

Hawkwell Village, NW Bicester, Oxfordshire  
Archaeological Desk-Based Assessment  
November 2022

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**Report**

Archaeological Desk-Based Assessment

**Site**

Hawkwell Village, NW Bicester

**Clients**

Hallam Land Management Ltd (SW)

**Date**

November 2022

**Planning Authority**

Cherwell District Council

**Site Centred At**

SP 56784 25340

**Prepared By**

Sylvia Lock BA ACIfA

**Approved By**

Rob Bourn BA MA MCIfA

**Report Status**

Final

**Orion Ref**

PN2935/WSI and DBA

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## Timescales Used in This Report

## Prehistoric

Palaeolithic	450,000 -12,000 BC
Mesolithic	12,000 - 4,000 BC

3

Neolithic	4,000 - 2,200 BC
Bronze Age	2,200 - 700 BC
Iron Age	700 - AD 43

**Historic**

Roman	43 - 410AD
Saxon/Early Medieval	410 - 1066AD
Medieval	1066 - 1485AD
Post Medieval	1486 - 1901AD
Modern	1901 - Present Day

## Executive Summary

This historic environment desk-based assessment considers land at Hawkwell Village, north-west Bicester in Cherwell District, Oxfordshire (Figure 1a). The area assessed in this report forms part of a larger site which is the subject of an extant planning application (Figure 1b, planning reference: 21/04275/OUT)<sup>1</sup>. In accordance with government policy (National Planning Policy Framework), 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.

### *Archaeological Assets*

A review of the available evidence has confirmed that the study site has a moderate potential to contain Prehistoric and Roman finds and features and a low potential for all other periods.

No statutory designations (Scheduled Ancient Monuments, Registered Battlefields or World Heritage Sites) are located within or adjacent to the study site boundary. None are recorded within the 1km study area.

As such the assessment has not identified any designated archaeological assets which will be negatively impacted by the proposed development.

A geophysical survey of the site was completed in April 2022. No anomalies suggestive of significant archaeological features were identified; however, several anomalies were detected, but were classed as being of undetermined origin. The survey identified anomalies of agricultural origin in the form of ridge and furrow ploughing in multiple orientations. Anomalies representing mapped and unmapped former field boundaries as well as modern ploughing were also identified.

The LPA Archaeologist has been consulted to agree a scope of works for archaeology as the application progresses and, following the geophysical survey results, has requested a 2% pre-determination trial trenching evaluation of the proposed residential areas and of targeted areas of the proposed solar farm. The evaluation will be carried out at the optimum time to avoid farm disturbance (summer months of 2023).

### *Built Heritage Assets*

A separate Heritage Statement has been prepared, which concluded that the proposals are considered to preserve the significance of all designated heritage assets assessed, with any potential harmful impacts arising from change within the settings of these assets being adequately mitigated. In respect of the non-designated heritage assets of Hawkwell Farm and Lords Farm the levels of harm caused by the development proposals are considered acceptable in heritage terms.

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<sup>1</sup> <https://planningregister.cherwell.gov.uk/Planning/Display/21/04275/OUT>

## 1.0 Introduction

- 1.1 This historic environment desk-based assessment considers land at Hawkwell Village, north-west Bicester, Cherwell District, Oxfordshire (Fig. 1a). It has been researched and prepared by Orion Heritage on behalf of Hallam Land Management. The site (hereinafter referred to as the “study site”) is located at grid reference SP 56784 25340. It has been prepared to support planning application 21/04275/OUT. A separate Heritage Statement has also been prepared by Orion Heritage Ltd.<sup>2</sup>
- 1.2 In accordance with the Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists 2017), the assessment draws together available information on designated and non-designated heritage assets, topographic and land-use information so as to establish the potential for non-designated archaeological assets within the study site. The assessment includes the results of a site survey, an examination of published and unpublished records, and charts historic land-use through a map regression exercise.
- 1.3 The assessment enables relevant parties to assess the significance of archaeological heritage assets on and close to the study site and considers the potential for hitherto undiscovered archaeological assets, thus enabling potential impacts on assets to be identified along with the need for design, civil engineering or archaeological solutions. It also provides an understanding of any constraints to development of the study site due to the presence of nearby heritage assets and provides an assessment of the potential impact development would have on the significance of heritage assets and also provides design responses that would serve to reduce that impact in line with local and national policy.
- 1.4 The study area used in this assessment is a 1km buffer from the study site boundary.

### Location, Topography and Geology

- 1.5 The study site is located c.1km north-west of the northern edge of Bicester and c.400m south of Bainton Road, which forms the main east-west axis through the village of Bucknell. The study site extends across seven arable and pasture fields and is bisected by Bicester Road near its western boundary. It rises very gently from c.95m aOD (above Ordnance Datum) in the east to c.100m aOD in the west. The study site is bounded by Bucknell village and agricultural fields to the north and by agricultural fields to the east and west. South of the study site are further agricultural fields which form part of the whole site (planning reference 21/04275/OUT). A stream flows north-south across the study site.
- 1.6 The British Geological Society records the study site’s bedrock geology as Cornbrash Formation – Limestone with no superficial deposits recorded.<sup>3</sup> No geotechnical data is currently available for the study site.

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<sup>2</sup> Orion Heritage Ltd. 2022. Hawkwell Village, NW Bicester, Oxfordshire. Heritage Statement

<sup>3</sup> <http://mapapps.bgs.ac.uk/geologyofbritain3d/>

## 2.0 Aims, Objectives & Methodology

2.1 The principal aims of the heritage desk-based assessment are to:

- Gain an understanding of the archaeological potential of the study site;
- Identify any archaeological constraints to the development of the study site; and to
- Assess the likely impact of the proposed development.

2.2 The results of the archaeological desk-based assessment will inform an archaeological strategy for further on-site assessment and formulation of a mitigation strategy, as appropriate to the archaeological potential of the study site.

2.3 This desk-based assessment conforms to the requirements of current national and local planning policy (including *National Planning Policy Framework* 2021) and it has been designed in accordance with current best archaeological practice, and the appropriate national and local standards and guidelines, including:

- Management of Recording Projects in the Historic Environment: MORPHE (English Heritage 2006);
- Code of Conduct (Chartered Institute for Archaeologists [ClfA] [revised edition] 2014); and
- Standard and Guidance for Historic Environment Desk-Based Assessment (ClfA January 2017).

2.4 It is noted that the Chartered Institute for Archaeologists defines desk-based assessment as:

*“a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets and, in England, the nature, extent and quality of the known or potential archaeological, historic, architectural and artistic interest. Significance is to be judged in a local, regional, national or international context as appropriate.”*

2.5 The Chartered Institute for Archaeologists Standard for desk-based assessment states that:

*“Desk-based assessment will determine, as far as is reasonably possible from existing records, the nature, extent and significance of the historic environment within a specified area. Desk-based assessment will be undertaken using appropriate methods and practices which satisfy the stated aims of the project, and which comply with the Code of conduct and other relevant regulations of ClfA. In a development context desk-based assessment will establish the impact of the proposed development on the significance of the historic environment (or will identify the need for further evaluation to do so) and will enable reasoned proposals and decisions to be made whether to mitigate, offset or accept without further intervention that impact.”*

### Methodology

2.6 The archaeological desk-based assessment is produced in accordance with the Archaeological Desk-Based Assessment: Advisory Document (Oxfordshire County Archaeological Services, undated). As per the advisory document, a Written Scheme of Investigation for the desk-based assessment (Orion Heritage 2022) was submitted to OCC for approval (04.05.22) and subsequently approved (12.05.22).



- 2.7 Oxfordshire County Archaeological Services were contacted to ascertain whether there were any specific requirements or data sources required for inclusion in the assessment.
- 2.8 The following sources will be consulted for the whole study area:
- a) the Oxfordshire Historic Environment Record (OHER);
  - b) the National Heritage List for England held by Historic England;
  - c) Designated assets such as Scheduled Monuments, Battlefields and Listed Buildings;
  - d) all Ordnance Survey maps (19th and 20th century) at 1:10000, 1:10560, 1:2500 and 1:1250 scales;
  - e) tithe maps (and apportionments), estate maps and any other relevant historical maps within the relevant County Record Office (parts of Oxfordshire were formerly part of Berkshire and may still be covered by the Berkshire Record Office), or readily available elsewhere;
  - f) English Place Name Society volumes or similar authoritative works covering place names of the study area;
  - g) geological maps of the study area;
  - h) geotechnical reports where such evidence is not being separately assessed;
  - i) previous archaeological evaluation and excavation records relating to sites in and immediately adjacent to the study area;
  - j) such other published works, reports and other information relevant to the desk-based assessment;
  - k) air photographic collections by Historic England Swindon and such other collections as are held by Oxfordshire County Council within the HER for the area of study;
  - l) An assessment of any Lidar holdings held by the Environment Agency for the study area (beyond the specific development area).
  - m) The Oxfordshire Historic Landscape Characterisation data (provided as part of the HER consultation).
  - n) National Mapping Programme Data where available.
  - o) Portable Antiquities Scheme data, available from the PAS website.
- 2.9 Lidar provides topographic data and is particularly useful in the detection and identification of heritage assets that survive as earthworks. The Environment Agency (EA) regularly collects Lidar data for England and makes these data available for public use through their online portal. Digital Terrain Models (DTM) are routinely used for heritage purposes as this model shows the ground surface with buildings and trees filtered out to create a 'bare earth' effect. The Environment Agency National Lidar Programme collected DTM data in 2019 and 2020 at 1m resolution that offers full coverage of the study site and 1km study area. These data were downloaded in May 2022 and were processed using the Relief Visualisation Toolkit (RVT) version 1.2 and were reviewed using QGIS. The processed data shows evidence for linear features in the form of residual banks, which may be associated with medieval agricultural activities.
- 2.10 Google Earth holds imagery which covers the study site for the period 1945-2020. The 1985 image is of poor quality and has not been assessed. Throughout the

remaining years, the site has been in agricultural use. The 2017 and 2018 images show crop trials in two of the fields.

- 2.11 Undated imagery available at Bing Aerial shows the study site in a similar condition to Google Earth images.
- 2.12 The study site is not within an area covered by the Historic England Aerial Archaeology Mapping Explorer.<sup>4</sup>
- 2.13 The Historic England Aerial Photograph Explorer (accessed 13.05.22) does not show any aerial photographs that cover the site; however, it is noted that the online viewer does not contain information for the full archive.
- 2.14 The Cambridge University Collection of Aerial Photography (CUCAP) is presently closed to the public and there is currently no projected reopening date for services. The CUCAP collection is searchable online, and, in some cases, there are detailed descriptions and thumbnail images which indicate the subject of the photographs however no photo locations are shown within the study site and full analysis has not been possible.

#### *Previous archaeological investigations*

- 2.15 Partially within the study site, an archaeological watching brief (EOX1104) was carried out during the demolition of the former sewage pumping station and the construction of a new submersible pump and control kiosk in 2003; no archaeological features were revealed.
- 2.16 The HER records seven further previous archaeological investigations within the 1km study area, these are illustrated at Figure 3 and listed at Appendix A. The following were carried out to the south of the study site, within the original extent of the site, to support a 2014 outline planning application (14/01384/OUT): a cultural heritage desk-based assessment (Hyder Consulting Ltd, 2014, ES technical appendix 10A), an interpretation of aerial photographs for archaeology (EOX3147 - Air Photo Services, 2010, ES Appendix 10B), an archaeological geophysical survey for the proposed Bicester Eco Development (EOX3414 and EOX5589 - Northamptonshire Archaeology December 2011 – February 2012, ES Technical Appendix 10C) and an archaeological evaluation (EOX5650 - Oxford Archaeology South, 2014, ES Technical Appendix 10D). Orion Heritage summarised the findings of all of the above in a heritage impact assessment in October 2021 (ES Chapter 10, Appendix 10.5 of the current planning application 21/04275/OUT). The investigations identified areas of potential Bronze age activity, as well as areas of Iron Age and Roman activity.

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<sup>4</sup> <https://www.arcgis.com/apps/webappviewer/index.html?id=d45dabecf5541f18255e12e5cd5f85a>

## 3.0 Statutory and Planning Policy Framework

### Ancient Monuments & Archaeological Areas Act 1979

- 3.1 The Ancient Monuments & Archaeological Areas Act 1979 (as amended) protects the fabric of Scheduled Monuments but does not afford statutory protection to their settings.

### Planning (Listed Building and Conservation Areas) Act 1990

- 3.2 The *Planning (Listed Buildings and Conservation Areas) Act 1990* sets out broad policies and obligations relevant to the listing of special buildings.
- 3.3 Section 66(1) of the Act states:

*“In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses”.*

### National Planning Policy Framework (NPPF) & National Planning Practice Guidance (NPPG)

- 3.4 Government policy in relation to the historic environment is outlined in Section 16 of the National Planning Policy Framework (NPPF), entitled ‘Conserving and Enhancing the Historic Environment’. This provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:
- Delivery of sustainable development;
  - Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
  - Conservation of England's heritage assets in a manner appropriate to their significance; and
  - Recognition of the contribution that heritage assets make to our knowledge and understanding of the past.
- 3.5 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term.
- 3.6 Paragraph 194 states that planning decisions should be based on the significance of the heritage asset, and that the level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to understand the potential impact of the proposal upon the significance of that asset.
- 3.7 Paragraph 198 states that decisions regarding the removal or alteration of historic statues, plaques, memorials or monuments should have regard to the importance of their retention in situ and, where appropriate, explaining their historic and social context rather than removal.
- 3.8 Paragraph 203 requires the decision-maker to take into account the effect on the significance of non-designated heritage assets and to take a balanced judgement having regard to the scale of harm or loss and the significance of the asset(s) potentially affected.

### 3.9 Annex 2 of the NPPF has the following heritage related definitions:

- **Historic environment:** *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 landscaped and planted or managed flora.*
- **Heritage asset:** *A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing);*
- **Designated heritage asset:** *A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.*
- **Significance (for heritage policy):** *The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting. For World Heritage Sites, the cultural value described within each site's Statement of Outstanding Universal Value forms part of its significance.*
- **Setting of a heritage asset:** *The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.*

3.10 Heritage assets that have not been designated as a listed building, scheduled monument, registered park and garden, protected wreck, battlefield or conservation area is referred to as a non-designated heritage asset.

3.11 The NPPF is supported by the PPG (July 2019). In relation to the historic environment, paragraph 002 (002 Reference ID: 18a-002-20190723) states that:

*“Where changes are proposed, the National Planning Policy Framework sets out a clear framework for both plan-making and decision-making in respect of applications for planning permission and listed building consent to ensure that heritage assets are conserved, and where appropriate enhanced, in a manner that is consistent with their significance and thereby achieving sustainable development. Heritage assets are either designated heritage assets or non-designated heritage assets.”*

3.12 Paragraph 18a-013 (Paragraph: 013 Reference ID: 18a-013-20190723) outlines that although the extent and importance of setting is often expressed in visual terms, it can also be influenced by other factors such as noise, dust and vibration. Historic relationships between places can also be an important factor stressing ties between places that may have limited or no intervisibility with each other. This may be historic as well as aesthetic connections that contribute or enhance the significance of one or more of the heritage assets.

3.13 Paragraph 18a-013 concludes:

*“The contribution that setting makes to the significance of the heritage asset does not depend on there being public rights or an ability to access or experience that setting. This will vary over time and according to circumstance. When assessing any application for development which may affect the setting of a heritage asset, local planning authorities may need to consider the implications of cumulative*

*change. They may also need to consider the fact that developments which materially detract from the asset's significance may also damage its economic viability now, or in the future, thereby threatening its on-going conservation."*

- 3.14 The key test in NPPF paragraphs 199-201 is whether a proposed development will result in substantial harm or less than substantial harm to a designated asset. However, substantial harm is not defined in the NPPF. Paragraph 18a-017 (Paragraph: 018 Reference ID: 18a-018-20190723) of the PPG provides additional guidance on substantial harm. It states:
- "What matters in assessing whether a proposal might cause harm is the impact on the significance of the heritage asset. As the National Planning Policy Framework makes clear, significance derives not only from a heritage asset's physical presence, but also from its setting."*
- 3.15 Proposed development affecting a heritage asset may have no impact on its significance or may enhance its significance and therefore cause no harm to the heritage asset. Where potential harm to designated heritage assets is identified, it needs to be categorised as either less than substantial harm or substantial harm (which includes total loss) in order to identify which policies in the National Planning Policy Framework (paragraphs 200-203) apply.
- 3.16 Within each category of harm (which category applies should be explicitly identified), the extent of the harm may vary and should be clearly articulated.
- 3.17 Whether a proposal causes substantial harm will be a judgment for the decision-maker, having regard to the circumstances of the case and the policy in the National Planning Policy Framework. In general terms, substantial harm is a high test, so it may not arise in many cases. For example, in determining whether works to a listed building constitute substantial harm, an important consideration would be whether the adverse impact seriously affects a key element of its special architectural or historic interest. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed. The harm may arise from works to the asset or from development within its setting.
- 3.18 While the impact of total destruction is obvious, partial destruction is likely to have a considerable impact but, depending on the circumstances, it may still be less than substantial harm or conceivably not harmful at all, for example, when removing later additions to historic buildings where those additions are inappropriate and harm the buildings' significance. Similarly, works that are moderate or minor in scale are likely to cause less than substantial harm or no harm at all. However, even minor works have the potential to cause substantial harm, depending on the nature of their impact on the asset and its setting.
- 3.19 Paragraph 202 of the NPPF outlines that where a proposed development results in less than substantial harm to the significance of a heritage asset, the harm arising should be weighed against the public benefits accruing from the proposed development. Paragraph 18a-020 of the PPG (Paragraph: 020 Reference ID: 18a-020-20190723) outlines what is meant by public benefits:
- "Public benefits may follow from many developments and could be anything that delivers economic, social or environmental objectives as described in the National Planning Policy Framework (paragraph 8). Public benefits should flow from the proposed development. They should be of a nature or scale to be of benefit to the public at large and not just be a private benefit. However, benefits do not always have to be visible or accessible to the public in order to be genuine public benefits, for example, works to a listed private dwelling which secure its future as a designated heritage asset could be a public benefit."*

Examples of heritage benefits may include:

- *sustaining or enhancing the significance of a heritage asset and the contribution of its setting;*
- *reducing or removing risks to a heritage asset; and*
- *securing the optimum viable use of a heritage asset in support of its long-term conservation.”*

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

### Local Planning Policy

- 3.21 The study site is located within the planning area for Cherwell District Council. The Cherwell Local Plan 2011-2031 was adopted in July 2015 and contains the following relevant policies:

#### *POLICY ESD 15: The Character of the Built and Historic Environment*

*Successful design is founded upon an understanding and respect for an area's unique built, natural and cultural context. New development will be expected to complement and enhance the character of its context through sensitive siting, layout and high quality design. All new development will be required to meet high design standards. Where development is in the vicinity of any of the District's distinctive natural or historic assets, delivering high quality design that complements the asset will be essential.*

*New development proposals should:*

*Be designed to deliver high quality safe, attractive, durable and healthy places to live and work in. Development of all scales should be designed to improve the quality and appearance of an area and the way it functions*

*Deliver buildings, places and spaces that can adapt to changing social, technological, economic and environmental conditions*

*Support the efficient use of land and infrastructure, through appropriate land uses, mix and density/development intensity*

*Contribute positively to an area's character and identity by creating or reinforcing local distinctiveness and respecting local topography and landscape features, including skylines, valley floors, significant trees, historic boundaries, landmarks, features or views, in particular within designated landscapes, within the Cherwell Valley and within conservation areas and their setting*

*Conserve, sustain and enhance designated and non designated 'heritage assets' (as defined in the NPPF) including buildings, features, archaeology, conservation areas and their settings, and ensure new development is sensitively sited and integrated in accordance with advice in the NPPF and NPPG. Proposals for development that affect non-designated heritage assets will be considered taking account of the scale of any harm or loss and the significance of the heritage asset as set out in the NPPF and NPPG. Regeneration proposals that make sensitive use of heritage assets, particularly where these bring redundant or under used buildings or areas, especially any on English Heritage's At Risk Register, into appropriate use will be encouraged*

*Include information on heritage assets sufficient to assess the potential impact of the proposal on their significance. Where archaeological potential is identified this should include an appropriate desk based assessment and, where necessary, a field evaluation.*

*Respect the traditional pattern of routes, spaces, blocks, plots, enclosures and the form, scale and massing of buildings. Development should be designed to*

*integrate with existing streets and public spaces, and buildings configured to create clearly defined active public frontages*

*Reflect or, in a contemporary design response, re-interpret local distinctiveness, including elements of construction, elevational detailing, windows and doors, building and surfacing materials, mass, scale and colour palette*

*Promote permeable, accessible and easily understandable places by creating spaces that connect with each other, are easy to move through and have recognisable landmark features*

*Demonstrate a holistic approach to the design of the public realm to create high quality and multi-functional streets and places that promotes pedestrian movement and integrates different modes of transport, parking and servicing. The principles set out in *The Manual for Streets* should be followed*

*Consider the amenity of both existing and future development, including matters of privacy, outlook, natural lighting, ventilation, and indoor and outdoor space*

*Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation*

*Be compatible with up to date urban design principles, including *Building for Life*, and achieve *Secured by Design* accreditation*

*Consider sustainable design and layout at the masterplanning stage of design, where building orientation and the impact of microclimate can be considered within the layout*

*Incorporate energy efficient design and sustainable construction techniques, whilst ensuring that the aesthetic implications of green technology are appropriate to the context (also see *Policies ESD 1 - 5* on climate change and renewable energy)*

*Integrate and enhance green infrastructure and incorporate biodiversity enhancement features where possible (see *Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment* and *Policy ESD 17 Green Infrastructure*). Well designed landscape schemes should be an integral part of development proposals to support improvements to biodiversity, the micro climate, and air pollution and provide attractive places that improve people's health and sense of vitality*

*Use locally sourced sustainable materials where possible.*

*The Council will provide more detailed design and historic environment policies in the *Local Plan Part 2*.*

*The design of all new development will need to be informed by an analysis of the context, together with an explanation and justification of the principles that have informed the design rationale. This should be demonstrated in the *Design and Access Statement* that accompanies the planning application. The Council expects all the issues within this policy to be positively addressed through the explanation and justification in the *Design & Access Statement*. Further guidance can be found on the Council's website. The Council will require design to be addressed in the pre-application process on major developments and in connection with all heritage sites. For major sites/strategic sites and complex developments, *Design Codes* will need to be prepared in conjunction with the Council and local stakeholders to ensure appropriate character and high quality design is delivered throughout. *Design Codes* will usually be prepared between outline and reserved matters stage*

to set out design principles for the development of the site. The level of prescription will vary according to the nature of the site.

*Policy Bicester 1: North West Bicester Eco-Town*

*Development Area: 390 hectares*

*Key site specific design and place shaping principles:*

*Proposals should comply with Policy ESD15.*

*Undertake a staged programme of archaeological investigation*

## Guidance

*Historic Environment Good Practice Advice In Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment (Historic England 2015)*

- 3.22 The purpose of this document is to provide information to assist local authorities, planning and other consultants, owners, applicants and other interested parties in implementing historic environment policy in the NPPF and NPPG. Paragraph 6 outlines a six-stage process to the assembly and analysis of relevant information relating to heritage assets potentially affected by a proposed development:
- *“Understand the significance of the affected assets;*
  - *Understand the impact of the proposal on that significance;*
  - *Avoid, minimise and mitigate impact in a way that meets the objectives of the NPPF;*
  - *Look for opportunities to better reveal or enhance significance;*
  - *Justify any harmful impacts in terms of the sustainable development objective of conserving significance and the need for change; and*
  - *Offset negative impacts on aspects of significance by enhancing others through recording, disseminating and archiving archaeological and historical interest of the important elements of the heritage assets affected.”*

*Historic Environment Good Practice Advice In Planning Note 3: The Setting of Heritage Assets (Historic England 2017)*

- 3.23 Historic England’s Historic Environment Good Practice Advice in Planning Note 3 provides guidance on the management of change within the setting of heritage assets.
- 3.24 The document restates the definition of setting as outlined in Annex 2 of the NPPF. Setting is also described as being a separate term to curtilage, character and context; while it is largely a visual term, setting, and thus the way in which an asset is experienced, can also be affected by noise, vibration, odour and other factors. The document makes it clear that setting is not a heritage asset, nor is it a heritage designation, though land within a setting may itself be designated. Its importance lies in what the setting contributes to the significance of a heritage asset.
- 3.25 The Good Practice Advice Note sets out a five-staged process for assessing the implications of proposed developments on setting:
1. Identification of heritage assets which are likely to be affected by proposals;
  2. Assessment of whether and what contribution the setting makes to the significance of a heritage asset;
  3. Assessing the effects of proposed development on the significance of a heritage asset;
  4. Maximising enhancement and reduction of harm on the setting of heritage assets; and
  5. Making and documenting the decision and monitoring outcomes



3.26 The guidance reiterates the NPPF in stating that where developments affecting the setting of heritage assets results in a level of harm to significance, this harm, whether substantial or less than substantial, should be weighed against the public benefits of the scheme.

## 4.0 Archaeological and Historic Baseline

- 4.2 The heritage assets under consideration have been identified by means of a review of a wide range of sources, in summary this includes (inter alia):
- Oxfordshire Historic Environment Record (NHER) Data;
  - The National Heritage List for England (NHLE) held by Historic England;
  - Historic England Archive;
  - Heritage Gateway;
  - Local studies and record office research; and
  - Review of historic mapping.
- 4.3 These resources have been used to provide an understanding of the heritage assets which may be affected by the proposed development. This chapter will describe the heritage assets which may be affected and assess their significance.
- 4.4 The location of heritage assets mentioned in the text are shown on Figs. 2 and 3.

### *Portable Antiquities Scheme*

- 4.5 The Portable Antiquities Scheme (PAS) encourages the recording of archaeological objects found by members of the public in England and Wales. A search of the online PAS database is appended to this report.
- 4.6 The PAS data is not available to download with spatial data however rough spatial information can be viewed, but not reproduced, using the PAS KML download in Google Earth.
- 4.7 The PAS contains 32 entries within a 1km area from the postcode closest to the study site, none of which appear to be located within the study site itself (however, this is based on rough spatial information).

### *Historic Landscape Characterisation Project*

- 4.8 The Historic Landscape Characterisation (HLC) data (Figure 2b) recorded the study site as follows: The western-most field (HOX1773) was recorded as 'reorganised enclosures' (planned enclosure of rough ground, re-organised with the addition of the railway line in the early modern period). The central fields (HOX1771) were also recorded as 'reorganised enclosures' (enclosure of rough ground by planned enclosure, some boundary change in the modern period, but overall character reflects the re-ordered enclosure shown on the 1<sup>st</sup> edition Ordnance Survey Map). The eastern-most field (HOX1784) was recorded as 'prairie/amalgamated enclosure' (enclosed by 1810 and re-ordered internally in the later part of the 19<sup>th</sup> century. Boundary loss in the modern times has created large prairie type fields).

