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Gladman Developments Ltd.

Beamhill Road, Burton on Trent

Scoping Report

4th October 2017

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1.0 INTRODUCTION

1.1 This is a request to East Staffordshire Borough Council for an Environmental Statement Scoping Opinion made on behalf of Gladman Developments Limited.

1.2 It is the intention to submit an outline planning application for a high quality residential development at Beamhill Road, Burton upon Trent. A Development Framework is currently being prepared to include land for residential development, green infrastructure and open space including a Community Park. Baseline environmental constraints have been assessed; this information has guided the Development Framework which will continue to evolve in response to further research and consultation responses.

1.3 In accordance with the Town and Country Planning (Environmental Impact Assessment) Regulation 2017, it is considered that the Proposed Development would fall within the threshold and criteria of a 'Schedule 2 Development' and therefore constitutes an 'EIA Development'.

1.4 This Scoping Report is a formal request by the applicant to East Staffordshire Borough Council for a 'scoping opinion' on the proposed development. In particular, the applicant seeks to understand whether;

- The environmental issues/topics identified within the Scoping Report are appropriate to the assessment.

- Confirmation that the environmental issues of: Biodiversity, Waste Disposal, Archaeology, Agricultural Land Quality, Odour, Ground Conditions, Noise, Climate change and Existing Services can be scoped out of the EIA as there would be no significant effects likely on these aspects.

- Whether there are any additional environmental issues that should be given due consideration: and;

- What additional developments in the locality need to be assessed in conjunction with the Proposed Development as part of an assessment of cumulative effects.

1.5 The EIA process would be presented by means of an Environmental Statement (ES) and would be prepared and submitted along with the planning application. The ES will comply with the latest Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

Context

1.6 The site is located to the north west of Burton upon Trent in the Beamhill area. Derby lies approximately 10km to the north east with Swadlincote approximately 7km to the south east. The A38 runs roughly north east to south west and divides Beamhill, Stretton and Horninglow from the main area of Burton upon Trent.

1.7 In very broad terms the proposed site covers a triangular section of land with Tutbury Road (A511) to the east, Beamhill Road to the south and Longhedge Lane and open farm land to the north west.

1.8 The site covers an area of 40.2Ha of agricultural land lying to the rear of existing properties to Tutbury Road and Beamhill Road. Bound by existing residential development to the south and east and by Longhedge Lane to the North West, it will be accessed via two points from Beamhill Road. There will also be pedestrian access at several points along Beamhill Road and Tutbury Road. St Modwen's Catholic Primary School is located adjacent to the site, to the east of Tutbury Road.

1.9 In general the southern area of the site is relatively flat with the southern boundary at around 85m AOD. The eastern field parcels fall away more sharply towards the existing residential development along Tutbury Road (A511) from 82m AOD to 72m AOD (approximately). The northern section of the site slopes to the north east with a central band at approximately 77m AOD sloping gently to 63m AOD.

1.10 It is expected that development will be sited to the southern section of the proposed site with a Community Park to the north. The site is currently in agricultural use and consists of mature field boundaries and trees. There is a small pond to the centre of the site and some farm structures which are proposed to be demolished. There is a farm track which passes through the site however there are no Public Rights of Way within the site. Piltons Farm is located to the north beyond Longhedge Lane.

1.11 Residential development is consented to sites both to the south of Beamhill Road (P/2013/00429) and to the east of Tutbury Road (P2015/00202).

2.0 ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENT

2.1 Planning applications for certain types of development in England and Wales need to be accompanied by an Environmental Statement in order to comply with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 ('2017 Regulations'). An Environmental Statement (ES) is to be prepared as part of the outline planning application for the development of the site. The ES will contain the findings of the Environmental Impact Assessment (EIA) and will be prepared in accordance with the requirements for the Regulations. The principle objective is to identify the potential for significant environmental effects arising from the Project.

2.2 The ES will include information required by Regulation 18 of the 2017 Regulations i.e.

- *A description of the proposed development comprising information on the site, design, size and other relevant features of the development;*
- *A description of the likely significant effects of the proposed development on the environment;*
- *The description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
- *A description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment; A non-technical summary of the information set out above.*
- *A non-technical summary of the information referred to in sub-paragraphs (a) to (d); and*
- *Any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.*

2.3 Schedule 4, Information for Inclusion in Environmental Statements is outlined below:

- *A description of the development, including in particular:*

  a) A description of the location of the development;

  (b) A description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;

  (c) A description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;

(d) An estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.

- *A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.*

- *A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.*

- *A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydro morphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.*

- *A description of the likely significant effects of the development on the environment resulting from, inter alia:*

  (a) The construction and existence of the development, including, where relevant, demolition works;

  (b) The use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;

  (c) The emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

  (d) The risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

  (e) The cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

  (f) The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

  (g) The technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC(1) and Directive 2009/147/EC(2).

- *A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.*

- *A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.*

- *A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU(**3**) of the European Parliament and of the Council or Council Directive 2009/71/Euratom(**4**) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.*

- *A non-technical summary of the information provided under paragraphs 1 to 8.*

- *A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.*

2.4 The 2017 Regulations (Regulation 18(4a) also outline the ES must:

- *Where a scoping opinion or direction has been issued in accordance with regulation 15 or 16, be based on the most recent scoping opinion or direction issued (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion or direction); A description of the likely significant effects of the proposed development on the environment;*

- *Include the information reasonably required for reaching a reasoned conclusion on the significant effects of the development on the environment, taking into account current knowledge and methods of assessment; and*

- *Be prepared, taking into account the results of any relevant UK environmental assessment, which are reasonably available to the person preparing the environmental statement, with a view to avoiding duplication of assessment.*

- *In order to ensure the completeness and quality of the environmental statement—*

  (a) The developer must ensure that the environmental statement is prepared by competent experts; and

  (b) The environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.

Scoping Opinion

2.5 The purpose of this Scoping Report is to seek a 'Scoping Opinion' from the Local Planning Authority (LPA) pursuant to Part 2, Regulation 15. This is the formal opinion of the LPA on the information to be supplied in the ES and enables the applicant to be clear about what the LPA and statutory consultees consider the main effects of the development are likely to be and therefore the topics on which the ES should focus.

2.6 This Scoping Report outlines the proposed development and identifies issues that will be assessed by the EIA and reported in the ES that will accompany the planning application. The following information is therefore provided:-

- **A site location plan (Figure 1);**
- **A brief description of the nature and purpose of the Project;**
- **An indication of the possible environmental effects and a broad indication of their likely scale and;**
- **Details of the EIA scope and methodologies proposed to be employed for the various environmental topics.**

3.0 PROJECT PROPOSALS DESCRIPTION

3.1 The Project will constitute high quality residential development complete with associated open space requirements to meet the community's needs as part of a cohesive green infrastructure (GI) framework. It is anticipated that the development will deliver approximately 630 new homes together with children's play space, including equipped play, amenity green space and GI connectivity, together with vehicular access from Beamhill Road.

3.2 As part of its GI, the project will incorporate the retention of existing trees and hedgerows. The site's GI will also include an extensive Community Park with generous public open space, native species woodland belt, two play areas and a Sustainable Urban Drainage System (SuDS). A network of footways will be created throughout the development linking into the existing network. The GI framework will create a diverse landscape structure, catering for a wide range of recreational needs. The GI will target biodiversity enhancements with new tree planting and attenuation ponds with associated planting.

3.3 A safe 'walkable' neighbourhood will be a fundamental objective of the overall design. Vehicular access into the site would be via two access points on Beamhill Road. The proposals will support convenient connections to the local public transport system linking to the town centre and major amenities. Design will be informed by reference to the latest guidance provided by government agencies such as CABE, Natural England, Sport England and the Environment Agency. Each environmental constraint will be assessed and the results used to guide the emerging framework which will continue to evolve in response to further research and consultation responses.

Parameters Plan

3.4 The Development Framework (Parameters Plan) will evolve in response to findings of the baseline environmental surveys and appraisals. This iterative process seeks to minimise potentially detrimental environmental effects from the outset, while maximising positive benefits. The preliminary prediction of environmental effects and the integral design of mitigation measures are central to this process and will enable good design and mitigation measures to be achieved in response to the environmental issue. A Parameters Plan will be prepared as part of the ES which will form the basis for the EIA, it will provide sufficient information regarding the siting, nature and size of the proposed development enabling the impacts and subsequent environmental effects of the development to be assessed. It will indicate the main fixed aspects of the project, including land use, movement, green infrastructure, maximum building heights and phasing. Measures to mitigate the anticipated effects will also be described.

4.0 ENVIRONMENTAL STATEMENT: SCOPE OF ASSESSMENT

Scope of Studies

4.1 It is anticipated the following topic areas are covered within the ES as they are expected to result in a level of significance:-

- **Socio Economics and Human Health**
- **Landscape Character and Visual Resources**
- **Air Quality**
- **Traffic, Transport and Access**
- **Water, Hydrology and Drainage**

4.2 Each consultant responsible for providing the chapters will provide a Statement of Competency outlining their relevant expertise and qualifications. This will be included in the introduction of each separate chapter.

4.3 An indication of possible environmental effects and the methodologies for each of the respective environmental issues is outlined within this document. The Project Proposals Description chapter provides a comprehensive statement covering the nature of the Project and collectively addresses all component parts of the proposal, including sustainability and design quality. It will relate directly to the companion Design and Access Statement which will support the Outline Planning Application. Consideration will be given, within the relevant ES chapters, to the effects of the proposals on green infrastructure.

Environmental Topics – Scoped Out

4.4 It is considered that the following topics should be 'scoped out 'of the EIA process as they will not result in significant effects. These topics will be included in separate appraisals which will form part of the outline Planning Application i.e. an ecological assessment will be submitted to address biodiversity.

Waste

4.5 The waste associated with this site and project is not expected to be significant and the implementation of a Construction Environment Management Plan (CEMP) will ensure waste is controlled, managed and minimised. A CEMP will be agreed with the LPA through the process of a planning condition. Construction waste including that from the demolished existing farms buildings will be separated to consider reuse and recycling potential. The collection of waste, once the development is operational, will form part of the detailed design and waste management systems in place in the area report sufficient capacity for waste generated by new dwellings. There are no significant 'cut and fill 'measures required. It is for these reasons that waste is proposed to be scoped out.

Biodiversity (Flora and Fauna)

4.6 A full suite of ecology surveys has been completed during 2017. Overall the site is considered to be of unremarkable ecological value with no significant constraints identified. The majority of the habitats comprise of common and widespread habitats and species. No great crested newts were recorded within any of the ponds surveyed. The breeding bird assemblage recorded and the levels of activity on site are considered to be unexceptional. No bat roosts have been recorded on site and the levels of bat activity recorded during the site-wide surveys was unremarkable comprising relatively low numbers of common and widespread species. The scheme will not directly or indirectly impact upon any statutory or non-statutory designated sites. Due to these reasons, with agreement from East Staffordshire Borough Council, it is recommended Biodiversity is scoped out of the EIA process. An Ecological Assessment will be included with the planning application.

