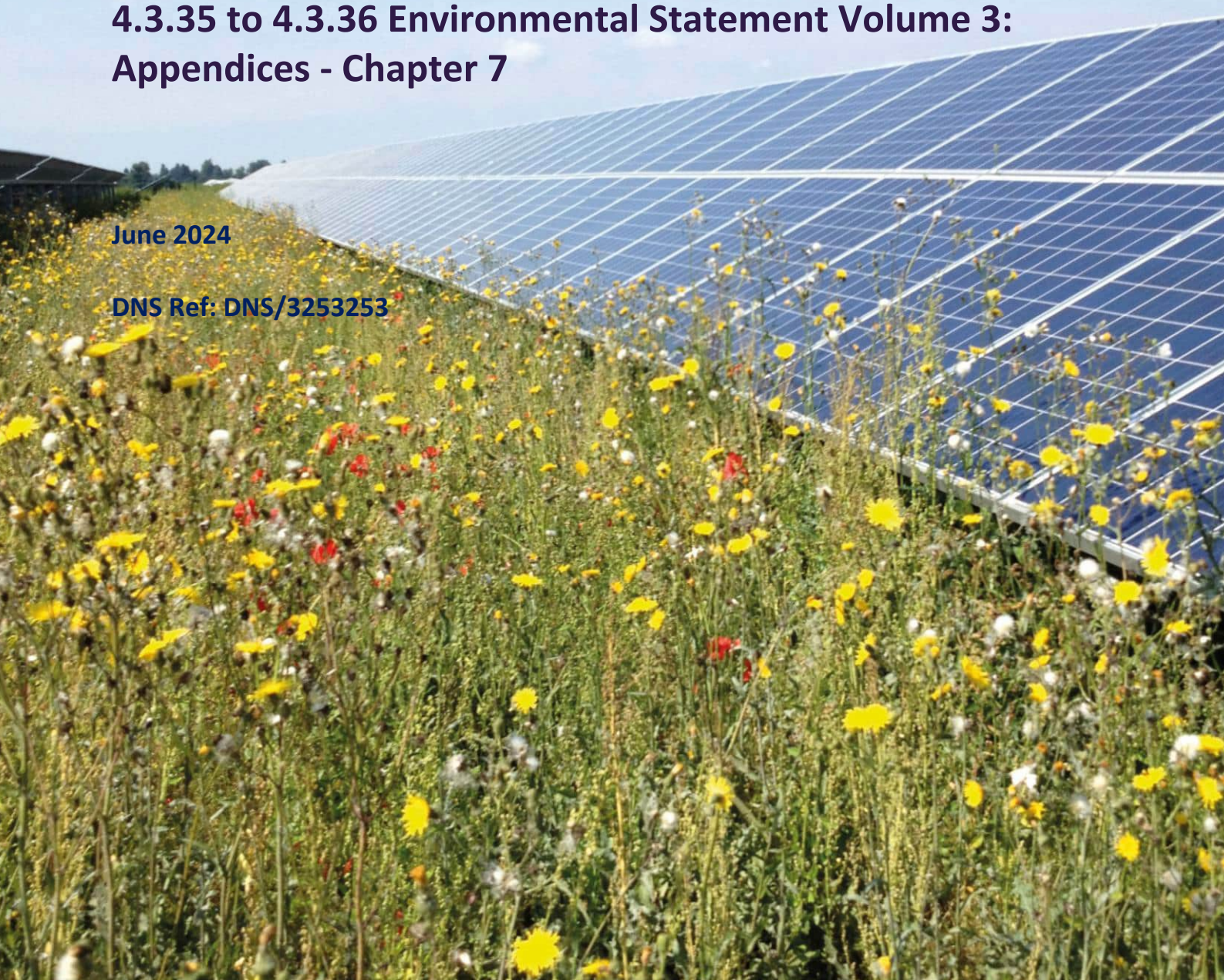
Plas Power Solar and Energy Storage Project

4.3.35 to 4.3.36 Environmental Statement Volume 3: Appendices - Chapter 7



June 2024

DNS Ref: DNS/3253253

Chapter 7: Cultural Heritage
Appendices

Appendix 7.1
Archaeological Desk Based Assessment

PLAS POWER SOLAR AND ENERGY STORAGE PROJECT, WREXHAM.

ARCHAEOLOGICAL DESK-BASED ASSESSMENT

Plas Power Solar and Energy Storage Project
Archaeological Desk-Based Assessment
February 2024

rpsgroup.com

Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Review date
1.0	Draft	Philip Bethell	Richard Smalley	Richard Smalley	September 2023
2.0	Update for revised scheme	Philip Bethell	Emily Avery	Richard Smalley	October 2023
2.1	Minor revisions following geophysical survey	Richard Conolly	Emily Avery	Richard Smalley	January 2024

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Prepared by:

RPS

Prepared for:

Lightsource bp

EXECUTIVE SUMMARY

The study site has been assessed for its below ground archaeological potential, and potential impacts on the settings of designated archaeological heritage assets. The study site is proposed for development as Plas Power Solar and Energy Storage Project.

There will be no direct impacts on any designated archaeological heritage assets. The proposed grid connection cable route options all pass through the line of Offa's Dyke, but any direct impact will be avoided through mitigation, e.g. through directional drilling.

The potential development impacts on non-designated buried archaeological remains are considered to be low. Much of the study site has been subject to opencast coal extraction, and therefore any archaeological remains within those areas has been destroyed. Geophysical survey has identified some potential archaeology in localised areas of the study site, but none of this is considered likely to be of more than low significance.

Archaeological potential by period and the likely significance of any archaeological remains which may be present is summarised in table form below:

Period:	Identified Archaeological Potential and Significance:	
Prehistoric	Low	Low (Local)
Roman	Low	Low (Local)
Early Medieval	Low	Low (Local)
Medieval	Low	Low (Local)
Post Medieval	Low	Low (Local)
Modern	Low	Low (Local)

There is a potential for impacts on the settings of designated archaeological heritage assets, and this potential is summarised in the table below:

Monument	Ref numbers	Level of impact on setting	Level of effect on significance
Section of Offa's Dyke in Plas Power Park	DE180, NPRN 275785	Low to Medium	Low
Section of Offa's Dyke in Plas Power Woods	DE139, NPRN 275766	None	None
Section of Offa's Dyke: Cadwgan Hall section	DE132, NPRN 275760	None	None
Sections of Offa's Dyke to the south of DE132 –	DE194/NPRN 275791, DE137/NPRN 275782	None	None

Sections of Offa's Dyke north of DE180: North section at Coedpoeth; South of River Gwenfro; Vron Section	 DE181, NPRN 275786 DE182, DE183, NPRN 303287 DE 113, NPRN 275787	None	None
Cadwgan Hall Mound	DE131, NPRN 275759	None	None
Croes-Foel Barrow	DE048, NPRN 307140	None	None
Llyntro Moat Rhostyllen	DE 193, NPRN 27460	None	None
Bersham Ironworks	DE189, NPRN 34051	None	None

There is the potential for impact on the settings of a section of Offa's Dike designated archaeological asset, however, the primary significance of the monument will not be affected. Although the setting will be altered, this will not be to the extent that the monument cannot still be experienced in its current form. In addition, any visual impact from the Proposed Development is completely reversible and can be removed following the operational period (usually 40 years). As a consequence of these factors, it is considered that the level of effect on the significance of any designated archaeological heritage asset will be no more than Minor.

It is not considered that any identified impact on the setting of any designated archaeological heritage asset from the Proposed Development would breach the unacceptable criterion as noted in Future Wales Policy 18.

Although some of the extant field boundaries may be important under the Hedgerow Regulations 1997, there is no intention to remove any hedgerows within the development proposals, and therefore no impact is anticipated on these assets.

Despite the low potential for any hitherto unknown significant buried archaeological remains to be present in the study site, the archaeological advisors at the Clwyd-Powys Archaeological Trust have expressed an opinion that evaluation of the site prior to development would be required. This has partly been addressed through geophysical survey, but further evaluation through trial trenching is likely to be required, followed by mitigation if necessary.

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1 INTRODUCTION AND SCOPE OF STUDY

1.1 This archaeological desk-based assessment has been prepared by Philip Bethell of RPS Consulting on behalf of Lightsource bp.

1.2 The subject of this assessment, also known as the study site, is the site of Plas Power Estate, Wrexham. The site is centred approximately on National Grid Reference SJ 30160 50380. The assessment considers the full extent of the site as shown in Figure 1a. The study site is very irregular in shape and has a total area of approximately 145ha. The study site occupies several areas of land that are not contiguous. For ease of reference throughout this assessment, the study site has been divided into four zones (A-D) which reflect both the topographic variation across the study site and the physical separation of different parts of the study site. These zones are shown in Figure 1b.

1.3 The Proposed Development is for the construction of a solar photovoltaic electricity generating station and Battery Energy Storage System (BESS) (Plas Power Solar and Energy Storage Project).

1.4 This desk-based assessment is designed to provide the baseline information to enable informed decisions about managing any impacts that may potentially arise on any significant archaeological assets in the site. This report discusses both the potential for encountering below-ground archaeology during the course of the development, and the potential for impacts to arise on the settings of designated archaeological heritage assets (Scheduled Monuments) within the study site and within a radius of 1km.

1.5 In accordance with government policy (Planning Policy Wales and associated guidance), this assessment draws together the available archaeological, historic, topographic and land-use information in order to clarify the heritage significance and archaeological potential of the study site.

1.6 Additionally, in accordance with the *Standard and guidance for historic environment desk-based assessment* (Chartered Institute for Archaeologists 2020), the assessment includes the results of a site inspection, an examination of published and unpublished records and charts historic land-use through a map regression exercise.

1.7 As a result, the assessment enables relevant planning decision makers to make a suitably informed decision, in relation to archaeology, on an application for the study site's development. Specifically, this would include assessment of the significance of archaeological heritage assets on and close to the study site and assesses the potential for hitherto undiscovered archaeological heritage assets, thus enabling potential impacts on such assets to be identified along with the need for design, civil engineering or archaeological impact mitigation solutions.

2 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

Legislation

2.1 National (UK-wide) legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014.

2.2 The Well-being of Future Generation (Wales) Act 2015 places duties on public bodies requiring them to act in accordance with the 'sustainable development principle'. The Act also establishes well-being goals which include achieving 'a Wales of vibrant culture and Welsh language', described as 'a society that promotes and protects culture, heritage and the Welsh language'. The Act lays down the principle that a properly protected, conserved and enhanced historic environment can improve the quality of life and well-being for everyone.

2.3 The Historic Environment (Wales) Act 2016 was given Royal Assent in March 2016. This Act provides the legislative framework for managing the historic environment in Wales. Accompanying the Act was new policy and guidance in the form of a Technical Advice Note (TAN) specific to the Historic Environment (TAN24, see below), and changes to Planning Policy Wales (PPW). This legislation and guidance supersedes the previous Welsh Office Circulars which formed the basis of historic environment policy in Wales.

2.4 A new Historic Environment (Wales) Act has been given Royal Assent on June 14th 2023. The purpose of this Act is to consolidate existing Welsh and UK-wide legislation in one place. The 2023 Act consolidates enactments in or made under the following:

- the Historic Buildings and Ancient Monuments Act 1953;
- Parts 1 and 3 of the Ancient Monuments and Archaeological Areas Act 1979;
- Parts 14 and 15 of the Town and Country Planning Act 1990;
- the Planning (Listed Buildings and Conservation Areas) Act 1990;
- Part 5 of the Planning and Compulsory Purchase Act 2004;
- the Historic Environment (Wales) Act 2016

2.5 The Welsh Government has published Planning Policy Wales (PPW), currently updated to Version 12 from February 2024 (PPW12). This sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs). Procedural advice is given in circulars and policy clarification letters.

2.6 PPW is additionally supported by guidance published by Cadw. This includes Heritage Impact Assessment in Wales (2017), and Setting of Historic Assets in Wales (2017).

National Planning Policy

Future Wales –the National Plan 2040 (February 2021)

2.7 Future Wales is the national development framework, setting the direction for development in Wales to 2040. It addresses key national priorities, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.

2.8 Policy 18 of Future Wales – 'Renewable and Low Carbon Energy Developments of National Significance' – makes reference to the historic environment, with clause 6 stating that renewable developments will be permitted as long as 'there are no unacceptable adverse impacts on statutorily protected built heritage assets'.

Planning Policy Wales (PPW)

2.9 Chapter 6 of PPW12, entitled 'Distinctive and Natural Places', has a section entitled 'The Historic Environment' (section 6.1 - pp. 125-131) which provides policy for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 6.1 in relation to the historic environment can be summarised as seeking to:

- protect the Outstanding Universal Value of the World Heritage Sites;
- conserve archaeological remains, both for their own sake and for their role in education, leisure and the economy;
- safeguard the character of historic buildings and manage change so that their special architectural and historic interest is preserved;
- preserve or enhance the character or appearance of conservation areas, whilst the same time helping them remain vibrant and prosperous;
- preserve the special interest of sites on the register of historic parks and gardens; and
- protect areas on the register of historic landscapes in Wales.

2.10 Section 6.1 of PPW12 describes the historic environment as comprising all the surviving physical elements of previous human activity and illustrates how past generations have shaped the world around us. The historic environment is made up of individual historic features, archaeological sites, historic buildings and historic parks, gardens, townscapes and landscapes, collectively known as historic assets.

2.11 Welsh planning legislation and policy guidance outlines that the conservation of archaeological remains and their settings is a material consideration in the determination of a planning application, whether those remains are scheduled or not (PPW12 Para. 6.1.23). In order to take account of archaeological considerations and deal with them from the beginning of the development control process, Local Planning Authorities in Wales need to be fully informed about the nature and importance of archaeological remains, and their setting, and the likely impact of any Proposed Development upon them.

2.12 Paragraphs 6.1.26 of PPW12 states that where archaeological remains are known to exist or there is a potential for them to survive, an application should be accompanied by sufficient information, through desk-based assessment and/or field evaluation, to allow a full understanding of the impact

of the proposal on the significance of the remains. The needs of archaeology and development may be reconciled, and potential conflict very much reduced, through early discussion and assessment.

2.13 Paragraph 6.1.27 of PPW12 states that if the planning authority is minded to approve an application and where archaeological remains are affected by proposals that alter or destroy them, the planning authority must be satisfied that the developer has secured appropriate and satisfactory provision for their recording and investigation, followed by the analysis and publication of the results and the deposition of the resulting archive in an approved repository. On occasions, unforeseen archaeological remains may still be discovered during the course of a development. A written scheme of investigation should consider how to react to such circumstances or it can be covered through an appropriate condition for a watching brief.

2.14 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance PPW12, by current Development Plan Policy and by other material considerations.

Hedgerow Regulations

2.15 Under the Hedgerow Regulations 1997, hedgerows are deemed to be historically Important if they are more than 20m long and over 30 years old and if they meet at least one of these criteria:

- they mark all or part of a parish boundary that existed before 1850;
- they mark an archaeological feature of a site that is a scheduled monument or noted on the Historic Environment Record;
- they mark the boundary of an estate or manor or looks to be related to any building or other feature that's part of the estate or manor that existed before 1600;
- they are part of a field system or looks to be related to any building or other feature associated with the field system that existed before the Inclosure Acts (that is before 1845);

2.16 In practice (and following case law) hedgerows are deemed Important under the above regulations if they can be demonstrated to exist on the appropriate pre-1845 parish tithe or enclosure map.

Local Planning Policy

2.17 The site is located within the Wrexham County Borough Council area, which has adopted the Wrexham Local Development Plan (LDP) 2013 – 2028. The relevant policy of the LDP is:

Policy SP15 Historic and Cultural Environment *– Development will only be supported where it conserves, protects, preserves or enhances the following cultural and historic assets of the County Borough and their setting:*

i. Listed Buildings;

ii. Conservation Areas;

iii. Pontcysyllte Aqueduct and Canal World Heritage Site;

iv. Registered Historic Parks, Gardens and Landscapes; and

v. Scheduled Monuments and Archaeological Remains.

2.18 In line with relevant planning policy and guidance, this desk-based assessment seeks to clarify the site's archaeological potential and the likely significance of that potential and the need or otherwise for additional mitigation measures.

Definitions and Guidance

2.19 The *'Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment in Wales'* published by Cadw in March 2011 provides the basic principles under which all subsequent guidance has evolved. The six principles expressed are:

- Historic assets will be managed to sustain their values.
- Understanding the significance of historic assets is vital.
- The historic environment is a shared resource.
- Everyone will be able to participate in sustaining the historic environment.
- Decisions about change must be reasonable, transparent and consistent.
- Documenting and learning from decisions is essential.

Definition of the historic environment

2.20 The historic environment is defined in TAN 24 (at para. 1.7) as:

- *"All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and deliberately planted or managed*."

Definition of Heritage Assets

2.21 Heritage assets are defined by Cadw (March 2011) and TAN 24 (2017) as:

- "*An identifiable component of the historic environment. It may consist or be a combination of an archaeological site, an historic building or area, historic park and garden or a parcel of historic landscape. Nationally important historic assets will normally be designated*."

2.22 A Designated Heritage Asset is considered to be a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area. In Wales areas of landscape have been designated and included in the non-statutory Register of Landscapes of Historic Interest in Wales.

Significance

2.23 Significance in relation to heritage policy considerations is defined as:

- The sum of the cultural heritage values (Cadw 2011).

Setting

2.24 Guidance on the assessments of impact on the settings of heritage assets is provided by Cadw in *'Setting of Historic Assets in Wales'* (May 2017). This provides a 4-stage process for determining if

any impact on the settings of historic assets would arise from a Proposed Development, and how it could be mitigated if impacts are identified.

3 GEOLOGY AND TOPOGRAPHY

Geology

3.1 The solid geology underlying the study site is composed of Carboniferous sandstone, mudstone and siltstone of both the Pennine Lower and Middle Coal Measures Formations. There are superficial deposits of sand and gravel from Devensian Glaciofluvial Sheet Deposits, along the eastern boundary of the study site and part of the southern boundary in the south-west corner.

3.2 Quaternary sand and gravel River Terrace Deposits are present along the course of the River Clywedog which runs along the southern boundary of the study site, but these deposits are not present within the Proposed Development area.

3.3 The base mapping on the British Geological Survey (BGS) on-line viewer shows a large part of the site shaded but with no descriptive data; in the BGS Geoindex Onshore, a large extent of the site is shown as 'Artificial Ground' (see Figure 4a). A BGS Technical Report (Hains 1991) contains a number of maps in which the area shown in Figure 4a is described as 'Worked out opencast coal area or worked clay or sand and gravel pit, wholly or partially backfilled' (e.g. Hains 1991, Figure 8). The extent of this disturbance can be seen in Figures 4a-4c.

Topography

3.4 The general topography of the study site and the area surrounding it is of a reduction in height from west to east. Height Above Ordnance Datum (AOD) at the western boundary of the site in Zone B is 180m, in Zone A 170m. The lowest parts of the site are along the eastern boundary of Zone D, where height AOD is approximately 105-110m.

3.5 The valley of the River Clywedog which runs along the southern boundary of Zone C and D provides a locally lower height.

3.6 Within the study site there are minor variations in this broad topography, e.g. where watercourses/drainage ditches are present, and these are best seen in the LiDAR plot, Figure 3.

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND WITH ASSESSMENT OF SIGNIFICANCE

Timescales used in this report

Prehistoric

Palaeolithic	c. 800,000 -	10,000 BC
Mesolithic	c. 10,000 -	4,400 BC
Neolithic	c. 4,400 -	2,300 BC
Bronze Age	c. 2,300 -	700 BC
Iron Age	c. 700 -	AD 43

Historic

Roman	AD 43 -	410
Post-Roman/Early Medieval	AD 410 -	1066
Medieval	AD 1066 -	1536
Post Medieval	AD 1536 -	1750
Industrial	AD 1750 -	1899
Modern	AD 1900 -	Present

Introduction

4.1 This chapter reviews the available archaeological evidence for the study site and the archaeological/historical background of the general area, and, in accordance with national and local policy, considers both the potential for any as yet to be discovered archaeological evidence on the study site, and the potential for impacts on the settings of designated archaeological assets (Scheduled Monuments).

4.2 What follows comprises a review of known archaeological assets within a 1km radius of the study site (Figs. 2a to 2d), also referred to as the study area. This assessment is based on a consideration of evidence in the Historic Environment Record (HER) curated by the Clwyd-Powys Archaeological Trust (CPAT) for the study site and for a 1km radius around the study site centre (the study area). Data held by The National Monuments Record (NMR), part of the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) was also consulted. Historic maps and documents in the Wrexham Archives were examined, as well as historic Ordnance Survey maps from open/commercial sources. This information has enabled a historic map regression exercise charting the development of the study area from the 19th century onwards until the present day.

4.3 Aerial Photographs from the Central Register of Aerial Photographs in Wales were also reviewed. No hitherto unidentified archaeological heritage assets were noted from the aerial photographs studied, but the extent of disturbance from opencast mining within the site was clearly seen. It is clear that at least 1/3 of the site area has been dug up (see Figs 4a to 4c), effectively most of Zones C and D, and consequently anywhere within the area of opencast mining has zero archaeological potential.

4.4 Chapter 5 subsequently considers the site conditions and whether the Proposed Development will impact the theoretical archaeological potential identified below.

Archaeological Work

4.5 A geophysical survey was carried out over the majority of the site in 2021 (SUMO 2021). The survey area was based on a previous version of the scheme, which excluded Zone A, and included an additional area to the south of the Clywedog valley. The survey did not include those areas identified as subject to open-cast mining, contained within study site Zones C and D.

4.6 Areas 1, 2, and 3 of the geophysical survey correspond to study site Zone B. Results from areas 1 and 2 along the western part of Zone B showed no anomalies with archaeological potential, but were potentially masked by Green Waste and area 3 in the eastern part of Zone B contained a group of discrete linear responses and curvilinear trends. The responses are magnetically weak; however, they do appear to form rectangular and sub-circular enclosures. While they could be archaeological in nature, they lack the defined morphology of anomalies that would normally be categorised as being of interest.

4.7 In study site Zone C (survey areas 4-8) linear anomalies were identified as former field boundaries.

4.8 One survey area (9) is located in study site Zone D. This contains a discrete broad linear ditch identified as possible archaeology. A discrete curvilinear response, linear trends and pit-like anomalies have also been recorded in Area 9. The curvilinear response could possibly be a ring-ditch. While archaeological origins for the anomalies is possible, it is worth noting Area 9 is heavily disturbed and they could be due to other modern processes.

4.9 The other survey areas (10-15) lie outside the site. Probable archaeology identified in these areas includes a possible barrow, enclosures which may be related to a Medieval monastic grange, and possible bell pits potentially indicative of early coal extraction.

4.10 Zone A was the subject of a geophysical survey in 2023 (SUMO 2023). This recorded magnetic disturbance, probably the result of the spreading of green waste, which is likely to have obscured any archaeological anomalies that may have otherwise been recorded. Despite this some anomalies corresponding with historic field boundaries were recorded.

4.11 Event data from the CPAT HER is plotted in Figure 2c. None of the recorded events provided evidence relevant to understanding the archaeological potential of the study site.

Prehistoric

4.12 There are no firmly identified Prehistoric finds or features recorded within the study site.

4.13 There is a single fieldname record, ‘Twmpath’ (HER 101522, 102637) 50m south-west of Zone A, which may indicate the former presence of a mound, which may refer to a Prehistoric barrow. No visible evidence exists for this now. Any such mound could also date from other periods.

4.14 Within the wider 1km study area, there is limited evidence of Prehistoric activity. A Neolithic hand-axe was found as an isolated find 1km north-west of Zone A (HER 87290).

4.15 A cluster of Bronze Age features is present 1.2km south of the study site. The cluster includes possible barrows visible as cropmarks (HER 101824, 105077), close to an extant mound (HER 101236), which is a Scheduled Monument (DE048). A Bronze Age cremation cemetery (HER 100044) was dug up in the 19th century immediately west of Offa’s Dyke, 300m west of Zone A.

4.16 The Scheduled Monument Cadwgan Hall Mound (HER 101151, DE131), 500m south-west Zone C, and adjacent to the proposed cable route, has been interpreted as a possible Bronze Age barrow, but remains undated.

4.17 Another 'Twmpath' fieldname is noted 400m north-west of the northern end of Zone A (HER 101523, 102691), and this may indicate the presence of an earlier mound, as in 4.8 above.

4.18 There is very little evidence of Iron Age activity within the study area. One enclosure (HER 120891) identified in a LiDAR survey (see Figure 3), 150m south of Zone C in the Clywedog valley, has been identified as an Iron Age defended enclosure on typological grounds alone. One undated enclosure identified from cropmarks (HER 1000084, 650m west of Zone A) is also considered to be possibly Prehistoric, but no other finds or features are recorded within the 1km study area.

4.19 Some of the anomalies identified in the geophysical survey may be of Prehistoric origin.

4.20 There is a very sparse spread of known Prehistoric features across the study site and study area recorded in the HER and NMR. As a result, it is considered that there is a low potential for hitherto unknown significant archaeological remains from the Prehistoric periods to be present within the undisturbed areas of the study site (Zones A-C).

Roman

4.21 There are no Roman finds or features firmly recorded within the study site, although finds from a group recorded as being within a 1km map grid square which partly overlaps the eastern part of the study site, may possibly lie within the study site. This group includes two Roman coins (HER 44826, 102980), but their precise locations are uncertain. Lead and other minerals were mined in the Esclusham and Minera Mountains to the west of the study area in the Roman period, but there is no evidence of such activities recorded within the study site.

4.22 A Roman coin was found 1km east of Zone D (HER 103005).

4.23 As a result of this very limited evidence, it is considered that there is a low potential for hitherto unknown significant archaeological remains from the Roman period to be present within the undisturbed areas of the study site (Zones A-C).

Early Medieval

4.24 There are no identified Early Medieval archaeological heritage assets within the study site.

4.25 Parts of the linear boundary earthwork known as Offa's Dyke run roughly from south to north through the study area to the west of the study site. It was originally planned, and construction commenced, in the late 8th century, when Offa was king of Mercia, the Saxon kingdom occupying most of the midlands of England.

4.26 One part of this earthwork runs from south-east to north-west approximately 150m west of Zone B at its closest. This is a Scheduled Monument (SM) (DE180). There are other sections of Offa's Dyke which run through the study area, aligned north-south (see Figure 2d).

4.27 Four sections (all SMs, DE181, DE182, DE183, DE113) are at the northern end of the study area, between 250m and 900m north-west of the western boundary of Zone A.

4.28 A further section (DE139) runs 250m west of the western boundary of Zone C, and to the south of this section, a further length (DE132) runs approximately 1km south of the southern boundary of

Zone C. Sections DE194 and DE137 continue the line of the Dyke southwards to the limit of the study area. The proposed cable routes cross some of these sections of Offa's Dyke.

4.29 The HER records a considerable number of entries along the length of the Dyke, but these are not listed here.

4.30 There are no other Post-Roman/Early Medieval assets recorded in the HER within the study site or study area.

4.31 Further evidence of Anglo-Saxon influence is provided by local place names incorporating 'Ham', an English word meaning settlement or manor, and 'Esclus', probably an English corruption of the Welsh 'Ystlys' that refers to the side or flank of a hillside.

4.32 Beyond the known Early Medieval asset of Offa's Dyke, it is considered that there is a low potential for hitherto unknown significant archaeological remains from the Early Medieval period to be present within the undisturbed areas of the study site (Zones A-C).

Medieval

4.33 There is one area of ridge and furrow cultivation recorded within the study site, HER 128255 in the central area of Zone B. Another area of ridge and furrow (HER 128244) lies 250m north of Zone A. These features may have their origin in the Medieval period, and indicate the agricultural use of the study site during this period.

4.34 There is a single fieldname record, 'Twmpath' (HER 101522, 102637) 50m south west of Zone A, which may indicate the former presence of a mound, which may refer to a Medieval motte. No visible evidence exists for this now. Any such mound could also date from other periods.

4.35 Within the wider study area, there is a number of Medieval assets recorded. There is a another 'Twmpath' fieldname record, (HER 101523, 102961) 400m north-west of Zone A, which may indicate the former presence of a mound, which may also refer to a Medieval motte. No visible evidence exists for this now. Any such mound could also date from other periods.

4.36 The Scheduled Monument Cadwgan Hall Mound (HER 101151, DE131), 1km south-west of the study site, has been interpreted as a possible Medieval motte, but remains undated.

4.37 There are moated sites recorded 200m east of the eastern boundary of Zone D (HER 100393) and 1km south of the study site (HER 101237, SM DE193).

4.38 A placename, 'Croes Foel', recorded 1km south of the study site, is interpreted as recording the presence of a standing cross (HER 102645) during the Medieval period. This location is within the group of Bronze Age features discussed above in 4.10.

4.39 A Medieval seal (HER 102636) is recorded 300m south-east of the south-east corner of Zone D.

4.40 The HER records the presence of a Medieval grange (HER 120659) somewhere in the eastern part of the study site. This is derived from documentary evidence which indicated that an outlying grange belonging to Valle Crucis Abbey was present in the area. This possible asset is not located in any detail.

4.41 Wrexham was established as a settlement in the Medieval period, and there was settlement in the surrounding countryside including within the study site area. The settlement at Bersham was formed during the Medieval period from two adjacent groups of cottages known as Pentre Dybenni and Dol Cuhelyn, and was part of the manor of Esclusham. This was later separated into Esclusham above

the dyke and Esclusham below the dyke, and Bersham then became a separate township within the parish of Wrexham. Plas Power Estate had its origins in the Medieval period (WCBC 2009).

4.42 There is no available evidence which suggests any Medieval settlement was present within the study site. The only evidence from within the study site consists of now destroyed ridge and furrow cultivation features which indicate the agricultural use of the study site during the Medieval period. The evidence for the potential presence of a monastic grange is weak, and any such asset is unlikely to be located within the study site.

4.43 Magnetic anomalies revealed in the geophysical survey may represent features of Medieval origin, but these are most likely to be evidence of agricultural activity.

4.44 Based on current knowledge, it is therefore considered that there is a low potential for hitherto unknown significant archaeological remains from the Medieval period to be present within the undisturbed areas of the study site (Zones A-C).

Post Medieval & Modern (including map regression exercise)

4.45 The archaeological interest of the study area during these periods is dominated by the development of local industry, associated with coal and mineral extraction, and iron production. The topography of the riverbank at Bersham made it ideal for iron production: the natural cliff formation allowed furnaces to be charged from the top and for the molten metal to run off below at road level; the surrounding woodlands supplied them with plentiful fuel; and the fast flow of the River Clywedog provided a power supply to drive the water wheels. Evidence suggests that there were already several iron furnaces and foundries along the Clywedog Valley by the seventeenth century.

4.46 In the late 18th century Isaac Wilkinson diverted the course of the River Clywedog and built a number of weirs along its length in order to better supply power to his mills. Whilst now dry, these leats remain visible in Plas Power woods and the meadow leading to Papermill Cottage. The Bersham Ironworks, 50m south of the study site, (SM DE189, HER 36683, 77982, 36682, 126369) was developed from the 1770s until its closure in 1812. Following the ironworks' decline, paper and corn mills came to re-use redundant ironwork buildings. Two paper mills were located in Bersham during the nineteenth-century and the blast furnace on the west side of the village was converted to a corn mill in 1829 and worked until 1933.

4.47 Through both the nineteenth and twentieth centuries, mining was another important local industry, with 38 collieries operating in the Wrexham area at peak. During the twentieth century, a large area of land to the north of Bersham, which encompassed much of Zones C and D of the Site, was used for opencast mining (see Figures 4a-4c).

4.48 Plas Power Estate had its main house replaced in the mid-19th century, and the associated parkland was enclosed with a high stone wall, much of which survives today. The group of buildings which lies in woodland between Zones B and C (outside the study site) represents the surviving ruins of this 19th century house and associated outbuildings (HER126370).

Map Regression

4.49 The earliest available detailed mapping of the Site is nineteenth-century tithe maps of the 1840s (not illustrated), with Zones A-D of the study site lying within the parish of Bersham Township, Wrexham. These tithe maps and their associated apportionments show that in the early 1840s Zones C and D comprised parkland associated with Plas Power, with Plas Power shown to be enclosed to the north, south and west by plantations. Zones A and B and comprise smaller field

parcels which are recorded as being agricultural land (predominantly arable and pasture) variously associated with Rhos Berse, Upper Berse, and Ty'n Ddol.

4.50 Ordnance Survey (OS) mapping from 1879 (Figure 5) and an estate map of 1899 (Figure 6) provide evidence of the 'improvements' made to the Plas Power Estate by owner William Lloyd. In this mapping, Zone B no longer comprises smaller agricultural field parcels but instead forms part of the parkland. This parkland stretches from Rhos Berse Road to the west, to what is now the A525 to the north, and the old Berse Road to the east. The re-building of Plas Power itself is also shown, with the new mansion in a similar position to the old but now enclosed to a greater extent, on all sides, by more substantial plantations. Zone A and the land to the south of the study site remained divided into smaller irregular-shaped fields. It is clear that no development was present within the study site, and the whole of the study site was either agricultural land or woodland.

4.51 The 1938 OS mapping (Figure 7) shows the extent of Plas Power Park shaded in grey. Land use was essentially the same as in the late-nineteenth century and the study site seems otherwise broadly unchanged. Within the surrounding area, however, some expansion of Coedpoeth is evident. Similarly, to the north-east, Broughton is shown to have expanded after the arrival of a second railway line.

4.52 In the Post-War period, however, both the Site and its surrounds underwent considerable change. In 1946-7 Plas Power was demolished; although, as illustrated in the 1963-4 OS mapping (Figure 8), a number of adjacent estate buildings and the plantation in which it was enclosed remained. Zone A which had previously been farmed independently was largely unchanged in this mapping, and the field divisions remained as in 1879. Zone B also appears to be largely unchanged. However, the former parkland to the east of Plas Power, including most of Zones C and D was being used for opencast mining by this time. The reservoir between Zones B and D was also built by this time. Within the surrounding area, both Coedpoeth and Broughton display further expansion.

4.53 The extent of the opencast mining on the former Plas Power parkland is illustrated on an aerial photograph from 1966 (Figure 4b), which shows these opencast workings extending right up to the plantation in which Plas Power had formerly stood. Figure 4c shows the extent of opencast mining as understood form the available evidence, overlaid onto a modern aerial photograph.

4.54 On OS mapping from the 1970s (Figure 9), however, this opencast mining is shown to have ceased, with made ground in the area of the former workings, displaying the field boundaries, linear tree belt, overflow pond and tracks we see today. It can be seen that the whole extent of the opencast workings has been restored to either woodland or agricultural land. Neither the mapping nor the aerial photographs show any buildings or other structures within the study site that might be related to this extraction phase. Zone A appears largely unchanged. Along the eastern boundary of the Site, the A435 is shown to have been constructed, dividing Bersham in two.

4.55 OS mapping from 2000 (Figure 10) shows few changes to the study site, with only a small number of field boundary changes evident, mainly in Zone A. No substantial changes to the surrounding area are apparent either. Although, to the north-east of the study site, the railway lines to the south of Broughton are shown to be disused and part has been built over with residential development at 'New Broughton'.

4.56 The evidence of historic mapping indicates that the study site was agricultural land throughout the Post-Medieval and early Modern periods, and that the developing extractive and iron-working industries which sprang up across the Wrexham area were not active in the study site.

4.57 There was, however, major intervention into the study site during the 1960s, when a large portion of Zones C and D were subject to opencast coal extraction across their extents. In the rest of the study site, Zones A and B, it is considered that there is a low potential for any significant archaeological

remains from the Post-Medieval and Modern periods to be present within these undisturbed areas of the study site.

Assessment of Significance (Designated Assets)

4.58 Existing national policy guidance for archaeology enshrines the concept of the 'significance' of heritage assets. Significance as defined in Cadw's *Conservation Principles* (2011) is 'the sum of the cultural heritage values' of a heritage assets.

4.59 There are no designated archaeological heritage assets within the study site.

4.60 Within the 1km study area, there are 12 Scheduled Monuments (see Figure 2d). These are as follows:

- Bersham Ironworks, (DE189), adjacent to southern boundary of Zone E;
- Section of Offa's Dyke (DE113), 900m north-west of Zone A;
- Section of Offa's Dyke (DE183), 850m north-west of Zone A;
- Section of Offa's Dyke (DE182), 700m west of Zone A;
- Section of Offa's Dyke (DE181), 450m west of Zone A;
- Section of Offa's Dyke (DE180), 200m west of Zone B at closest;
- Section of Offa's Dyke (DE139), 200m west of Zone C;
- Section of Offa's Dyke (DE132), 350m south-west of Zone C;
- Section of Offa's Dyke (DE194), 850m south-west of Zone C;
- Section of Offa's Dyke (DE137), 1km south-west of Zone C;
- Cadwgan Hall Mound (DE131), 600m south-west of Zone C;
- Moated site (DE193), 950m south of Zone F;
- Bronze Age barrow (DE048), 1km south of Zone F.

4.61 All of the above assets are designated Scheduled Monuments of national (UK) significance.

4.62 Potential impacts from the Proposed Development on designated built heritage assets are the subject of a separate report.

Assessment of Significance (Non-Designated Assets)

4.63 As identified by desk based work, archaeological potential by period and the likely significance of any archaeological remains which may be present is summarised in table form below:

Period:	Identified Archaeological Potential	Identified Archaeological Significance
Prehistoric	Low	Low (Local)
Roman	Low	Low (Local)
Early Medieval	Low	Low (Local)
Medieval	Low	Low (Local)
Post Medieval and Modern	Low	Low (Local)

4.64 The identified potential applies only to Zones A and B, and part of C, of the study site. Zones C and D have been disturbed by opencast mining to the extent that any archaeological features in those disturbed areas has been destroyed, and consequently there is no archaeological potential left.

4.65 Some of the hedgerows within the study site may be considered important under the 1997 Hedgerow Regulations.

5 SITE CONDITIONS, THE PROPOSED DEVELOPMENT & REVIEW OF POTENTIAL DEVELOPMENT IMPACTS ON ARCHAEOLOGICAL ASSETS

Site Conditions

5.1 The study site consists of a series of agricultural fields divided into a number of separate zones divided by areas of woodland, on topographical variation, and other landscape features. These zones are mapped in Figure 1b, and described here. A series of plates is included to illustrate the general nature of the study site (Plates 1-46).

Zone A

5.2 Zone A, located in the north-western part of the study site, is the highest part of the study site, with a series of smaller fields rising to the west. There are wider views eastwards and south-eastwards from the western boundary, but the downwards slope and intervening field boundaries reduce these views in the eastern part of the zone. The western boundary has been drawn along a set of field boundaries that are below the ridge line to the west, and so the zone is enclosed to the west; to the south and north there are belts of woodland that reduce any visual interaction in these directions (Plates 1-7).

Zone B

5.3 Zone B is the north-western part of the study site, rising gently up to the west and bounded on the west by a hedgerow field boundary. It is made up of three large fields. The Zone is largely enclosed by woodland to the north, with frequent tree belts to the east breaking up and restricting longer views in this direction. Views to the west are dominated by a distinctive narrow dense tree belt running south-east to north-west, which is a section of Offa's Dyke. Beyond this is a high stone-built estate wall which runs along Berse Road. There are dense tree-filled hedgerows to the south. Zone C therefore has its most open aspect to the east (Plates 10-16).

Zone C

5.4 Zone C is an irregular-shaped area that is wrapped around the eastern and southern sides of the Plas Power manor and buildings, which are in turn enclosed in woodland. There is an extension of Zone C to the north-east. There are dense woodland boundaries along the east, south and west sides of Zone C, which is relatively flat. These woods serve to enclose Zone C and inhibit any views in or out across the wider landscape (Plates 17-20).

Zone D

5.5 Zone D is the largest zone of the study site, occupying the eastern side of the study site. It is largely composed of large, flat agricultural fields, with a central band of woodland. There are some longer-distance views westwards from a small area in the north-east of the zone. On the east side, the A483 trunk road forms a strong boundary, and the tree belts along the road serve to enclose the zone in that direction. The whole of Zone D is essentially flat, rising only slightly from south to north, and in general is very enclosed by woodland and the tree belts lining the A483. The woodland along the Clywedog valley to the south serves to enclose the zone strongly in that direction (21-31).

5.6 No hitherto unrecorded earthworks or vestigial structures were noted during the site visit that would indicate the presence of hitherto unrecorded archaeological features.

Proposed Development

5.7 The development proposal is for the installation of solar photo-voltaic (PV) panels across the study site and Battery Energy Storage System with associated infrastructure of access roads, transformers, cable trenches, lighting and security fencing.

Review of Potential Development Impacts on Designated Archaeological Assets

5.8 The Proposed Development has no potential for a direct physical impact on any designated archaeological asset within the main development area.

5.9 There is a potential for some impact where cable route Option B crosses Offa's Dyke. As this is a protected national monument, any development directly on or adjacent to this monument will be avoided or mitigated. As a result, it is considered there will be no direct physical impact on any designated archaeological heritage asset from the cable run(s).

5.10 The Proposed Development has the potential for impacts on the settings of designated archaeological heritage assets, as identified in 4.52 above. The preliminary assessment below has used the process outlined in Cadw's settings guidance (Cadw 2017). In all of the following assessments it has been borne in mind that the Proposed Development is fully reversible in terms of any visual impacts, and of a temporary nature.

5.11 Impacts on designated built heritage assets are the subject of a separate report (RPS 2023b).

5.12 The following is a review of potential impacts on designated archaeological assets within 1km of the study site. There are further designated archaeological assets within 3km of the study site (Figure 2d), but it is considered at this stage of the assessment, that all significant impacts arising from the Proposed Development would take place within 1km of the study site. The great majority of designated assets between 1km and 3km distant from the study site are shielded by the topography, intervening vegetation, or urban development, and as such it is highly unlikely that a significant effect would arise on the significance of any asset further than 1km from the study site.

Offa's Dyke - general

5.13 The Dyke is a large linear earthwork that roughly follows the current border between England and Wales. The structure is named after the 8th century king of the Saxon kingdom of Mercia, and although its precise purpose is unknown, it is assumed it was intended to mark a territorial boundary from inception. The overall length of the Dyke is approximately 240km, and sections of it have been constructed at different times. It is up to 20m wide, and consists of a raised linear earthwork and a flanking ditch. The earthwork is up to 2.4m high.

5.14 The significance of the monument is vested in its survival as a feature in the landscape for over 1,000 years. It has evidential value for survival of original material and features, and a strong historical value as a marker of the border between Wales and England.

Section of Offa's Dyke in Plas Power Park (DE180, NPRN 275785)

5.15 This section of the Dyke is 640m long, and runs on a south-east to north-west alignment (Plates 10-14) to the west of Zone B of the study site. The line of the Dyke is very easy to follow, as the bank

is heavily overgrown with trees and shrubs, and so is experienced as a dense hedgerow between two arable fields. There is no pedestrian route alongside or parallel to the Dyke, and it is not clear that there is a bank until climbing over the monument when using the footpath that crosses it at right angles towards its north-western end.

5.16 The setting consists essentially of the two adjoining fields immediately to the west of Zone B. The monument is not generally visible from the west, where the estate wall blocks any view, but can be seen from the road to the west where it reaches that road. It can be seen from the footpath which crosses the Dyke. Towards the east, the ground slopes downwards and views are obscured by woodland and to some extent enclosed by the hedgerow which forms the western boundary of Zone B.

5.17 The significance of the monument is vested in its survival as a feature in the landscape for over 1,000 years. It has evidential value for survival of original material and features, and a strong historical value as a marker of the border between Wales and England.

5.18 The immediate setting of this particular section of the Dyke is relatively open (compared to neighbouring sections), but nonetheless constrained by the enclosing effect of the estate wall to the west, and the woodland further east. This setting does contribute to the understanding of the monument as a linear earthwork, and therefore contributes to its significance.

5.19 As the western part of Zone B lies in the wider setting of the monument, Proposed Development within the study site can be considered to have a potential impact on that setting. While the visual nature of the setting will be altered, there will be no alteration to how the monument is experienced, nor any diminution in how it is understood. The solar panels will present a uniform appearance across the field to the east, and will introduce a more static, industrial feel to the setting, but nonetheless the monument will retain its form and function as a field boundary, and so retain the bulk of its significance. There will be a suitable buffer between the monument and the nearest solar panels, and the footpath and the panels, so the monument will still be visible from the current vantage points along the footpath which crosses it.

5.20 Overall, it is clear that the Proposed Development will impact on the significance of the monument to some extent, but it is considered that this will not reach an unacceptable level. The primary significance of the monument will not be affected, and the setting will be altered but not to the extent that the monument cannot be experienced in its current form. In addition, any visual impact from the Proposed Development is completely reversible, and can be removed following the operational period (usually 40 years). As a consequence of these factors, it is considered that the level of effect on the significance of this section of Offa's Dyke can be regarded as no more than Minor, and temporary.

5.21 Within this section of the development, there is scope for mitigation of effects. This would take the form primarily of maintaining a suitable buffer zone between the monument and the edge of the solar panel array in Zone B, and between the footpath and the edge of the solar panel array in Zone B. This buffer lies between the monument an the western boundary hedgerow of Zone B. This buffer zone would leave the monument open to view from the footpath as it is now, and preserve how it is experienced. Strengthening of the western boundary hedgerow of Zone B will also help to diminish or remove views eastwards across the solar panels in Zone B.

Section of Offa's Dyke in Plas Power Woods (DE139, NPRN 275766)

5.22 This section of the Dyke runs for c. 550m southwards from the southern end of DE180, through Plas Power Woods to the river Clywedog. The monument lies largely in dense woodland, and is not currently easily accessible – it is difficult to experience due to this (Plate 44).

5.23 The significance of the monument is as described in the sections above for Offa's Dyke as a whole, but it does not have the open aspect and accessibility of DE180.

5.24 The setting is contained entirely within Plas Power Wood.

5.25 The western boundary of Zone C lies within 150m to 200m of the monument, but it is considered that that the development will not be intervisible with the Dyke at this point due to the density of the woodland screening it from view.

5.26 As a result, it is considered that no impact will arise on the monument from the Proposed Development.

Section of Offa's Dyke: Cadwgan Hall section (DE132, NPRN 275760)

5.27 This section runs north-south from the Clywedog river to an east-west stream, and beyond to a disused railway for approximately 1km. DE 132 is experienced as an overgrown field boundary. Its setting is confined to the agricultural fields to east and west, with a more open aspect to the west (Plates 36, 42, 43).

5.28 The dense woodland in the Clywedog valley effectively prevents any intervisibility with the monument, and it cannot be seen from the study site.

5.29 As a result of these factors, it is considered that the Proposed Development would have no impact on the setting of the monument, on account of the lack of intervisibility, and therefore no impact on its significance.

Sections of Offa's Dyke to the south of DE132 – DE194/NPRN 275791, DE137/NPRN 275782,

5.30 These sections of Offa's Dyke are not intervisible with the study site, and therefore it is considered that no impact would arise on their settings or significance as a result of the Proposed Development.

Sections of Offa's Dyke north of DE180: North section at Coedpoeth (DE181, NPRN 275786); south of River Gwenfro (DE182, DE183, NPRN 303287); Vron Section (DE 113, NPRN 275787).

5.31 These sections of Offa's Dyke run northwards away from Plas Power Park, and at an increasing distance (300m to 900m) from Zone A of the study site. The western boundary of Zone A has been drawn because it is enclosed by higher ground immediately to the west, beyond which the land slopes down to the Gwenfro valley. As a result, there is no intervisibility between these sections of Offa's Dyke and the study site. It is considered therefore that no impact would arise on their settings or significance as a result of the Proposed Development.

Cadwgan Hall Mound (DE131, NPRN 275759)

5.32 This monument is an earthwork built on a natural hillock, approximately 2.4m high and 42m in diameter. It is adjacent to Offa's Dyke (DE 132 section) and has been variously interpreted as a Prehistoric barrow, a Medieval motte, and an entirely natural feature (HER 01151, 142403). There is a World War 2 air-raid shelter cut into the side of the mound. Current thinking favours its identification as a Medieval motte (Hankinson 2016), but it remains formally undated (Plates 45, 46).

5.33 The significance of the mound is vested in its provision of an example of a Medieval defensive structure, and its association with the later Medieval house of Cadwgan Hall, and the earlier boundary earthwork of Offa's Dyke.

5.34 The setting of the mound is tightly constrained to the south and east by the farm buildings and other structures of Cadwgan Hall. It is more open to the west and north, and includes partial views over Zone F of the study site to the north-east. The setting makes some contribution to the significance of the monument, but as the interpretation of the mound remains unproved, the scale of this contribution is difficult to assess.

5.35 The study site to the north-east (approximately 1km at nearest) forms no part of the setting of the monument. There is no intervisibility between the monument and the study site. It is considered therefore that no impact would arise on its settings or significance as a result of the Proposed Development.

Croes-Foel Barrow (DE048, NPRN 307140)

5.36 This monument is a circular mound, approximately 28m in diameter and 1.3m high. It lies in an agricultural field just under 1km south of the study site, and is assumed to be of Bronze Age date. Such barrows are significant for the information they contain about beliefs and burial rituals in the Bronze Age, and can contain environmental and other archaeological evidence preserved in the original deposits, and in the buried soil horizon in which the barrow is built.

5.37 The setting is enclosed within the field, with relatively limited views outwards, due to intervening vegetation in the form of hedgerows with frequent mature trees. The dense tree growth along the disused railway to the north is the main inhibitor to views northwards towards the study site. It effectively masks any such views.

5.38 As a result of this lack of intervisibility, and lack of any associative relationship with the study site, it is considered that no impact would arise on the setting of the barrow form the Proposed Development, and consequently no effect on its significance would arise.

Llyntro Moat Rhostyllen (DE 193, NPRN 27460)

5.39 This Medieval moated site is described by the Ordnance Survey as a subrectangular platform, c. 28m north-south and 24m east-west. Remains of buildings were reported here, and depicted on the OS map of 1979. The monument is overgrown with trees, and there is a high-voltage overhead electricity pylon adjacent to it. The monument lies just under 1km south of the study site.

5.40 The setting is within the field in which it sits, with relatively limited views outwards, due to intervening vegetation in the form of hedgerows with frequent mature trees. The dense tree growth along the disused railway to the north is the main inhibitor to views northwards towards the study site. It effectively masks any such views.

5.41 As a result of this lack of intervisibility, and lack of any associative relationship with the study site, it is considered that no impact would arise on the setting of the barrow form the Proposed Development, and consequently no effect on its significance would arise.

Bersham Ironworks (DE189, NPRN 34051).

5.42 The remains of the Bersham Ironworks lie in the Clywedog valley immediately south of Zone D, and 200m east of Zone F.

5.43 The ironworks was established in about 1715, although there are a couple of documentary references to an earlier furnace, possibly in Bersham, from the 1670s (Cadw Coflein information). The works started to produce cast iron goods from the early 1730's. Isaac Wilkinson took over the works in 1753 and for the first time began producing iron cannon. A large steam engine was installed

for pumping water around the furnace water wheel, and a number of waggonways to the works were constructed.

5.44 John Wilkinson took over ownership of the ironworks in 1763. A new method of gun manufacture was developed, whereby the guns were cast solid and bored out later, and steam engine cylinders were produced in the same way. Producing these items, Bersham dramatically increased in size and profitability reaching its peak in about 1795. Decline set in soon afterward with the establishment by John of Brymbo ironworks nearby and with John's death in 1808. The works were finally sold in 1812.

5.45 Surviving buildings include the octagonal cannon foundry (NPRN 40427) and adjacent probable fettling shop, a boring mill (NPRN 24854) later converted into a corn mill (NPRN 24853) as well as substantial remains, including lengths of wooden railway and a furnace (NPRN 34053), uncovered through excavations since 1987. Associated are two weirs (NPRNs 34404 and 33629) and the former accounts house (NPRN 26752). Its significance is vested in the survival of these original features and structures, and in the historical importance of the processes developed at Bersham.

5.46 The setting of the monument is largely enclosed in the wooded valley of the Clywedog river. It is more open to the south, where the road runs and other village buildings are clustered around the works. On the north side, the valley rises in a shallow cliff, with trees above, which serve to prevent any intervisibility with the study site Zone E. Woodland and intervening buildings prevent any intervisibility with Zone F.

5.47 Although there is a historical association between the works and the southern end of Zone D, the remains of any related activity would have been removed by the opencast mining activity, which extracted coal to within a few metres of the top of the cliff (see Figures 4a to 4c).

5.48 As a result of the lack of intervisibility, and the erasure of any potential archaeological remains of the ironworks in Zone E, it is considered that the Proposed Development would have no impact on the monument or its setting. It will, therefore, have no effect on the significance of the Bersham ironworks.

Summary of potential impacts on settings

5.49 The potential impacts are summarised in the following table:

Monument	Ref numbers	Level of impact on setting	Level of effect on significance	Potential Mitigation
Section of Offa's Dyke in Plas Power Park	(DE180, NPRN 275785)	Minor	Minor to Negligible	Maintaining buffer zones; increasing planting density along western boundary of study site.
Section of Offa's Dyke in Plas Power Woods	DE139, NPRN 275766	None	None	None
Section of Offa's Dyke: Cadwgan Hall section	DE132, NPRN 275760	None	None	None
Sections of Offa's Dyke to the south of DE132 –	DE194/NPRN 275791, DE137/NPRN 275782	None	None	None

Sections of Offa's Dyke north of DE180: North section at Coedpoeth; south of River Gwenfro; Vron Section	DE181, NPRN 275786 DE182, DE183, NPRN 303287 DE 113, NPRN 275787	None	None	None
Cadwgan Hall Mound	DE131, NPRN 275759	None	None	None
Croes-Foel Barrow	DE048, NPRN 307140	None	None	None
Llyntro Moat Rhostyllen	DE 193, NPRN 27460	None	None	None
Bersham Ironworks	DE189, NPRN 34051	None	None	None

Future Wales Policy 18 threshold

5.51 It is not considered that any identified impact on the setting of any designated archaeological heritage asset from the Proposed Development would be unacceptably adverse.

Review of Potential Development Impacts on Non-Designated Assets

5.52 The proposed new build could potentially have a below-ground impact on any buried archaeological remains if any are present. Any such impact could be destructive of any buried remains.

5.53 The geophysical survey has identified some potential archaeology in the undisturbed areas of the study site, but the potential for hitherto unknown archaeological remains from any period to be present is considered to be low, and it is further considered that any archaeological remains present in the study site are unlikely to be of more than local significance. The Proposed Development is therefore not considered likely to have any significant effect on the buried archaeological element of the historic environment.

5.54 Although some of the extant field boundaries may be important under the Hedgerow Regulations 1997, there is no intention to remove any hedgerows within the development proposals, and therefore no impact is anticipated on these assets.

Heritage Impact Sensitivity of Study Site Zones

5.55 The different zones of the study site had a varying sensitivity in terms of their potential for adverse impacts on the archaeological record in the original scheme plan. This variation was a result of variation in their topography, boundary treatments, and previous land use. The revised scheme has reduced the overall sensitivity to low, as a result of re-design.