### *Aerial Photographs & Lidar*

- 4.9 A search of the Historic England Archive aerial photography collection in May 2022 under reference AP/134186 returned 30 oblique records, 0 military oblique records and 119 vertical records; these are listed at Appendix A.
- 4.10 All available aerial photographs were viewed at the Historic England Archive on the 17<sup>th</sup> May 2022.

- 4.11 Within the study site the following were identified (Plate 1): areas of ridge and furrow cultivation earthworks (Historic England RAF/CPE/UK/1897, 562, 3151 – dated 1946) of varying degrees of preservation, an area showing potential discrete pits & an area showing linear ditches as cropmarks (Historic England OS/94214, 14692, 5) as well as an area showing a Z-shaped bank earthwork and a potential former field boundary earthwork (Historic England OS/84243/12669/1024).

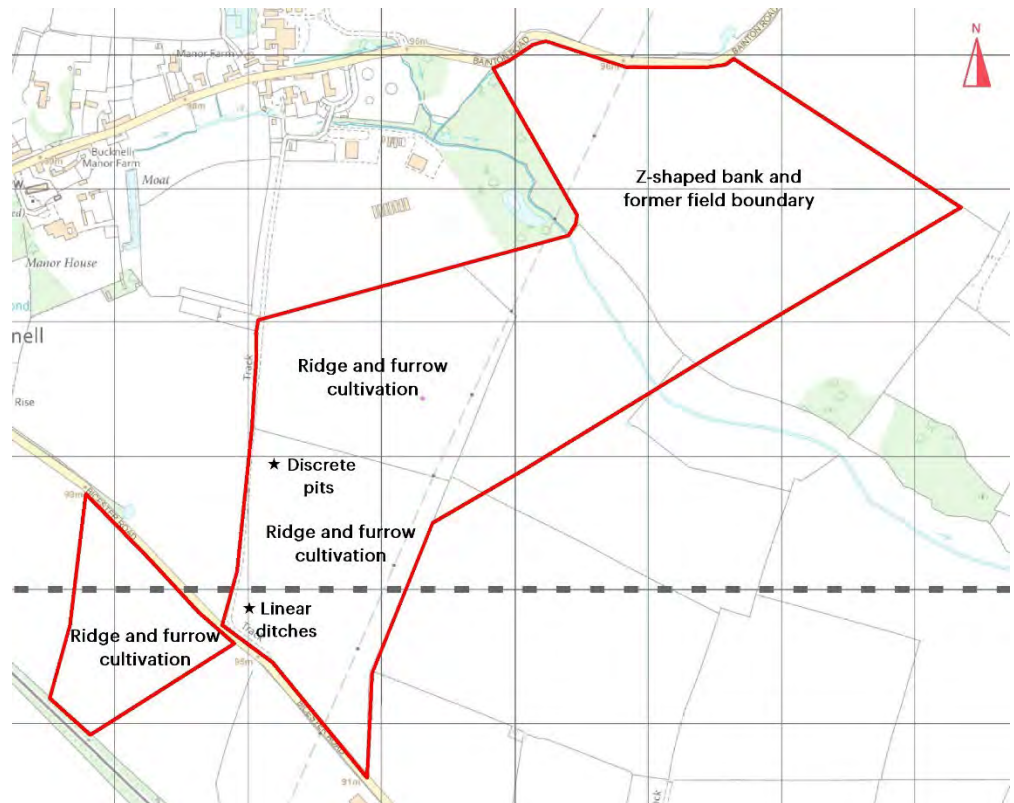


Plate 1: Features within the study site seen on aerial photographs

- 4.12 The wider area was observed as largely agricultural with numerous examples of earthwork and cropmark ridge and furrow observed on multiple photographs. The deserted medieval village at Caversfield was observed, as was the cropmark evidence for the archaeology which was revealed during previous investigations within the ‘whole study site’ (an interpretation of aerial photographs for archaeology (EOX3147), an archaeological geophysical survey for the proposed Bicester Eco Development (EOX3414 and EOX5589) and an archaeological evaluation (EOX5650). In addition to this, multiple areas of linear ditches, possible pits (or possible geology) and rectilinear enclosures were also observed in the wider study area and beyond.
- 4.13 The Cambridge University Collection of Aerial Photographs (CUCAP) is presently closed to the public and there is currently no projected reopening date for services. The CUCAP collection is searchable online and a list of aerial photographs within the study area is at Appendix A. In some cases, there are detailed descriptions and thumbnail images which indicate the subject of the photographs however full analysis has not been possible.
- 4.14 Google Earth holds historic aerial photography from 1945. The photograph shows the study site as enclosed agricultural fields.
- 4.15 Satellite and aerial imagery held by Google Earth covers the study site for the period 1985-2021. The 1985 image is of poor quality and has not been assessed. Throughout the remaining years, the site has been in agricultural use. The 2017 and 2018 images show crop trials in two of the fields.

- 4.16 Undated aerial imagery available at Bing Aerial show the study site comprising enclosed agricultural fields.
- 4.17 The Environment Agency National Lidar Programme collected data in 2019 and 2020 which covers the study site and 1km study area at 1m resolution. The processed lidar data show four residual earthwork banks which may represent former field boundaries or ploughing headlands (Plate 2). None of these are shown on available historic mapping dating to the 17<sup>th</sup> century onwards and could therefore be of an earlier date. The areas of ridge and furrow cultivation observed on the 1946 aerial photograph (see paragraph 4.11) have since largely been ploughed out and are barely discernible on the 2019 and 2020 lidar data.



Plate 2: National Lidar Programme 2019 and 2020 1m DTM, Multidirectional Hillshade RGB

### *Geophysical Survey*

- 4.18 A geophysical survey of the site was completed in April 2022 (Magnitude Surveys Ltd, Appendix B, Figure 17). No anomalies suggestive of significant archaeological features were identified; however, several anomalies were detected, but were classed as being of undetermined origin. The survey identified anomalies of agricultural origin in the form of ridge and furrow ploughing in multiple orientations. Anomalies representing mapped and unmapped former field boundaries as well as modern ploughing were also identified.

### *Previous archaeological investigations*

- 4.19 Partially within the study site, an archaeological watching brief (EOX1104) was carried out during the demolition of the former sewage pumping station and the construction of a new submersible pump and control kiosk in 2003; no archaeological features were revealed.
- 4.20 The HER records seven further previous archaeological investigations within the 1km study area, these are illustrated at Figure 3 and listed at Appendix A. The following were carried out to the south of the study site, within the original extent of the site, to support a 2014 outline planning application (14/01384/OUT): a cultural heritage desk-based assessment (Hyder Consulting Ltd, 2014, ES technical appendix 10A), an interpretation of aerial photographs for archaeology (EOX3147 - Air Photo Services, 2010, ES Appendix 10B), an archaeological geophysical

survey for the proposed Bicester Eco Development (EOX3414 and EOX5589 - Northamptonshire Archaeology December 2011 – February 2012, ES Technical Appendix 10C) and an archaeological evaluation (EOX5650 - Oxford Archaeology South, 2014, ES Technical Appendix 10D). Orion Heritage summarised the findings of all of the above in a heritage impact assessment in October 2021 (ES Chapter 10, Appendix 10.5 of the current planning application 21/04275/OUT). The investigations identified areas of potential Bronze age activity, as well as areas of Iron Age and Roman activity.

#### *Undated*

- 4.21 No undated finds or features were recorded on the HER within the study site. The HER recorded an undated rectangular enclosure (12227) c.900m west of the study site.
- 4.22 Linear features (28875) were recorded c.780m south/south-east of the study site. These were interpreted as possible ditches during an archaeological evaluation (EXO5650), however, it was stated that they may equally be natural features. No finds were recovered.

#### *Prehistoric*

- 4.23 There are no recorded Prehistoric finds or features recorded on the HER within the study site.
- 4.24 Previous archaeological investigations (EOX3147, EOX3414, EOX5589, EOX5650) within the 'whole site' have identified an area of potential Bronze Age activity c.800m south/south-east of the study site and two areas of Iron Age activity c.100m south and c.1.3km south/south-east of the study site.
- 4.25 Partially within the study site, an archaeological watching brief (EOX1104) was carried out during the demolition of the former sewage pumping station and the construction of a new submersible pump and control kiosk in 2003; no archaeological features were revealed.
- 4.26 A ring ditch, which may represent a possible Bronze Age barrow (13597) is visible as a cropmark c.650m north of the study site.
- 4.27 Rectilinear enclosures (15958) are visible as cropmarks in an area c.400m south of the study site, within the 'whole site' (planning ref. 21/04275/OUT). These were interpreted to indicate probable occupation in the prehistoric and Roman periods and/or medieval farming and settlement features.
- 4.28 Magnetometry survey (EOX3414) confirmed archaeological features of late prehistoric or Roman date (27989) originally identified during an aerial photography survey (EOX3147) in an area c.300m south of the study site, within the 'whole site' (21/04275/OUT).
- 4.29 A single Bronze Age ring ditch (13907) was identified on aerial photographs c.990m south-south-west of the study site.
- 4.30 In summary, there are no recorded Prehistoric finds or features within the study site. Given the proximity of the study site to known Bronze Age – Iron Age activity, the study site is considered to have a moderate potential to contain finds and features from the Prehistoric periods.

#### *Roman*

- 4.31 There are no recorded Roman finds or features within the study site.

- 4.32 Rectilinear enclosures (15958) are visible as cropmarks in an area c.400m south of the study site, within the 'whole site' (planning ref. 21/04275/OUT). These were interpreted to indicate probable occupation in the prehistoric and Roman periods and/or medieval farming and settlement features. Two areas of Roman activity were identified during previous archaeological investigations (EOX3147, EOX3414, EOX5589, EOX5650) within the 'whole site' c.100m south and c.360m south (in the area of 15958) of the study site respectively.
- 4.33 In summary, there are no recorded Roman finds or features within the study site. There is evidence for rural settlement activity c.100m and c.330m south of the study site. Based upon the available evidence the study site is considered to have a moderate potential to contain finds and features relating to the Roman period.

#### *Saxon and early Medieval*

- 4.34 The HER does not record any evidence for settlement and funerary Saxon/early medieval activity within the 1km study area and there are no recorded finds or features within the study site or its immediate environs. It is considered that the study site was located within the rural hinterland to settlement during the Saxon/early medieval period and that it has a low potential to contain finds and features relating to the Saxon/early medieval period.
- 4.35 The Church of St Peter (Grade I listed, NHLE1200258) has 11<sup>th</sup> century origins. Its Norman tower is, unusually, located between the chancel and the nave and is believed to have formed part of an earlier church.<sup>5</sup>

#### *Medieval*

- 4.36 Bucknell was recorded as a settlement in the Domesday Book of 1086, in the hundred of Kirtlington and the county of Oxfordshire. It had a recorded population of 12 households and was in the possession of Robert d'Oilly.<sup>6</sup> Bucknell was recorded as '*Buchehele*' in 1086, to mean '*hill of a man called Bucca, or where bucks (male deer or he-goats) graze.*'<sup>7</sup>
- 4.37 The focus of settlement during the Medieval period was around the historic core of Bucknell, in the area of the Church of St Peter and the manor house, c.300m north-west of the study site. The Grade I listed Church of St Peter (NHLE1200258) is located c.390m north/north-west of the study site. Its origins date to the 11<sup>th</sup> century, with 12<sup>th</sup>, 13<sup>th</sup> and 15<sup>th</sup> century additions. The church was restored in 1893. The church is one of the best examples of 13<sup>th</sup> century work in the county and has the largest number of low-side windows of any church in England.<sup>8</sup> Two arms of a moat (1114) survive to define the site of the medieval manor house in Bucknell. The present manor house dates to the early 17<sup>th</sup> century (possibly partly earlier) and is Grade II listed (NHLE1046889); it is located c.300m north/north-west of the study site. The east arm is waterfilled, the west arm is filled in and no traces remain of the south arm.
- 4.38 Rectilinear enclosures (15958) are visible as cropmarks in an area c.400m south of the study site, within the 'whole site' (planning ref. 21/04275/OUT). These were interpreted to indicate probable occupation in the prehistoric and Roman periods and/or medieval farming and settlement features.

<sup>5</sup> <http://www.visitoruk.com/Buckingham/bucknell-C592-V30675.html>

<sup>6</sup> <https://opendomesday.org/place/SP5625/bucknell/>

<sup>7</sup> Mills, A.D. 2011. A Dictionary of British Place Names. Oxford University Press.

<sup>8</sup> <https://historicengland.org.uk/listing/the-list/list-entry/1200258?section=official-list-entry>

- 4.39 Caversfield deserted medieval village (1016) was recorded c.850m south-east of the study site; associated earthwork remains are visible on lidar data and aerial photographs.
- 4.40 A medieval fishpond (13743) was recorded north-east of Caversfield House, c.700m south-east of the study site.
- 4.41 The study site appears to have been located within the rural hinterland to settlement. Therefore, the study site is considered to have a low potential to contain finds and features relating to the medieval period.

#### *Post Medieval and Modern*

- 4.42 The study site has remained beyond the settlement core of Bucknell in the rural hinterland during the post medieval and modern periods. The majority of post-medieval entries in the HER relate to historic buildings within the village of Bucknell, which are listed at Appendix A and illustrated at Figure 2a.
- 4.43 A post-medieval extant fishpond (5107) is located c.820m south-east of the study site.
- 4.44 The 1805 Cary Map of Oxfordshire (Figure 4) shows the general area of the study site as open space to the south of Bucknell. The site of Hawkwell Farm is labelled as 'Hawkwell'.
- 4.45 The 1815 OS Drawing (Figure 5) shows the study site as enclosed agricultural fields.
- 4.46 The 1834 Greenwood & Greenwood Map of the County of Oxford (Figure 6) shows the study site as open fields, with the park of Bucknell Manor potentially bordering the study site or extending into it.
- 4.47 No study site is not represented on the Bucknell and Caversfield tithe maps.
- 4.48 The 1885 Ordnance Survey Map (Figure 7) shows the study site as enclosed agricultural fields. A footpath runs from Lower Farm, c.300m north of the study site, into the study site and along its northern boundary before crossing the study site in a south-easterly direction towards Caversfield.
- 4.49 The 1888 Plan of the Bucknell Manor Estate (Figure 8, reproduced with permission from Oxfordshire History Centre, reference J XIII/a/2), for sale by Mess<sup>rs</sup> Egerton & Breach, records the study site as part of Lots 1 and 5, with the western-most field excluded from the estate and recorded as in the possession of Rev. E. Miller of St Peter's Church in Bucknell.
- 4.50 By 1900 the course of the footpath had been altered, as shown on the Ordnance Survey Map (Figure 9). No other changes are visible.
- 4.51 By 1923, as shown on the Ordnance Survey Map (Figure 10), the Ashendon & Aynho branch of the Great Western Railway had been constructed to form the study site's western boundary. Filter beds had been constructed along the study site's southern boundary.
- 4.52 No changes are visible on the 1938-1952 Ordnance Survey Map (Figure 11).
- 4.53 The 1982-1988 Ordnance Survey Map (Figure 12) shows a slight field boundary loss and the former filter beds are labelled as disused sewage works. The footpath is not shown anymore, but overhead power lines are shown to cross the study site in a north-east to south-west direction.

- 4.54 Further field boundary loss is visible on the 1999 Ordnance Survey Map (Figure 13). The former filter beds had been removed. The study site remains unchanged, as shown on Figures 14 to 16.
- 4.55 In summary, the study site has remained outside settlement during the post medieval and modern periods. The historic map regression exercise has confirmed that the study site has been in agricultural use. Therefore, the study site is considered to have a low potential to contain finds and features relating to the post medieval and modern periods.

#### *Site walkover*

- 4.56 A site visit was undertaken on the 17<sup>th</sup> May 2022 to gain a greater understanding of existing land use and the potential for archaeological constraints within the study site. The study site is currently in use as enclosed agricultural fields. No noticeable archaeological finds or features were observed during the site visit.

#### *Summary of Archaeological Potential and Assessment of Significance*

- 4.57 A review of the available evidence has confirmed that the study site has a moderate potential to contain Prehistoric and Roman finds and features and a low potential for all other periods. It is considered that any such finds and features would be of Local/Regional Significance.

#### *Designated Archaeological Assets*

- 4.58 No statutory designations (Scheduled Ancient Monuments, Registered Battlefields or World Heritage Sites) are located within or adjacent to the study site boundary. None are recorded within the 1km study area.
- 4.59 As such the assessment has not identified any designated archaeological assets which will be negatively impacted by the proposed development.



## 5.0 Built Heritage Assets

- 5.1 This section will consider the potential effects of development within the study site on the significance of built heritage assets, including impacts on their settings. This includes heritage assets within the immediate environs of the study site, whose settings may be affected.
- 5.2 The study site contains no designated or non-designated heritage assets, as such the assessment will consider only heritage assets whose settings may be affected.
- 5.3 Heritage assets and potential impacts will be assessed using best practice, including that set out in Historic England's Good Practice Advice Note 3, The Setting of Heritage Assets. The heritage assets which require assessment have been selected with reference to the National Heritage List for England (NHLE) database held by Historic England, as well as information held by the Local Planning Authority (LPA) on conservation areas and locally listed or other non-designated heritage assets identified by the LPA.
- 5.4 Stage 1 of Historic England's five-stage settings assessment (Historic England 2017) requires the assessor to "Identify which heritage assets and their settings are affected" (Hist England 2017). There are no strict parameters for the setting of study areas. This has been defined based on the results of the site visit, professional judgement and experience of potential significant direct and indirect effects likely to arise from the Proposed Development. A radius of 1 km from the boundary of the application site has been used for assessing indirect effects on all listed buildings and non-designated heritage assets.
- 5.5 The distribution of built heritage assets in relation to the study site can be found in Figure 2a and the assets are listed at Appendix A. The National list and HER were reviewed, and it is noted that all built heritage assets within the 1km study area are suitably screened from the development by distance, vegetation and topography.
- 5.6 Following a site visit on 17<sup>th</sup> May 2022, it was confirmed that there was no direct intervisibility between the built heritage assets within the 1km study area and the study site. The study site is located within the wider setting of the built heritage assets (Appendix A), however, it does not make a direct contribution to their significance.
- 5.7 Historic ownership ties and functional links were also reviewed, and the 1888 Plan of the Bucknell Manor estate (Figure 8) showed a historic ownership link between the Church of St Peter and the western-most field within the study site. The remainder of the study site historically formed part of the Manor of Bucknell, however, the estate was advertised for sale in 1888 and no ownership ties or functional links remain. The owners of Lords Farm (off the A4095, south of Hawkwell Farm) bought the farm in 1901 and later on, in 1962, they also bought Hawkwell Farm. The owners of Lower Farm in Bucknell bought it in 1943 and the 'whole site' is associated with these three farms today.
- 5.8 A separate Heritage Statement<sup>9</sup> has also been prepared, which concluded that the proposals are considered to preserve the significance of all designated heritage assets assessed, with any potential harmful impacts arising from change within the settings of these assets being adequately mitigated. In respect of the non-designated heritage assets of Hawkwell Farm and Lords Farm the levels of harm

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<sup>9</sup> Orion Heritage Ltd. 2022. Hawkwell Village, NW Bicester, Oxfordshire. Heritage Statement

caused by the development proposals are considered acceptable in heritage terms.

## 6.0 Proposed Development and Potential Impact on Designated and Non-Designated Heritage Assets

### Site Conditions

- 6.1 The study site is located c.1km north-west of the northern edge of Bicester and c.400m south of Bainton Road, which forms the main east-west axis through the village of Bucknell. The study site extends across seven arable and pasture fields and is bisected by Bicester Road near its western boundary. It rises very gently from c.95m aOD (above Ordnance Datum) in the east to c.100m aOD in the west. South of the study site are further agricultural fields which form part of the whole site (planning reference 21/04275/OUT).

### The Proposed Development

- 6.2 The proposed development is the subject of an extant planning application (Planning reference 21/04275/OUT) for outline planning permission for residential development and associated infrastructure.

### Potential Archaeological Impacts and Mitigation Measures

- 6.3 A review of the available evidence has confirmed that the study site has a moderate potential to contain prehistoric and Roman finds and features and a low potential for all other periods.
- 6.4 No statutory designations (Scheduled Ancient Monuments, Registered Battlefields or World Heritage Sites) are located within or adjacent to the study site boundary. None are recorded within the 1km study area.
- 6.5 As such the assessment has not identified any designated archaeological assets which will be negatively impacted by the proposed development.
- 6.6 A geophysical survey of the site was completed in April 2022. No anomalies suggestive of significant archaeological features were identified; however, several anomalies were detected, but were classed as being of undetermined origin. The survey identified anomalies of agricultural origin in the form of ridge and furrow ploughing in multiple orientations. Anomalies representing mapped and unmapped former field boundaries as well as modern ploughing were also identified.
- 6.7 The LPA Archaeologist has been consulted to agree a scope of works for archaeology as the application progresses and has requested a 2% pre-determination trial trenching evaluation of the proposed residential areas and of targeted areas of the proposed solar farm.

### Potential Built Heritage Impacts and Mitigation Measures

- 6.8 A separate Heritage Statement has been prepared<sup>10</sup>, which concluded that the proposals are considered to preserve the significance of all designated heritage assets assessed, with any potential harmful impacts arising from change within the settings of these assets being adequately mitigated. In respect of the non-designated heritage assets of Hawkwell Farm and Lords Farm the levels of harm caused by the development proposals are considered acceptable in heritage terms.

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<sup>10</sup> Orion Heritage Ltd. 2022. Hawkwell Village, NW Bicester, Oxfordshire. Heritage Statement

## 7.0 Summary and Conclusions

- 7.1 This historic environment desk-based assessment considers Land at Hawkwell Village, NW Bicester.

### *Archaeological Assets*

- 7.2 A review of the available evidence has confirmed that the study site has a moderate potential to contain Prehistoric and Roman finds and features and a low potential for all other periods.
- 7.3 No statutory designations (Scheduled Ancient Monuments, Registered Battlefields or World Heritage Sites) are located within or adjacent to the study site boundary. None are recorded within the 1km study area.
- 7.4 As such the assessment has not identified any designated archaeological assets which will be negatively impacted by the proposed development.
- 7.5 A geophysical survey of the site was completed in April 2022. No anomalies suggestive of significant archaeological features were identified; however, several anomalies were detected, but were classed as being of undetermined origin. The survey identified anomalies of agricultural origin in the form of ridge and furrow ploughing in multiple orientations. Anomalies representing mapped and unmapped former field boundaries as well as modern ploughing were also identified.
- 7.6 The LPA Archaeologist has been consulted to agree a scope of works for archaeology as the application progresses and, following the geophysical survey results, has requested a 2% pre-determination trial trenching evaluation of the proposed residential areas and of targeted areas of the proposed solar farm. The evaluation will be carried out at the optimum time to avoid farm disturbance (summer months of 2023).

### *Built Heritage Assets*

- 7.7 A separate Heritage Statement has been prepared, which concluded that the proposals are considered to preserve the significance of all designated heritage assets assessed, with any potential harmful impacts arising from change within the settings of these assets being adequately mitigated. In respect of the non-designated heritage assets of Hawkwell Farm and Lords Farm the levels of harm caused by the development proposals are considered acceptable in heritage terms.

