Donaldson

December 2005

Ref no. 123

ARCHAEOLOGICAL SURVEYS

Upper Farm, Rhoose, The Vale of Glamorgan

Magnetic Susceptibility and Magnetometer survey

for

Cotswold Archaeology

Report and fieldwork by David Sabin and Kerry Donaldson

Survey date – **December 2005**

Ordnance Survey Grid Reference – **ST 069 663**

Archaeological Surveys
2, Westway Close, Castle Combe, Wiltshire, SN14 7QZ
Tel. 01249 782234 FAX 0871 661 8804
Email: info@archaeological-surveys.co.uk
Web: www.archaeological-surveys.co.uk

CONTENTS

SUMMARY	1
1 INTRODUCTION.....	1
1.1 Survey background	1
1.2 Survey objectives	1
1.3 Site location.....	1
1.4 Site description.....	1
1.5 Site history and archaeological potential	2
1.6 Geology and soils.....	2
2 METHODOLOGY	2
2.1 Technical synopsis.....	2
2.2 Equipment details and configuration	3
2.3 Data processing and presentation.....	4
3 RESULTS.....	4
3.1 Magnetic susceptibility	4
3.2 Detailed magnetometry	5
4 CONCLUSION	8
5 REFERENCES.....	9
Appendix A – basic principles of magnetic survey.....	10

LIST OF FIGURES

Figure 1	General location map (1:50 000)
Figure 2	Interpolated colour plot of magnetic susceptibility data (1:3000)
Figure 3	Location and referencing for magnetometer survey grids (1:3000)
Figure 4	Raw magnetometer data – Areas 1, 2, 3 & 4 (1:1000)
Figure 5	Trace plot of raw magnetometer data – Areas 1, 2, 3 & 4 (1:1000)
Figure 6	Processed magnetometer data – Areas 1, 2, 3 & 4 (1:1000)
Figure 7	Abstraction and interpretation of magnetometer anomalies – Areas 1, 2, 3 & 4 (1:1000)
Figure 8	Raw magnetometer data – Area 5 (1:1000)
Figure 9	Trace plot of raw magnetometer data – Area 5 (1:1000)
Figure 10	Processed magnetometer data – Area 5 (1:1000)
Figure 11	Abstraction and interpretation of magnetometer anomalies – Area 5 (1:1000)

LIST OF PLATES

Plate 1 Central area looking south-east.....	2
--	---

LIST OF HISTOGRAMS

Histogram 1 Frequency of magnetic susceptibility values derived from Vertical Mapper	5
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SUMMARY

A geophysical survey was carried out on land at Rhoose in the Vale of Glamorgan. A magnetic susceptibility reconnaissance survey over 26ha revealed that the east of the site was generally moderately to highly enhanced with values in the west of the site generally lower. Five areas were targeted using detailed magnetometry, four within the east of the site over the moderate to highly enhanced zones, and one in the west over a low to moderate zone. Results of the detailed survey show that the highest zones of enhancement correspond to areas of magnetic debris and disturbance. Positive area and linear anomalies have been located within Areas 1, 4 and 5 but their form does not allow for confident interpretation.

1 INTRODUCTION

1.1 *Survey background*

- 1.1.1 Archaeological Surveys was commissioned by Cotswold Archaeology to undertake a geophysical survey of an area of land at Upper Farm, Rhoose that has been outlined for development as a housing development. This survey formed part of an assessment of any potential archaeology that may be affected by the development.

1.2 *Survey objectives*

- 1.2.1 The objective of the survey was to carry out magnetic susceptibility reconnaissance at a coarse resolution in order to identify zones of magnetic enhancement that may indicate areas of human occupation/modification. Subsequent targeting of enhanced areas, using detailed magnetometry in order to locate geophysical anomalies that may be archaeological in origin, was conducted to allow a more detailed assessment of the archaeological potential of the site.

1.3 *Site location*

- 1.3.1 The site is located to the south of Rhoose in the Vale of Glamorgan and approximately centred on ST 069 663. The site is bounded to the north by the current development of Rhoose and Cardiff-Wales Airport and to the south by a railway line.

1.4 *Site description*

- 1.4.1 The geophysical survey covers an area of approximately 26ha of agricultural land currently used for pasture. The site is split within seven fields and the east and west of the site is separated by a trackway. The topography gently slopes southwards towards the sea.



Plate 1 Central area looking south-east

1.5 Site history and archaeological potential

- 1.5.1 There is evidence for Roman activity from pottery finds, together with medieval, post medieval and modern activity in the vicinity of the site (Cotswold Archaeology, 2005). There may therefore be possible for geophysical survey to locate anomalies that may be of archaeological potential.

1.6 Geology and soils

- 1.6.1 The underlying geology is Lower Lias, part of the Lower Jurassic era (BGS 2001).
- 1.6.2 The overlying soils are from the Ston Easton association which are typical argillic brown earths. These consist of loamy soils with a subsurface horizon showing significant clay enrichment. (Soil Survey of England and Wales 1983).
- 1.6.3 Magnetic survey carried out over similar conditions in other areas of the UK has generally produced good results where archaeological features are present.

2 METHODOLOGY

2.1 Technical synopsis

- 2.1.1 Iron minerals within the soil can be altered through biological decay and burning which can enhance the magnetic susceptibility of the soil. Field equipment can be used to measure the magnetic susceptibility of the soil allowing zones to be mapped which may indicate areas of potential archaeological activity. This also allows subsequent targeting of higher resolution survey techniques such as magnetometry or resistivity, in order to obtain more detail.

- 2.1.2 Magnetic susceptibility is only measurable in the presence of a magnetic field and is defined as a ratio between the intensity of the induced field to that of the magnetising field. As the two fields are measured in the same units the ratio can effectively be defined using no units although it is common practice to add SI to distinguish measurements from an older system.
- 2.1.3 Detailed magnetometry records localised magnetic fields that can relate to former human activity. Alteration of iron minerals present within topsoil is related to activities such as burning and the break down of biological material. These minerals become weakly magnetic within the Earth's magnetic field and can accumulate in features such as ditches and pits that are cut into the underlying subsoil. Mapping this magnetic variation can provide evidence of former settlement and land use. Additional technical details can be found in Appendix A.
- 2.1.4 The localised variations in magnetism are measured as sub-units of the tesla which is a SI unit of magnetic flux density. These sub-units are nanoteslas (nT) which are equivalent to 10^{-9} tesla (T).

2.2 *Equipment details and configuration*

- 2.2.1 The magnetic susceptibility survey was conducted using an MS2 meter with MS2D field coil manufactured by Bartington Instruments Ltd. The instrument was used in conjunction with a CSI Wireless Differential Global Positioning System (dGPS) receiver used to navigate to measuring positions.
- 2.2.2 Magnetic susceptibility data was collected every 20m. Each position was recorded 3 to 5 times to ensure a representative value free from erratic or spurious readings created by ferrous debris or poor soil contact.
- 2.2.3 The detailed magnetic survey was carried out using a Bartington Grad601-2 gradiometer. This instrument effectively measures a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally. The instrument is extremely sensitive and is able to measure magnetic variation to 0.1 nanoTesla (nT). All readings are saved to an integral data logger for analysis and presentation.
- 2.2.4 Data was collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids giving 3600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 1995).
- 2.2.5 The survey grids were set out using a Topcon GTS212 total station and CSI Wireless dGPS (differential Global Positioning System). The dGPS was used to establish and reference a baseline orthogonal to the Ordnance Survey National Grid using the OSGB36 datum. Positional accuracy achievable using dGPS is considered as sub-metre as correction signals are received either from ground-based beacons or a geostationary satellite. A number of

parameters are constantly monitored by the system in order to achieve best accuracy.