Cultural Heritage and Archaeology

4.7 There is a Grade I listed church (St Mary at Rolleston on Dove), two Grade II listed mileposts and a Conservation Area with further listed buildings, within the vicinity of the site however the existing assessments completed have demonstrated that the development site does not contribute to the setting or significance of these assets. There will therefore be no significant effect on the significance of designated assets as a result of the development. Desk-based assessment and geophysical survey of the development site have only identified remains of medieval or post-medieval ridge and furrow remains within the development site. These remains are of low or negligible heritage interest and the effect arising from development is not significant. There is considered to be low potential for the identification of further previously unrecorded archaeological remains within the development site. Any effects on archaeological assets can be mitigated through the implementation of a programme of archaeological investigation and recording. The archaeological appraisal, built heritage statement and geophysical survey reports completed for the development site will be submitted with the planning application.

4.8 More information is provided in Appendix 1.

Ground Conditions (Contamination)

4.9 Given that the site is predominantly green field in nature and is largely in agricultural use it is concluded that there would be no substantive issues in terms of ground contamination and no significant effects on ground conditions will occur.

Agricultural Land Quality

4.10 The site has been surveyed and found to contain mainly lower quality land (subgrade 3b and non-agricultural) with only 7.8 ha (19%) BMV land (subgrade 3a). This small loss is not considered a significant effect and, since no mitigation for loss of BMV to built development is possible, inclusion in ES scoping is not judged to be necessary. An Agricultural Land Quality Report will be submitted with the planning application.

Odour

4.11 An Odour Impact Assessment including 'sniff test' was undertaken to consider potential odours. This relates predominantly to the farm to the north. This assessment was done in accordance with

the Institute of Air Quality management (IAQM) document 'Guidance on the Assessment of Odour for Planning dated May 2014. It is assessed that Odour effects are not significant. The Odour assessment will be included as an appendix to the Air Quality Chapter.

Noise and Vibration

4.12 Road traffic on Tutbury Road is likely to be the dominant noise source affecting the proposed development. Road traffic on remaining existing and proposed local infrastructure may also contribute to the local noise climate, however, it is likely that all traffic noise could be adequately mitigated using straightforward mitigation measures. Additional road traffic generated by the development is likely to result in a small, but imperceptible increase in noise levels at existing sensitive receptors. Noise from the construction phase of the development is likely to be audible at existing and future receptors and mitigation measures should be employed prior to works being undertaken to control noise impact to acceptable levels during transient construction phases. It is considered that this will take the form of a CEMP that will be agreed with the LPA through a planning condition. The proposed Development would not lead to any significant effects on noise and vibration.

Existing Utilities and Services

4.13 Due to the location of the site and its proximity to existing residential development, it is considered that there would be no significant effects to the existing Utilities or Services. Public foul sewers are located in the roads that surround the site to which a connection of foul water flows from the development will be made in accordance with the provisions of the Water Industry Act 1991.

Climate Change

4.14 Given the scale of the development and appropriate design and mitigation measures it is considered that the proposed development would not lead to any significant effects on Climate change. Effects will be addressed through each chapter as appropriate to include impacts from construction (carbon emissions, energy usage), increased flood risk, impact through operation (sustainability, water usage, low carbon energy, waste management) and impact through loss of onsite vegetation.

5.0 ENVIRONMENTAL STATEMENT: CONTENT

5.1 The ES will contain a series of introductory chapters which will include an Introduction, EIA Methodology and Description of the Development. A Consideration of Alternatives chapter will also be included.

Introduction & EIA Methodology

5.2 The Introduction will set out the project information and the scope and content of the Environmental Statement. It will also set out the topics assessed and the assessment methodology, together with any cumulative projects to be assessed.

Description of Development

5.3 Aspects such as layout, scale, access and movement are described. This chapter also covers environmental performance measures, implementation and phasing and maintenance, together with proposed design and mitigation measures.

Consideration of Alternatives

5.4 Alternative sites and design options are considered. Alternative uses for the site are also discussed and a conclusion drawn.

Non-Technical Summary

5.5 A Non-Technical Summary is required under the EIA Regulations and will be provided, in suitable non-technical language for use by non-experts. The summary will outline the project, the main findings of the assessment (for each environmental topic outlined above), the mitigation/design measures adopted, as well as the overall environmental impact of the Project. The Non-Technical Summary will be included within the ES and will be a stand alone document.

6.0 ENVIRONMENTAL STATEMENT: STRUCTURE AND APPROACH

6.1 The purpose of each environmental chapter within the ES is to assess the impact of the Proposed Development on that environmental aspect, and to come to a conclusion on the level of significance. This would address:

- The construction phases of the Proposed development (to include demolition activities); and
- The operational phase (ie all the Proposed development completed).

6.2 The chapters would consider whether the impacts are deemed to be:

- Direct or indirect;
- Temporary or permanent
- Short, medium or long term
- Whether effects are positive (beneficial) or negative (adverse)

6.3 A judgement of the levels of effects and significance would be quantified using a word scale of Major; Moderate; Minor and Negligible.

6.4 It is expected that each chapter will be set out as follows:

Introduction

6.5 The consultant practice/company that has prepared the environmental chapter would be identified.

Assessment Methodology & Significance Criteria

6.6 Where it may differ from the guiding EIA Methodology (contained within Chapter 1 of the ES), the technical criteria and methodology that has been used by the author would be explained. This includes any reference to any particular threshold and any legislative standards for that topic, and any agreed approaches with consultees.

Planning, Legislative Context & Guidance

6.7 A summary of the planning/legislative context would be provided with any relevant guidance that is specific to that topic.

Baseline Conditions

6.8 Each chapter would provide an assessment of the receiving environment in which the Proposed Development is to occur. This would consider resource and receptors, together with land use, condition and sensitivity.

Description of Development- Design

6.9 Each topic refers to the design that is demonstrated by the Parameters Plan(s) and the description of the Proposed Development (ES Chapter 2). Any specific design/mitigation measures relevant to that topic would be explained.

6.10 It is expected that the effects will be assessed as follows:

6.11 **Demolition/ Construction: Potential Effects** - Each chapter would consider the likely impact of the Proposed Development during the demolition/ construction phases of the Proposed Development prior to mitigation.

6.12 **Demolition/ Construction: Mitigation** - Any specific mitigation measures relevant to that topic that will be adopted at the demolition/ construction phase would be outlined. This also considers any environmental benefits and opportunities for enhancement.

6.13 **Demolition/ Construction Effects** - Each chapter considers the effect during the demolition/ construction phase with mitigation in place. Depending on the topic, either qualitative or quantitative assessment is made on the level of effects and significance.

6.14 **Operation: Potential Impacts** - This considers the likely impact of the Proposed Development during the operation of the Proposed Development, i.e. with the full development built and in place prior to mitigation.

6.15 **Operation: Mitigation** - Design and mitigation measures that are imbedded into the design would be explained within Chapter 2 (Description of Development). This would include primary and secondary mitigation measures to prevent, reduce and offset any significant adverse effects, in addition to delivering and environmental benefits and opportunities for enhancement. Each chapter would expand on any specific mitigation measures relevant to that topic.

6.16 **Operation Effects** - Each chapter considers the effect during the operation phase of the Proposed Development

6.17 **Residual Effects** - A description and assessment of any impacts that will remain beyond the operation stage after the proposed design and mitigation measures are in place would be explained and assessed, i.e. this is the longer-term effects.

6.18 **Cumulative Effects** - Through the means of the Scoping Report, the applicant seeks confirmation from ESBC on any additional developments that are either within the vicinity of the site, or considered to share the same environmental resource that are required to be assessed as part of the Cumulative Effects section of the EIA. If other projects are to be assessed, then each chapter would assess the cumulative effects of the Proposed Development coming forward in conjunction with these developments.

6.19 **Future Baseline or the 'Do Nothing Scenario'** – In the event that the Proposed Development does not come forward, i.e. in the 'do nothing' scenario, then an assumption is made on future environmental baseline.

7.0 ENVIRONMENTAL STATEMENT: SUMMARY OF ISSUES AND POSSIBLE IMPACTS

7.1 In accordance with EIA Regulations 2017, a summary of each environmental topic is outlined below together with the possible impacts and resulting effects of the Proposed Development of that Topic.

SOCIO ECONOMICS AND HUMAN HEALTH

7.2 Relevant background documents would be obtained from a number of sources.

7.3 The possible impacts and consequential effects arising from the Proposed Development are considered to be in relation to:

- The impact on housing, retail, economy and employment, health, education, community facilities and open space.

LANDSCAPE CHARACTER AND VISUAL RESOURCES

7.4 A Landscape and Visual Impact Assessment (LVIA) would assess the effect of the Proposed Development on landscape character and visual amenity. This would be prepared in accordance with Guidelines for Landscape and Visual Impact Assessment GLVIA3 (2013).

- The possible impact on local landscape character and landscape receptors; and
- Impact on views that are experienced by receptors

AIR QUALITY

7.5 The air quality assessments for the ES Chapter will be prepared in accordance with the Institute of Air Quality Management (IAQM) documents: Guidance on the Assessment of Dust from Demolition and Construction v1.1 (June 2016) and Land-Use Planning & Development Control: Planning For Air Quality v1.2 (January 2017).

7.6 The air quality at the site and in the surrounding area will be established through the identification of local sources of pollutants, a review of relevant local and national monitoring and mapping data, the presence of any local Air Quality Management Areas (AQMAs) and baseline road traffic emissions dispersion modelling. The topic will focus on nitrogen dioxide (NO2) and particulate matter (PM10 and PM2.5) emissions and will assess the impact on existing receptors as well as future proposed receptors.

7.7 The possible impact and consequential effects arising from the Proposed Development are considered to be:

- the impacts of the construction of the proposed development on dust soiling and concentrations of PM_{10} during the construction period;

- the impacts of additional road traffic generated by the proposed development on concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ in the proposed year of opening; and
- the impacts of existing sources (i.e. existing local traffic) and proposed sources (i.e. traffic generated by the proposed development) on future residents of the proposed development itself (if necessary).

TRAFFIC, TRANSPORT AND ACCESS

7.8 A Transport Assessment (TA) and associated ES chapter will be prepared in accordance with the *Environmental Assessment of Road Traffic* (1993) (IEMA Guidance), the *Design Manual for Roads and Bridges' (DMRB), Volume 11, Environmental Assessment*, as well as documents such as *Travel Plans, Transport Assessments and Statements in Decision-Taking, Planning Practice Guidance (2014)*. It is expected that the TA will form a separate volume of the ES. The analysis will encompass effects on all modes of transport.

7.9 The possible impacts and consequential effects arising from the Proposed Development are considered to be:

- Changes to traffic conditions on the local highway network and potential for congestion;
- Impact of increased trip generations to and from the Proposed Development which could affect the performance of junctions and the flow of the highway network; and
- Severance, driver delay, accidents and safety.