## Sources

### General

British Library

The National Archives

Oxfordshire Historic Environment Record

Oxfordshire History Centre

Historic England Archive Swindon

### Cartographic

1605 Speed Map of Oxfordshire

1659 Janssonius Map of Oxfordshire

1787 Cary Oxfordshire Map

1805 Cary Map of Oxfordshire

1815 OS Drawing Bicester (OSD223)

1834 Greenwood & Greenwood Map of the County of Oxford

1885 Ordnance Survey Map (1:10560)

1888 Plan of the Bucknell Manor Estate

19<sup>th</sup> century Plan of Bucknell (Oxfordshire History Centre, no exact date available)

1900 Ordnance Survey Map (1:10560)

1923 Ordnance Survey Map (1:10560)

1938-1952 Ordnance Survey Map (1:10560)

1982-1988 Ordnance Survey Map (1:10000)

1999 Ordnance Survey Map (1:10000)

2006 Ordnance Survey Map (1:10000)

2021 Ordnance Survey Map (1:10000)

### Websites

Archaeology Data Service – <https://archaeologydataservice.ac.uk/>

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

British Geological Society Geology of Britain Viewer –

<https://mapapps.bgs.ac.uk/geologyofbritain3d/>

Cherwell District Council Local Plan –

<https://www.cherwell.gov.uk/downloads/download/45/adopted-cherwell-local-plan-2011-2031-part-1-incorporating-policy-bicester-13-re-adopted-on-19-december-2016>

Historic England Aerial Archaeology Mapping Explorer –

<https://historicengland.maps.arcgis.com/apps/webappviewer/index.html?id=d45dabecef5541f18255e12e5cd5f85a>

Historic England Aerial Photo Explorer –

<https://historicengland.org.uk/images-books/archive/collections/aerial-photos/>

Historic England National Heritage List for England –

<https://www.historicengland.org.uk/listing/the-list/>

Heritage Gateway - [www.heritagegateway.org.uk](http://www.heritagegateway.org.uk)

MAGIC - [www.magic.gov.uk](http://www.magic.gov.uk)

Open Domesday - <https://opendomesday.org/place/SP5625/bucknell/>

The Rural Settlement of Roman Britain: an online resource –

<https://archaeologydataservice.ac.uk/archives/view/romangl/map.html>

Welcome to Buckingham - <http://www.visitoruk.com/Buckingham/bucknell-C592-V30675.html>

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Setting of Heritage Assets

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Reference MSSP1197

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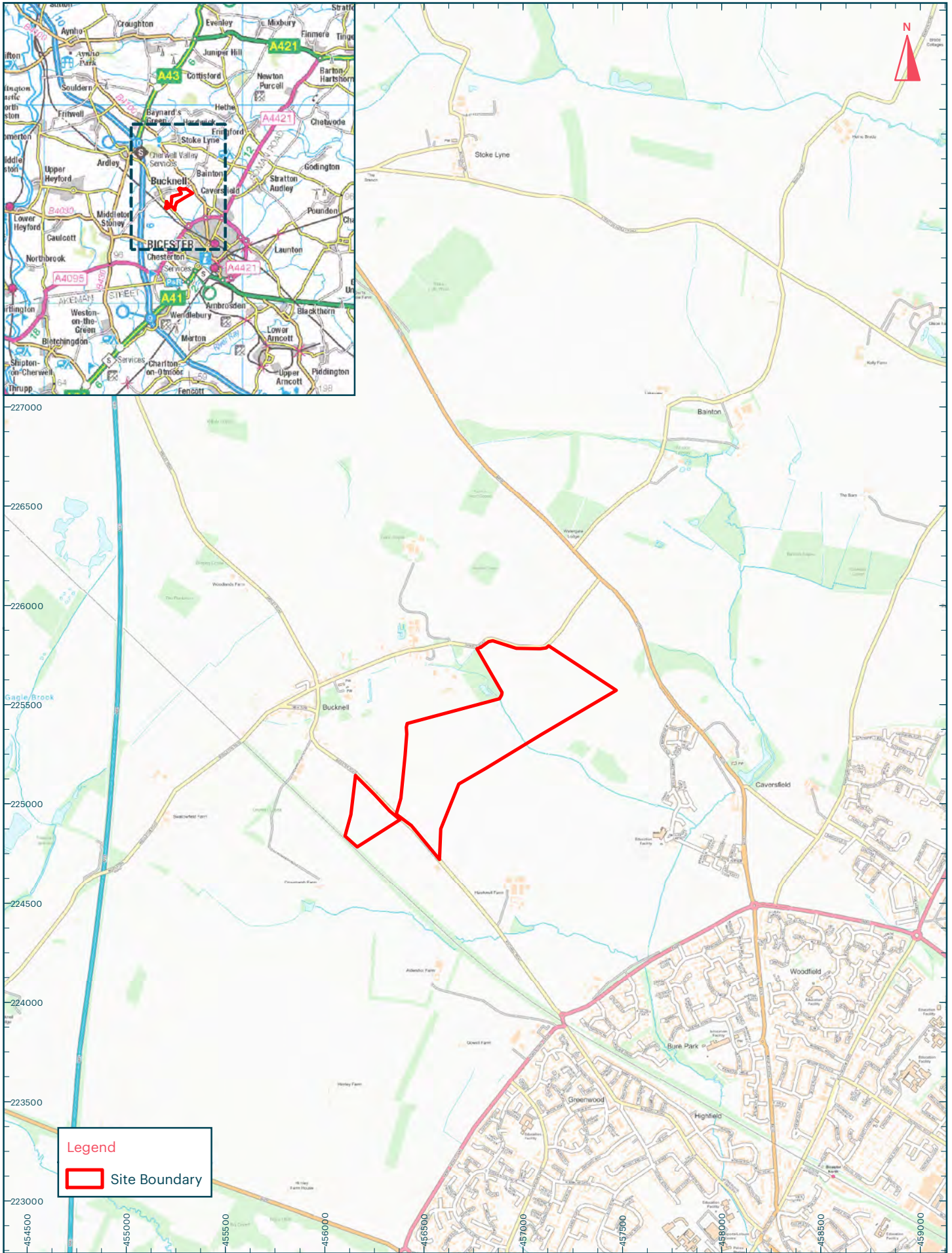
Orion Heritage Ltd. 2022. Hawkwell Village, NW Bicester, Oxfordshire. Heritage Statement

### Lidar

Lidar data were downloaded from the Environment Agency website in May 2022

<https://environment.data.gov.uk/DefraDataDownload/?Mode=survey>

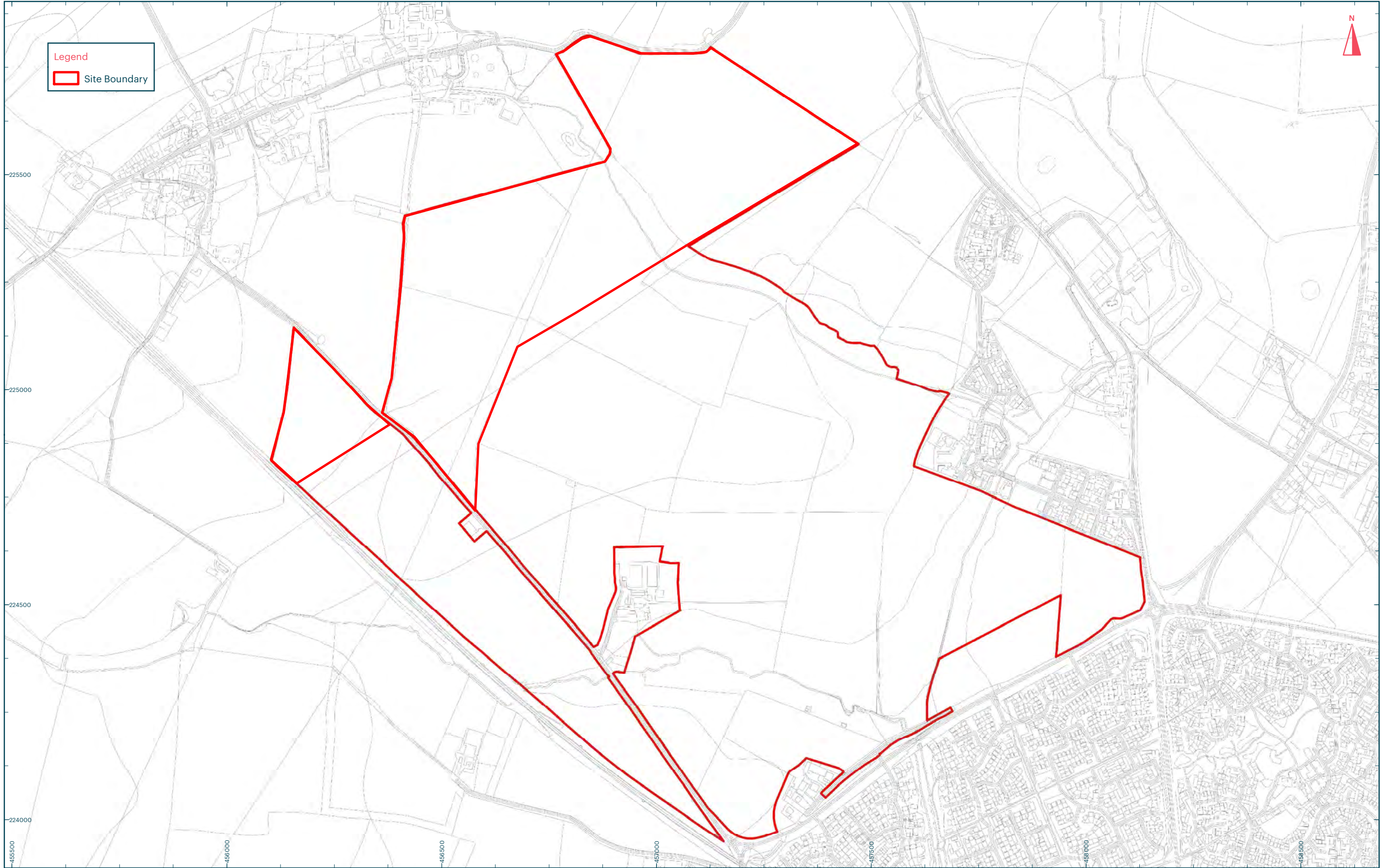
Tile Name	Year	Resolution (m)
SP52NE	2019	1
SP52SE	2020	1



**Title:**  
Figure 1a: Site Location  
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Hawkwell Village, NW Bicester

Scale at A4: 1:25,000



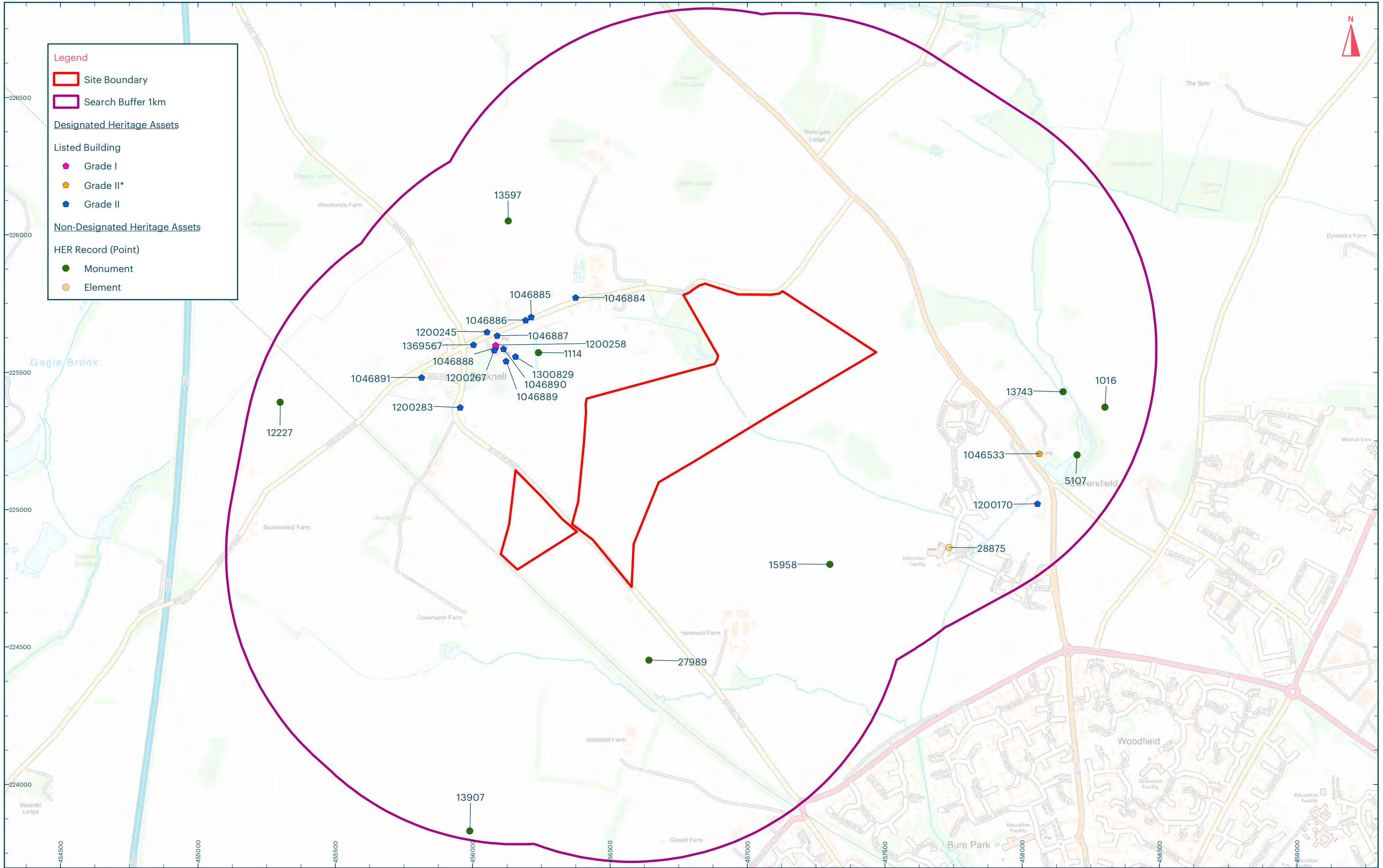


**Title:**  
 Figure 1b: Whole Site (planning reference 21/04275/OUT)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A3: 1:8,000  
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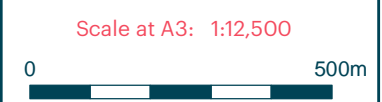




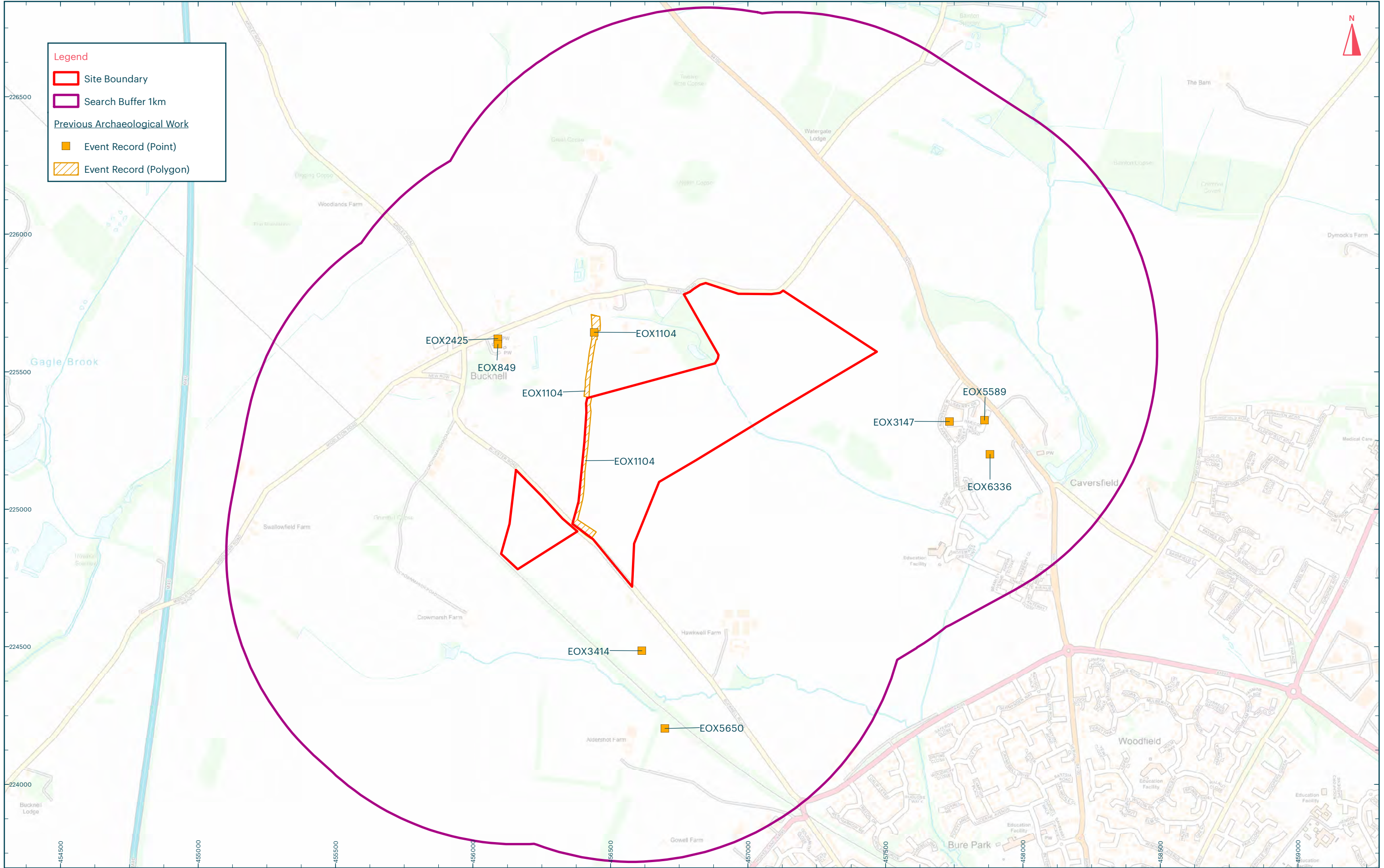


**Title:**  
Figure 2a: HER Monuments data

**Address:**  
Hawkevell Village, NW Bicester



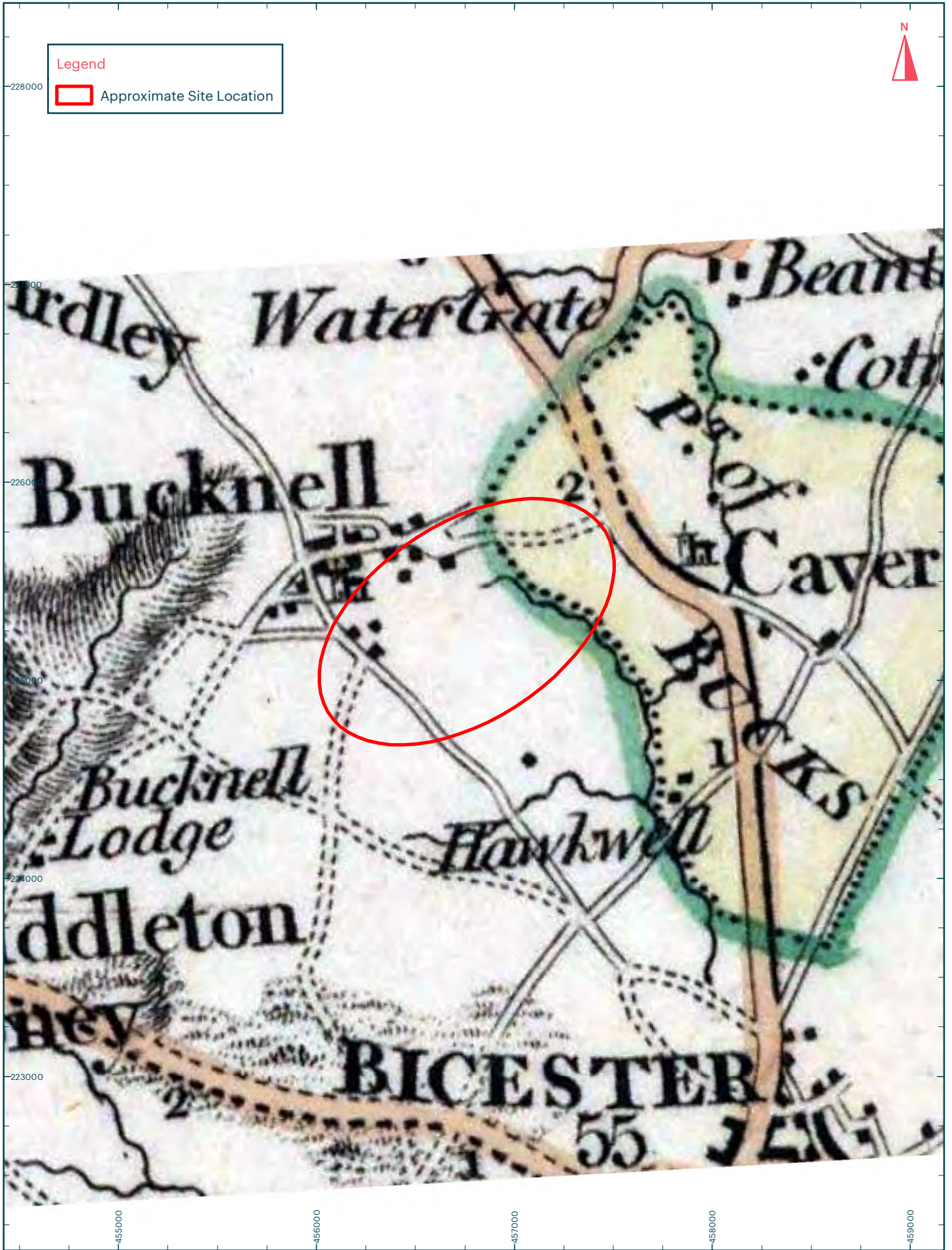





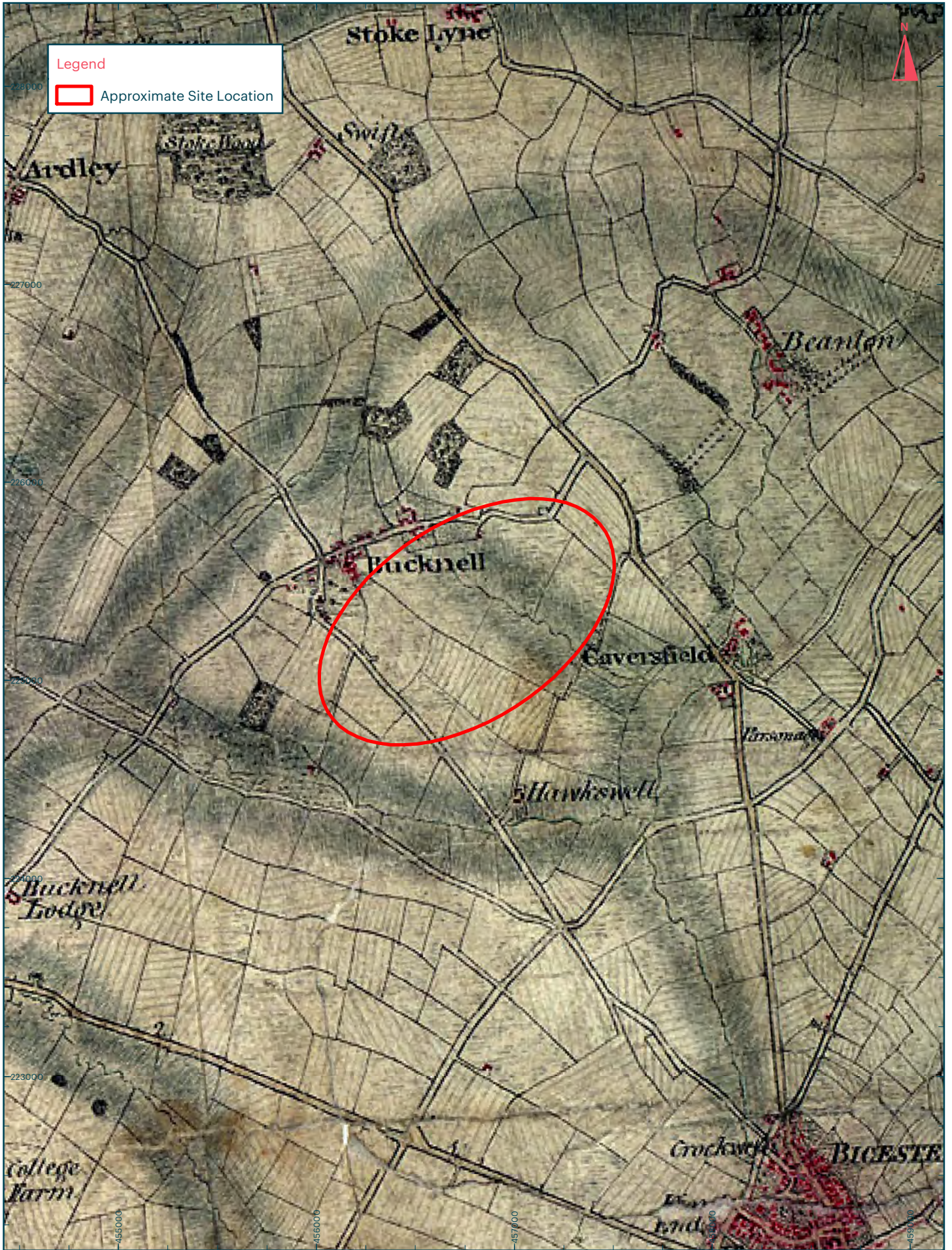
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Figure 3: HER Events data  
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Hawkwell Village, NW Bicester

Scale at A3: 1:12,500  
0 500m





<p><b>Title:</b> Figure 4: 1805 Cary Map</p> <p><b>Address:</b> Hawkwell Village, NW Bicester</p>	<p>Scale at A4: 1:25,000</p> <p>0 500m</p> 	
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**Title:**  
 Figure 5: 1815 OS Drawing Bicester (OSD223)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:25,000  
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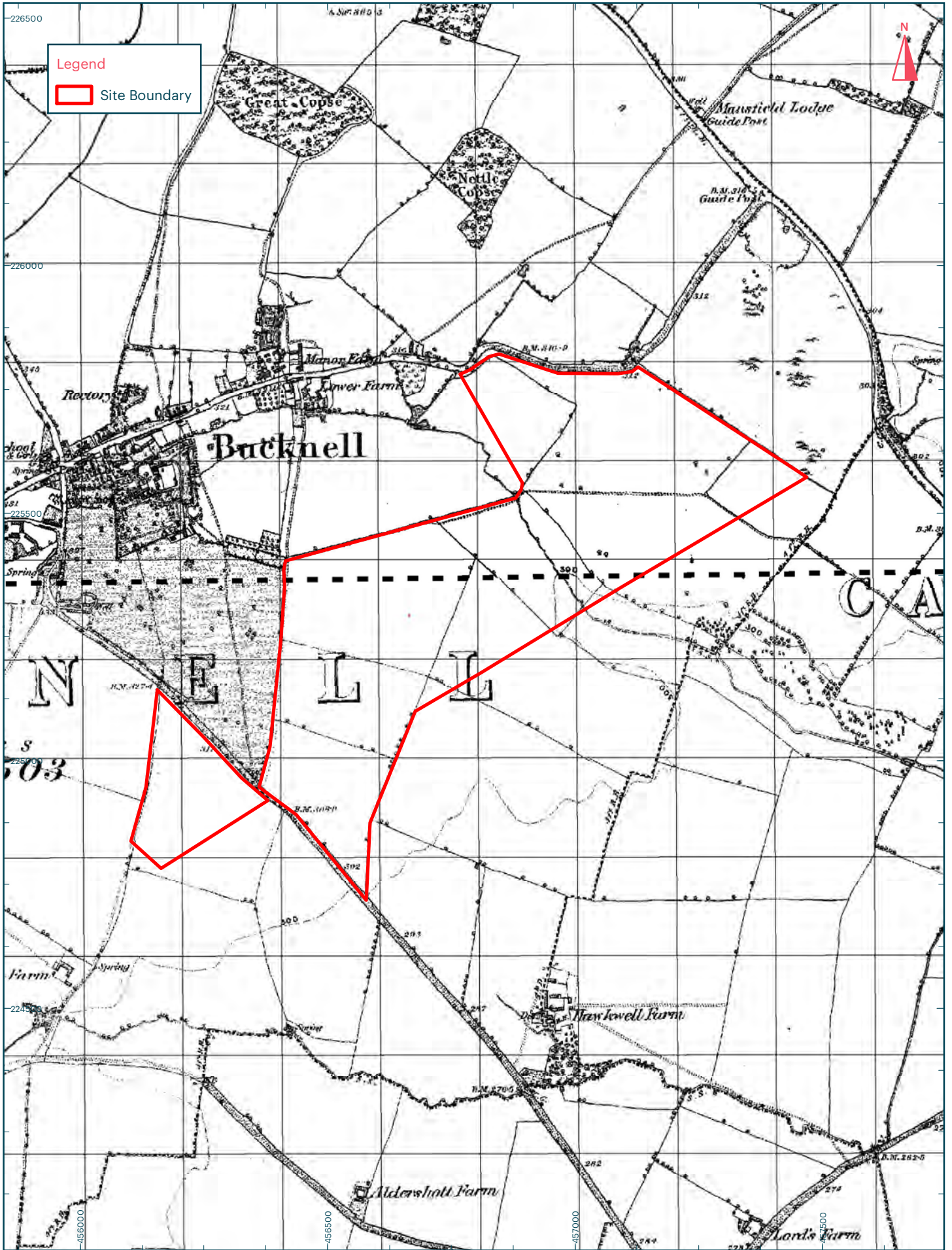