2.3 *Data processing and presentation*

- 2.3.1 Magnetic susceptibility readings recorded in the field using PocketGIS were downloaded into MapInfo GIS software with Vertical Mapper and displayed as an interpolated colour plot using a fifth order polynomial solution, see Figure 02. No processing is required for this data.
- 2.3.2 Magnetometry data downloaded from the Grad 601-2 data logger is analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display.
- 2.3.3 Only minimal processing is carried out in order to enhance the results of the survey for display. Raw data is always analysed and displayed in the report as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey. It should be noted that image processing does not change the values of the data and is used for visual enhancement; data processing will alter values through mathematical functions.

Image processing

- Clipping of the raw data at $\pm 10\text{nT}$ to improve greyscale resolution
- Clipping of processed data at either $\pm 3\text{nT}$ or $\pm 1\text{nT}$ to enhance low magnitude anomalies
- Clipping of trace plots at $\pm 100\text{nT}$ in order to minimise strong readings obscuring low magnitude responses
- Destagger may also be used to enhance linear anomalies

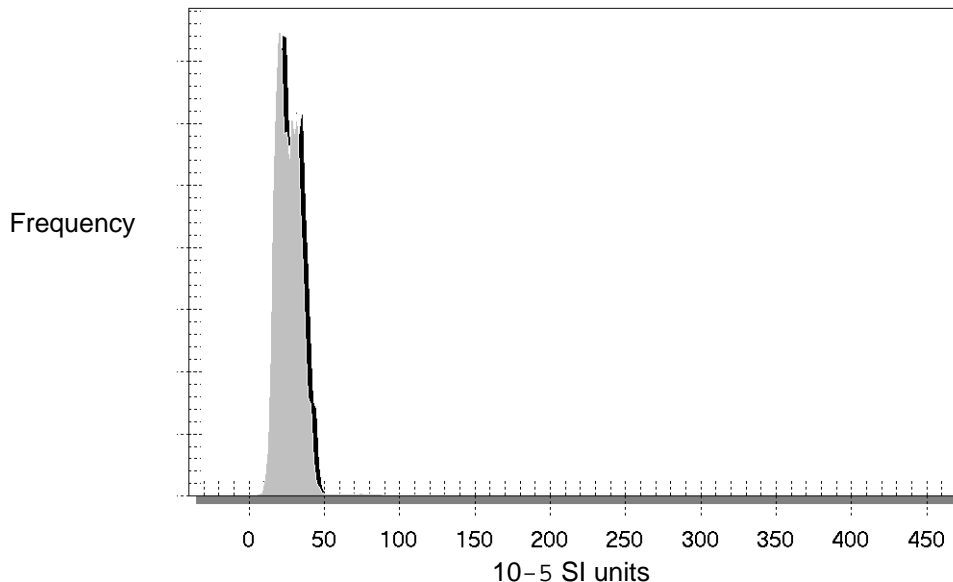
Data processing

- Zero mean traverse is applied in order to balance readings along each traverse

3 RESULTS

3.1 *Magnetic susceptibility*

- 3.1.1 The magnetic susceptibility survey shows that levels of enhancement were generally low within the west of the site, between 5 and 25 10^{-5} SI units, with the highest zone in the south-west corner (see Figure 2). Values were generally higher in the east of the site, predominately between 30 and 50 10^{-5} SI units, but with zones of high enhancement between 100 and 400 10^{-5} SI. The terms high, medium and low are used in a relative sense.
- 3.1.2 The histogram shown in Histogram 1 below reveals relatively few measurements above 50 10^{-5} SI although the upper end of the distribution



Histogram 1 Frequency of magnetic susceptibility values derived from Vertical Mapper

3.1.3 Detailed magnetic survey was targeted on the two highest areas of magnetic enhancement (Areas 1 and 2, Figure 3) together with two areas targeted over moderate to high enhancement (Areas 3 and 4, Figure 3) and one moderate to low area (Area 5, Figure 3) to sample the western part of the site.

3.2 *Detailed magnetometry*

3.2.1 The detailed magnetic survey was carried out over a total of five survey areas totalling 2ha and mainly targeted over the highest areas of magnetic enhancement as indicated by the magnetic susceptibility reconnaissance. Geophysical anomalies located can be generally classified as positive linear and area responses of an uncertain origin, linear anomalies of an agricultural origin, negative linear anomaly possibly relating to a former boundary, areas of magnetic debris relating to thermoremanent material spreads, areas of magnetic disturbance from ferrous material and pipelines and strong dipolar anomalies relating to ferrous objects and material in the topsoil.

3.2.2 The brief listing of anomalies below attempts to set out a number of separate categories that reflect the range and type of likely causative features:

3.2.2.1 *Anomalies with an uncertain origin*

(Positive anomalies abstracted are plotted in orange)

The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features but equally relatively modern features, geological/ pedological anomalies and agricultural features should be considered.

3.2.2.2 *Anomalies with an agricultural origin*

(Anomalies abstracted are plotted in green)

Where confidence is high that anomalies have been caused by agricultural features this category is applied. The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to more modern ploughing.

3.2.2.3 *Anomalies with a modern origin*

(Anomalies abstracted are plotted in magenta)

The majority of magnetic anomalies fall within this category. The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables etc. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance – such disturbance can effectively obscure low magnitude anomalies if they are present. Magnetic debris often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material (occasionally magnetic debris may be associated with kilns, furnace structures or hearths and may therefore be archaeologically significant).

3.2.3 *Area 1 centred on 307070, 166370, see Figures 3-7.*

Anomalies with an uncertain origin

- A low magnitude positive area anomaly can be seen within this survey area. It is not possible to determine the origin of this anomaly although it may be associated with an adjacent area of magnetic debris (see below).
- There are several low magnitude positive linear anomalies, the majority of which are parallel to the western field boundary and may relate to agricultural activity.

Anomalies with a modern origin

- An area of magnetic debris which has caused a high level of disturbance can be seen adjacent to the western edge of the survey area. It is likely that this is a response to thermoremnant and ferrous material within the site which has either been dumped here or is related to demolished structures. This

corresponds directly to the zone of very high enhancement located during the magnetic susceptibility survey.

- The site contains several strong discrete dipolar anomalies which are responses to ferrous objects within the topsoil.

3.2.4 Area 2 centred on 307150, 166250, see Figures 3-7.

Anomalies with a modern origin

- A large and a smaller area of magnetic debris can be seen within Area 2. This response is of a high magnitude suggesting a spread of thermoremanent and ferrous material. This corresponds to the highest zone of magnetic enhancement located by the magnetic susceptibility survey.
- Area 2 contains several strong discrete dipolar anomalies which are responses to ferrous objects within the topsoil.