WATER, HYROLOGY AND DRAINAGE

7.10 A hydrological desk study will be undertaken to assess the existing hydrology, and to identify any potential effects caused by the Proposed Development. The hydrology will be assessed in terms of the natural drainage patterns, baseflows and volumes, run-off rates, hydrology, geomorphology and water quality and private water supplies. A Flood Risk Assessment (FRA) will be produced as part of the EIA. The Flood Risk Assessment will include the following additional items:

- Assessment of the potential sources of flood risk to the site;
- Analysis of flood record data for the area;
- A climate change impact analysis;
- Consultation with and review of designs made by the project planners, architects and engineer; and
- Preparation of a stand-alone Flood Risk Assessment Report based on the requirements of NPPF.

7.11 As a Flood Risk Assessment will be undertaken, it is requested that the following parameters are to be scoped out of the EIA:

- Flood risk from fluvial and tidal sources, can be scoped out of the assessment for the site. The site lies in Flood Zone 1 according to the EA fluvial and tidal flood maps, and there are no areas of flood zone in the surrounding areas. As such fluvial flood risk can be categorized as very low and as such can be scoped out of the EIA for the construction, operational and decommissioning phases. The site is also located far enough inland for tidal flooding to be of no impact, and as such can be scoped out of the EIA for the construction, operational and decommissioning phases.
- The impact of reservoir flooding, groundwater flooding and flooding from artificial sources were assessed as low risk in the FRA and therefore have been scoped out of the EIA for the construction, operational and decommissioning phases.
- The impact of silts on water quality during the occupational phase is to be scoped out of the EIA due to the absence of earthworks resulting in stripped or stockpiled soils on site.
- The impact of inappropriate disposal of foul waste on water quality during the occupational and decommissioning periods is to be scoped out of the EIA as formal foul drainage systems will be designed into the development.
- The impact of diffuse highway and urban pollution on water quality during the construction and decommissioning phase is to be scoped out of the EIA due to the lack of formal infrastructure on site.

7.12 The following parameters are to be assessed further within the EIA:

- The impact of pluvial flooding and flooding from sewers on and from the development will be assessed at the construction, operational and decommissioning phases
- The impact of silt laden runoff on water quality will be assessed at the construction and decommissioning phases.
- The impact of chemical spillages (including construction and household chemicals) on water quality will be assessed at the construction, operational and decommissioning phases.
- The impact of cements and concrete spillages on water quality will be assessed at the construction, operational and decommissioning phases.
- The impact of inappropriate foul waste disposal will be assessed at the construction phase.
- The impact of diffuse highway and urban pollution will be assessed at the operational phase.
- The impact of a demand for potable water will be assessed at the occupation phase.

8.0 SUMMARY

8.1 This document is a Scoping Opinion Request submitted to East Staffordshire Borough Council and has been prepared under the EIA Regulations 2017 in order to gain their formal opinion on the information to be supplied in the ES for Beamhill Road, Burton upon Trent.

8.2 As per the EIA Regulations 2017 (Reg18 (4a), the Environmental Statement will be based on the Scoping Opinion.

8.3 The likely potential effects have been identified and a detailed scope of the proposed methodology and structure of the ES has been included within this scoping request.

8.4 We would welcome comments on the proposed approach to the EIA and invite a response within the requisite 5 week time period upon receipt of the request in accordance with Regulation 15(4).

NOTES

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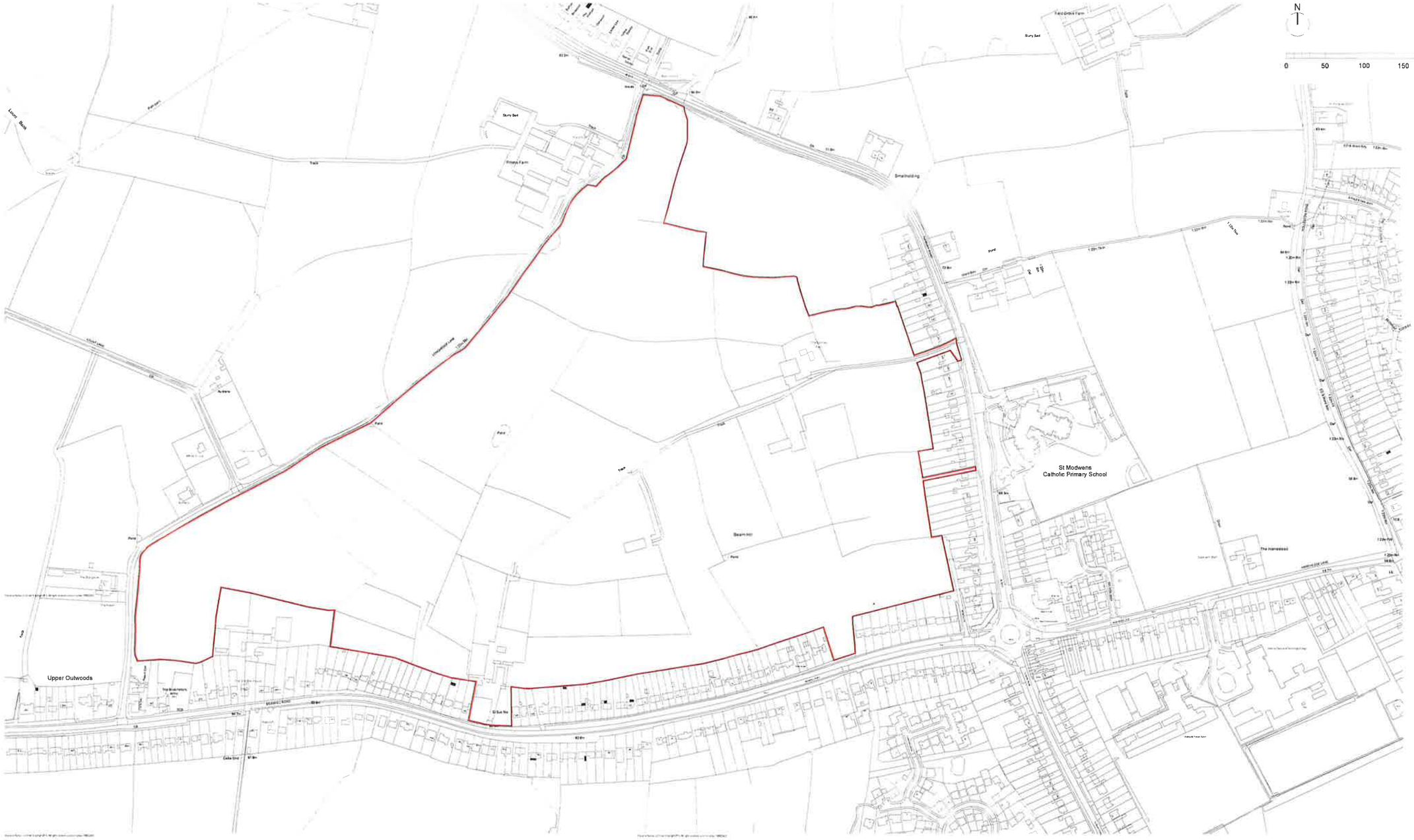

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Beamhill Rd
Burton -Upon-Trent

REDLINE BOUNDARY PLAN

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Appendix 1

Beamhill Road, Burton-on-Trent

Archaeology and Cultural Heritage – Scoping Report Inputs (04/10/17)

Introduction

This chapter provides the scoping stage in relation to the potential archaeological and cultural heritage effects that may occur as a result of the proposed development. The consideration of the potential for significant environmental effects on cultural heritage is considered relevant as this is a topic requiring consideration as stated within the EIA Regulations.

Archaeology and cultural heritage within this context includes all buried and upstanding archaeological remains, built heritage sites, historic landscapes and any other features that contribute to the archaeological and historic interest of the area.

The chapter considers whether potential effects on archaeology and cultural heritage assets are "significant" in EIA terms. Significant effects would normally be considered to equate to substantial impacts on heritage assets of medium significance, or moderate/substantial impacts on assets of high significance. Impacts on assets of low significance would not normally be considered significant in EIA terms.

Previous Assessments

The following assessments have already been completed for the proposed development and form the basis of the assessment within this chapter:

- WYG (2017a) Land to the north of Beamhill Road, Burton upon Trent, Staffordshire Archaeological Appraisal (Appendix X.1);
- WYG (2017b) Land North of Beamhill Road, Burton-On-Trent, Built Heritage Statement – Draft Report; and
- Headland Archaeology (2017) Land to the north of Beamhill Road, Burton on Trent, Geophysical Survey (Appendix X.2).

A study area representing a 1km buffer of the development site boundary was used for the Archaeological Appraisal and Built Heritage Statement. Full details of the methodology and assessment methods are included in the appendix reports. The Built Heritage Statement has not been finalised and therefore the results are summarised in this scoping chapter.

Existing Baseline Environment

Designated Sites

There are no World Heritage Sites, Scheduled Monuments, Registered Parks and Gardens or Registered Battlefields within the development site or study area.

There are two Grade II listed buildings within the study area. The Beamhill crossroads milepost is located c. 50 metres from the site's south-eastern corner; it dates from 1828, and is made of cast iron with relief lettering inscription (NHL 1392050). A further milepost is located at SK 224 270, c. 720 metres from the site's north-eastern corner; it dates from 1828, and is made of cast iron with relief lettering inscription (NHL 1190684).

The Rolleston on Dove Conservation Area just encroaches into the 1km study area to the north of the development site. The majority of the Conservation Area and most of the listed buildings within its historic core, including the Grade I listed St Mary's Church (NHLE 1374442) are located outside the 1km study area.

Non-Designated Sites

The Historic Environment Record holds details for 55 sites within the study area, excluding designated sites. The Historic Environment Record also holds details for 5 archaeological events within the study area.

There are no known sites of prehistoric date within the study area. Most evidence for activity in these periods in the wider region is focussed on the river valleys such as the Trent and Dove valleys to the north and north-east of the study area. Evidence of Bronze Age and Iron Age settlement has been recorded at Stretton and Clay Mills to the north of Burton on Trent and east of the study area.

The Roman road of Ryknild Street follows the line of the modern A38 to the east of the study area. No significant Roman activity has been recorded in the study area, with most documented evidence of Roman activity recorded on sites in the river valleys which had their origins in the Iron Age.

The political and religious core of the Mercian kingdom was centred on the middle Trent valley with key centres at Repton and Lichfield. The study area would therefore have lain within the sway and hinterland of these centres. The first minster church was likely to have been established at Burton in the 7th century, although it may not have survived the advance of the Danes in the 9th century. The lack of woodland names in the Domesday Survey of 1086 indicates that much of the woodland may have been cleared in this area by the medieval period. Large deer parks were established in the 13th century with smaller parks such as the one at Rolleston on Dove established in the 14th and 15th centuries.