**Title:**  
Figure 6: 1834 Greenwood & Greenwood Map  
**Address:**  
Hawkwell Village, NW Bicester

Scale at A4: 1:25,000  
0 500m

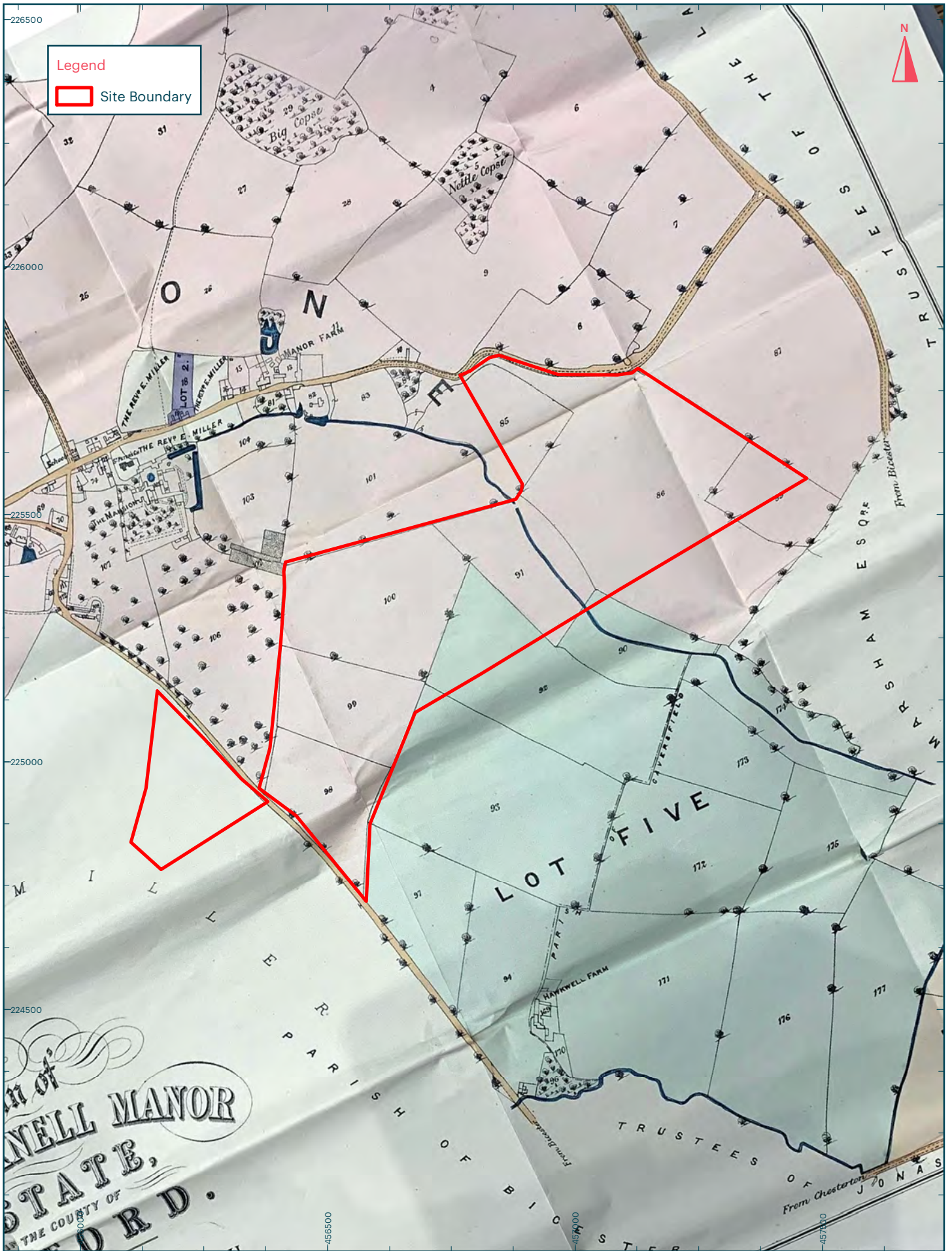





**Title:**  
Figure 7: 1885 Ordnance Survey Map (1:10560)  
**Address:**  
Hawkwell Village, NW Bicester

Scale at A4: 1:10,000

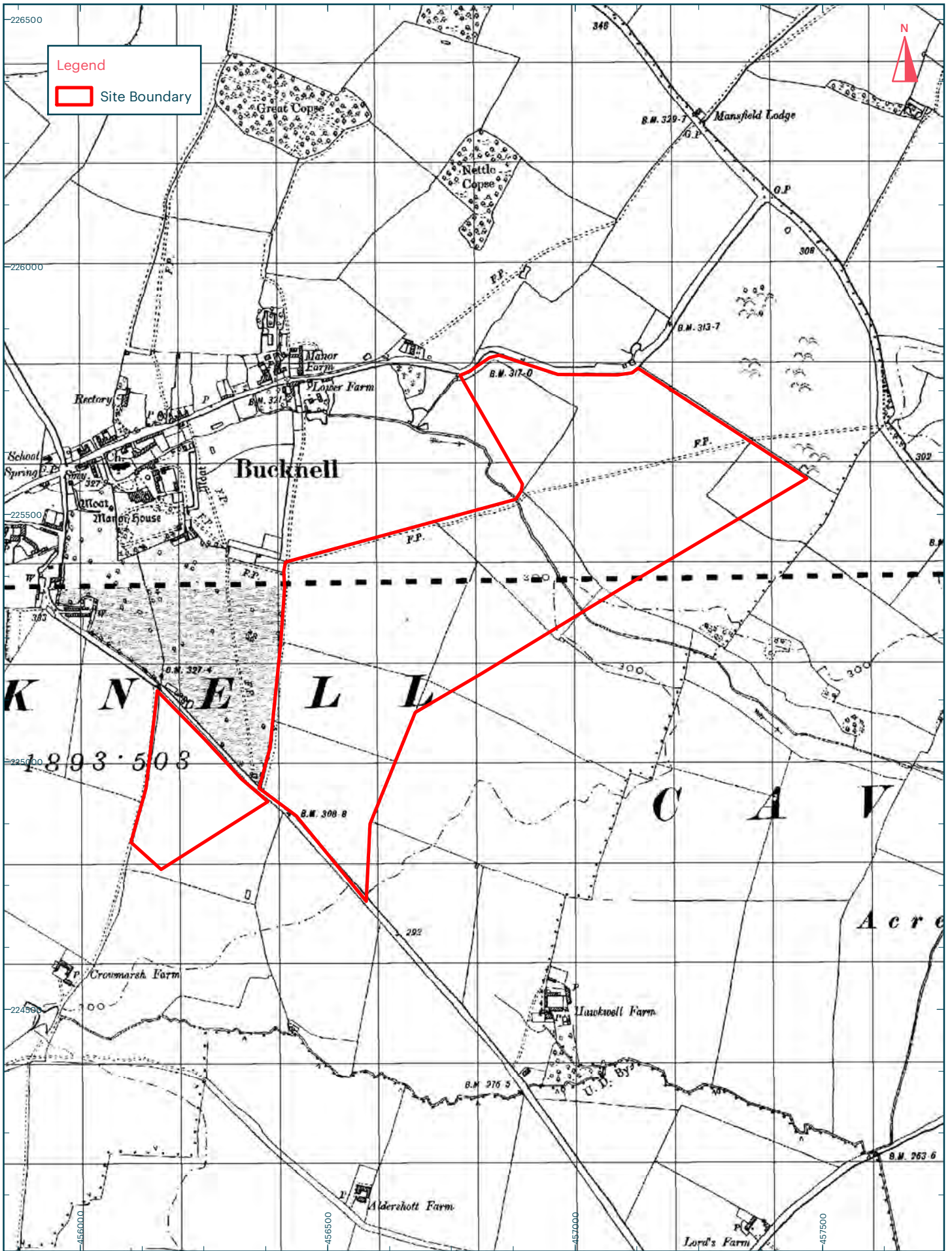




<p><b>Title:</b> Figure 8: 1888 Plan of the Bucknell Manor estate</p> <p><b>Address:</b> Hawkwell Village, NW Bicester</p>	<p>Scale at A4: 1:10,000</p> 	
--	---	---

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 Licence No: 100056706. Data contained in this material was obtained on 12.05.22

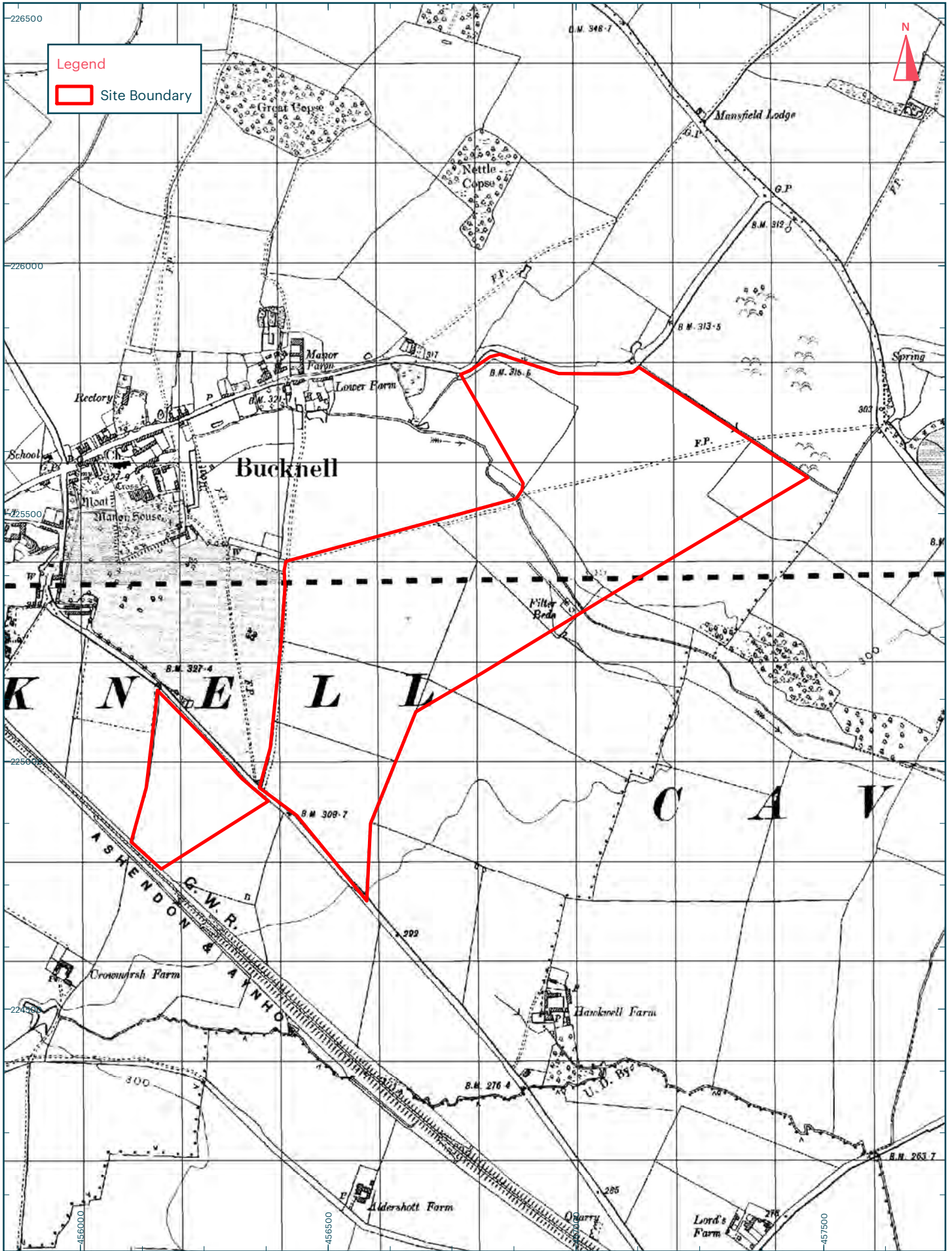




**Title:**  
 Figure 9: 1900 Ordnance Survey Map (1:10560)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:10,000  
 0 300m

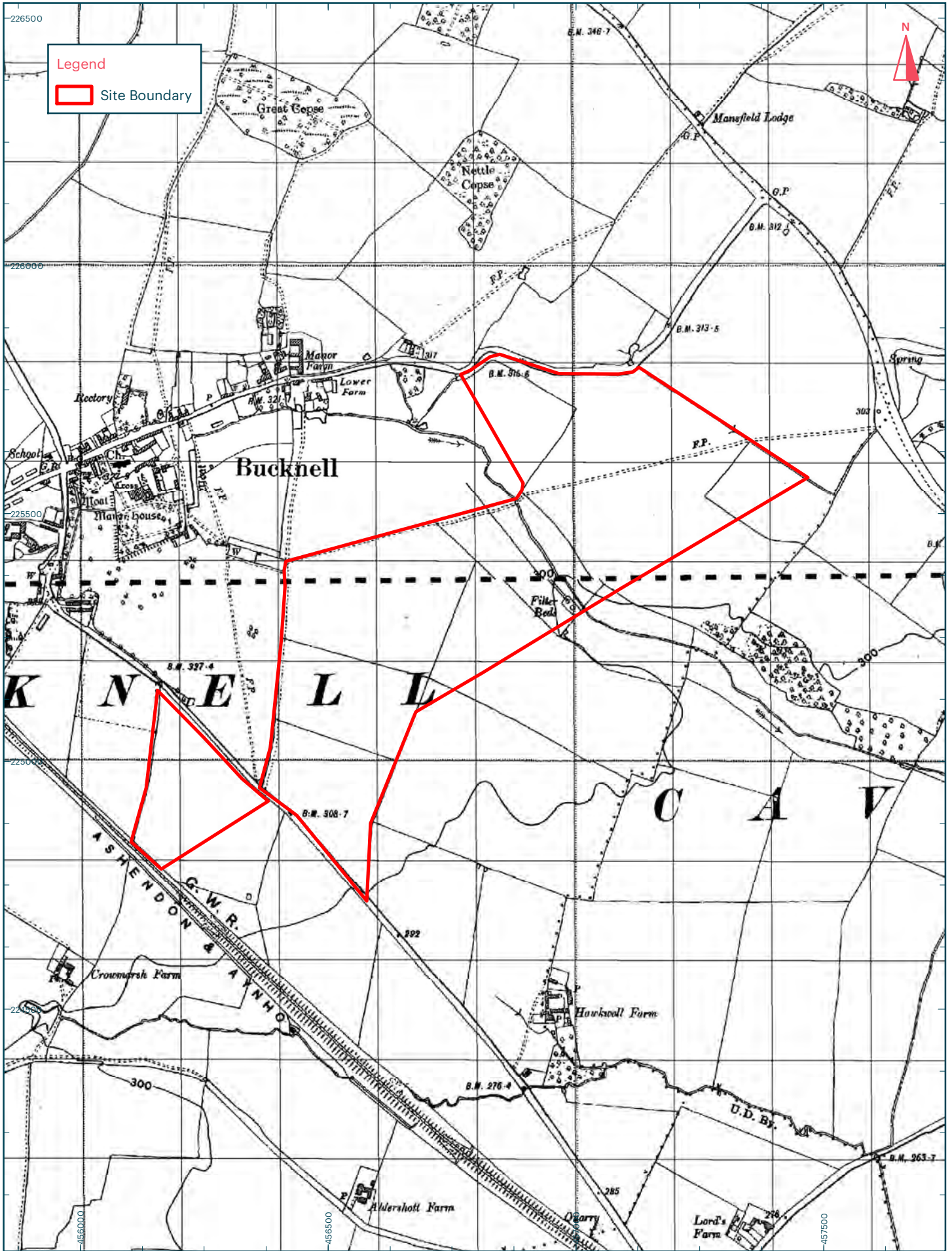




**Title:**  
 Figure 10: 1923 Ordnance Survey Map (1:10560)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:10,000

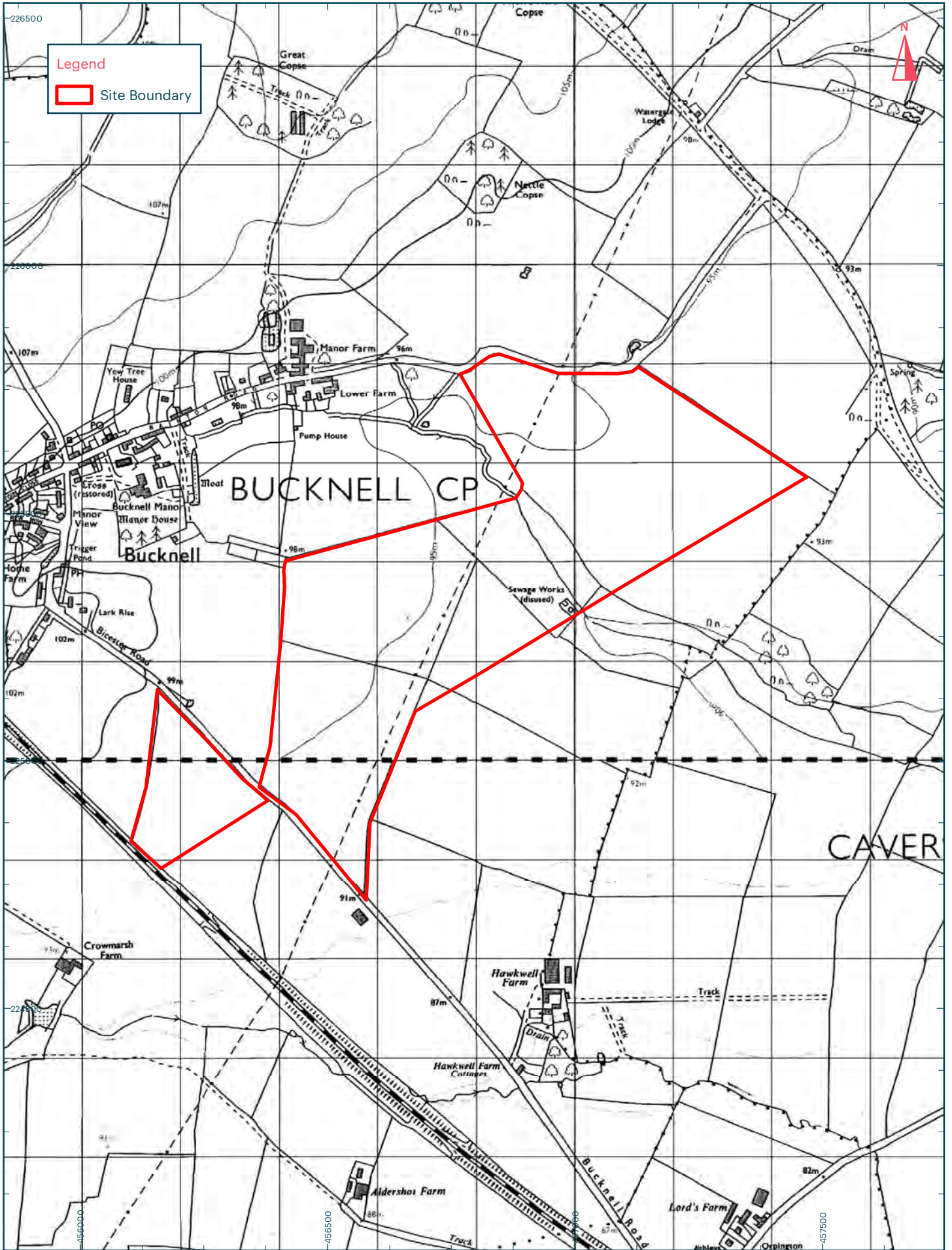




**Title:**  
 Figure 11: 1938-1952 Ordnance Survey Map (1:10560)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:10,000  
 0 300m

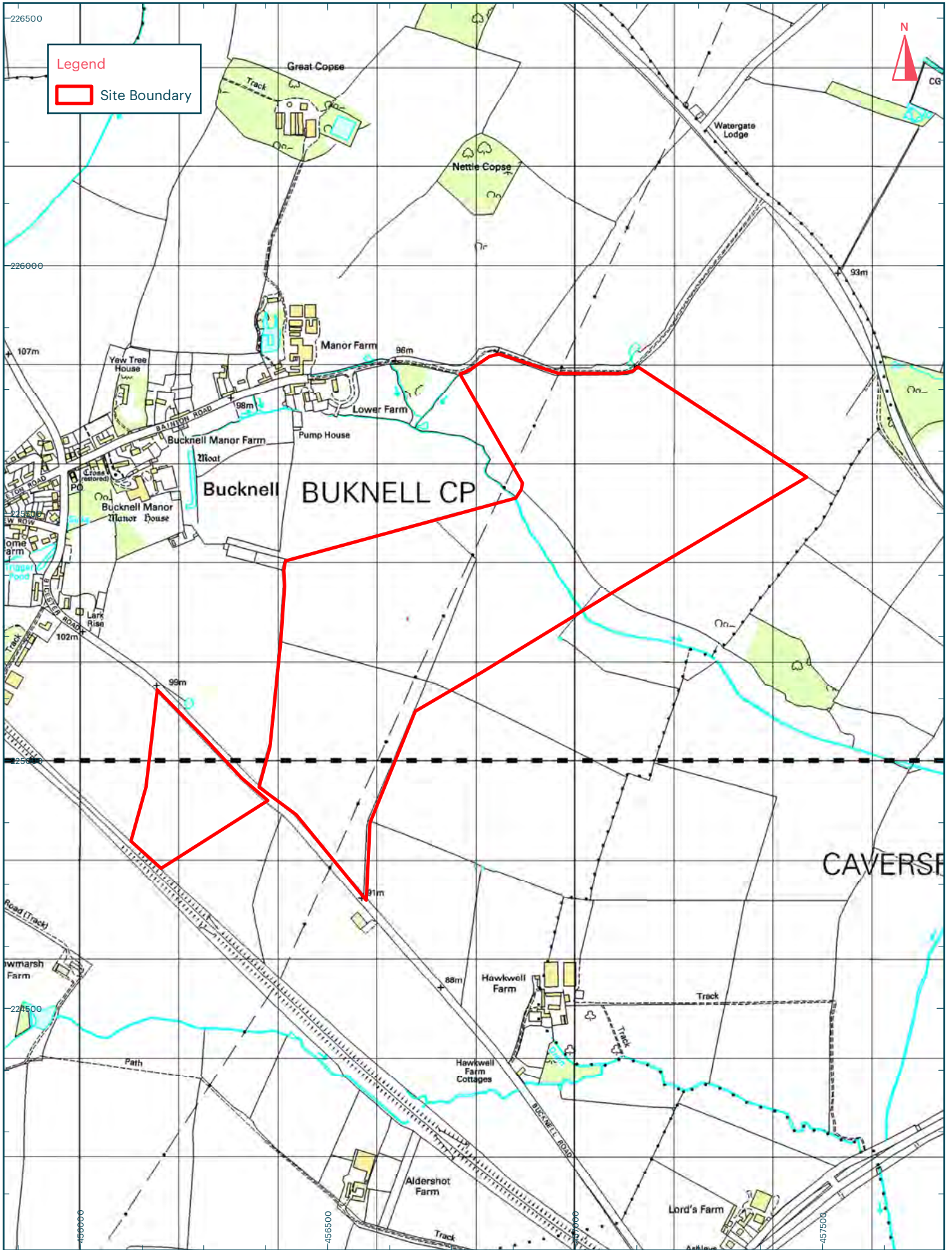




**Title:**  
 Figure 12: 1982-1988 Ordnance Survey Map (1:10000)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:10,000  
 0 300m