3.2.5 Area 3 centred on 307190, 166170, see Figures 3-7.

Anomalies with a modern origin

- In the south of the survey area is a strong dipolar linear anomaly which has caused surrounding magnetic disturbance. This is a response to a buried service or pipeline.
- An area of magnetic debris is located in the north-west corner of the survey area. This is likely to be a response to dumped thermoremanent or ferrous material.
- Several strong discrete dipolar anomalies indicate the location of ferrous objects within the survey area.

3.2.6 Area 4 centred on 307015, 166250, see Figures 3-7.

Anomalies with an uncertain origin

- A low magnitude positive area anomaly can be seen within this survey area. The origin cannot be determined from this survey, causes may include a response to the magnetically enhanced fill of a cut feature or underlying response to changes in geology or pedology.
- Two low magnitude positive linear anomalies are located in the south of the survey area. It is not possible to determine their origin.

Anomalies with an agricultural origin

- A series of linear anomalies extend across the site and are parallel to the eastern land boundary. These responses are likely to have been caused

mainly by ploughing although two larger linear responses within the area are more likely to represent former field boundary ditches or drains.

- A negative linear anomaly extends across the centre of the site and is parallel to the eastern field boundary. It is possible that this anomaly is a response to a former land boundary that has been constructed from material such as Lias Limestone that is less enhanced than the surrounding soil. It is also possible that this may have been an extension of the trackway that can be seen on the same orientation to the south of the survey area.

Anomalies with a modern origin

- The site contains several strong discrete dipolar anomalies which are responses to ferrous objects within the topsoil.

3.2.7 Area 5 centred on 306590, 166260, see Figures 8-11.

Anomalies with an uncertain origin

- Three positive linear anomalies (coloured orange) extend across the survey area and are approximately oriented south-west to north-east. It is not possible to determine the origin of these anomalies although it is possible that they have been formed by previous agricultural activity within the site.

Anomalies with an agricultural origin

- In the east of the survey area are several parallel positive linear anomalies (green). These are generally parallel with the eastern field boundary and are likely to have been caused by agricultural activity.

Anomalies with a modern origin

- In the south-west corner of the survey area, an area of magnetic disturbance has been caused by a response to ferrous material within the nearby fencing.
- The site contains several strong discrete dipolar anomalies which are responses to ferrous objects within the topsoil.

4 CONCLUSION

- 4.1.1 The magnetic susceptibility reconnaissance survey revealed that levels of magnetic enhancement were generally moderate to high in the east of the site and much lower in the west. Pockets of very high response in the eastern half of the site are typical of modern dumping or landfill although small scale industrial activity should also be considered.
- 4.1.2 The detailed magnetometry survey revealed that the highest areas of magnetic susceptibility do corresponded to areas of magnetic debris. The debris has a very high magnitude confirming the presence of ferrous material having a strong magnetic flux.

- 4.1.3 Several low magnitude positive linear and area anomalies have also been located within Areas 1, 4 and 5. Although these type of anomalies can be responses to enhanced material within cut features, it is not possible to confidently determine their origin from geophysical survey alone.

5 REFERENCES

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Appendix A – basic principles of magnetic survey

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

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

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

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

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

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

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

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

Geophysical Survey
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Map of survey area

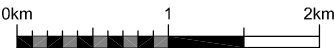
Reproduced from OS Landranger map
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● Survey location

Site centred on OS NGR
ST 069 663

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Interpolated plot of magnetic
susceptibility data

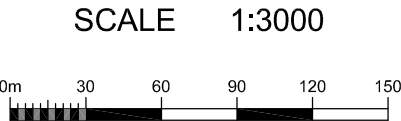
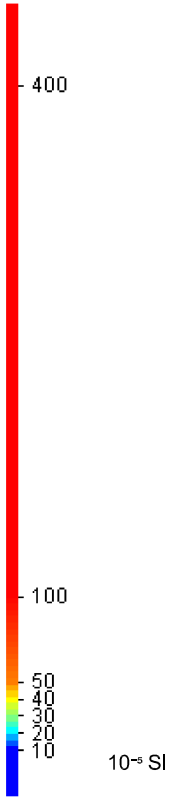
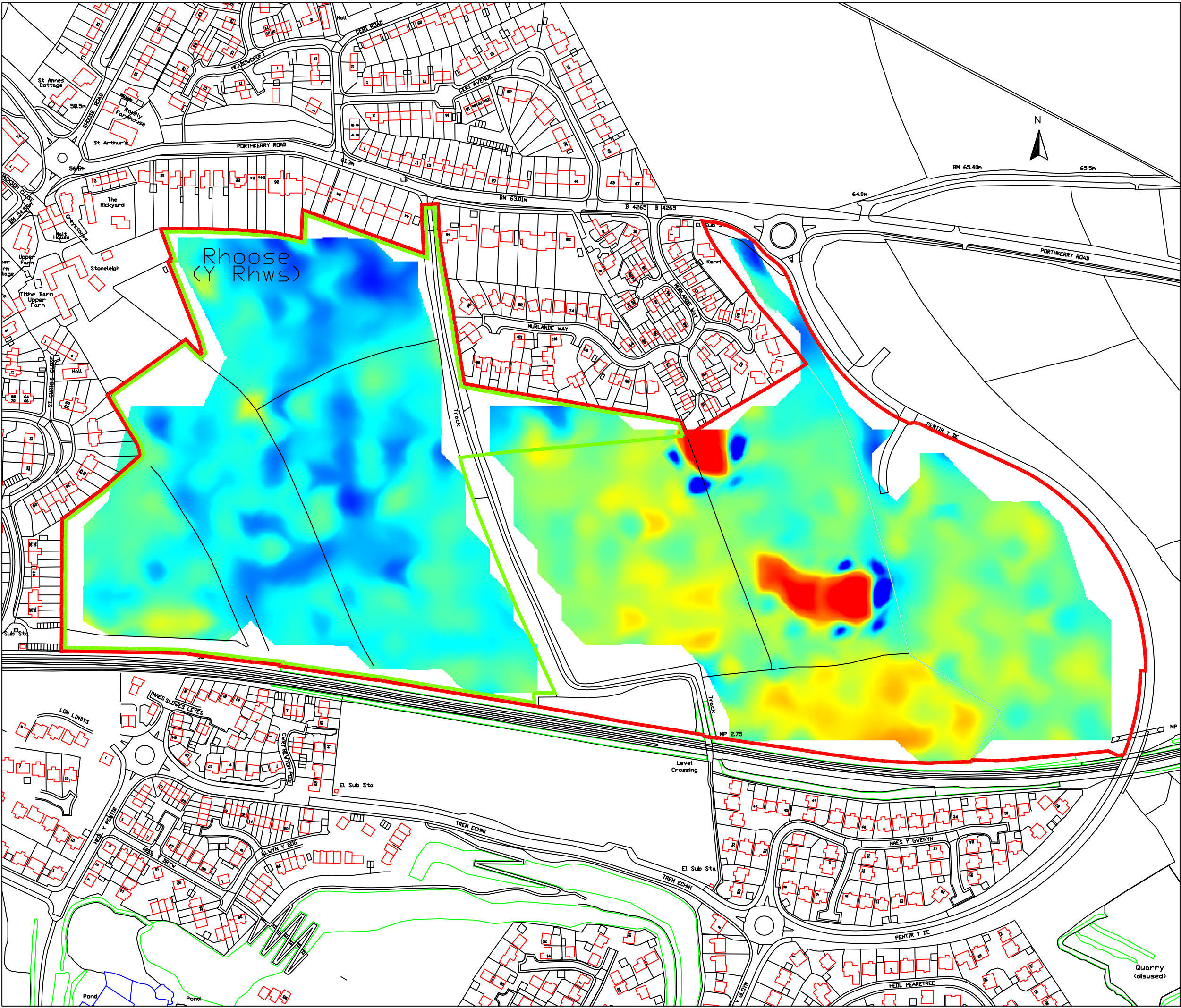