The form of settlement and landscape was largely established in this period, with many modern villages, and the location of many of the farms having their origins in medieval settlement. During the later medieval period, there were areas where open strip arable farming dominated the economy. The arable farming is most readily identified in remains of reverse-S ridge and furrow. Field boundaries originating from enclosure of these fields often display sinuous lines and ridge and furrow remains can be preserved within them. Within the development site an area of extant ridge and furrow remains is present in the north of the site (MST17266) observed on the walkover survey and reflected in the geophysical survey results. An area of levelled ridge and furrow remains in the west of the site (MST4795) have been observed on aerial photographs but were reflected in the geophysical survey indicating that there may be no or limited buried remnants of ridge and furrow in this area. A number of the field boundaries within the development site, as depicted on historic maps, have sinuous field boundaries indicating that ridge and furrow may once have been more extensive across the development site. Evidence for buried remnants of ridge and furrow remains have been identified in the geophysical survey results in the south of the development site.

The post-medieval period continued with many of the same economic, agricultural and landscape processes largely unaltered within the study area. The most significant changes during this period occurred within the town centre from increased industrialisation including woollen textiles, fulling mills, iron working, hat making and brewing. The biggest built environment changes were the wider residential development of the suburbs of Burton upon Trent and establishment of other transport networks such as the turnpike road to the east.

No significant alterations to the current baseline conditions of the site with regard to archaeology and heritage are anticipated to occur in the future.

Significance and Value

The mileposts are of high significance, derived from the historical illustrative value they have reflecting the standardisation of the road system and the introduction of turnpikes to assist with transport requirements in an increasingly industrialised landscape. Their original roadside setting and group value with other mileposts in the surrounding area contributes to their significance. The development site makes no contribution to the setting or significance of the mileposts.

Rolleston Conservation Area is of moderate significance, derived primarily from the historic and architectural special interest of the listed buildings contained within it, and the evidential value of the street plan which characterises the historic core of the settlement. Much of the Conservation Area's character and appearance derives from the presence of green open and wooded space within its boundary. Views which are considered to contribute to the distinctive character of the settlement are those identified along Church Road, toward the Church, and north and south into the surrounding countryside. The development site makes a negligible contribution to the setting and significance of the Conservation Area as it forms only a very small part of one identified key view. There are no historic connections identified between the development site and the Conservation Area or its listed buildings.

The earthwork remains of ridge and furrow in the north of the development site are considered significant at a local level as a historic landscape feature indicative of the past medieval or post-medieval agricultural use of the development site. Further areas of ridge and furrow remains in the west and south-east of the site have no surface expression are considered of negligible heritage significance.

There is a paucity of archaeological remains pre-dating the medieval period within the study area and there is limited potential for archaeological remains from the prehistoric, Roman or early medieval periods to be identified within the development site. From the medieval period onwards, the site is anticipated to have remained in agricultural use rather than utilised for settlement or industry. This assessment of potential has been borne out by the results of the geophysical survey which has not identified any significant anomalies that may be indicative of prehistoric Roman or early medieval activity, or of settlement or industrial activity from the medieval period onwards. The potential to identify archaeological remains other than those associated with medieval and post-medieval agriculture is considered very low.

Potential Environmental Effects of the Scheme

Construction Effects

The development of the site for residential use will result in the removal of ridge and furrow remains and any previously unrecorded archaeological remains. The extent of groundworks associated with residential development would normally result in impacts to buried remains across the whole of the area to be developed. This would equate to a substantial magnitude of impact, but only assets of local heritage significance. These effects would not be considered significant in EIA terms.

Operational Effects

The development site makes no contribution to the setting or significance of the listed mileposts. The residential development will therefore result in no change to the setting of the two listed mileposts and this is considered to result in a neutral, not significant effect.

The development site makes a negligible contribution to the setting and significance of the Rolleston-on-Dove Conservation Area and the listed buildings, including the Grade I listed St Mary's Church, within it. Although a small part of the development site is visible in one key view from the Conservation Area, the potential limited visibility of residential development within the site is not considered to affect the setting or significance of the assets. It is considered to result in a neutral, not significant effect.

There are not considered to be any ongoing operational effects on archaeological remains as a result of the development, as any effects on these assets would occur at the construction stage.

Potential Additional Mitigation, Compensation and Enhancement Measures

There are no effects on the setting of designated heritage assets and therefore no mitigation measures are proposed with respect to these assets.

The effects on the identified remains of ridge and furrow within the development site are considered not significant in EIA terms. There is considered low potential for significant previously unrecorded archaeological remains to be present within the site. However, some harm will occur to archaeological assets from the construction activities. It is therefore proposed that a programme of archaeological recording is implemented during the construction phase of the scheme to record the identified remains of ridge and furrow and any previously unrecorded archaeological remains that are identified during construction. This programme of archaeological monitoring and recording can be secured through a condition on the planning permission. Mitigation works should be undertaken in accordance with the Standards and Guidance from the Chartered Institute for Archaeologists.

Conclusion

It is proposed to scope out consideration of archaeology and cultural heritage from the Environmental Statement. The existing assessments completed for the development and summarised in this chapter have demonstrated that significant effects on archaeological remains and cultural heritage are unlikely to arise from the development. The only effects are on assets of local or negligible heritage interest and can be mitigated through the implementation of a programme of archaeological investigation.

We seek agreement from East Staffordshire Borough Council to scope out the assessment of effects on archaeology and cultural heritage from the EIA in the scoping opinion. The archaeological appraisal, built heritage statement and geophysical survey reports completed for the development site will be submitted with the planning application.

Land to the north of Beamhill Road, Burton upon Trent, Staffordshire

Archaeological Appraisal

A101663

Gladman Developments Ltd

March 2017

Prepared on behalf of WYG Environment Planning Transport Limited.

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Contents

Appendices

1.0 Introduction

This Archaeological Appraisal has been prepared by Kirsten Holland, Associate Archaeologist, WYG on behalf of Gladman Developments to inform a planning application for proposed residential development to the north of Beamhill Road, Burton upon Trent, Staffordshire. A separate Heritage Statement considering built heritage has been completed by Simon Roper-Pressdee, Associate Director, WYG.

WYG is a Registered Organisation with the Chartered Institute for Archaeologists.

1.1 Aims and Objectives

This study examines the archaeological potential of the proposed development site and the surrounding area. The aim of the study is to:

- Identify recorded archaeological sites within the site boundary and assess its heritage significance/value;
- Identify the potential for previously unrecorded sites to be present within the site; and
- Identify potential impacts on archaeological remains from development.

This appraisal considers the archaeological potential within the site itself, the surrounding area and wider local and regional context. The appraisal does not attempt to plot and review every archaeological find and monument; rather it aims to examine the distribution of evidence and to use this to predict the archaeological potential of the study area and the likely impact of the development proposals upon those remains.

The appraisal is not a comprehensive desk-based assessment as defined by the CIfA Standards and Guidance for Historic Environment Desk-Based Assessment, as it does not include detailed consideration of all information resources.

This report only considers the potential effects on archaeological remains; a separate Heritage Statement has been completed by Simon Roper-Pressdee, Associate Director, WYG, which considers all built heritage matters, including impacts upon the setting and significance of affected heritage assets.

2.0 Site and Development Description

The development site is located to the north-west of Burton upon Trent, Staffordshire. The site is centred on grid reference SK 2300 2634 (423000, 326340), extends to approximately 40.2 hectares and from 65m above Ordnance Datum at the north of the site rising to 86m aOD at the summit of Beamhill in the south of the site. The development site is in agricultural use, primarily pasture and grazing for horses. The development site is bound by Beamhill Road and residential development to the south, Tutbury Road and residential development to the east, Longhedge Lane and agricultural land to the north and west. A site location plan can be seen in Appendix A and site photographs can be seen in Appendix B.

The bedrock geology of the development site is Mercia Mudstone. There are no superficial deposits recorded over most of the development site. The exception to this is an area around Beamhill towards the south of the site where glaciofluvial deposits of sands and gravels are recorded (British Geological Survey, 2017).

The proposed development will be for residential use. There are no masterplans or design plans available at this stage, therefore the appraisal has assumed the whole of the site will be developed with housing, access roads and associated infrastructure.

3.0 Methodology

3.1 Assessment Methodology

Impact assessment has been carried out through the consideration of baseline conditions in relation to the elements of the scheme that could cause cultural heritage impacts. Baseline conditions are defined as the existing environmental conditions and in applicable cases, the conditions that would develop in the future without the scheme. In accordance with best practice this report assumes that the scheme will be constructed, although the use of the word 'will' in the text should not be taken to mean that implementation of the scheme is certain.

No standard method of evaluation and assessment is provided for the assessment of impact significance upon cultural heritage, therefore a set of evaluation and assessment criteria have been developed using a combination of the Secretary of State's criteria for Scheduling Monuments (Scheduled Monument Statement, Annex 1) and the Design Manual for Roads and Bridges, Volume 11, Part 3, Section 2, HA 208/07. Professional judgment is used in

conjunction with these criteria to undertake the impact assessment. The full assessment methodology can be seen in Appendix C.

3.2 Sources Consulted

A study area of a 1km buffer has been examined to assess the nature of the surrounding heritage sites, and to place these sites within their archaeological and historic context. The sources consulted were:

- Staffordshire Historic Environment Record (HER);
- Historic England and Local Planning Authority for designated sites;
- Historic Landscape Characterisation data and data from the Extensive Urban Survey and East Staffordshire Historic Environment Assessment;
- Early Ordnance Survey mapping; and
- Appropriate secondary and documentary sources.

In addition to the above, a site walkover survey was undertaken on 17th March 2017 by Kirsten Holland to assess the site for previously unrecorded archaeological remains and the suitability for future evaluation and mitigation measures.

4.0 Legislation and Policy Context

4.1 Ancient Monuments and Archaeological Areas Act, 1979

Scheduled Monuments are designated by the Secretary of State for Culture, Media and Sport on the advice of Historic England as selective examples of nationally important archaeological remains. Under the terms of Part 1 Section 2 of the Ancient Monuments and Archaeological Areas Act 1979 it is an offence to damage, disturb or alter a Scheduled Monument either above or below ground without first obtaining permission from the Secretary of State. This Act does not allow for the protection of the setting of Scheduled Monuments.

4.2 National Planning Policy Framework, 2012

The National Planning Policy Framework (NPPF) sets out the Government's national planning policies including those on the conservation of the historic environment. The NPPF covers all aspects of the historic environment and heritage assets including designated assets (World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Conservation Areas, Registered Parks and Gardens and Registered Battlefields) and non-designated assets. The NPPF draws attention to the benefits that conserving the historic environment can bring to the wider objectives of the NPPF in relation to sustainability, economic benefits and place-making (para 126).

The NPPF states that the significance of heritage assets (including their settings) should be identified, described and the impact of the proposal on the significance of the asset should be assessed. The planning application should include sufficient information to enable the impact of proposals on significance to be assessed and thus where desk-based research is insufficient to assess the interest, field evaluation may also be required. The NPPF identifies that the requirements for assessment and mitigation of impacts on heritage assets should be proportional to their significance and the potential impact (para 128).

The NPPF sets out the approach local authorities should adopt in assessing development proposals within the context of applications for development of both designated and non-designated assets. Great weight should be given to the conservation of designated heritage assets and harm or loss to significance through alteration or destruction should require clear and convincing justification. Substantial harm to or loss of a grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional (para 132). Additional guidance is given on the consideration of elements within World Heritage Sites and Conservation Areas (para 138).