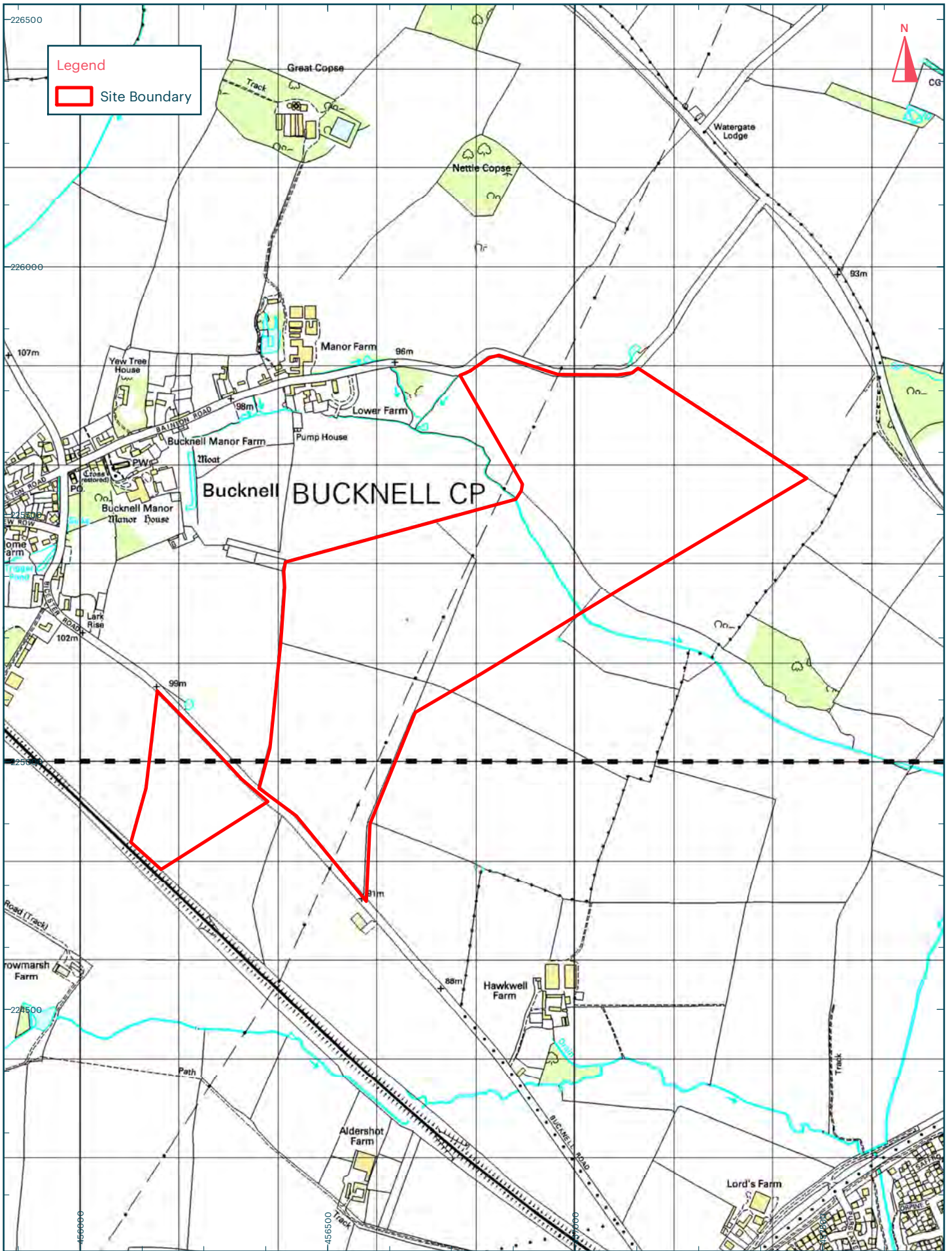




**Title:**  
 Figure 13: 1999 Ordnance Survey Map (1:10000)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:10,000

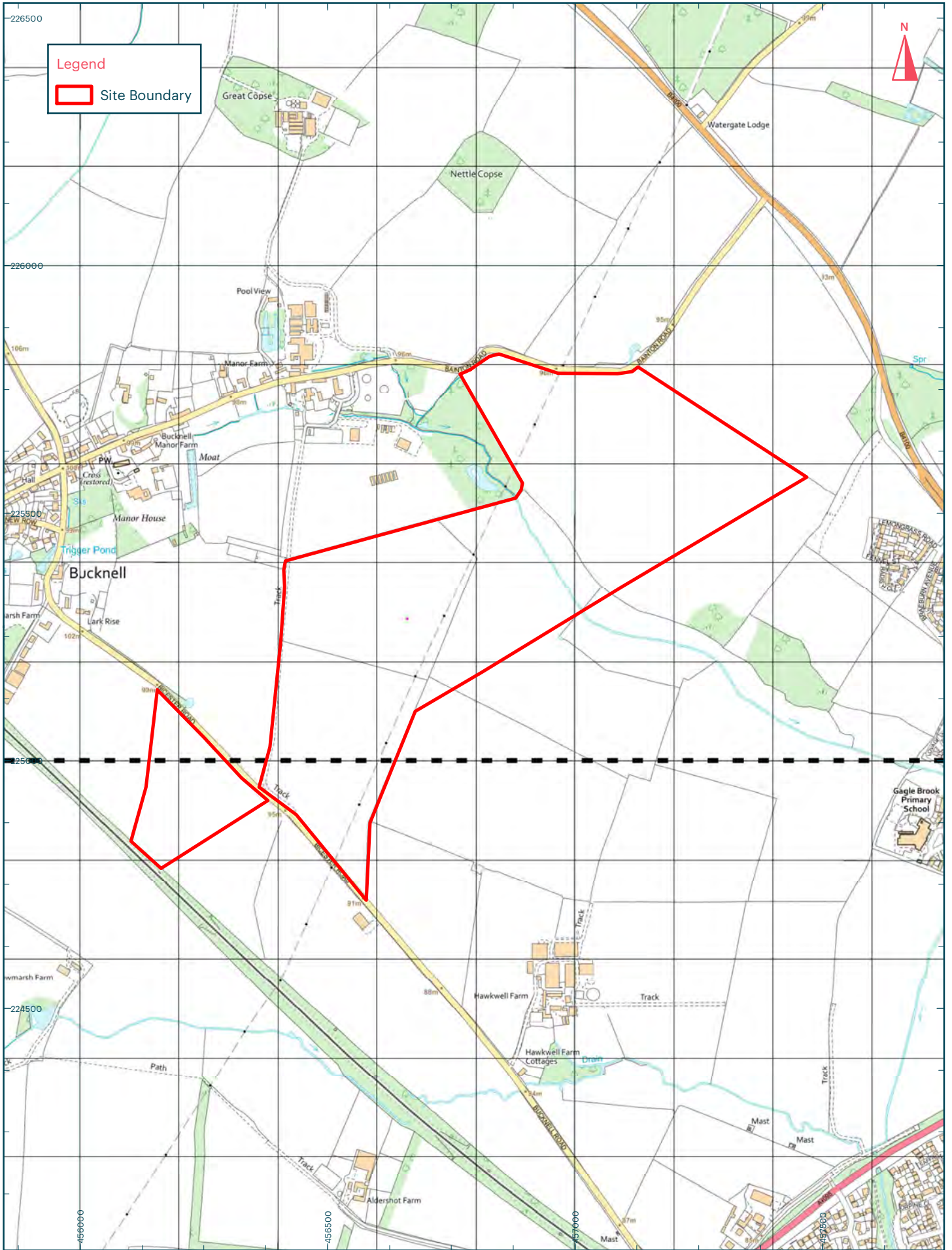




**Title:**  
 Figure 14: 2006 Ordnance Survey Map (1:10000)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:10,000

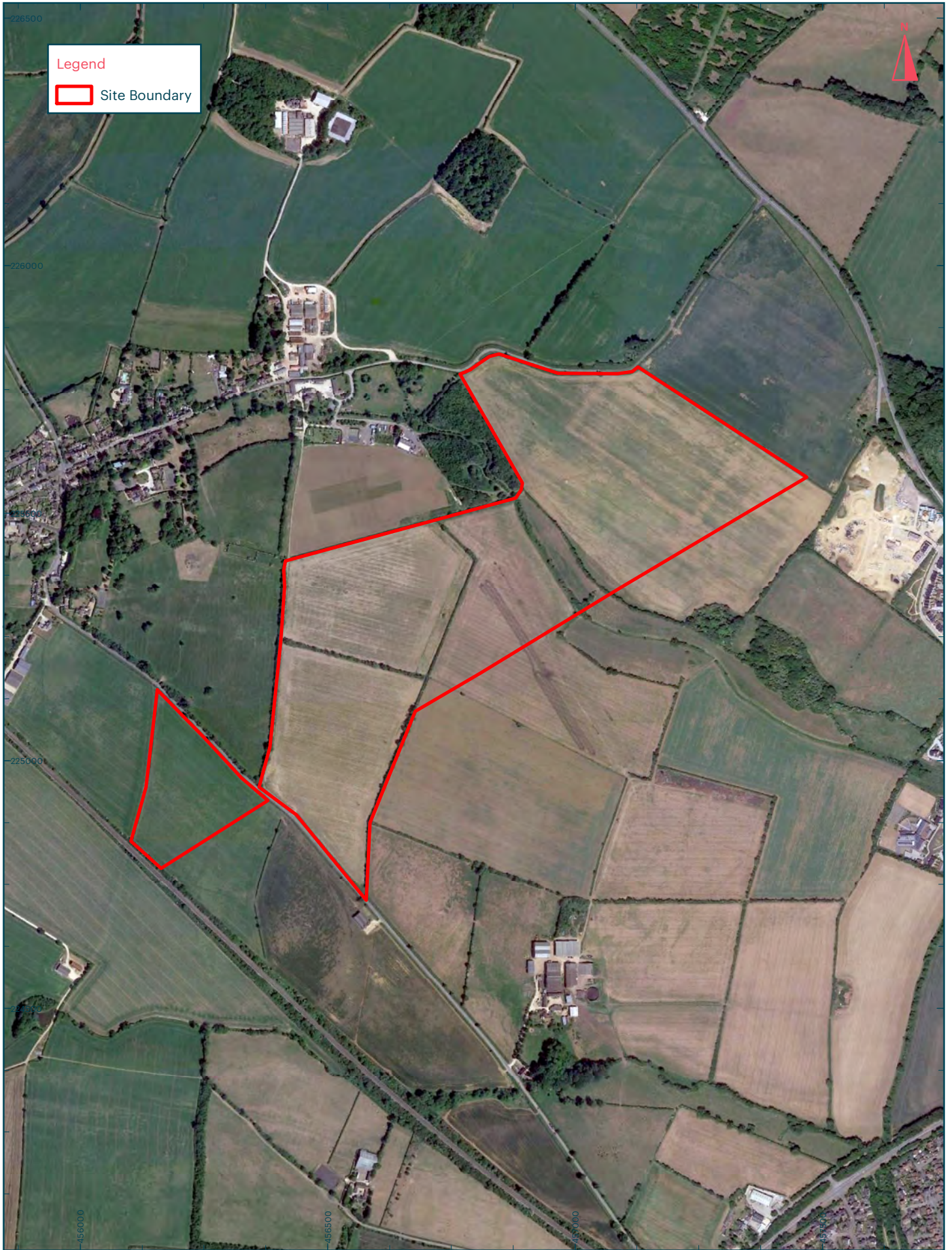




**Title:**  
 Figure 15: 2021 Ordnance Survey Map (1:10000)  
**Address:**  
 Hawkwell Village, NW Bicester

Scale at A4: 1:10,000  
 0 300m





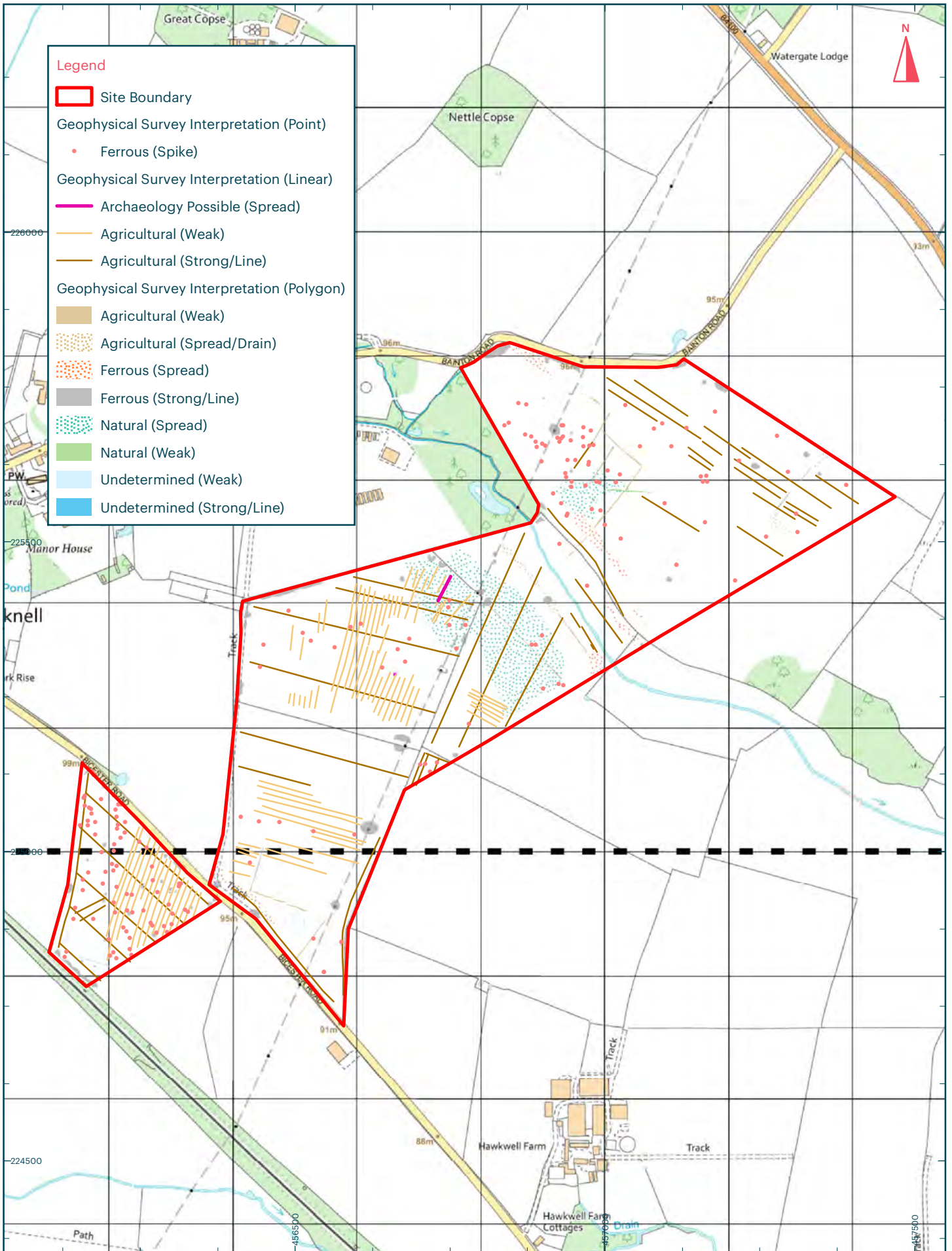
**Title:**  
Figure 16: 2021 Google Earth Image  
**Address:**  
Hawkwell Village, NW Bicester

Scale at A4: 1:10,000

0 300m







**Title:**  
Figure 17: Geophysical Survey Results  
**Address:**  
Hawkwell Village, NW Bicester

Scale at A4: 1:8,000



## APPENDIX A – GAZETTEERS

## GAZETTEER OF ARCHAEOLOGICAL ASSETS

In order to understand the nature and extent of the surrounding archaeological resource, a study area of a 1km buffer from the study site boundary was adopted. The following gazetteer represents all entries from the Oxfordshire HER.

**Abbreviations:****OHER:**

Oxfordshire Historic Environment Record

**MonUID and PrefRef:**

Oxfordshire Historic Environment Record monument identification reference numbers

MonUID	PrefRef	Name
MOX24518	27989	Late Prehistoric or Roman features at Bicester Eco-development
MOX27255	28875	Possible ditches
MOX4882	1016	Caversfield Deserted Medieval Village
MOX4883	1114	Medieval Moat and Site of Manor House
MOX4895	5103	Church of St Peter, Bainton Road
MOX4896	5104	Medieval Cross, Church of St Peter
MOX4897	5105	Manor House, Bainton Road
MOX4898	5106	Church of St Lawrence, A41
MOX4899	5107	Post Medieval Fishpond
MOX4906	12227	Undated Square Enclosure
MOX4916	13597	Bronze Age Ring Ditch (c.380m N of Bucknell)
MOX4917	13743	Medieval Fishpond (NE of Caversfield House)
MOX5631	13907	Bronze Age Ring Ditch (350m N of Himley Farm)
MOX5633	15958	Later Prehistoric Rectilinear Enclosures

## GAZETTEER OF ARCHAEOLOGICAL EVENTS

The following gazetteer represents all events recorded by the OHER within the 1km study area.

**Abbreviations:**

**OHER:** Oxfordshire Historic Environment Record  
**Event ID:** Oxfordshire Historic Environment Record event identification reference number

EvUID	Name
EOX2425	Watching Brief: The Old Rectory, Bainton Road
EOX3147	Bicester Eco Town interpretation of aerial photographs for archaeology
EOX3414	Archaeological geophysical survey for the proposed Bicester Eco Development Oxfordshire
EOX5589	Bucknell Road archaeological geophysical survey
EOX5650	Bicester Eco Development archaeological evaluation
EOX6336	Bicester Eco Town, Exemplar Site archaeological evaluation
EOX849	The Churchyard, St Peter's Church archaeological watching brief
EOX1104	Archaeological watching Brief at Bucknell Sewage Pumping Station

## GAZETTEER OF DESIGNATED HERITAGE ASSETS

The following gazetteer represents all known designated heritage assets within the 1km study area.

### Abbreviations:

**NHLE:** National Heritage List for England

NHLE REFERENCE	NAME	DESIGNATION
1200170	Home Farmhouse	II
1046533	Church of St Laurence	II*
1200283	The Trigger Pond Public House	II
1046891	Numbers 28 (The Thatches) and 30	II
1369567	Number 13 and attached outbuildings	II
1200245	8 and 9 Bainton Road, includes 10 and 11 Bainton Road	II
1046887	Old Rectory	II
1200258	Church of St Peter	I
1046888	Brock Memorial approximately 3 metres south east of porch of Church of St Peter	II
1200267	Churchyard cross approximately 10 metres south of Church of St Peter	II
1046890	Outbuilding approximately 50 metres north of Manor House	II
1046889	Manor House	II
1300829	Outbuilding approximately 30 metres east of Manor House	II
1046886	5-6 Bainton Road	II
1046885	Laneside House	II
1046884	Manor Farmhouse	II

## GAZETTEER OF PORTABLE ANTIQUITIES SCHEME DATA

The following gazetteer represents all known Portable Antiquities Scheme Data within the 1km study area.

**Abbreviations:****PAS:** Portable Antiquities Scheme**PAS ID:** Portable Antiquities Scheme Identification Reference Number

PAS ID	Name	Period
PAS5A9D6248001818	BROOCH	IRON AGE
PAS5A9D5ECC001F19	BROOCH	ROMAN
PAS5A9D5D6A001CE6	BROOCH	ROMAN
PAS5A9D5617001CB4	BROOCH	ROMAN
PAS5A9D4C88001BD7	BROOCH	ROMAN
PAS599ED48B001E9A	COIN	ROMAN
PAS599ED310001AC5	COIN	ROMAN
PAS599ECFBB00125B	COIN	ROMAN
PAS599ECDAD001E20	COIN	ROMAN
PAS599C4FD4001943	COIN	ROMAN
PAS599C4EEF001416	COIN	ROMAN
PAS599C4DA600124A	COIN	ROMAN
PAS599C4C92001775	COIN	ROMAN
PAS599C48FC001288	COIN	ROMAN
PAS599C472B0015CB	COIN	ROMAN
PAS599C45D5001A50	COIN	ROMAN
PAS599C44AE0011EC	COIN	ROMAN
PAS599C422A001875	COIN	ROMAN
PAS599C41800015C7	COIN	ROMAN
PAS599C403F0016C5	COIN	ROMAN
PAS599C3F4C0010A8	COIN	ROMAN
PAS599C3A2D001CBE	BROOCH	MEDIEVAL
PAS599C35CF001D0A	COIN	MEDIEVAL
PAS599C2DB3001E00	COIN	MEDIEVAL
PAS599C2A9100122B	COIN	ROMAN
PAS599C272B001250	COIN	ROMAN
PAS599C244F001D13	COIN	ROMAN
PAS587B62D400177F	BROOCH	ROMAN
PAS587B614B001232	BROOCH	ROMAN
PAS587B5F880012AE	BROOCH	ROMAN
PAS57EA39DE001DFB	COIN HOARD	ROMAN
PAS57E2C994001859	COIN HOARD	ROMAN

## Historic England Aerial Photographs

A search of the Historic England Archive aerial photography collection in May 2022 under reference AP/134186 returned 30 specialist oblique records, 0 military oblique images and 119 vertical records. These are listed in the tables below.

### Specialist Oblique Aerial Photographs

Photo reference	Date	Grid Reference
SP 5525 / 1	16-Jul-96	SP 553252
SP 5525 / 2	16-Jul-96	SP 553252
SP 5525 / 3	16-Jul-96	SP 553252
SP 5525 / 4	16-Nov-99	SP 559253
SP 5525 / 5	16-Nov-99	SP 559253
SP 5625 / 1	16-Nov-99	SP 561253
SP 5625 / 2	16-Nov-99	SP 561253
SP 5625 / 3	16-Nov-99	SP 562253
SP 5625 / 4	16-Nov-99	SP 561254
SP 5625 / 5	16-Nov-99	SP 561254
SP 5625 / 6	16-Nov-99	SP 560254
SP 5625 / 7	16-Nov-99	SP 560254
SP 5625 / 8	16-Nov-99	SP 561255
SP 5724 / 1	02-Jun-90	SP 573248
SP 5724 / 2	02-Jun-90	SP 573248
SP 5724 / 5	07-Jun-06	SP 574244
SP 5724 / 6	07-Jun-06	SP 574244
SP 5724 / 7	07-Jun-06	SP 574245
SP 5724 / 8	07-Jun-06	SP 574245
SP 5724 / 9	07-Jun-06	SP 573244
SP 5724 / 10	07-Jun-06	SP 573244
SP 5724 / 11	07-Jun-06	SP 574243
SP 5725 / 1	23-Apr-03	SP 578258
SP 5725 / 2	23-Apr-03	SP 578259
SP 5725 / 3	23-Apr-03	SP 578258
SP 5725 / 4	23-Apr-03	SP 578258
SP 5725 / 5	23-Apr-03	SP 578259
SP 5725 / 6	23-Apr-03	SP 578259
SP 5725 / 7	23-Apr-03	SP 579257
SP 5725 / 8	23-Apr-03	SP 579257

### Vertical Aerial Photographs

Sortie number	Frame number	Date	Centre point
RAF/CPE/UK/1897	3151	12-Dec-46	SP 557 256
RAF/CPE/UK/1897	3152	12-Dec-46	SP 566 257
RAF/CPE/UK/1897	3153	12-Dec-46	SP 574 258
RAF/CPE/UK/1897	3154	12-Dec-46	SP 583 259
RAF/CPE/UK/1897	4151	12-Dec-46	SP 561 241

RAF/CPE/UK/1897	4152	12-Dec-46	SP 570 242
RAF/CPE/UK/1897	4153	12-Dec-46	SP 578 243
FSL/6125	13021	1961	SP 569 239
FSL/6125	13022	1961	SP 562 239
FSL/6125	13113	1961	SP 559 251
FSL/6125	13114	1961	SP 567 251
FSL/6125	13115	1961	SP 574 251
FSL/6125	13136	1961	SP 580 264
FSL/6125	13137	1961	SP 573 265
FSL/6125	13138	1961	SP 565 265
FSL/6125	13139	1961	SP 558 265
RAF/82/1006	291	31-Aug-54	SP 550 252
RAF/82/1006	292	31-Aug-54	SP 553 241
RAF/540/1400	162	01-Sep-54	SP 571 238
RAF/540/1400	163	01-Sep-54	SP 564 238
RAF/540/1400	164	01-Sep-54	SP 558 238
RAF/58/4627	385	16-Aug-61	SP 574 243
RAF/58/4627	386	16-Aug-61	SP 578 269
RAF/542/1	6	04-Aug-54	SP 566 237
RAF/542/1	7	04-Aug-54	SP 565 250
RAF/542/1	8	04-Aug-54	SP 563 263
RAF/541/340	3131	26-Jul-49	SP 567 237
RAF/16/AC638	5026	07-Nov-43	SP 553 239
OS/73252	74	06-Jun-73	SP 556 248
OS/73252	75	06-Jun-73	SP 563 248
OS/73252	76	06-Jun-73	SP 569 249
OS/73252	77	06-Jun-73	SP 576 249
OS/73274	51	06-Jun-73	SP 574 263
OS/73274	52	06-Jun-73	SP 567 263
OS/73274	53	06-Jun-73	SP 561 262
OS/70023	26	23-Mar-70	SP 571 246
OS/66042	6	29-Apr-66	SP 561 241
OS/66042	7	29-Apr-66	SP 568 241
OS/66042	34	29-Apr-66	SP 561 252
OS/66042	35	29-Apr-66	SP 565 252
OS/66042	36	29-Apr-66	SP 574 251
OS/68252	15	05-Jul-68	SP 565 253
OS/68252	16	05-Jul-68	SP 568 250

OS/68252	17	05-Jul-68	SP 572 247
OS/75312	31	05-Jul-75	SP 576 243
OS/84243	1004	26-Nov-84	SP 558 259
OS/84243	1005	26-Nov-84	SP 558 250
OS/84243	1024	26-Nov-84	SP 575 249
OS/84243	1025	26-Nov-84	SP 575 258
OS/91258	14	19-Sep-91	SP 569 238
OS/91258	15	19-Sep-91	SP 563 238
OS/91258	16	19-Sep-91	SP 557 238
OS/94214	4	28-Jun-94	SP 570 261
OS/94214	5	28-Jun-94	SP 570 256
OS/94214	6	28-Jun-94	SP 570 250
OS/94214	7	28-Jun-94	SP 570 245
OS/94214	28	28-Jun-94	SP 579 247
OS/94214	29	28-Jun-94	SP 579 252
OS/94214	30	28-Jun-94	SP 579 258
OS/94214	31	28-Jun-94	SP 579 262
OS/96633	75	15-Jun-96	SP 560 255
OS/96633	76	15-Jun-96	SP 565 255
OS/96633	77	15-Jun-96	SP 570 255
OS/96633	78	15-Jun-96	SP 575 255
OS/96633	79	15-Jun-96	SP 580 255
OS/96633	158	15-Jun-96	SP 565 265
OS/96633	159	15-Jun-96	SP 570 265
OS/96633	160	15-Jun-96	SP 575 265
OS/96633	255	15-Jun-96	SP 565 235
OS/96633	256	15-Jun-96	SP 560 235
OS/96634	51	15-Jun-96	SP 574 245
OS/96634	52	15-Jun-96	SP 569 245
OS/96634	53	15-Jun-96	SP 564 245
OS/96634	54	15-Jun-96	SP 559 244
OS/96634	55	15-Jun-96	SP 554 244
RAF/540/673	3448	12-Feb-52	SP 555 246
RAF/540/673	3449	12-Feb-52	SP 555 253
RAF/540/673	3450	12-Feb-52	SP 555 261
RAF/540/673	4448	12-Feb-52	SP 573 246
RAF/540/673	4449	12-Feb-52	SP 573 253
RAF/540/673	4450	12-Feb-52	SP 574 260



OS/99329	20	03-Sep-99	SP 580 261
OS/99329	21	03-Sep-99	SP 576 261
OS/99329	22	03-Sep-99	SP 571 261
OS/99329	23	03-Sep-99	SP 566 261
OS/99329	24	03-Sep-99	SP 562 261
OS/99329	25	03-Sep-99	SP 557 261
OS/99329	31	03-Sep-99	SP 553 244
OS/99329	32	03-Sep-99	SP 557 244
OS/99329	33	03-Sep-99	SP 562 244
OS/99329	34	03-Sep-99	SP 567 244
OS/99329	35	03-Sep-99	SP 571 244
OS/99329	36	03-Sep-99	SP 576 244
OS/99329	56	03-Sep-99	SP 580 253
OS/99329	57	03-Sep-99	SP 576 253
OS/99329	58	03-Sep-99	SP 571 253
OS/99329	59	03-Sep-99	SP 566 253
OS/99329	60	03-Sep-99	SP 562 253
OS/99329	61	03-Sep-99	SP 557 253
OS/99329	62	03-Sep-99	SP 553 253
OS/03119	40	30-Aug-03	SP 555 254
OS/03119	41	30-Aug-03	SP 559 250
OS/03119	42	30-Aug-03	SP 563 246
OS/03119	43	30-Aug-03	SP 567 243
OS/04980(Y)	1039	23-Apr-04	SP 558 265
OS/04980(Y)	1040	23-Apr-04	SP 565 266
OS/04980(Y)	1041	23-Apr-04	SP 572 265
OS/04980(Y)	1042	23-Apr-04	SP 579 266
OS/04982	1792	14-Jun-04	SP 560 253
OS/04982	1793	14-Jun-04	SP 567 253
OS/04982	1794	14-Jun-04	SP 573 253
OS/04982	1795	14-Jun-04	SP 580 253
OS/04983	3236	08-Sep-04	SP 571 240
OS/04983	3237	08-Sep-04	SP 564 240
OS/04983	3238	08-Sep-04	SP 558 240
OS/09061	75	19-Aug-09	SP 576 251
OS/09061	76	19-Aug-09	SP 576 259
OS/09061	91	19-Aug-09	SP 559 258
OS/09061	92	19-Aug-09	SP 559 250

## Cambridge University Collection of Aerial Photographs

The following cover search lists all aerial photographs covering the study site and 1km study area, which were accessioned to the digital CUCAP archive as of 05.05.2022

**Abbreviations:**

**CUCAP:** Cambridge University Collection of Aerial Photographs

Photo Reference	Oblique or Vertical	Date	Subject	Easting	Northing
ZknSE61	Vertical	2006-11-09	ULM extra 2 South	456909	224268

**APPENDIX B** – Magnitude Surveys Geophysical Survey report of Land  
South of Bucknell, Bicester April 2022



**magnitude**  
surveys

**Geophysical Survey Report  
of  
Land South of Bucknell, Bicester**

**For  
Orion Heritage**

**Magnitude Surveys Ref: MSSP1197**

**OASIS Number: TBC**

**April 2022**



## magnitude surveys

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**Report By:**

Eleanor Dacre MESci

**Report Approved By:**

Finnegan Pope-Carter BSc (Hons) MSc FGS

**Issue Date:**

26 April 2022

### Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of c. 48.3ha of land south of Bucknell, Bicester. A fluxgate gradiometer survey was successfully completed across the survey area. No anomalies suggestive of significant archaeological features were identified; however, several anomalies were detected but are of undetermined classification. The survey has identified anomalies of an agricultural origin in the form of ridge and furrow ploughing regimes in multiple orientations; mapped and unmapped former field boundaries as well as modern ploughing regimes. Modern disturbance is limited to the edges of the survey area, and surrounding pylons.