5.56 This sensitivity is summarised in the table below:

	Buried archaeology	Designated assets	Overall sensitivity
Zone A	Low potential	Low potential for impact	Low

Zone B	Low potential, some possible archaeology in geophysical survey	Section of Offa's Dyke to west, Minor potential for impact	Low/Medium
Zone C	Low potential, some possible archaeology in geophysical survey, partly area of opencast mining	Low potential for impact	Low
Zone D	No potential, area of opencast mining	Low potential for impact	Low

6 SUMMARY AND CONCLUSIONS

6.1 The study site has been assessed for its below ground archaeological potential, and potential impacts on the settings of designated archaeological heritage assets.

6.2 There will be no direct impacts on any designated archaeological heritage assets. The proposed grid connection cable run options all pass through the line of Offa's Dyke, but any impact will be avoided through mitigation, e.g. through directional drilling.

6.3 The potential development impacts on non-designated buried archaeological remains are considered to be low. Much of the study site has been subject to opencast coal extraction, and therefore any archaeological remains within those areas has been destroyed. Geophysical survey has identified some potential archaeology in localised areas of the study site, but none of this is considered likely to be of more than low significance.

6.4 Archaeological potential by period and the likely significance of any archaeological remains which may be present is summarised in table form below:

Period:	Identified Archaeological Potential and Significance:	
Prehistoric	Low	Low (Local)
Roman	Low	Low (Local)
Early Medieval	Low	Low (Local)
Medieval	Low	Low (Local)
Post Medieval	Low	Low (Local)
Modern	Low	Low (Local)

6.5 There is a greater potential for impacts on the settings of designated archaeological heritage assets, and this potential is summarised in the table below, using a simple traffic light system (Low, Medium, High):

Monument	Ref numbers	Level of impact on setting	Level of effect on significance
Section of Offa's Dyke in Plas Power Park	DE180, NPRN 275785	Low to Medium	Low
Section of Offa's Dyke in Plas Power Woods	DE139, NPRN 275766	None	None
Section of Offa's Dyke: Cadwgan Hall section	DE132, NPRN 275760	None	None
Sections of Offa's Dyke to the south of DE132 –	DE194/NPRN 275791, DE137/NPRN 275782	None	None

Sections of Offa's Dyke north of DE180: North section at Coedpoeth; South of River Gwenfro; Vron Section	 DE181, NPRN 275786 DE182, DE183, NPRN 303287 DE 113, NPRN 275787	None	None
Cadwgan Hall Mound	DE131, NPRN 275759	None	None
Croes-Foel Barrow	DE048, NPRN 307140	None	None
Llyntro Moat Rhostyllen	DE 193, NPRN 27460	None	None
Bersham Ironworks	DE189, NPRN 34051	None	None

6.7 There is the potential for impacts on the settings of designated archaeological assets. In each case, the primary significance of the monument will not be affected. Although the settings will be altered, this will not be to the extent that the monuments cannot still be experienced in their current form. In addition, any visual impact from the Proposed Development is completely reversible, and can be removed following the operational period (usually 40 years). As a consequence of these factors, it is considered that the level of effect on the significance of any designated archaeological heritage asset will be no more than Minor.

6.8 It is not considered that any identified impact on the setting of any designated archaeological heritage asset from the Proposed Development would breach the unacceptable criterion as noted in Future Wales Policy 18.

6.9 Although some of the extant field boundaries may be important under the Hedgerow Regulations 1997, there is no intention to remove any hedgerows within the development proposals, and therefore no impact is anticipated on these assets.

6.10 Despite the low potential for any hitherto unknown significant buried archaeological remains to be present in the study site, the archaeological advisors at the Clwyd-Powys Archaeological Trust have expressed an opinion that evaluation of the site prior to development would be required. This has partly been addressed through geophysical survey, but further evaluation through trial trenching is likely to be required, followed by mitigation if necessary.

Sources Consulted

General

British Library

CPAT Historic Environment Record

Wrexham Archives

The National Monument Record for Wales (RCAHMW)

The Central Register for Aerial Photographs in Wales

Internet

British Geological Survey – http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html

British History Online – http://www.british-history.ac.uk/

Portable Antiquities Scheme – www.finds.org.uk

Cadw Coflein https://coflein.gov.uk/en/

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Chartered Institute for Archaeologists Standard & Guidance for historic environment desk based assessment 2014, revised 2017

Hains, B.A (1991) *Applied geological mapping in the Wrexham area: geology and land-use planning*. British Geological Survey Technical Report WA/91/4 Onshore Geology Series

Hankinson, R. (2016) *Cadwgan Hall, Bersham: Heritage Impact Assessment,* CPAT Report No 1450.

RPS (2023) *Plas Power Estate – Built Heritage Assessment*. Unpublished report, RPS ref JAC25883

SUMO (2021) *Geophysical survey report: Land at Plas Power Estate, Wrexham*. Unpublished report reference SUMO-04255.

Wrexham County Borough Council (2009) *Bersham Conservation Area Character Assessment and Management Plan*. Adopted December 2009.

Cartographic

1841 Tithe map for the parish of Bersham Township

1844 Tithe map for the parish of Esclusham Below, Wrexham

1899 Estate map

Ordnance Survey 1:2,500: 1872-87, 1899, 1912, 1939, 1963-64, 1968-76, 1983-87, 1984, 1992-93

Ordnance Survey 1:10,560/10,000: 1879, 1900, 1914-15, 1938, 1954, 1963-64, 1974-79, 1981, 1987, 1988, 1990-93, 2000, 2006, 2019

APPENDICES

Appendix A

Gazetteer of CPAT HER data

CPAT Core Data

prn	site name	period
104374	Aberoer Colliery	POST MEDIEVAL
104500	Adwy'r Clawdd Milestone	POST MEDIEVAL
16691	Berse Drelincourt Church (St Paul), yard	POST MEDIEVAL
141554	Bersham Conservation Area	MODERN
44826	Bersham finds	ROMAN
120659	Bersham Grange (Valle Crucis)	MEDIEVAL
101243	Bersham Ironworks	POST MEDIEVAL
101248	Bersham Ironworks, East Ironworks	POST MEDIEVAL
77977	Bersham Lodge Leat	POST MEDIEVAL
77984	Bersham Lodge Wall	POST MEDIEVAL
102980	Bersham Roman Coins	ROMAN
144650	Bersham, Bersham Statue, war memorial	MODERN
36682	Bersham, Caeau Bridge	POST MEDIEVAL
36683	Bersham, Caeau Weir	POST MEDIEVAL
144704	Bersham, Capt G Fitzhugh And Men Of Plas Power Estate, war memorial	MODERN
36680	Bersham, East Weir on River Clywedog	POST MEDIEVAL
36687	Bersham, Nant Bridge	POST MEDIEVAL
36686	Bersham, Western Weir on the River Clywedog	POST MEDIEVAL
104453	Broughton Colliery	POST MEDIEVAL
104452	Broughton Hall Kiln	POST MEDIEVAL
124076	Broughton, Broughton Colliery, shaft	POST MEDIEVAL
124077	Broughton, Broughton Colliery, shaft	POST MEDIEVAL
124075	Broughton, gasometer	POST MEDIEVAL
124074	Broughton, weighing machine	POST MEDIEVAL
119853	Brymbo Tunnel Junction to Broughton Forge branch railway	POST MEDIEVAL
16553	Brynteg	MULTIPERIOD
88799	Cadwgan Hall coin	POST MEDIEVAL
104360	Cadwgan Hall limekiln	POST MEDIEVAL
142403	Cadwgan Hall mound, air raid shelter	MODERN
128267	Cadwgan Hall ridge and furrow	MEDIEVAL
97000	Cadwgan Hall spindlewhorl	ROMAN;MEDIEVAL
101512	Cae Nesar Stryt Fieldname	MEDIEVAL
101522	Cae Twmpath Fieldname	MEDIEVAL;BRONZE AGE
101523	Cae Twmpath Fieldname	MEDIEVAL;BRONZE AGE
102637	Cae Twmpath Fieldname	BRONZE AGE
102961	Cae Twmpath Fieldname	MEDIEVAL
68163	Caeau Bridge trackway	POST MEDIEVAL
126369	Caeau Farmstead, garden	POST MEDIEVAL
77982	Caeau Leat	POST MEDIEVAL
101513	Caer Groes Fieldname	MEDIEVAL
85166	Coedpoeth, Deep Day Level and Exit	POST MEDIEVAL
102645	Croes Foel placename	MEDIEVAL
101824	Croes Foel ring ditch	BRONZE AGE
105077	Croes Foel ring ditch	BRONZE AGE
101236	Croes Foel round barrow	BRONZE AGE
17016	Escluslham Mill	POST MEDIEVAL
142401	GWR Rhos Branch near Cadwgan Hall	MODERN
68993	Hafod Farm, shaft	POST MEDIEVAL
87290	Hafod Farm, stone axe	NEOLITHIC
68991	Hafod Farm, well	POST MEDIEVAL
55039	Hafod, ford	POST MEDIEVAL
55042	Hafod, well	POST MEDIEVAL
26236	Hafod-y-Bwch Hall, house and gate piers	POST MEDIEVAL
104370	Legacy Station Coal Shaft	POST MEDIEVAL
102636	Little Fawnog Seal	MEDIEVAL
1000084	Lliiart Fanny 'enclosure'	POST MEDIEVAL;PREHISTORIC
101237	Llyntro moated site	MEDIEVAL
104439	Lodge Colliery	POST MEDIEVAL
100393	Lower Berse Farm, moat	MEDIEVAL
18124	Minera, Nant	POST MEDIEVAL
120981	Nant Bridge, defended enclosure	IRON AGE
121565	Nant Farm coal shaft I	POST MEDIEVAL
121566	Nant Farm coal shaft II	POST MEDIEVAL
77981	Nant Mill Millers House	POST MEDIEVAL
77985	Nant Mill Wood Boundary	POST MEDIEVAL
77983	Nant Mill Wood Coal Pit	POST MEDIEVAL
106030	New Broughton East Earthworks	UNKNOWN
110361	New Broughton, Bersham Road/Windsor Road, Soar Church	POST MEDIEVAL
110362	New Broughton, Windsor Road/Dale Road, Church	POST MEDIEVAL
104800	Offa's Dyke	EARLY MEDIEVAL
106749	Offa's Dyke - Bersham	EARLY MEDIEVAL
106747	Offa's Dyke - Brymbo	EARLY MEDIEVAL
106748	Offa's Dyke - Brymbo De113	EARLY MEDIEVAL
106751	Offa's Dyke - Coed Poeth	EARLY MEDIEVAL
106753	Offa's Dyke - Coed Poeth	EARLY MEDIEVAL
106752	Offa's Dyke - Coed Poeth	EARLY MEDIEVAL
106755	Offa's Dyke - Coed Poeth	EARLY MEDIEVAL
106756	Offa's Dyke - Coed Poeth	EARLY MEDIEVAL
106758	Offa's Dyke - Coed Poeth	EARLY MEDIEVAL
106759	Offa's Dyke - Coed Poeth	EARLY MEDIEVAL
106760	Offa's Dyke - Coed Poeth De139	EARLY MEDIEVAL
106757	Offa's Dyke - Coed Poeth De180	EARLY MEDIEVAL
106754	Offa's Dyke - Coed Poeth De181	EARLY MEDIEVAL
106750	Offa's Dyke - Coed Poeth De183	EARLY MEDIEVAL
28194	Offa's Dyke - DC entry	EARLY MEDIEVAL
28195	Offa's Dyke - DC entry	EARLY MEDIEVAL
28196	Offa's Dyke - DC entry	EARLY MEDIEVAL
28197	Offa's Dyke - DC entry	EARLY MEDIEVAL
28198	Offa's Dyke - DC entry	EARLY MEDIEVAL
28199	Offa's Dyke - DC entry	EARLY MEDIEVAL
28200	Offa's Dyke - DC entry	EARLY MEDIEVAL
28201	Offa's Dyke - DC entry	EARLY MEDIEVAL
28202	Offa's Dyke - DC entry	EARLY MEDIEVAL
28203	Offa's Dyke - DC entry	EARLY MEDIEVAL
28204	Offa's Dyke - DC entry	EARLY MEDIEVAL
28205	Offa's Dyke - DC entry	EARLY MEDIEVAL
28206	Offa's Dyke - DC entry	EARLY MEDIEVAL
28207	Offa's Dyke - DC entry	EARLY MEDIEVAL
28208	Offa's Dyke - DC entry	EARLY MEDIEVAL
28209	Offa's Dyke - DC entry	EARLY MEDIEVAL
28210	Offa's Dyke - DC entry	EARLY MEDIEVAL
28211	Offa's Dyke - DC entry	EARLY MEDIEVAL
28212	Offa's Dyke - DC entry	EARLY MEDIEVAL
28213	Offa's Dyke - DC entry	EARLY MEDIEVAL
28214	Offa's Dyke - DC entry	EARLY MEDIEVAL
28215	Offa's Dyke - DC entry	EARLY MEDIEVAL
28216	Offa's Dyke - DC entry	EARLY MEDIEVAL
28217	Offa's Dyke - DC entry	EARLY MEDIEVAL
28218	Offa's Dyke - DC entry	EARLY MEDIEVAL
28219	Offa's Dyke - DC entry	EARLY MEDIEVAL
28220	Offa's Dyke - DC entry	EARLY MEDIEVAL
28221	Offa's Dyke - DC entry	EARLY MEDIEVAL
28222	Offa's Dyke - DC entry	EARLY MEDIEVAL
28223	Offa's Dyke - DC entry	EARLY MEDIEVAL
28224	Offa's Dyke - DC entry	EARLY MEDIEVAL
28225	Offa's Dyke - DC entry	EARLY MEDIEVAL
28226	Offa's Dyke - DC entry	EARLY MEDIEVAL
28227	Offa's Dyke - DC entry	EARLY MEDIEVAL
28228	Offa's Dyke - DC entry	EARLY MEDIEVAL
28229	Offa's Dyke - DC entry	EARLY MEDIEVAL
28230	Offa's Dyke - DC entry	EARLY MEDIEVAL
28231	Offa's Dyke - DC entry	EARLY MEDIEVAL
28232	Offa's Dyke - DC entry	EARLY MEDIEVAL
28233	Offa's Dyke - DC entry	EARLY MEDIEVAL
28234	Offa's Dyke - DC entry	EARLY MEDIEVAL
28235	Offa's Dyke - DC entry	EARLY MEDIEVAL
28236	Offa's Dyke - DC entry	EARLY MEDIEVAL
28237	Offa's Dyke - DC entry	EARLY MEDIEVAL
28238	Offa's Dyke - DC entry	EARLY MEDIEVAL

28239	Offa's Dyke - DC entry	EARLY MEDIEVAL
28240	Offa's Dyke - DC entry	EARLY MEDIEVAL
28241	Offa's Dyke - DC entry	EARLY MEDIEVAL
106762	Offa's Dyke - Esclusham	EARLY MEDIEVAL
106761	Offa's Dyke - Esclusham De132, De137, De194	EARLY MEDIEVAL
101153	Pentre Bychan Coins	EARLY MEDIEVAL
126378	Pentre-bychan, fish pond	POST MEDIEVAL
126379	Pentre-bychan, hydraulic pump I	POST MEDIEVAL
126380	Pentre-bychan, hydraulic pump II	POST MEDIEVAL
101151	Plas Cadwgan mound	MEDIEVAL;EARLY MEDIEVAL
72310	Plas Power and Nant Mill Wood	POST MEDIEVAL
104494	Plas Power Colliery	POST MEDIEVAL
77979	Plas Power Croft I	POST MEDIEVAL
77980	Plas Power Croft II	POST MEDIEVAL
126370	Plas Power Estate, garden	POST MEDIEVAL
36663	Plas Power Estate, wall	POST MEDIEVAL
36664	Plas Power Estate, wall	POST MEDIEVAL
126736	Plas Power Park, fish pond	POST MEDIEVAL
128255	Plas Power Park, ridge and furrow	MEDIEVAL
142076	Plas Power Prisoner of War camp	MODERN
77978	Plas Power Track	POST MEDIEVAL
68162	Plas-Buckley Cottage, well I	POST MEDIEVAL
68164	Plas-Buckley Cottage, well II	POST MEDIEVAL
68165	Plas-Buckley, footbridge	POST MEDIEVAL
17253	Rhostyllen Church	MULTIPERIOD
17255	Rhostyllen Church (Holy Trinity), yard	MODERN
132621	Rhostyllen, Plas Grono Road, Bersham Bank Colliery Tip	POST MEDIEVAL
145067	Rhostyllen, Rhostyllen Memorial Gardens, war memorial	MODERN
104495	Smithy Road Boundary Stone	POST MEDIEVAL
17072	Southsea Brickworks	POST MEDIEVAL
1000103	Southsea, Church Road, site of former church (All Saints)(2)	MODERN
128244	Southsea, Smithy Road, ridge and furrow	MEDIEVAL
145122	Southsea, Southsea And Gwenfro WW1 Memorial Cross, war memorial	MODERN
104490	Talwrn Colliery I	POST MEDIEVAL
145196	Tan-y-fron, Vron School - Boer War And WW1, war memorial	MODERN
145197	Tan-y-fron, Vron Ward, war memorial	MODERN
15699	Tanyfron	MULTIPERIOD
17466	Tanyfron Church	MODERN
17446	Tanyfron Church (St Alban), yard	MODERN
126782	The Nant, fields	POST MEDIEVAL
142404	Ty'n-y-twll well	POST MEDIEVAL
100044	Tyn y Coed Cremation Cemetery	BRONZE AGE
104423	Vron Colliery	POST MEDIEVAL
86819	Vron Colliery, horizontal engine	POST MEDIEVAL
86813	Vron Colliery, shaft I	POST MEDIEVAL
86814	Vron Colliery, shaft II	POST MEDIEVAL
86815	Vron Colliery, shaft III	POST MEDIEVAL
86820	Vron Colliery, winding engine	POST MEDIEVAL
27390	Wat's Dyke - DC entry	EARLY MEDIEVAL
103005	Wrexham Roman Coin	ROMAN
119860	Wrexham, Mold and Connah's Quay Railway, Brymbo branch	POST MEDIEVAL
119866	Wrexham, Mold and Connah's Quay Railway, Vron branch	POST MEDIEVAL

CPAT Events Data

prn	site name	type
106595	Offa's Dyke - Legacy, watching brief 2002	WATCHING BRIEF
110517	Wrexham, Ruthin Road, assessment project 2005	ASSESSMENT PROJECT
113119	Offa's Dyke - Coedpoeth, watching brief 2008	WATCHING BRIEF
113546	Offa's Dyke - Coedpoeth, Heol Offa, 14, evaluation 2009	EVALUATION
123124	Medieval and Post-Medieval Industry, assessment project 2011-12	ASSESSMENT PROJECT
124527	Bersham Ironworks (DE189), Scheduled monument consent 2012	SCHEDULED MONUMENT CONSENT
124769	Bersham Ironworks, Scheduled monument consent 2015	SCHEDULED MONUMENT CONSENT
124914	Bersham Ironworks, Scheduled monument consent 2016	SCHEDULED MONUMENT CONSENT
124921	Wrexham, Tanyfron, St Albans Road (no. 14), Cana Chapel, photographic survey 2016	PHOTOGRAPHIC SURVEY
125014	Offa's Dyke: Cadwgan Hall Section and Pentre-Bychan Hall Section	SCHEDULED MONUMENT CONSENT
129139	New Broughton, Higher Berse Road, Higher Berse Farm, The Farm	PHOTOGRAPHIC SURVEY
129367	Rhostyllen, Plas Grono Road, Bersham Bank Colliery Tip	PHOTOGRAPHIC SURVEY
129371	Caego, Berse Road, St Paul's Church	PHOTOGRAPHIC SURVEY
129535	Coedpoeth, Middle Road (No 47)	PHOTOGRAPHIC SURVEY
129723	Mills and Milling Scheduling Enhancement Programme 2011-12	ASSESSMENT PROJECT
129724	Mills and Milling Scheduling Enhancement Programme, desk-based assessment 2011-12	DESK BASED ASSESSMENT
129725	Mills and Milling Scheduling Enhancement Programme, field survey 2012-13	FIELD SURVEY
132753	Southsea, Southsea Road, Former Chapel	PHOTOGRAPHIC SURVEY
132797	Coedpoeth, Tanllan Lane, Tyn Y Coed	PHOTOGRAPHIC SURVEY
132798	Coedpoeth, Smithy Road, Bethlehem Congregational Chapel	PHOTOGRAPHIC SURVEY
141996	Medieval and Post-Medieval Industry, desk based assessment 2011-12	DESK BASED ASSESSMENT
142322	The Monastic Granges of East Wales. The Scheduling Enhancement Programme, 2014-15	PROJECT
142323	The Monastic Granges of East Wales. The Scheduling Enhancement Programme, desk-based assessment 2014-15	DESK BASED ASSESSMENT
38211	Bersham Ironworks, research project 1987-91ff	RESEARCH PROJECT
38231	Churn Mill, excavation 1981	EXCAVATION
38543	Wrexham Water Company Conjunctive Use Scheme, assessment 1992	ASSESSMENT PROJECT
58813	Bersham Ironworks, excavation 1987-91	EXCAVATION
58814	Bersham Ironworks, building recording 1987-91	BUILDING SURVEY
59007	New Broughton, Berse Road, Chapel, photographic survey 1998	PHOTOGRAPHIC SURVEY
64017	Offa's Dyke - Coed Poeth, watching brief 2001	WATCHING BRIEF
72045	Bersham Ironworks, excavations 1997	EXCAVATION
72180	Cadwgan Hall, watching brief 1998	WATCHING BRIEF
72309	Plas Power and Nant Mill Woods, assessment 1998	ASSESSMENT PROJECT
85749	Offa's Dyke - Vron Farm, watching brief 2003	WATCHING BRIEF
86821	Tanyfron Tip, watching brief 1999	WATCHING BRIEF
86822	Tanyfron Tip, evaluation 1999	EVALUATION
86824	Tanyfron Tip, building recording 1999	BUILDING SURVEY
87506	Bersham, Mill House Farm, Wilkinson Stable, photographic survey 2001	PHOTOGRAPHIC SURVEY
95111	Tanyfron, Vron Farm Barns, photographic survey 2004	PHOTOGRAPHIC SURVEY

Appendix B

Gazetteer of RCAHMW data

HER RCAHMW

nprn	nmrwname
410984	BRITISH SCHOOL;GIRLS BOARD SCHOOL AND TEACHER'S HOUSE, COEDPOETH
410981	YSGOL BABANOD PENYGELLI;PENYGELLI INFANTS SCHOOL;YSGOL BRYN TABOR, COEDPOETH
304333	WALL TO PLAS POWER PARK
27854	RHOSBERSE LODGE, COEDPORTH
7482	HOREB WESLEYAN METHODIST CHAPEL, NANT ROAD, THE NANT
24889	NANT MILL, COEDPOETH
7470	SARON WELSH INDEPENDENT CHAPEL, MIDDLE ROAD, THE NANT
23535	CAE NESA'R STRYT, HAFOD-GWNI, ESCLUSHAM
409228	LLIDIART FANNY FARM DEFENDED ENCLOSURE
97280	FORMER CALVINISTIC METHODIST CHAPEL, NANT ROAD, THE NANT, COEDPOETH
266419	PEN-Y-GELLI HALL, GARDEN, COEDPAOETH
7468	BETHLEHEM ENGLISH CONGREGATIONAL CHAPEL, SMITHY ROAD, PENYGELLI, COEDPOETH;ADWY
7474	ADWY'R CLAWDD CHAPEL (WELSH CALVINISTIC METHODIST), MEOL MAELOR, ADWY'R CLAWDD
7481	BATHAFARN WELSH WESLEYAN METHODIST CHAPEL, TALWRN ROAD,COEDPOETH; BATHAVARN
7478	DISGWYLFA WELSH CALVINISTIC METHODIST CHAPEL, HIGH STREET, COEDPOETH; NANT-YR-ADWY
275787	OFFA'S DYKE: VRON SECTION
27700	PLAS BUCKLEY
97354	PENTREBYCHAN CREMATORIUM CHAPEL, PENTREBYCHAN
266432	PENTRE BYCHAN GARDEN, ESCLUSHAM

275791	OFFA'S DYKE: SECTION EXTENDING 120M FROM RAILWAY TO BRONWYLFA ROAD, LEGACY
275782	OFFA'S DYKE: SECTION S (?N) OF BRYN YR OWEN FARM
27140	ESCLUSHAM HALL
27640	PENTRE BYCHAN HALL, ESCLUSHAM
275766	OFFA'S DYKE: PLAS POWER SECTION
275760	OFFA'S DYKE: CADWGAN HALL SECTION, EXTENDING FROM RIVER CLYWEDOG TO THE RAILWAY
37233	PLAS POWER GAME LARDER, BERSHAM
37232	PLAS POWER DAIRY, BERSHAM
304594	OFFA'S DYKE: CADWGWN HALL SECTION
33304	ICE HOUSE ON PLAS POWER SECTION OFFA'S DYKE
86652	PLAS POWER, GARDEN, WREXHAM
23408	PENTRE BYCHAN CREMATORIUM, ESCLUSHAM
26901	PLAS CADWGAN
402313	LEGACY LIVING HISTORY SITE
401540	PENTRE BYCHAN HALL, DOVECOTE, ESCLUSHAM
27477	LOWER BERSE, BERSHAM
7935	QUEENS PARK METHODIST CHURCH (WESLEYAN), QUEENS PARK ?, WREXHAM
26793	BERSHAM HALL
26896	BUNKERS HILL COTTAGES;FORGE ROW
26897	BUNKER'S HILL COTTAGES;FORGE ROW, BERSHAM
266337	BERSHAM HALL, GARDEN, WREXHAM
266425	PLAS PEN-Y-DDOL, GARDEN, WREXHAM
266424	LAUREL GROVE, GARDEN, WREXHAM
12537	METHODIST CHAPEL (WESLEYAN), DDOL, BERSHAM
91688	BERSHAM COLLIERY: GLAN-YR-AFON OFFICES
91689	BERSHAM COLLIERY: GLAN-YR-AFON PITHEAD BATHS

97283	TABERNACLE CHAPEL (1) (CALVINISTIC METHODIST), MOUNT STREET, RHOSTYLLEN
7603	SALEM INDEPENDENT CHAPEL, SCHOOL STREET, RHOSTYLLEN;CAPEL COFFA WILLIAMS O'R WERN
7604	AINON WELSH BAPTIST CHAPEL, SCHOOL STREET, RHOSTYLLEN;RHOSTYLLEN
7605	TABERNACLE ENGLISH PRESBYTERIAN CHAPEL, HILL STREET, RHOSTYLLEN
7502	CYSSEGR CHAPEL (WELSH CALVINIST METHODIST;CYSEGR, Y), BERSE RD. AND CHAPEL RD., CAEGO
12538	HOLY TRINITY CHURCH, WREXHAM ROAD, RHOSTYLLEN
266427	ESLESS HALL, GARDENS, WREXHAM
27567	NEUADD ESLESS;ESLESS HALL, WREXHAM
24039	CAEAU ROAD BRIDGE, BERSHAM
27770	PLAS POWER ESTATE COTTAGES
26752	BERSHAM IRONWORKS: ACCOUNTS HOUSE
37149	HIGHER BERSE DOVECOT
34404	BERSHAM IRONWORKS: WEST WEIR
406019	MILL HOUSE FARMHOUSE
7496	MORIAH BAPTIST CHAPEL, SOUTHSEA ROAD, NEW BROUGHTON
97232	ROCKWOOD GOSPEL MISSION, ROCKWOOD RD. AND LONG LANE, BRYNTEG
26792	BERSHAM BANK COTTAGES, BERSHAM
40427	BERSHAM IRONWORKS: CASTING HOUSE
24853	BERSHAM CORNMILL, BERSHAM
24854	BERSHAM IRONWORKS: BORING MILL
307140	CROES-FOEL, BARROW
34051	BERSHAM IRONWORKS
34053	BERSHAM IRONWORKS: FURNACE REMAINS
400692	CAE'R GROES, TALWRN
275785	OFFA'S DYKE: SECTION IN PLAS POWER PARK

27460	LLYNTRO MOAT, RHOSTYLLEN
35536	VICARAGE, RHOSTYLLEN
24032	BRIDGE NEAR BUNKERS HILL;BERSHAM BRIDGE, BERSHAM
7509	SOAR WELSH WESLEYAN METHODIST CHAPEL, BERSHAM ROAD, NEW BROUGHTON
12564	ENGLISH METHODIST CHURCH (WESLEYAN), WINDSOR RD AND DALE RD. (CLUBHOUSE RD), NEW BROUGHTON
97239	ALL SAINTS (3) CHURCH, CHURCH ROAD, SOUTHSEA
35546	VICARAGE
12560	ALL SAINTS' CHURCH (1) & (2), SOUTHSEA, WREXHAM
27771	PLAS POWER LODGE, BERSHAM
7479	GLANRAFON ENGLISH PRESBYTERIAN CHAPEL, TALWRN ROAD, SOUTHSEA
7477	SEION WELSH CALVINISTIC METHODIST CHAPEL, TALWRN ROAD, SOUTHSEA;GLANYRAFON
7486	SALEM WESLEYAN METHODIST CHAPEL, HIGH STREET, SOUTHSEA
97240	SEION CHAPEL (2), (WELSH CALVINISTIC METHODIST), HIGH ST. AND COLLIERY RD., SOUTHSEA
97241	SEION CHAPEL (1) (CALVINISTIC METHODIST), CHURCH STREET, SOUTHSEA
302163	CROES FOEL TIMBER-FRAMED FARM BUILDING, RHOSTYLLEN
266433	BRYN-TIRION, GARDEN, RHOSTYLLEN
27082	CROES FOEL FARM, RHOSTYLLEN
33629	BERSHAM IRONWORKS: EAST WEIR
27272	HAFOD-Y-BWLCH, GATE PIERS
31674	BERSE DRELINCOURT BARN
96489	BERSE COTTAGE
23350	BERSE DRELINCOURT CHARITY SCHOOL AND ORPHANAGE
413932	2011 NATIONAL EISTEDDFOD OF WALES, LOWER BERSE FARM, WREXHAM
404691	LAUREL GROVE, NOS. 1 - 3

11617	ST PAUL'S CHURCH, BERSE DRELINCOURT
26790	BERSE DRELINCOURT COTTAGE;SUNDAWN, BROUGHTON, WREXHAM
26791	BERSE DRELINCOURT;VICARAGE
411177	RHOSTYLLEN COUNCIL SCHOOL;RHOSTYLLEN COUNTY SECONDARY SCHOOL
411176	BERSHAM BOARD SCHOOL;RHOSTYLLEN INFANTS COUNTY PRIMARY SCHOOL, RHOSTYLLEN
410693	NATIONAL SCHOOL, BERSHAM
26822	BRIDGE COTTAGE;1, BRIDGE COTTAGES, BERSHAM
23351	BERSHAM SCHOOL (FORMER);INDUSTRIAL HERITAGE CENTRE, BERSHAM
27522	MILLWARD HOUSE;NEW BROUGHTON
11629	ST MARY'S CHURCH, BERSHAM
7492	BEREA WELSH INDEPENDENT CHAPEL, SOUTHSEA ROAD, SOUTHSEA
26837	BROUGHTON HALL
27327	HIGHER BERSE FARMHOUSE, HIGHER BERSE ROAD, COEDPOETH
97284	SALEM (1) WELSH INDEPENDENT CHAPEL, CHAPEL STREET, RHOSTYLLEN
7599	RHOSTYLLEN PRIMITIVE METHODIST CHAPEL, CHAPEL STREET, RHOSTYLLEN
27375	SQUIRE COTTAGE;IVY COTTAGE, BERSHAM
34052	BERSHAM FURNACE
33077	BERSHAM
85038	PLAS POWER COLLIERY: UNIDENTIFIED BUILDING
85036	PLAS POWER COLLIERY: HEAPSTEAD
85032	PLAS POWER COLLIERY: WORKSHOPS
85033	PLAS POWER COLLIERY: LAMP ROOM
85037	PLAS POWER COLLIERY: FAN HOUSE
85034	PLAS POWER COLLIERY: WEST WINDING HOUSE

85035	PLAS POWER COLLIERY: EAST WINDING HOUSE
37188	MILL FARM BARN
27769	PLAS POWER, BERSHAM
97233	MOSS BAPTIST CHAPEL, MOSS VALLEY
85031	PLAS POWER COLLIERY: POWER HOUSE
85027	PLAS POWER COLLIERY, SOUTHSEA, WREXHAM
421238	ST ALBAN'S CHURCH, TANYFRON, WREXHAM
31720	ESCLUSHAM HALL, OUTBUILDINGS
275759	CADWGAN HALL MOUND
7510	CANA WELSH INDEPENDENT CHAPEL, ST ALBAN'S ROAD, TANYFRON;TAN-Y-FRON
7521	MYNYDD SEION WELSH WESLEYAN METHODIST CHAPEL, PARK ROAD, TAN-Y-FRON
97282	METHODIST CHAPEL (WESLEYAN), HEOL OFFA, VRON
37280	TYN-Y-COED OUTBUILDINGS
35483	TYN-Y-COED;TY'N-Y-COED, HEOL OFFA, COEDPORTH
303287	OFFA'S DYKE: SECTION SOUTH OF RIVER GWENFRO
275786	OFFA'S DYKE: (NORTH) SECTION AT COEDPOETH
7483	OFFA ENGLISH WESLEYAN METHODIST CHAPEL, HEOL OFFA, ADWY'R CLAWDD, COEDPOETH;FRON OFFA
27439	LLIDIART FANNY;LLIDIART VANI, COEDPORTH

PAS Point

id	objecttype	broadperiod
98909	POLISHED AXEHEAD	NEOLITHIC
381846	COIN	ROMAN
381845	COIN	ROMAN
175258	SPINDLE WHORL	ROMAN
175238	COIN	POST MEDIEVAL

Appendix C

Geophysical Survey 2021 - Report

GEOPHYSICAL SURVEY REPORT

Land at Plas Power Estate, Wrexham

Client

RPS Consulting Services

For

Lightsource BP

Survey Report

SUMO-04255

Date

October 2021

Survey Report 04255: Land at Plas Power Estate, Wrexham

Survey dates	3 - 12 August 2021 28 September -1 October 2021
Field co-ordinator	Robert Knight BA MA Jay Griffiths BA
Field Team	James Hunt BA Simon Lobel BSc Jordan Morris BA James Lorimer BA Darcy Hooper MSci
Report Date	02 September 2021
CAD Illustrations	Thomas Cockcroft MSc
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Appendix A Technical Information: Magnetometer Survey Methods, Processing and Presentation

Appendix B Technical Information: Magnetic Theory

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Figure 12	1:7000	1966 Aerial Imagery (RPS 2019)
Figure 13	1:7000	Minimally Processed Data - Greyscale Plots

2. SURVEY TECHNIQUE

Detailed magnetic survey (magnetometry) was chosen as the most efficient and effective method of locating the type of archaeological anomalies which might be expected at this site.

Bartington Grad 601-2	Traverse Interval 1.0m	Sample Interval 0.25m
Bartington Cart System	Traverse Interval 1.0m	Sample Interval 0.125m

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3 SUMMARY OF RESULTS

3.1 A magnetometer survey of 63 ha of land at Plas Power Estate, Wrexham has recorded numerous magnetic responses that are of archaeological interest. A small circular and two rectilinear enclosures are visible in the dataset; they are located in the approximate vicinity of a Medieval grange (HER 120659) that is recorded in the HER. In addition, the line of a Post-Medieval, Caeau Bridge trackway (HER 68163) has also tentatively been mapped in the survey. The locations of a number of probable and possible bell pits have also been marked. Numerous responses of uncertain origin have been detected which is to be expected in a survey of this size. Zones of magnetic disturbance and strong ferrous responses are visible throughout the dataset, predominantly in the norther half of the survey which are likely to have been caused by open cast mining.

3 Crynodeb o'r Canlyniadau

3.1

4 INTRODUCTION

4.1 **SUMO Geophysics Ltd** were commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by **RPS Consulting Services** on behalf of **Lightsource BP**.

4.2 Site details

NGR / Postcode	SJ 30248 49591 / LL14 4LW
Location	The site is located 2.5km west of Wrexham. The survey area is bounded to the north by the A525 and to the south by an unnamed road. River Clywedog flows through the middle of the site.
HER	Clwyd-Powis Archaeological Trust
District	Denbighshire
Parish	Wrexham
Topography	Undulating
Current Land Use	Pasture / arable agriculture
Geology (BGS 2021)	Bedrock: Pennine Lower Coal Measures Formation and Pennine Middle Coal Measures Formation (undifferentiated) - mudstone, siltstone and sandstone. Pennine Lower Coal Measures Formation and Pennine Middle Coal Measures Formation (undifferentiated) - sandstone Superficial: Glaciofluvial Deposits, Devensian - sand and gravel Till, Devensian - diamicton
Soils (CU 2021)	Soilscape 6: Freely draining slightly acid loamy soils. Soilscape 17: Slowly permeable seasonally wet acid loamy and clayey soils. Soilscape 24: Restored soils mostly from quarry and opencast spoil.
Archaeology (RPS 2019)	RPS Consulting Services have assessed the site for its below ground archaeological potential. Two findspots of Roman Coins (HER 44826, 102980) are recorded within the south of the site, although their precise locations are uncertain. The HER records the presence of a Medieval grange (HER 120659) somewhere in the southern part of the study site. This is derived from documentary evidence which indicated that an outlying grange belonging to Valle Crucis Abbey was present in the area;

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	however, this possible asset is not located in any detail. Ridge and furrow cultivation is recorded in the north of the site (HER 128255) which it thought to date to the Medieval period. Caeau Bridge trackway (HER 68163) which dates to the Post-Medieval period is also located in the south the site. Offa's Dyke, a Scheduled Monument (DE180) which dates from the late 8th century is located due west of the site. Much of the wider landscape has been subject to opencast coal extraction, and therefore any archaeological remains within those areas have been destroyed.
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	63 ha

4.3 Aims and Objectives

To locate and characterise any anomalies of possible archaeological interest within the study area.

5 RESULTS

The survey has been divided into fifteen survey areas (Areas 1-15) and specific anomalies have been given numerical labels [1] [2] *which appear in the text below, as well as on the Interpretation Figure(s).*

5.1 *Probable / Possible Archaeology*

5.1.1 A circular discrete response [1] has been detected in survey Areas 12 and 13 which measures 17.5m in diameter. The anomaly could be a small enclosure or a barrow; consequently, the anomaly has been assigned to the category of *Probably Archaeology*.

5.1.2 In area 14 a number of discrete linear responses and weaker trends are visible in the magnetic data and appear to form two partial rectilinear enclosures [2 and 3]. Whilst it is unclear if the anomalies are associated with one another, they do appear to share an alignment. The HER records the presence of a Medieval grange (HER 120659) belonging to Valle Crucis Abbey in the vicinity, but the asset is not located in any detail. It is plausible that the responses could be associated with the Medieval grange.

5.1.3 A Post-Medieval Caeau Bridge trackway (HER 68163) is also located in the south the site. Linear discrete responses, trends and bands of increased responses [4] traverse survey Areas 13, 14 and 16. These anomalies roughly correspond to the location of the bridge trackway and could mark its route. However, some of the bands of increased response have been assigned to the category of *Uncertain*, as they are weaker and amorphous.

5.1.4 A broad arching linear ditch-like responses [5] has been detected in Area 9 and has been assigned to the category of *Possible Archaeology*. A discrete curvilinear response, linear trends and pit-like anomalies have also been recorded in Area 9. The curvilinear response could possibly be a ring-ditch. While archaeological origins for the anomalies is possible, it is worth noting Area 9 is heavily disturbed and they could be due to other modern processes.

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5.2 *Bell Pits*

5.2.1 A number of discrete circular responses, some 17m in diameter, have been detected in Areas 13, 14 and 15. Given the underlying geology is Pennine Lower Coal Measures Formation, it is likely that these responses mark the location on *Bell Pits*. While some of these anomalies are more convincing than others, four probable and three possible *Bell Pits* have been mapped.

5.3 *Uncertain*

5.3.1 Groups of linear trends, discrete anomalies and increased magnetic responses [6] have been recorded in the Areas 13, 14, 15 and 16. While they are generally weak and lack the defined morphology of archaeological anomalies, they are in close proximity to responses of probable archaeology (see 5.1). Given the wider context it is possible that these anomalies are also of interest but their function is unknown.

5.3.2 A group of discrete linear responses and curvilinear trends [7] have been recorded in the north of Area 3. The responses are magnetically weak; however, they do appear to form rectangular and sub-circular enclosures. While they could be archaeological in nature, they lack the defined morphology of anomalies that would normally be categorised as being of interest.

5.3.3 Throughout the survey there are numerous discrete anomalies, linear trends and zones of increased responses which have been assigned to the category of *Uncertain*, which is to be expected in a survey of this size. Some of the ostensibly pit-like responses could be due to deeply buried ferrous debris, especially in the northern half of the survey as it is in close proximity to the open cast mining (see 5.9.1). It is likely that a combination of agricultural and underlying natural processes may have also cause some of the responses.

5.4 *Former Field Boundary (Corroborated)*

5.4.1 Discrete linear responses have been detected in Areas 4, 5, 8, 9 and 15 which correspond to the location of former field boundaries that are recorded in historic mapping (see Figure 11).

5.5 *Agricultural – Ploughing / Land Drains*

5.5.1 Numerous closely spaced, parallel and magnetically weak linear anomalies are visible in Areas 3, 10, 12, 13, 14 and 15 which are evidence of past ploughing, probably relatively recent.

5.1.2 Magnetically weak linear dipolar ferrous responses have been recorded in Areas 5, 7, 8 and 9 which are typical of responses emitted by land drains.

5.6 *Natural / Geological / Pedological / Topographical*

5.6.1 Broad linear amorphous and sinuous anomalies have been detected in Areas 4, 5, 12, 13, 14, 15 and 16 which are relatively weak. Consequently, they are likely to be natural, perhaps relating to pedological variations.

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5.7 *Green Waste*

5.7.1 Unfortunately, Areas 1 and 2 have been disturbed by the presence of what is assumed to be Green Waste. Green waste can have a marked effect on the results from magnetic surveys and has been recognised as an issue for some time (Gerrard et al 2015). However, not all green waste is the same, so it is impossible to predict in advance any potentially detrimental effects; it depends on the quantity of inorganic contaminants, including batteries, pieces of metal cans and other ferrous items which result in spurious anomalies or 'noise'.

5.8 *Services*

5.8.1 Strong dipolar linear ferrous responses have been recorded in Areas 2, 6, 8 and 16 which mark the routes of Service pipes.

5.9 *Ferrous / Magnetic Disturbance*

5.9.1 Zones of magnetic disturbance and strong ferrous responses are visible throughout the dataset, predominantly in the norther half of the survey. Adjacent to the survey area (north-east), the landscape was subject to opencast coal extraction. The ferrous anomalies and disturbance are likely to be a by-product of the opencast mining, possibly due to spreads of debris. The extent of the open cast mining is visible on 1966 aerial imagery (see Figure 12).

5.9.2 Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris (or brick / tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

6 DATA APPRAISAL & CONFIDENCE ASSESSMENT

6.1 Historic England guidelines (EH 2008) Table 4 states that the typical magnetic response on the local soils / geology is variable. The results from this survey indicate the presence of probable enclosures, a small circular enclosure and bell pits; as a consequence, the survey is deemed to have been effective. However, some of the dataset is magnetically disturbed due to the open cast mining and the spreading of green waste; in these areas it is likely that weaker anomalies of interest would have been masked.

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7 CONCLUSION

7.1 The magnetometry survey has recorded numerous magnetic responses that have been interpreted as being of archaeological interest. Linear ditch-like responses forming enclosures, a small circular enclosure and other responses have been assigned to the categories of probable and possible archaeology. Some of the responses could mark the presence of a Medieval grange (HER 120659) belonging to Valle Crucis Abbey and a Post-Medieval Caeau Bridge trackway (HER 68163). The survey has also recorded the location of a number of probable and possible bell pits. Numerous uncertain responses have been detected in the survey, which is to be expected in a survey of this size. Former field boundaries, land drains and relatively modern ploughing are also visible in the dataset. The routes of several service pipes have been marked in the survey. Zones of magnetic disturbance and strong ferrous responses are visible throughout the dataset, predominantly in the northern half of the survey which are likely to have been caused by open cast mining. The magnetic data in Areas 1 and 2 is disturbed by the spreading of green waste.

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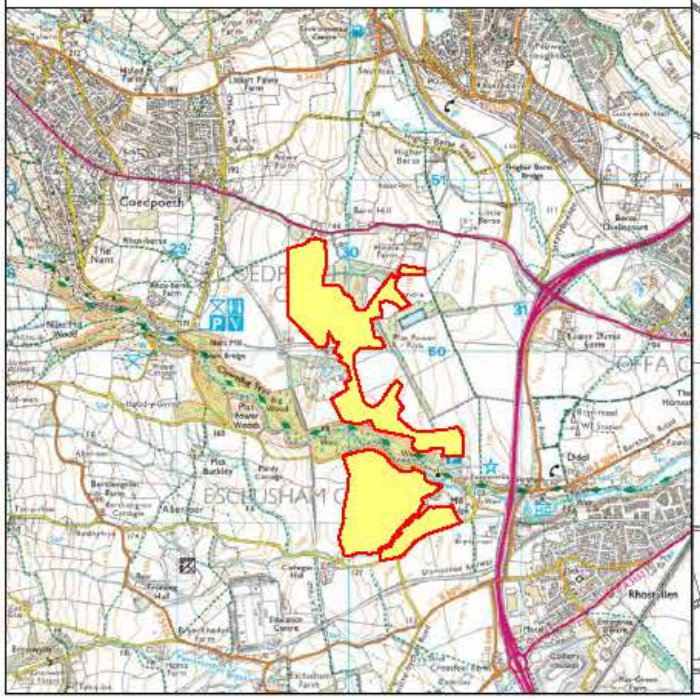
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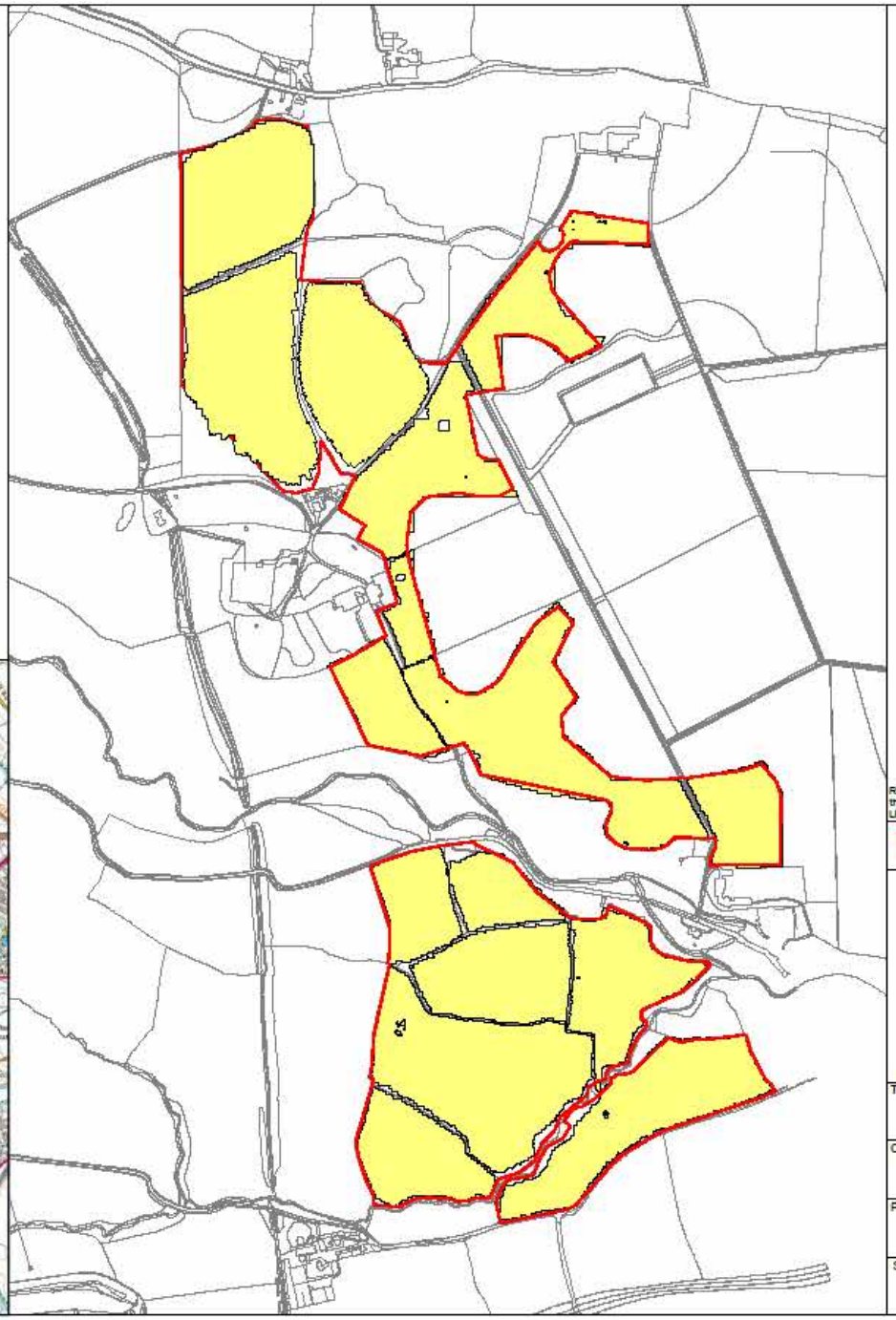
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Survey Areas

N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title: Site Location

Client: RPS Consulting Services

Project: SUMO-04255 Land at Plas Power Estate, Wrexham

Scale: NOT TO SCALE

Fig No: 01



N

+2nT

-1nT

sumo Survey

GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Magnetometer Survey - Greyscale Plots

Client:
RPS Consulting Services

Project:
SUMO-04255 Land at Plas Power Estate, Wrexham

Scale:
0 metres 350
1:7000 @ A3

Fig No:
02



N

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-20nT

sumo Survey

GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

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Magnetometer Survey - Colour Plots