FIG 02

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Referencing information for
magnetometry survey areas

Based on OS coordinates (OSGB36)

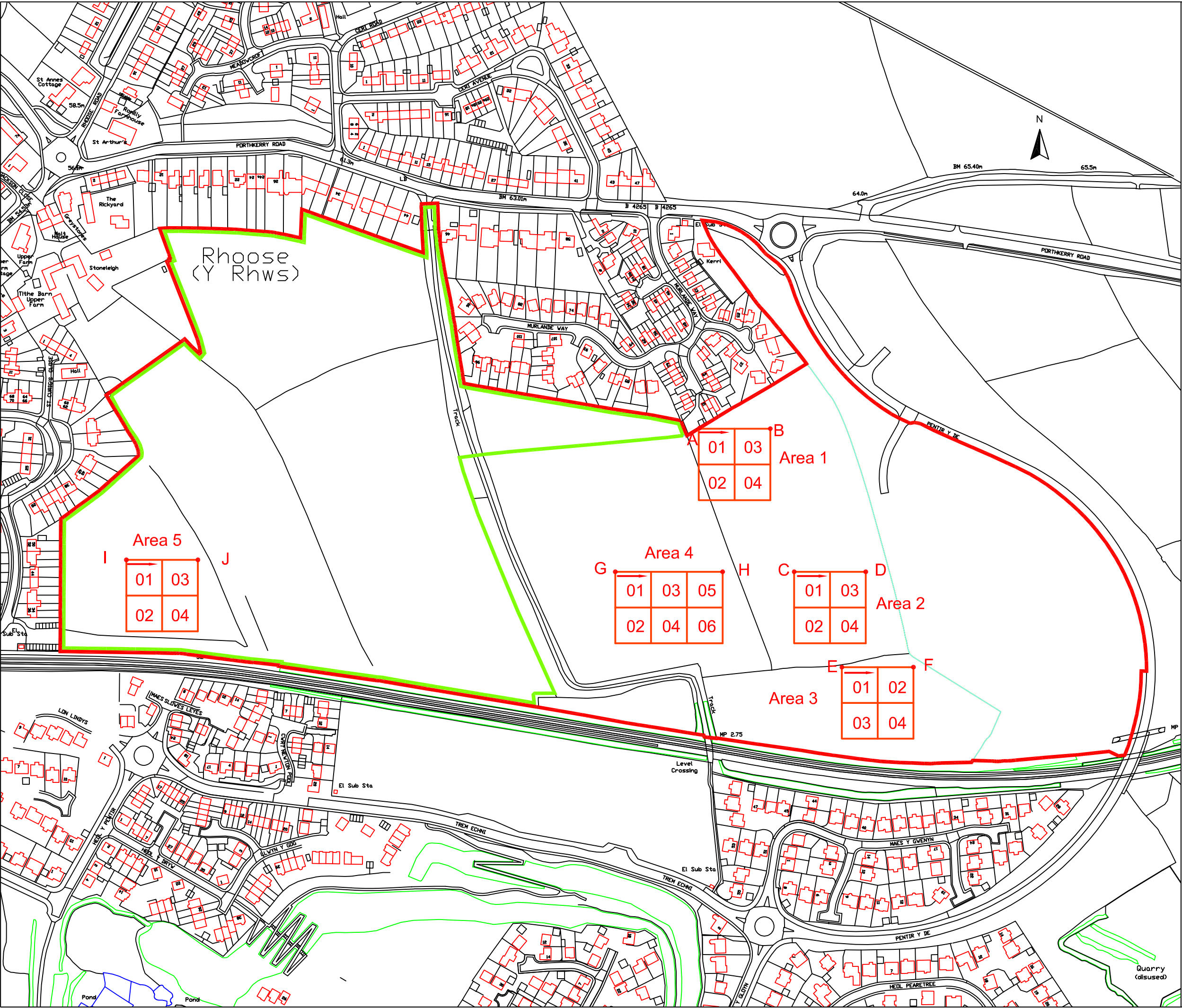
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- B 307100, 166400
- C 307120, 166280
- D 307180, 166280
- E 307160, 166200
- F 307220, 166200
- G 306970, 166280
- H 307060, 166280
- I 306560, 166290
- J 306620, 166290

→ Survey start and traverse direction

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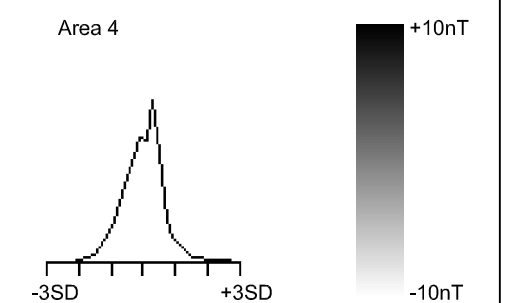
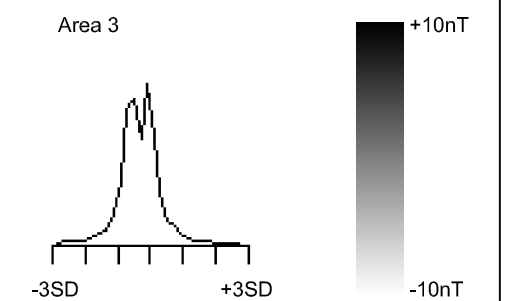
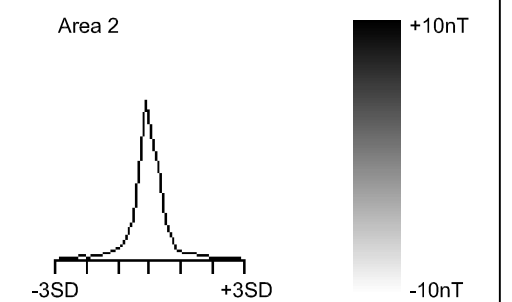
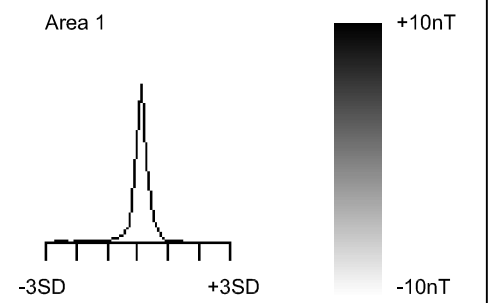
FIG 03