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## 1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by Orion Heritage to undertake a geophysical survey over a c. 48.30ha area of land south of Bucknell, Bicester (SP 56851 25482).
- 1.2. The geophysical survey comprised quad-towed, cart-mounted GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to its ability to detect a range of different features. The technique is particularly suited for detecting fired or magnetically enhanced features, such as ditches, pits, kilns, sunken featured buildings (SFBs) and industrial activity (David *et al.*, 2008).
- 1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David *et al.*, 2008), the Chartered Institute for Archaeologists (CIfA, 2020) and the European Archaeological Council (Schmidt *et al.*, 2015).
- 1.4. It was conducted in line with a WSI produced by MS (Garst, 2022).
- 1.5. The survey commenced on 4<sup>th</sup> April and took five days to complete.

## 2. Quality Assurance

- 2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society for Archaeological Prospection).
- 2.2. The directors of MS are involved in cutting edge research and the development of guidance/policy. Specifically, Dr Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CIfA and is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London, has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.
- 2.3. All MS managers, field and office staff have degree qualifications relevant to archaeology or geophysics and/or field experience.

## 3. Objectives

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



## 4. Geographic Background

4.1. The survey area was located c. 497m east of Bucknell (Figure 1). Gradiometer survey was undertaken across 7 fields under arable cultivation and pasture. The survey area lies south of Bainton Road, bisected by Bicester Road with further agricultural fields on all other sides (Figure 2).

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	The survey area was a flat arable field with crop present.	The field was bordered by hedges on all sides. Overhead cables and their associated pylons ran parallel to the eastern border, and a fallen tree was present on the western border. A large area of scrub was present in the northern half of the field.
2	The survey area was a flat arable field.	The field was bordered by hedges on all sides. Overhead cables and their associated pylons ran parallel to the eastern border, and a metal gate was present on the southern border.
3	The survey area was an undulating pasture field.	The field was bordered by hedges to the north, east and west. The field continued to the south. On the south-western border, a metal gate and wire fence were present. Overhead cables and their associated pylons ran approximately north to south over the north-western corner of the field.
4	The survey area was a flat pasture field.	The field was bordered by barbed wire fences in the north, and the field continued to the south. A pylon was located on the north-western border.
5	The survey area was a flat arable field.	The field was bordered by hedges in the north and west, by hedges and a treeline in the south, and the field continued to the east. Overhead cables and their associated pylons ran across the centre of the survey area approximately east to west.
6	The survey area was a pasture field with a ridge running northwest to southeast in the centre of the field.	The field was bordered by hedges on all sides, and a small portion of the southern border continued to the south. Metal gates and powerlines were present along the northern border.
7	The survey area was a flat arable field	The field was bordered by hedges to the north, east and west. The field continued to the south.

4.3. The underlying geology comprises almost entirely limestone of the Cornbrash Formation. A very small region of interbedded limestone and mudstone Forrest Marble Formation is present along the eastern field boundary. No superficial deposits are recorded across the site (British Geological Survey, 2022).

4.4. The soils consist of freely draining lime-rich loamy soils (Soilscapes, 2022).

## 5. Archaeological Background

- 5.1. The following is a summary of a Heritage Impact Assessment produced and provided by Orion Heritage (Lock, 2021).
- 5.2. Pottery dated to the middle Iron Age has been found approximately 200m southeast of the survey area, within a ditch of significant size containing iron, animal bone and early Romano-British materials.
- 5.3. Surrounding the survey area, evidence of Romano-British activity is recorded in various forms. Approximately 800m west of the survey area, ditches, pits, cremation pits with human and animal burnt remains have been recorded. Pottery from various trenches has also been recorded, indicating the area was a settlement during the Romano-British period.
- 5.4. Evidence of furrows from trenching has been recorded, indicating that the land was used for arable cultivation during the medieval period through to modern day.

## 6. Methodology

### 6.1. Data Collection

6.1.1. Magnetometer surveys are generally the most cost effective and suitable geophysical technique for the detection of archaeology in England. Therefore, a magnetometer survey should be the preferred geophysical technique unless its use is precluded by any specific survey objectives or the site environment. For this site, no factors precluded the recommendation of a standard magnetometer survey. Geophysical survey therefore comprised the magnetic method as described in the following section.

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

6.1.3. Table of survey strategies:

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

6.1.4. The magnetic data were collected using MS' bespoke quad-towed cart system and hand-carried GNSS-positioned system.

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

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

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

## 6.2. Data Processing

6.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.*, 2015: 33 and Section IV.2 in David *et al.*, 2008: 11).

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

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

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

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

## 6.3. Data Visualisation and Interpretation

6.3.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images of the gradient and total field at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figures 9, 12, 15, 18 and 21). XY trace plots visualise the magnitude and form of the geophysical response, aiding anomaly interpretation.

6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historical maps, LiDAR data, and soil and geology maps. Google Earth (2022) was also consulted, to compare the results with recent land use.

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

## 7. Results

### 7.1. Qualification

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

### 7.2. Discussion

- 7.2.1. The geophysical results are presented in combination with satellite imagery and historical maps (Figures 4 and 6).
- 7.2.2. The fluxgate gradiometer survey has responded well to the environment of the survey area and primarily identified anomalies of an agricultural origin. Modern disturbance is limited to the edges of the survey area as a result of metal fencing, and surrounding pylons. Although some anomalies were ascribed an 'Undetermined origin', no anomalies indicative of significant archaeological activity were identified.
- 7.2.3. Anomalies of an agricultural origin have been identified throughout the survey area. This is visible as ridge and furrow ploughing regimes in multiple orientations, reflecting the complex agricultural use of the land. In addition, anomalies collocating with mapped field boundaries have been detected, along with evidence of unmapped field boundaries and modern ploughing trends.
- 7.2.4. Anomalies of an undetermined origin have been identified throughout the survey area. These are linear and curvilinear in shape, and they do not match any features seen on historical or satellite images. Whilst they are most likely a result of modern or agricultural practices, due to their defined shapes and signals, an archaeological origin cannot be ruled out completely.

## 7.3. Interpretation

### 7.3.1. General Statements

- 7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.
- 7.3.1.2. **Ferrous (Spike)** – Discrete dipolar anomalies are likely to be the result of isolated pieces of modern ferrous debris on or near the ground surface.
- 7.3.1.3. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentration of multiple discrete, dipolar anomalies usually resulting from highly magnetic material such as rubble containing ceramic building materials and ferrous rubbish.
- 7.3.1.4. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures, typically including fencing, pylons, vehicles and service pipes, have been classified as ‘Magnetic Disturbance’. These magnetic ‘haloes’ will obscure weaker anomalies relating to nearby features, should they be present, often over a greater footprint than the structure causing them.
- 7.3.1.5. **Undetermined** – Anomalies are classified as Undetermined when the origin of the geophysical anomaly is ambiguous and there is no supporting contextual evidence to justify a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally distinct from those caused by ferrous sources.

### 7.3.2. Magnetic Results - Specific Anomalies

- 7.3.2.1. **Agricultural (Weak & Zone)** – Across the entire survey area, weak linear anomalies have been identified. These collocate with mapped field boundaries on historical OS maps. Three small areas of enhanced magnetic background have been detected in Area 5 [5a] (Figure 17), located along the line of a former field boundary. These are most likely caused by the field boundary being dragged out via ploughing regimes; however, it could indicate an entrance to the field system. In the centre of Area 5, a series of linear anomalies have also been detected [5b] (Figure 17). These exhibits a more complex pattern, however the magnetic signal matches that of the mapped field boundaries and therefore have been classified as anomalies of an agricultural origin, most likely unmapped field divisions.
- 7.3.2.2. **Ridge and Furrow (Trend)** – Across the survey area, several parallel linear anomalies have been detected. These can be seen most prominently in the Total Field data (Figures 3 and 5) and have been detected in multiple orientations. These linear anomalies are characteristic of ridge and furrow ploughing regimes due to their c. 3-5m spacing and orientation with former field boundaries. Furrows were also recorded during excavation in the area, further supporting the classification of ridge and furrow (see section 5.4).

7.3.2.3. **Agricultural (Trend)** – Across the survey area a series of parallel linear anomalies have been detected which exhibit a weaker magnetic signal, most notable in the Total Field (Figures 3 and 5). These are very closely spaced and only a few indicative linear trends have been picked out to give an idea of direction and presence across the site. The orientation is well matched with modern cultivation visible in recent satellite imagery and these are interpreted as agricultural trends caused by modern ploughing (Figures 4 and 6).

7.3.2.4. **Undetermined** – Several linear and curvilinear anomalies have been identified across the survey. These have a weak signal, and do not match any features recorded on satellite or historical maps. It is likely that these anomalies have natural or agricultural origins, however an archaeological origin cannot be ruled out by the geophysical data alone.

## 8. Conclusions

8.1. A fluxgate gradiometer survey was successfully completed over the survey area. The geophysical survey has detected a range of anthropogenic features including historic and more recent agricultural activity. The anomalies ascribed an 'Undetermined' classification lack any distinctive archaeological shape or pattern; as such, no anomalies indicative of significant archaeological activity has been identified. Modern activity in the form of magnetic disturbance is generally limited to the boundaries of the survey area and as a result of pylons .

8.2. Evidence of agricultural practices, both modern and historical, have been identified across the survey area in the form of ridge and furrow cultivation, mapped and unmapped field boundaries and modern ploughing trends.

## 9. Archiving

- 9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.
- 9.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to any dictated time embargoes.

## 10. Copyright

- 10.1. Copyright and intellectual property pertaining to all reports, figures and datasets produced by Magnitude Services Ltd is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.

## 11. References

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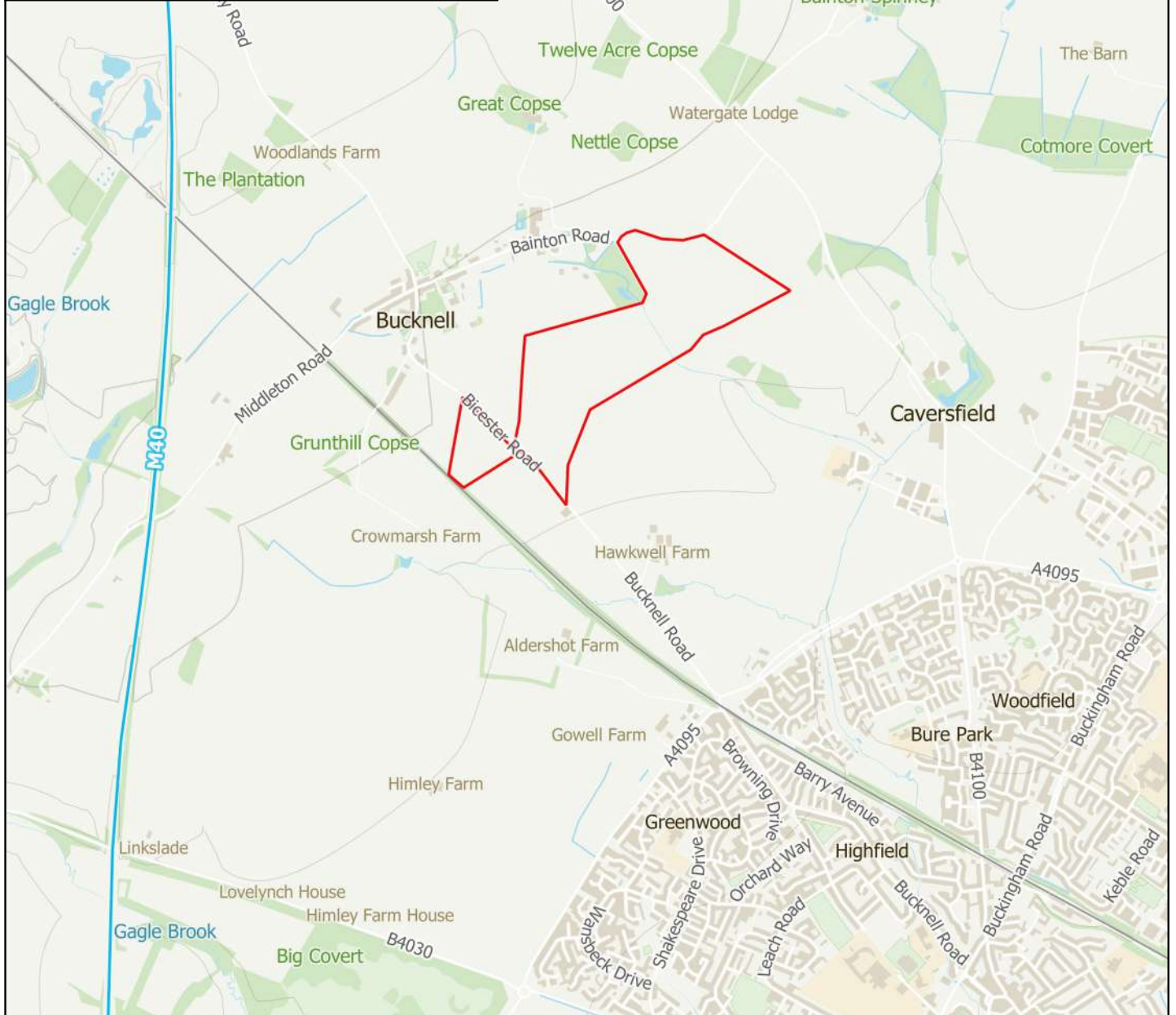
## 12. Project Metadata

MS Job Code	MSSP1197
Project Name	Land south of Bucknell, Bicester
Client	Orion Heritage
Grid Reference	SP 56851 25482
Survey Techniques	Magnetometry,
Survey Size (ha)	48.3ha
Survey Dates	2022-04-04 to 2022-04-08
Project Lead	Leigh A. Garst BFA MSc
Project Officer	Leigh A. Garst BFA MSc
HER Event No	TBC
OASIS No	TBC
Report Version	0.3

## 13. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	ED	LAG	21 April 2022
0.2	Changes following Project Lead review	ED	LAG	22 April 2022
0.3	Changes following Director correction3	ED		26 April 2022





MSSP1197- Land South of Bucknell, Bicester

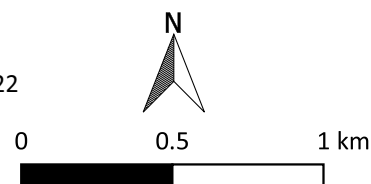
Figure 1 - Site Location

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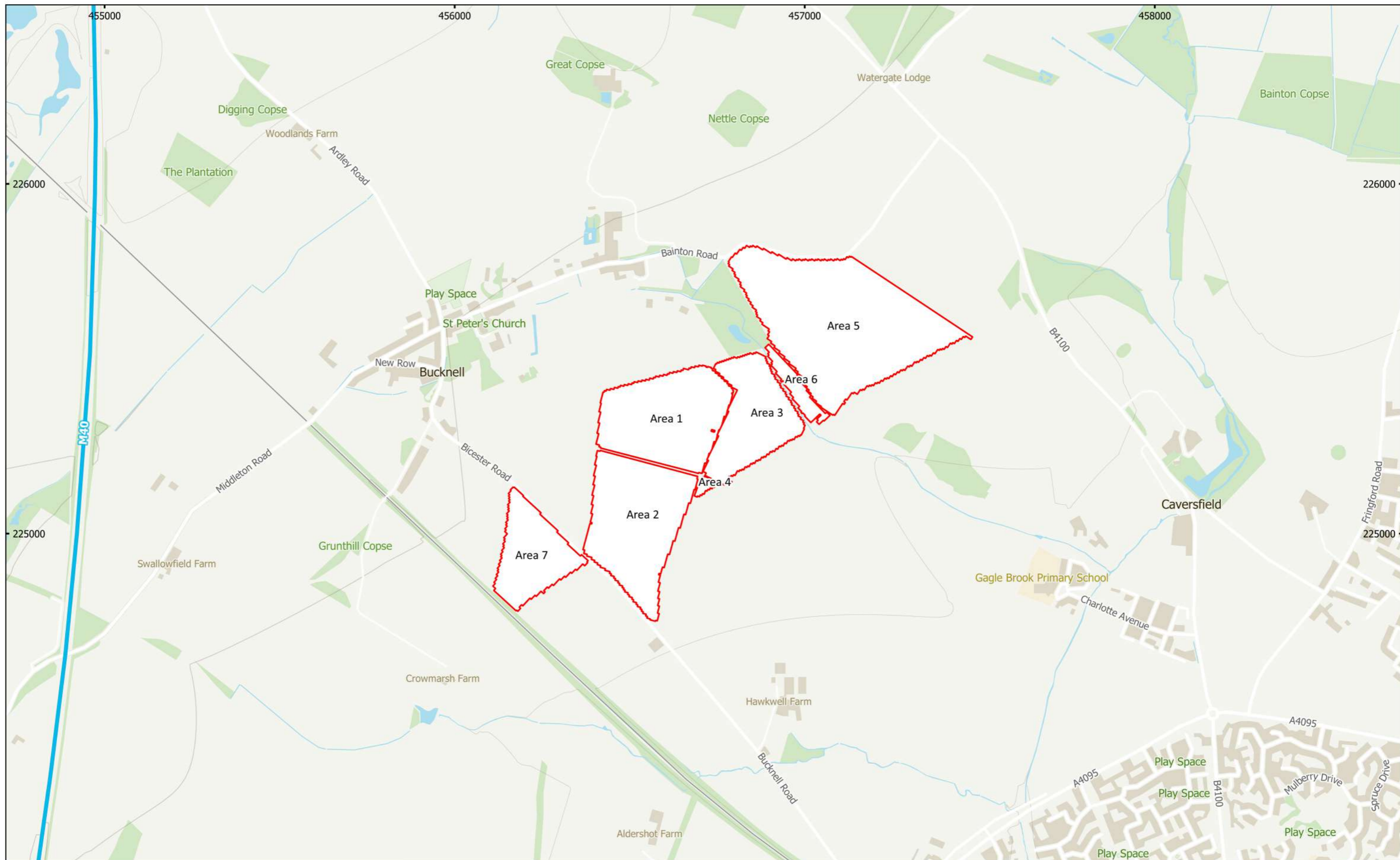
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 Site Boundary

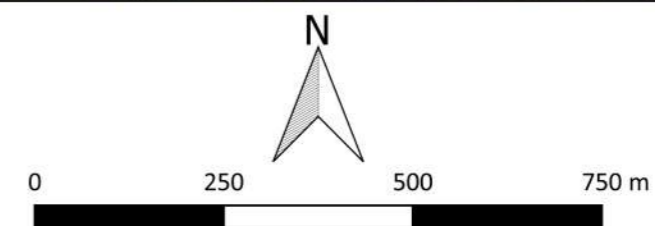


**magnitude**  
surveys



MSSP1197- Land South of Bucknell, Bicester  
 Figure 2 - Location of Survey Areas  
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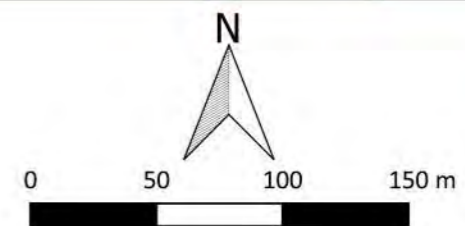
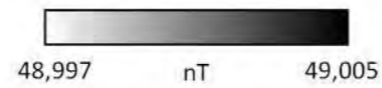
 Survey Area



**magnitude**  
surveys



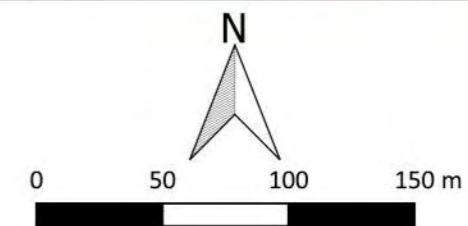
MSSP1197- Land South of Bucknell, Bicester  
 Figure 3 - Magnetic Total Field (Lower Sensor) (North)  
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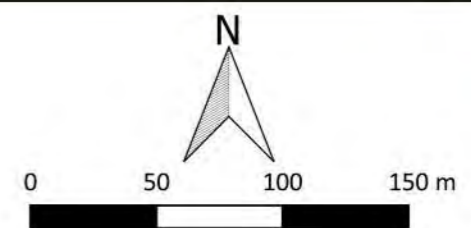
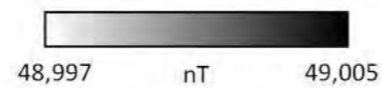
MSSP1197- Land South of Bucknell, Bicester  
 Figure 4 - Magnetic Interpretation Over Combined Historical and Satellite Imagery (North)  
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 Contains satellite imagery © Bing Satellite 2022

- |                       |                          |
|-----------------------|--------------------------|
| Agricultural (Spread) | Magnetic Disturbance     |
| Agricultural (Weak)   | Ferrous/Debris (Spread)  |
| Natural (Weak)        | Agricultural (Trend)     |
| Natural (Spread)      | Ridge and Furrow (Trend) |
| Undetermined (Weak)   | Ferrous (Spike)          |





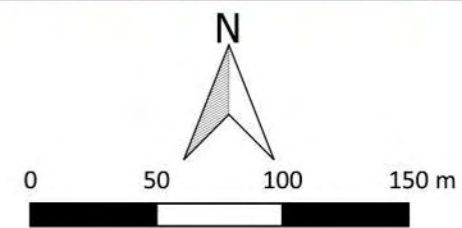
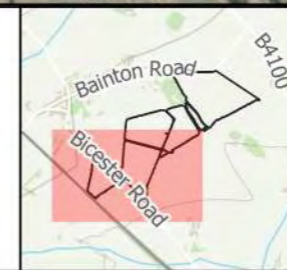
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 Figure 5 - Magnetic Total Field (Lower Sensor) (South)  
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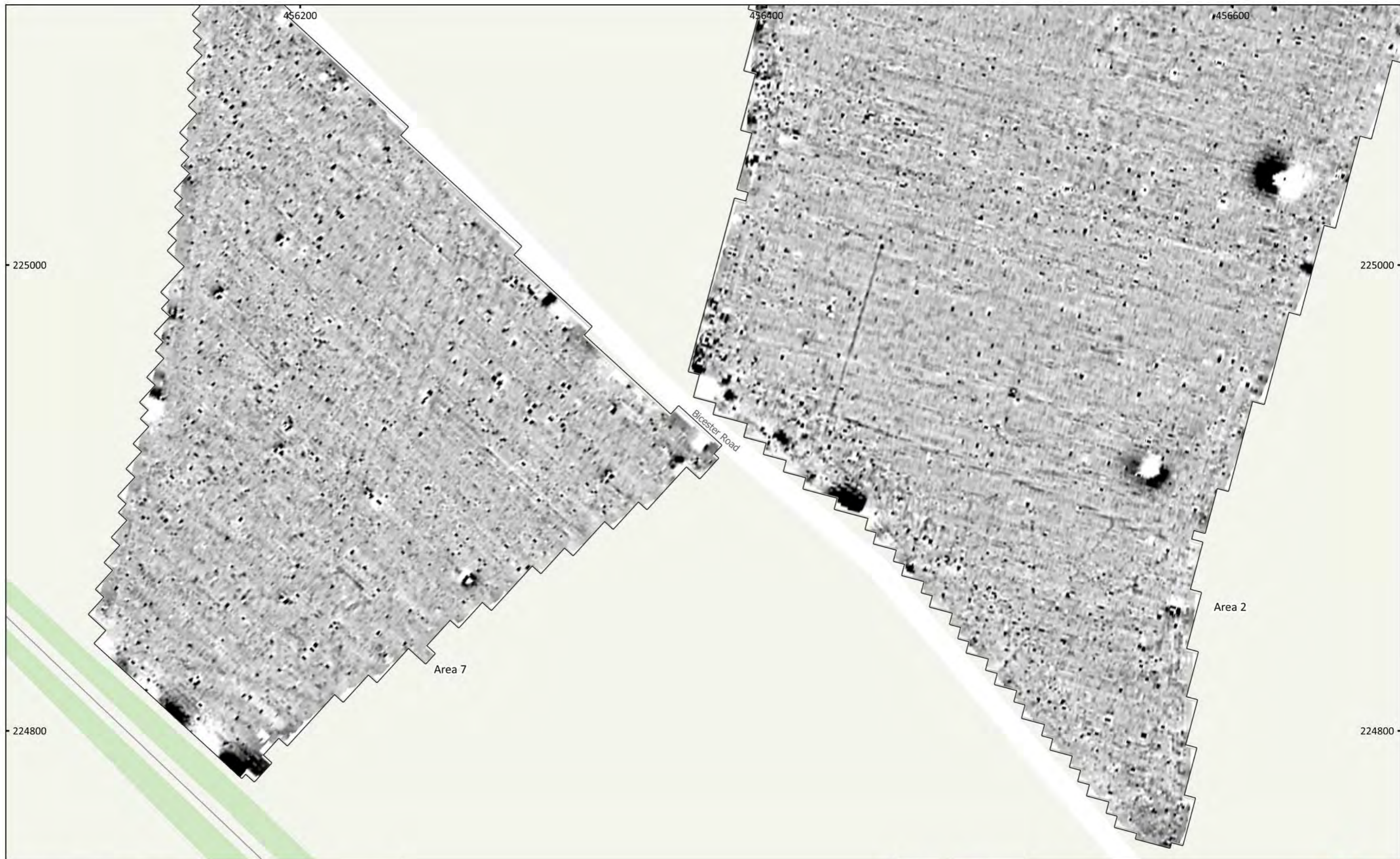