Client:
RPS Consulting Services

Project:
SUMO-04255 Land at Plas Power Estate, Wrexham

Scale:
0 metres 350
1:7000 @ A3

Fig No:
03



N

KEY

	Probable archaeology (Discrete / Trend)
	Possible Archaeology (Discrete / Trend / Increased Response)
	Bell Pits (Probable / Possible)
	Uncertain Origin (Discrete / Trend / Increased Response)
	Former Field Boundary (Corroborated)
	Green Waste (Increased Magnetic Response)
	Agriculture (Plough)
	Land Drain
	Natural (e.g. Geological / Pedological)
	Magnetic Disturbance
	Service
	Ferrous

sumo Survey
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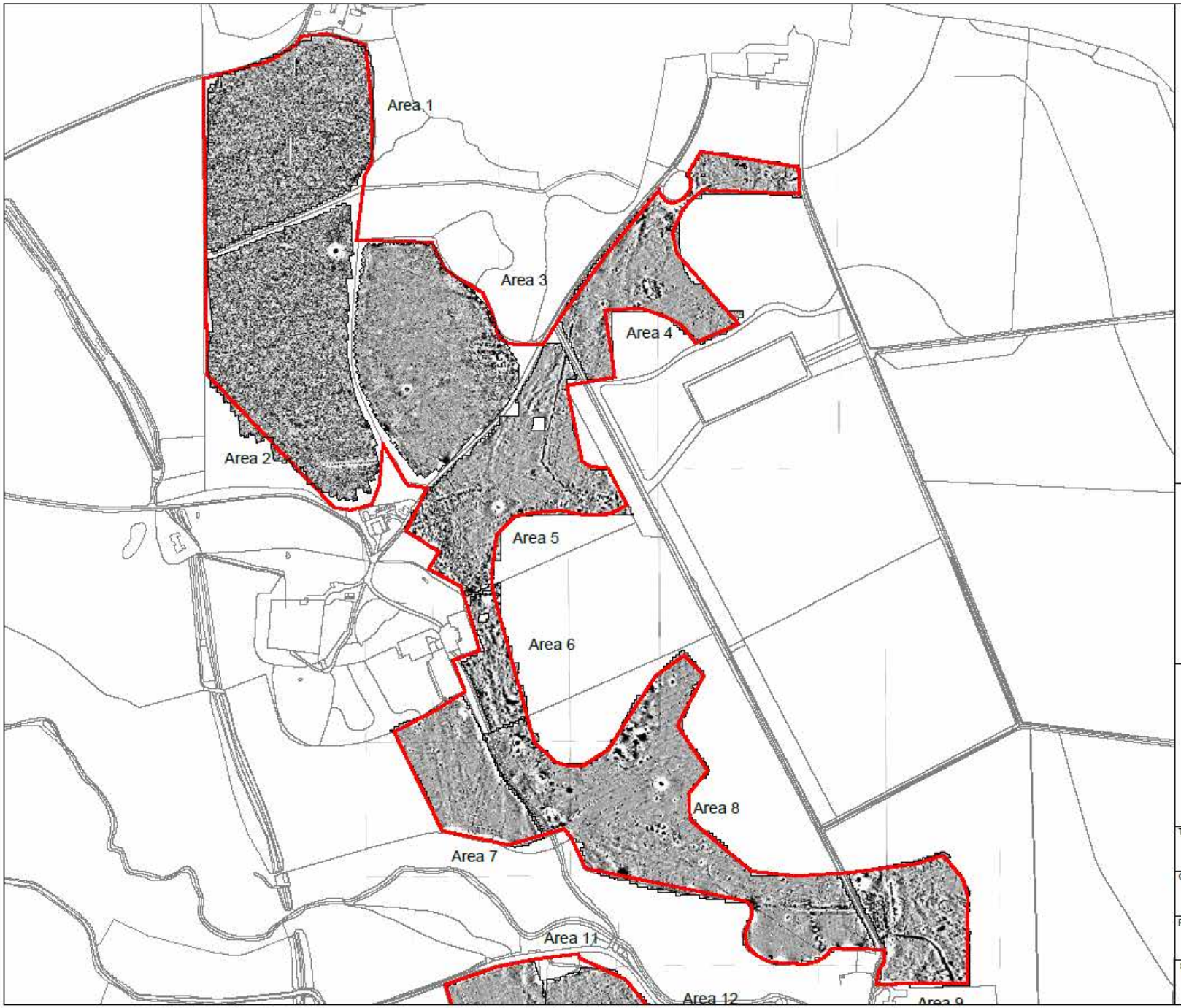
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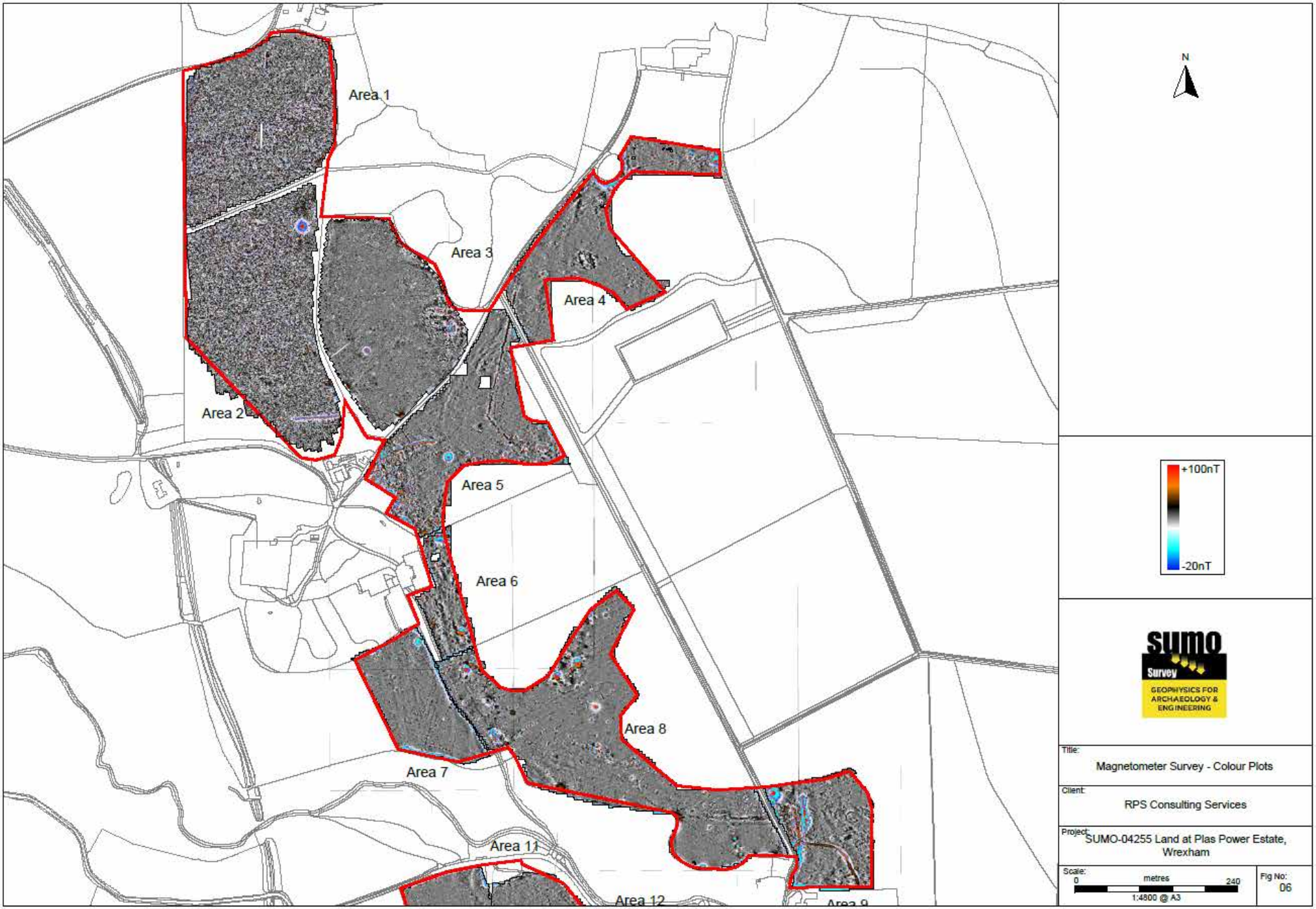
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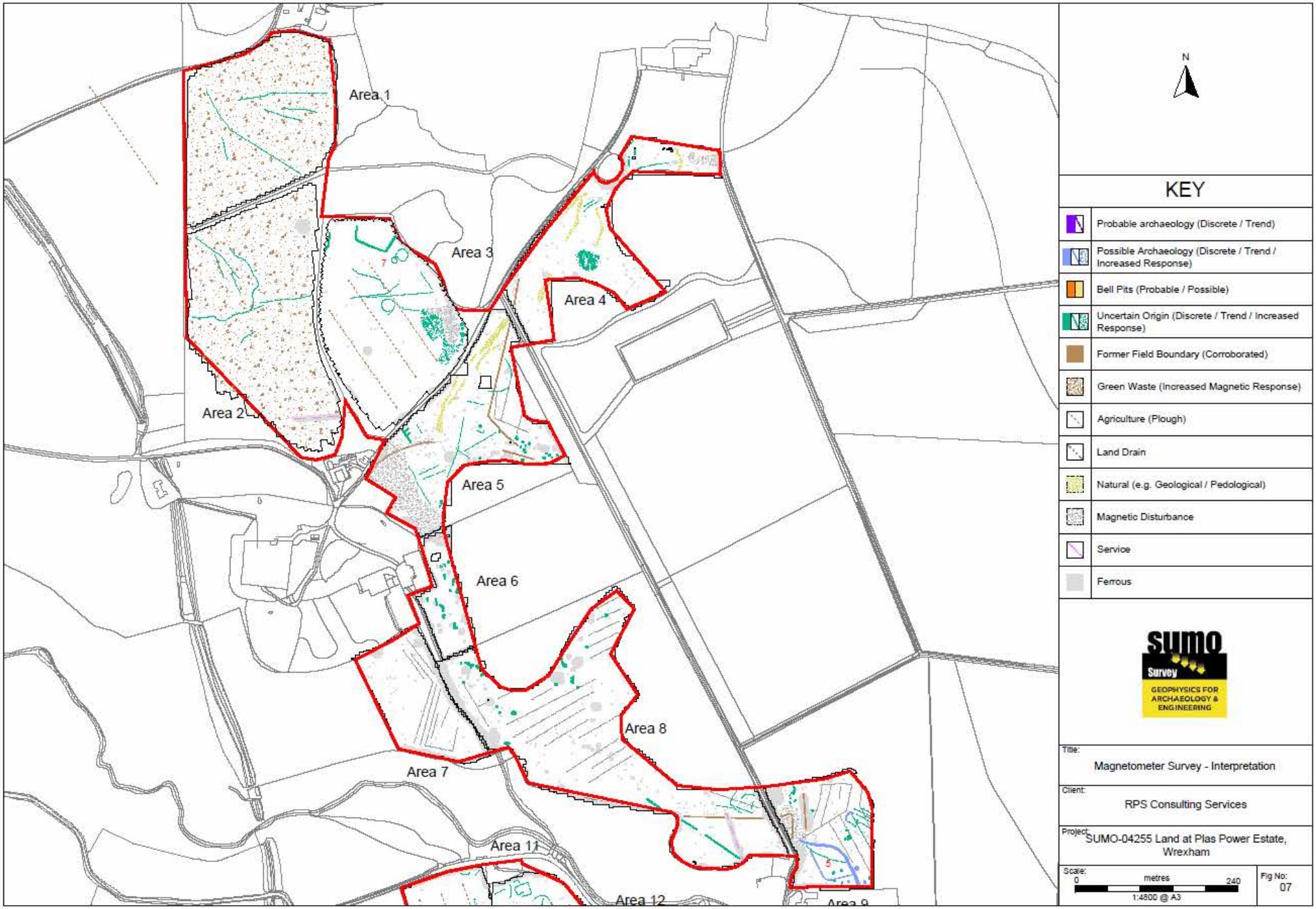
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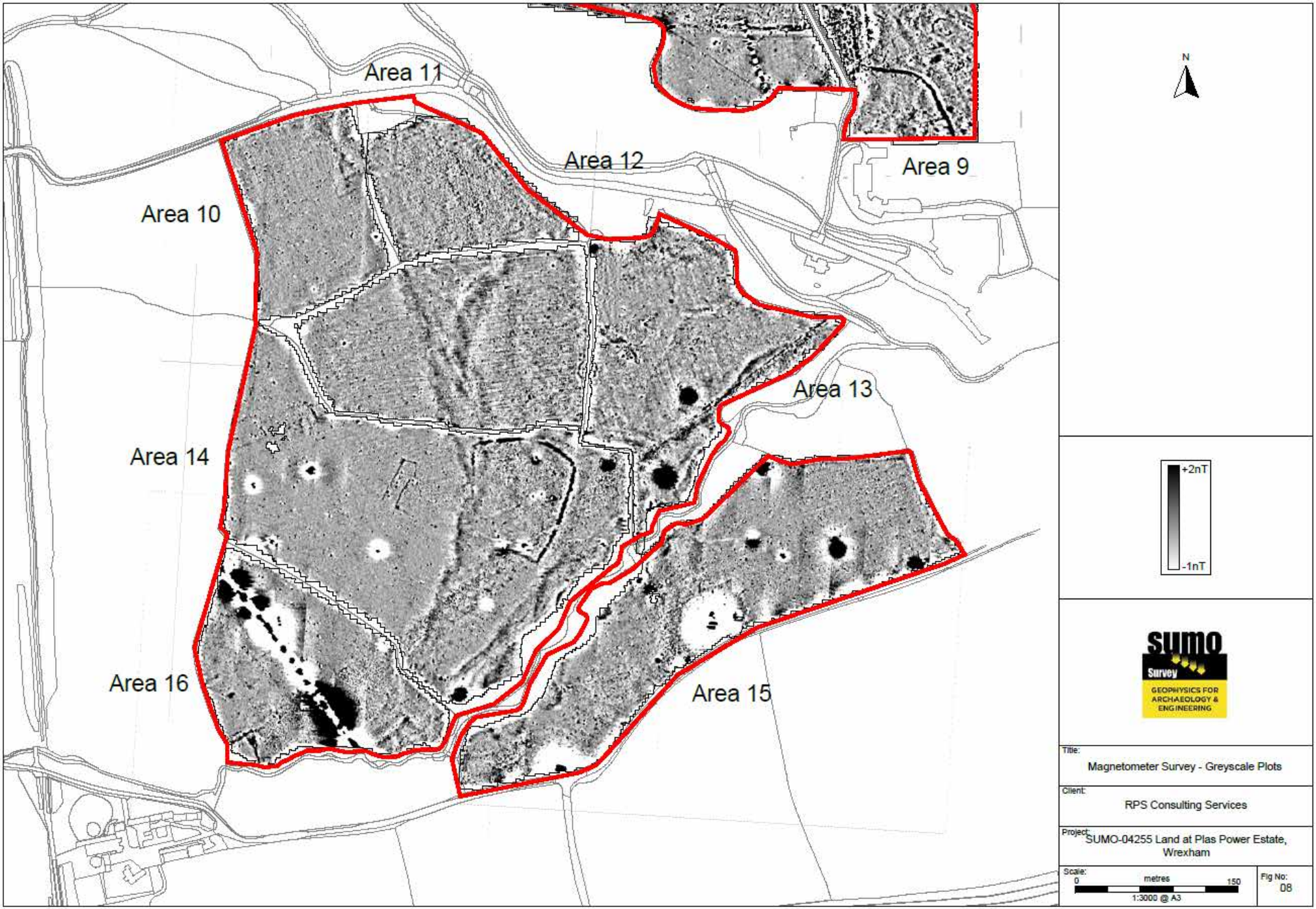
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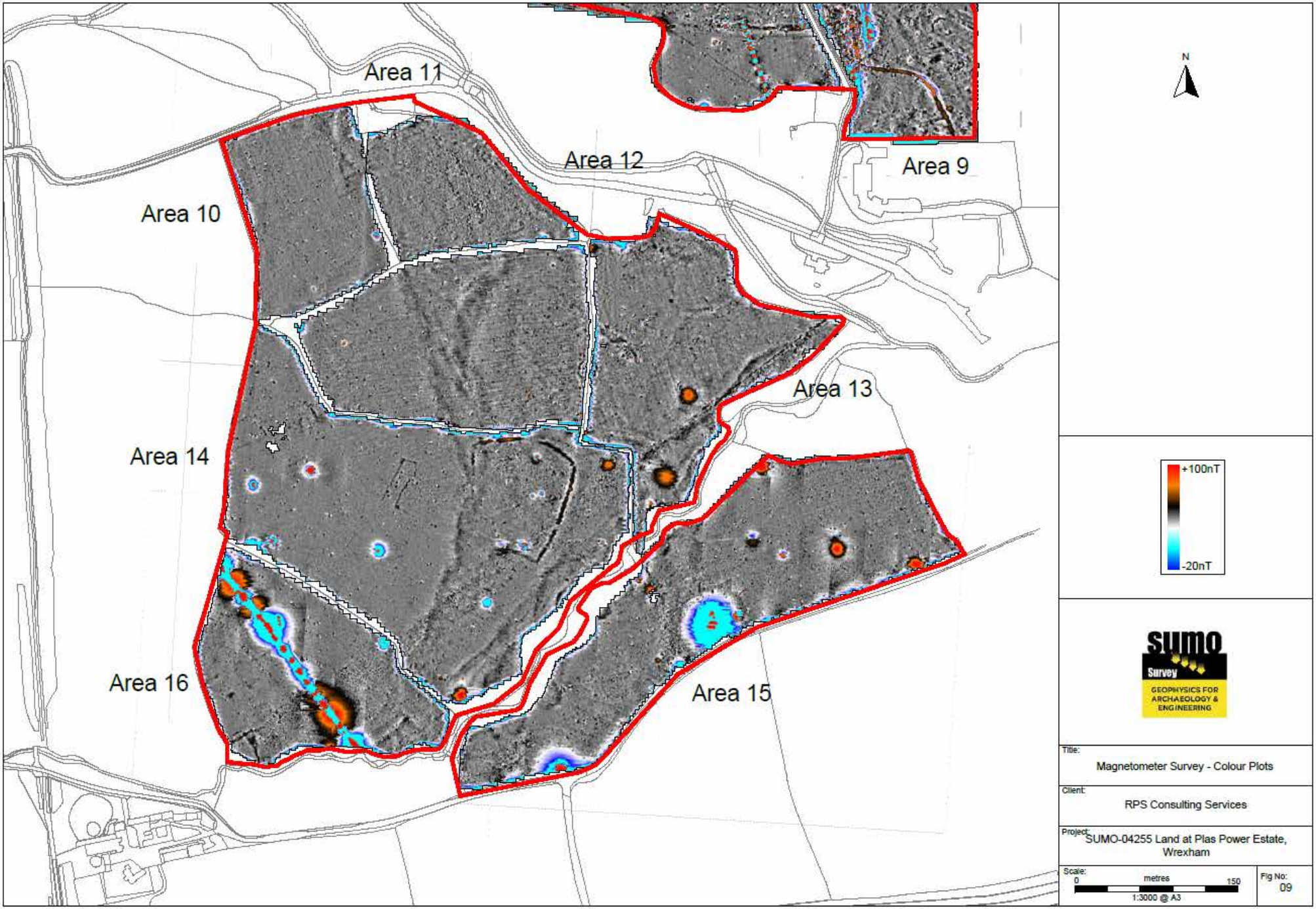
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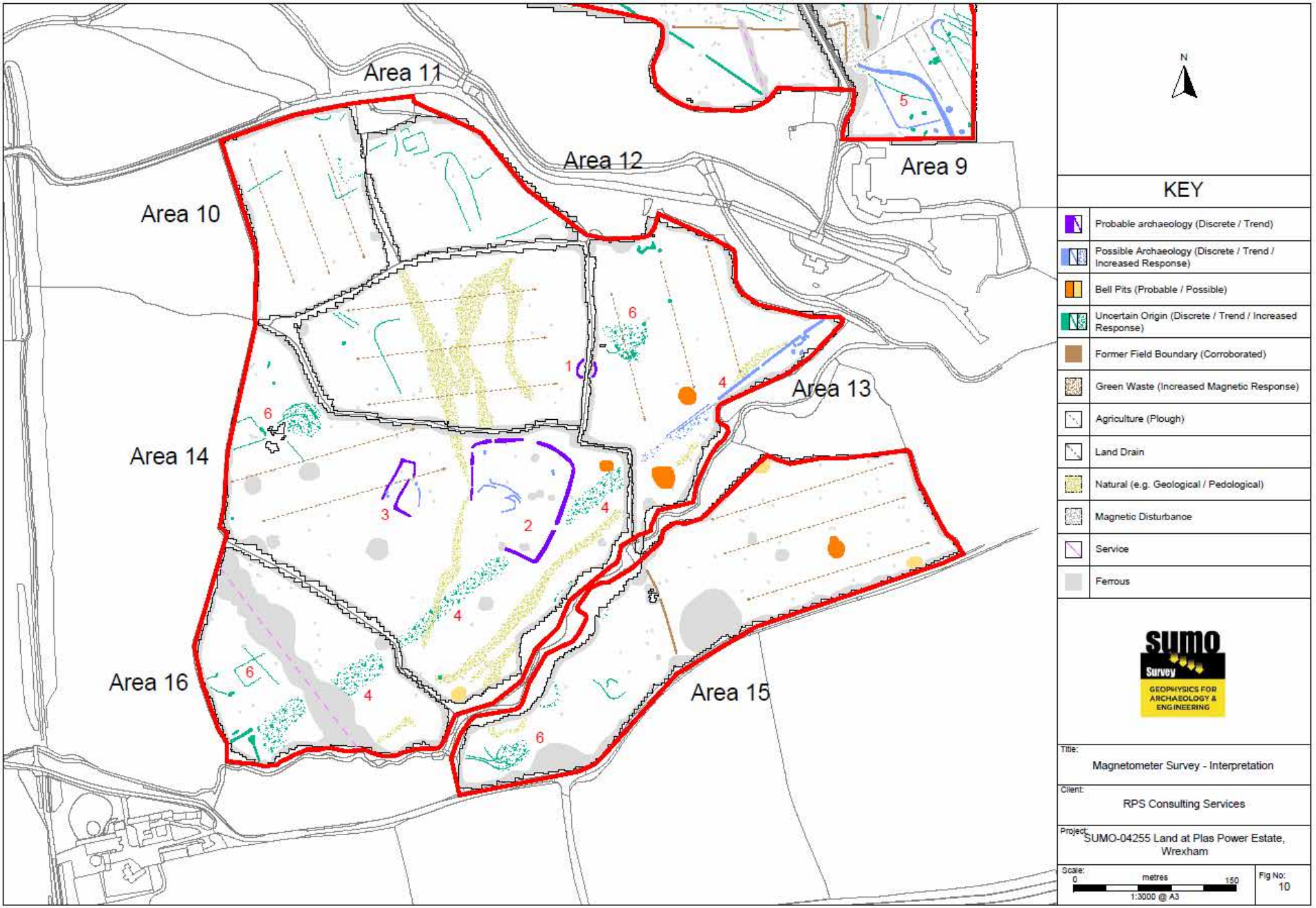
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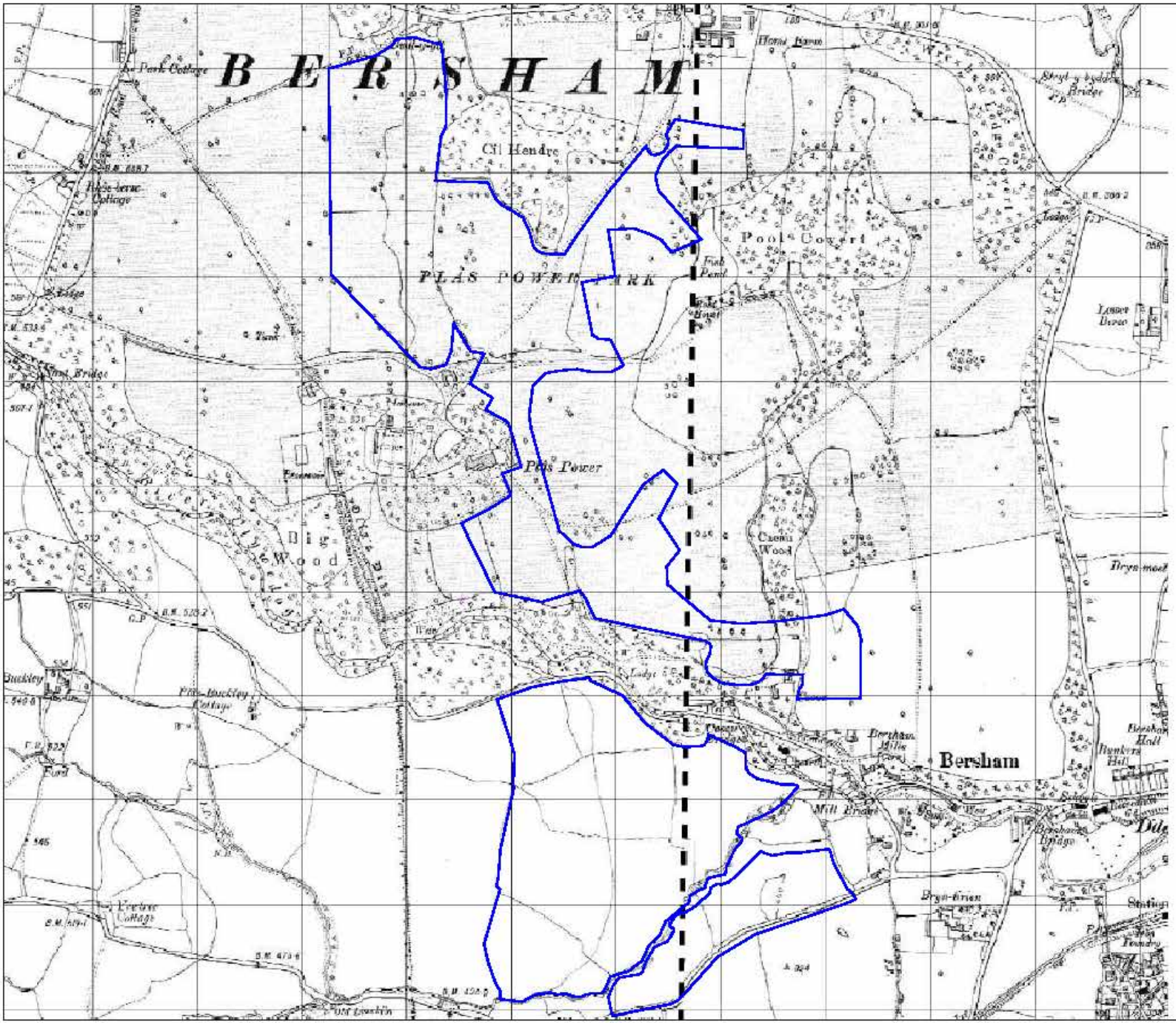

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Area 7
Area 8
Area 11
Area 12
Area 9
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+100nT
-20nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Colour Plots
Client:
RPS Consulting Services
Project:
SUMO-04255 Land at Plas Power Estate, Wrexham
Scale:
0
metres
240
1:4800 @ A3
Fig No:
06


Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Area 7
Area 8
Area 11
Area 12
Area 9
N
KEY
Probable archaeology (Discrete / Trend)
Possible Archaeology (Discrete / Trend / Increased Response)
Bell Pits (Probable / Possible)
Uncertain Origin (Discrete / Trend / Increased Response)
Former Field Boundary (Corroborated)
Green Waste (Increased Magnetic Response)
Agriculture (Plough)
Land Drain
Natural (e.g. Geological / Pedological)
Magnetic Disturbance
Service
Ferrous
sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Interpretation
Client:
RPS Consulting Services
Project:
SUMO-04255 Land at Plas Power Estate, Wrexham
Scale:
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1:4800 @ A3
Fig No:
07


Area 11
Area 12
Area 9
Area 10
Area 13
Area 14
Area 16
Area 15
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+2nT
-1nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
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Magnetometer Survey - Greyscale Plots
Client:
RPS Consulting Services
Project:
SUMO-04255 Land at Plas Power Estate, Wrexham
Scale:
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metres
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1:3000 @ A3
Fig No:
08


Area 11
Area 12
Area 9
Area 10
Area 13
Area 14
Area 16
Area 15
N
+100nT
-20nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Colour Plots
Client:
RPS Consulting Services
Project:
SUMO-04255 Land at Plas Power Estate, Wrexham
Scale:
0
metres
150
1:3000 @ A3
Fig No:
09


Area 11
Area 12
Area 9
Area 10
Area 13
Area 14
Area 16
Area 15
1
2
3
4
5
6
N
KEY
Probable archaeology (Discrete / Trend)
Possible Archaeology (Discrete / Trend / Increased Response)
Bell Pits (Probable / Possible)
Uncertain Origin (Discrete / Trend / Increased Response)
Former Field Boundary (Corroborated)
Green Waste (Increased Magnetic Response)
Agriculture (Plough)
Land Drain
Natural (e.g. Geological / Pedological)
Magnetic Disturbance
Service
Ferrous
sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Interpretation
Client:
RPS Consulting Services
Project:
SUMO-04255 Land at Plas Power Estate, Wrexham
Scale:
0
metres
150
1:3000 @ A3
Fig No:
10



N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

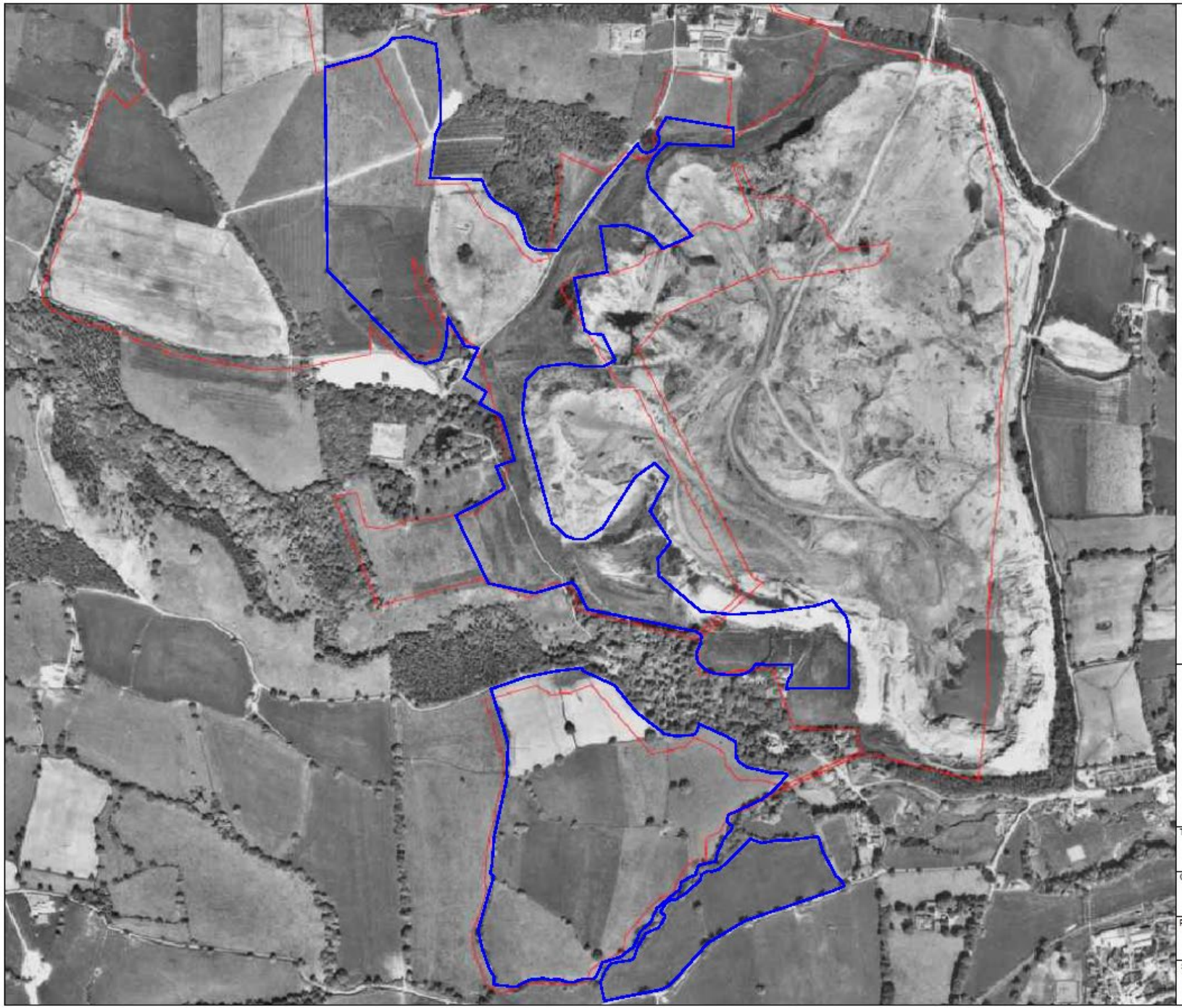
Title: 1914 Ordnance Survey Mapping (RPS 2019)

Client: RPS Consulting Services

Project: SUMO-04255 Land at Plas Power Estate, Wrexham

Scale: 0 metres 350
1:7000 @ A3

Fig No: 11



N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title: 1966 Aerial Imagery (RPS 2019)

Client: RPS Consulting Services

Project: SUMO-04255 Land at Plas Power Estate, Wrexham

Scale: 0 metres 350
1:7000 @ A3

Fig No: 12



N

+10nT

-10nT

sumo Survey

GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Minimally Processed Data - Greyscale Plots

Client:
RPS Consulting Services

Project:
SUMO-04255 Land at Plas Power Estate, Wrexham

Scale:
0 metres 350
1:7000 @ A3

Fig No:
XX

Appendix A - Technical Information: Magnetometer Survey Method, Processing and Presentation

Standards & Guidance

This report and all fieldwork have been conducted in accordance with the latest guidance documents issued by Historic England (EH 2008) (then English Heritage), the Chartered Institute for Archaeologists (ClfA 2014) and the European Archaeological Council (EAC 2016).

Grid Positioning

For hand held gradiometers the location of the survey grids has been plotted together with the referencing information. Grids were set out using a Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS GPS system.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. This results in an accuracy of around 0.01m.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1m	0.25m

Instrumentation: Bartington *Grad* 601-2

Bartington instruments operate in a gradiometer configuration which comprises fluxgate sensors mounted vertically, set 1.0m apart. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried, or cart mounted, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method, though strongly magnetic objects may be visible at greater depths. The Bartington instrument can collect two lines of data per traverse with gradiometer units mounted laterally with a separation of 1.0m. The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

Data Processing

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (De-stagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

Display

Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly, all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.

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Presentation of results and interpretation

The presentation of the results includes a ‘minimally processed data’ and a ‘processed data’ greyscale plot. Magnetic anomalies are identified, interpreted and plotted onto the ‘Interpretation’ drawings.

When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated and the local conditions at the site (geology, pedology, topography etc.). Anomalies are categorised by their potential origin. Where responses can be related to other existing evidence, the anomalies will be given specific categories, such as: Abbey Wall or Roman Road. Where the interpretation is based largely on the geophysical data, levels of confidence are implied, for example: Probable, or Possible Archaeology. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification Possible.

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Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall,* etc.) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

Archaeology / Probable Archaeology	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and /or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
Possible Archaeology	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
Industrial / Burnt-Fired	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
Former Field Boundary (probable & possible)	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
Ridge & Furrow	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity.
Agriculture (ploughing)	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
Land Drain	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
Natural	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
Magnetic Disturbance	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
Service	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. pvc) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
Ferrous	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
Uncertain Origin	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of *Possible Archaeology* / *Natural* or (in the case of linear responses) *Possible Archaeology* / *Agriculture*; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

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Appendix B - Technical Information: Magnetic Theory

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTeslas (nT) in an overall field strength of 48,000 (nT), can be accurately detected.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

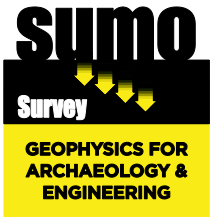
Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns; material such as brick and tile may be magnetised through the same process.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried feature. The difference between the two sensors will relate to the strength of a magnetic field created by this feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity and disturbance from modern services.

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- Utility Mapping

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Appendix D

Geophysical Survey 2023 - Report

GEOPHYSICAL SURVEY REPORT

Plas Power Estate, Wrexham Northern Area

Client

RPS Consulting

For

Lightsource BP

Survey Report

13152

Date

13 December 2023

Survey Report 13152: Plas Power Estate, Wrexham Northern Area

Survey dates	23-27 October 2023
Field co-ordinator	Liam Brice-Bateman BA
Field Team	Darcy Hooper MSc
Report Date	13 December 2023
CAD Illustrations	Thomas Cockcroft MSc MCIfA
Report Author	Thomas Cockcroft MSc MCIfA
Project Manager	Simon Haddrell BEng AMBCS PCIfA
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2 LIST OF APPENDICES

Appendix A	Technical Information: Magnetometer Survey Methods, Processing and Presentation
Appendix B	Technical Information: Magnetic Theory
Appendix C	Data Management Plan & Archive Selection Strategy

3 SURVEY TECHNIQUE

3.1 Detailed magnetic survey (magnetometry) was chosen as the most efficient and effective method of locating the type of archaeological anomalies which might be expected at this site. All survey techniques followed the guidance set out by CIFA (2014, updated 2020), Historic England (2008), and the European Archaeology Council (EAC) (2016).

Bartington Cart System Traverse Interval 1.0m Sample Interval 0.125m

The only processes performed on data are the following unless specifically stated otherwise:

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes instrument striping effects and edge discontinuities over the whole of the data set.

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4 SUMMARY OF RESULTS

4.1 A magnetometer survey of 21 hectares of land at Plas Power Estate, Wrexham (Northern Area) has not recorded any magnetic responses that could be interpreted as being of definite archaeological interest. Green waste has resulted in extensive magnetic disturbance across the entire site. Responses of uncertain origin have been detected which are likely to have been caused by agricultural and natural processes. The routes of several former field boundaries have also been marked.

5 Crynodeb o'r Canlyniadau

5.1 Ni welwyd unrhyw nodweddion o ddiddordeb pendant archeolegol yn ystod arolwg magnetomedr ar dir, yn mesur 21 ha, Plas Power Estate, Wrecsam (y parth gogleddol). Gwastraff gwyrdd sydd yn gyfrifol am yr anomaleddau magnetig amlwg ar draws y safle. Mae anomaleddau llai sicr wedi eu cofnodi ar y safle, ac mae'n bosib mae prosesau amaethyddol neu naturiol sy'n gyfrifol. Fe nodwyd sawl ffin cae yn ystod y gwaith.

6 INTRODUCTION

6.1 **SUMO Geophysics Ltd** were commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by **RPS Consulting** on behalf of **Lightsource BP.**

6.2 Site Details

NGR / Postcode	SJ 29915 50850 / LL11 3BS
Location	The site is located 3km west of Wrexham and 1km east of Coedpoeth. The survey area is bounded to the south by the A525.
HER	Clwyd-Powys Historic Environment Record
District	Wrexham County Borough
Parish	Coedpoeth Community
Topography	Undulating
Land Use	Agricultural / rough pasture
Geology (BGS 2023)	Bedrock: Cefn Rock - Sandstone Superficial: Till, Devensian - Diamicton
Soils (CU 2023)	Soilscape 6: Freely draining slightly acid loamy soils Soilscape 17: Slowly permeable seasonally wet acid loamy and clayey soils
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	21 ha

6.3 ***Archaeological Background***

6.3.1 No designated heritage or non-designated heritage assets are recorded within the survey area. It is thought there is a low potential for archaeological remains of all periods within the survey area. Although there is a section of Offa's Dyke, a Scheduled Monument, within the wider area, it falls outside the development area (RPS 2019).

6.3.2 A UAS landscape survey was carried out in 2023 (SGS) partly over the survey area but extended onto fields south of the current site. The southern survey area predominantly comprised land that had previously been extracted through opencast mining, and later reinstated. As a result, most of the features observed in the UAS data within this area can be attributed to these activities. Some relict ridge and furrow plough scars were evident, although ephemeral in character. A spread of raised ground was observed in the northernmost survey area (area 4). The micro-topographic feature, discerned through terrain flattened processing,

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is expressed at surface level as a low rise, measuring no more than 0.10 m in height. The feature is located at the edge of ground that slopes down towards the east and north/north-west.

6.3.3 A previous phase of geophysics survey (SGL 2021) carried out on land south of the site recorded numerous magnetic responses of archaeological interest. A small circular and two rectilinear enclosures were visible in the dataset, located some 1.2km south of the current site. The locations of probable and possible bell pits were also marked along with several former field boundaries.

6.4 *Aims and Objectives*

6.4.1 To locate and characterise any anomalies of possible archaeological interest within the study area.

7 RESULTS

7.1 *The survey has been divided into five survey areas (Areas 1-5). The majority of Area 2 and the west of Area 5 was overgrown which rendered these parts of the site unsurveyable.*

7.2 *Probable / Possible Archaeology*

7.2.1 No magnetic responses have been recorded that could be interpreted as being of definite archaeological interest.

7.3 *Uncertain*

7.3.1 A series of linear and curvilinear trend plus discrete amorphous responses and pit-like anomalies have been detected in the survey which have been assigned to the category of *Uncertain*. They generally lack the defined morphology of anomalies that would ordinarily be interpreted as being of archaeological interest. However, the increased levels of magnetic background ‘noise’ in the survey (see 7.5) has made interpreting the magnetic responses with confidence difficult. While archaeological origins cannot be entirely ruled out for some of the anomalies, the majority are likely to be due to underlying geological variations or agricultural processes.

7.4 *Former Field Boundary – Corroborated*

7.4.1 Numerous linear and curvilinear responses have bee plotted in the survey which correspond with the location of former field boundaries that are recorded on 1888-1913 Ordnance Survey mapping (see Figure 13).

7.5 *Green Waste*

7.5.1 Unfortunately, increased levels of background ‘noise’ resulting from green waste are visible across the entire dataset, and this will have masked any weak anomalies of archaeological interest if present. This waste has a marked effect on the results from magnetic surveys and has been recognised as an issue for some time (Gerrard *et al* 2015). However, not all green waste is the same, so it is impossible to predict in advance any potentially detrimental effects; it depends on the quantity of inorganic contaminants, including batteries, pieces of metal cans and other ferrous items which result in spurious anomalies or ‘noise’.

7.6 *Ferrous / Magnetic Disturbance*

7.6.1 Two strong ferrous responses in the west of the site have been caused by pylons. Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces

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of ferrous debris (or brick / tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

8 DATA APPRAISAL & CONFIDENCE ASSESSMENT

8.1 Historic England guidelines (EH 2008) Table 4 states that the typical magnetic response on the local soils / geology is variable. The results from this survey indicate the presence of former field boundaries; however, increased levels of background 'noise' has been recorded throughout the site which will have masked any anomalies of increased response, if present.

9 CONCLUSION

9.1 The magnetometer survey has not recorded any magnetic responses that could be interpreted as being of definite archaeological interest. Numerous anomalies of uncertain origin have been plotted throughout the survey; they are likely to be due to underling geological variations or agricultural processes. Former field boundaries are also visible in the data. Increased levels of background noise have been recorded throughout the site which is likely to have been caused by the spreading of green waste.

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10 REFERENCES

BGS 2023 British Geological Survey, Geology of Britain viewer [accessed 08/11/2023] *website*: (http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps)

CIfA 2014 Amended 2020 *Standard and Guidance for Archaeological Geophysical Survey.* Amended 2020. CIfA Guidance note. Chartered Institute for Archaeologists, Reading https://www.archaeologists.net/sites/default/files/CIfAS%26GGeophysics_3.pdf

CU 2023 The Soils Guide. Available: www.landis.org.uk. Cranfield University, UK. [accessed 08/11/2023] *website: http://mapapps2.bgs.ac.uk/ukso/home.html*

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EH 2008 *Geophysical Survey in Archaeological Field Evaluation.* English Heritage, Swindon (now withdrawn, but used for evaluating suitability of soil types)

RPS 2019 *Plas Power Estate, Wrexham Archaeological Desk-Based Assessment. RPS Consulting, Gloucester*

SGL 2021 *Land At Plas Power Estate, Wrexham Geophysical Survey Report.* SUMO Geophysics Limited, Upton-upon-Severn

SGS 2023 *Land To The West Of Wrexham UAS Landscape Survey.* SUMO GeoSurveys, Upton-upon-Severn

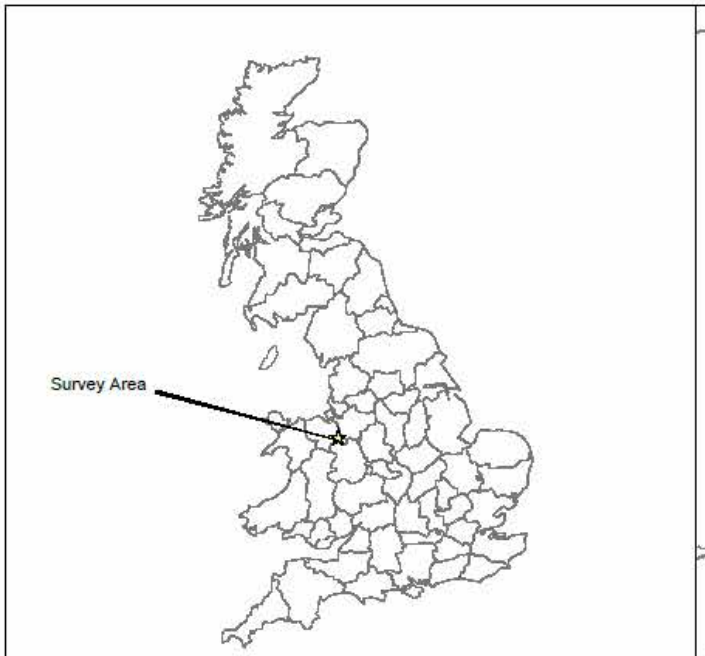
11 ARCHIVE

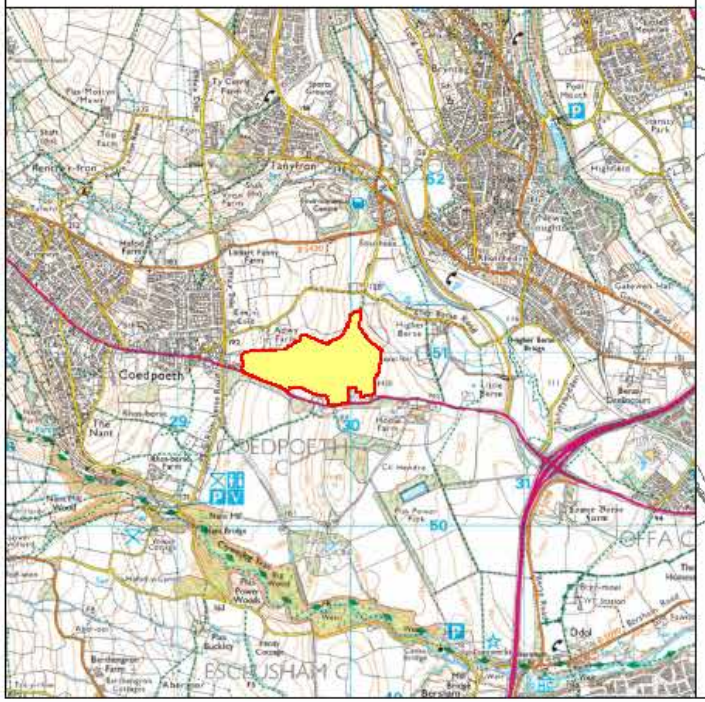
11.1 The minimally processed data, data images, XY traces and a copy of this report are stored in **SUMO Geophysics Ltd.'s** digital archive, on an internal RAID configured NAS drive in the Midlands Office. These data are also backed up to the Cloud for off-site storage**.**

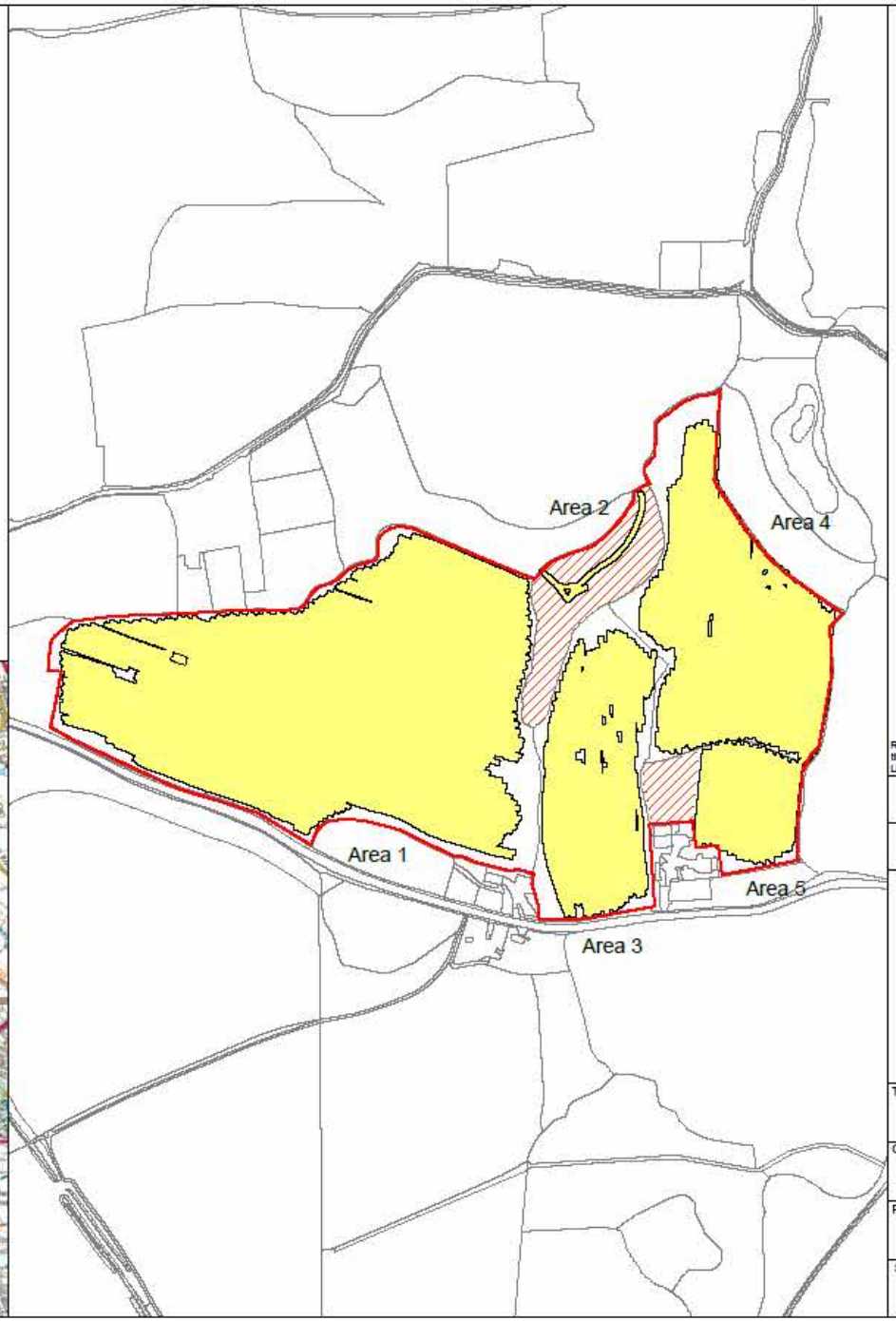
11.1.1 Deposition of a high resolution pdf copy of the final report with the HER via the HEDDOS portal here https://cpat.org.uk/heddos.html and in accordance with the Welsh HER submission guidelines https://cpat.org.uk/curatorial-services/historic-environment-record/#page-content Contact her@cpat.org.uk if any requirements need to be discussed.

11.2 Deposition of the full archive with the National Monuments Record, RCAHMW and/or The Archaeology Data Service in accordance with their submission guidelines.