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Vale of Glamorgan

Greyscale plot of raw
magnetometer data - Areas 1 - 4



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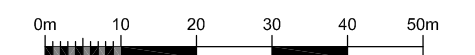


FIG 04

Area 1

Area 4

Area 2

Area 3

Track

MP 2.75

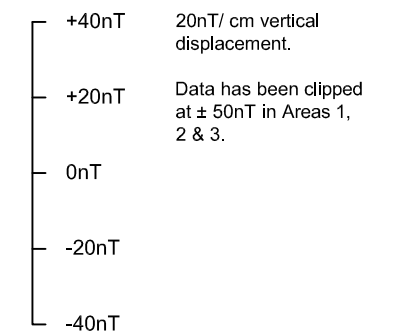
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Geophysical Survey
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Traceplot of raw magnetometer
data - Areas 1 - 4



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FIG 05

Area 1

Area 4

Area 2

Area 3

Track

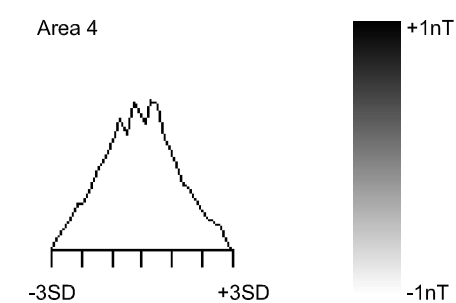
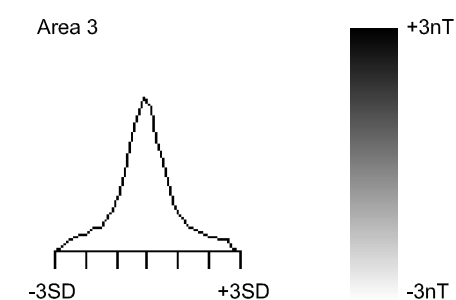
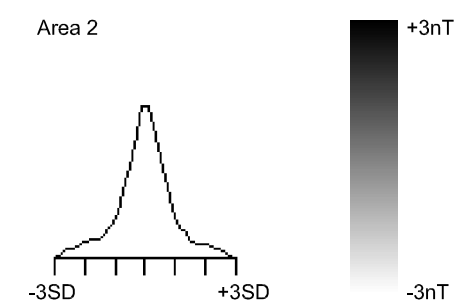
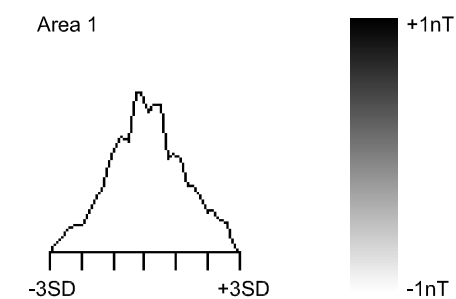
MP 2.75

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Greyscale plot of processed
magnetometer data - Areas 1 - 4



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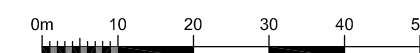


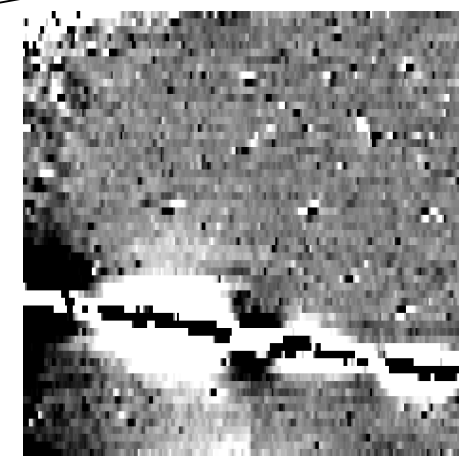
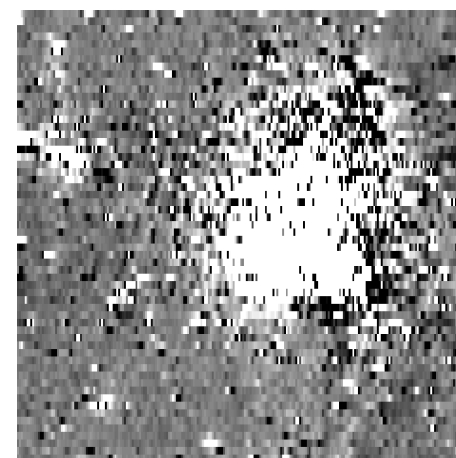
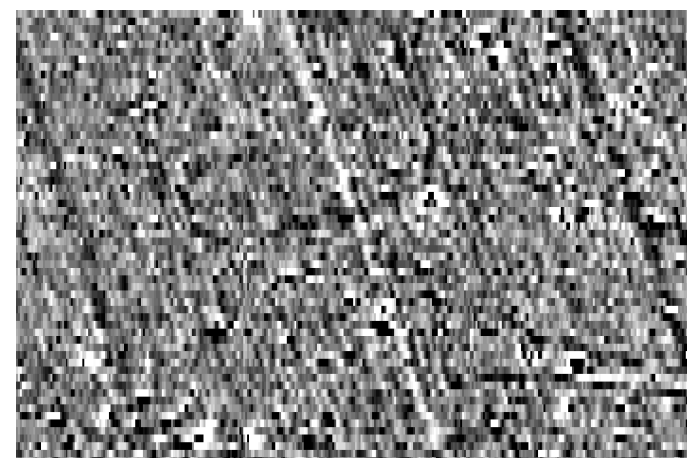
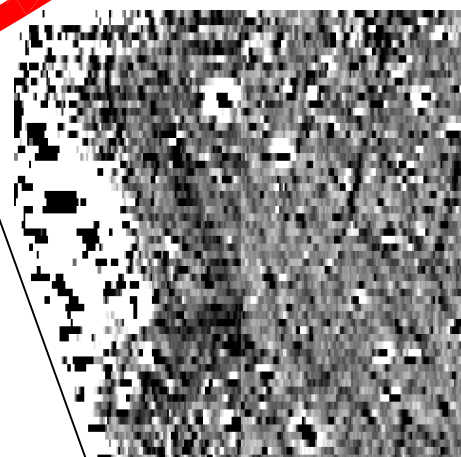
FIG 06