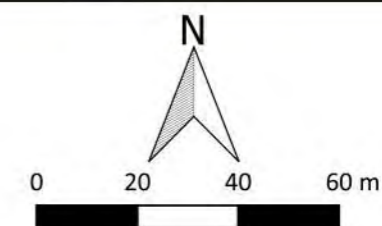
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 Figure 6 - Magnetic Interpretation Over Combined Historical and Satellite Imagery (South)  
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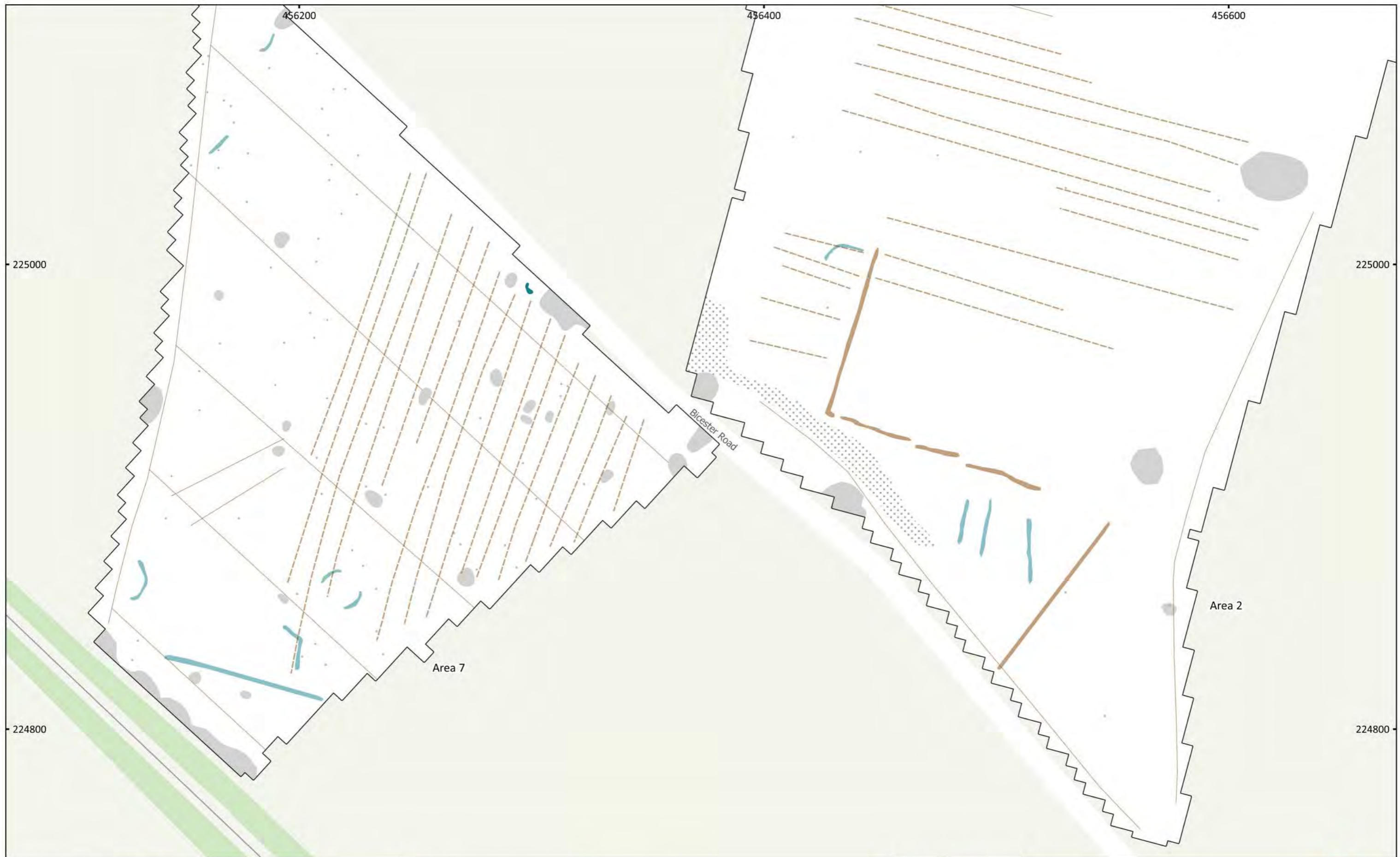
- |                         |                          |
|-------------------------|--------------------------|
| Agricultural (Weak)     | Undetermined (Strong)    |
| Natural (Spread)        | Agricultural (Trend)     |
| Undetermined (Weak)     | Ridge and Furrow (Trend) |
| Magnetic Disturbance    | Ferrous (Spike)          |
| Ferrous/Debris (Spread) |                          |





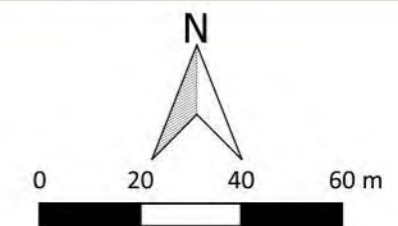
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 Figure 7 - Magnetic Gradient (Areas 2 & 7)  
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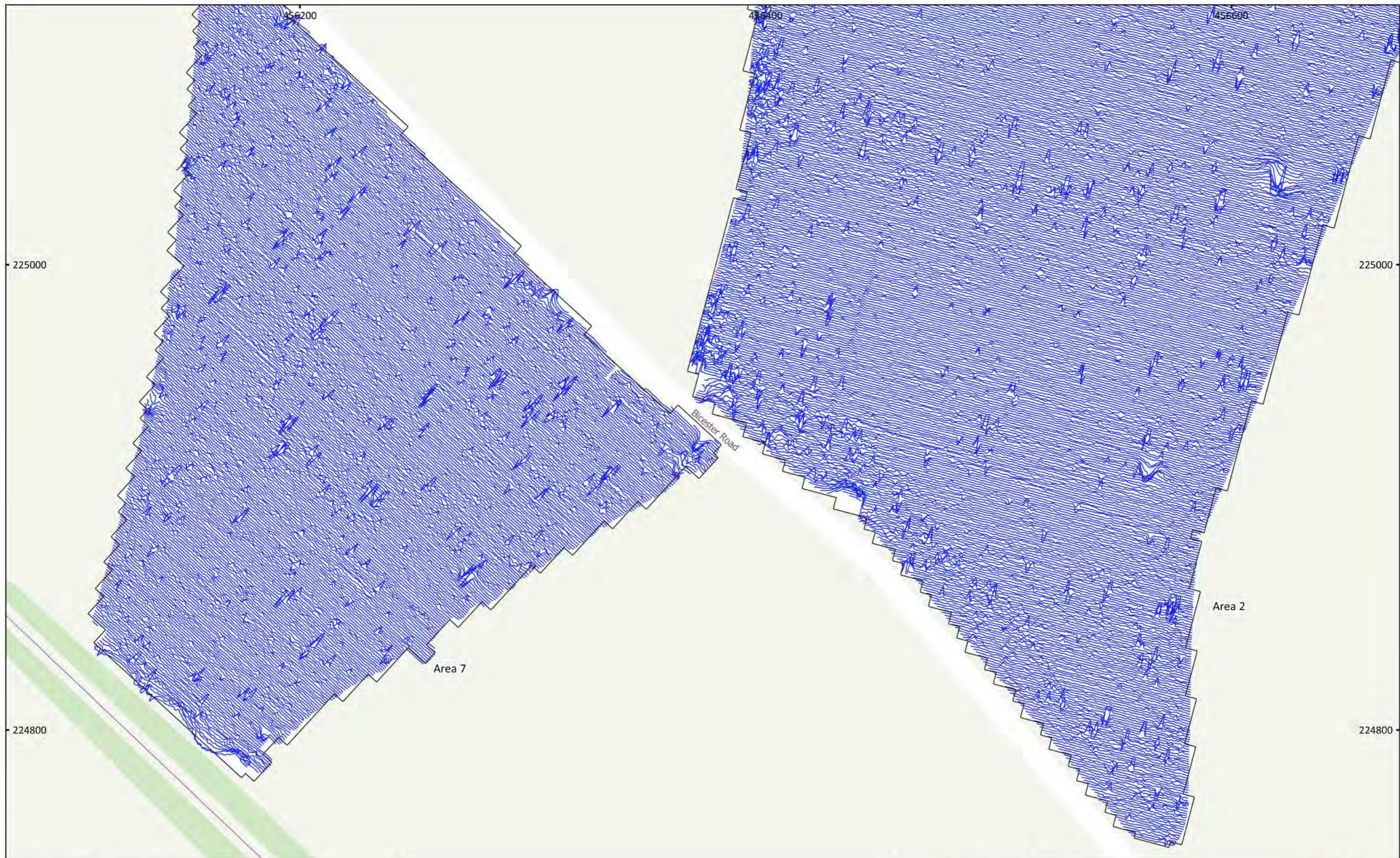


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 Figure 8 - Magnetic Interpretation (Areas 2 & 7)  
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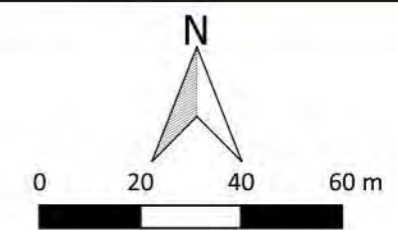
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|-------------------------|--------------------------|
| Agricultural (Weak)     | Undetermined (Strong)    |
| Undetermined (Weak)     | Agricultural (Trend)     |
| Magnetic Disturbance    | Ridge and Furrow (Trend) |
| Ferrous/Debris (Spread) | Ferrous (Spike)          |

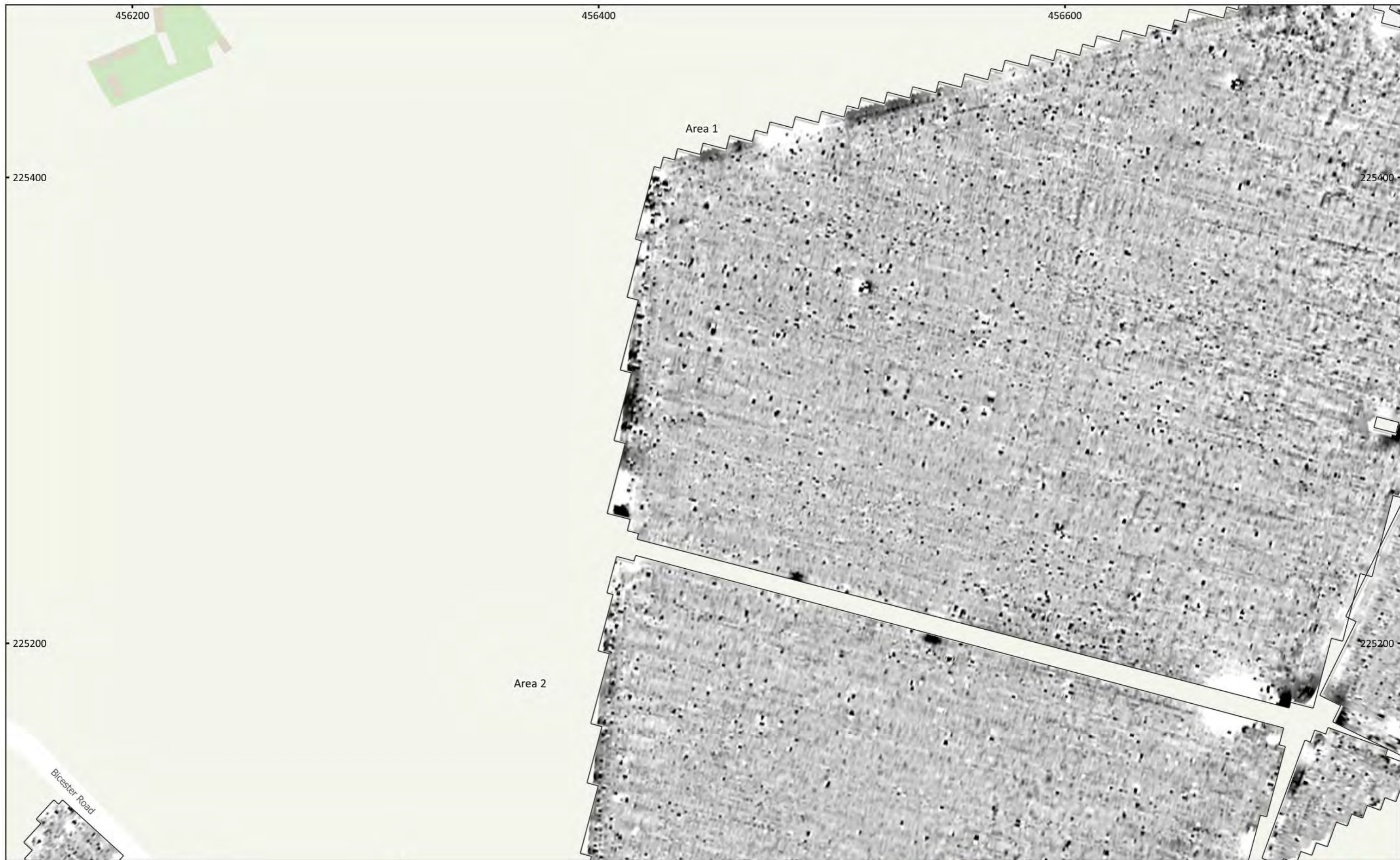




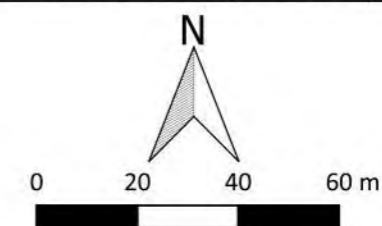


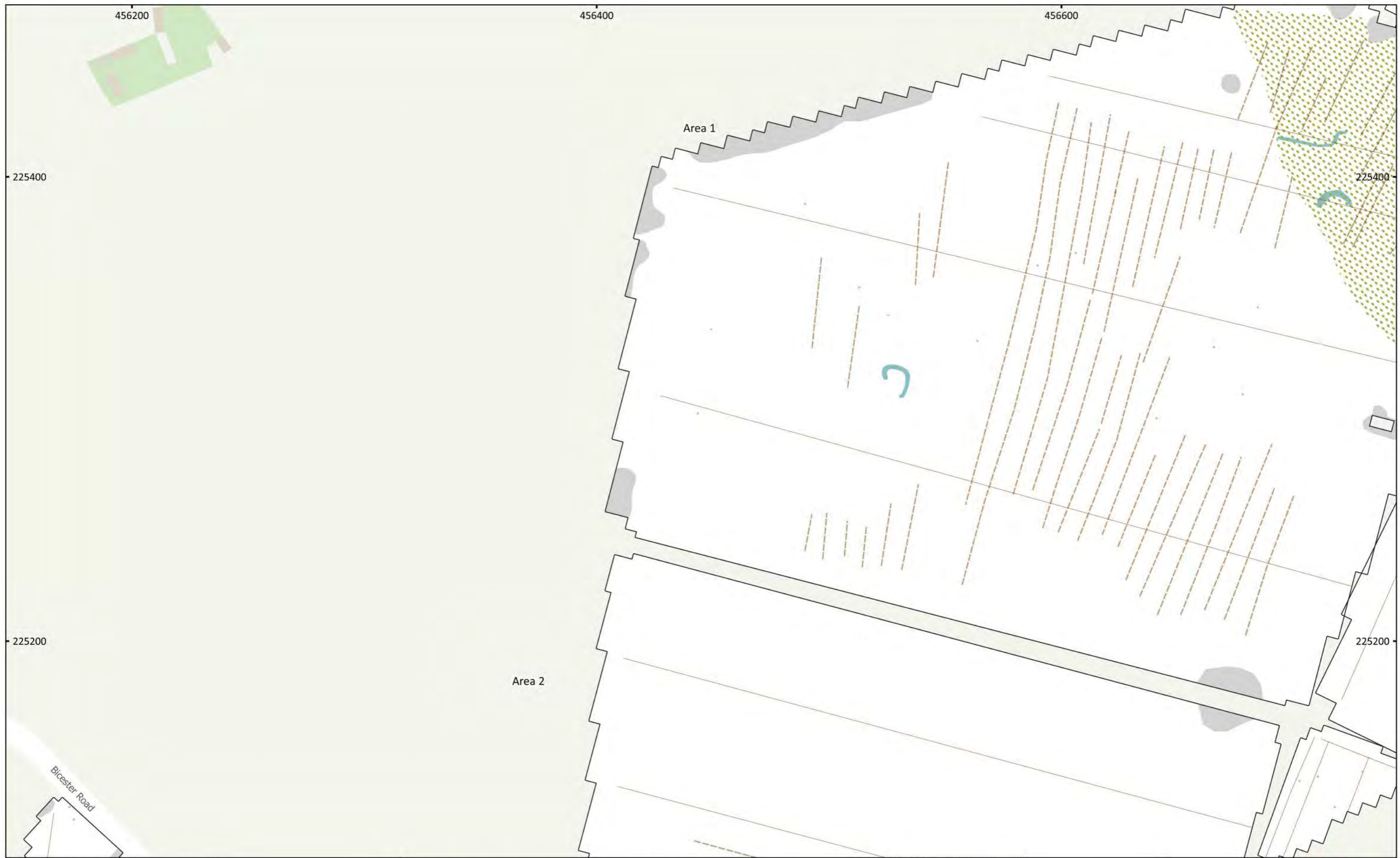
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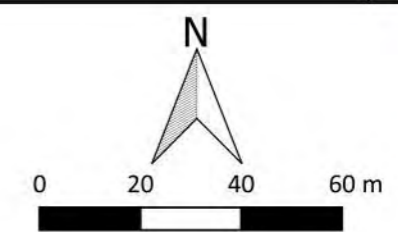
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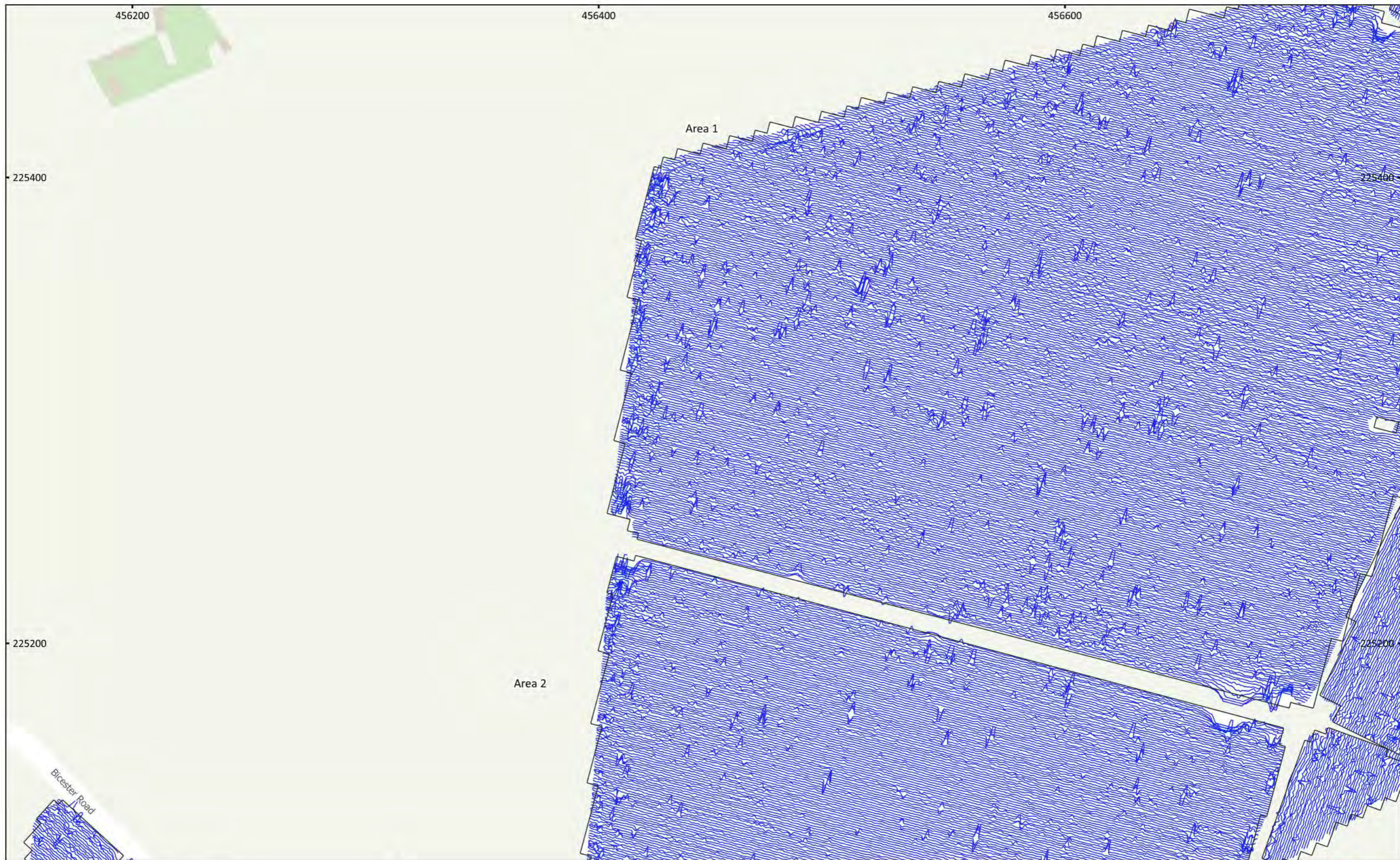




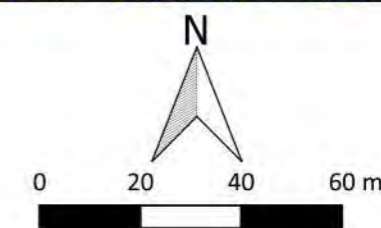
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 Figure 11 - Magnetic Interpretation (Areas 1 & 2)  
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- |                      |                          |
|----------------------|--------------------------|
| Natural (Spread)     | Agricultural (Trend)     |
| Undetermined (Weak)  | Ridge and Furrow (Trend) |
| Magnetic Disturbance | Ferrous (Spike)          |



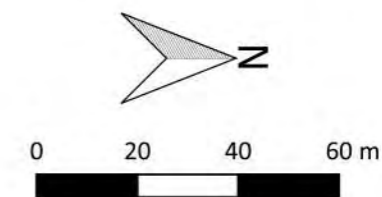


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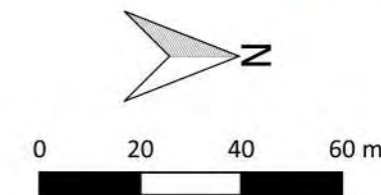
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 Figure 13 - Magnetic Gradient (Areas 1, 3 & 4)  
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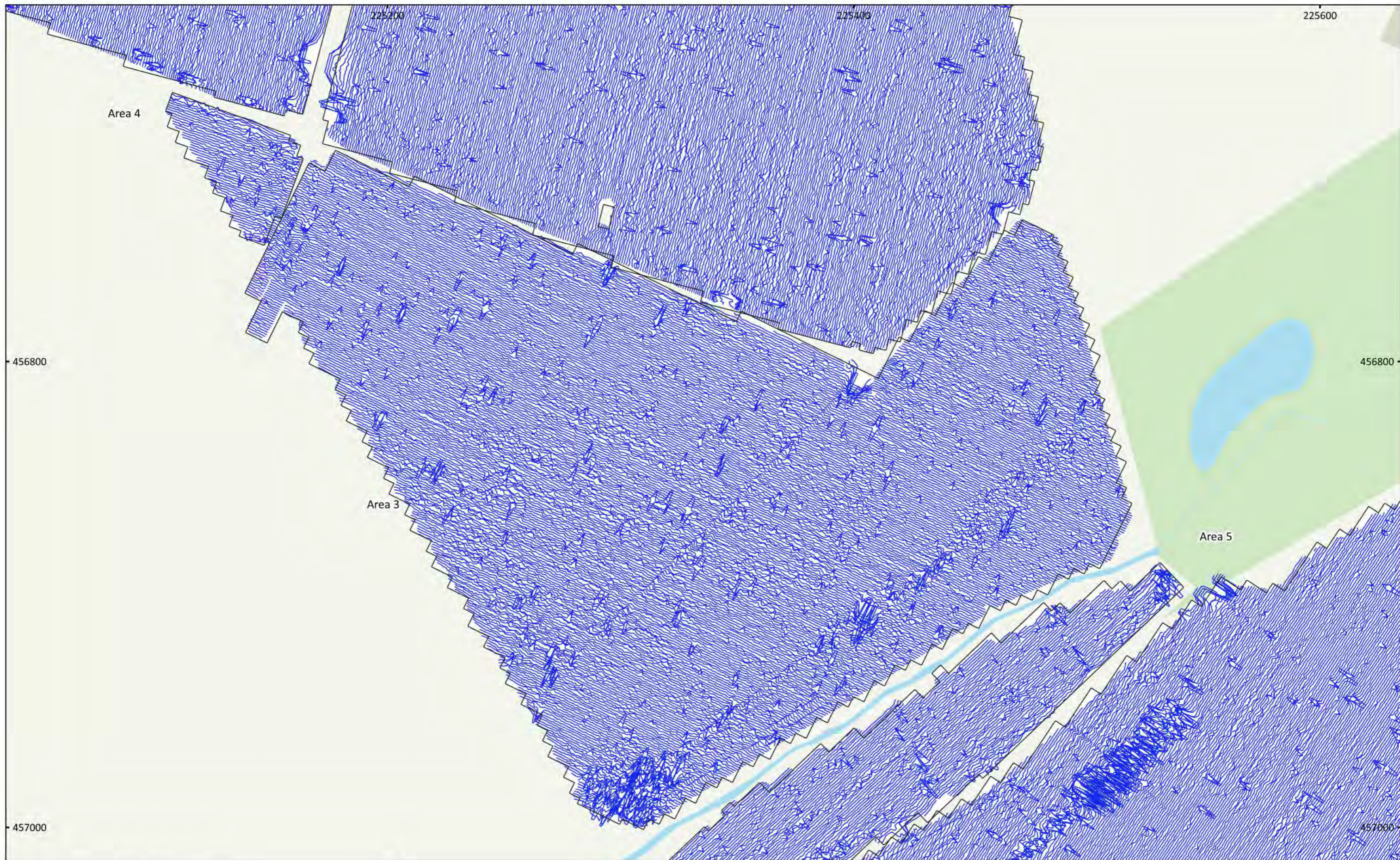