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N

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	Survey Areas
	Unsurveyable

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

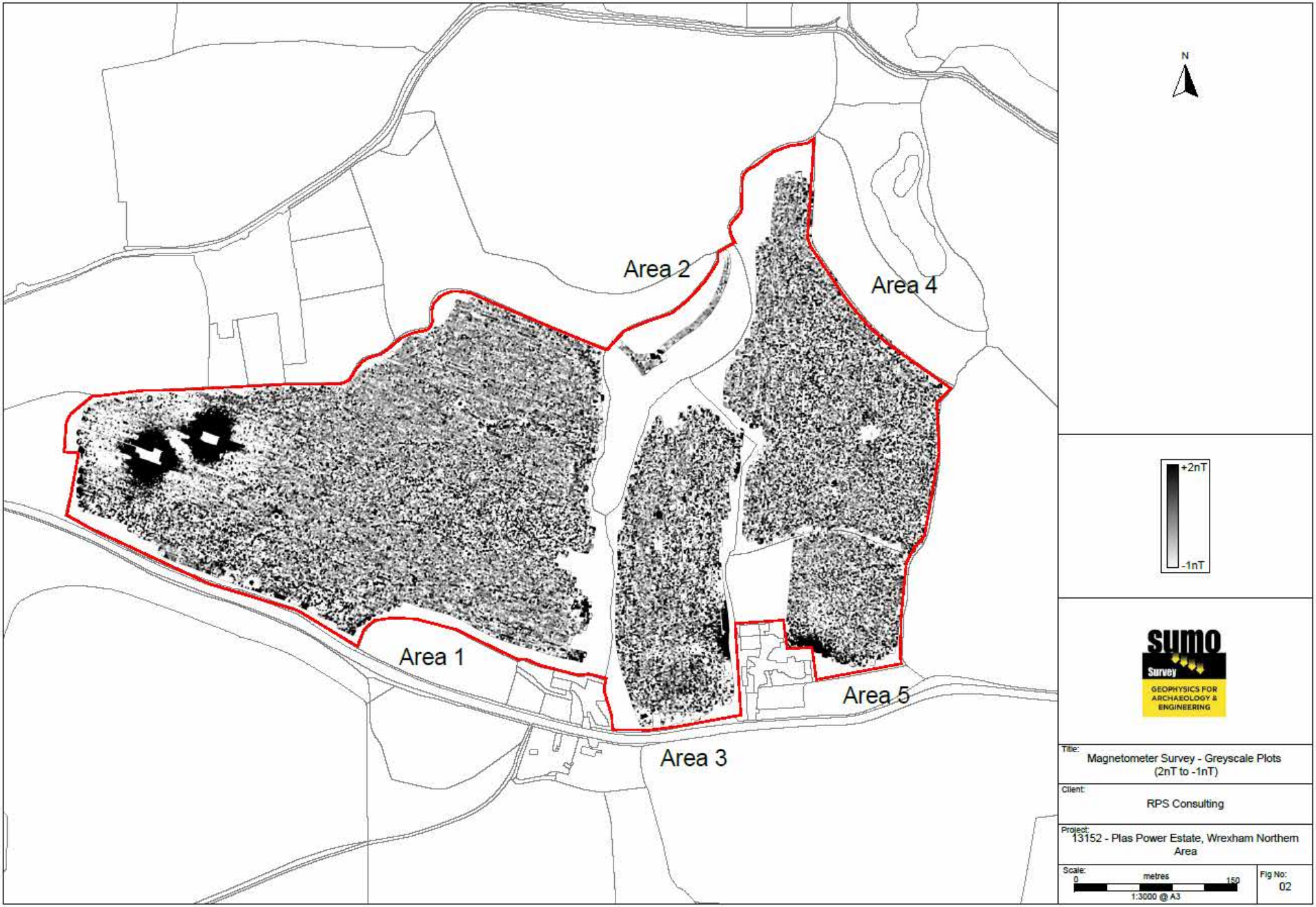
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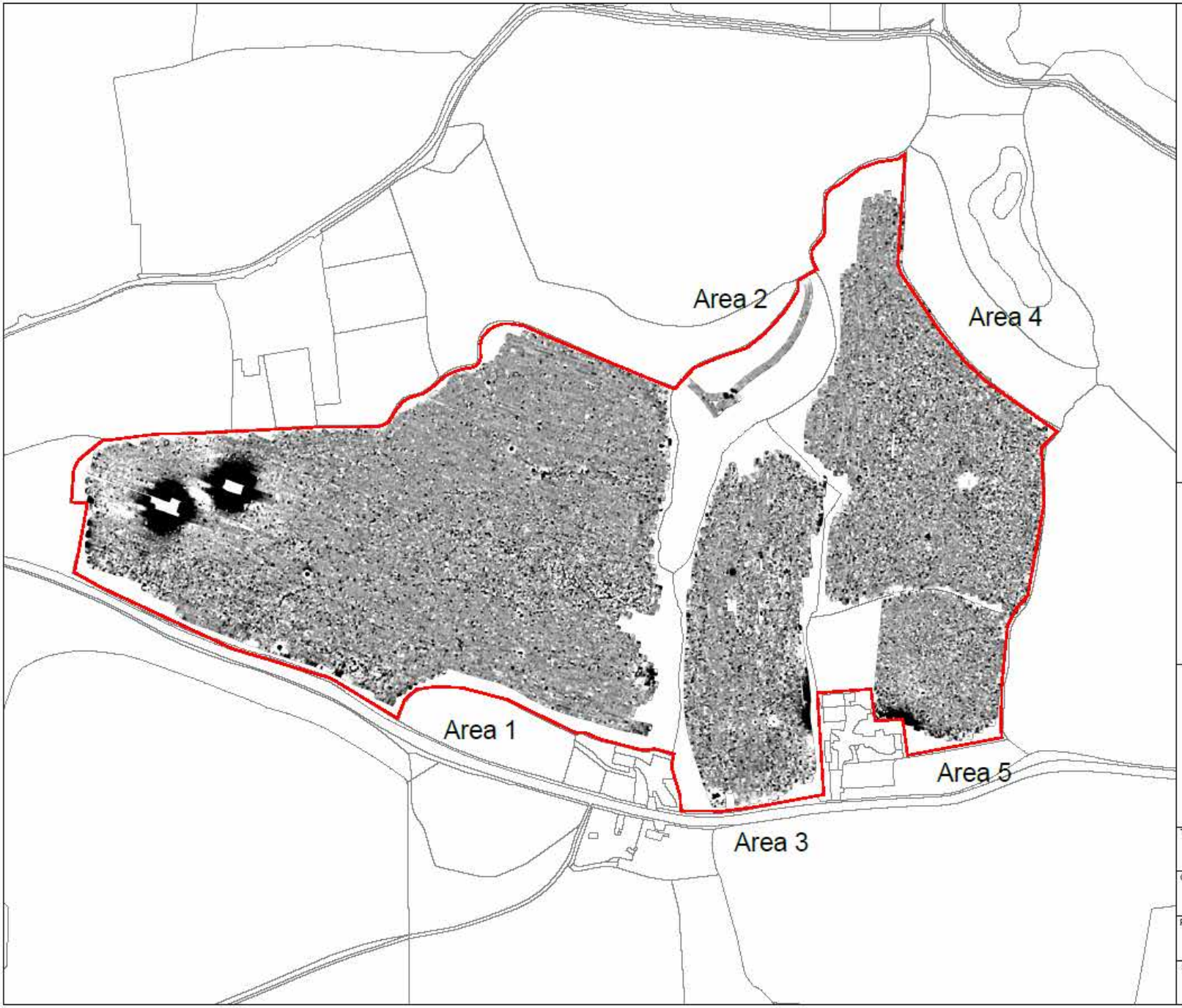
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Project: 13152 - Plas Power Estate, Wrexham Northern Area

Scale: NOT TO SCALE

Fig No: 01


N
Area 1
Area 2
Area 3
Area 4
Area 5
+2nT
-1nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Greyscale Plots (2nT to -1nT)
Client:
RPS Consulting
Project:
13152 - Plas Power Estate, Wrexham Northern Area
Scale:
0
metres
150
1:3000 @ A3
Fig No:
02



N

+5nT

-3nT

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
Magnetometer Survey - Greyscale Plots (5nT to -3nT)

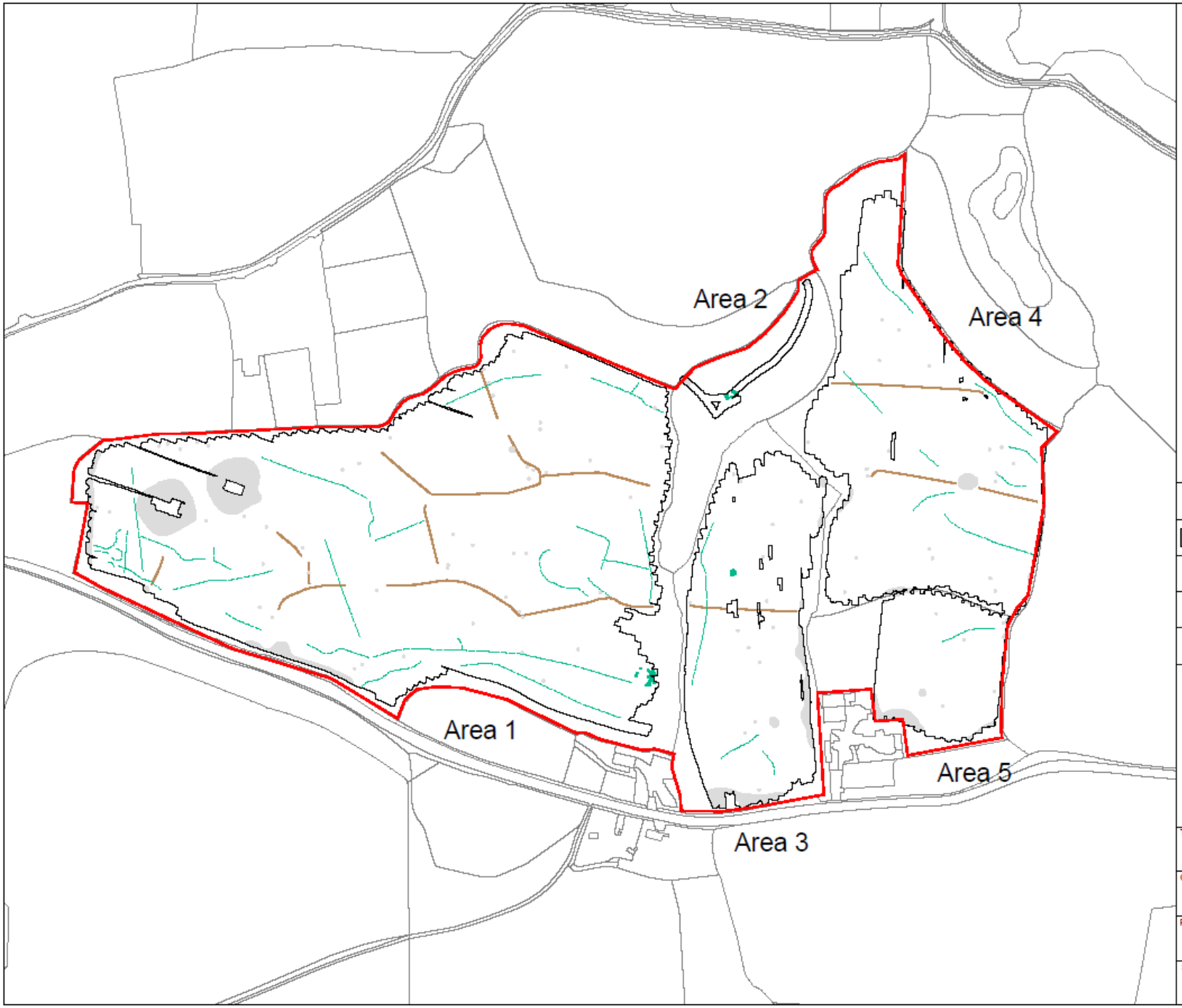
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RPS Consulting

Project:
13152 - Plas Power Estate, Wrexham Northern Area

Scale:
0 metres 150
1:3000 @ A3

Fig No:
03


N
Area 1
Area 2
Area 3
Area 4
Area 5
+100nT
-100nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Colour Plots
Client:
RPS Consulting
Project:
13152 - Plas Power Estate, Wrexham Northern Area
Scale:
0
metres
150
1:3000 @ A3
Fig No:
04



N

KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Magnetic disturbance
	Ferrous

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

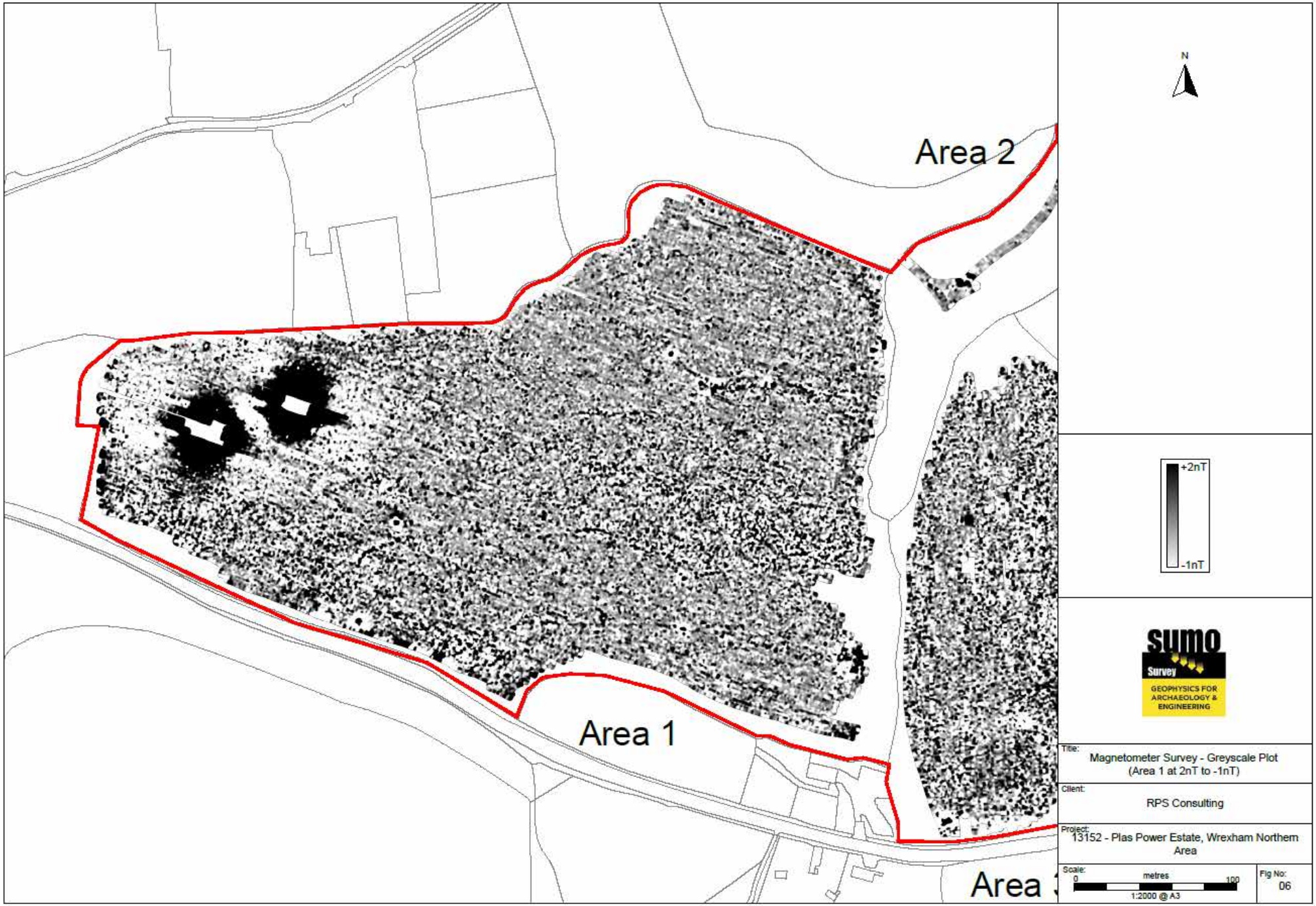
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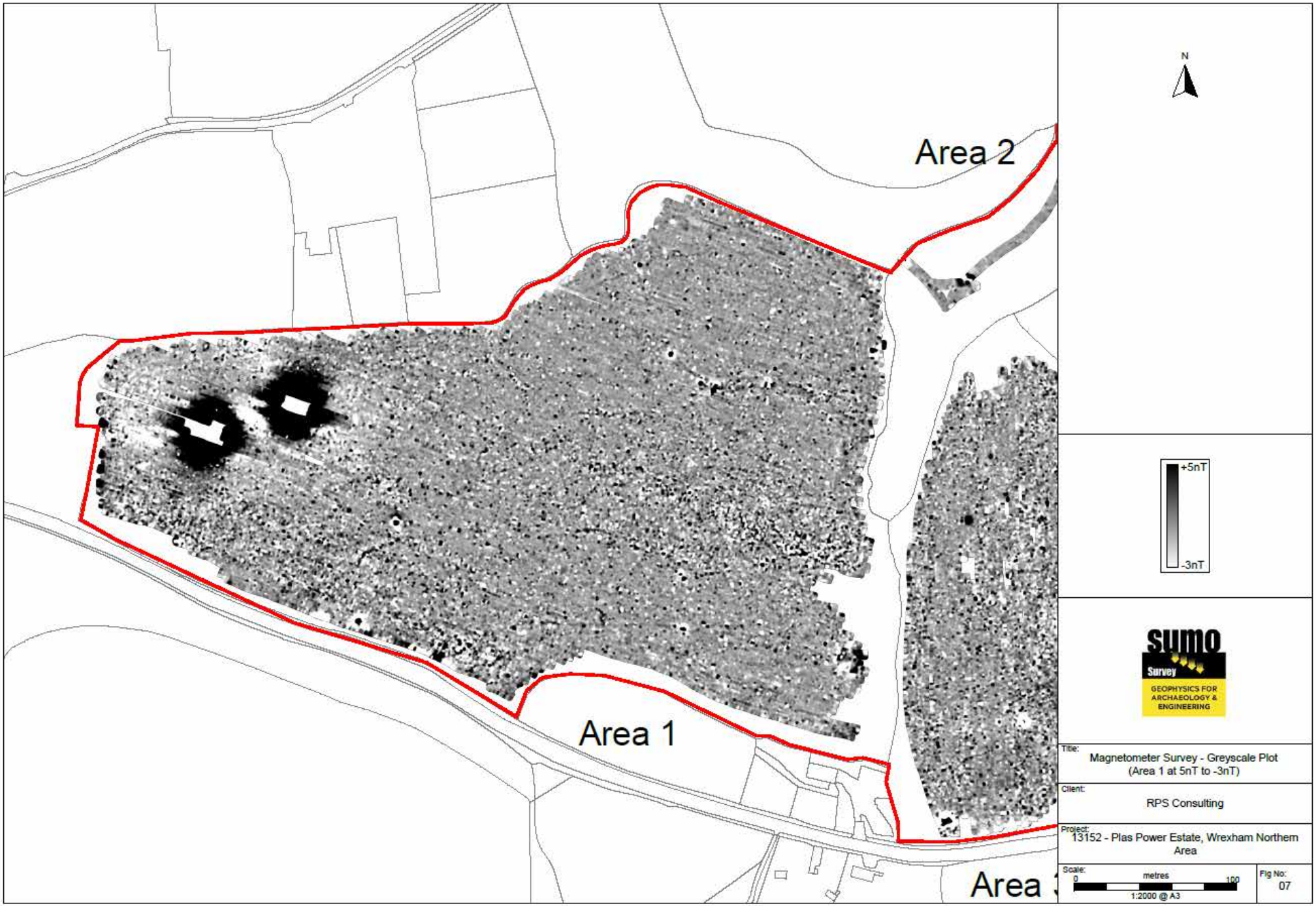
Client:
RPS Consulting

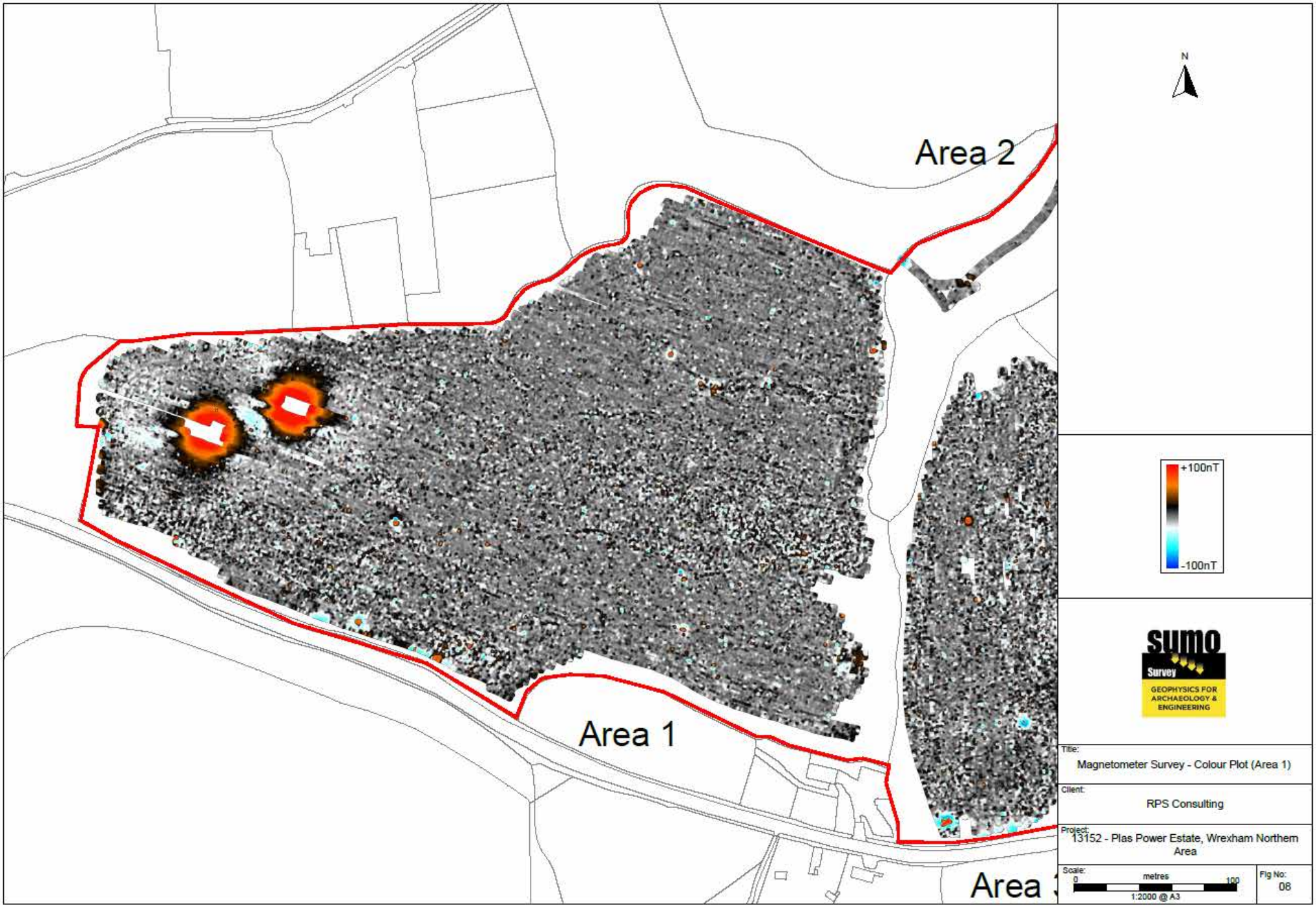
Project:
13152 - Plas Power Estate, Wrexham Northern Area

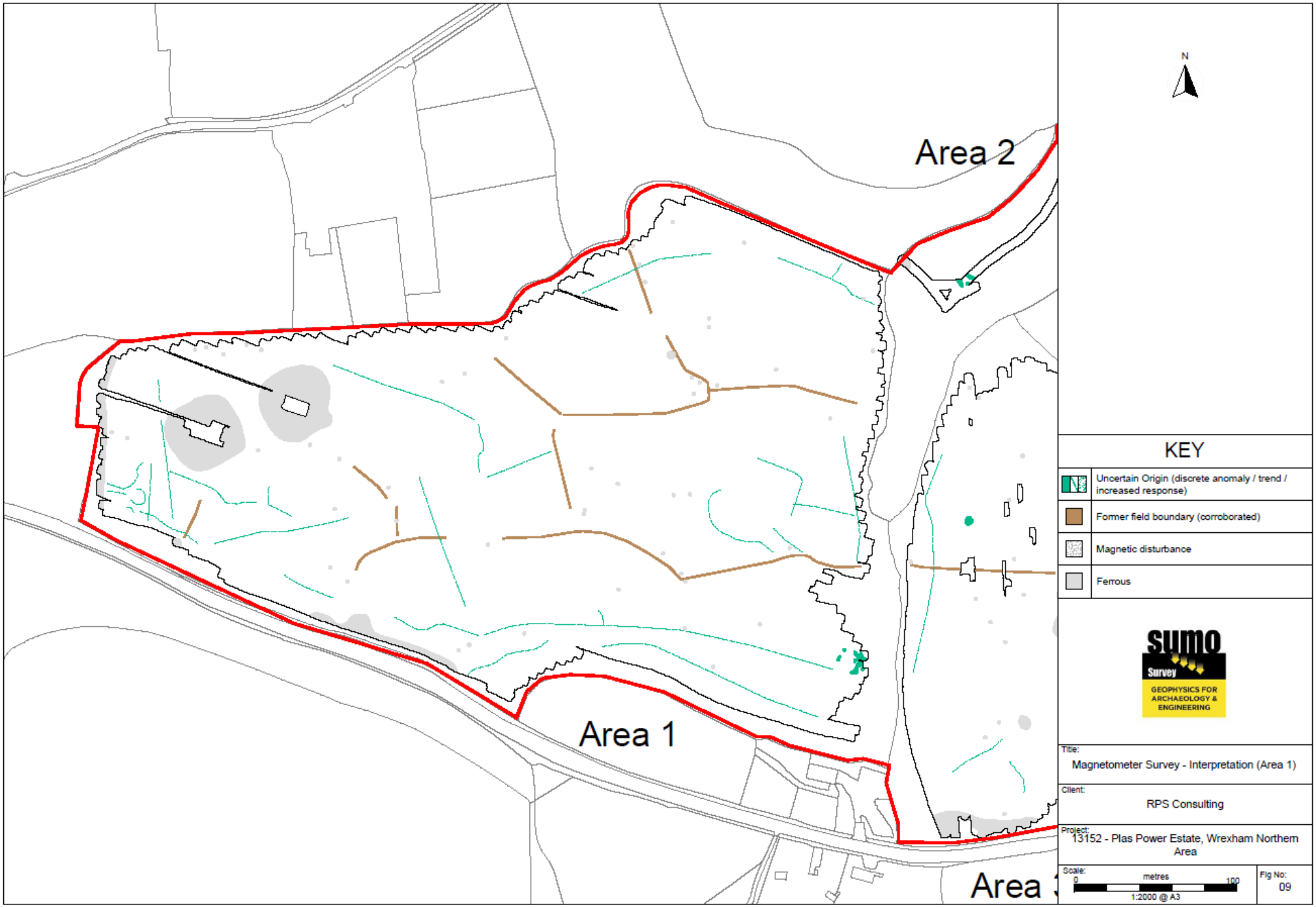
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1:3000 @ A3

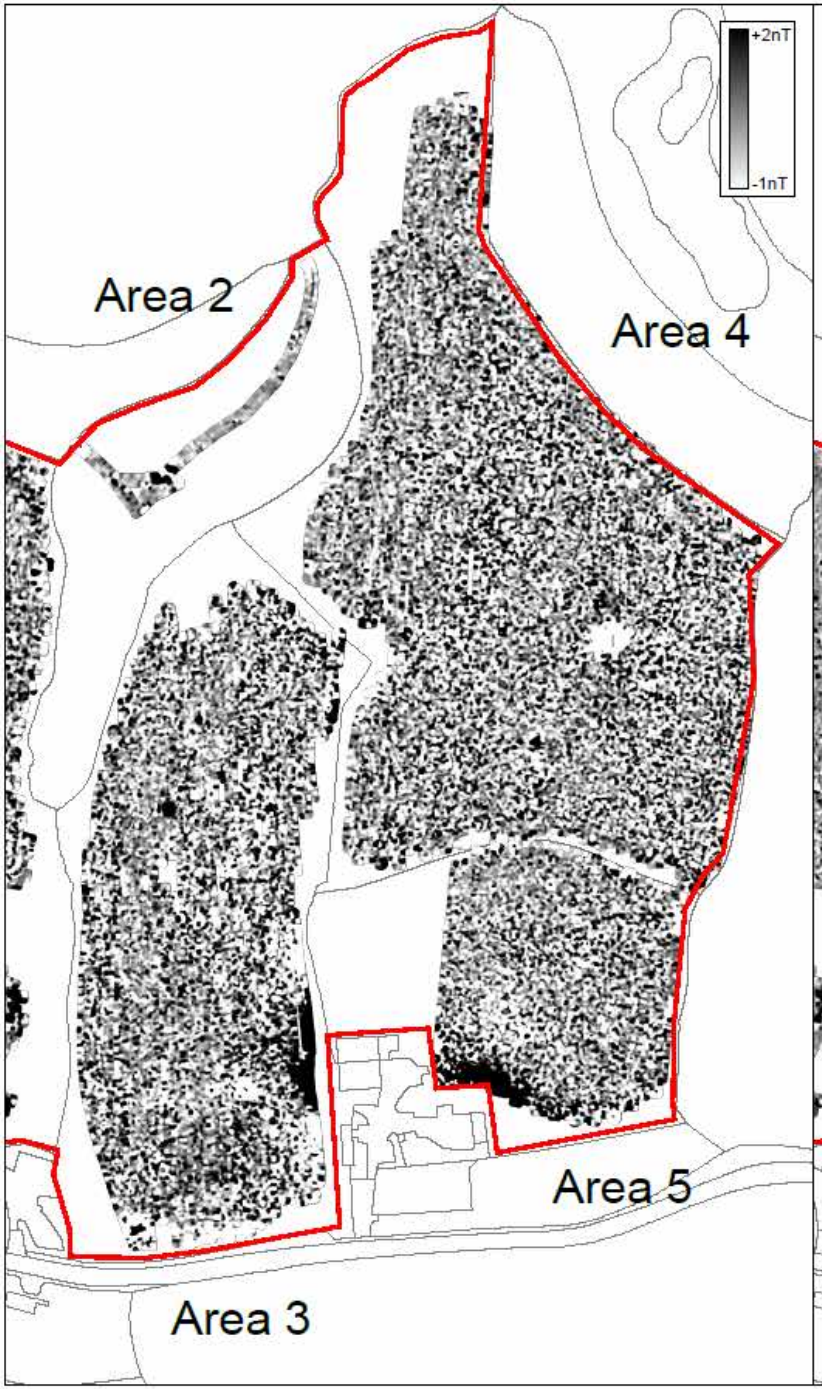
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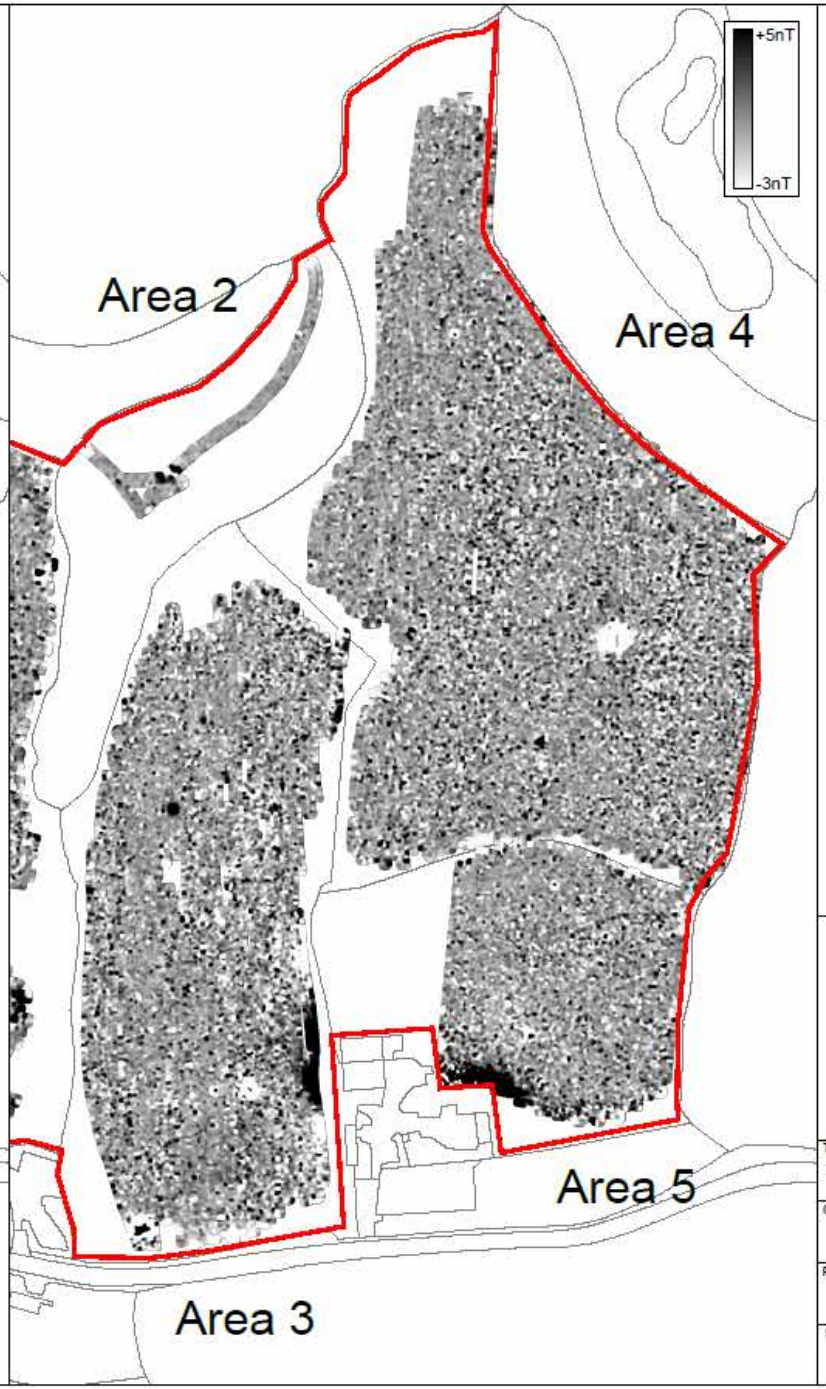

N
Area 2
Area 1
Area 3
+2nT
-1nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Greyscale Plot
(Area 1 at 2nT to -1nT)
Client:
RPS Consulting
Project:
13152 - Plas Power Estate, Wrexham Northern Area
Scale:
0
metres
100
1:2000 @ A3
Fig No:
06


Area 2
Area 1
Area 3
N
+5nT
-3nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Greyscale Plot
(Area 1 at 5nT to -3nT)
Client:
RPS Consulting
Project:
13152 - Plas Power Estate, Wrexham Northern Area
Scale:
0
metres
100
1:2000 @ A3
Fig No:
07


Area 2
Area 1
Area 3
N
+100nT
-100nT
sumo
Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Colour Plot (Area 1)
Client:
RPS Consulting
Project:
13152 - Plas Power Estate, Wrexham Northern Area
Scale:
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metres
100
1:2000 @ A3
Fig No:
08


Area 2
Area 1
Area 3
N
KEY
Uncertain Origin (discrete anomaly / trend / increased response)
Former field boundary (corroborated)
Magnetic disturbance
Ferrous
sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING
Title:
Magnetometer Survey - Interpretation (Area 1)
Client:
RPS Consulting
Project:
13152 - Plas Power Estate, Wrexham Northern Area
Scale:
0
metres
100
1:2000 @ A3
Fig No:
09





N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

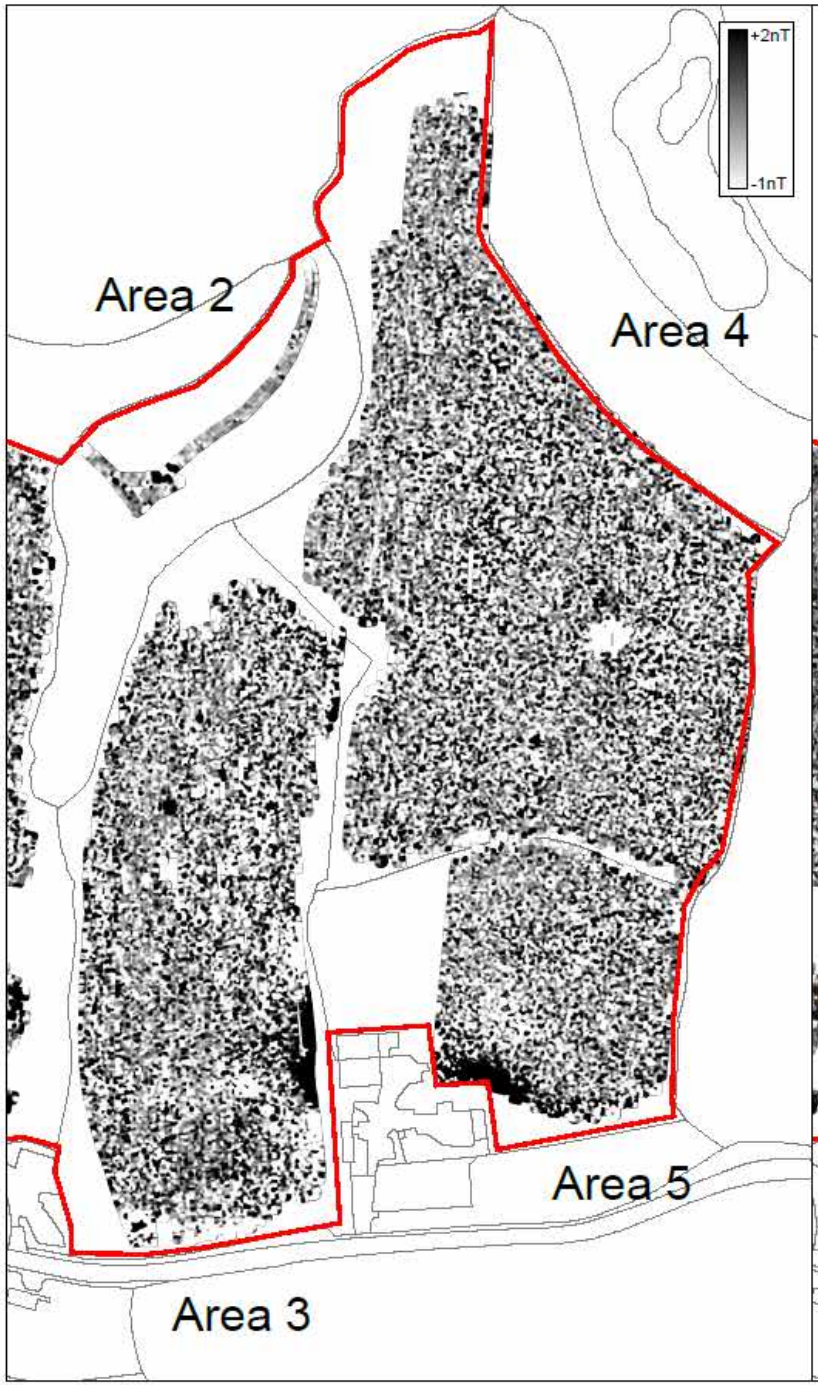
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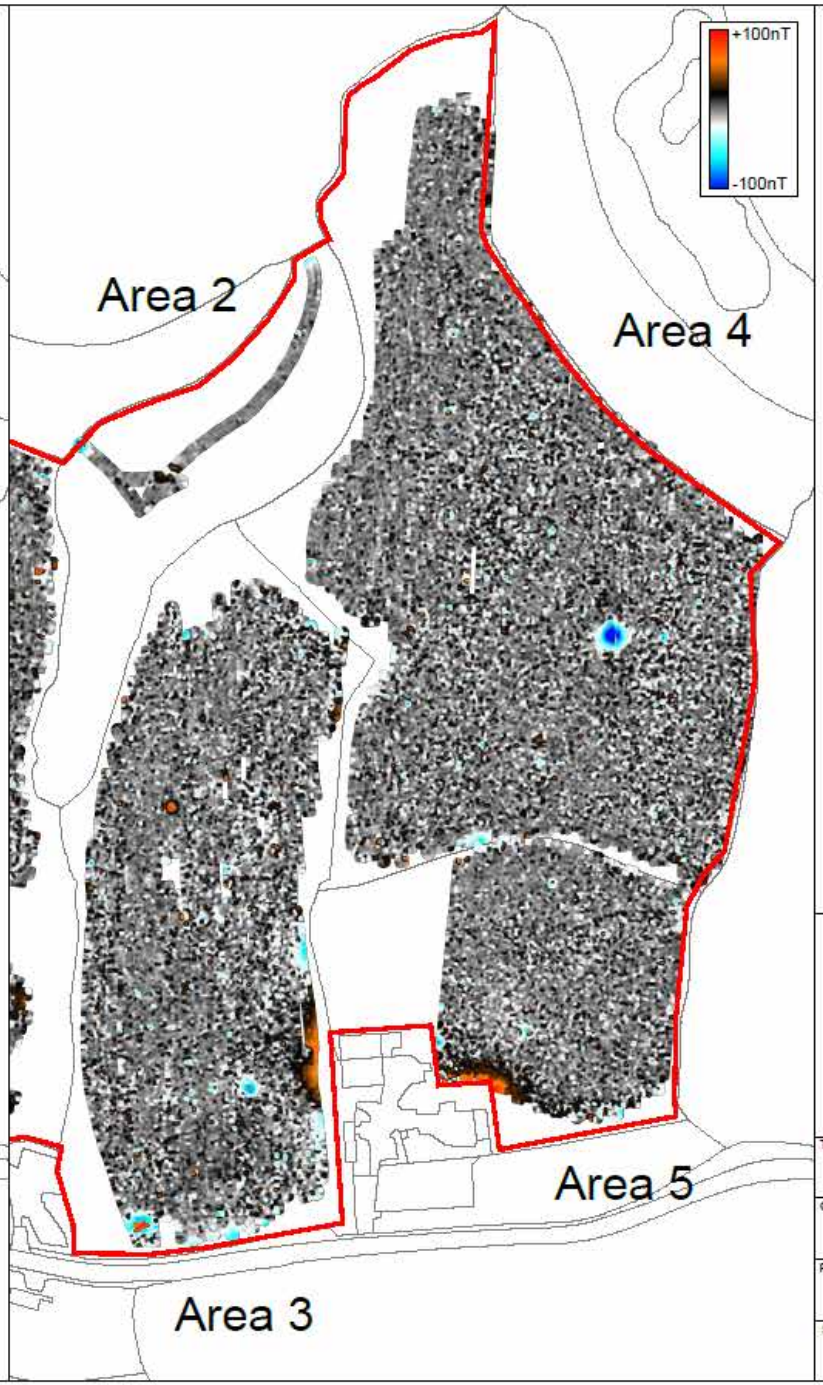
Client: RPS Consulting

Project: 13152 - Plas Power Estate, Wrexham Northern Area

Scale: 0 metres 110
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Fig No: G





N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

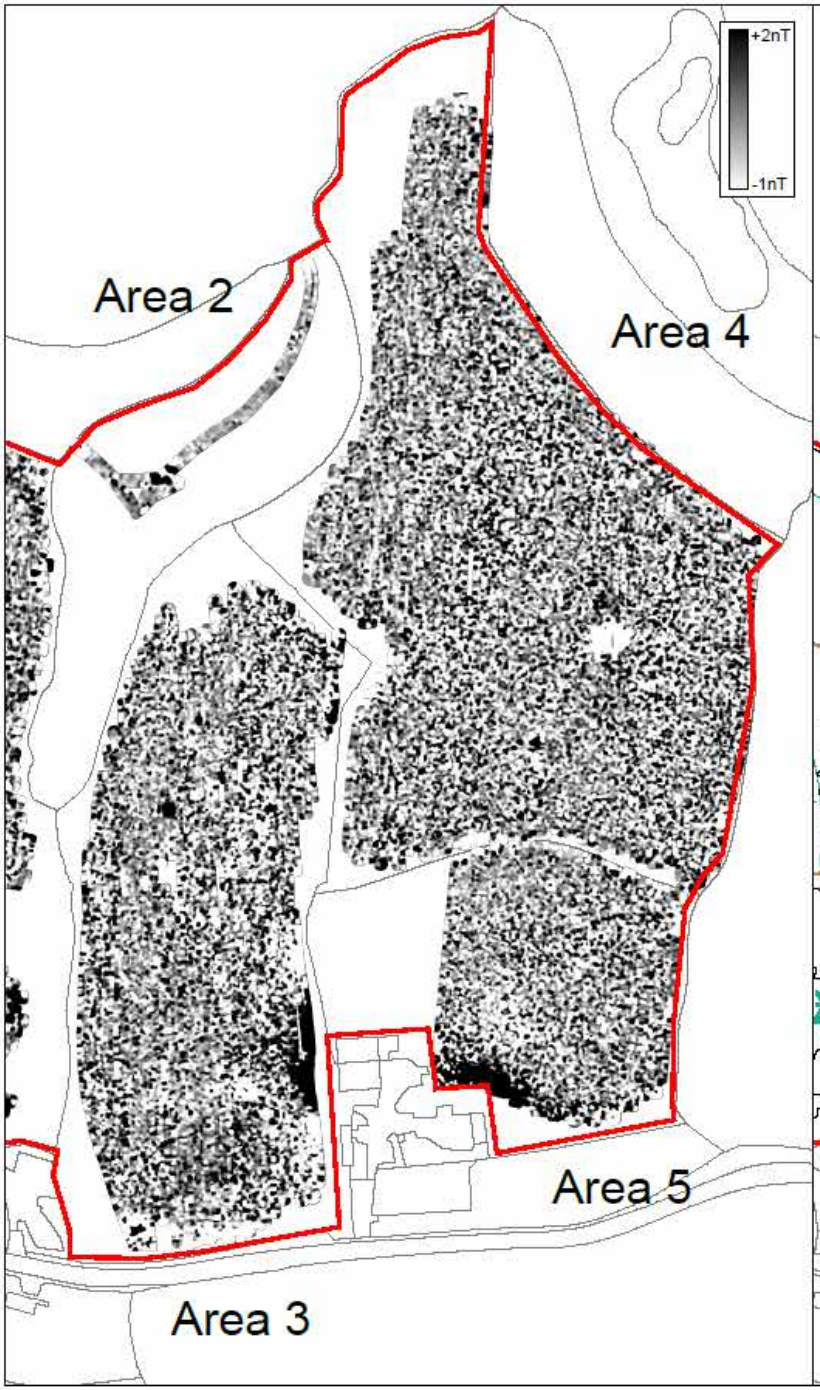
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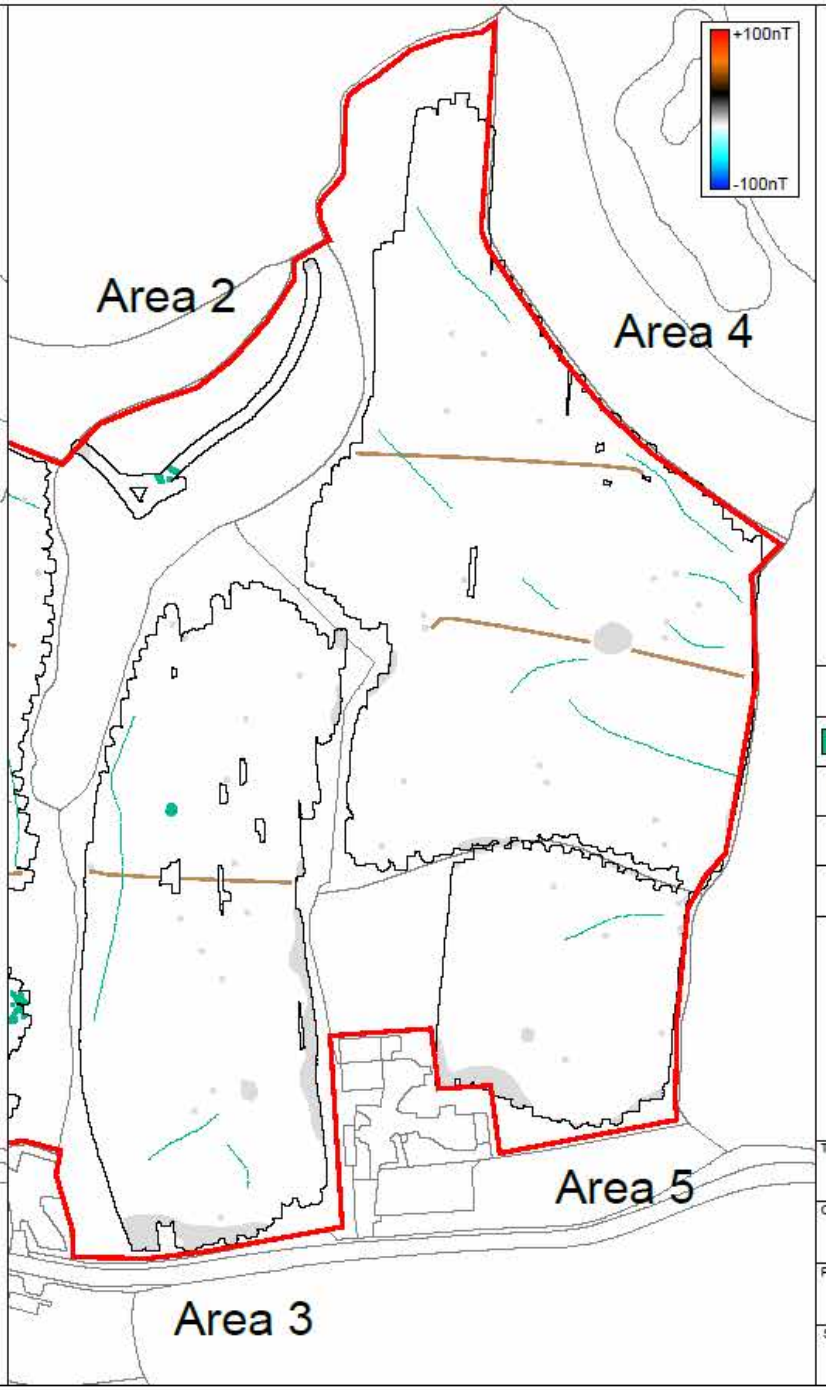
Client:
RPS Consulting

Project:
13152 - Plas Power Estate, Wrexham Northern Area

Scale:
0 metres 110
1:2200 @ A3

Fig No:
H





N

KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Magnetic disturbance
	Ferrous

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

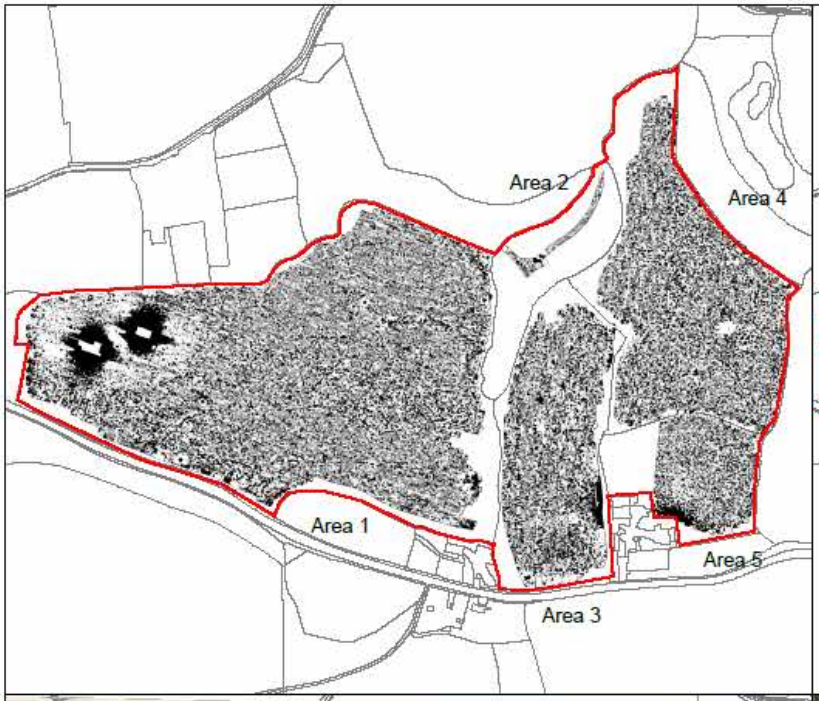
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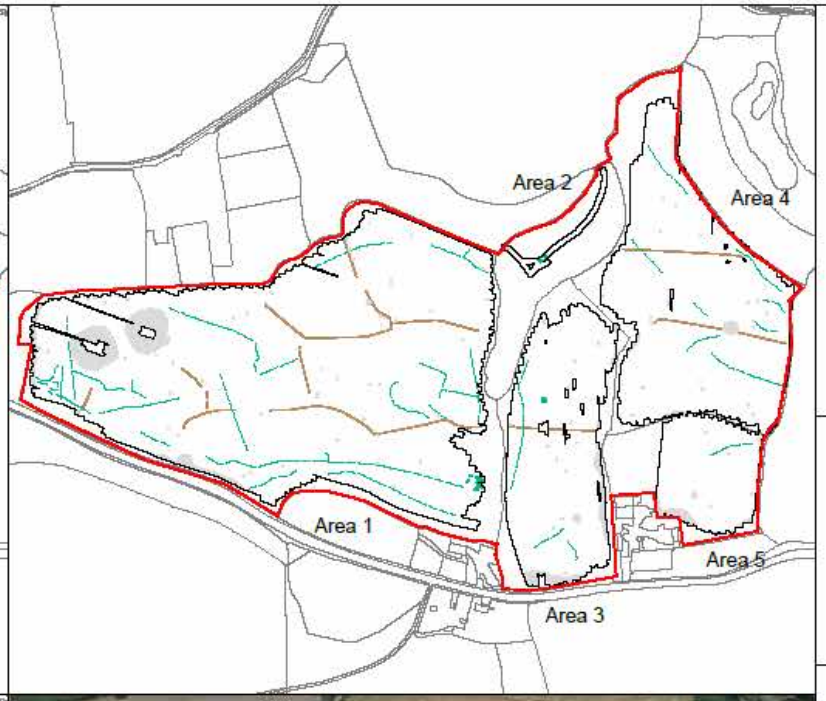
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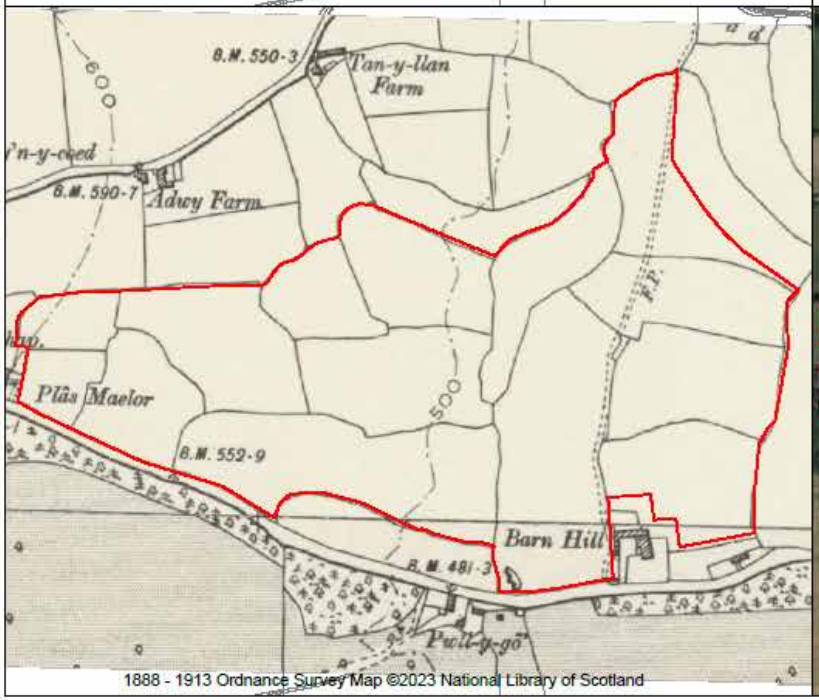
Project: 13152 - Plas Power Estate, Wrexham Northern Area

Scale: 0 metres 110
1:2200 @ A3

Fig No: 12







1888 - 1913 Ordnance Survey Map ©2023 National Library of Scotland



©2023 Google Earth

N

+2nT

-1nT

KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Magnetic disturbance
	Ferrous

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

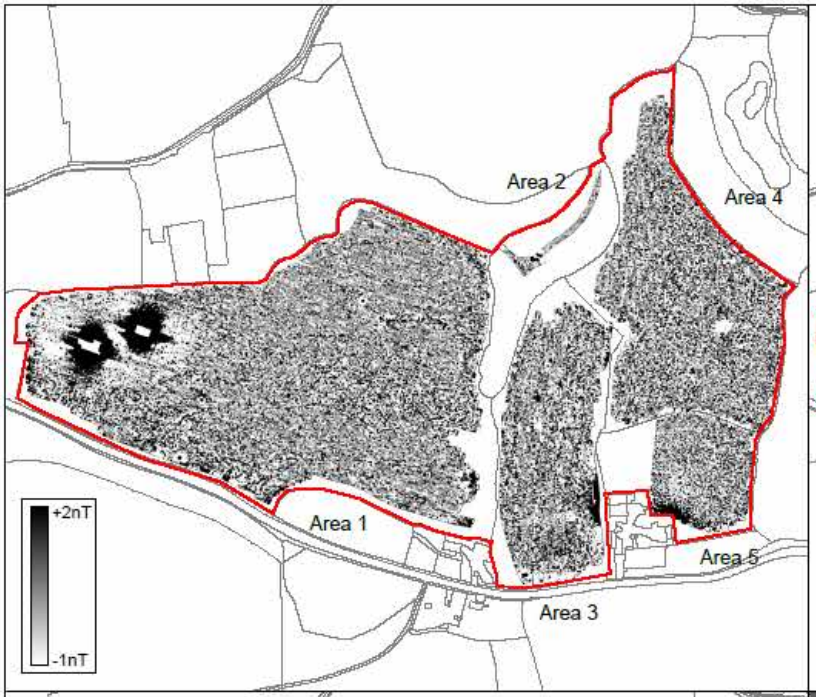
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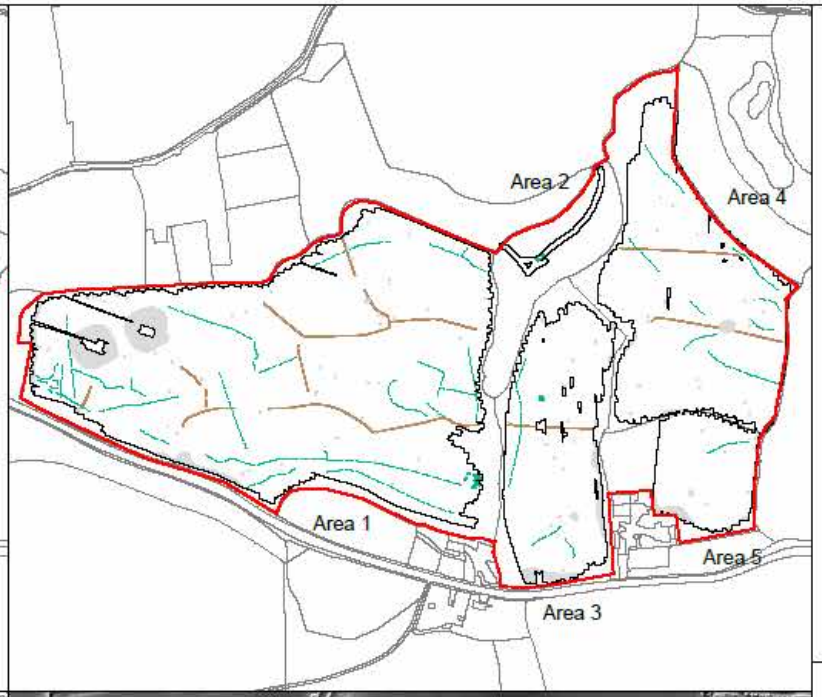
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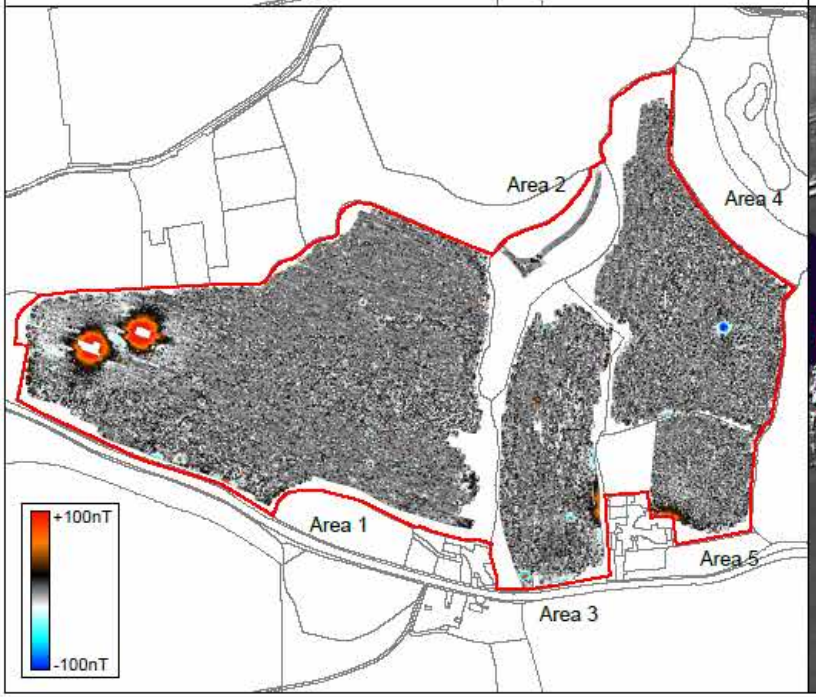
Project:
13152 - Plas Power Estate, Wrexham Northern Area

Scale:
NOT TO SCALE

Fig No:
13









N

KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Magnetic disturbance
	Ferrous