Area 1

Area 4

Area 2

Area 3



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Track

MP 2.75

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Vale of Glamorgan**

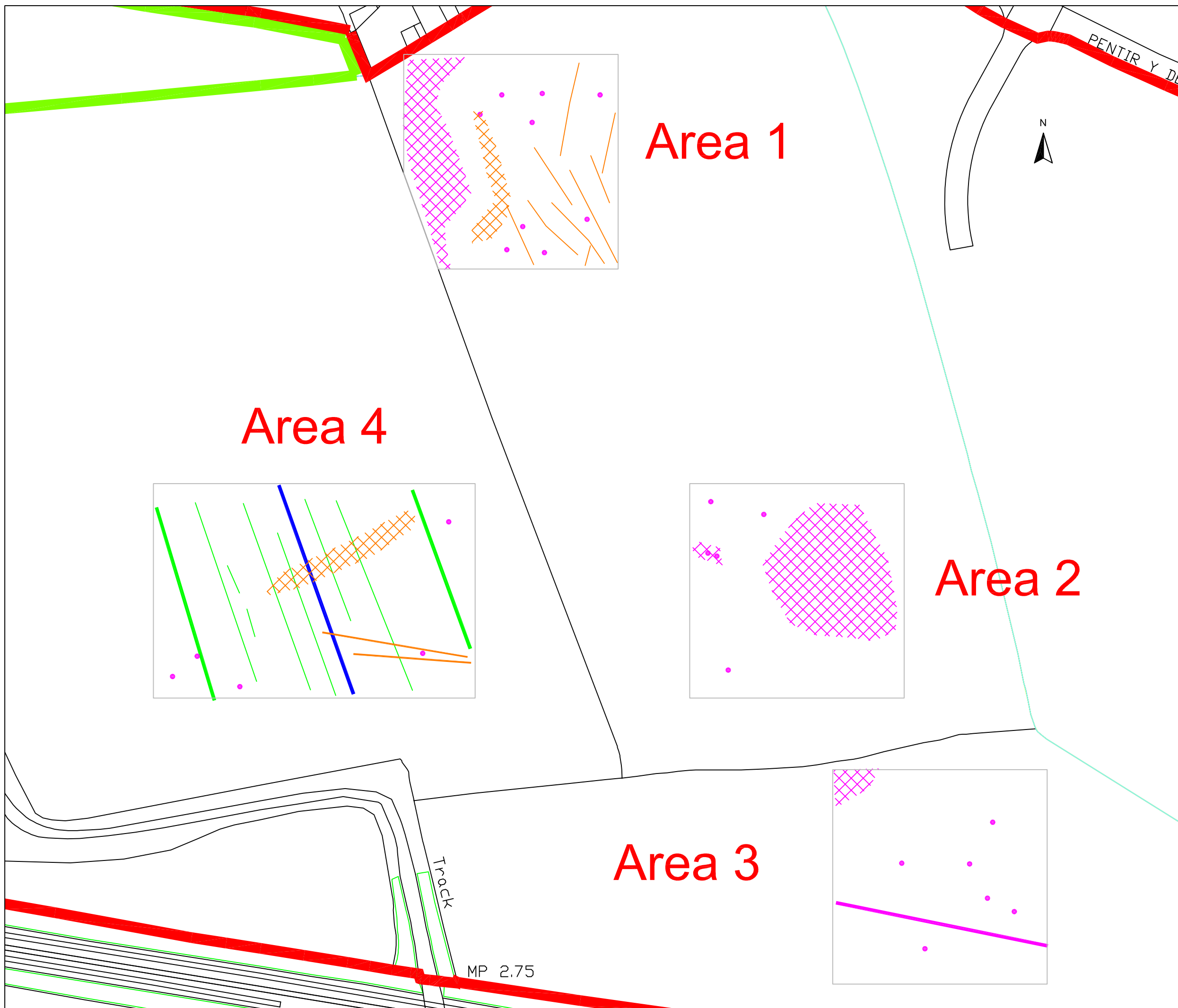
Abstraction and interpretation of magnetometer anomalies - Areas 1 - 4

- Positive linear anomaly - cut feature of uncertain origin
- Positive area anomaly of uncertain origin
- Negative linear anomaly - possible former boundary/extension of trackway
- Positive linear anomaly - of agricultural origin
- Magnetic debris - spread of thermoremnant material
- Magnetic disturbance from ferrous material
- Strong dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object in topsoil

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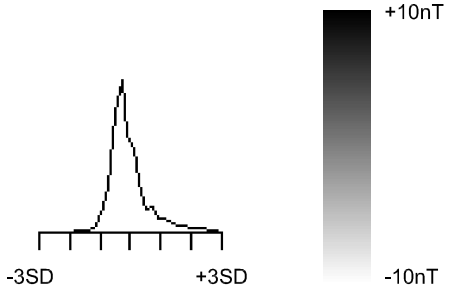
FIG 07



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Greyscale plot of raw
magnetometer data - Area 5



Area 5

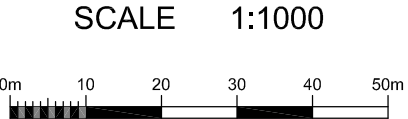
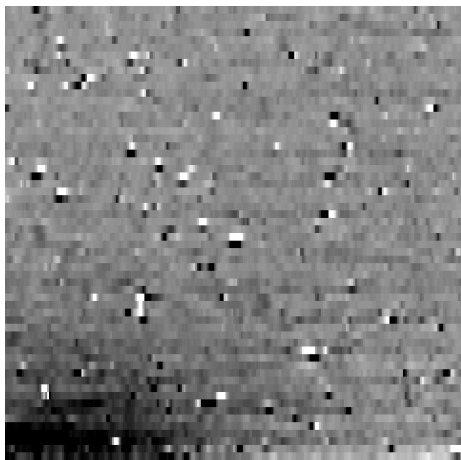


FIG 08

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Traceplot of raw magnetometer
data - Area 5