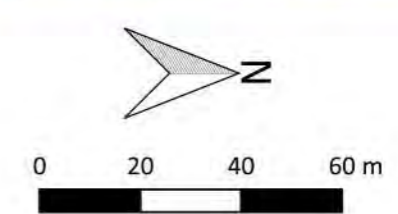
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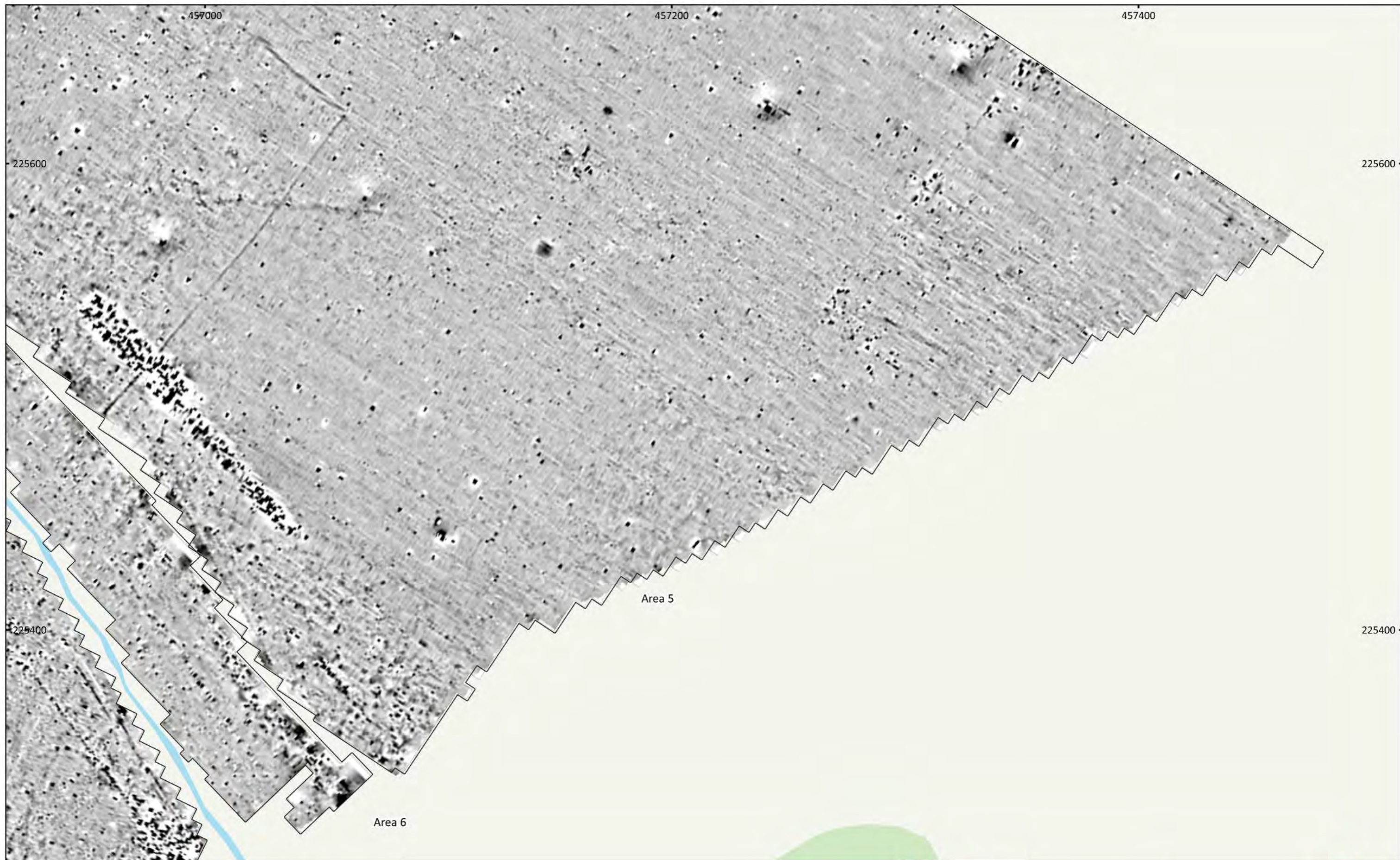
- |                       |                          |
|-----------------------|--------------------------|
| Agricultural (Spread) | Ferrous/Debris (Spread)  |
| Agricultural (Weak)   | Agricultural (Trend)     |
| Natural (Spread)      | Ridge and Furrow (Trend) |
| Undetermined (Weak)   | Ferrous (Spike)          |
| Magnetic Disturbance  |                          |



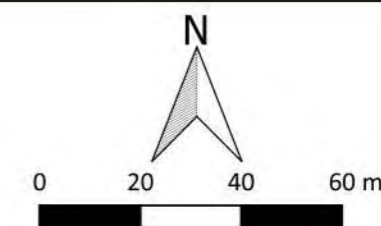


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 Figure 15 - XY Trace Plot (Areas 1, 3 & 4)  
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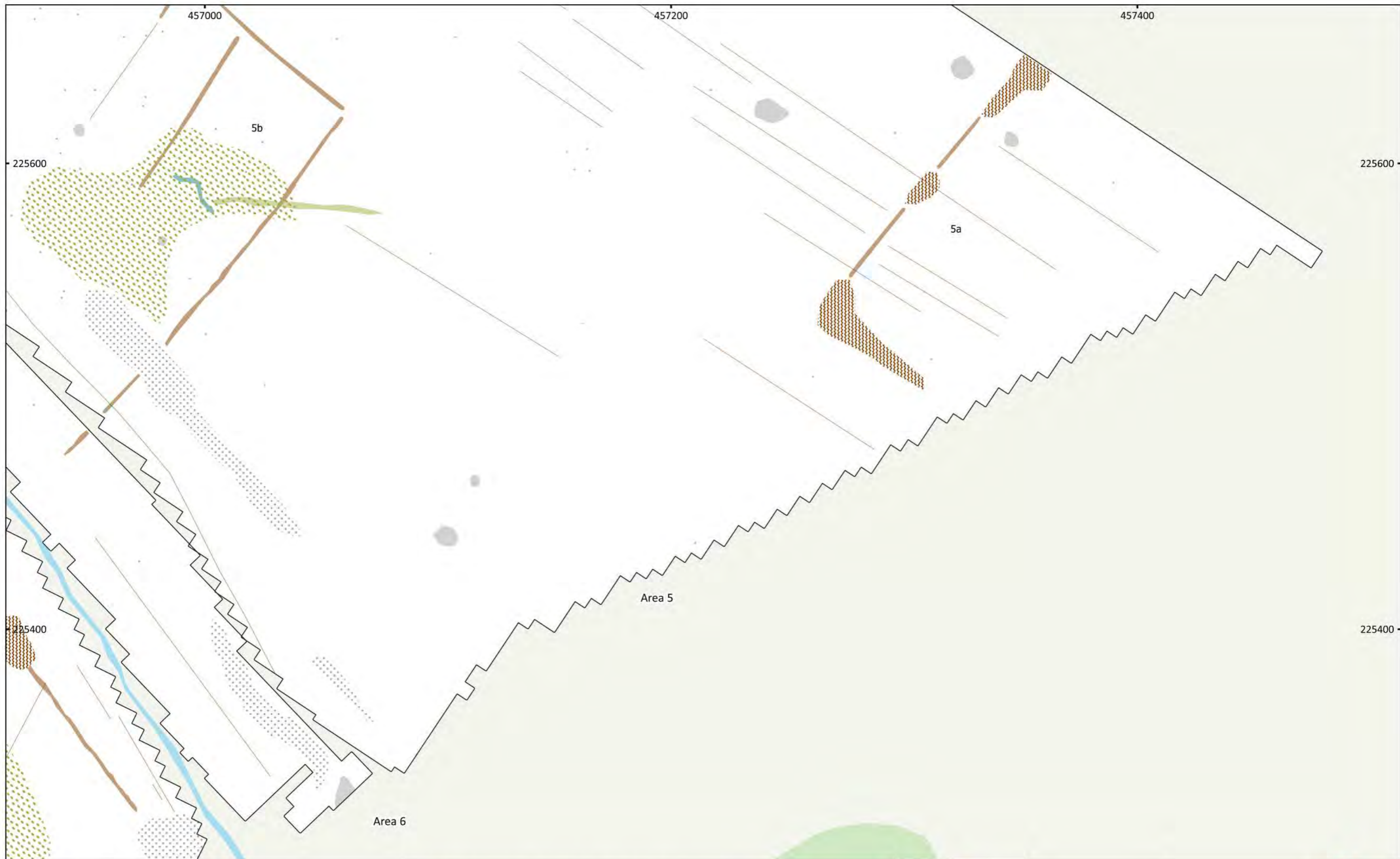




MSSP1197- Land South of Bucknell, Bicester  
 Figure 16 - Magnetic Gradient (Areas 5 & 6)  
 1:1,500 @ A3  
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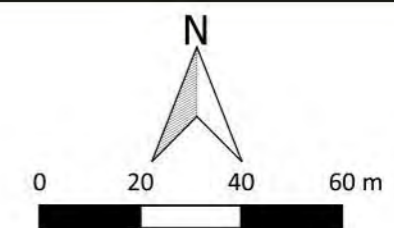


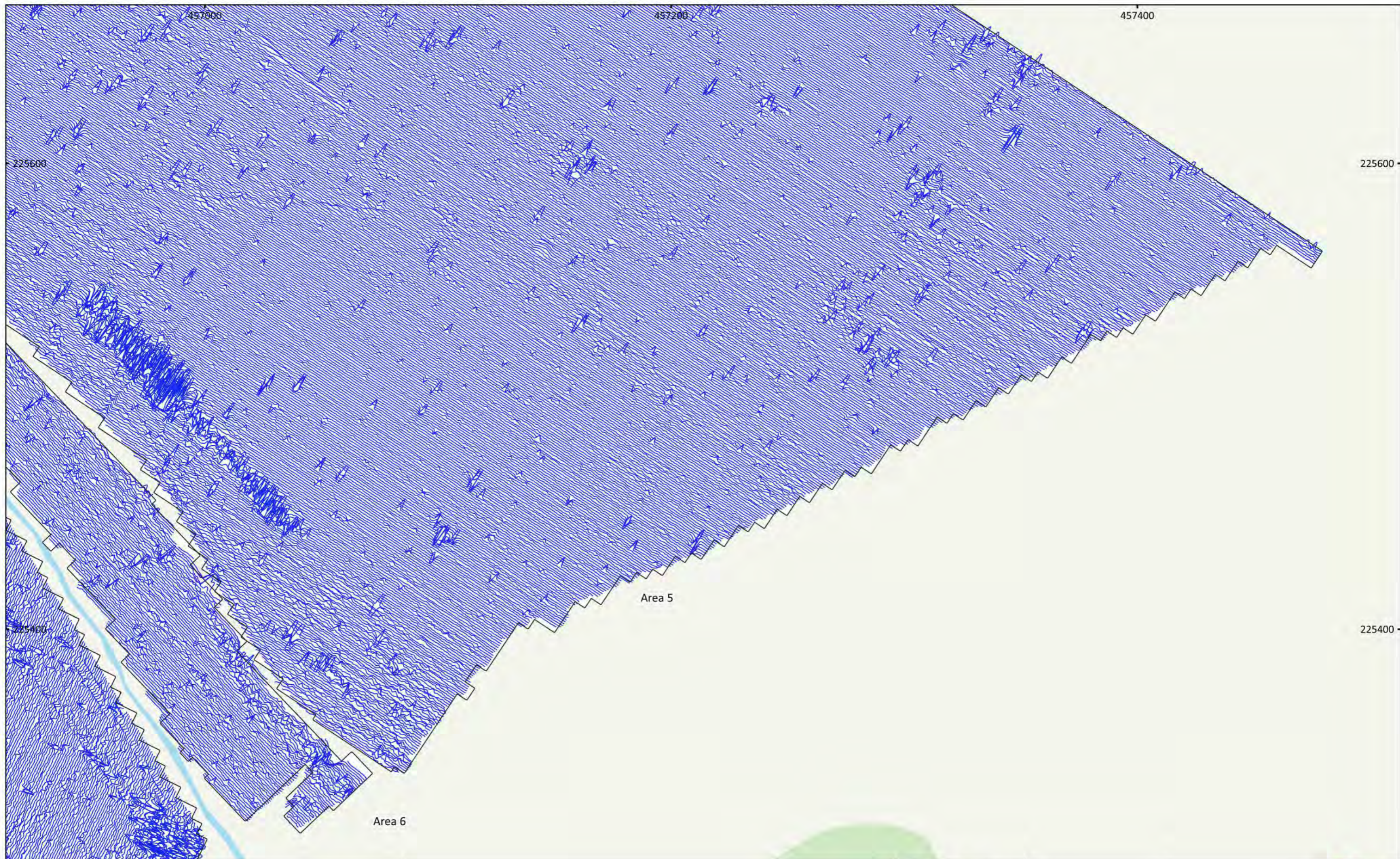




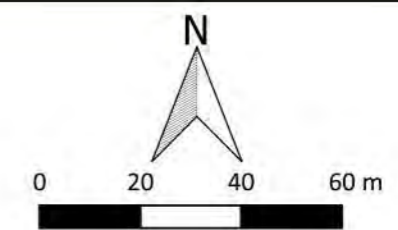
MSSP1197- Land South of Bucknell, Bicester  
 Figure 17 - Magnetic Interpretation (Areas 5 & 6)  
 1:1,500 @ A3  
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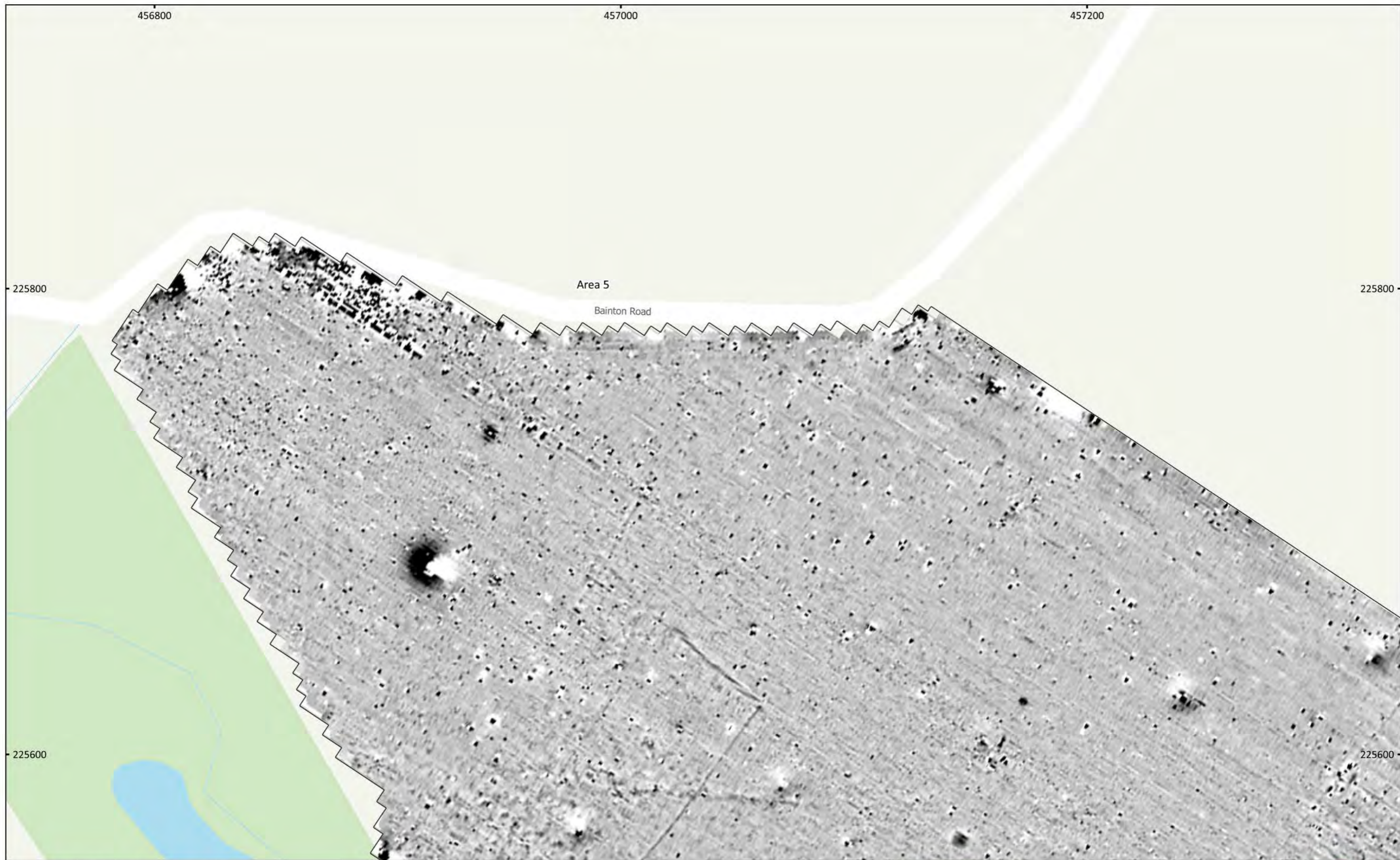
- |                       |                         |
|-----------------------|-------------------------|
| Agricultural (Spread) | Magnetic Disturbance    |
| Agricultural (Weak)   | Ferrous/Debris (Spread) |
| Natural (Weak)        | Agricultural (Trend)    |
| Natural (Spread)      | Ferrous (Spike)         |
| Undetermined (Weak)   |                         |



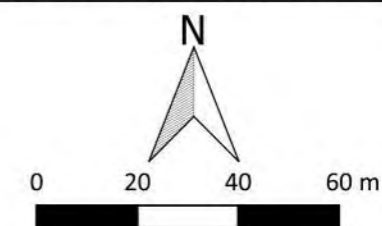


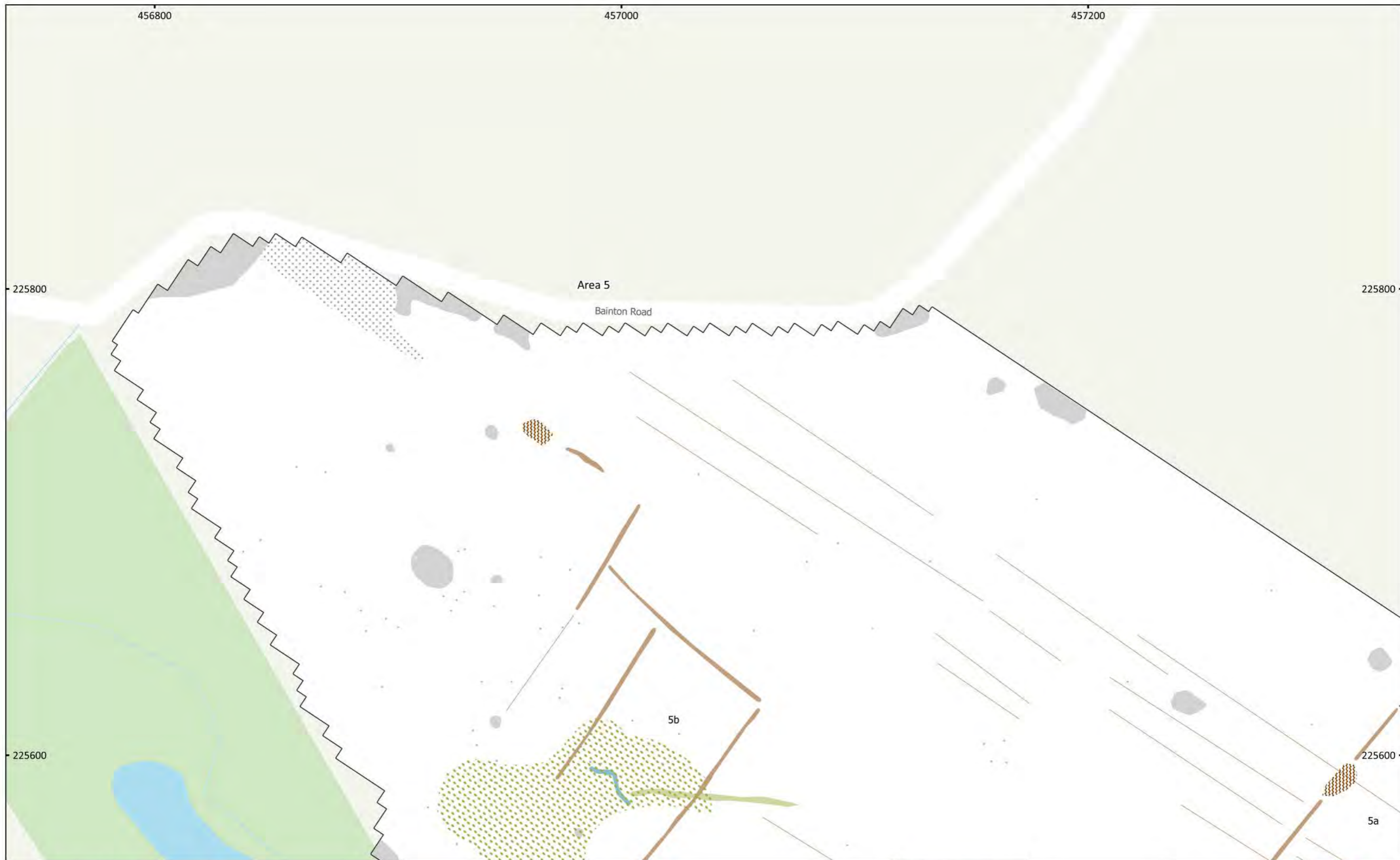
MSSP1197- Land South of Bucknell, Bicester  
 Figure 18 - XY Trace Plot (Areas 5 & 6)  
 30nT/cm at 1:1,500 @ A3  
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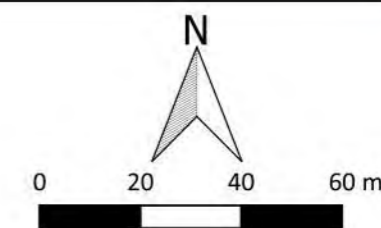
MSSP1197- Land South of Bucknell, Bicester  
 Figure 19 - Magnetic Gradient (Area 5)  
 1:1,500 @ A3  
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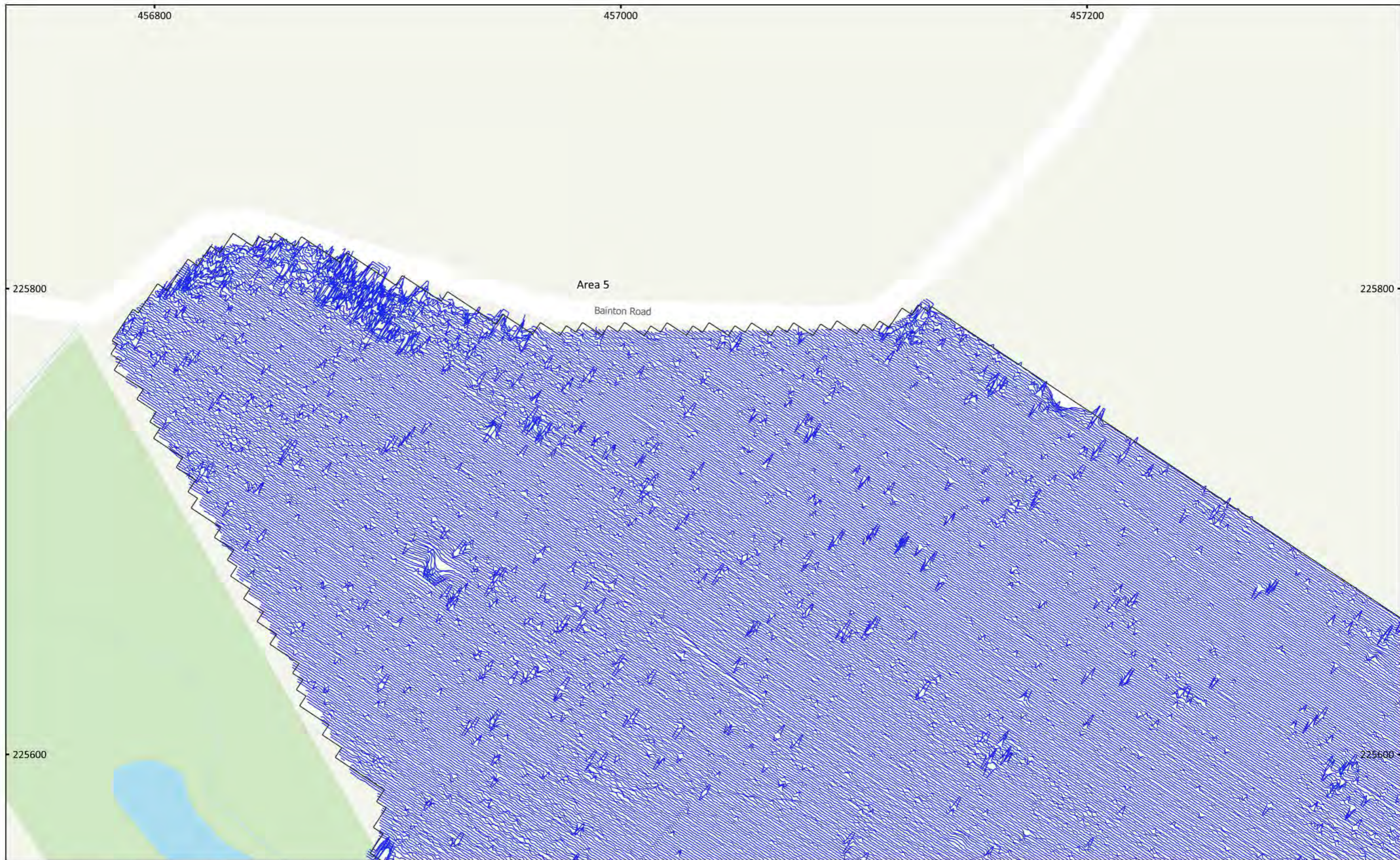




MSSP1197- Land South of Bucknell, Bicester  
 Figure 20 - Magnetic Interpretation (Area 5)  
 1:1,500 @ A3  
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- |                       |                         |
|-----------------------|-------------------------|
| Agricultural (Spread) | Magnetic Disturbance    |
| Agricultural (Weak)   | Ferrous/Debris (Spread) |
| Natural (Weak)        | Agricultural (Trend)    |
| Natural (Spread)      | Ferrous (Spike)         |
| Undetermined (Weak)   |                         |





MSSP1197- Land South of Bucknell, Bicester  
 Figure 21 - XY Trace Plot (Area 5)  
 30nT/cm at 1:1,500 @ A3  
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