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

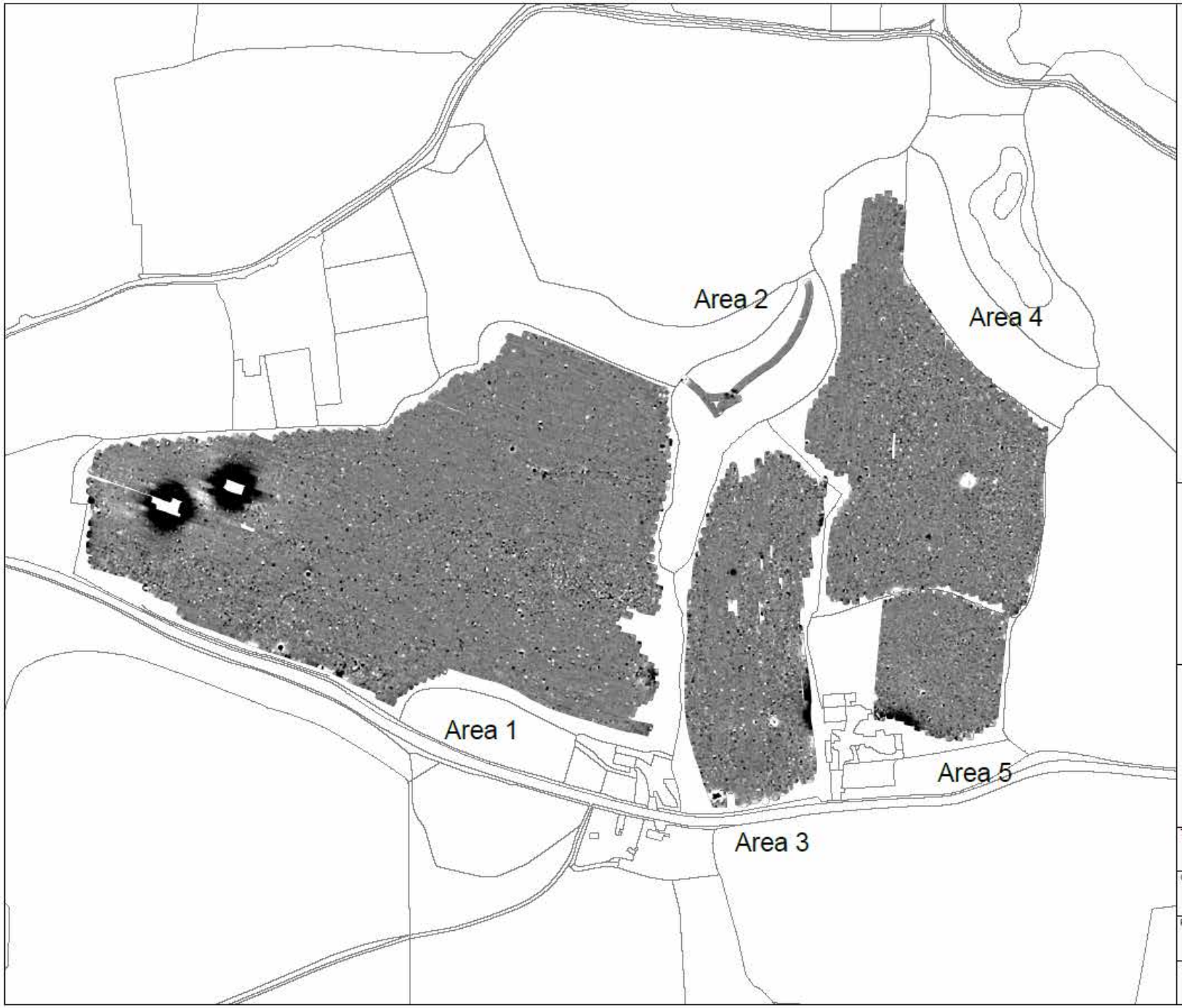
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Client: RPS Consulting

Project: 13152 - Plas Power Estate, Wrexham Northern Area

Scale: NOT TO SCALE

Fig No: 14



N

+10nT

-10nT

sumo Survey

GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

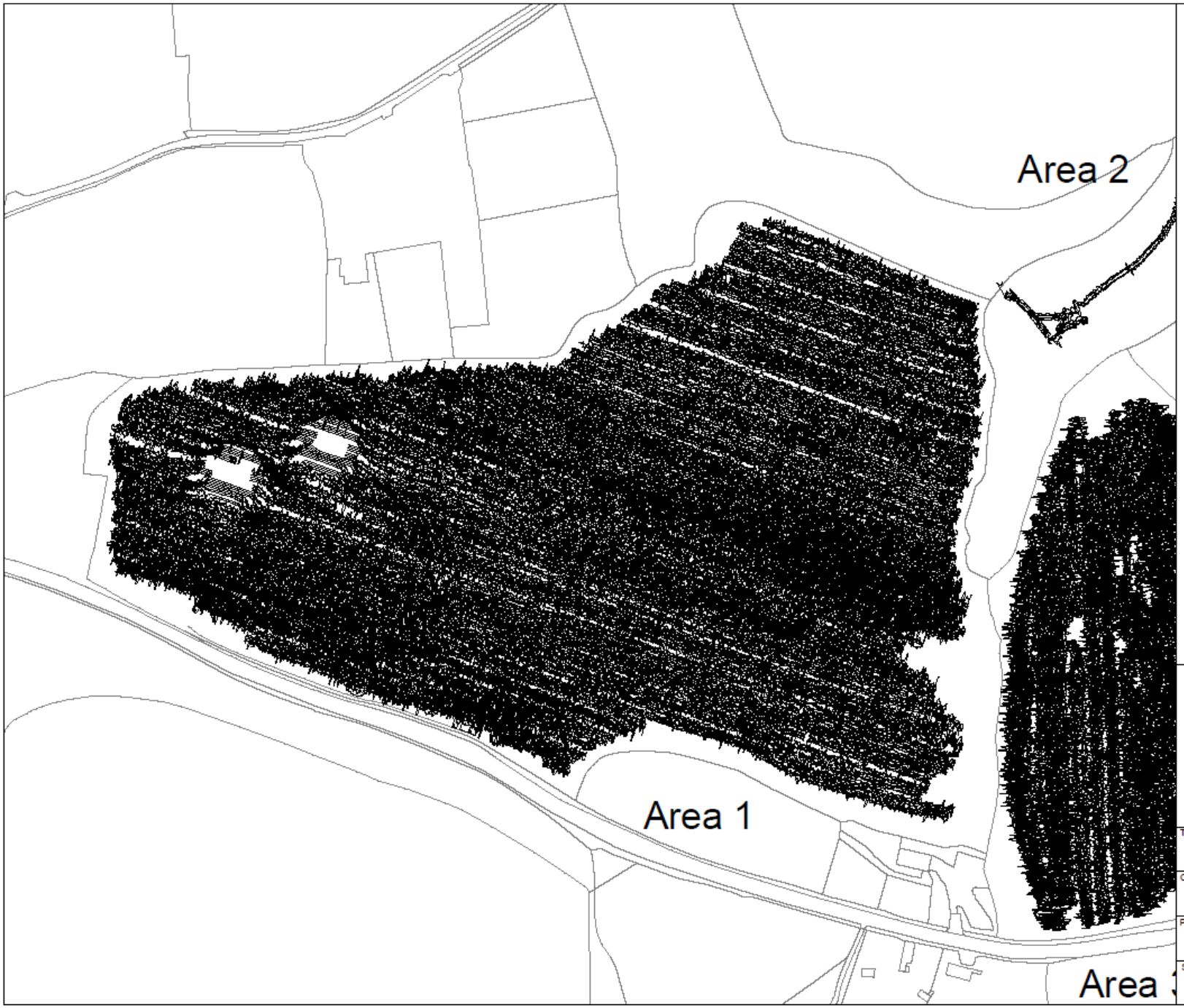
Title:
Minimally Processed Data - Greyscale Plots

Client:
RPS Consulting

Project:
13152 - Plas Power Estate, Wrexham Northern Area

Scale:
0 metres 150
1:3000 @ A3

Fig No:
15



N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

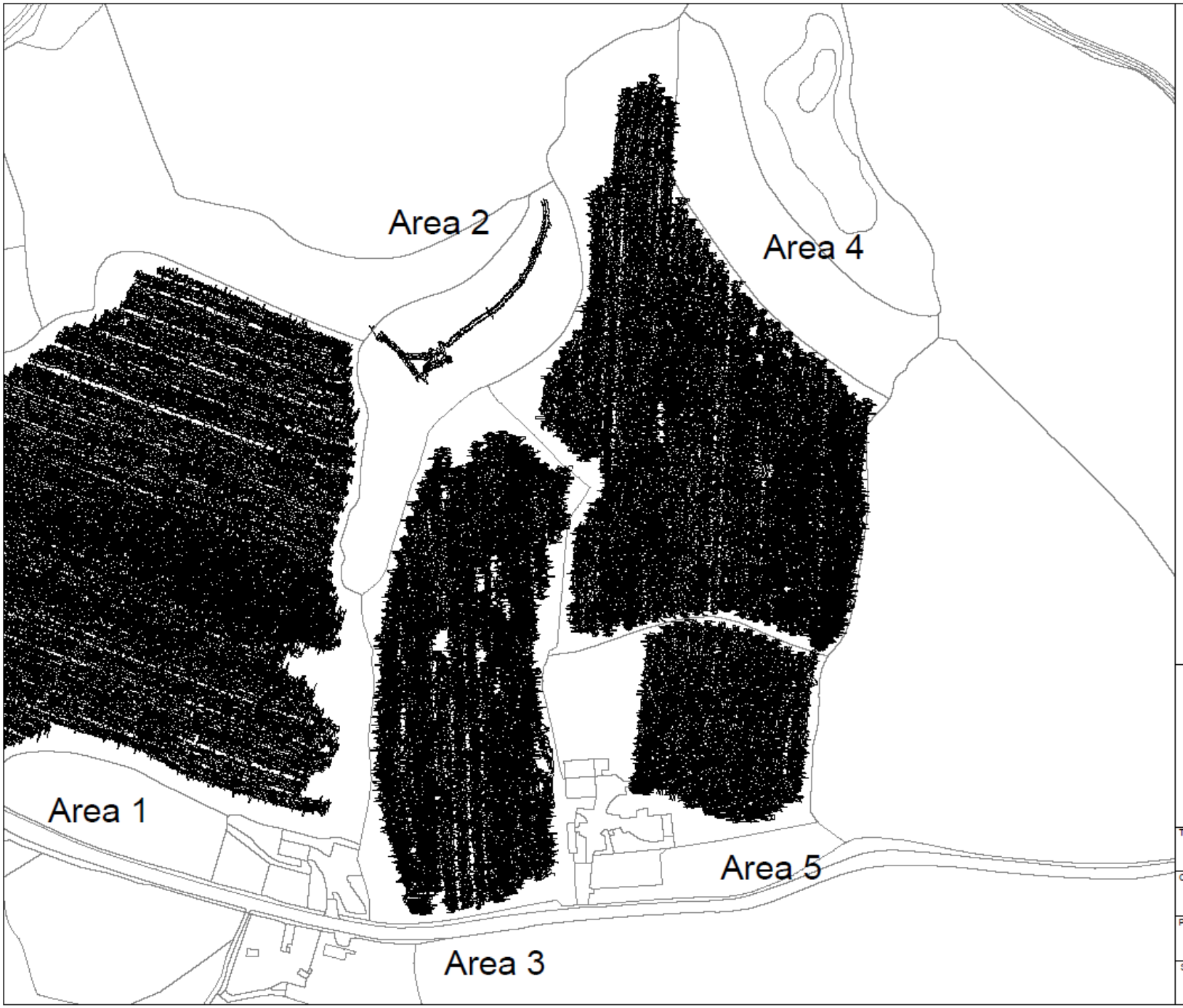
Title: XY Trace Plots (Area 1 clipped at +/-15nT)

Client: RPS Consulting

Project: 13152 - Plas Power Estate, Wrexham Northern Area

Scale: 0 metres 100
1:2000 @ A3

Fig No: 16



N

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title:
XY Trace Plots
(Area 2, 3, 4 & 5 clipped at +/-15nT)

Client:
RPS Consulting

Project:
13152 - Plas Power Estate, Wrexham Northern Area

Scale:
0 metres 110
1:2200 @ A3

Fig No:
17

Appendix A - Technical Information: Magnetometer Survey Method

Grid Positioning

For hand held gradiometers the location of the survey grids has been plotted together with the referencing information. Grids were set out using a Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS GPS system.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. This results in an accuracy of around 0.01m.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1.0m	0.25m
Magnetometer	Bartington Cart System	1.0m	0.125m

Instrumentation:

Bartington instruments operate in a gradiometer configuration which comprises fluxgate sensors mounted horizontally, set 1.0m apart. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried, or cart mounted, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method, though strongly magnetic objects may be visible at greater depths.

Bartington Grad 601-2

Hand-Held: Data will be collected using a Bartington Grad 601-2. The instrument consists of two paired sensors and readings are logged at 0.25m centres along traverses 1.0m apart across 30m grids. The collection of data at 0.25m centres provides an appropriate methodology balancing cost and time with resolution as per Historic England guidelines

Bartington Cart System

Data will be collected using a cart carrying four paired Bartington magnetic sensors. Each data point is geographically referenced using an on-board Trimble RTK survey grade GPS system. Readings will be taken at 0.125m centres along traverses 1.0m apart.

Data Processing

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (De-stagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

Display

Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly, all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.

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Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall,* etc.) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

Archaeology / Probable Archaeology	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and /or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
Possible Archaeology	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
Industrial / Burnt-Fired	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
Former Field Boundary (probable & possible)	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
Ridge & Furrow	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity.
Agriculture (ploughing)	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
Land Drain	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
Natural	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
Magnetic Disturbance	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
Service	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. pvc) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
Ferrous	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
Uncertain Origin	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of *Possible Archaeology* / *Natural* or (in the case of linear responses) *Possible Archaeology* / *Agriculture*; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

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Appendix B - Technical Information: Magnetic Theory

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTeslas (nT) in an overall field strength of 48,000 (nT), can be accurately detected.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns; material such as brick and tile may be magnetised through the same process.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried feature. The difference between the two sensors will relate to the strength of a magnetic field created by this feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity and disturbance from modern services.

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Appendix C – Data Management Plan & Archive Selection Strategy

Data Management Plan

Project ID

SUMO-13152

Project Name

Plas Power Estate, Wrexham Northern Area

Project Description

Detailed magnetic survey over approx. 21ha

Client

RPS Consulting Ltd for Lightsource BP

Project Manager

Thomas Cockcroft

Field Leader

Liam Brice-Bateman

Date DMP created

12.07.2023

Date DMP last updated

13.12.2023

Version

2

Technique - data

Detailed magnetic survey.

Manual – cart - other

Hand pushed Cart magnetometers.

Documentation and metadata

All documentation and data produced are stored on SUMO servers in a specific job file.

Data storage, access and back-up

- SUMO Secure server during the project life set up in a RAID configuration (a RAID configuration incorporates a level of data redundancy meaning if a single hard drive in fails data can still be restored).

- Snap shots of the data will be made at several intervals during the day to allow data to be restored for up to 30 days if changed / deleted.
- Once the final report has been completed data will be moved onto NAS drive set up in a RAID configuration.
- All data is backed up to an off-site location (Cloud storage).

Archive Selection Strategy

Digital Data

Selection

It is proposed that only the final version of all born digital documents (reports, images and CAD files) will be selected for inclusion in the Preserved Archive. All raw and processed survey data will be included in the preserved archive. Below is what will constitute the selected archive:

- Raw data in XYZ format .csv and .png plus .pgw world file
- Processed data as .png plus .pgw world file
- Final survey report .pdf
- CAD and Vector graphics (interpretations) in .dwg format

De-selected digital data

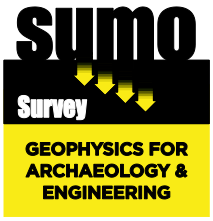
The de-selected material will be retained on the SUMO Secure server and Cloud storage.

Documents

Not applicable – no archive

Materials

Not applicable – no archive



- Archaeological
- Geophysical
- Laser Scanning
- Measured Building
- Topographic
- Utility Mapping

SUMO Services Ltd, incorporated under the laws of England and Wales,
Company Registration No.4275993.
Registered Office Unit 8 Hayward Business Centre, New Lane, Havant, Hampshire, PO9 2NL

PLATES



Plate 1: Zone A: View north across zone A from the southern boundary, showing the density of the enclosing woodland to the west



Plate 2: Zone A: View south-west across zone A from the eastern boundary, shoign part of zone C and the enclosing woodland to the west



Plate 3: Zone A: View eastwards from western edge of zone A, with long-distance views over Wrexham



Plate 4: Zone A: View south-east across the study site, showing how the intervening hedgerows and woodland blocks break up views between the zones



Plate 5: Zone A: View west from the western boundary of zone A, showing the limited views in this direction



Plate 6: Zone A: View south across the study site, from the northernmost point of zone A



Plate 7: Zone A: View south-west along the western boundary of zone A, showing how the topography and the enclosing woodland prevent any views to the west



Plate 8: Zone B: View south across zone B from the northern boundary, showing the enclosing woodland



Plate 9: Zone B: View north towards zone A, from centre of zone B eastern boundary



Plate 10: Zone C: View north-east along footpath which crosses Offa's Dyke



Plate 11: Zone C: View south-east along the line of Offa's Dyke – south side



Plate 12: Zone C: View eastwards across the study site from east of Offa's Dyke



Plate 13: Zone C: View south-east along line of Offa's Dyke – north side



Plate 14: Zone C: View south across zone C, and line of Offa's Dyke, from centre of zone C northern boundary



Plate 15: Zone C: Enclosing woodland at northern end of zone C



Plate 16: Zone C: View eastwards from northern end of zone C, showing the partial long distance views from zone C, broken up by the intervening woodland and hedgerows



Plate 17: Zone D: View north-west from southern boundary



Plate 18: Zone D: View north from southern boundary



Plate 19: Zone D: View north-east from southern boundary



Plate 20: Zone D: View east from southern boundary



Plate 21: Zone E: View south-east across zone E from northernmost point, showing its flat topography and enclosing woodland



Plate 22: Zone E: View south across zone E from northernmost point, showing its flat topography and enclosing woodland



Plate 23: Zone E: View west over the sheltered, enclosed north-western part of zone E



Plate 24: Zone E: View south over zone E from the woodland fringe towards its northern end



Plate 25: Zone E: View south-west from centre of zone E



Plate 26: Zone E: View north-west from centre of zone E



Plate 27: Zone E: View north-east from centre of zone E



Plate 28: Zone E: View south-east from centre of zone E



Plate 29: Zone E: View of southern boundary of zone E, showing tree belt which completely masks Bersham Ironworks from any intervisibility with the study site



Plate 30: Zone E: Close up of tree belt masking Bersham Ironworks from view



Plate 31: Zone E: View south-east towards Bersham Ironworks from within zone E southern part. The Ironworks buildings cannot be seen from zone E



Plate 32: Bersham Ironworks remains from the south



Plate 33: Bersham Ironworks remains from the south



Plate 34: Zone F: View south-east over zone F from the north-eastern corner



Plate 35: Zone F: View southwards along the western boundary of zone F



Plate 36: Zone F: View west from the western boundary of zone F, towards section of Offa's Dyke to the west



Plate 37: Zone F: View north across zone F from its highest point



Plate 38: Zone F: View north-east across zone F from its highest point



Plate 39: Zone F: View south-east across zone F from its highest point



Plate 40: Zone F: View south across zone F from its highest point



Plate 41: Zone F: View east from the centre of zone F, towards Bersham Ironworks



Plate 42: View south along section of Offa's Dyke to west of zone F, showing land rising up to zone F on left of photo, preventing any intervisible between solar panels in zone F and this section of the Dyke



Plate 43: View north along section of Offa's Dyke to west of zone F



Plate 44: View north along the section of Offa's Dyke running through Plas Power woods, to the west of zone D – the line of the Dyke is marked by the dense trees on the right of the picture

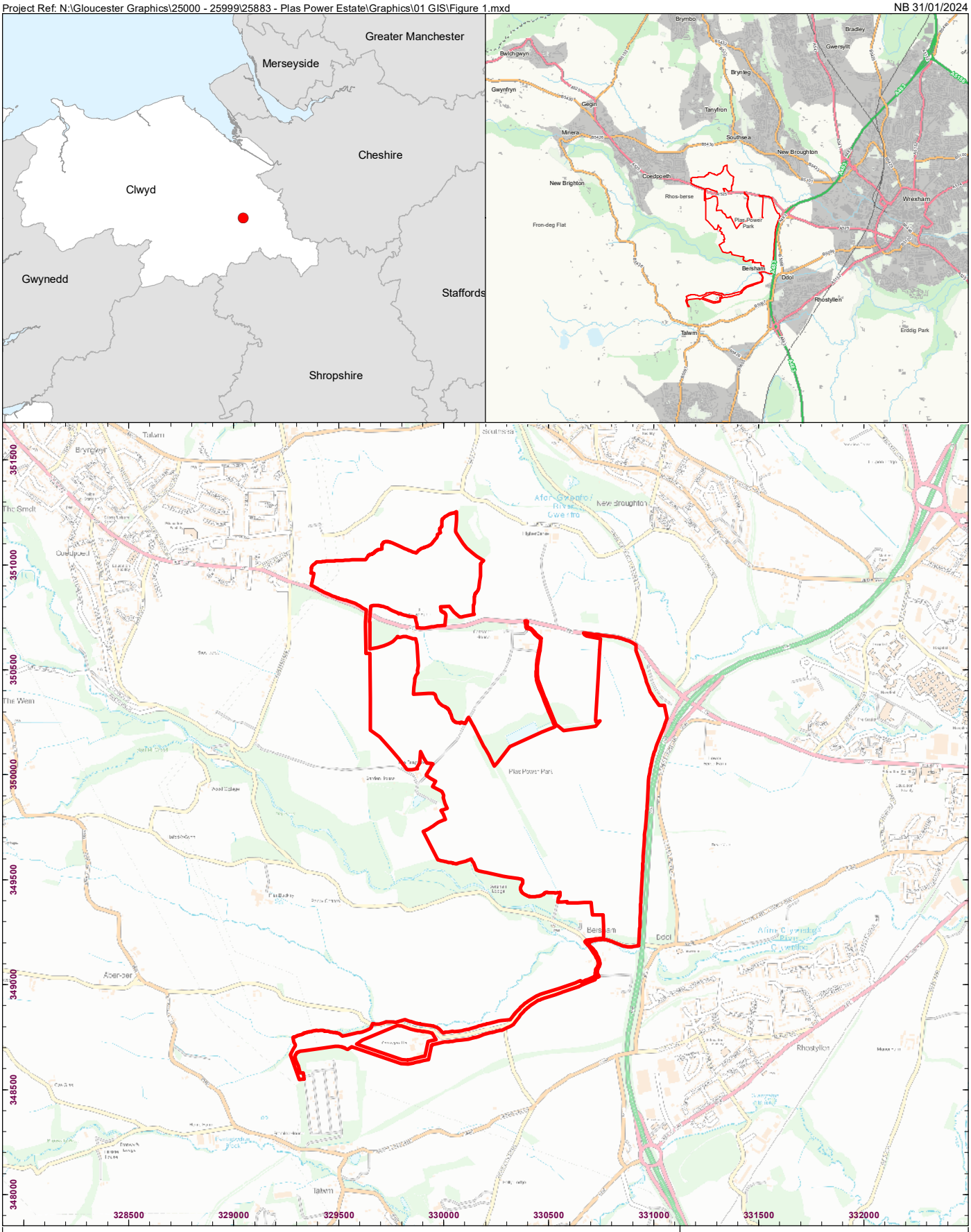


Plate 45: Cadwgan Hall Mound, from the north-west, with the buildings of Plas Cadwgan beyond



Plate 46: View from the south-west over Cadwgan Hall Mound towards zone F

FIGURES



Site Boundary

N

0 260 520 780m

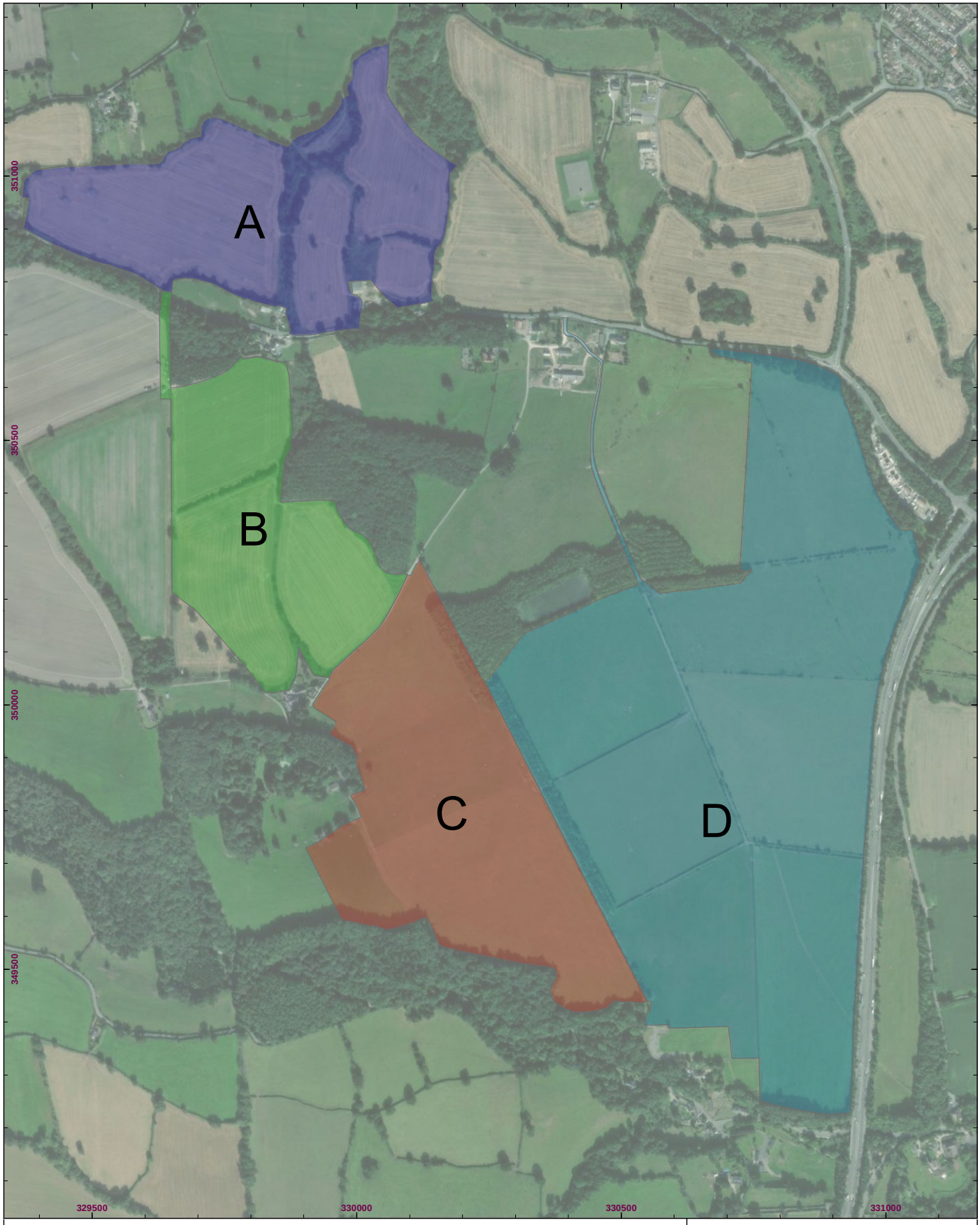
Scale at A4: 1:25,000

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Figure 1a

Site Location

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Site Boundary

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0 100 200 300m

Scale at A4: 1:10,000

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Figure 1b

Division of the Site into Zones A-D

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NB 31/01/2024

Legend

- Site Boundary
- 1km search radius

Non-designated Heritage Assets:

- HER RCAHMW Point
- NMW Objects
- HER PAS Point
- Offa's Dyke

N

0 75 150 300 450m

Scale at A3: 1:18,000

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Figure 2a

RCAHMW HER Data

Project Ref: N:\Gloucester Graphics\25000 - 25999\25883 - Plas Power Estate\Graphics\01 GIS\HER Plot.mxd

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NB 31/01/2024

Legend

- Site Boundary
- 1km search radius

Non-designated Heritage Assets:

- Offa's Dyke
- CPAT Core Data

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Scale at A3: 1:18,000

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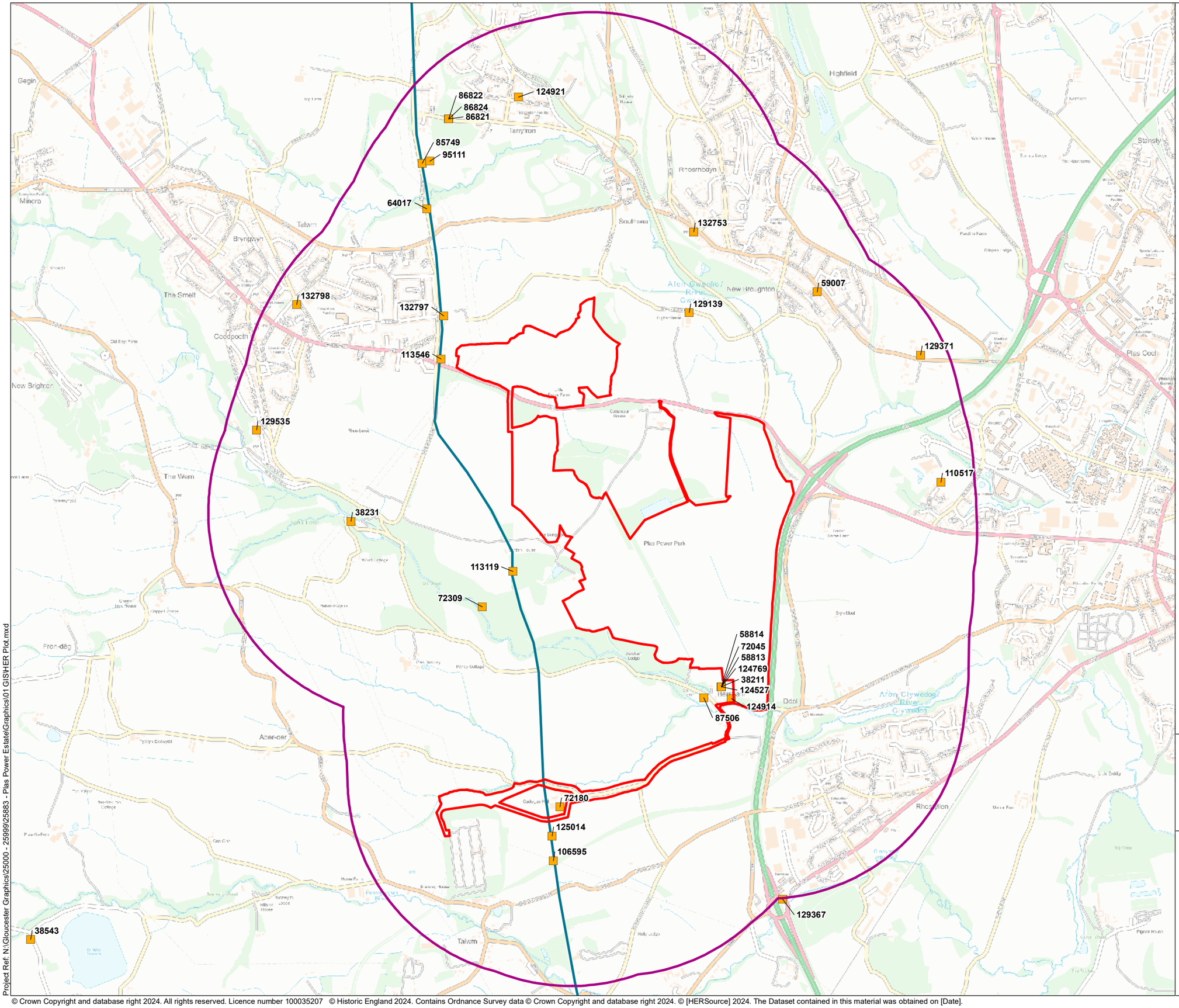
Figure 2b

CPAT Historic Environment Record - Core Data

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Legend

- Site Boundary
- 1km search radius

Non-designated Heritage Assets:

- Offa's Dyke

Previous Archaeological Work:

- CPAT Event Data

N

0 75 150 300 450m

Scale at A3: 1:18,000

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Figure 2c

CPAT Historic Environment Record - Event Data

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DE017
DE152
DE153

Legend

- Site Boundary
- 3km search radius
- Scheduled Monuments

Low Visibility (up to 1 origin point)

High Visibility (up to 19 origin points)

N

0 250 500 1,000 1,500 m

Scale at A3: 1:35,000

A TETRA TECH COMPANY

Notes:

ZTV compiled assuming observer height as 1.7 m at eye level, and takes into account screening effects of local settlements at 9m and existing vegetation / woodland at a height of 10m.
24 origin points, from within the Application Site, have been used to illustrate the full parameters of the proposed development. Including:

- 23 origin points (in total), set at 3m above existing ground level (EGL), within the centre of each of the fields of the Application Site containing solar panels; and,
- 1 origin point, set at 3 m EGL, at the approxmate highest point within the Application Site.

OS Terrain 5 data has been used for generating the ground model.

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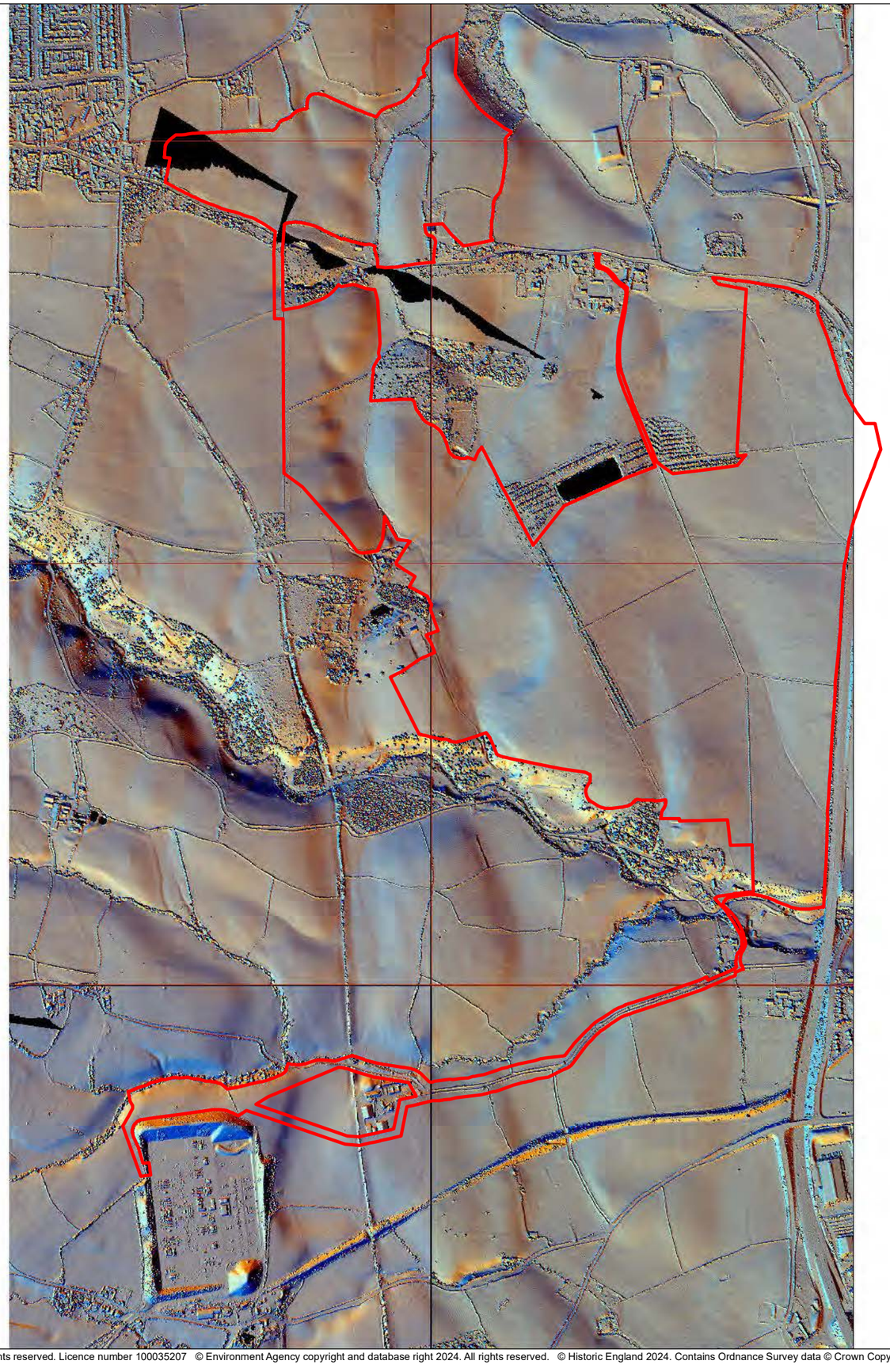
Figure 2d

Scheduled Monuments and the Zone of Theoretical Visibility

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NB 31/01/2024



Legend

Site Boundary

LiDAR DATA

Source:
Environment Agency

Data Type: DSM

Resolution: 1m

Processing:
Multi-direction Hillshade

N

0 200 400 m

Scale at A3: 1:11,500

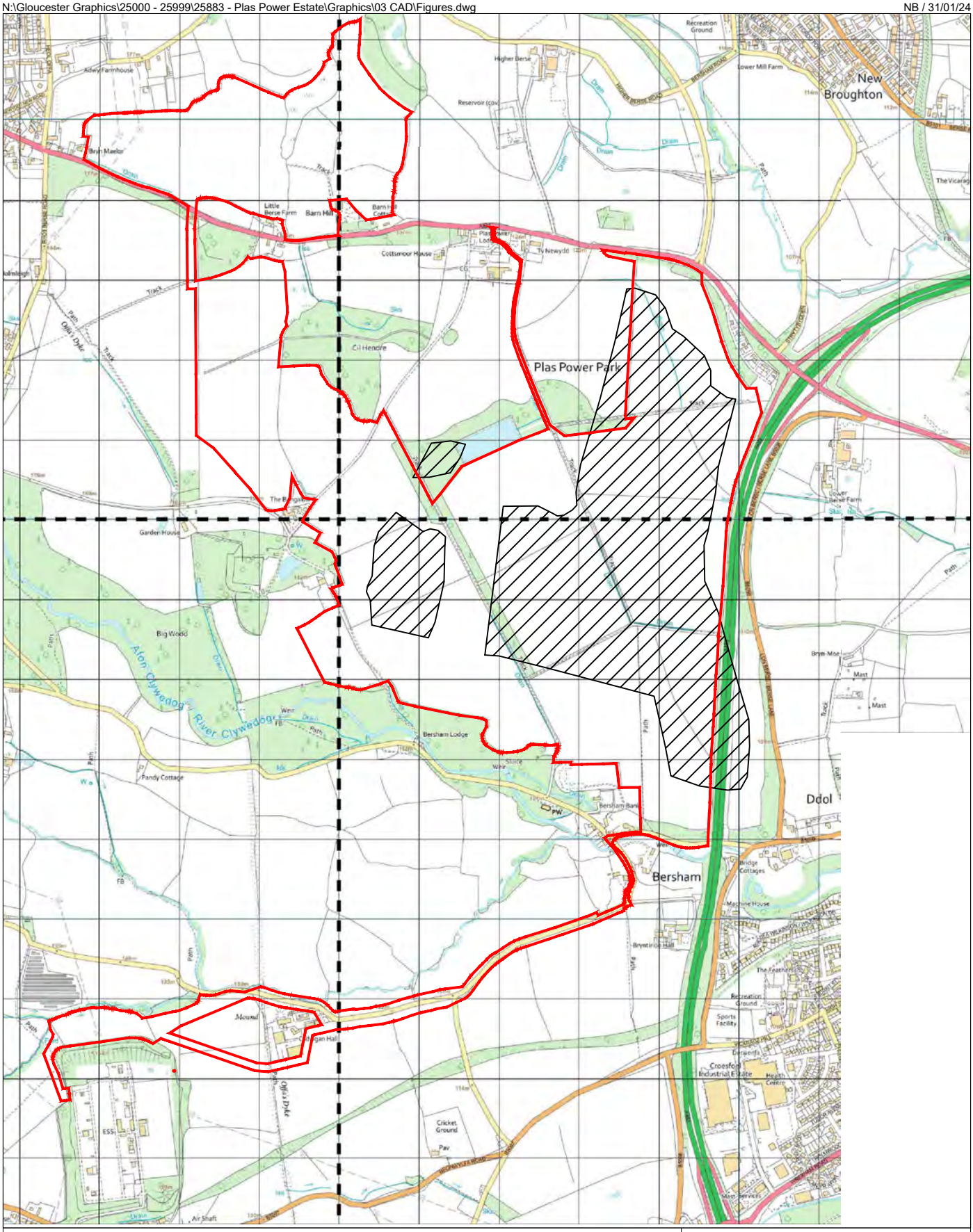
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Figure 3

LiDAR Data

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Figure 4a
Geological map showing extent of 'made ground' within the site, as mapped on the BGS Geoindex Onshore Data

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Site Boundary

N

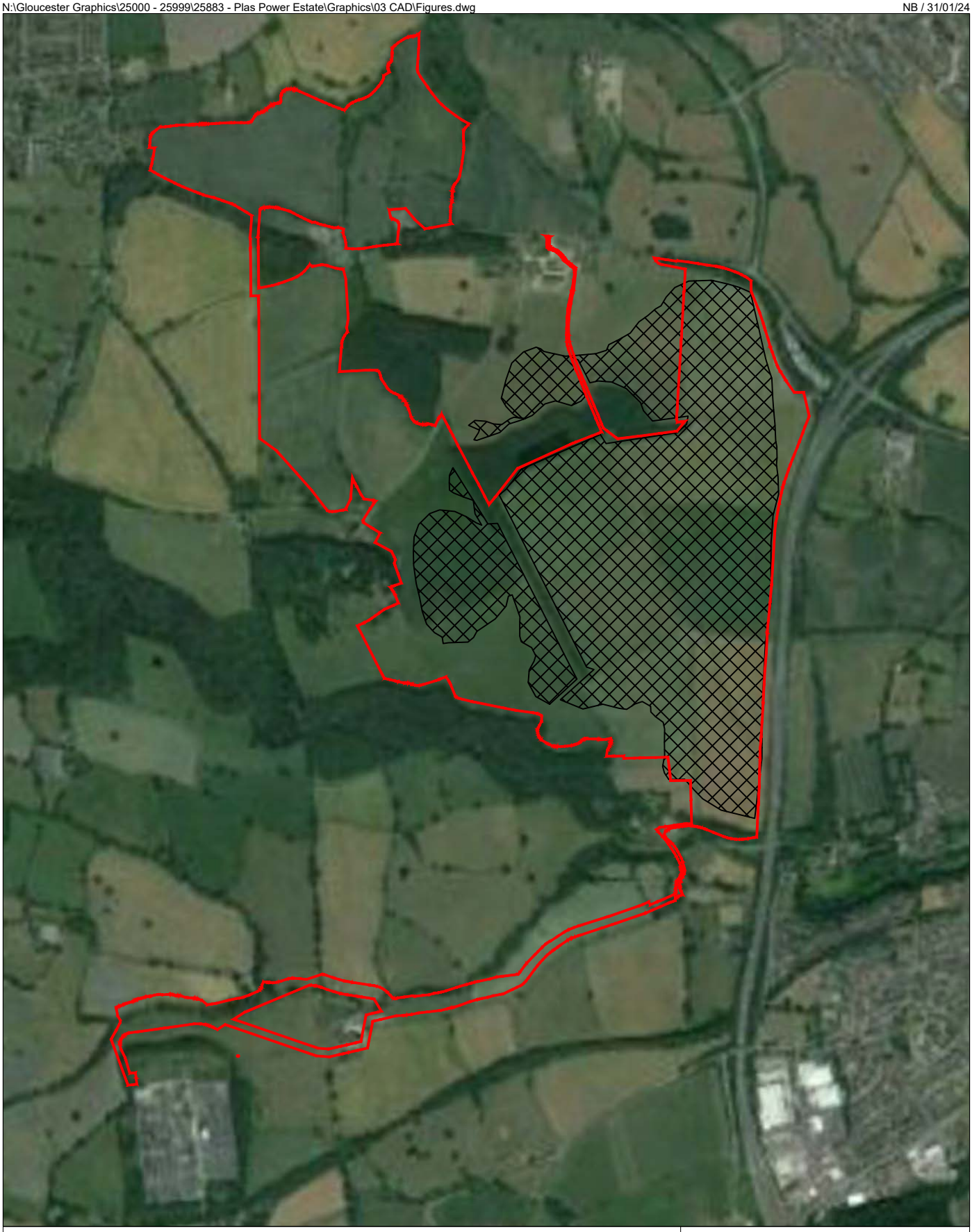
Not to Scale
Illustrative Only

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Figure 4b

1966 Aerial Photograph showing extent of opencast mining

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Site Boundary

Opencast mining

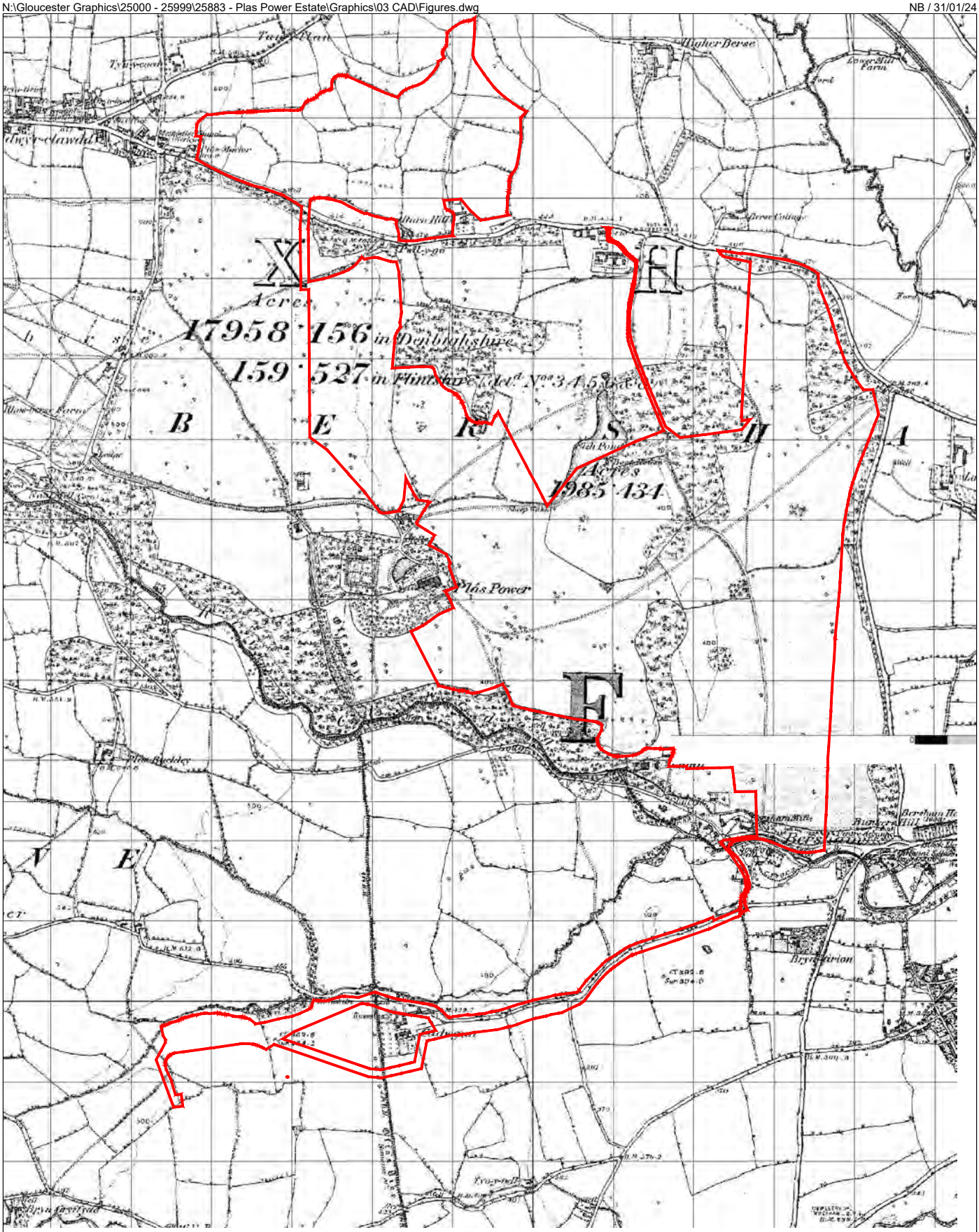
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Figure 4c
Google Earth image showing extent of opencast mining on the modern field layout

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Site Boundary

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Figure 5

1879 Ordnance Survey Map

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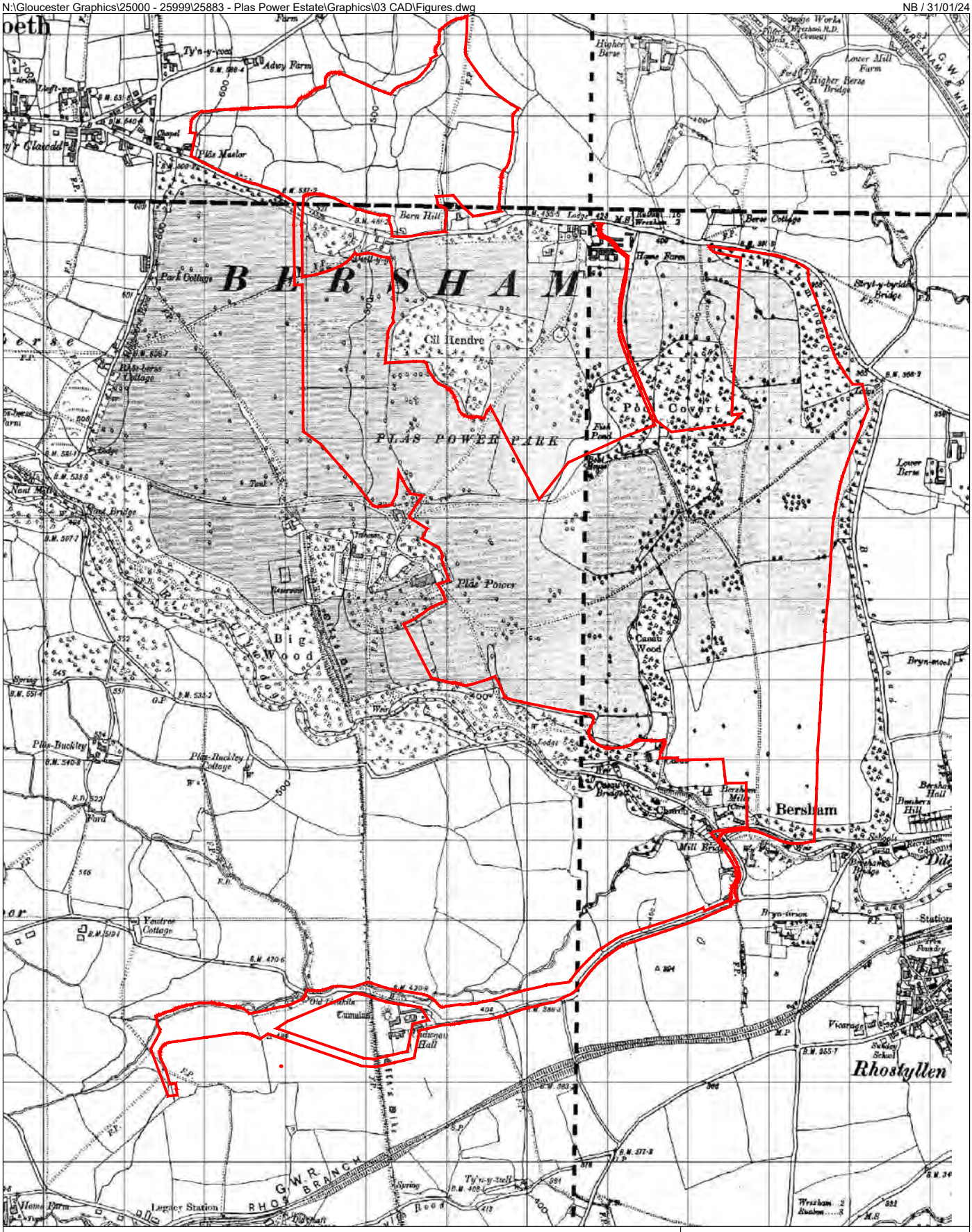


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Figure 6

1899 Plas Power Estate Map

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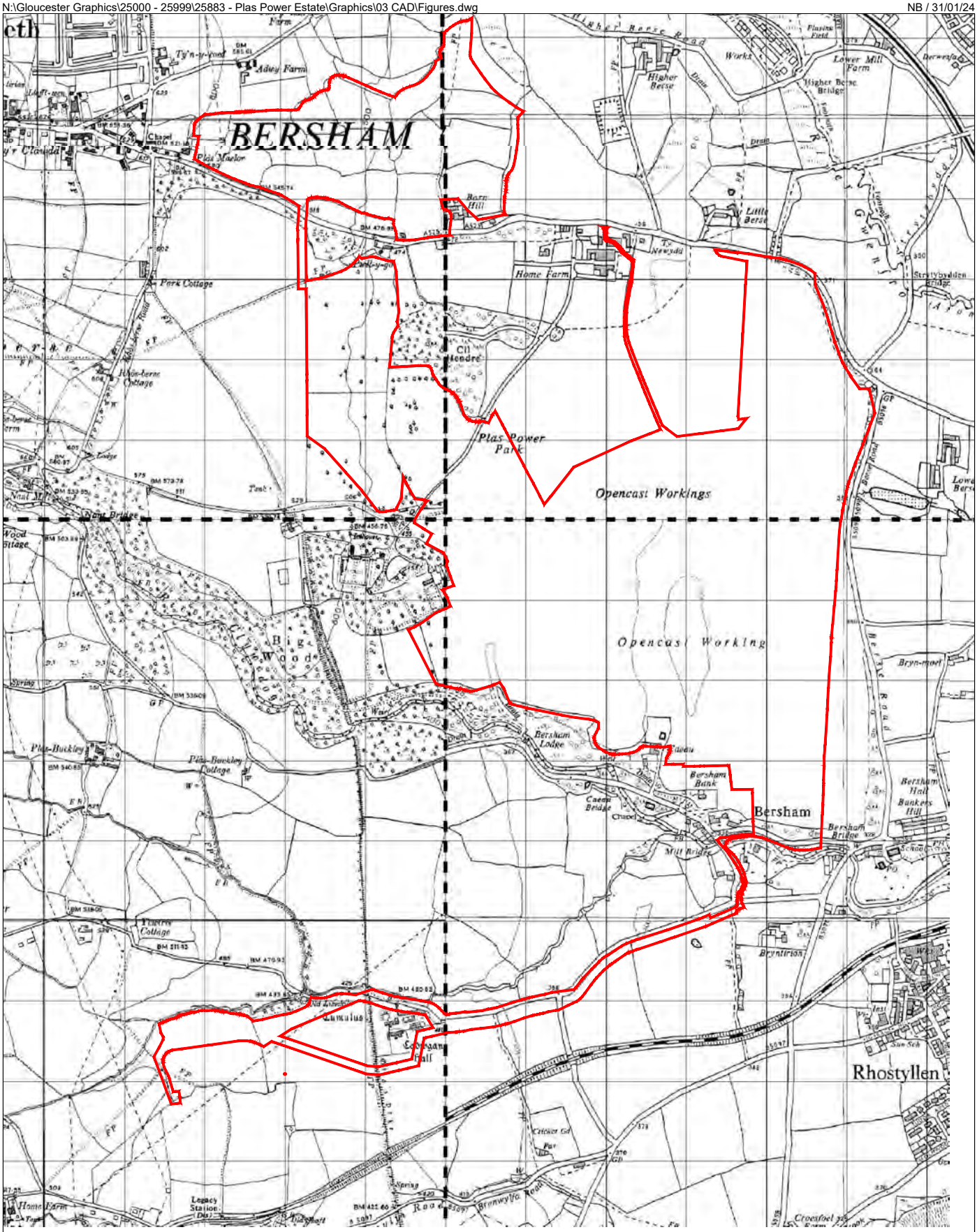