Where there is substantial harm to or total loss of significance of a designated heritage asset a number of criteria must be met alongside achieving substantial public benefits (para 133). Where there is less than substantial harm the harm should be weighed against the public benefits of the development (para 134). Balanced judgements should be made when weighing applications that affect non-designated heritage assets (para 134). The NPPF also makes provision to allow enabling development (para 140) and allowing development which enhances World Heritage Sites and Conservation Areas (para 127).

Where loss of significance as a result of development is considered justified, the NPPF includes provision to allow for the recording and advancing understanding of the asset before it is lost in a manner proportionate to the importance and impact. The results of these investigations and the archive should be made publicly accessible. The ability to record evidence should not however be a factor in deciding whether loss should be permitted (para 141).

The NPPF is supported by Planning Practice Guidance on Conserving and Enhancing the Historic Environment (2014). This provides further information on how to interpret and apply the NPPF in practice and the relationship to the legislative framework for planning and the historic environment.

4.3 Local Policy and Guidance

4.3.1 East Staffordshire Local Plan 2012-2013, Adopted October 2015

The Local Plan for East Staffordshire was adopted in October 2015. The historic environment is the subject of one of the strategic objectives, one of the strategic policies and two detailed policies:

- Strategic Objective 9: Heritage (Historic Environment – Sustainable management and Use);
- Strategic Policy 25: Historic Environment;
- Detailed Policy 5 - Protecting the Historic Environment: All Heritage Assets, Listed Buildings, and Conservation Areas and Archaeology; and
- Detailed Policy 6 Protecting the Historic Environment: Other Heritage Assets.

The full text of the policies can be seen in Appendix D. Outwood has an adopted Neighbourhood Plan, however it does not contain any policies directly relevant to archaeology.

5.0 Baseline Data

5.1 Designated Sites

There are no World Heritage Sites, Scheduled Monuments, Listed Buildings, Conservation Areas or Registered Parks and Gardens or Battlefields within the development site.

The Rolleston on Dove Conservation Area is located to the north-east of the study area. The Conservation Area contains 27 listed buildings, including the Grade I Church of St Mary. Two Grade II listed milestones are located within the study area. One milestone is located 50m to the south-east of the development site, the other milestone is 720m to the north-east of the development site.

The Conservation Area and Listed Buildings are considered within the separate Built Heritage Assessment prepared by WYG and are not considered further in this report.

5.2 Non-Designated Sites

The Historic Environment Record holds details for 55 sites within the study area, excluding designated sites. The Historic Environment Record also holds details for 5 archaeological events within the study area.

Details of the sites can be seen in Appendix E and their locations can be seen on Figures 2 and 4.

5.2.1 Prehistoric (up to 43AD)

Lower Palaeolithic evidence in the region is heavily biased to findspots of artefacts in the gravel quarries of the Trent Valley to the north-east of the study area. During the Upper Palaeolithic, the study area is anticipated to have been in the periglacial zone and subject to discontinuous permafrost. There is very little evidence for activity from this period with isolated lithic findspots being recorded in the wider area (Knight and Howard, 2004). The Mesolithic is characterised by seasonal transhumance processes, and sites are principally recognised from concentrations of lithics, as the temporary settlements used by these communities left little trace in the landscape. The most significant site in the immediate region is probably the multi-period settlement at Swarkestone Lowes to the north-east of the study area. The flint assemblages include Wolds-type flint from Lincolnshire and/or Yorkshire and local flint, indicating movement of hunter-gather groups over relatively large areas

(Knight and Howard, 2004).

The Neolithic was a period of increasingly permanent human occupation, although seasonal mobility and the exploitation of wild resources continued throughout the period. Traditionally, mortuary monuments, along with the introduction of pottery and domesticates, and vegetative clearance and arable farming practices mark the beginning of the Neolithic period. Important sites in the wider region include the cursus monument at Potlocks Farm near Willington, hengiform enclosure at Twyford and settlement remains to the south-west of Willington (WYG, 2012).

A change in material culture, domestic and ceremonial architecture, including the introduction of bronze metalworking, characterises the Bronze Age. Mortuary ceremonies also change emphasis in this period, with a shift from the large communal complexes and inhumations of the Neolithic, to individual cremations and round barrow cemeteries. There is extensive evidence of barrows and other funerary remains to the north and north-east of the study area in the Dove and Trent Valleys. In the area of Stretton and Clay Mills to the north of Burton upon Trent and east of the study area, there were records of several sites recorded from cropmark evidence of ring ditches and field boundaries. These were partially excavated and evidence of Bronze Age and Iron Age occupation was recorded (SCC,2012). By the Iron Age period, the regional landscape saw increasing evidence for field systems and enclosures and the period is also marked by evidence for the appearance of iron technology in the archaeological record. There are numerous sites with evidence for settlement and field divisions indicating agricultural and pastoral practices from the Trent Valley to the north-east of the study area including sites at Willington, Swarkestone and Eggington (Knight and Howard, 2004 and WYG, 2012).

5.2.2 Roman/Romano-British (43AD to c450AD)

There is a bias in the study of the Roman and Romano-British periods to the areas with a greater density of finds such as the Trent valley. The majority of the excavated Roman enclosed farms have their origins in the Iron Age. This landscape pattern corresponds with the theory that across much of the country the Roman administration was superimposed upon the existing Iron Age society with relatively few visible changes in the first instance. The enclosures, structures and field systems are the same, or very similar, to those preceding the invasion (Wardle, 2002b, p.22). The Roman field systems at Willington to the north-west were associated with settlement foci which covered a reasonably large area and evidence of other Roman farmsteads have been recorded at Stapenhill and Clay Mills (SCC,

2012).

The Roman road of Ryknild Street passes to the east of the study area, along the line of the modern A38. This road connects Wall (near Lichfield) in the south, with Littlechester (Derby) in the north, passing through Burton upon Trent (Ordnance Survey, 1994). There are no recorded temporary or permanent camps along Ryknild Street within or the southern part of Derbyshire (Wardle, 2002, p. 4). Settlement along the road is most likely to have been focussed around the river valleys. The only recorded site of Roman date within the study area is the findspot of a bronze fibula (brooch) in the far southwest of the study area (MST4596). This is likely to represent an isolated loss.

5.2.3 Early Medieval (c410AD to 1066AD) and Medieval (1066AD to c1540AD)

The evidence for activity in the early medieval period is affected by a lack of recorded or documented sites of this date. There are few recorded field systems of Anglo-Saxon date, and where they have been identified (e.g. Catholme) they are generally very shallow. It is anticipated that most of the Romano-British boundary ditches would have endured into the early medieval period and possibly even later as medieval ridge and furrow remains respect these alignments in Willington (Knight and Howard, 2004, p. 168). A number of cemeteries have been identified in the area, notably at Stretton to the east of the study area (SCC, 2012). The political and religious core of the Mercian kingdom was centred on the middle Trent valley with key centres at Repton and Lichfield. The study area would therefore have lain within the sway and hinterland of these centres. The first minster church was likely to have been established at Burton in the 7th century, although it may not have survived the advance of the Danes in the 9th century. The access through the River Trent, which was navigable from the North Sea, was a weakness for the kingdom and in AD874 an invading Danish army overwintered at Repton. Although the wider area passed into the Danelaw in the 9th century, the Scandinavian influences around Burton appear to have been relatively limited and it is unclear whether it fell under Danelaw (SCC, 2012). There is an Anglo-Scandinavian cross at St Mary's Church, Rolleston on Dove.

The evidence in the Domesday Book (1086AD) provides a snapshot of the country soon after the Norman invasion in 1066. There were industries in the area such as a mill at Rolleston. The lack of woodland derived names in the Domesday survey for this area indicates that much of the extensive woodland had probably been cleared by this date. There is evidence that many of the large deer parks were established by the 13th century, with smaller parks becoming established in the 14th and 15th centuries (Lewis, 2006, p.209). Within the study area the deer park at Rolleston (MST711) is anticipated to have been established as part of

this later phase.

The form of settlement and landscape was largely established in this period, with many modern villages, and the location of many of the farms having their origins in medieval settlement. During the later medieval period there were areas where open strip arable farming dominated the economy. The arable farming is most readily identified in remains of reverse-S ridge and furrow. Field boundaries originating from enclosure of these fields often display sinuous lines and ridge and furrow remains can be preserved within them. Within the development site an area of extant ridge and furrow remains is present in the north of the site (MST17266) and an area of levelled ridge and furrow remains in the west of the site (MST4795). A number of the field boundaries within the development site, as depicted on historic maps, have sinuous field boundaries indicating that ridge and furrow may once have been more extensive across the development site. There are extensive areas of ridge and furrow cultivation across the study area and numerous cropmarks of potential medieval field boundaries. These are located primarily to the south, west and north of the development site where the landscape has remained agricultural and therefore conducive to the identification of cropmarks.

Burton upon Trent was established as a medieval market borough in the medieval period with characteristic features such as the planned market place and laying out of burgage plots along the principal streets, the layout of which persisted into the post-medieval period. The Abbey buildings which survive in the town date to the 14th century (SCC, 2012).

5.2.4 Post-Medieval Period (c.1540AD to 1750AD), Industrial (1750AD to 1900AD) and Modern (1900AD to present)

The post-medieval period is an age of transition between the medieval world and the Agricultural and Industrial revolutions of the 18th and early 19th century. The post-medieval period continued with many of the same economic, agricultural and landscape processes largely unaltered for the early part of the period. There are several areas of ridge and furrow remains and field boundaries that are considered more likely to date to the post-medieval period rather than the medieval period. The town of Burton upon Trent continued to be a focal point for the economy of the local area with industries including woollen textiles, fulling mills, iron working, hat making and brewing. The more recent changes within the region have had a relatively limited impact on the majority of the study area. The biggest built environment changes were the wider residential development of the suburbs of Burton upon Trent and establishment of other transport networks such as the turnpike road to the east of

the development site (MST22327).

6.0 Historic Mapping

A selection of historic maps is included in Appendix F. The earliest mapping examined for the development site was the 1884 Ordnance Survey plan (not reproduced). This depicts the development site in agricultural use and sub-divided into fields which correlate with the modern field alignment. A number of the field boundaries within the development site have since been removed; additionally, further sub-division has taken place within the area of horse paddocks. The Spinney Farm within the development site had not been constructed, nor had the residential housing along the A511 and Beamhill Road.

There were no significant changes on the 1905 and 1925 Ordnance Survey plans. By the time of the 1948 Ordnance Survey plan (surveyed 1938) several proposed building plots of residential housing were depicted along Beamhill Road and the A511, with a limited number of properties at the western end of Beamhill Road constructed. By the mid-1950s more of these properties had been constructed, with the full extent of residential housing constructed by the mid -970s. The Spinney Farm within the development site was also constructed by the mid-1970s. The only other significant changes to the development site have been the construction of several modern agricultural sheds within the central part of the site and stables within the southern part of the site.