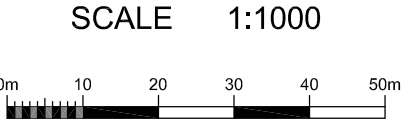
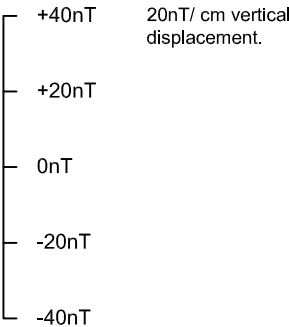
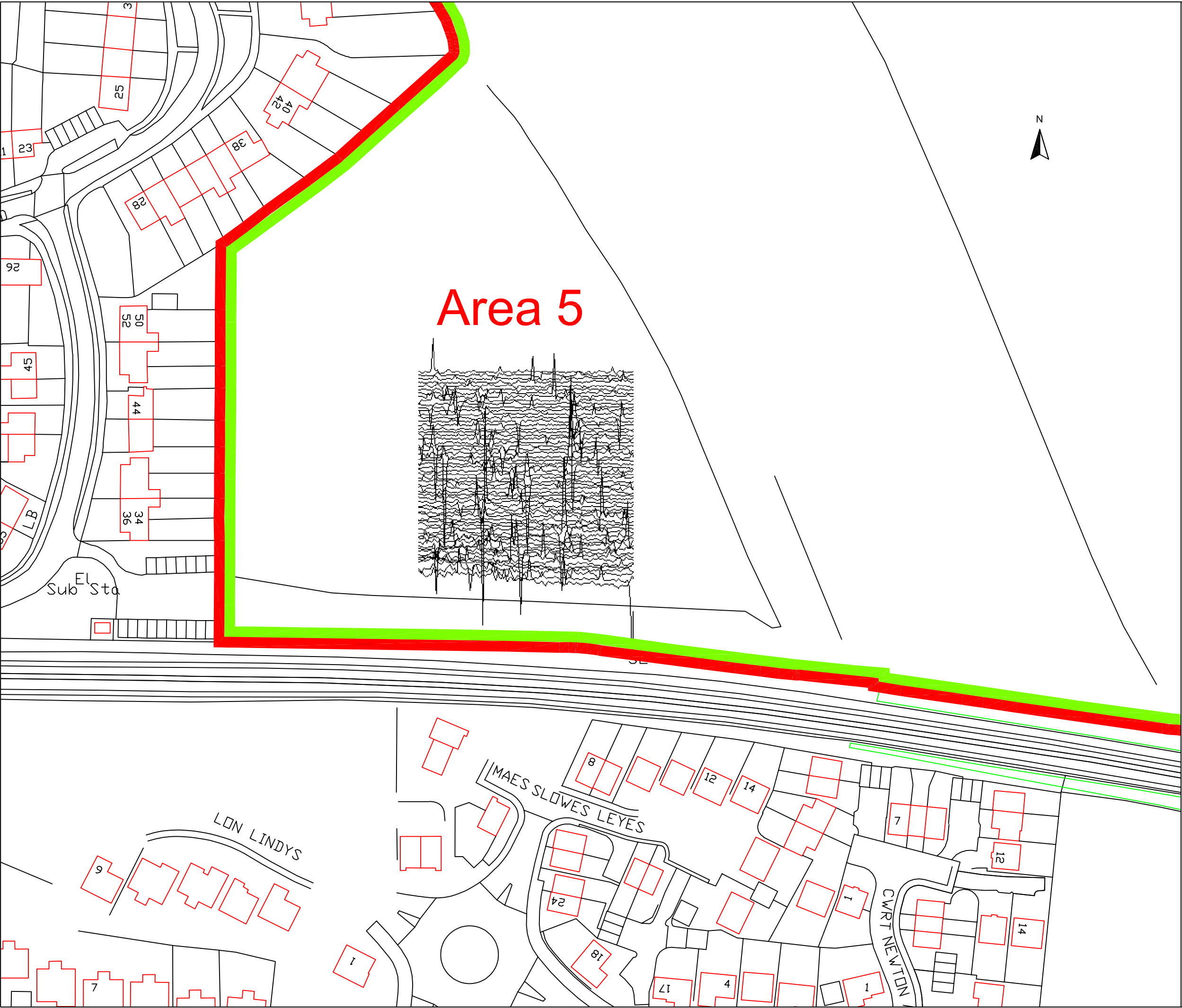
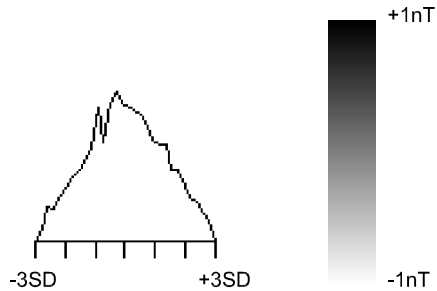


FIG 09



Geophysical Survey
Upper Farm, Rhoose,
Vale of Glamorgan

Greyscale plot of processed
magnetometer data - Area 5



Area 5

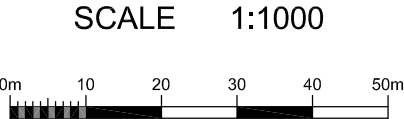
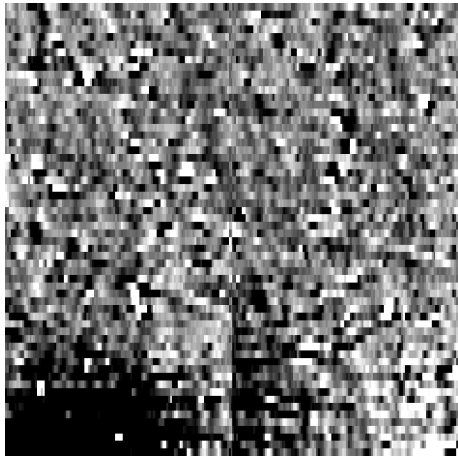
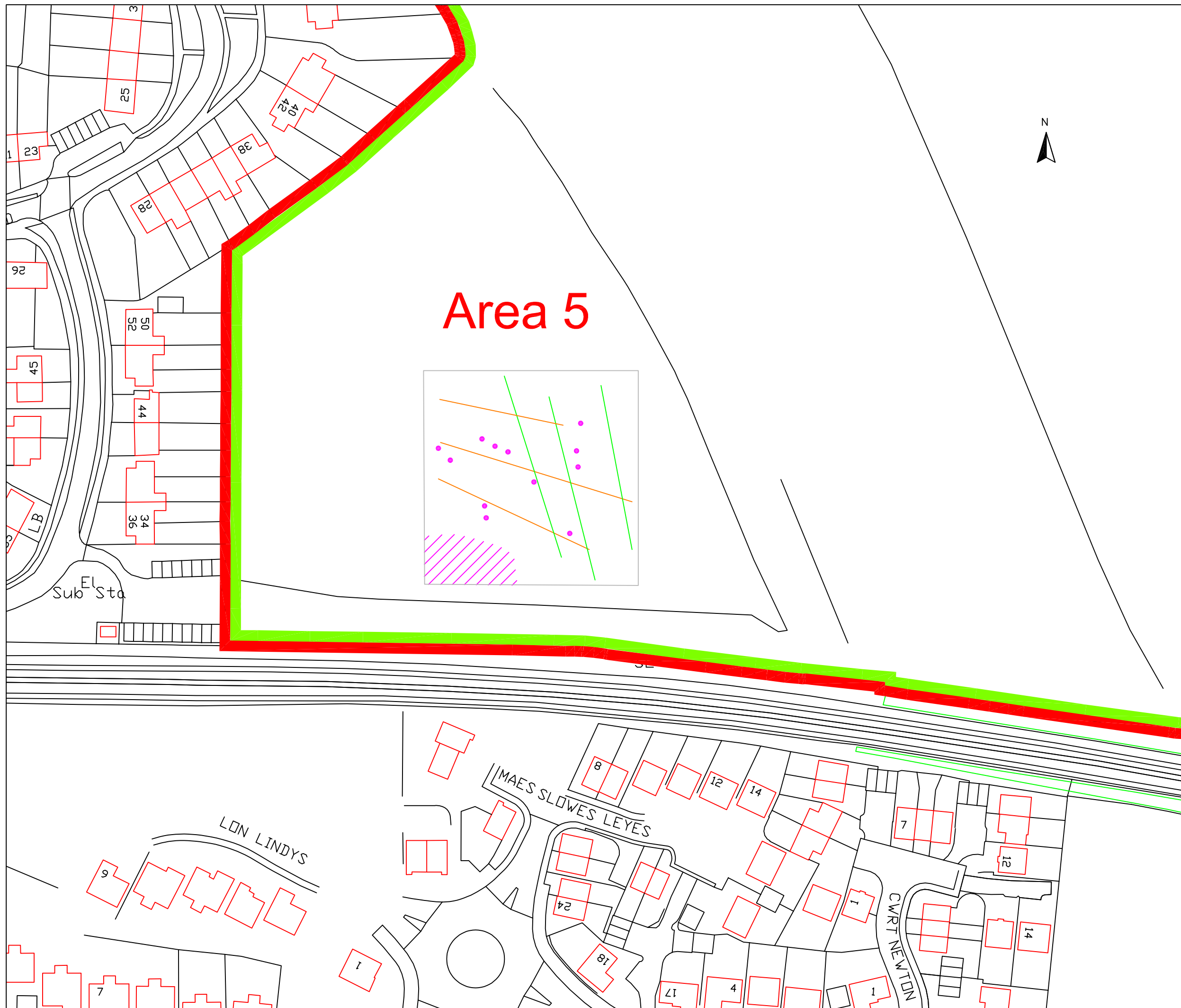