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Figure 7

1938 Ordnance Survey Map

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Site Boundary

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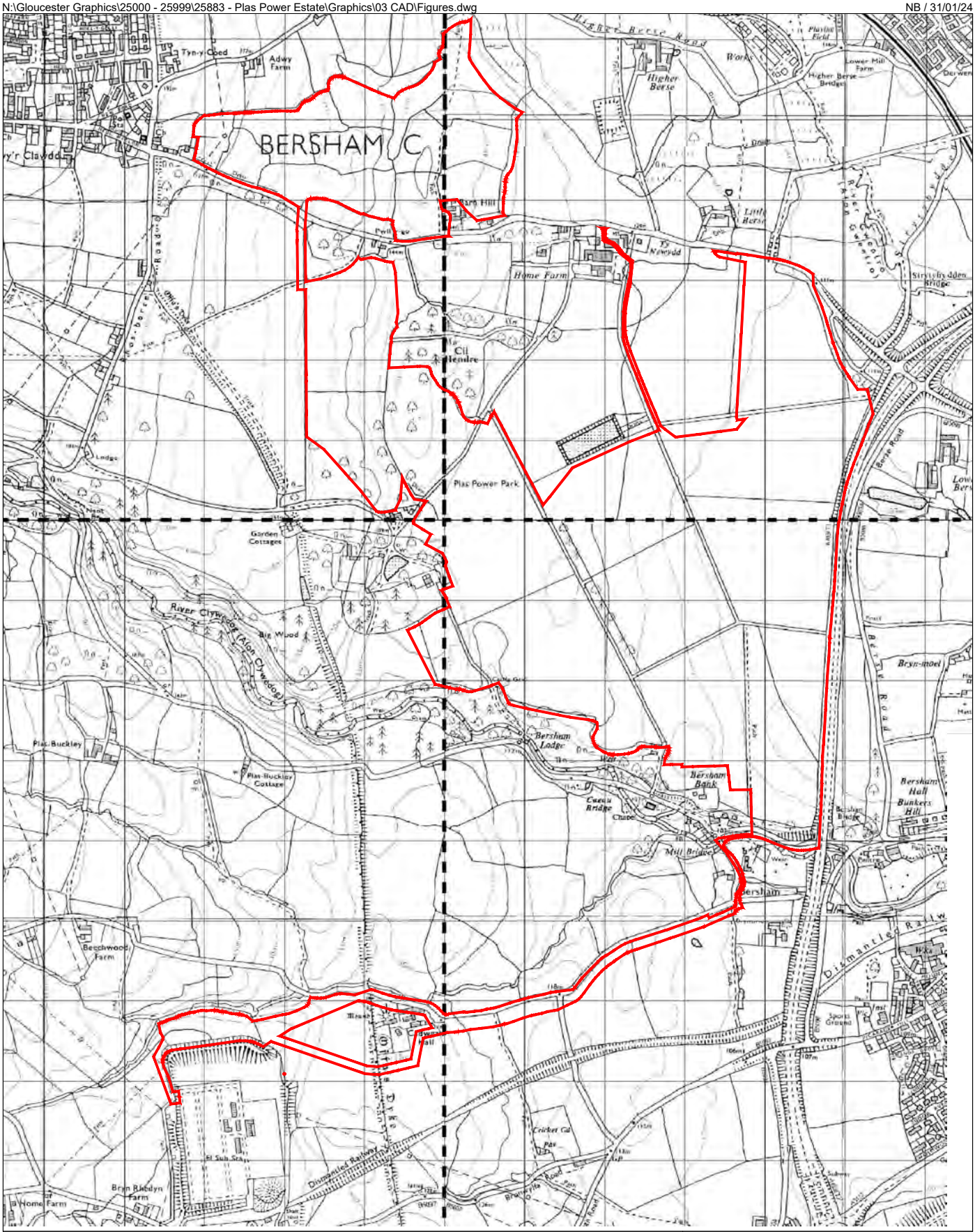
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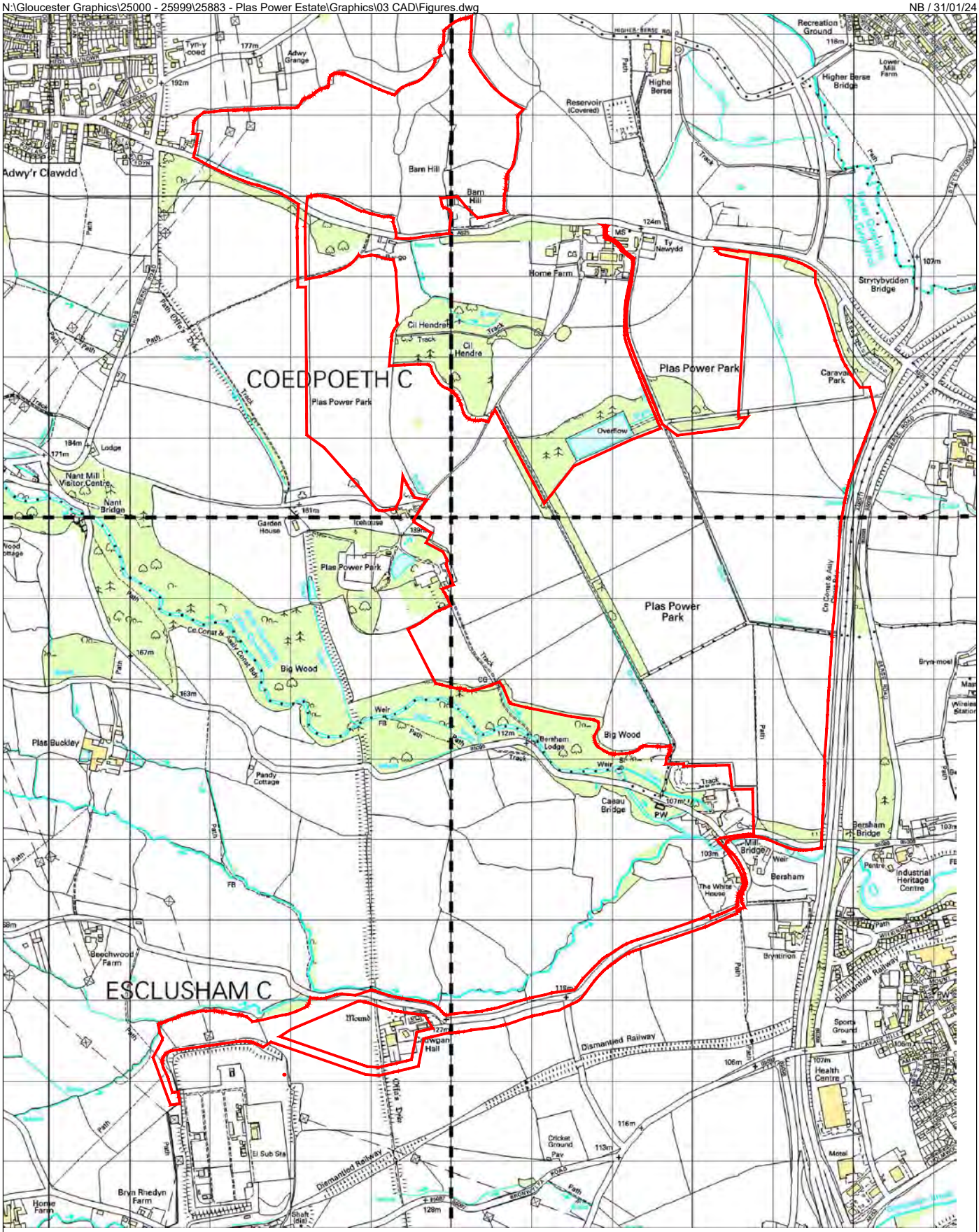
Figure 8

1963-1964 Ordnance Survey Map

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Site Boundary

N

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Figure 10

2000 Ordnance Survey Map

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Appendix 7.2
Built Heritage Desk Based Assessment

PLAS POWER SOLAR AND ENERGY STORAGE PROJECT

Built Heritage Statement



JAC25883
Plas Power
BH 2
February 2024

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Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Review date
BH1	Draft	Emma Winder BA (Oxon) MSc	Richard Smalley BA (Hons) MCIfA	Richard Smalley BA (Hons) MCIfA	04.10.2019
BH2	Updated following revisions to scheme	Richard Conolly MA(Hons) MCIfA			06/11/23

Approval for issue

Richard Smalley 4 October 2019

File/Model Location

Document location: \\CHEL-BH-03\MDrive\Cheltenham\live\Archaeology\Current Jobs\25000 - 25999\25883 - Plas Power Estate\Reports\BHS

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Prepared by:

RPS

Prepared for:

Lightsource bp

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1 INTRODUCTION

1.1 This Built Heritage Statement has been researched and prepared by RPS, on behalf of Lightsource bp, in order to identify and assess the significance of built heritage assets potentially affected by the development of land at Plas Power Estate ('the Site') as a solar farm with battery energy storage system, and to consider the possible impacts of the Proposed Development on these built heritage assets.

1.2 This report is intended to provide the baseline information required to inform decisions about the design and layout of the Proposed Development and any mitigation measures that may be required.

1.3 The full extent of the Site considered in this report is illustrated in Figure 1. The Site is centred at NGR SJ 30160 50380 and covers an area of approximately 145ha. The Site is very irregular in shape. For ease of reference throughout this report, the Site has been divided into Zones A-D that reflect both the topographic variation across the Site. These Zones are shown in Figure 2.

1.4 This report makes reference to the relevant legislation contained within the Historic Environment (Wales) Act 2016 and both Welsh government and local planning policy. In addition, relevant guidance documents have been consulted to inform the judgements made, notably *Technical Advice Note (TAN) 24: The Historic Environment* (2017), Setting of Historic Assets in Wales (2017) and *Conservation Principles for the Sustainable Management of the Historic Environment in Wales (Conservation Principles)* (2011). Relevant information including the listed citations for relevant heritage assts have also been consulted in preparing this Built Heritage Statement. The conclusions reached in this report are the result of detailed historic research, a walkover survey of the Site and publicly accessible locations in the surrounding area, map studies, and the application of professional judgement.

2 LEGISLATIVE AND PLANNING POLICY FRAMEWORK

Legislation

The Historic Environment (Wales) Act 2016

2.1 The Historic Environment (Wales) Act 2016 was passed by the Welsh National Assembly on 9th February 2016 and became law after receiving Royal Assent on 21st March 2016. This Act amends the two pieces of UK legislation, the Ancient Monument and Archaeological Areas Act 1979 and the Planning (Listed Buildings and Conservation Areas) Act 1990, which currently provide the framework for the protection and management for the Welsh historic environment. These amendments predominantly relate to the transference of a number of existing powers, including the designation of scheduled monuments and listed buildings, from the Secretary of State to Welsh Ministers. The key provisions of the Act can be summarised as the following:

- amendments to the procedure for determining scheduled monument consent;
- provision for Welsh Ministers to enter into a Heritage Partnership Agreement with the owner of a scheduled monument, or any associated land, within Wales;
- provision for Welsh Ministers to compile and maintain a register of historic parks and gardens of special historic interest; and
- provision for Welsh Ministers and/or local authorities to enter into a Heritage Partnership Agreement with the owner of a listed building, or part of such a building, situated in Wales.

2.2 The Act also contains new stand-alone provisions for the compilation of a list of historic place names in Wales; for the compilation of an historic environment record for each local authority area in Wales; and for the establishment of an Advisory Panel for the Welsh Historic Environment.

2.3 A new Historic Environment (Wales) Act was given Royal Assent on June 14th 2023. The purpose of this Act is to consolidate existing Welsh and UK-wide legislation in one place. The 2023 Act consolidates enactments in or made under the following:

- the Historic Buildings and Ancient Monuments Act 1953;
- Parts 1 and 3 of the Ancient Monuments and Archaeological Areas Act 1979;
- Parts 14 and 15 of the Town and Country Planning Act 1990;
- the Planning (Listed Buildings and Conservation Areas) Act 1990;
- Part 5 of the Planning and Compulsory Purchase Act 2004;
- the Historic Environment (Wales) Act 2016.

2.4 Although the Act has received Royal Assent, it will not come into force until supporting secondary legislation has been made and guidance and administrative documents have been revised and updated to reflect its passage. It is expected that the Act will come into force in the latter part of 2024.

Planning (Listed Buildings and Conservation Areas) Act 1990 and the Planning (Listed Buildings and Conservation Areas) (Wales) (Amendment No.2) Regulations 2017

2.5 Where any development may affect designated heritage assets, there is a legislative framework in place to ensure that due regard is given to its impact on the historic environment. Notwithstanding

the amendments made in the Historic Environment (Wales) Act 2016, this extends from primary legislation under the Planning (Listed Buildings and Conservation Areas) Act 1990.

2.6 Section 66(1) states that special regard must be given by the planning authority in the exercise of planning functions to the desirability of preserving or enhancing listed buildings and their setting.

2.7 The meaning and effect of these duties have been considered by the courts in recent cases, including the Court of Appeal decision in relation to Barnwell Manor Wind Energy v East Northamptonshire District Council [2014] EWCA Civ 137.

2.8 The Court agreed with the High Court's judgement that Parliament's intention in enacting Section 66(1) was that decision-makers should give 'considerable importance and weight' to the desirability of preserving (i.e. keeping from harm) the setting of listed buildings.

2.9 Additionally, Section 72 of the 1990 Act states that in exercising all planning functions, local planning authorities must pay special attention to the desirability of preserving or enhancing conservation areas, with this duty applying to any buildings or land within a conservation area.

2.10 The mechanisms for implementation of the 1990 UK Act were updated for a Welsh context in The Planning (Listed Buildings and Conservation Areas) (Wales) Regulations 2012. These Regulations have most recently been amended in the Planning (Listed Buildings and Conservation Areas) (Wales) (Amendment No.2) Regulations 2017. In this most recent amendment, the requirement that an application for listed building consent is accompanied by a design and access statement has been replaced with the requirement that an application for listed building or conservation area consent is accompanied by a heritage impact statement.

National Planning Policy

Planning Policy Wales (Edition 12)

2.11 Chapter 6 of PPW12, entitled 'Distinctive and Natural Places', has a section entitled 'The Historic Environment' (section 6.1 - pp. 125-131) which provides policy for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 6.1 in relation to the historic environment can be summarised as seeking to:

- protect the Outstanding Universal Value of the World Heritage Sites;
- conserve archaeological remains, both for their own sake and for their role in education, leisure and the economy;
- safeguard the character of historic buildings and manage change so that their special architectural and historic interest is preserved;
- preserve or enhance the character or appearance of conservation areas, whilst the same time helping them remain vibrant and prosperous;
- preserve the special interest of sites on the register of historic parks and gardens; and
- protect areas on the register of historic landscapes in Wales.

2.12 Section 6.1 of PPW12 describes the historic environment as comprising all the surviving physical elements of previous human activity and illustrates how past generations have shaped the world around us. The historic environment is made up of individual historic features, archaeological sites, historic buildings and historic parks, gardens, townscapes and landscapes, collectively known as historic assets.

2.13 Welsh planning legislation and policy guidance outlines that the conservation of archaeological remains and their settings is a material consideration in the determination of a planning application, whether those remains are scheduled or not (PPW12 Para. 6.1.23). In order to take account of archaeological considerations and deal with them from the beginning of the development control process, Local Planning Authorities in Wales need to be fully informed about the nature and importance of archaeological remains, and their setting, and the likely impact of any Proposed Development upon them.

2.14 Paragraphs 6.1.26 of PPW12 states that where archaeological remains are known to exist or there is a potential for them to survive, an application should be accompanied by sufficient information, through desk-based assessment and/or field evaluation, to allow a full understanding of the impact of the proposal on the significance of the remains. The needs of archaeology and development may be reconciled, and potential conflict very much reduced, through early discussion and assessment.

2.15 Paragraph 6.1.27 of PPW12 states that if the planning authority is minded to approve an application and where archaeological remains are affected by proposals that alter or destroy them, the planning authority must be satisfied that the developer has secured appropriate and satisfactory provision for their recording and investigation, followed by the analysis and publication of the results and the deposition of the resulting archive in an approved repository. On occasions, unforeseen archaeological remains may still be discovered during the course of a development. A written scheme of investigation should consider how to react to such circumstances or it can be covered through an appropriate condition for a watching brief.

2.16 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance PPW12, by current Development Plan Policy and by other material considerations.

National Guidance

Technical Advice Note (TAN) 24: The Historic Environment (2017)

2.17 TAN 24 is one of a suite of documents designed to aid the application of PPW. TAN 24 was adopted in May 2017, and supersedes pre-existing Welsh Office Circular concerning the historic environment.

2.18 TAN 24 provides specific guidance on how the planning system considers each aspect of the historic environment during development plan preparation and decision making on planning and Listed Building (LBC) applications. It also sets out that it is for an applicant to provide the LPA with sufficient information to allow the assessment of their proposal in respect of historic assets, irrespective of their designation, which may take the form of a heritage impact statement.

Technical Advice Note (TAN) 12: Design (2016)

2.19 TAN 12 provides advice on the good design of new development. Alongside promoting sustainability, it sets out that the context of a development should be appraised, including the historic environment, to inform design. Section 5.6 Historic Environment highlights that design should have regard to the desirability of preserving or enhancing the character and appearance of areas of special character, such as conservation areas. It also highlights that specialists are needed to accurately assess areas of architectural or historic character.

Conservation Principles for the Sustainable Management of the Historic Environment in Wales (Conservation Principles) (2011)

2.20 Conservation Principles provides the basis upon which Cadw discharges certain statutory duties on behalf of the Welsh Ministers. It is also for use by others (including owners, developers and other

public bodies) to assess the potential impacts of development proposals on the significance of historic assets, and assist in the decision-making process where the historic environment is affected by the planning process.

2.21 The document echoes PPW in the emphasis it places upon the importance of understanding significance as a means to properly assess the effects of change to heritage assets. The guidance describes a range of heritage values which enable the significance of assets to be established systematically, with the four main component values being:

- **Evidential value**: which derives from those elements of an historic asset that can provide evidence about past human activity, including its physical remains or historic fabric. These may be visible and relatively easy access, or may be buried below ground, under water or be hidden by later fabric. These remains provide the primary evidence for when and how an historic asset was made or built, what it was used for and how it has changed over time.
- **Historical value**: derives from the ways an historic asset might illustrate a particular aspect of past life or be associated with a notable family, person, event or movement. These illustrative or associative values of an historic asset may be less tangible than its evidential value but will often connect past people, events and aspects of life with the present. As the functions of an historic asset are likely to have changed over time, the full range of changing historical values might not become clear until all the evidential values have been gathered together.
- **Aesthetic value**: which derives from the ways in which people draw sensory and intellectual stimulation from a place. Aesthetic values can be the result of the conscious design of a place, including artistic endeavour, or they can be the seemingly fortuitous outcome of the way in which a place has evolved and been used over time, or a combination of both.
- **Communal value**: which derives from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values, but tend to have additional and specific aspects. Commemorative and symbolic values reflect the meanings of a place for those who draw part of their identity from it, or have emotional links to it. Social value is associated with places that people perceive as a source of identity, distinctiveness, social interaction and coherence. Spiritual value attached to places can emanate from the beliefs and teachings of an organised religion or reflect past or present-day perceptions of the spirit of a place.

Best Practice Guidance Overview

2.22 Cadw publishes a wide range of Best Practice Guidance documents (BPGs). This guidance relates to: the care and understanding of historic buildings, scheduled monuments and other archaeological remains; understanding the significance of, and managing, conservation areas; managing local lists, historic parks and gardens, wider historic landscapes, and World Heritage Sites; the role of the planning system in the management of the historic environment; and technical guidance for conservation.

2.23 This Best Practice Guidance is intended to complement the Historic Environment (Wales) Act 2016 and recent planning policy and advice. In particular, it is designed to provide information on good conservation practice to assist LPAs, planning and other consultants, owners, applicants, and other interested parties when implementing Welsh policy. BPGs of particular relevance are discussed below:

Heritage Impact Assessment in Wales (May 2017)

2.24 This document sets out the general principles to consider when planning changes to historic assets and applying for listed building, conservation area, and scheduled monument consent. In particular,

it emphasises the purpose and value of undertaking Heritage Impact Assessments in order to help identify the most appropriate way to accommodate change within the historic environment. The guidance echoes PPW by stressing that understanding the significance of historic assets is key to making decisions regarding the historic environment.

Setting of Historic Assets in Wales (May 2017)

2.25 This guidance document focuses on the management of change within the setting of heritage assets. It explains what setting is, how it contributes to the significance of a historic asset, and why it is important, in order to aid practitioners with the implementation of Welsh national policies and guidance relating to the historic environment.

2.26 This document defines setting as 'including the surroundings in which it is understood, experienced and appreciated, embracing present and past relationships to the surrounding landscape. Its extent is not fixed and may change as the asset and its surroundings evolve'. The guidance emphasises that setting is not a heritage asset in itself, although land within a setting may contain other historic assets. Instead, the importance of setting is noted to lie in what it contributes to the significance of a historic asset. The document also states that elements of setting may make a positive, negative or neutral contribution to the significance of an asset.

2.27 Whilst views to and from an historic asset are often the most obvious consideration in any assessment of the contribution that setting makes to the significance of an asset, other sensory elements can also affect setting, including noise, vibration, and odour. Setting may also incorporate perceptual and associational attributes pertaining to the asset's surroundings.

2.28 This document provides guidance on practical and proportionate decision making with regards to the management of Proposed Development and the setting of heritage assets. It is stated that the protection of the setting of a heritage asset need not prevent change, and also that the scale of an assessment needs to be proportionate to the likely impact of the proposal. Although not prescriptive in setting out how this assessment should be carried out, section four of the document outlines the general principles that both assessors and decision makers should consider when assessing the impact of a proposed change or development within the setting of historic assets. It identifies four key stages:

1. Identification of the historic assets that might be affected by a proposed change or development;
2. Defining and analysing the settings to understand how they contribute to the significance of the historic assets and, in particular, the ways in which the assets are understood, appreciated and experienced;
3. Evaluation of the potential impact of a proposed change or development on that significance; and
4. If necessary, considering options to mitigate or improve the potential impact of a proposed change or development on that significance.

2.29 The guidance states that the introduction of offsetting or compensatory proposals, such as public access or interpretation panels, will not reduce the impact of the development within the setting of the historic asset, and thus should not be accepted as mitigation. However, these may be considered when the decision-making body weighs up the benefits of the scheme.

Local Planning Policy

2.30 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance PPW, by current Development Plan Policy and by other material considerations.

2.31 The Site is located within the Wrexham County Borough Council area, which has adopted the Wrexham Local Development Plan (LDP) 2013 – 2028. The relevant policy of the LDP is:

Policy SP15 Historic and Cultural Environment *– Development will only be supported where it conserves, protects, preserves or enhances the following cultural and historic assets of the County Borough and their setting:*

i. Listed Buildings;

ii. Conservation Areas;

iii. Pontcysyllte Aqueduct and Canal World Heritage Site;

iv. Registered Historic Parks, Gardens and Landscapes; and

v. Scheduled Monuments and Archaeological Remains.

Local Planning Guidance

2.32 The Council have approved a series of Local Planning Guidance Notes. Local Planning Guidance Note No 4 – Conservation Areas has been referred to in the production of this report; although, the main objective of this document is to provide guidelines to improve design standards in Conservation Areas and does not address issues relating to the setting of Conservation Areas. The Bersham Conservation Area Assessment and Management Plan (adopted December 2009) has also been referred to in the production of this report.

3 HISTORIC BUILT ENVIRONMENT APPRAISAL

Introduction

3.1 The full extent of the Site considered in this report is illustrated in Figure 1. The Site is centred at NGR SJ 30160 50380 and covers an area of approximately 145ha. The Site is very irregular in shape and takes in arable fields to the north of the A525 (Zone A) and to its south (Zones C-D). The fields are bounded by hedgerows with a shelter belt between Zones C and D.

3.2 Height Above Ordnance Datum (AOD) at the western boundary of the site in Zone B is 180m, in Zone A 170m. The lowest parts of the site are along the eastern boundary of Zone D, where height AOD is approximately 105-110m. As a result, from some western parts of the Site there are long-distance views east over Wrexham. The valley of the River Clywedog which runs along the southern boundary of Zone C and D and in which the village of Bersham is steep-sided and wooded.

3.3 Within the study site there are minor variations in this broad topography.

Historic Development

Bersham and Surrounding Area

3.4 Activity in the Bersham area can be traced back to the Roman period, when lead and other minerals were mined in the Esclusham and Minera Mountains. Evidence of later Anglo-Saxon influence in the area is provided by Offa's Dyke, which was constructed in the mid- to late-eighth century by King Offa of Mercia and runs broadly north-south past the Site. Further evidence of Anglo-Saxon influence is provided by local place names incorporating 'Ham', an English word meaning settlement or manor, and 'Esclus', probably an English corruption of the Welsh 'Ystlys' that refers to the side or flank of a hillside.

3.5 By the Medieval period, Bersham formed part of the manor of Esclusham. This was later separated into Esclusham above the dyke and Esclusham below the dyke, and Bersham then became a separate township within the parish of Wrexham. The settlement at Bersham was formed during the Medieval period from two adjacent groups of cottages known as Pentre Dybenni and Dol Cuhelyn.

3.6 Industry has played an important role in the history of Bersham and the surrounding area. The topography of the riverbank at Bersham made it ideal for iron production: the natural cliff formation allowed furnaces to be charged from the top and for the molten metal to run off below at road level; the surrounding woodlands supplied them with plentiful fuel; and the fast flow of the River Clywedog provided a power supply to drive the water wheels. Bersham also lay in a favourable position between the busy ports at Liverpool and Chester, the mineral deposits of North Wales, and the rich markets of central England. Evidence suggests that there were already several iron furnaces and foundries along the Clywedog Valley by the seventeenth century, and in the late-eighteenth century the settlement prospered from, and was shaped by, its booming iron industry.

3.7 In 1763 Isaac Wilkinson diverted the course of the River Clywedog and built a number of weirs along its length in order to better supply power to his mills. Whilst now dry, these leats remain visible in Plas Power woods and the meadow leading to Papermill Cottage. In 1774, his son, John Wilkinson, patented the first machine to accurately bore cannon, and in 1775 the village's Octagonal Building (Grade II* listed, ref. 1568) (plate 1) was built to keep up with the huge demand. In the same year, Wilkinson also began producing bored cylinders for the Boulton and Watt steam engine, thereby placing Bersham at the heart of the Industrial Revolution.

3.8 From 1777 to 1795 the Bersham ironworks prospered as international conflicts such as the American War of Independence ensured a strong demand for Wilkinson's cannon. However, increased competition from rival iron works and Wilkinson's focus on other more profitable sites led to the

closure of the ironworks in Bersham in 1812. Following the ironwork's decline, paper and corn mills came to re-use redundant ironwork buildings. Two paper mills were located in Bersham during the nineteenth-century and the blast furnace on the west side of the village was converted to a corn mill in 1829 and worked until 1933.

3.9 Through both the nineteenth and twentieth centuries, mining was another important local industry, with 38 collieries operating in the Wrexham area at peak. During the twentieth century, a large area of land to the north of Bersham, which encompassed much of Zone D of the Site, was used for opencast mining (see Figure 8).

Plas Power

3.10 Plas Power Estate has origins in the fifteenth-century, when it was owned by Robert Bellow. In the seventeenth century, the Estate passed by inheritance to the Power family, after whom it was re-named. The estate's relationship to the Power family was short-lived, however, as by 1847 it was under the ownership of William Lloyd, who replaced the original house with a new red-brick mansion (demolished after World War II). Lloyd also made a number of other 'improvements' to the estate, and it was Lloyd who was responsible for enclosing the associated parkland with the imposing stone wall that remains a strong character feature of the local area to this day. St Mary's Church (Grade II*, ref. 16553) (plate 2), which is a local landmark building, was commissioned by Lloyd's descendants in the later-nineteenth century. The distinctive 'estate architecture' style that is a feature of the surrounding area, comprising sandstone walling, slate roofing, cast-iron latticed windows and decorative timber barge-boards, is characteristic of the influence of the Plas Power Estate.

Map Regression

3.11 The earliest available detailed mapping of the Site is the Bersham Township tithe map (1841) not illustrated). The tithe map and their associated apportionment shows that in the early 1840s Zones C and D comprised parkland associated with Plas Power, with Plas Power shown to be enclosed to the north, south and west by plantations. Zones A and B were also owned by Thomas Fitzhugh of Plas Power but comprised smaller field parcels which are recorded as being agricultural land (predominantly arable and pasture) variously associated with Rhos Berse, Upper Berse, and Ty'n Ddol.

3.12 Ordnance Survey (OS) mapping from 1879 (Figure 4) provides evidence of the 'improvements' made to the Plas Power Estate by William Lloyd. In this mapping, Zone B no longer comprises smaller agricultural field parcels but instead forms part of the parkland. This parkland stretches from Rhos Berse Road to the west, to what is now the A525 to the north, and the old Berse Road to the east. The re-building of Plas Power itself is also shown, with the new mansion in a similar position to the old but now enclosed to a greater extent, on all sides, by more substantial plantation. The West Drive is also shown to have been constructed. An Estate Map dated 1899 that uses the 1879 OS map as a base (Figure 5) indicates all of Zones B, C and D, except a small parcel of land adjoining Bersham at the south of Zone D, were 'in hand'. Zone A was occupied by S. J. Reeves, Robert Morris, and Sarah Pritchard.

3.13 The 1938 OS mapping (Figure 6) shows the extent of Plas Power Park shaded in grey, reflecting the change in Ordnance Survey practice. This is largely the same as in the late-nineteenth century, except that the south-eastern part of Zone D, adjacent to Bersham, is no longer shown as part of the Park. The Site seems otherwise broadly unchanged. Within the surrounding area, however, some expansion of Coedpoeth is evident. Similarly, to the north-east, Broughton is shown to have expanded after the arrival of a second railway line.

3.14 In the Post-War period, however, both the Site and its surrounds underwent considerable change. In 1946-7 Plas Power was demolished; although, as illustrated in the 1963-4 OS mapping (Figure 7), a number of adjacent estate buildings and the plantation in which it was enclosed remained.

Zone A, which had previously been farmed independently, is largely unchanged in this mapping. Zone B also appears to be largely unchanged. However, the former parkland to the east of Plas Power, including much of Zones C and D was being used for opencast mining by this time. Within the surrounding area, both Coedpoeth and Broughton display further expansion.

3.15 The extent of the opencast mining on the former Plas Power parkland is illustrated in an aerial photograph from 1966 (Figure 8), which shows these opencast workings extending right up to the plantation in which Plas Power had formerly stood.

3.16 By 1974-1979 OS mapping (Figure 9), however, this opencast mining is shown to have ceased, with made ground in the area of the former workings, displaying the field boundaries, linear tree belt, overflow pond and tracks now present. Zone B also appears to be in agricultural use with a number of new field boundaries dividing the formerly open land. Zone A appears largely unchanged. Along the eastern boundary of the Site, the A435 is shown to have been constructed, dividing Bersham in two.

3.17 Ordnance Survey mapping from 2000 (Figure 10) shows no changes to the Site, with only a small number of field boundary changes evident. No substantial changes to the surrounding area are apparent either. Although, to the north-east of the Site, the railway lines to the south of Broughton are shown to be disused and part has been built over with residential development at ‘New Broughton’.

Assessment of Heritage Assets

3.18 In order to identify and assess those built heritage assets potentially affected by the Proposed Development, an initial 3-kilometre search-radius was used over which a Zone of Theoretical Visibility (ZTV) was produced (Figure 3). This along with site visits have informed the identification of those assets that may be affected by the Proposed Development, i.e. Stage 1 of the four stage assessment process laid out in guidance (Cadw 2017).

3.19 The Site contains no designated or non-designated built heritage assets.

3.20 There are 287 Listed Buildings in the 3km study area. These comprise two Grade I, 24 Grade II* and 261 Grade II. Of these, 141 lie in Wrexham, in excess of 1km to the east of the Site. The ZTV demonstrates that there will be no intervisibility between these, their immediate surroundings and the Proposed Development. It is it is considered that there is no potential for their settings to be affected and they are not considered further.

3.21 Fifteen Listed Buildings are in Brynteg and the ZTV demonstrates that there will be no intervisibility between these, their immediate surroundings and the Proposed Development. It is concluded that there is no potential for the Proposed Development to affect their setting and they are not considered further.

3.22 Thirty Listed Buildings are in Minera, Coedpoeth, New Brighton and Rhossllannerchrugog. The ZTV demonstrates that there will be no intervisibility between these, their immediate surroundings and the Proposed Development. It is concluded that there is no potential for the Proposed Development to affect their setting and they are not considered further.

3.23 There are 35 Listed Buildings in the Erddig Registered Park, including the Grade I Erddig itself (1533), which is 1.9km from the Site. The ZTV indicates that the Proposed Development will not be visible from most of the Listed Buildings, including Erddig, and the greater part of the park. It suggests some intervisibility from the eastern part of the park. However, in practice, trees in the park result in there being no intervisibility between those parts of the park within the ZTV and the Site. It is concluded that there is no potential for the Proposed Development to affect their settings and they are not considered further.

3.24 A further 11 Listed Buildings lie scattered to the south of the Site at Talwrn and to the south of Rhostyllen. The ZTV demonstrates that there will be no intervisibility between these, their immediate

surroundings and the Proposed Development. It is concluded that there is no potential for the Proposed Development to affect their setting and they are not considered further.

3.25 A further 28 Listed Buildings are scattered across the study area, outside the ZTV. As the Proposed Development will not be visible from them or their surroundings it is concluded that there is no potential for their settings to be affected and they are not considered further.

3.26 The remainder of the Listed Buildings comprise 16 in the Bersham Conservation Area, immediately to the south of the Site, a group of five at Plas Power close to the western limit of the Site, a group of four on Rhos Berse Road to the west of the Site, two farmhouses to the north of the Site. Whilst some of these lie outside the ZTV, they have been taken through to assessment owing to proximity.

3.27 There are six Conservation Areas in the study area. The nearest of these is Bersham, which lies adjacent to the Site. This has been taken through to assessment. The remaining Conservation Areas are a minimum of 1.9km from the Site and the ZTV indicates that the Proposed Development will not be visible from them or their surroundings. It is concluded that there is no potential for their settings to be affected and they are not considered further.

3.28 There are two Registered Parks and Gardens in the study area. These are approximately 1.5km to the east of the Site. As discussed above, Erddig lies partially within the ZTV. However, trees mostly within the park screen these views and consequently there is no potential for the Proposed Development to affect the setting of the park and it is not considered further. Similarly, the ZTV indicates a degree of intervisibility between Wrexham Cemetery and the Proposed Development. However, trees surrounding the cemetery screen these views and it is concluded that the there is no potential for the setting of either of these assets to be affected by the Proposed Development

3.29 Scheduled Monuments are considered in a separate archaeological report (RPS 2023).

3.30 Following the Stage 1 assessment, the following listed buildings and conservation areas that lie within a 3-kilometre search radius of the Site are considered below. Where appropriate, namely where the Site is considered to make the same contribution to the significance of a number of assets, these assets have been grouped, as indicated below. For the same reason, those listed buildings situated within the Bersham Conservation Area (including the Grade II* listed Octagonal Building at Bersham Ironworks Site (ref. 1586), Single Storeyed Building to SE of Octagonal Building at Bersham Ironworks Site (ref. 16539), and Church of St Mary (ref. 16553)) will be assessed below in conjunction with the Conservation Area.

- Bersham Conservation Area and listed buildings within.
- Plas Power Grouping - comprising the Ice House (Grade II, ref. 1793), Stable Block (Grade II, ref. 16452), Bath House (Grade II, ref.16453), Game Larder (Grade II, ref. 1737), and Dairy (Grade II, ref. 1738).
- Walls, railings, gates and entrance lodge to Plas Power Park – comprising the Walls to Plas Power Park including Park Cottage (Grade II, ref. 16455), Wall to Plas Power Park SW of Rhosberse Lodge (Grade II, ref. 16456), Rhosberse Lodge at Entrance to West drive at Plas Power (Grade II, ref. 1740), and Railings and Gates to West Entrance Drive at Plas Power (Grade II, ref. 16454).
- Higher Berse Farmhouse (Grade II, ref. 16457).
- Tyn-y-Coed (Grade II, ref. 1562).

Bersham Conservation Area

3.31 **Description:** Bersham Conservation Area was first designated in August 1975, with its boundary later amended in 2003. It is situated approximately 2.5 miles to the south-west of Wrexham city centre, within the wooded part of the upper reaches of the Clywedog Valley, which runs from Minera to Wrexham. It is broadly linear, with its eastern reaches situated due north of Rhostyllen and its

wooded western reaches extending a little way beyond Bersham Lodge (Grade II listed, Ref: 16556). The A483 fly-over passes north-south through the centre of the Conservation Area.

3.32 A Conservation Area Appraisal and Management Plan (CAAMP) was adopted by Wrexham County Borough Council in December 2009. As detailed in the CAAMP, the Conservation Area possess four distinctive character areas: the lane from the west boundary to Mill Farm; the area of the West Ironworks Site; the East Ironworks; and Bunkers Hill and Y Ddol. However, the overall character and appearance of the Conservation Area is largely of a rural settlement that has been heavily influenced by both its industrial past and the nearby Plas Power estate. Built form within the Conservation Area demonstrates a variety of architectural styles and is generally of a high quality, with many listed buildings and structures. The remains of Wilkinson's Ironworks - which includes the Grade II* listed Octagonal Building at Bersham Ironworks Site (ref. 1586) and the Single Storeyed Building to SE of Octagonal Building at Bersham Ironworks Site (ref. 16539) – in addition to structures relating to historic water management, and workers' cottages, provide an important link to the Area's industrial past. The architectural influence of the Plas Power Estate is also evident in the Area's built form, with the Romanesque-style Church of St Mary (Grade II*, ref. 16553) (plate 2) built for the use of the Plas Power household forming a landmark building within the Conservation Area, and with a number of buildings within the Conservation Area displaying the distinctive 'estate architecture' style that indicates their origins as part of the Plas Power Estate (plate 3).

3.33 There is also a great sense of enclosure throughout the Conservation Area, with buildings, boundary walls, and mature trees closely abutting the routeways through the Conservation Area, relieved only in its central part where the Conservation Area briefly opens up to allow occasional glimpsed views of the surrounding countryside to the south. The western reaches of the Conservation Area are the mostly tightly enclosed, with the valley sides and dense woods on its north side and the hedges and mature trees to the south creating a strong sense of enclosure and shadow along the lane from the west boundary to Mill Farm (plate 4). Being well treed throughout, particularly along its boundaries, has resulted in Bersham being a discrete, visually enclosed settlement.

3.34 The CAAMP provides the following summary of the special character of the Conservation Area: '*The special character of the area has been greatly influenced by the valley landscape setting and the historical and architectural association with John Wilkinson's ironworks and the Plas Power Estate. A number of factors contribute to the special character of the area and these are now outlined below:*

- *The Iron work buildings and sites – The remains of Wilkinson's Ironworks are an important link with the area's industrial past. The old blast furnace, now known as The Mill, and the octagonal foundry are both particular landmark buildings, built of hand made bricks in contrast to other structures in the area.*
- *The numerous bridges and remains of the river weirs, sluice gates and leats – The weirs situated at various points along the River Clywedog contribute greatly to the character and distinctiveness of the area. The differing styles and varying materials used in the construction of the bridges and weirs contribute to the visual diversity of the area and assist in the integration of the built with the natural environment.*
- *The wooded valley sides and banks of the River Clywedog – Plas Power Wood is a striking landscape feature that dominates the upper part of the Conservation Area. It gives the site a feeling of enclosure and contributes to the setting of a number of buildings. It is a designated wildlife site that contains ancient woodland managed by the Woodland Trust. The Clywedog Trail runs through the wood, along the path of Wilkinson's wagon way, originally used to transport raw materials to the works from the mines in Minera.*
- *The strong architectural influence of the Plas Power Estate – Bersham Lodge, St Mary's Church, and the Estate Cottages are landmark buildings creating a strong sense of place and identity. The distinctive 'estate architecture' style, comprising sandstone walling, slate roofing, heavy cast-iron latticed windows and carved decorative barge-boards, is characteristic of the influence of the Plas Power Estate.*

- *Boundary details – Sandstone boundary walls of various types with differing capping styles are a common and distinctive feature of the Conservation Area. In particular, the high boundary wall to the Plas Power Estate dominates long stretches of the roadside. Elsewhere the walls are lower in height, creating a more open feel. There is a long stretch of historic cast iron park railings along the roadside from Bersham Lodge to the entrance to Bersham Bank. The heavily decorated railings and gates surrounding Bersham Lodge are particularly good examples. In some places, stone boundary walls are softened by natural vegetation with hedges grass verges and the absence of pavement and kerbs, creating a distinctly rural feel. The hedging consists of a variety of mixed indigenous species including hawthorn, holly, hazel, yew, and sycamore. In the Ddol area, Ruabon red engineering brick walls and cast iron railings and gates take precedence.*
- *The historic place, street and house names – Various historic place names have survived (ed. Bunkers Hill, Ballistics Bank, The Smith, Pentre Dybenni and Y Ddol).*
- *Y Ddol – A compact area of high-density buildings set into the steep valley side close to the river, creating a sense of compactness. Very characteristic of the 19th and 20th century style industrial housing using terraces, semi-engineering and red brick, slate roofs with red ridge tiles, brick boundary walls and cast iron gates.'*

3.35 **Setting and contribution of the Site:** The Conservation Area abuts the northern edge of the village of Rhostyllen to the south-east but is otherwise surrounded by agricultural land and areas of woodland. As discussed above, and in the CAAMP, the Conservation Area's landscape setting within the wooded upper reaches of the Clywedog Valley has had a formative impact on the special architectural and historic interest of the Conservation Area, in particular its historically significant contribution to the Industrial Revolution. The Conservation Area's historic connection to the Plas Power Estate, of which the Site forms a part, has also contributed to the special character of the Conservation Area.

3.36 However, whilst the agricultural land (including the Site) that now largely surrounds the Conservation Area makes a contribution to the rural character of the settlement, it makes no contribution to an appreciation of the significance of Bersham's industrial heritage. Moreover, as noted above and in the CAAMP (2009), the Conservation Area is characterised by a strong sense of enclosure and is heavily wooded/enclosed by trees. As such, there is very little intervisibility between the Conservation Area and the surrounding countryside.

3.37 As the Conservation Area lies adjacent to the Site, the Site forms part of the agricultural surroundings. It therefore makes some contribution to its character as a rural settlement. However, those parts of the Conservation Area the Site abuts are particularly well enclosed by the local topography, woodland to the north, and trees and hedgerow to the south. As such, '*there are no vistas or glimpses of distant hills, surrounding countryside of the adjacent Plas Power Estate'* (CAAMP, 2009). Nor is the Site visible when approaching the Conservation Area from the west. Moreover, available views of the Conservation Area from the Site do not take in any of the Conservation Area's built form. As such, there is no appreciation of the historic and architectural special interest of the Conservation Area, or the listed buildings that lie within the Conservation Area, from the Site. The present appearance of the Site is such that Zones C and D are not readily discernible as former parkland. The Site is not, therefore, considered to contribute to the sense of place and identify the influence of Plas Power has provided the Conservation Area. Overall, it is therefore considered that the Site presently makes only a very small positive contribution to the significance of the Conservation Area and the listed buildings within it.

Plas Power Grouping

3.38 **Description:** The Plas Power Grouping comprises five listed estate buildings situated in close proximity to the site of the former Plas Power country house (demolished 1946-7). As detailed above, the Plas Power Estate has fifteenth-century origins, but the House was remodelled in 1858 by

architect John Gibson for the then-owner Thomas Lloyd Fitzhugh. All five listed estate buildings appear to be largely contemporary with this remodelling and period of improvements to the estate. For a full description of the assets, reference should be made to their statutory listing descriptions (appendix A). During the Site walkover survey, it was apparent that, with the exception of the Stables (plate 5) which remain in use, these listed buildings are in a particularly poor state of repair, with undergrowth preventing close inspection.

3.39 **Significance:** The significance of these assets is largely derived from their historic form and fabric, and from their historic interest as surviving architectural elements of the Plas Power Estate. The assets possess historic illustrative value as mid-nineteenth century estate buildings, with the Bath House being a rare example of an architecturally conceived well-house and the Stables remaining largely intact and in their original use. The assets also possess associative value with both the Plas Power Estate and notable architect John Gibson, and evidential value as they provide evidence of the layout and form of Thomas Lloyd Fitzhugh's remodelling of the Estate. The assets possess some aesthetic value due to their high-quality design and construction; although with the exception of the Stables this has been significantly detracted from by their poor state of repair (plates 6 and 7). The assets share group value.

3.40 **Setting and contribution of the Site:** With the exception of the Stables, these assets are surrounded by the plantation that (as demonstrated above) has enclosed them since they were constructed alongside the main house in the mid-nineteenth century. Within the plantation, in addition to the assets themselves, a number of other historic features survive (albeit in dilapidated condition) such as the walled garden and pond (plate 7) and, to their south, a ha-ha (plate 8). It is considered that this immediate setting contributes positively to the assets' historic illustrative, associative and evidential values as constituent elements of Thomas Lloyd Fitzhugh's Estate, and by providing further evidence of its historic form and layout. Although, if left to further overwhelm the assets, this surrounding vegetation may put the assets' significance at risk.

3.41 The Stables lie immediately north of the plantation, just off the bottom of the steep access route from the west introduced contemporaneously by Thomas Lloyd Fitzhugh. The immediate setting of the Stables is defined by clipped hedges to the west, mid-twentieth century buildings to the north-east, and mature trees to the south-east. Some aspects of the Stables' immediate setting are considered to detract from the asset's significance, such as the adjacent mid-twentieth-century built form that detracts from an appreciation of the Stables' aesthetic value. Other elements, such as the contemporary West Drive and the plantation and the surviving historic features within, contribute positively to the Stables' significance. This is because they help to place the asset within its historic setting, thereby providing historic illustrative and evidential value. They also share group value with the asset as constituent parts of the Plas Power Estate as remodelled in the mid-nineteenth century.

3.42 The wider setting of the assets comprises agricultural land to the north-west, north-east and south-east, much of which lies within the Site, interspersed with tree belts. Much of this agricultural land, including the Site, shares an historic functional connection to the assets as part of the Plas Power Estate. Zones B, C and D of the Site historically formed part of the parkland surrounding Plas Power and the assets. When approaching the assets from the west, having passed through the listed walls, railings and gates, and past Rhosberse entrance lodge (assessed below), there is some appreciation of the historic functional connection between the assets and parts of the Site visible from this approach. However, on the whole, the current appearance of this agricultural land means it is not readily discernible as historic parkland. Furthermore, there is no intervisibility between the assets and Zones A and D, or all but the south-westernmost part of Zone B. Due to its position to the north of the plantation, there is intervisibility between Zone B and the Stables. However, the other assets are almost entirely enclosed by plantation and have little to no intervisibility with Zone C. Overall, the assets' wider setting, of which the Site forms a part, is considered to make only a low-moderate contribution to the significance of the assets. This contribution is secondary to the contribution made by the assets' immediate setting and their historic form and fabric.

Walls, railings, gates and entrance lodge to Plas Power Park

3.43 **Description**: The walls with cottage, railings, gates, and Rhosberse Lodge are Grade II listed assets broadly contemporary to the remodelling of Plas Power in 1848 by the then-owner Thomas Lloyd Fitzhugh, and are all associated with his enclosure of the Parkland around this time too. As with much of the mid-nineteenth century work at Plas Power, these assets, situated along Rhosberse Road, are examples of the Picturesque style of architecture. For a full description of the assets, reference should be made to their statutory listing descriptions (appendix A) (see also plates 9 and 10).

3.44 **Significance**: The significance of these assets is largely derived from their historic form and fabric, and from their historic interest as surviving architectural elements of the Plas Power Estate. The assets possess historic illustrative value and aesthetic value as fine examples of estate architecture adopting the Picturesque architectural style, in particular the striking boundary wall. The assets provide evidence of Lloyd Fitzhugh's ambitions to extensively remodel the Plas Power Estate in the mid-nineteenth century. They also possess associative value with the Estate, and share group value with each other and with other surviving elements of Lloyd Fitzhugh's works (such as the Plas Power Grouping assessed above).

3.45 **Setting and contribution of the Site**: The assets are situated along Rhosberse Road, forming the western boundary of the former area of parkland at Plas Power. This setting makes an important contribution to the significance of the assets, as they were originally constructed to enclose this parkland, and were intended to be experienced when passing along Rhosberse Road. It remains the case that the historic illustrative and aesthetic values of these assets as structures in the Picturesque style can be mostly readily appreciated passing along Rhosberse Road. However, the appearance of this this former parkland, of which Zones B, C and D of the Site are comprised, has undergone great change. Its present appearance is as parcels of agricultural land rather than as parkland, and this detracts from the ability to understand the assets as having been built to enclose an estate parkland. Indeed, the ability to recognise them as part of a country estate is largely derived from their highly distinctive architectural form and style, rather than the character and appearance of the surrounding landscape. Although, a number of specimen trees adjacent to the listed Wall and within the plantation surrounding the Plas Power Grouping provide some indication of this as former parkland. Overall, it is considered that the Site - and in particular Zones B, C and D as former parkland - makes a low-moderate positive contribution to the significance of the assets.

Higher Berse Farmhouse (Grade II, ref. 16457)

3.46 **Description**: Higher Berse Farmhouse is a fine example of an early-nineteenth century farmhouse retaining much of its original fabric and design. It was built in 1814 on the site of an earlier farmhouse that was purchased and immediately demolished by the Plas Power Estate. The asset appears to be largely constructed of roughly coursed and squared rubble stone, although the main front is tooled ashlar. It is arranged over two storeys, with a double pile plan under a hipped slate roof with bold overhanging eaves and three stacks. The front (south) elevation is of three bays, with a full-height recessed central arch in which the doorway is set. The building's fenestration is of a mixture of sizes and styles. There is a recent single-storey rear extension under a hipped slate roof to the rear of the property. The interior of the building was not inspected, but the listing description (Appendix A) notes the building retains much of its original interior detailing.

3.47 **Significance**: The significance of Higher Berse Farmhouse is as an early-nineteenth century gentry farmhouse retaining a relatively high degree of integrity. The asset possesses historic illustrative value as a substantial farmhouse of some status, typical of a period when many landowners were undertaking agricultural 'improvement'. Its surviving original interior features likely illustrate tastes in décor in this period also. The asset's pleasing design and architectural detailing provides the asset with aesthetic value, and the asset may possess some evidential value as further investigation may reveal more about the previous farmhouse that stood on the site.

3.48 **Setting and contribution of the Site**: The immediate setting of Higher Berse Farmhouse comprises the sizeable garden plot in which it is situated and the former farmyard to the east. This immediate setting makes a positive contribution to the significance of the listed building, contributing to its aesthetic value in reinforcing its domestic character as a residence of some status. This garden plot appears in historic mapping to have long been well-planted. Some of the current structures within the area of the former farmyard appear to be of some age, potentially contemporary to the Farmhouse, sharing an historic functional connection to the asset. Although, the legibility of the relationship between these former outbuildings and the Farmhouse has been somewhat eroded by their conversion to residential use.

3.49 Return views from the field immediately south of the farmhouse take in the southern (front) elevation of the asset, in conjunction with the adjacent former agricultural buildings. These views allow for an experience of the asset's aesthetic and historic illustrative values and significance as the centrepiece of a nineteenth-century farmstead.

3.50 The wider setting of the asset can be considered to include the surrounding open fields, which include Zone A approximately 350m to the west. This agricultural land helps to place the asset in its historic rural context, making a positive contribution to its historic illustrative value and significance. However, as illustrated in the 1899 Estate Map, Zone A is not a part of Higher Berse Farm's historic landholding. This part of the Site therefore has a very slight historic functional connection to the asset. The raised twentieth-century reservoir to the south-west of the asset, which adjoins the primary approach to the asset from the south, has also partly eroded the rural character of the assets' wider setting.

3.51 The remainder of the Site possesses a similarly loose functional connection to the asset, both having once been part of the historic Plas Power Estate. It forms part of the extended rural setting of the asset, but there is no intervisibility or sequential views of the asset and Zones B, C and D. Due to the rising topography to the west, there are some views of the asset from within Zone A, but these views take in only the roof and chimneys of the asset which provides a very limited appreciation of the historic and architectural significance of the asset. Overall, the remainder of the Site is considered to make only a negligible positive contribution to the significance of the asset and the ability to appreciate that significance.

Tyn-y-Coed (Grade II, ref. 1562)

3.52 **Description**: Tyn-y-Coed is an example of a mid-eighteenth century dwelling house that appears to represent a single phase of building, albeit with some twentieth-century alterations to the exterior. It is constructed of brown brick with a slate roof, coped gables, and multi-pot end stacks. The rear of the building has been rendered and painted. The asset is arranged over three storeys with its primary front (being of three bays with a central entranceway). The asset's fenestration is original, but the windows themselves are modern.

3.53 **Significance:** The listed description for the asset notes that its significance and reason for designation is as '*a significant survivor of a mid C18th house in this area, notwithstanding extensive alteration to exterior detail*'. The asset possesses historic illustrative and evidential values as a substantial mid-eighteenth-century farmhouse, demonstrating local design practices and vernacular materials employed at this time. Its materials and architectural detailing also provide the asset with some aesthetic value, notwithstanding the modern alterations that detract somewhat from its appearance.

3.54 **Setting and contribution of the Site**: The immediate setting of the asset is defined to the north by a collection of agricultural outbuildings arranged around a former yard. The present use of these outbuildings is not clear, but a number of them appear to be of some age. This aspect of the asset's immediate setting helps to place the asset in its historic and functional context, contributing to its historic illustrative value as an historic farmhouse. To the south, east and west, the asset's immediate setting comprises a well-treed garden plot and areas of hardstanding surrounded by a

random rubblestone wall approximately 1.8m in height. The well-treed garden plot garden in which the asset is situated reinforces the domestic character of the asset and contributes positively to the aesthetic value of the asset. Conversely, the sizeable areas of hardstanding are considered unsympathetic and detract slightly from the ability to appreciate the asset's aesthetic value.

3.55 The asset is situated on the eastern edge of Coedpoeth and its wider setting is varied both in its character and the contribution it makes to the asset's significance. To the east, this wider setting comprises agricultural land, hedgerows and some isolated developments such as Adwy Grange, which on the whole helps to place the asset in its historic rural setting, contributing to its historic illustrative value as an historic farmhouse. However, to the west, the asset's wider setting comprises Post-War residential development, the suburban character and appearance of which detracts from the above.