7.0 Site Walkover Survey

A site walkover survey was undertaken on 17th March 2017. The weather was overcast with occasional rain showers. A selection of site photographs and plate showing ridge and furrow is included in Appendix B.

The development site is under pasture with areas set aside for horse grazing and paddocks in the south of the site. The majority of field boundaries across the site are formed of hedgerows and trees. Many of the field margins also include areas of denser vegetation growth. The southern area of the site immediately to the rear of properties on Beamhill Road is largely given over to paddocks and horse grazing. This has resulted in the creation of numerous additional sub-divisions of fields with post and rail fencing, or electric fences.

Occasional additional stock fences have been erected elsewhere within the site.

Extant ridge and furrow earthworks were observed in the north-east of the development site. These earthworks correlate with the location of HER site MST17266. The ridge and furrow is aligned north-west to south-east within the main field area, with a smaller north-east to south-west alignment in the dogleg of the field leading to the A511. The ridge and furrow is broad with a slight curve to the ends of the ridges, but has been eroded and is not well preserved. There is no clearly discernible wider field pattern or historic landscape associated with them.

There is no visible evidence for the ridge and furrow remains associated with HER site MST5553 located in the west of the development site. This pasture field is flat and any ridge and furrow earthworks have been ploughed out or levelled in the past. No other features of historic or archaeological interest were observed during the walkover survey.

8.0 Archaeological Potential and Impact Assessment

The only identified archaeological assets within the development site are the earthwork remains of ridge and furrow. The earthwork remains are located in the north-east of the development site. The earthwork remains of ridge and furrow are considered significant at a local level as a historic landscape feature indicative of the past medieval agricultural use of the development site. Their overall heritage value in accordance with the methodology in Appendix C is considered low. A further area of ridge and furrow remains are recorded in the west of the site, although there is no surface expression of these. Any buried archaeological evidence of the ridge and furrow is considered to be of negligible heritage value.

There is potential for previously unrecorded archaeological remains to be present within the development site. There is a paucity of archaeological remains pre-dating the medieval period within the study area and there is considered to be limited potential for archaeological remains from the prehistoric, Roman or early medieval periods to be identified within the development site. From the medieval period onwards the site is anticipated to have remained in agricultural use rather than utilised for settlement or industry, as the ridge and furrow indicates. Further archaeological remains associated with the medieval and post-medieval agricultural uses of the development site may be identified. If previously unrecorded archaeological remains were to be identified within the development site, they would have potential to contribute to local or regional research objectives dependent on their

complexity and survival. Their heritage value would be considered to be low or medium.

The development of the site for residential use could result in the removal of any previously unrecorded archaeological remains. There is no masterplan for the development, however, the extent of groundworks associated with residential development would normally result in impacts to buried remains across the whole of the area to be developed. This would equate to a substantial magnitude of impact. The significance of effect would therefore be up to intermediate adverse or intermediate minor adverse for remains of medium or low value respectively.

The impact of development on the ridge and furrow, or previously unrecorded assets, can be mitigated. This mitigation could take the form of geophysical survey to determine the subsurface expression of former earthworks and identify previously unrecorded remains and/or archaeological monitoring during topsoil stripping and construction to identify and excavate archaeological remains in a manner proportionate to their significance. The requirement for any further archaeological assessment or mitigation will be identified during the determination of the planning application.

The development site does not contain any designated heritage assets and is not anticipated to contain any previously unrecorded archaeological remains of national significance. The recorded ridge and furrow remains are of low heritage significance and any previously unrecorded archaeological remains are likely to be of medium or low significance depending on their complexity and survival. In line with paragraph 135 of the National Planning Policy Framework the Local Planning Authority is required to make a balanced judgement with regard to the scale of harm to the heritage asset and its significance.

9.0 References

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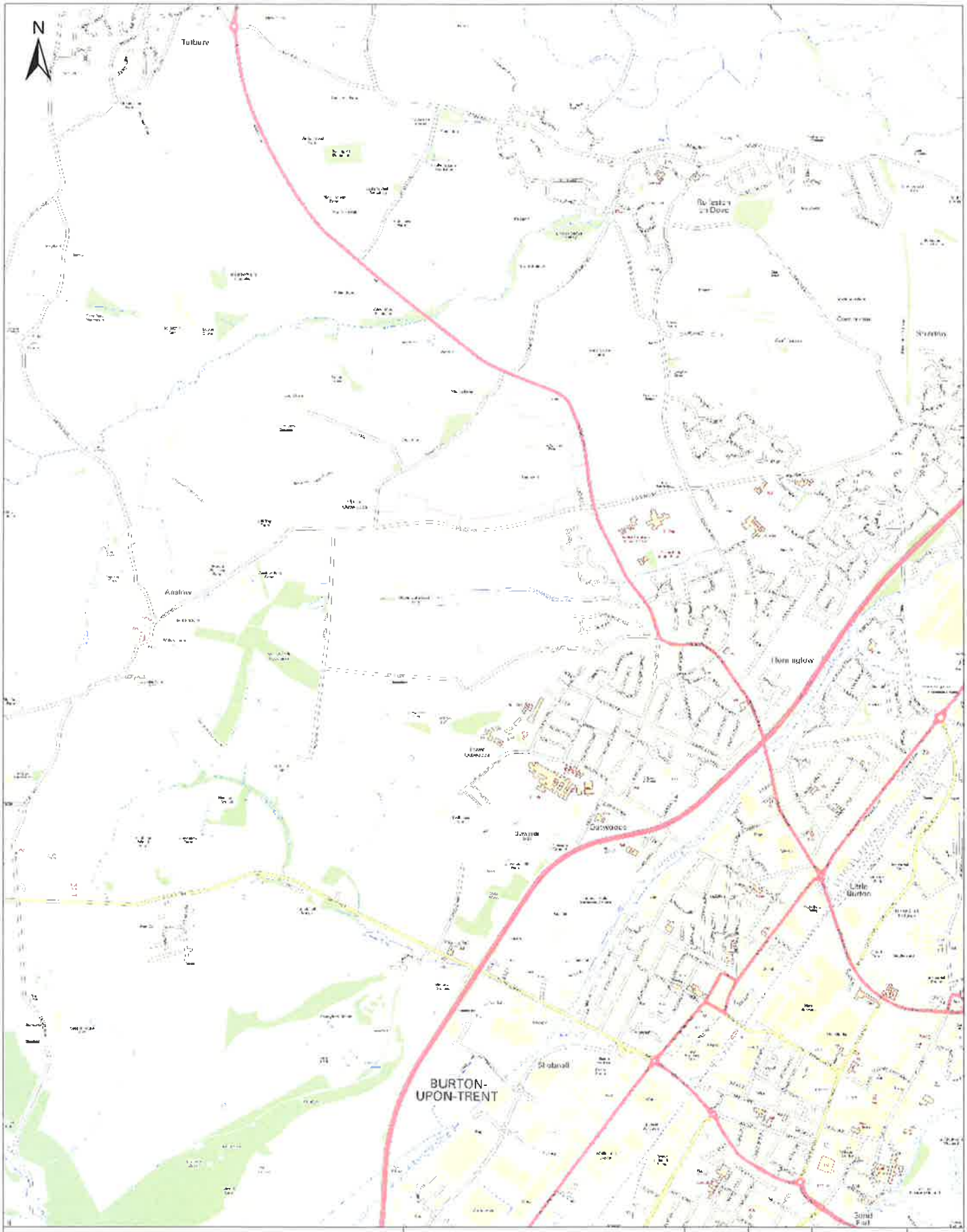
Historic Mapping

Ordnance Survey 6" to 1 mile/1:10,000 1884, 1905, 1924, 1948 (surveyed 1938), 1955, 1973, 1993.

Appendix A – Site Location Plan



0 150 300 600 900 1,200 1,500

Metres

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Created:	Checked:	Date:	Version:

Sheet Size: **A4** Scale of Original: **1:25,000**

Client: Gladman Developments Ltd

Project: Land North of Beamhill Road, Burton on Trent

Title: Site Location Plan

Office:	Project No:	Figure No:
4154	A101663	1

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Appendix B – Site Photographs

Photograph 1: View north across area of ridge and furrow earthwork in the north of the site (MST17266).

Photograph 2: View south across ridge and furrow remains opposite Piltons Farm in the north of the development site.

Photograph 3: View south-west across the area of levelled ridge and furrow remains associated with HER site MST4795.

Photograph 4: View west across the northern part of the development site.

Photograph 5: General view south across the central part of the development site.

Photograph 6: General view south paddocks in the south of the development site.

Photograph 7: General view west across the south-east of the development site.

Photograph 8: General view west across the north-east of the development site.

Appendix C – Assessment Methodology

Cultural Heritage Impact Assessment Methodology

No standard method of evaluation and assessment is provided for the assessment of significance of effects upon cultural heritage, therefore a set of evaluation and assessment criteria have been developed using a combination of the Secretary of State's criteria for Scheduling Monuments (Scheduled Monument Statement, Annex 1) and Design Manual for Roads and Bridges, Volume 11, Part 3, Section 2, HA 208/07. Professional judgement is used in conjunction with these criteria to undertake the impact assessment.

Value

The table below provides guidance on the assessment of cultural heritage value on all archaeological sites and monuments, historic buildings, historic landscapes and other types of historical site such as battlefields, parks and gardens, not just those that are statutorily designated.

Value	Examples
Very High	World Heritage Sites, Scheduled Monuments of exceptional quality, or assets of acknowledged international importance or can contribute to international research objectives Grade I Listed Buildings and built heritage of exceptional quality Grade I Registered Parks and Gardens and historic landscapes and townscapes of international sensitivity, or extremely well preserved historic landscapes and townscapes with exceptional coherence, integrity, time-depth, or other critical factor(s)
High	Scheduled Monuments, or assets of national quality and importance or that can contribute to national research objectives Grade II* and Grade II Listed Buildings, Conservation Areas with very strong character and integrity, other built heritage that can be shown to have exceptional qualities in their fabric or historical association. Grade II* and II Registered Parks and Gardens, Registered Battlefields and historic landscapes and townscapes of outstanding interest, quality and importance, or well preserved and exhibiting considerable coherence, integrity time-depth or other critical factor(s)
Medium	Designated or undesignated assets of regional quality and importance that contribute to regional research objectives Locally Listed Buildings, other Conservation Areas, historic buildings that can be shown to have good qualities in their fabric or historical association Designated or undesignated special historic landscapes and townscapes with reasonable coherence, integrity, time-depth or other critical factor(s) Assets that form an important resource within the community, for educational or recreational purposes.
Low	Undesignated assets of local importance Assets compromised by poor preservation and/or poor survival of contextual associations but with potential to contribute to local research objectives. Historic (unlisted) buildings of modest quality in their fabric or historical association

Value	Examples
	Historic landscapes and townscapes with limited sensitivity or whose sensitivity is limited by poor preservation, historic integrity and/or poor survival of contextual associations. Assets that form a resource within the community with occasional utilisation for educational or recreational purposes.
Negligible	Assets with very little or no surviving cultural heritage interest. Buildings of no architectural or historical note. Landscapes and townscapes that are badly fragmented and the contextual associations are severely compromised or have little or no historical interest.