FIG 10

Geophysical Survey Upper Farm, Rhoose, Vale of Glamorgan

Abstraction and interpretation of magnetometer anomalies - Area 5

- Positive linear anomaly - ?cut feature of uncertain origin
- Linear anomaly of agricultural origin
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object in topsoil



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FIG 11

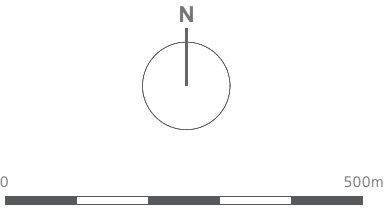
Plans

- Plan EDP 1** Known Designated Heritage Assets
(EDP2127/02a 24 January 2014 GC/MM)
- Plan EDP 2** Known Undesignated Heritage Assets
(EP2127/03a 24 January 2014 GC/MM)
- Plan EDP 3** Extracts from:
a) First Edition Ordnance Survey Map, 1885
b) Second Edition Ordnance Survey Map, 1900
(EDP2127/15a 07 February 2014 TB/MM)

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- Application Site Boundary
- Scheduled Monument
- 01483s Grade II Listed Building
- Rhoose Conservation Area
- Porthkerry Conservation Area



THE ENVIRONMENTAL DIMENSION PARTNERSHIP
Tithe Barn, Barnsley Park Estate, Barnsley, Cirencester,
Gloucestershire, GL7 5EG t 01285 740427 f 01285 740848
e info@edp-uk.co.uk www.edp-uk.co.uk

client

Taylor Wimpey Plc.

project title

Land North of the Railway Line
(West), Rhoose

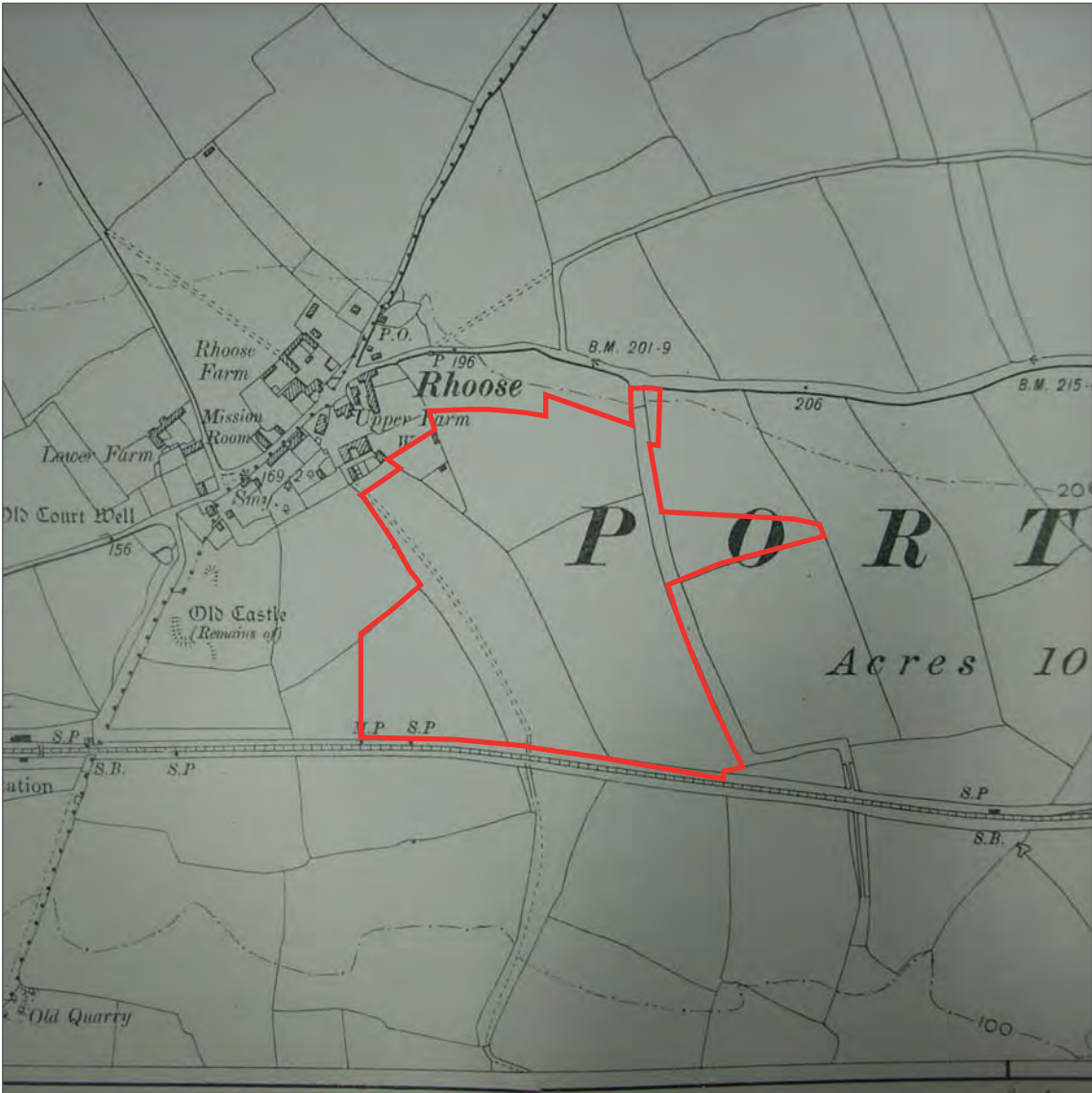
drawing title

Plan EDP 1: Known Designated
Heritage Assets

date	01 MAY 2014	drawn by	GC
drawing number	EDP 2127/02a	checked	MM
scale	NTS		



a) First Edition Ordnance Survey Map, 1885



b) Second Edition Ordnance Survey Map, 1900

Approximate Application Site Boundary



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Tithe Barn, Barnsley Park Estate, Barnsley, Cirencester,
Gloucestershire, GL7 5EG t 01285 740427 f 01285 740848
e info@edp-uk.co.uk www.edp-uk.co.uk

client

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project title

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drawing title

Plan EDP 3: Extracts from:
a) First Edition Ordnance Survey Map, 1885
b) Second Edition Ordnance Survey Map, 1900

date	17 APRIL 2014	drawn by	TB
drawing number	EDP 2127/15a	checked	MM
scale	NTS		



THE
ENVIRONMENTAL
DIMENSION
PARTNERSHIP

CIRENCESTER (Head Office)

Tithe Barn, Barnsley Park Estate
Barnsley, Cirencester
Gloucestershire GL7 5EG
t 01285 740427 f 01285 740848
e info@edp-uk.co.uk
www.edp-uk.co.uk

SHREWSBURY

Rural Enterprise Centre
Battlefield Enterprise Park
Shrewsbury, Shropshire SY1 3FE
t 01743 454960 f 01743 453121
e info@edp-uk.co.uk



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