3.56 The Site is considered to contribute positively to the significance of the asset insofar as Zone A forms part of the asset's wider rural setting. It is experienced as such when approaching the asset from the east along Tan Llan (plate 11), and the elevated westernmost parts of Zone A are also likely to be visible in the long-distance eastward views available from the asset due to its elevated position and orientation. Available return views of the asset from the Site are, however, distant and partial and therefore provide little meaningful appreciation of the significance of the asset. Overall, it is considered that the Site, and specifically Zone A, makes a minor positive contribution to the significance of the asset as part of its rural setting.

4 PROPOSALS AND POTENTIAL IMPACTS

Proposed Development

4.1 The proposals are for the development of the Site as a solar farm with Battery Energy Storage System (BESS) and associated infrastructure of access roads, transformers, cable trenches, lighting and security fencing.

Potential Impacts

4.2 The Proposed Development will have no direct impacts on any identified built heritage assets. All impacts will arise as a result of change within the respective settings of the heritage assets.

Bersham Conservation Area

4.3 The Proposed Development will result in change in the setting of the Conservation Area, insofar as it will be visible at short range from the Conservation Area's northern fringes. This will erode the currently rural character of the Conservation Area's surroundings. The affected views, however, make a negligible contribution to the Conservation Area. Indeed, the CAAMP notes '*there are no vistas or glimpses of distant hills, surrounding countryside of the adjacent Plas Power Estate'* (CAAMP, 2009). Nor are there any views of the Conservation Area and the assets within it from the land their south that contribute to their significance. It is concluded that the Proposed Development will result in a neutral change in the setting of the Conservation Area and no change in the setting of the assets within it. It is concluded that there will be no impact.

Plas Power Grouping

4.4 This group of listed buildings is largely enclosed by plantation. Consequently, the only parts of the Proposed Development will be visible are the southernmost part of Zone B, from The Stables (ref. 16452), and parts of Zone C, from the Game Larder (1737) and Dairy (1738). Views from the Game Larder and Dairy are filtered through trees, whilst the solar arrays have been pulled back from the Stables up the slope to their north to minimise visual impact.

4.5 As a part of the Plas Power Estate, the agricultural surroundings of these assets, including the Site, are historically connected with them. However, these fields are no longer readily discernible as parkland and consequently make only a low to moderate contribution to their significance. Owing to the very limited intervisibility between The Stables and the Site, it is considered that the Proposed Development will have a negligible impact upon this grouping.

Walls, railings, gates and entrance lodge to Plas Power Park

4.6 This group of Listed Buildings lies approximately 500m to the west of the Site. The ZTV demonstrates that the Proposed Development will not be visible from the lodge (ref. 1740), gates (ref 16454) and southern wall (ref. 16456). However, the Proposed Development will be visible from the northern wall and Park Cottage (ref. 16455). The Site and these assets are components of the Plas Power Estate and hence historically linked, but the affected views make minimal contribution to their significance as the Site retains little of its historic parkland character. It is concluded that the Proposed Development will have a negligible impact upon this grouping.

Higher Berse Farmhouse (Grade II, ref. 16457)

4.7 The Proposed Development will result in slight change to the wider setting of Higher Berse Farmhouse appearing in incidental views to the south and south-west at a minimum distance of approximately 470m. It will be seen filtered through trees in the foreground and middle distance. The affected views make a minimal contribution to the house's significance and the change will be

slight. It is concluded that the Proposed Development will have a negligible impact upon the farmhouse.

Tyn-y-Coed (Grade II, ref. 1562)

4.8 The ZTV indicates that the Proposed Development will be visible from the farmhouse at a distance of approximately 130m. However, trees immediately adjacent to the farmhouse largely screen the Site from view. There is potential that the solar arrays will be glimpsed from the upper storeys of the house. These views make a minimal contribution to the farmhouse's significance and it is concluded that the Proposed Development will have a negligible impact upon the farmhouse.

5 CONCLUSION

5.1 This Built Heritage Statement has been prepared by RPS on behalf of Lightsource bp. It addresses built heritage considerations in relation to the development of a solar farm and Battery Energy Storage System (BESS) on land at Plas Power, Wrexham.

5.2 The assessment provides a description of the built heritage assets potentially affected by the development and addresses the information requirements of Government's Planning Policy Wales and the Council's Local Development Plan in relation to built heritage.

5.3 The impact of the development on archaeological heritage assets and the archaeological potential of the site is considered separately in the accompanying Archaeological Desk-Based Assessment (RPS, 2023).

5.4 There are no designated or non-designated built heritage assets located within the site. Located within the study area are 287 Listed Buildings, six Conservation Areas and two Registered Parks and Gardens.

5.5 Following a Stage 1 assessment, informed by a Zone of theoretical Visibility (ZTV) and site visits, to identify those assets that might be affected, the following have been taken through to assessment:

- Bersham Conservation Area and listed buildings within;
- Plas Power Grouping - comprising the Ice House (Grade II, ref. 1793), Stable Block (Grade II, ref. 16452), Bath House (Grade II, ref.16453), Game Larder (Grade II, ref. 1737), and Dairy (Grade II, ref. 1738);
- Walls, railings, gates and entrance lodge to Plas Power Park – comprising the Walls to Plas Power Park including Park Cottage (Grade II, ref. 16455), Wall to Plas Power Park SW of Rhosberse Lodge (Grade II, ref. 16456), Rhosberse Lodge at Entrance to West drive at Plas Power (Grade II, ref. 1740), and Railings and Gates to West Entrance Drive at Plas Power (Grade II, ref. 16454);
- Higher Berse Farmhouse (Grade II, ref. 16457); and
- Tyn-y-Coed (Grade II, ref. 1562).

5.6 In all cases it is considered that the Proposed Development will have a negligible impact upon the assets taken through to assessment. It is not considered that the impact of the proposals will be '*critically damaging'* to any listed building or conservation area vista and, as such, the proposals should be supported.

PLATES



Plate 1: Octagonal Building, Bersham (Grade II*, ref.1568)



Plate 2: St Marys Church, Bersham (Grade II*, ref.1170764)



Plate 3: Bersham Lodge (Grade II, ref.16556), illustrates the influence of Plas Power and its 'estate architecture' on the Conservation Area

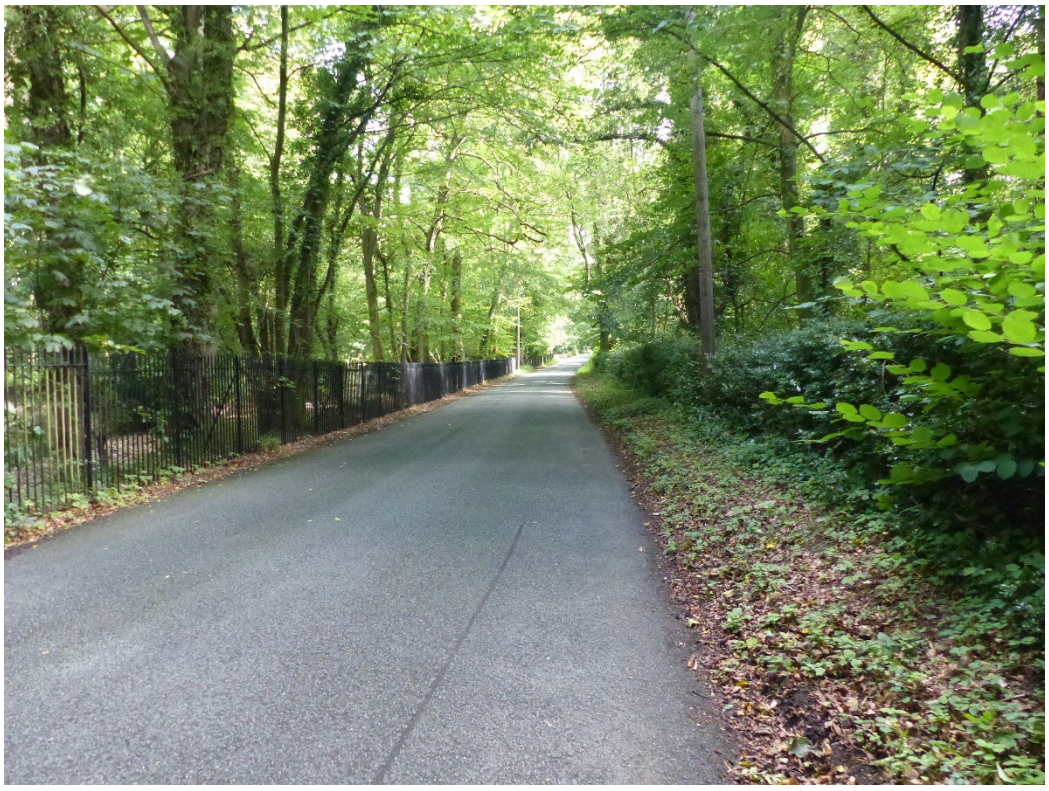


Plate 4: Trees forming a strong sense of enclosure in the west of the Conservation Area



Plate 5: Stables (Grade II, ref.16452) at Plas Power remain in their original use



Plate 6: Dairy (Grade II, ref. 1738) at Plas Power, in poor condition and threatened by undergrowth



Plate 7: Walled Garden at Plas Power, in very poor condition but sharing group value with the listed assets



Plate 8: Ha-ha to the south of Plas Power grouping (outside Application Site)



Plate 9: Rhosberse Lodge (Grade II, ref. 1740) and Railings and Gates to West Entrance Drive at Plas Power (Grade II, ref. 16454)



Plate 10: Wall to Plas Power Park SW of Rhosberse Lodge (Grade II, re.16456)



Plate 11: Distant view of Tyn-y-Coed across Zone A from Tan Llan

APPENDICES

Appendix A

Statutory Listing Descriptions

Ice-House at Plas Power

Grade II

Ref. 1739

Designated 30/01/1992 (amended 26/10/1995)

Remotely sited, set into a man-made bank on the edge of woodland close to Offa's Dyke; to NW of site of Plas Power house and to E of Garden Cottages.

Circular, red brick structure with conical slate roof. N (upper) side has large, gable ended porch with coursed rubble base; the change to brickwork probably indicates later enlargement. Stone lintel over outer entrance to steps down to ice chamber.

Domed and brick lined ice chamber with round-headed entrance arch that slopes and curves inwards resulting in complex brickwork; stone sill. Either side of this are concave recesses.

Listed as a rare example of an intact ice house and for its special interest as a surviving estate building at Plas Power.

Stable Block at Plas Power

Grade II

Ref. 16452

Designated 26/10/1995

Plas Power Estate lies NW of Bersham and SE of Coedpoeth; the stables are near the southern end of the park and reached 1km along N drive off A525. They lie immediately to the NW of the drive.

Brick with stone dressings and slate roof carried forward on moulded timber eaves cornice. The stables are built as 3 sides of a blue-brick lined courtyard, with a small rear wing offset to the NW housing domestic accomodation above tack rooms etc. Main range facing courtyard entrance articulated as 5 bays with segmental arches on plain brick pilasters with stone impost band. Outer arches have glazed tympana; central doorway has entablature carried on brackets. Advanced ranges to either side are similarly articulated, but with narrow outer bays housing doorways with overlights at either end, and wider segmental arches to centre. In the right-hand range, one of these arches is blind, and the other has double doors with glazed overlight; in the left hand range, both arches have full-height doors into the head of the arch.

Original fittings survive in stabling in main range: hexagonal tiled walls, with lined-out stucco above, boarded and iron railed stall dividers, and blue brick flooring. Loose boxes in right hand range; left hand range open, probably as coach house.

Listed as a well-detailed architecturally designed stable range which retains its original character intact, and for its special interest as a surviving estate building at Plas Power.

Bath House in Plas Power

Grade II

Ref. 16453

Designated 26/10/1995

In woodland immediately S of the stables in Plas Power Park.

Plas Power was completely remodelled by John Gibson, architect, for Thomas Lloyd Fitzhugh in 1858, and many ancillary buildings in the park were remodelled or newly built at that time. It is likely that the Bath House is contemporary. The building is said to have been used as a shower house in association with the adjacent hunting stables, but may have been built as a well house.

Small circular structure; coursed and squared stone with shallow domed roof recessed behind rusticated embattled parapet. Ogee headed doorway facing S, with cast-iron barred gate, and segmentally arched window towards E.

The building is lined with quartzite in the manner of agrotto. It contains a cast-iron pump.

Listed as a rare example of an architecturally conceived well-house, which has group value with other structures in the park at Plas Power.

Game Larder at Plas Power

Grade II

Ref. 1737

Designated 30/01/1992

Amended 26/10/1995

Immediately to SW of the site of Plas Power house, adjoining brick wall that formerly bordered the service courtyard.

Plas Power estate lies NW of Bersham and SE of Coedpoeth; the game larder is near the southern end of the park and is reached 1km along the N drive off A425. Close to Offa's Dyke. Plas Power was completely remodelled in 1858 for Thomas Lloyd Fitzhugh by John Gibson, architect, of London and was demolished in 1946-7. The Game Larder is contemporary with this remodelling and the associated improvements to the estate and is shown on a plan of 1866.

Octagonal red brick structure with hammer dressed, long and short sandstone quoins. Unusually steep slate roof with bands of shaped slates and very wide overhanging eaves carried on arched timber brackets springing from stone corbels; timber finial to top. Rectangular windows concealed under the eaves with freestone architraves, metal bars and gauze. Panelled door. Internally the walls are diagonally tiled below the windows with blue and white band to the top.

Listed as a good example of this building type and for its special interest as a surviving building associated with Plas Power. Group value with the Dairy at Plas Power.

Dairy at Plas Power

Grade II

Ref. 1738

Designated 30/01/1992

Amended 26/10/1995

To W of and uphill from the Game Larder whcih adjoins the site ofof Plas Power house; close to the SE corner of the walled garden.

Single-storey red brick building with hipped slate roof and wide overhanging eaves. The design is distinctive for its heavily tooled sandstone dressings, similar in style to those on the game larder but more extensive, including quoins, architraves and linking bands at sill and eaves level. 3-bay symmetrical front with rectangular windows and central entrance. Taller window on left hand end with inward opening casements; gauze to other windows; similar window treatment to rear with cut down chimney stack.

Central lobby opens onto 2 large rooms; that to right is lined with blue and white glazed tiles laid diagonally and enriched by Greek fret pattern banding; tiled floor and slate slab shelves carried on brackets. Small fireplace to left hand part.

Listed for its special interest as a surviving estate building at Plas Power. Group value with the Game Larder at Plas Power.

Wall to Plas Power Park SW of Rhosberse Lodge

Grade II

Ref. 16456

Designated 26/10/1995

Forms part of the western boundary to Plas Power Park, from closeto Nant Bridge to Rhosberse Lodge on Rhosberse Road.

Plas Power was completely remodelled in 1858 for Thomas Lloyd Fitzhugh, by John Gibson, architect, of London. The reconstruction of the house formed part of an extensive programme of improvement and rebuilding on the estate, and the wall was erected c1860 as part of this programme.

Rusticated rock-faced rubble with rustic projecting castellations, varying in height.

Included as an integral part of the mid C19 landscaping of Plas Power Park, and as an excellent example of the Picturesque style adopted in various interpretations for most of the mid C19 work at Plas Power.

Wall to Plas Power Park including Park Cottage

Grade II

Ref. 16455

Designated 26/10/1995

Forms the western boundary to Plas Power Park, parallel with Rhosberse Road from its junction with the A525 at Coedpoeth to Rhosberse Lodge on Rhosberse Road.

Plas Power was completely remodelled in 1858 for Thomas Lloyd Fitzhugh, by John Gibson, architect, of London. The reconstruction of the house formed part of an extensive programme of improvement and rebuilding on the estate, and the wall was erected c1860 as part of this programme.

Rusticated rock-faced rubble with rustic projecting castellations, varying in height and incorporating two minor entrances into the park. Park Cottage pre-dates the wall and is probably early C19: coursed and squared stone with slate roof: 2 storeys, 2-unit plan with central entrance, and rear wing parallel to the road. Fenestration renewed, mainly in original openings.

The wall is included as an integral part of the mid C19 landscaping of Plas Power Park, and as an excellent example of the Picturesque style adopted in various interpretations for mostof the mid C19 work at Plas Power. Park Cottage is included for its group value with the wall.

Rhosberse Lodge at Entrance to West Drive at Plas Power

Grade II

Ref. 1740

Designated: 30/01/1992

Amended 26/10/1995

On the western boundary of the Plas Power Estate; set back from Rhosberse Road, approximately 0.75km S of A525 near Coedpoeth.

The Lodge lies on the N side of the drive beyond the iron railings and gates that close the drive entrance and is attached to the stone boundary wall of the park. Plas Power was completely remodelled

in 1858 for Thomas Lloyd Fitzhugh by John Gibson, architect, of London, and was demolished in 1946-7. Rhosberse Lodge is contemporary with this remodelling and the associated improvements to the estate, and is therefore believed to be by the same architect.

Picturesque Tudor Gothic style, single storey L-plan lodge of consciously random rubble construction with plinth. Slate roofs with fishscale bands and cresting; crenellated stone chimney stacks. Gables to each elevation with distinctive undulating bargeboards further ornamented by dentilling and pendants and finials. Fine, diamond-paned, mullioned and transomed windows, 3-light to front gable and 2-light set back to left.

Listed as a well preserved lodge to Plas Power, which is a good example of the Picturesque style favoured in the mid C19 improvements to the estate.

Railings and Gates to West Entrance Drive at Plas Power

Grade II

Ref: 16454

Designated 30/01/1992

Amended 26/10/1995

On the western boundary of the Plas Power Estate; set back from Rhosberse Road, approximately 0.75km S of A525 near Coedpoeth.

The iron railings flank the gates that close the drive entrance, and are attached to Rhos Berse Lodge on one side, and the boundary wall of the park on the other. Plas Power was completely remodelled in 1858 for Thomas Lloyd Fitzhugh by John Gibson, architect, of London, and was demolished in 1946-7. Rhosberse Lodge with the associated entrance gates and railings are contemporary with this remodelling and the associated improvements to the estate, and are therefore believed to be by the same architect.

Iron railings with spearhead finials flank central gates hung from square, openwork, piers with Gothic arches and scrolled and finialed caps.

Listed as a well preserved entrance feature to Plas Power, part of a group with Rhosberse Lodge and the boundary wall to the park, and a good example of decorative cast-iron work.

Higher Berse Farmhouse

Grade II

Ref. 16457

Designated 20/10/1995

Higher Berse Road runs to the N of and parallel to the A525 on the E side of Coedpoeth; the farm is towards the E of the community, close to New Broughton.

The house is dated on rainwater heads 1815 and appears to be entirely of this date. There had been a house here since at least the mid C15 (owned by the Puleston family, and subsequently by the Drelincourts of Berse Drelincort), but it was acquired by the Plas Power estate in 1814, and immediately rebuilt. The initials on the rainwater heads may be those of Thomas Fitzhugh.

Main front is tooled ashlar, the rest roughly coursed and squared rubble; hipped slate roof with bold overhang to eaves, brick end wall and rear stacks. 2 storeys, deep pile plan, with 3 window entrance front facing S. This has full-height recessed central arch housing doorway in reeded pedimented architrave, with interlace fanlight to 6-panelled door. Above it is a wide 12-pane sash window with cambered stone lintel. Similar windows in the outer bays have wedge lintels. Ground floor windows are 6-pane sashes. Return elevation to W has casement windows of 2 and 3-lights set towards rear of first floor; doorway and 3-light small-paned mullioned and transomed window towards rear. Rear elevation has central doorway with y-traceried window over it, in tall round-arched architrave. E return has 3-light small-paned mullioned and transomed windows.

Central entrance hall with principle rooms facing S. The hall is divided by a wide segemental archway with radial fanlight over door in moulded architrave, with the staircase set to the rear of the house. The house retains much of its contemporary detail, with plaster ceiling cornices and joinery including plain spindle stair with scrolled tread-ends, panelled doors and window shutters.

Listed due to being A fine example of an early C19 gentry farmhouse, retaining a high degree of integrity.

Tyn-y-Coed

Grade II

Ref. 1562

Designated: 07/06/1963

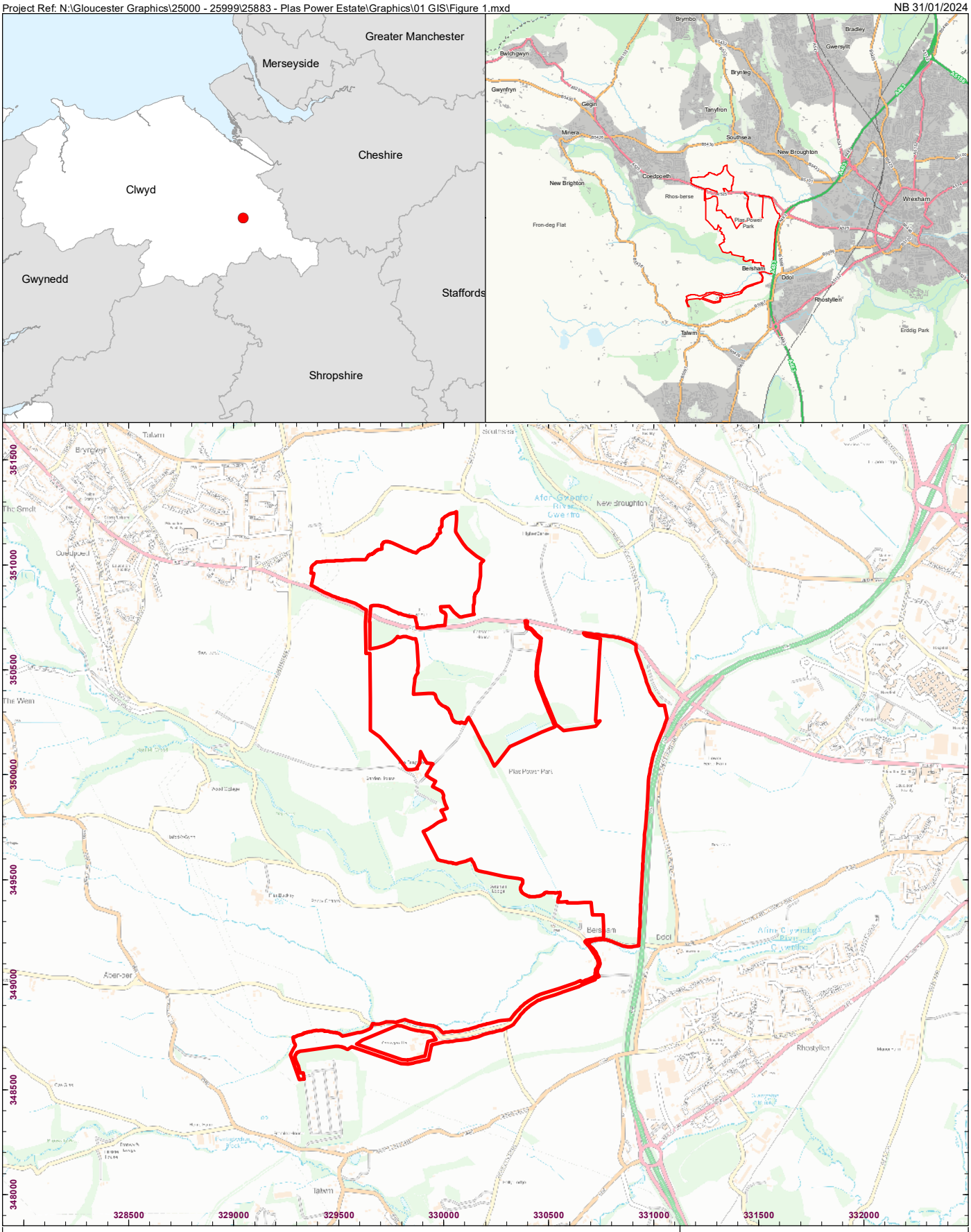
Amended: 26/10/1995

On the E side of Coedpoeth, the house is approached from the lanelane that leaves Heol Offa immediately N of its junction with New Road, 200m approx. N of the junction with the A525.The house is built on or adjacent to the line of Offa's Dyke.

The house is dated 1758 (the recorded date-stone was obscured at time of inspection, July 1995) and appears to represent a single building phase. Much of the exterior detail however, has been renewed in the C20. Inscribed datestone with the name 'Elizabeth Price'.

Brown brick with slate roof and coped gables with moulded kneelers. 3 storeys, 3-window range with central entrance. Original detail of doorcase now obscured by added timber gabled porch. Windows all renewed in original openings (but previously flush-framed casements), with steep cambered brick heads.

FIGURES



Site Boundary

N

0 260 520 780m

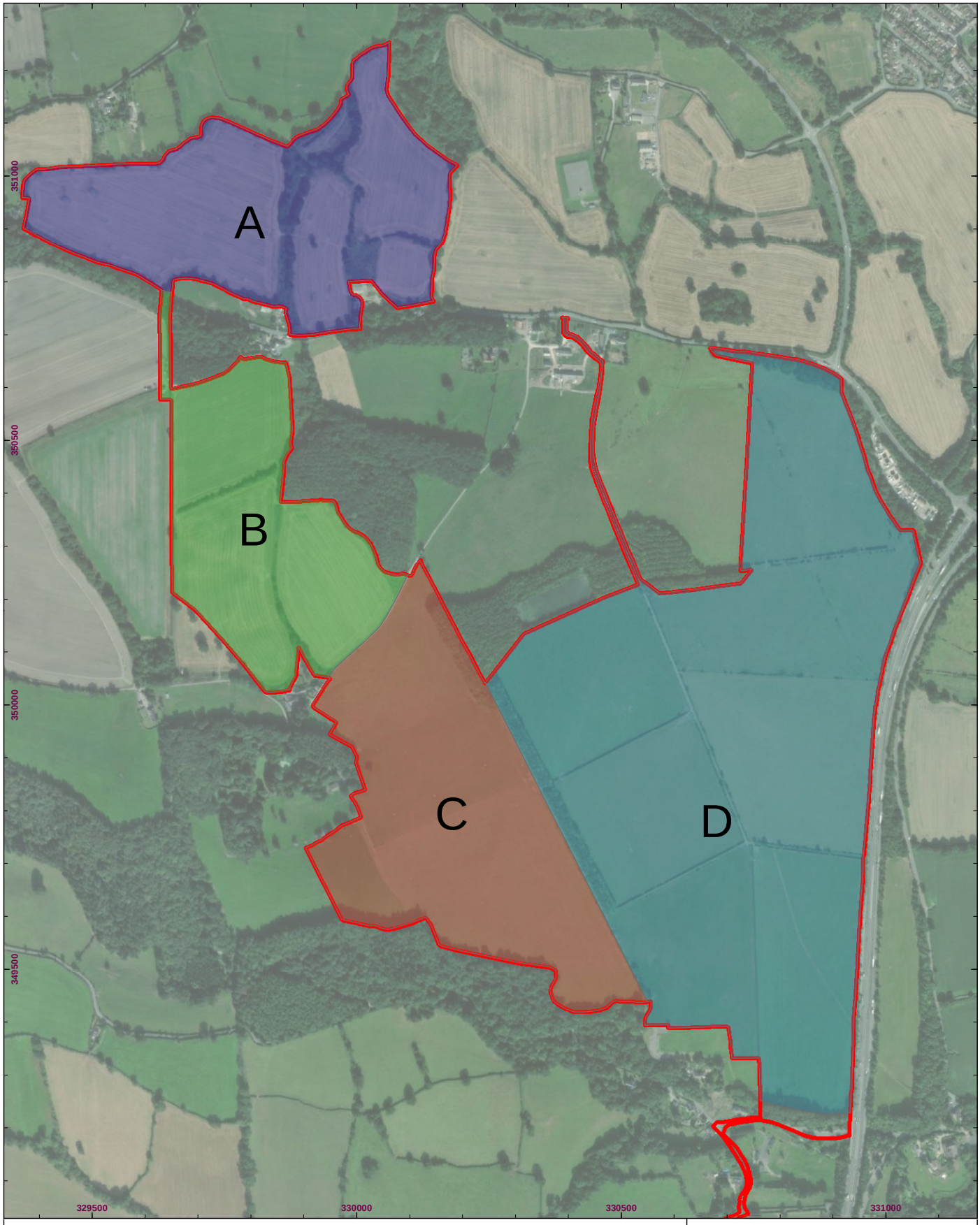
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Figure 1a

Site Location

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Site Boundary

N

0 100 200 300m

Scale at A4: 1:10,000

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Figure 2

Division of the Site into Zones A-D

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NB 09/02/2024

Minera CA
9355
16457
1562
16455
1740, 16454 & 16456
16452
1739
16453
1738
1737
16558
16556-7
16554-5
16553
16540-1, 16546-7 & 16549-50
16561
16552
16560
Bersham CA
1762
1560
1720
1533
Grosvenor Road, Wrexham CA
Wrexham Town CA
Salisbury Park CA
Fairy Road CA
PGW(C)67(WRE) Wrexham Cemetery
PGW(C)62(WRE) Erddig

Legend

- Site Boundary
- 3km search radius
- Conservation Areas
- Registered Parks and Gardens

Listed Buildings

- Grade I
- Grade II*
- Grade II

Low Visibility (up to 1 origin point)

High Visibility (up to 19 origin points)

N

0 250 500 1,000 1,500m

Scale at A3: 1:35,000

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Notes:

ZTV compiled assuming observer height as 1.7 m at eye level, and takes into account screening effects of local settlements at 9m and existing vegetation / woodland at a height of 10m.
24 origin points, from within the Application Site, have been used to illustrate the full parameters of the proposed development. Including:

- 23 origin points (in total), set at 3m above existing ground level (EGL), within the centre of each of the fields of the Application Site containing solar panels; and,
- 1 origin point, set at 3 m EGL, at the approxmate highest point within the Application Site.

OS Terrain 5 data has been used for generating the ground model.

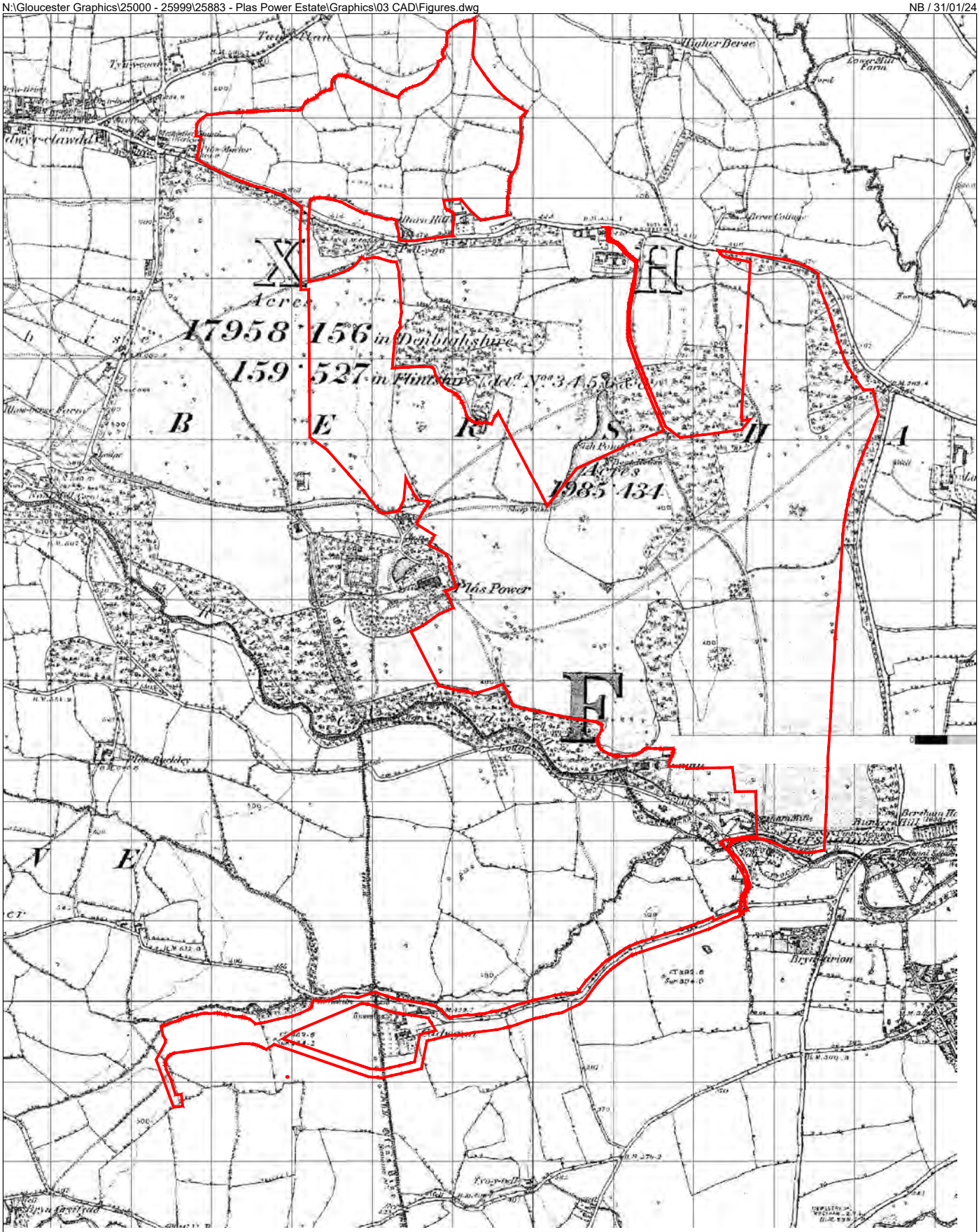
Figure 3

Designated Heritage Assets and the Zone of Theoretical Visibility

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Project Ref: C:\Users\richard.conolly\OneDrive - RPS Group PLC\25883 - Plas Power Estate\Graphics\01 GIS\25833 Plas Power BHS fig 3_Feb24.mxd

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Site Boundary

N

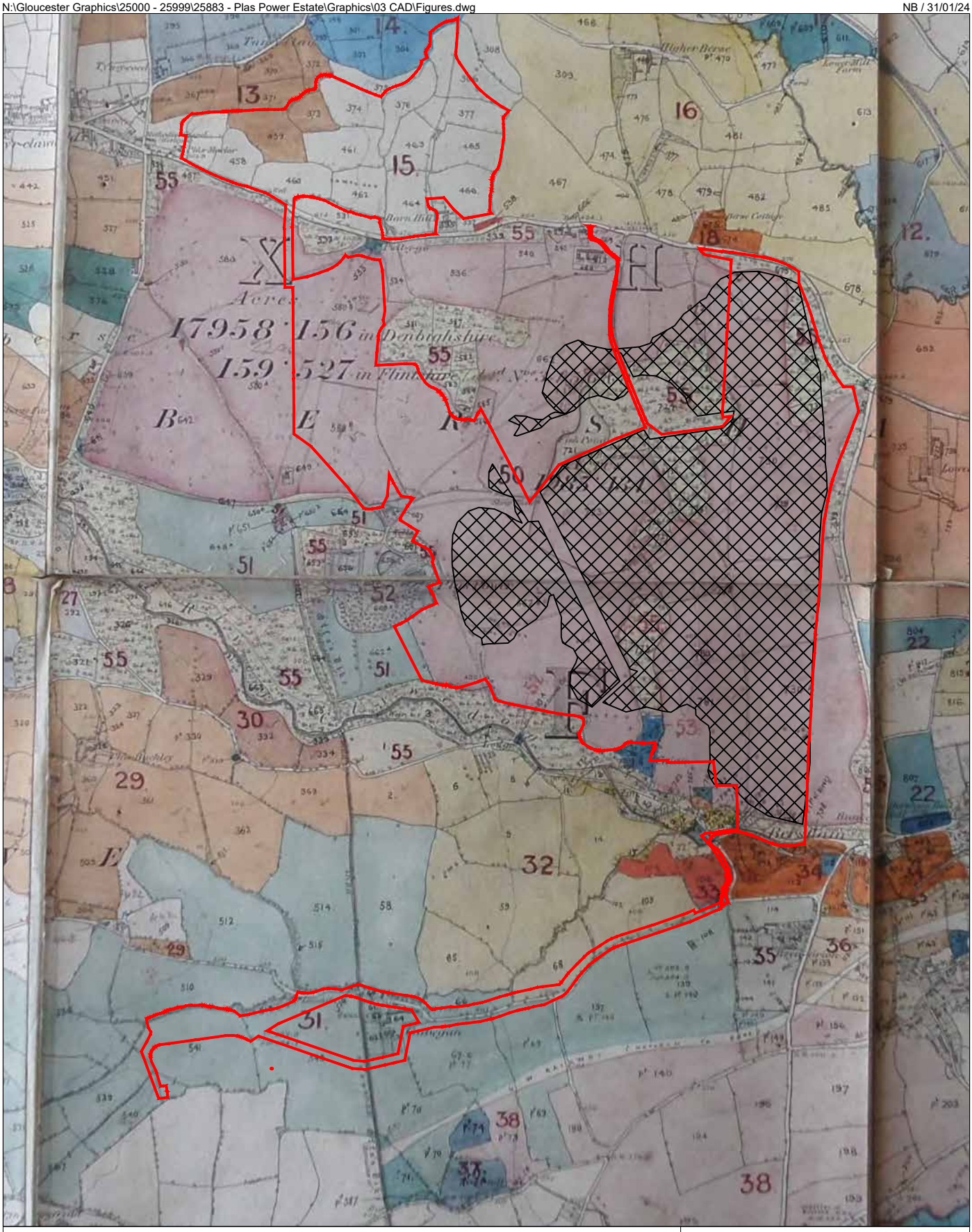
Not to Scale
Illustrative Only

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Figure 4

1879 Ordnance Survey Map

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Site Boundary

N

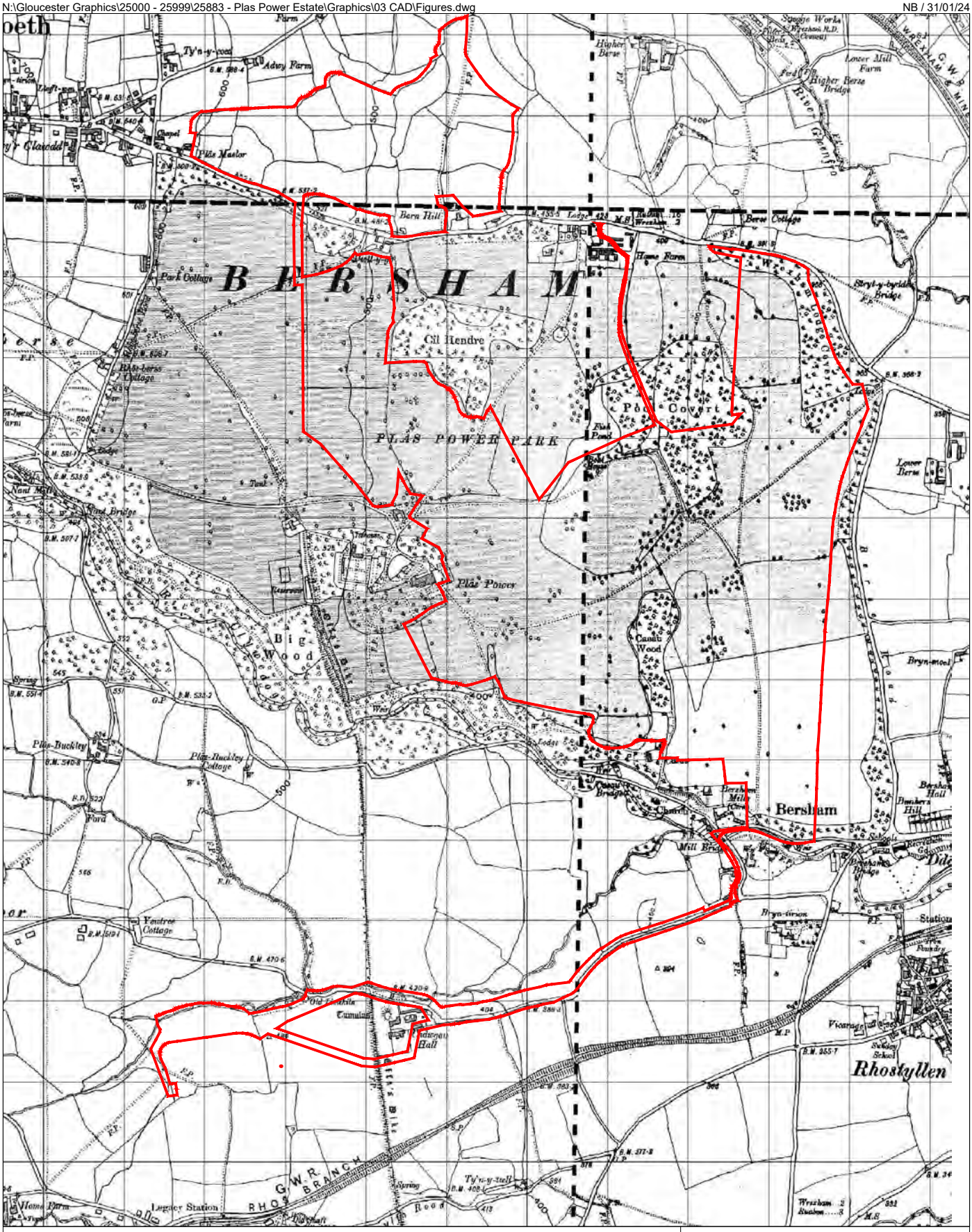
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Figure 5

1899 Plas Power Estate Map

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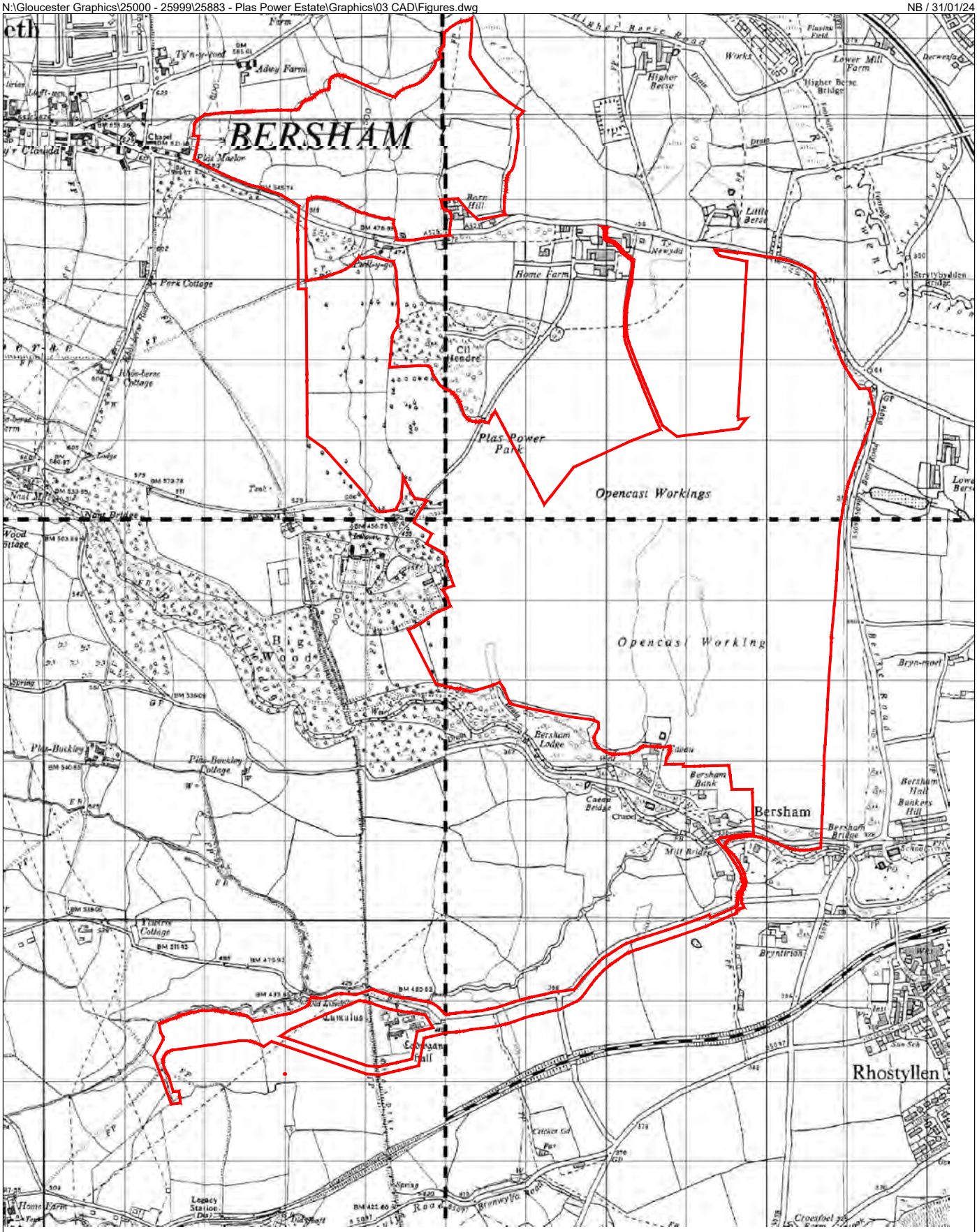


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Figure 6

1938 Ordnance Survey Map

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Site Boundary

N

Not to Scale
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Figure 7

1963-1964 Ordnance Survey Map

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Site Boundary

N

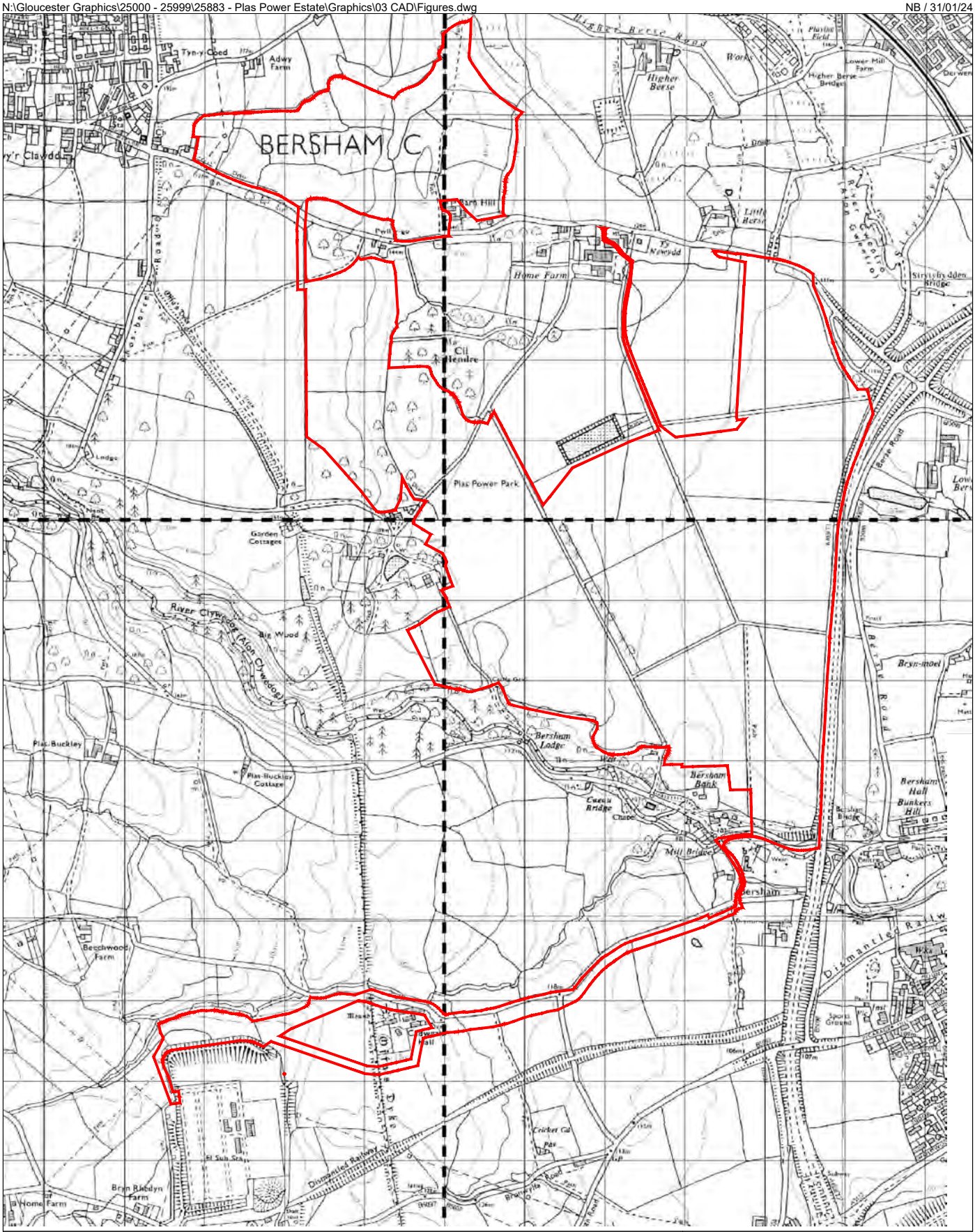
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Figure 8

1966 Aerial Photograph showing extent of opencast mining

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Site Boundary

N

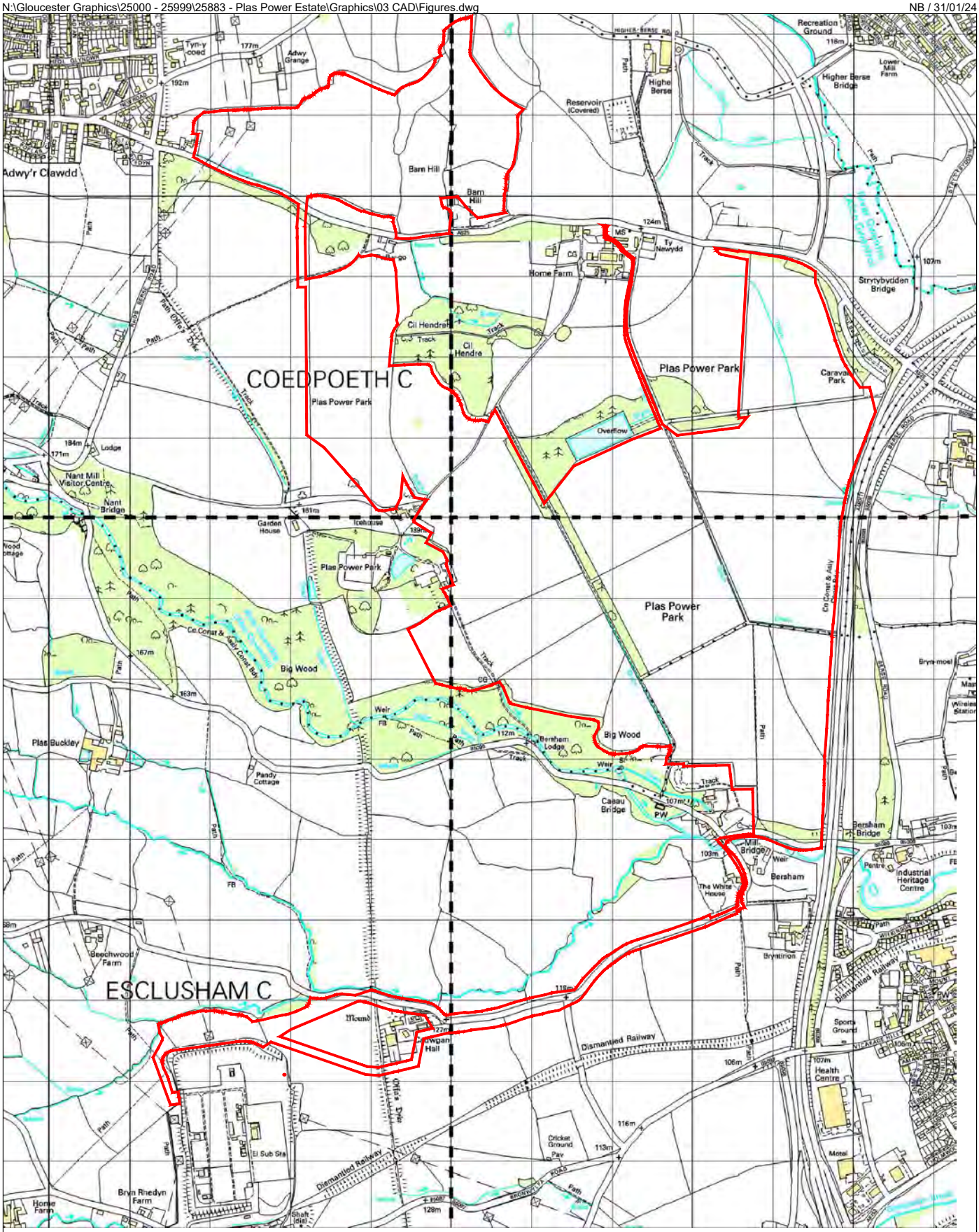
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Figure 9

1974-1979 Ordnance Survey Map

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Site Boundary

N

Not to Scale
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Figure 10

2000 Ordnance Survey Map

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Appendix 7.3
Trial Trenching Report

Plas Solar and Energy Storage Project

Plas Power Estate, Wrexham

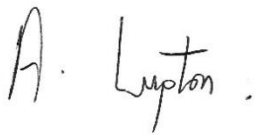
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Plas Solar and Energy Storage Project, Plas Power Estate, Wrexham

Archaeological Evaluation Report

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SUMMARY

Oxford Archaeology was commissioned by RPS to undertake an archaeological trial trench evaluation at the site of a proposed solar and energy storage project on the Plas Power Estate, Wrexham (NGR: SJ 30179 50165). A preceding geophysical survey undertaken on site detected a number of anomalies of possible archaeological origin, as such a scheme of archaeological trial trenching was devised to test the anomalies.

A total of 10 trenches were excavated across the investigation area, five of which contained archaeological remains. These largely comprised shallow ditches and one posthole concentrated in the northern and southern extents of the scheme.

There was a fairly poor correlation between the geophysical anomalies and the archaeological remains uncovered. Most of the geophysical anomalies were identified as variations within the underlying natural geology. The archaeological remains that were identified were determined to be of an agricultural nature of unknown dates, suggesting the continued agricultural use of the land throughout the past. The limited finds assemblage suggested that, where finds were recovered, the features were of post-medieval or modern date.

CRYNODEB

Comisiynwyd Oxford Archaeology gan RPS i gynnal gwerthusiad ffos treial archeolegol ar safle prosiect storio solar ac ynni arfaethedig ar Ystâd Pwer y Plas, Wrecsam (NGR: SJ 30179 50165). Canfu arolwg geoffisegol blaenorol a gynhaliwyd ar y safle nifer o anghysonderau o darddiad archeolegol posibl, oherwydd hynny dyfeisiwyd cynllun o ffosio treialon archeolegol i brofi'r anghysonderau.

Cloddiwyd cyfanswm o 10 ffosydd ar draws ardal yr ymchwiliad, gyda phump ohonynt yn cynnwys olion archeolegol. Roedd y rhain i raddau helaeth yn cynnwys ffosydd bas ac un twll post wedi'i ganoli yn ardaloedd gogleddol a deheuol y cynllun.