Magnitude

The magnitude of the potential impact is assessed for each site or feature independently of its archaeological or historical value. Magnitude is determined by considering the predicted deviation from baseline conditions. The magnitude of impact categories are adapted from the Transport Assessment Guidance (TAG Unit 3.3.9) and Design Manual for Roads and Bridges, Volume 11, Part 3, Section 2, HA 208/07.

Magnitude of Impact	Typical Criteria Descriptors
Substantial	Impacts will damage or destroy cultural heritage assets; result in the loss of the asset and/or quality and integrity; cause severe damage to key characteristic features or elements; almost complete loss of setting and/or context of the asset. The assets integrity or setting is almost wholly destroyed or is severely compromised, such that the resource can no longer be appreciated or understood. (Negative) The proposals would remove or successfully mitigate existing damaging and discordant impacts on assets; allow for the restoration or enhancement of characteristic features; allow the substantial re-establishment of the integrity, understanding and setting for an area or group of features; halt rapid degradation and/or erosion of the heritage resource, safeguarding substantial elements of the heritage resource. (Positive)
Moderate	Substantial impact on the asset, but only partially affecting the integrity; partial loss of, or damage to, key characteristics, features or elements; substantially intrusive into the setting and/or would adversely impact upon the context of the asset; loss of the asset for community appreciation. The assets integrity or setting is damaged but not destroyed so understanding and appreciation is compromised. (Negative) Benefit to, or restoration of, key characteristics, features or elements; improvement of asset quality; degradation of the asset would be halted; the setting and/or context of the asset would be enhanced and understanding and appreciation is substantially improved; the asset would be bought into community use. (Positive)
Slight	Some measurable change in assets quality or vulnerability; minor loss of or alteration to, one (or maybe more) key characteristics, features or elements; change to the setting would not be overly intrusive or overly diminish the context; community use or understanding would be reduced. The assets integrity or setting is damaged but understanding and appreciation would only be diminished not compromised. (Negative)

Magnitude of Impact	Typical Criteria Descriptors
	Minor benefit to, or partial restoration of, one (maybe more) key characteristics, features or elements; some beneficial impact on asset or a stabilisation of negative impacts; slight improvements to the context or setting of the site; community use or understanding and appreciation would be enhanced. (Positive)
Negligible / No Change	Very minor loss or detrimental alteration to one or more characteristics, features or elements. Minor changes to the setting or context of the site. No discernible change in baseline conditions (Negative). Very minor benefit to or positive addition of one or more characteristics, features or elements. Minor changes to the setting or context of the site No discernible change in baseline conditions. (Positive).

Impacts may be of the following nature and will be identified as such where relevant:

- Negative or Positive.
- Direct or indirect.
- Temporary or permanent.
- Short, medium or long term.
- Reversible or irreversible.
- Cumulative.

Significance

By combining the value of the cultural heritage resource with the predicted magnitude of impact, the significance of the effect can be determined. This is undertaken following the table below. The significance of effects can be beneficial or adverse.

Significance of Effects	Magnitude of Impact			
Cultural Heritage Value	Substantial	Moderate	Slight	Negligible / No Change
Very High	Major	Major – Intermediate	Intermediate	Minor
High	Major – Intermediate	Intermediate	Intermediate – Minor	Neutral
Medium	Intermediate	Intermediate - Minor	Minor	Neutral
Low	Intermediate – Minor	Minor	Minor – Neutral	Neutral
Negligible	Minor-Neutral	Minor-Neutral	Neutral	Neutral

Significance should always be qualified as in certain cases an effect of minor significance could be considered to be of great importance by local residents and deserves further consideration. The significance of effect is considered both before and after additional mitigation measures proposed have been taken into account.

Appendix D – Planning Policies

East Staffordshire Local Plan 2012-2013, Adopted October 2015

SO9: Heritage (Historic Environment – Sustainable Management and Use)

To deliver high quality places that conserve and enhance the historic environment whilst promoting local distinctiveness, place making, significance and sustainable development to support heritage-led regeneration and the sustainable use of heritage assets, particularly in Burton upon Trent, the market town of Uttoxeter, rural villages and the wider countryside.

Strategic Policy 25 Historic Environment

Development proposals should protect, conserve and enhance heritage assets and their settings, taking account of their significance, as well as the distinctive character of the Borough's townscapes and landscapes. Such heritage assets may consist of undesignated and designated assets including conservation areas, listed buildings, scheduled monuments, archaeological sites, registered parks and gardens and historic landscapes which contribute to the Borough's historic environment and local distinctiveness.

This should include the use of high quality design as stipulated in the NPPF and the Borough Council's Design SPD. Development proposals that are likely to have negative impacts on the historic environment should demonstrate how harm can be effectively and justifiably mitigated.

Development proposals should be informed by the various information sources and evidence base that are available.

The towns of Burton-upon-Trent and Uttoxeter, including their historic retail centres should be a focus for heritage-led regeneration and the repair of key heritage assets will be supported. Such regeneration should be informed by relevant historic environment evidence base. This will be delivered through various initiatives such as through new development proposals or regeneration schemes with key partners such as English Heritage and the Heritage Lottery Fund.

Inner Burton is a focus for regeneration in order to improve poor quality building stock which consists of Victorian terraced housing. Initiatives should therefore consist of effective repair and refurbishment of Victorian housing stock as part of sustainable development with opportunities to introduce innovative energy efficiency technology, which reflects the local historic character.

Detailed Policy 5 - Protecting the Historic Environment: All Heritage Assets, Listed Buildings, and Conservation Areas and Archaeology

The significance of the Borough's historic environment and heritage assets (designated and undesignated) will be protected and enhanced where new development proposals will be expected to make a positive contribution to the fabric and integrity of existing buildings, conservation areas or other non-designated areas where there is distinctive character, strategic views or a sense of place.

All heritage assets

New development proposals within the historic environment such as within conservation areas or which fixes or adjoins a listed building must respect the context of the character and appearance of such heritage assets in terms of using sound design principles which are stipulated in the Design SPD. The design of new development must be informed by the context of its surroundings and take account of the local character through the Historic Environment Record and/or other relevant sources of information/evidence base.

There may be an opportunity to introduce innovative development which complements the existing historic environment through high quality contemporary architecture and energy efficient technology, where such technology would not cause harm to the character, setting or fabric of the heritage asset.

The reuse of heritage assets contributes to viable places and should be seen as a positive opportunity. The reuse of a heritage asset should continue in its original function where possible, but where this is not economically viable, a sensitive change of use should be considered which retains the significance of the heritage asset. Development Proposals should articulate how the heritage asset can accommodate the new use without causing significant harm to the context and fabric of the asset.

Listed Buildings

Alterations, extensions to listed buildings or development within the listed curtilage or that which affects the setting of a listed building will be considered if accompanied with a Statement of Significance which sets out how the proposal would potentially affect the significance of the asset. It is expected that alterations and extensions to listed buildings should generally preserve and enhance the integrity and setting of a listed building without harm.

If harm cannot be avoided, then this must be articulated in the Statement of Significance with clear justification as to why harm is not avoidable and how such harm can be mitigated. Development Proposals to reuse vacant listed buildings, such as those that are at risk or neglected, for reuse are supported, subject to appropriate methods of repair and that conversions do not have an undue impact on the existing fabric of the building.

The loss of listed buildings or significant fabric of a listed building, a significant building in a conservation area or heritage asset normally constitutes substantial harm and therefore should be considered 'wholly exceptional'. The loss of historic fabric through a development proposal must be clearly justified and the loss of an entire listed building must be accompanied by a structural survey and full economic viability study which should provide evidence as to why the listed building cannot be retained. Where any loss (either fully or partly) has been determined to be justified then suitable mitigation in the form of a record should be made to advance understanding of the heritage asset's significance.

Conservation Areas

Development will be permitted in conservation areas, including demolition of existing buildings or structures, where it can be demonstrated that it would protect and enhance the character and appearance, including the setting of the conservation area and is in accordance with the principles set out in the Design SPD as well as using guidance set out in relevant Conservation Area Appraisals. Should a Conservation Area Appraisal be absent, then a Character Statement should be submitted. It will be expected that any new development within or adjacent the conservation area will respect the existing character in terms of scale, form, materials and detailing. Key views into and out of the conservation (some of which may be identified within a Conservation Area Appraisal) will remain uninhibited.

Scheduled Monuments, Archaeology & Archaeology Sites

Scheduled Monuments are legally protected under the Ancient Monuments and Archaeological Areas Act (1979). No works are to be carried out on Scheduled Monuments without Scheduled Monument Consent. Applications for consent are submitted to English Heritage in their role as advisors to the Secretary of State for Culture, Media & Sport.

Scheduled Monuments and other nationally important archaeological sites and their settings should be preserved and development proposals should take account of undesignated archaeological sites and sites of potential archaeological interest. This should be informed by relevant information including the Historic Environment Record (HER), Historic Environment Assessment (HEA) and the Extensive Urban Survey (EUS) (if relevant). Archaeological sites should be subject to appropriate and relevant assessment and field assessment where appropriate especially to determine whether remains should remain in in situ or to be excavated. All subsequent archaeological reports should be deposited with to Staffordshire County Council so that the information is made publicly available.

Detailed Policy 6 Protecting the Historic Environment: Other Heritage Assets

Shopfronts and Advertisements

Traditional shopfronts which form part of a listed building, on a building within conservation areas or on a building that may be undesignated but is considered as a heritage asset should be retained and repaired. If a replacement shopfront is considered necessary, it should be designed appropriately to relate to its host building and using the correct proportions. New shopfronts should utilise the existing facia and use appropriate materials, finishes and illumination. For shopfronts on listed buildings and on buildings within conservation areas, traditional materials and finishes will be expected.

Non-designated heritage assets

Should planning permission be granted which includes the loss of an undesignated heritage asset an appropriate level of recording should take place prior to, and/or during, the commencement of works.

Setting

Planning permission will be permitted for development proposals that can demonstrate that the integrity and setting of a heritage asset will be protected and enhanced, through the use of high quality design, materials with appropriate scale and massing. This could be in the form of new building or new public realm.

The roofscape and skyline of the towns of Burton upon Trent and Uttoxeter reinforce the character of not only the respective towns but the approaches to them. These should be protected with the sensitive location of new development and appropriate massing in order to retain an appropriate skyline.

New development in villages and rural areas should carefully consider scale, massing and layout (including orientation). This includes new the change of use and new development for historic farmsteads, where the historic layout and form should be preserved and legible.

Historic Landscape and townscape character

Where Statements of Significance and Environmental Impact Assessments are required the applicant should also assess the impact of new development upon the wider historic landscape character, potential unseen archaeology and local townscape and seek to protect and enhance it where appropriate. The assessment of historic character should also be used to inform the design of any new development and seek opportunities to retain any significant or defining assets of the historic landscape/townscape as part of open space and Green Infrastructure provision where appropriate.