Roedd cydberthynas weddol wael rhwng yr anghysonderau geoffisegol a'r olion archeolegol heb eu darganfod. Nodwyd bod y rhan fwyaf o'r anghysonderau geoffisegol yn amrywiadau o fewn y ddaeareg naturiol sylfaenol. Roedd yr olion archeolegol a nodwyd yn benderfynol o fod o natur amaethyddol o ddyddiadau anhysbys, gan awgrymu parhad defnydd amaethyddol o'r tir drwy gydol y gorffennol. Roedd y casgliad cyfyngedig o ganfyddiadau yn awgrymu bod y nodweddion o ddyddiad ôl-ganoloesol neu fodern pan adferwyd y darganfyddiadau.

ACKNOWLEDGEMENTS

Oxford Archaeology would like to thank Chris Clarke of RPS for commissioning this project. Thanks are also extended to Neil Bayliss who monitored the work on behalf of Clwyd-Powys Archaeological Trust (CPAT).

The project was managed for Oxford Archaeology by Paul Dunn. The fieldwork was directed by Catherine O'Doherty and Becky Weigel, who were supported by Andrew McGuire, Eleanor Jones, Johnnie Stewart, Alex Whitehead, Aiden Dooley, and Steve Clarke. Survey and digitising was carried out by Catherine O'Doherty and Mark Tidmarsh. Thanks are also extended to the teams of OA staff that cleaned and packaged the finds under the supervision of Karen Barker, processed the environmental remains under the supervision of Denise Druce, and prepared the archive under the supervision of Karen Barker.

1 INTRODUCTION

1.1 Scope of work

1.1.1 Oxford Archaeology (OA) was commissioned by RPS to undertake an archaeological trial trench evaluation at the site of a proposed solar and energy storage project at the Plas Power Estate, Wrexham (NGR: SJ 30179 50165; Fig 1). A total of 10 trenches were excavated, four to the north of the A525 and six to the south, in March 2024. The trenches were set out to target geophysical anomalies identified by a preceding geophysical survey (SUMO 2021, 2023a & 2023b).

1.1.2 The work was undertaken to inform the planning decision on the project. Following the geophysical survey, discussions between RPS and the Senior Planning Archaeologist for Clwyd-Powys Archaeological trust, the scope of the evaluation was defined. A written scheme of investigation (WSI) was then produced by RPS (2024), on behalf of Lightsource BP, detailing the Local Authority's requirements for work necessary to inform the planning process. This document outlines how OA implemented the specified requirements.

1.1.3 All work was carried out in accordance with The Chartered Institute for Archaeologists' *Code of Conduct*, *Standard for archaeological field evaluation* (2023) and *Universal guidance for archaeological field evaluation* (2023).

1.2 Location, topography and geology

1.2.1 The site lies on the south-western outskirts of Wrexham, north and south of the A525, and west of the A483 (Fig. 1). The red line boundary is centred at NGR SJ 3001 5045, approximately 240m south of the A525.

1.2.2 The area of proposed development consists of agricultural land, which the valley of the River Clywedog runs through. The general topography of the site and surrounding area is noted as reducing in height from west to east. The height Above Ordnance Datum (AOD) at its western extent is 180m, whilst the lowest parts lie to the east at *c* 105-110m AOD (RPS 2024).

1.2.3 The geology of the area is mapped as Carboniferous sandstone, siltstone, and mudstone of the Pennine Lower and Middle Coal Measures Formations with superficial deposits of sand and gravel from Devensian Glaciofluvial Sheet Deposits (BGS 2023). Furthermore, parts of the site have been subject to open cast mining throughout the latter half of the twentieth century (RPS 2024).

1.3 Archaeological and historical background

1.3.1 The archaeological and historical background of this site is set out in more detail within the desk-based assessment and WSI carried out by RPS (RPS 2019, 2024). The following summarises the relevant information.

1.3.2 ***Prehistoric***: there are no firmly identified prehistoric finds or features recorded within the site and there is limited evidence of prehistoric activity within the wider 1km study area.

1.3.3 ***Roman***: there are also no Roman finds or features within the site, however, finds from a group of two Roman coins (HER 44826, 102980), which may lie within the site, although their locations are uncertain.

1.3.4 ***Early Medieval***: the linear boundary earthwork and scheduled monument (SM) (DE180) known as Offa's Dyke runs from the south-east to the north-west of the site area for approximately 640m. Further sections of the earthwork run adjacent to the site boundary in the north (DE181, DE182, DE183, DE113), west (DE139) and south (DE132, DE194, DE137).

1.3.5 ***Medieval***: Plas Power Estate had its origins in the medieval period. Wrexham was established as a settlement within this time, with there also being settlements established in the surrounding countryside including within the site area (RPS 2024). Bersham was formed from two adjacent groups of cottages known as Pentre Dybenni and Dol Cuhelyn and was also part of the Esclusham manor. Later, this was separated into Esclusham above the dyke and Esclusham below the dyke with Bersham becoming a separate township within Wrexham parish (*ibid*). Two areas of ridge and furrow cultivation are recorded within the site (HER 128244 & 128255) with a likely origin in the Medieval period that suggests agricultural use of the site during this time. The Cadwgan Hall Mound SM (HER 101151, DE131) is located 150m south-west of site. This has been interpreted as a possible medieval motte but is still undated. Further references to mounds that are suggestive of medieval mottes are extant in the area (HER 101523, 102961, 101522 & 102637), however visible remains no longer exist for these and any mounds could date from other periods. Finally, moated sites are recorded 200m east (HER 100393) and 750m south of site (HER 101237, SM DE193), as well as a medieval seal 300m to the south-east (HER 102636).

1.3.6 ***Post-medieval and Modern***: Coal and mineral extraction, alongside iron production associated with local industry development are the main aspect of archaeological interest during this period. By the seventeenth century, there is evidence which suggests that there were already several iron furnaces and foundries along the Clywedog Valley (RPS 2024). Bersham Ironworks (SM DE189, HER 36683, 77982, 36682, 126369) was developed from the 1770s until its 1812 closure. Later, paper and corn mills repurposed decommissioned ironwork buildings, with one blast furnace to the west of Bersham village being used as a corn mill until 1933. Mining was also of local importance: 38 collieries have been recorded as operating in the Wrexham area at its peak (RPS 2024).

1.3.7 Historic map regression is discussed in more detail in the WSI produced by RPS (2024) and will not be repeated here. However, results of the study indicated that the extraction and iron-working industries were not active within the site area, rather it was used as agricultural land throughout the post-medieval and early modern periods.

1.3.8 ***Geophysical survey***: These surveys were undertaken by SUMO (2021 & 2023b). The area north of the A525 did not show magnetic responses that could be interpreted as being definite archaeological interest due to disturbance from green waste (RPS 2024). Routes of several former field boundaries, however, were recorded here. The area south of the A525 yielded results showing a small circular and two rectilinear enclosures near the

vicinity of a HER recorded Medieval grange (HER 120659), as well as a number of probable bell pits.

2 AIMS AND METHODOLOGY

2.1 Aims

2.1.1 The following objectives and rationale of the trenching programme were stated in the WSI (RPS 2024).

i. to establish whether any archaeological evidence survives within the proposed area of impact;

ii. the trial trenching should aim to determine, as far as is reasonably possible, the location, form, extent, date, character, condition significance and quality of any surviving archaeological remains, irrespective of period, liable to be threatened by the proposed development; and

iii. the trial trenching should also seek to clarify the nature and extent of existing disturbance and intrusions and hence assess the degree of archaeological survival of buried deposits and any surviving structures of archaeological significance.

2.1.2 Within these parameters, the trial trenching of this site presents an opportunity to address the following objectives:

i. To establish the presence or otherwise of activity on the site dating to the Prehistoric periods. Can the Prehistoric features identified be associated with potential funerary use of the local landscape;

ii. To establish the presence or otherwise of any Roman activity;

iii. To establish the presence or otherwise of any Early Medieval/Medieval activity on site. Can any such activity be established be determined to be contemporary with Offa Dyke;

iv. To establish the presence or otherwise of any Post-Medieval or Modern activity on site. Can any of ten features identified provide insight on the development and utilisation of the North Wales rural landscape during these periods;

v. To establish the environmental context of prehistoric, Roman, Anglo-Saxon, Medieval activity;

vi. Evaluate the likely impact of past land use and development.

2.1.3 If significant archaeological remains are identified, reference will be made to the Research Framework for the Archaeology of Wales (Research Framework 2016), so that the remains can, if possible, be placed within their local and regional context.

2.2 Methodology

2.2.1 The methodology specified for the trial trenching can be found in full in the WSI (RPS 2024) and is summarised below.

2.2.2 The evaluation comprised the excavation of 10 trenches, measuring 50m by 1.8m. The trenches were positioned in order to establish the reliability of the geophysical survey results (Fig. 2).

2.2.3 The trenches were set out by a real-time kinematic (RTK) global navigation satellite system (GNSS), accurate to 0.02m, and scanned for any potential services. They were excavated using a tracked mechanical excavator fitted with a toothless bucket under direct archaeological supervision. Modern topsoil and subsoil deposits were removed in stratigraphic order and placed adjacent to, but at a safe distance from the trench edges. Machining continued in even spits down to the top of the undisturbed natural geological deposits or the first archaeological horizon, whichever was encountered first.

2.2.4 The exposed surfaces were sufficiently cleaned to establish the presence/absence of archaeological remains. Where these were encountered, they were partially excavated by mattocks and shovels in order to assess and characterise the nature of the archaeology encountered.

2.2.5 All features and deposits were issued with unique context numbers and contexts were recorded on *pro forma* sheets in accordance with established best practice and the OA (1992) *Field Manual*. Environmental samples were allocated unique numbers. Bulk finds, where present, were retrieved and collated by context.

2.2.6 Limited bulk soil samples were collected from deposits identified to have potential for the recovery of environmental remains (*e.g.* carbonised or waterlogged plant macrofossils) and/or small artefacts and faunal remains.

2.2.7 All excavated trenches and features were planned by RTK GNSS. Sections of features were hand drawn at a scale of 1:20 and 1m-wide sample sections of stratigraphy were drawn at a scale of 1:10. All section drawings were located on the plan.

2.2.8 A full photographic record comprising digital images of all archaeological features, deposits, and trenches was collated. In addition, a number of photographs representative of the general work on site were taken.

2.2.9 Upon completion of the works and in agreement with CPAT, the trenches were backfilled with the arisings in reverse order of excavation.

3 RESULTS

3.1 Introduction and presentation of results

3.1.1 The results of the evaluation are presented below and include a stratigraphic description of the trenches that contained archaeological remains. These trenches will be grouped together and discussed by field location. Trenches devoid of archaeology will not be discussed in further detail. The full details of all trenches with dimensions and depths of all deposits can be found in *Appendix A*. Finds data and spot dates are tabulated in *Appendix B*.

3.2 General soils and ground conditions

3.2.1 The soil sequence in the trenches was fairly uniform with most trenches consisting of natural yellow silty clay geology, overlain by subsoil, 0.1 – 0.2m thick, which was, in turn, sealed by topsoil. Colluvium (0.2m thick) was encountered in Trench 3 only, where it sealed natural and was overlain by subsoil. Made ground deposits were extant in Trenches 8 and 9 and were likely associated with the nearby ironworks.

3.2.2 Ground conditions throughout the evaluation were generally good, and the site remained dry throughout. Archaeological features, where present, were easy to identify against the underlying natural geology.

3.3 General distribution of archaeological deposits

3.3.1 Archaeological features were present in five of the trenches opened, in the northern and southern-most extents of the investigation area (Fig 2). The features in the northern trenches (Trenches 1, 2 and 10) consisted of small- to medium-sized ditches and gullies and one posthole. Only one of those ditches corresponded to a corroborated field boundary on the geophysical survey (SUMO 2023b). Trenches 8 and 9 also contained small ditches.

3.4 Trenches 1, 2 & 10

3.4.1 Trench 1 was positioned on a north-east/south-west-alignment to target three linear geophysical anomalies of uncertain origin. Three linear features were investigated, but only one roughly corresponded to the geophysical anomalies (Fig 3). The natural clay, ***102***, was cut by east/west-aligned ditches ***106***/***109*** and ***103***/***112***.

3.4.2 Ditches ***106***/***109*** measured 1.1m wide and 0.4m deep and had steep sloping sides with a concave base (Fig. 4; Plate 1). Its fill was a mid-blueish grey silty sand (***110***) from which no finds were recovered. Ditches ***103***/***112*** measured 1.5m wide by 0.6m deep and had moderately sloping sides with a slightly flat base. Both fills (***104*** & ***105***) were grey silty sands, from which no finds were recovered. Cutting these features was a third north-west/south-east-aligned linear, ***108***, measuring 0.42m wide and 0.2m deep, with steep sloping sides and single light brown silt sand fill, ***111*** (Fig. 4; Plate 2). Ditch ***108*** appeared to correspond fairly well with one of the anomalies identified on the geophysical survey.



*Plate 1: East-facing section of ditch **109** (0.5m scale)*



Plate 2: Ditches in Trench 1 (1m scale)

3.4.3 Trench 2 was positioned on a north-east/south-west alignment to target two linear geophysical anomalies of uncertain origin and one former field boundary (Fig. 3). The natural clay, ***202***, was cut by a north/south-aligned shallow ditch ***207***, with moderately sloping sides and a concave base. Ditch ***207*** measured 0.74m wide and 0.22m deep, filled by a single light brownish grey silty clay, but very mottled, deposit ***208***. Ditch ***205*** clearly cut deposit

208, and was on the same alignment, and with a similar profile as ditch ***207*** (Fig. 5; Plate 3). Ditch ***205*** was filled by a light brownish grey silty clay, ***206***, with no finds. The northern extent of these ditches was truncated by a modern feature (Plate 4). A small posthole, ***203***, measuring 0.3m wide and 0.37m deep also cut the natural geology to the south-west of the ditches. This has steeply sloping sides and a flat base with a light greyish brown silty sand fill, ***204*** (Fig. 5; Plate 5). No other archaeological features were identified within the trench.

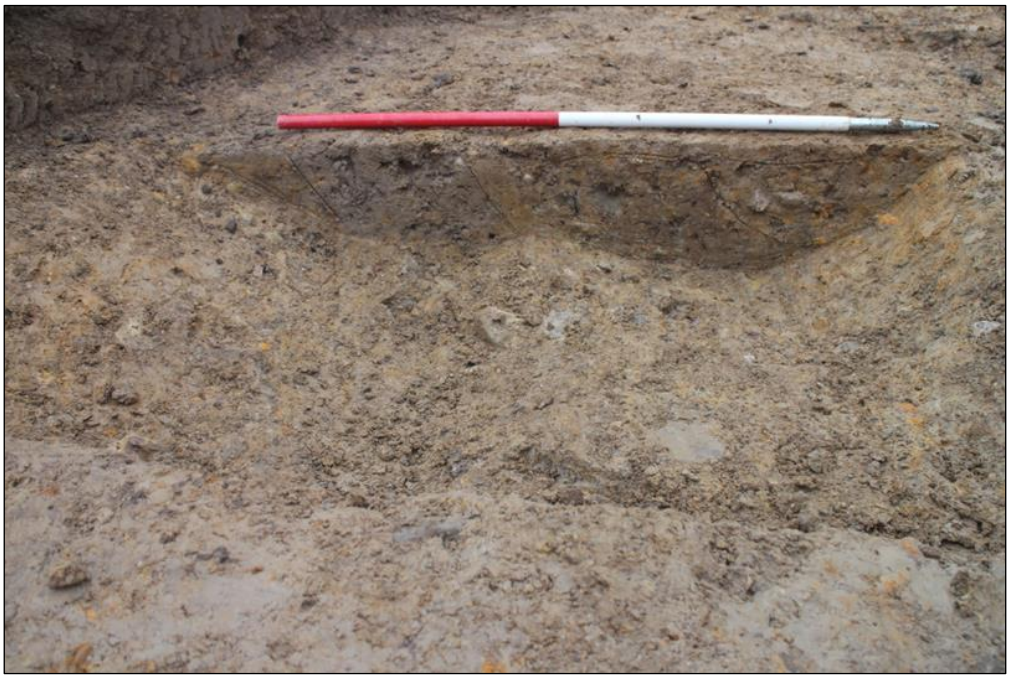


*Plate 3: North-facing section of ditches **205** and **207** (1m scale)*



*Plate 4: Trench 2 showing modern truncation of ditches **205**/**207** (two 1m scales)*



*Plate 5: Posthole **203** (0.2m scale)*

3.4.4 Trench 10 was positioned on a north-west/south-east-alignment and did not target any geophysical anomalies. The natural clay, ***1002***, was cut by two small gullies on a roughly north-east/south-west-alignment (Fig. 3). ***1003*** measured 0.3m wide by 0.08m depth (Plate 6) and ***1005*** was 0.28m wide by 0.08m depth (Fig. 5; Plate 7). Both were filled with a light grey silty sand and no finds were recovered.

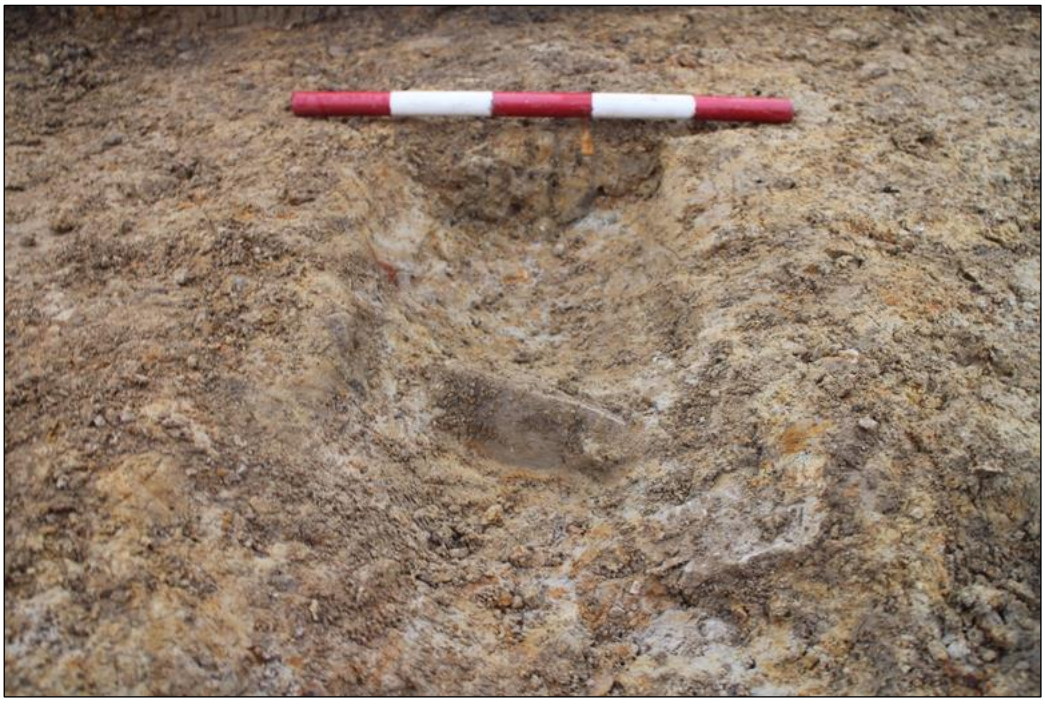


*Plate 6: North-east-facing section of ditch **1003** (0.5m scale)*



*Plate 7: North-east-facing section of ditch **1005** (0.5m scale)*

3.5 Trenches 8 & 9

3.5.1 Trench 8 was positioned on a north-east/south-west-alignment to target three possible archaeological features identified on the geophysical survey (Fig. 6). The natural clay geology, ***803***, was cut by north-west/south-east-aligned ditch ***804***. This measured 0.8m wide and 0.12m deep with shallow sloping sides and a concave base, filled by a single dark grey clayey silt deposit, ***805*** (Fig. 7; Plate 8). Fill ***805*** was sealed by (and similar to) a dark grey made ground deposit, ***802*** (Plate 9). A further made ground deposit, ***801***, overlay this, which was, in turn, sealed by topsoil ***800***.



*Plate 8: North-west-facing section of ditch **804** (0.5m scale)*



*Plate 9: North-west-facing representative section of Trench 8 showing made ground deposits **801** and **802** (1m scale)*

3.5.2 Trench 9 was on the same alignment as Trench 8 and targeted several geophysical anomalies (Fig. 6). The natural clay, ***903***, was cut by ditch ***904*** that measured 1.2m wide and 0.38m deep (Fig. 7; Plate 10). This roughly east/west-aligned ditch had steep sloping sides and a flat base, and was filled by mid greyish brown silty clay, ***905***. Ditch ***904*** was sealed by made ground deposits (***902***/***901***) in the same stratigraphy as seen in Trench 8.



*Plate 10: North-west-facing section of ditch **904** (1m scale)*

3.6 Environmental and finds summary

3.6.1 Environmental samples taken from the fill of Ditch ***904*** did not yield any significant remains to aid in the interpretation of that feature. The other archaeological features were not sampled on site, due to their fills being identified as being sterile on site.

3.6.2 Finds were only recovered from the fill of Ditch ***805***, a sherd of late post-medieval ceramic; there were no finds recovered from any of the other features on the site.

4 DISCUSSION

4.1 Reliability of field investigation

4.1.1 The ground and site conditions were generally good throughout the course of the investigations and the machining was carried out cleanly. Archaeological features, where present, were easily identifiable against the underlying natural geology and demonstrated clusters of activity in the northern and southern extents of the investigation area. Whilst limited dating evidence was recovered from excavated features, the results of the investigations are a true reflection of the archaeological potential of the site.

4.2 Evaluation objectives and results

4.2.1 The trial trenching is considered to have achieved the objectives as set out in *Section 2* and the WSI (RPS 2024). The investigations established that limited archaeological remains survive within the proposed area of impact.

4.2.2 The remains encountered mostly consisted of shallow ditches and one posthole. Limited dating evidence was recovered, thus making dating the features difficult. The fields containing trenches 1, 2 and 10 are currently used as for crops and appear to be heavily ploughed. This, paired with the shallow nature of the features here suggests that the archaeology, in this area has been disturbed by agricultural practices since their end of use. The field containing trenches 8 and 9 was located very close to Bersham Ironworks and disturbance from the ironworks is present in the made ground deposits that were sealing the features. Therefore, whilst archaeological remains have survived within the investigation area, both industrial and agricultural practices in the area have caused disturbance and intrusions to a large amount of it.

4.3 Interpretation

4.3.1 It was determined that the geophysical anomalies that were expected to be the main indication of archaeological remains were largely as a result of variation in the natural geology, with some exceptions.

4.3.2 It's likely that ditch ***108*** was the feature that corresponded to a geophysical anomaly in Trench 1, as it is on the same alignment. However, its location is approximately 2m north-east of the anomaly, so this anomaly could also be represented by ditch ***103/112***. No dating evidence was able to be recovered from the ditches in Trench 1 so their date and usage is unknown. The stratigraphic relationship shows that ***108*** was the latest feature to be cut within this trench and it is likely that they represent activities related to agriculture, i.e. drainage or boundary ditches that predate historic mapping for the area.

4.3.3 The modern feature observed in Trench 2 is likely the remnants of the corroborated former field boundary, last depicted on historic mapping in 1979, identified on the geophysics. It is also, therefore, highly likely that the intercutting ditches ***205*** and ***207*** represent an earlier iteration of the field boundary.

4.3.4 Ditch ***804*** did not directly correlate to an anomaly; however, a north-west/south-east-aligned anomaly was identified approximately 6m south-west of the ditch. The ditch's fill, ***805***, was morphologically similar to the

made ground deposit sealing it, deposit ***802***, and a fragment of post-medieval/industrial pottery was recovered from it.

4.3.5 Ditch ***904*** potentially corresponds to a geophysical linear anomaly approximately 1.5m to the south. The stratigraphic evidence suggests that it predates the industrial activities of the nearby ironworks. The ditch's use is unknown but likely relates to agricultural activities.

4.3.6 The gullies investigated in Trench 10 and the posthole in Trench 2 (***203***) did not correspond to geophysical anomalies. None of these features yielded dating evidence and their function is unknown.

4.4 Significance

4.4.1 The geophysical survey of the investigation area overall showed a poor correlation to the archaeological remains uncovered (Fig. 2). Ditches found within the trial trenches are likely to represent agricultural activities, therefore confirming that the land has been utilised for agriculture for most of its history. Consequently, the features identified within the evaluation trenching are considered to be of low local significance and are unlikely to contribute further to our understanding of the area.

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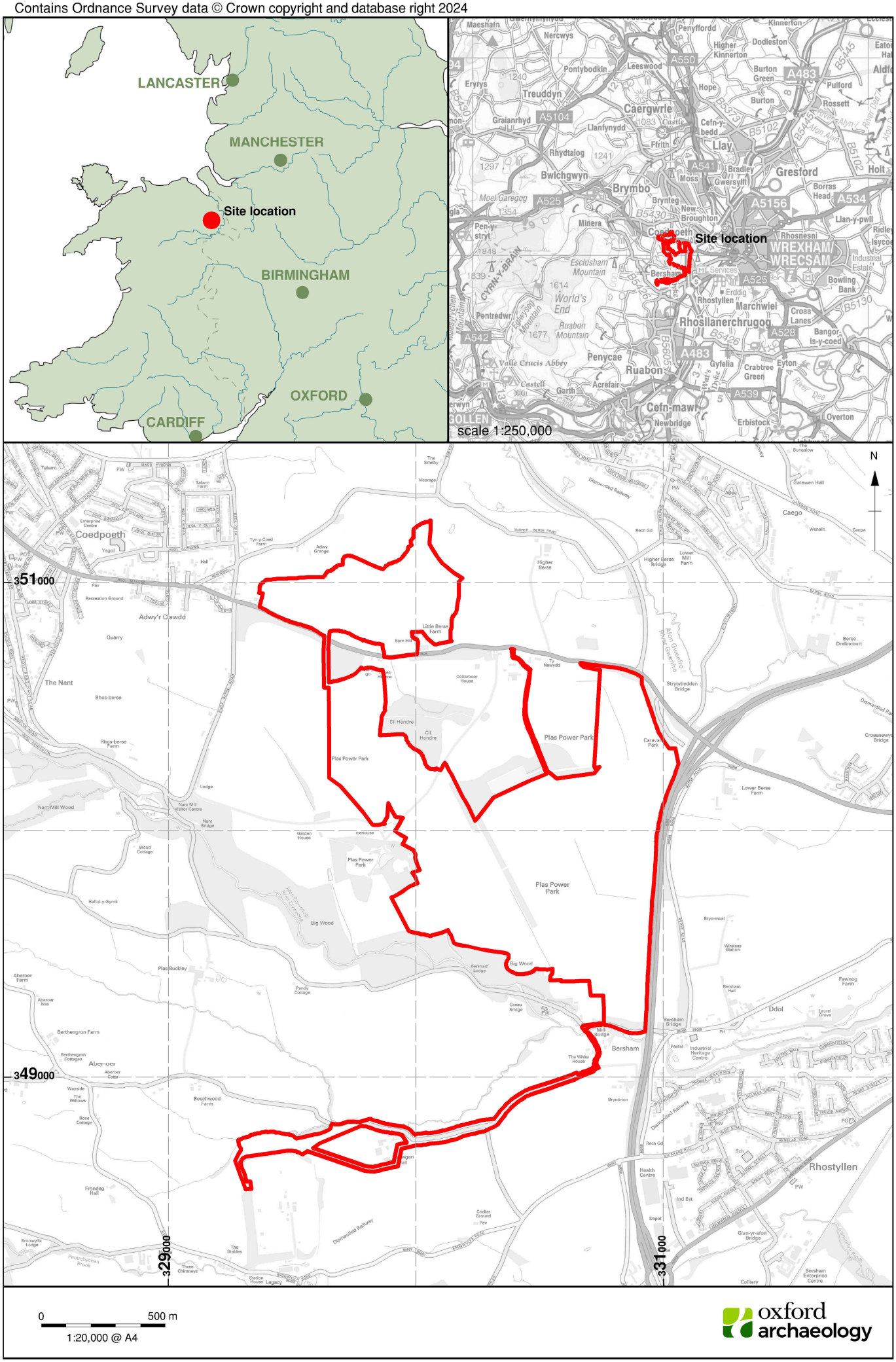


Figure 1: Site location

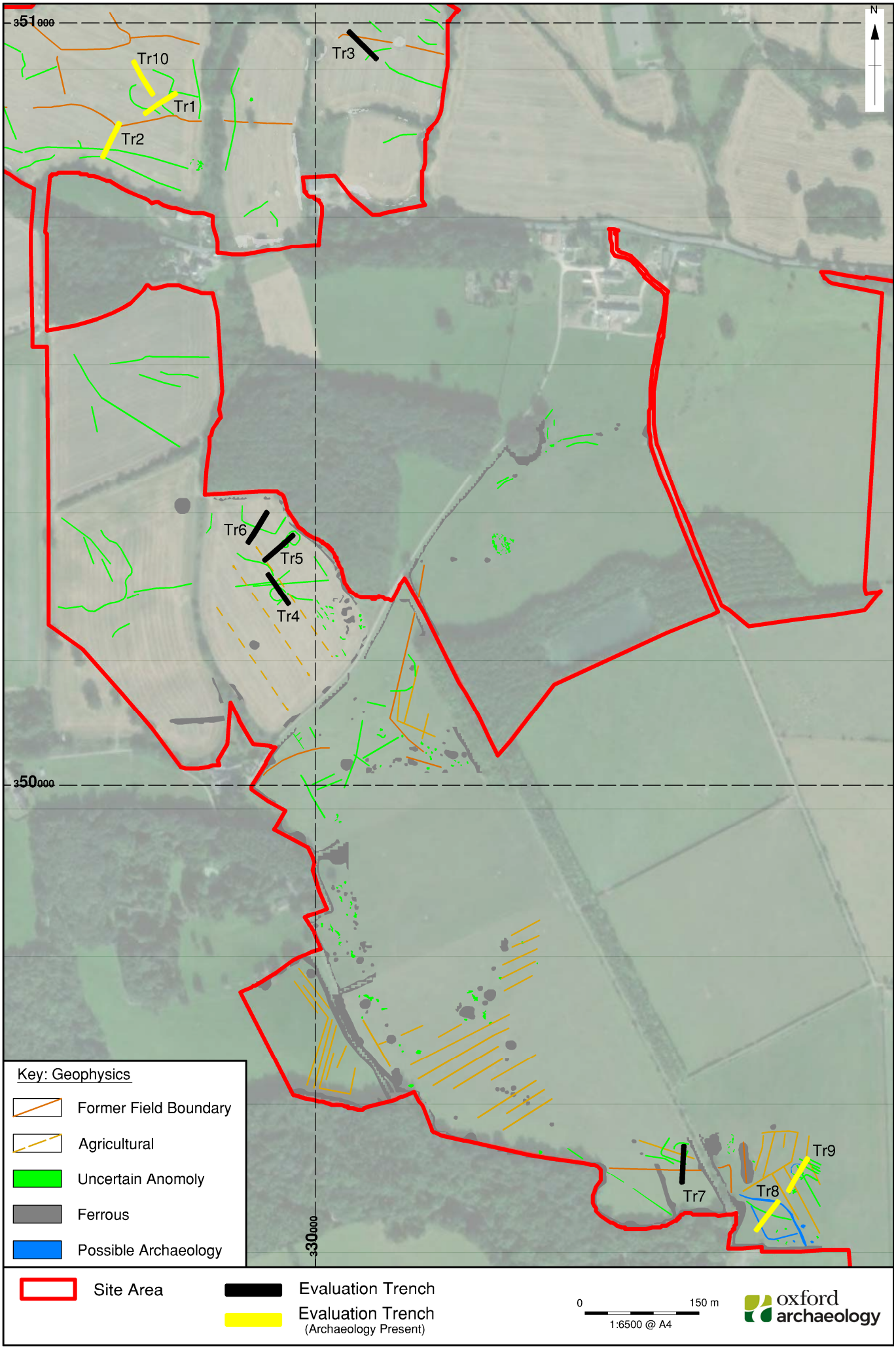


Figure 2: Evaluation Trench Plan

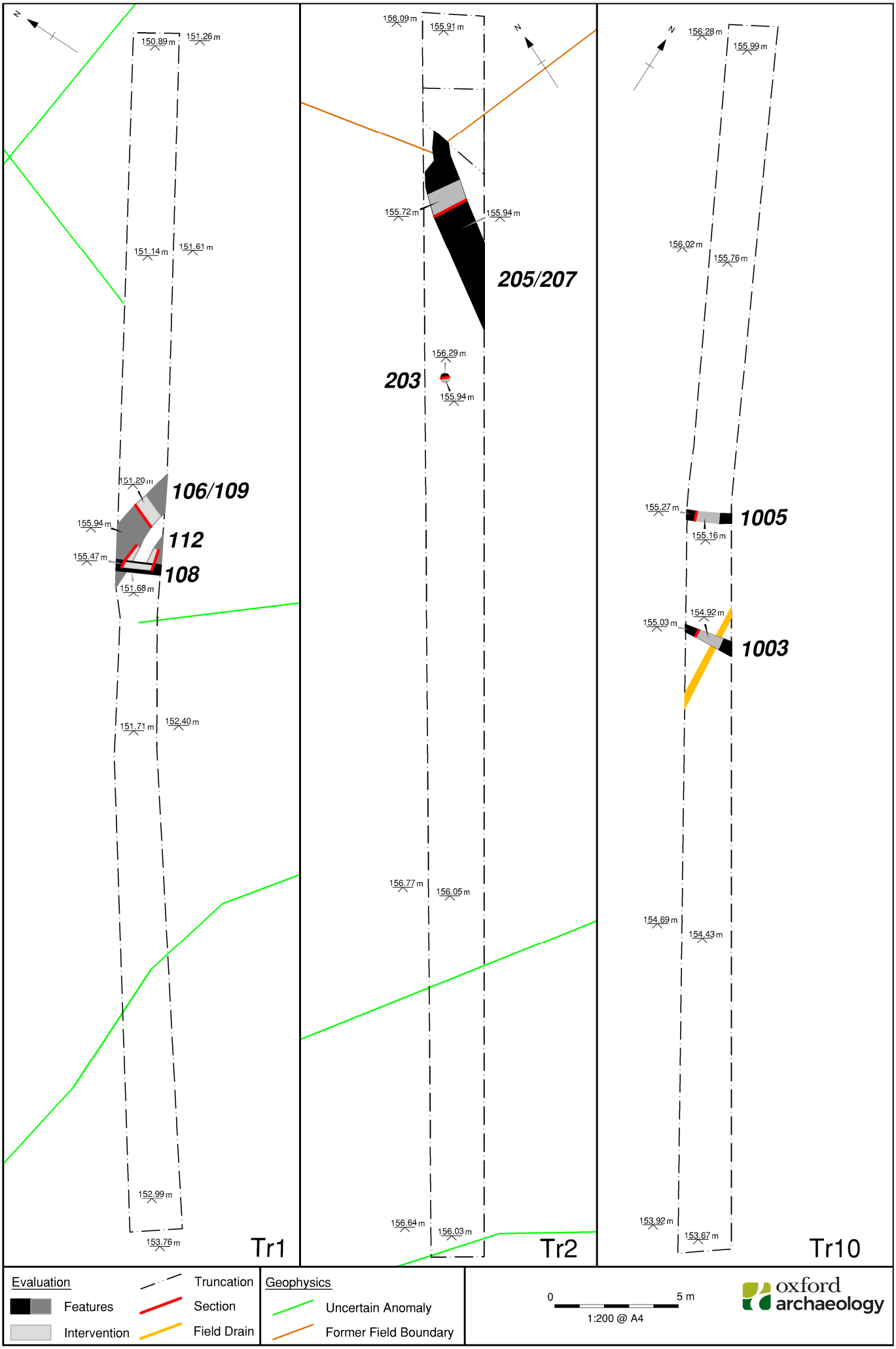
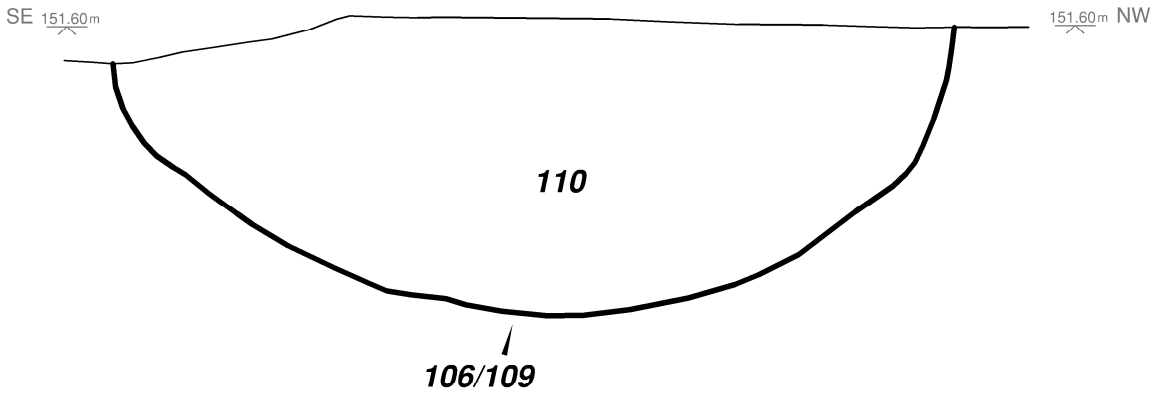
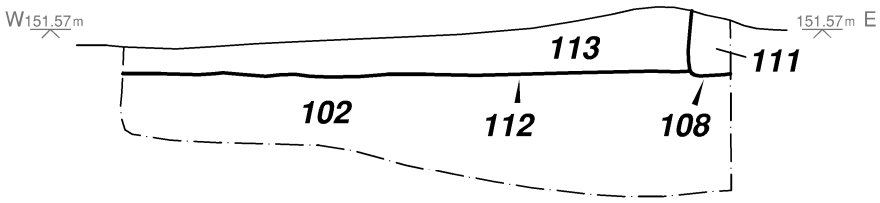


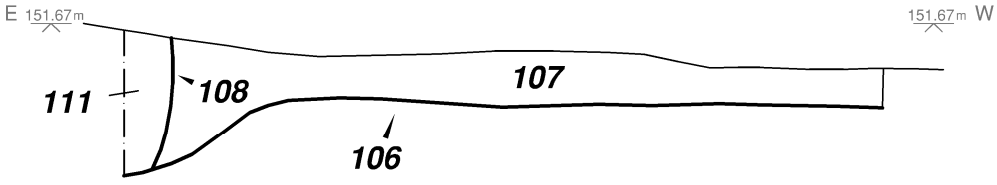
Figure 3: Plans of Trenches 1, 2 and 10



North-East facing section of ditch ***106***/***109*** in Trench 1



North facing section of ditches ***108*** and ***112*** in Trench 1



South facing section of ditches ***106*** and ***108*** in Trench 1

Cut

Layer/Deposit

Stone

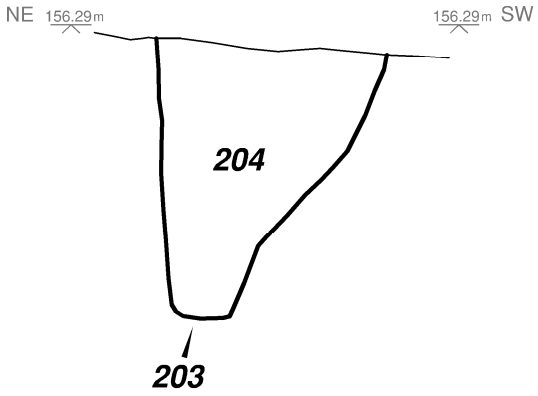
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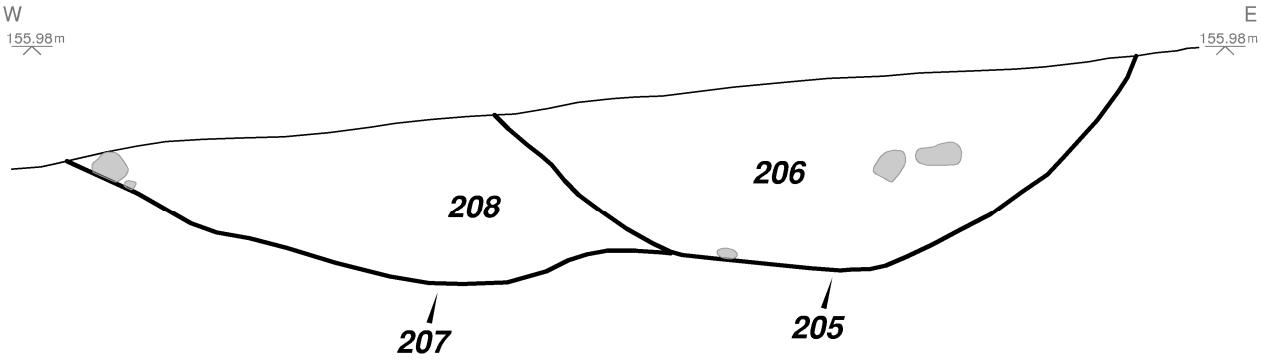
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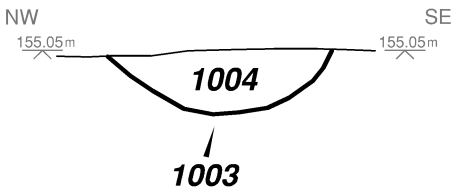
Figure 4: Sections of features in Trench 1



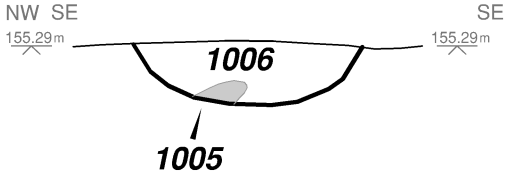
South-West facing section of posthole ***203*** in Trench 2



North facing section of ditches ***205*** and ***207*** in Trench 2



North-East facing section of ditch ***1003*** in Trench 10



North-East facing section of ditch ***1005*** in Trench 10

Cut

Layer/Deposit

Stone

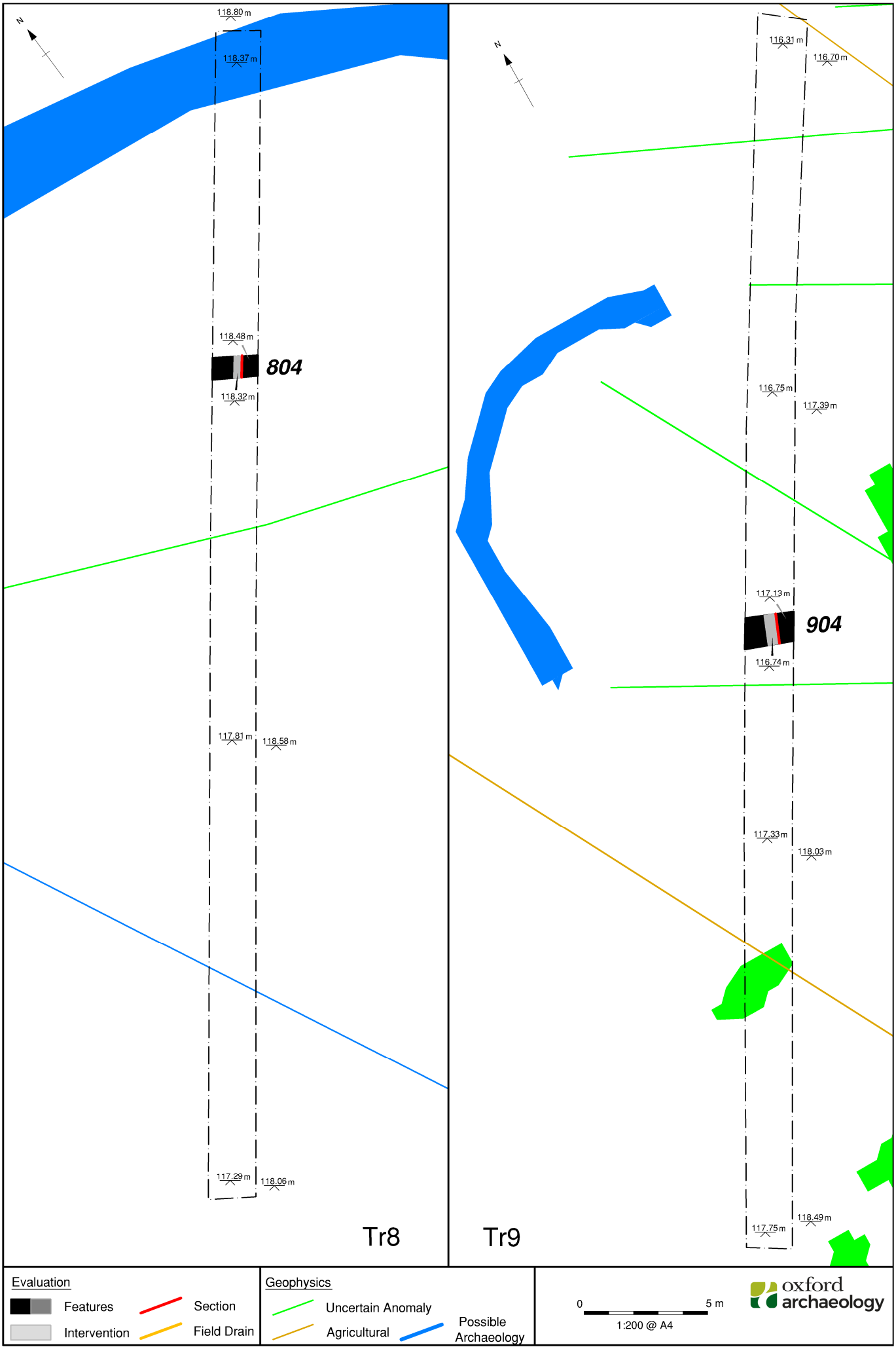
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oxford archaeology

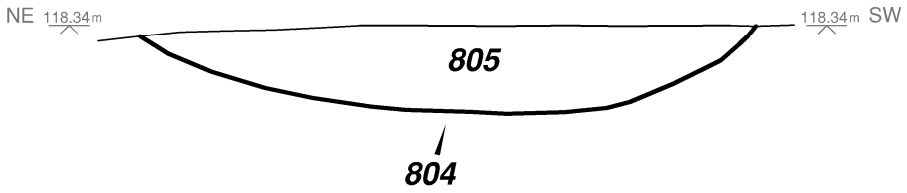
PD*L11545*MAT*April 2024

Figure 5: Sections of features in Trenches 2 and 10

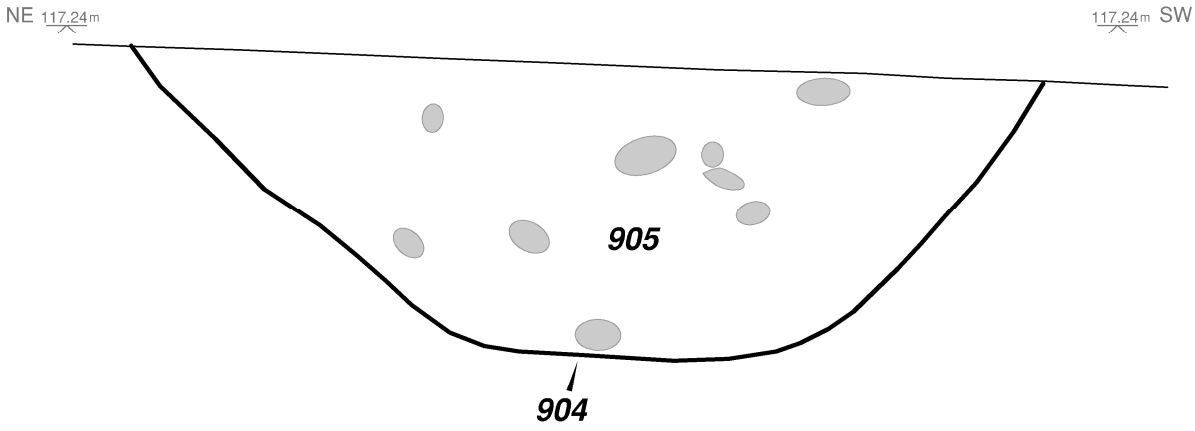


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Figure 6: Plans of Trenches 8 and 9



North-West facing section of ditch ***804*** in Trench 8



North-West facing section of ditch ***904*** in Trench 9

Cut

Layer/Deposit

Stone

0 0.25 m

1:10 @ A4

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Figure 7: Sections of features in Trenches 8 and 9

APPENDIX A TRENCH DESCRIPTIONS AND CONTEXT INVENTORY

Trench 1							
General description					**Orientation**		NE/SW
Two ditches and a gully cut the natural geology. These were sealed by localised subsoil deposits, which were overlain by topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.7
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
100	Layer			0	Topsoil. 0.3m thick		
101	Layer			0.3	Subsoil. 0.2m thick		
102	Layer			0.5	Natural		
103	Cut		1.5	0.6	Ditch		
104	Fill	***103***	1.5	0.3	Secondary Fill. Light grey silty sand, lower fill		
105	Fill	***103***	1.5	0.3	Secondary Fill. Dark grey silty sand, upper deposit		
106	Cut		0.3	0.3	Ditch. Same as [109]		
107	Fill	***106***	0.3	0.3	Secondary Fill		
108	Cut		0.3	0.2	Ditch		
109	Cut		1.1	0.4	Ditch. Same as [106]		
110	Fill	***109***	1.1	0.4	Secondary Fill		
111	Fill	***108***	0.3	0.2	Secondary Fill		
112	Cut		0.1	0.08	Ditch		
113	Fill	***112***	0.1	0.08	Secondary Fill		

Trench 2							
General description					**Orientation**		NE/SW
A ditch with a later recut and a posthole cut into natural geology. The ditch was then truncated by a modern pit. Subsoil sealed these features and was overlain by topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.5
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
200	Layer			0	Topsoil. 0.35m thick		
201	Layer			0.35	Subsoil. 0.15m thick		
202	Layer			0.5	Natural		
203	Cut		0.3	0.37	Posthole		
204	Fill	***203***	0.3	0.37	Secondary Fill		
205	Cut		0.84	0.25	Ditch		
206	Fill	***205***	0.84	0.25	Secondary Fill		
207	Cut		0.74	0.22	Ditch		
208	Fill	***207***	0.74	0.22	Secondary Fill		

Trench 3							
General description					**Orientation**		NW/SE
No archaeology present. Natural geology was sealed by colluvium. This was overlain by topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.4
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
300	Layer			0	Topsoil. 0.3m thick		
301	Layer			0.3	Subsoil. 0.1m thick		
302	Layer			0.4	Colluvial Layer. 0.2m thick		
303	Layer			0.6	Natural		

Trench 4							
General description					**Orientation**		NW/SE
No archaeology present. Natural geology was sealed by subsoil. This was overlain by topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.45
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
400	Layer			0	Topsoil. 0.2m thick		
401	Layer			0.2	Subsoil. 0.2m thick		
402	Layer			0.4	Natural		

Trench 5							
General description					**Orientation**		NE/SW
No archaeology present. Natural geology sealed topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.35
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
500	Layer			0	Topsoil. 0.3m thick		
501	Layer			0.3	Natural		

Trench 6							
General description					**Orientation**		NE/SW
No archaeology present. Natural geology sealed topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.3
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
600	Layer			0	Topsoil. 0.3m thick		
601	Layer			0.3	Natural		

Trench 7							
General description						**Orientation**	N/S
No archaeology present. Natural geology was sealed by two alluvial deposits and a made ground deposit near the southern extent. These were overlain by topsoil.						**Length (m)**	50
						Width (m)	1.8
						Avg. depth (m)	0.5
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
700	Layer			0	Topsoil. 0.25m thick		
701	Layer			0.25	Alluvial Layer. 0.20m thick. Dark brown grey alluvial		
702	Layer			0.45	Alluvial Layer. 0.15m thick. Light grey brown alluvial		
703	Layer			0.25	Other Layer. Thickness unknown. Made ground		
704	Layer			0.6	Natural		

Trench 8							
General description						**Orientation**	NE/SW
A ditch cut natural geology and was sealed by two made ground deposits. These were overlain by topsoil.						**Length (m)**	50
						Width (m)	1.8
						Avg. depth (m)	0.7
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
800	Layer			0	Topsoil. 0.3m thick		
801	Layer			0.3	Other Layer. 0.20m thick. Orange made ground		
802	Layer			0.5	Other Layer. 0.20m thick. Black made ground		
803	Layer			0.7	Natural		
804	Cut		0.8	0.12	Ditch		
805	Fill	804	0.8	0.12	Secondary Fill		

Trench 9							
General description					**Orientation**		NE/SW
A ditch cut natural geology and was sealed by two made ground deposits. These were overlain by topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.74
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
900	Layer			0	Topsoil. 0.15m thick		
901	Layer			0.15	Other Layer. 0.15m thick. Orange made ground		
902	Layer			0.3	Other Layer. 0.16m thick. Black made ground		
903	Layer			0.46	Natural		
904	Cut		1.2	0.38	Ditch		
905	Fill	***904***	1.2	0.38	Secondary Fill		

Trench 10							
General description					**Orientation**		NW/SE
Two gullies cut the natural geology and were sealed by topsoil.					**Length (m)**		50
					Width (m)		1.8
					Avg. depth (m)		0.2
Context No.	**Type**	**Fill Of**	**Width (m)**	**Depth (m)**	**Description**	**Finds**	**Date**
1000	Layer			0	Topsoil. 0.2m thick		
1001	Layer			0.2	Subsoil. 0.15m thick		
1002	Layer			0.35	Natural		
1003	Cut		0.3	0.08	Ditch		
1004	Fill	***1003***	0.3	0.08	Secondary Fill		
1005	Cut		0.28	0.08	Ditch		
1006	Fill	***1005***	0.28	0.08	Secondary Fill		

APPENDIX B BIBLIOGRAPHY

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APPENDIX C SITE SUMMARY DETAILS

Site name:	Plas Solar and Energy Storage Project, Plas Power Estate, Wrexham
Site code:	PPW24
Grid Reference	SJ 30179 50165
Type:	Evaluation
Date and duration:	19th March 2024, 5 days
Location of archive:	The archive is currently held at OA, Mill 3, Moor Lane Mills, Moor Lane, Lancaster, LA1 1QD, and will be deposited with the National Monuments Record, Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) or Archaeological Data Service (ADS) in due course.
Summary of Results:	Oxford Archaeology was commissioned by RPS to undertake an archaeological trial trench evaluation at the site of a proposed solar and energy storage project on the Plas Power Estate, Wrexham (NGR: SJ 30179 50165). A preceding geophysical survey undertaken on site detected a number of anomalies of possible archaeological origin, as such a scheme of archaeological trial trenching was devised to test the anomalies. A total of 10 trenches were excavated across the investigation area, five of which contained archaeological remains. These largely comprised shallow ditches and one posthole concentrated in the northern and southern extents of the scheme. There was a fairly poor correlation between the geophysical anomalies and the archaeological remains uncovered. Most of the geophysical anomalies were identified as variations within the underlying natural geology. The archaeological remains that were identified were determined to be of an agricultural nature of unknown dates, suggesting the continued agricultural use of the land throughout the past. The limited finds assemblage suggested that, where finds were recovered, the features were of post-medieval or modern date.

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