Registered Parks and Gardens and Other Significant Landscapes

Development proposals should consider the setting of a Registered Park and Garden and other significant landscapes in terms of potential overall impact of the wider landscape.

Canals

Development Proposals should take account of the historic significance of canals and its setting. New development alongside the Trent and Mersey Canal, including any brownfield sites should interact and interrelate with each other and utilise appropriate high quality design. Historic fabric and heritage assets such as structures that are related to the canal should be conserved.

Appendix E – Recorded Heritage Sites

Recorded Heritage Sites (Staffordshire Historic Environment Record)

Identifier	Grid Reference	Period	Name
MST709	SK 21 25	Medieval	Apparent site of a pre-reformation chapel at Anslow which fell into disuse after the dissolution.
MST711	SK 2132 2705	Medieval	Rolleston Deer Park. A medieval deer park, the pale of which can be traced s a wide earthwork bank in places.
MST2142	SK 215 251	Medieval	Anslow Deer Park associated with Tutbury Castle. Part of the eastern boundary of the park has been identified following existing parish and field boundaries.
MST2220	SK 2204 2686	Medieval / Post-Medieval	The earthwork remains of a mill pond and pond bay of uncertain date. The mill which they served is no longer extant.
MST4596	SK 215 254	Roman	Findspot of a bronze fibula of possible second century date, found in Anslow parish.
MST4752	SK 2179 2592	Post-Medieval	Site of Anslow Brickworks, operating in the late 19th century with associated clay pit and building platform.
MST4753	SK 2348 2565	Medieval / Post-Medieval	The earthwork remains of former field boundaries identified on aerial photography and though to be of mid 18th century date. The boundaries enclose an area of earlier ridge and furrow which has now been built over.
MST4755	SK 23271 27120	Medieval / Post-Medieval	The site of a brick kiln which appears to have gone out of use by the late 19th century. The site is now built over.
MST4761	SK 2283 2519	Unknown	An enclosure of unknown date, identified as a cropmark on aerial photography in the area to the south-east of Upper Outwoods Farm.
MST4780	SK 2317 2699	Medieval	The earthwork remains of a former field boundaries of possible medieval date, identified on aerial photography to the north of Tutbury Road.
MST4786	SK 2226 2708	Post-Medieval	The earthwork remains of a probable post-medieval field boundaries, identified on aerial photography to the north of Alder Moor Plantation.
MST4787	SK 2242 2686	Unknown	A possible enclosure identified as a cropmark feature on aerial photography to the south of Alder Moor Plantation.
MST4788	SK 2257 2683	Medieval / Post-Medieval	A cropmark enclosure identified on aerial photography to the south of Alder Moor Plantation. Interpreted as the probable remains of a post-medieval field.
MST4789	SK 2279 2674	Medieval / Post-Medieval	An earthwork bank identified from aerial photography to the west of Anslow Lane, which probably represents the remains of a post-medieval field boundary.

Identifier	Grid Reference	Period	Name
MST4790	SK 2272 2680	Unknown	A linear feature identified as a cropmark on aerial photography, to the west of Anslow Lane. Interpreted as a possible former field boundary of uncertain date.
MST4791	SK 2281 2691	Unknown	A linear feature identified as a cropmark on aerial photography to the west of Anslow Lane and interpreted as possible evidence of a former field system or field boundary.
MST4793	SK 2173 2620	Medieval / Post-Medieval	Parallel linear cropmark features identified on aerial photography to the north of Newgatefield Lane. Interpreted as the remains of probable post-medieval field boundaries.
MST4794	SK 2198 2619	Medieval / Post-Medieval	A linear feature identified as a cropmark on aerial photography to the north of Newgatefield Lane and interpreted as the remains of a post-medieval field boundary.
MST4795	SK 2222 2611	Medieval / Post-Medieval	A series of cropmarks identified as the possible remains of post-medieval field boundaries, mapped from aerial photography in the area to the north of Upper Outwoods.
MST4796	SK 2203 2590	Medieval / Post-Medieval	A linear feature identified as a cropmark on aerial photography to the east of Upper Hill Top Farm. The feature has been interpreted as a probable boundary ditch of probable post-medieval date.
MST4797	SK 2246 2642	Unknown	A linear feature identified as a cropmark on aerial photography to the north of Lount Lane, Anslow. Possibly the remains of a former boundary of unknown date.
MST4802	SK 2157 2657	Medieval / Post-Medieval	Former field boundaries of post-medieval date, identified as cropmarks on aerial photography to the west of Lount Farm.
MST5539	SK 2216 2777	Medieval	Ridge and furrow earthworks identified on aerial photography in the area to the west of Fiddler's Lane.
MST5552	SK 2160 2579	Medieval	The earthwork remains of medieval ridge and furrow earthworks, identified on aerial photography from the 1960s in the area to the west of Hill Top Farm.
MST5553	SK 2226 2604	Medieval	The earthwork remains of medieval or later ridge and furrow earthworks, identified on aerial photography from the 1960s.
MST5554	SK 2154 2511	Medieval	The earthwork remains of medieval ridge and furrow, identified on aerial photography from 1963 in the area to the east of Anslow.
MST5555	SK 2269 2743	Medieval	Ridge and furrow earthworks identified on aerial photography in the Rolleston area.
MST5556	SK 2437 2724	Medieval	The earthwork remains of medieval or later ridge and furrow, identified on aerial photography from 1963.
MST5559	SK 2129 2632	Medieval	The earthwork remains of medieval or later ridge and furrow earthworks, identified on aerial photography from the 1960s.

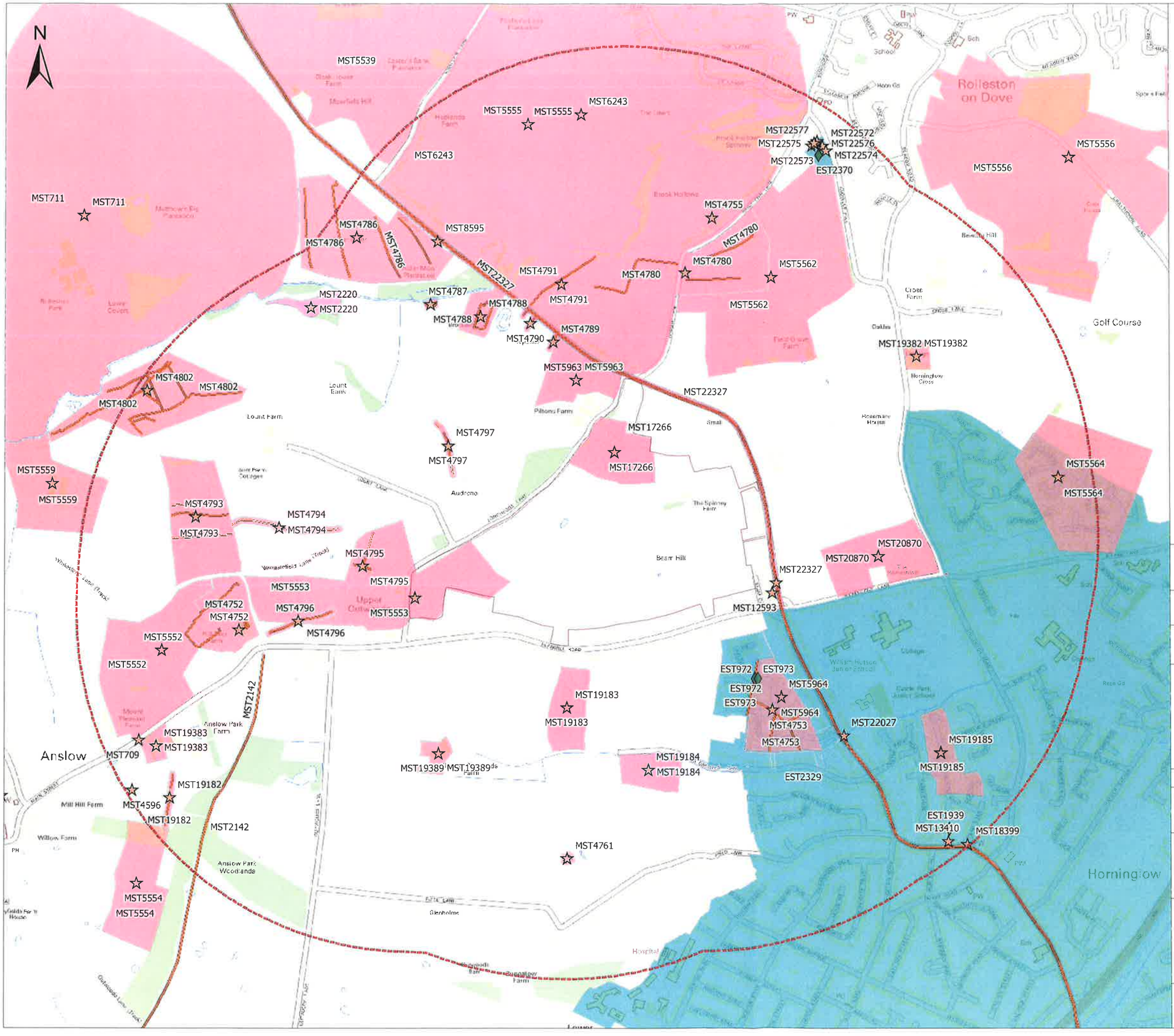
Identifier	Grid Reference	Period	Name
MST5562	SK 2343 2696	Medieval	The earthwork remains of medieval or later ridge and furrow earthworks, identified on aerial photography from the 1960s to the south-west of Rolleston on Dove.
MST5564	SK 2438 2632	Medieval	The earthwork remains of medieval ridge and furrow at Stretton, identified on aerial photography from the 1960s. The area has now been largely built over.
MST5963	SK 22867 26658	Medieval	An area of medieval ridge and furrow identified as earthworks on aerial photography from the 1960s in the vicinity of Piltons Farm.
MST5564	SK 2348 2565	Medieval	An area of medieval ridge and furrow identified on aerial photography. Trial trenching prior to development revealed some evidence relating to the formation of the ridge and furrow. The area has now been built over and no earthwork remains survive.
MST6243	SK 2291 2733	Post-Medieval	A landscape park around Rolleston Hall, which was probably in existence by the first half of the 19th century.
MST8595	SK 2244 2704	Post-Medieval	A listed early 19th century cast-iron milepost. **Listed Building Grade II.**
MST12593	SK 2345 2599	Post-Medieval	A listed cast iron milepost of early 19th century date, which is situated at Beam Hill Cross Roads. The milepost gives distances to Burton and Tutbury as well as to London. **Listed Building Grade II.**
MST13410	SK 2397 2524	Post-Medieval	The Chestnuts, Horninglow Road North. A listed mid 18th century farmhouse of red brick construction with tiled and welsh slate roofs. **Listed Building Grade II.**
MST17266	SK 2297 2641	Medieval	The earthwork remains of medieval ridge and furrow, identified on aerial photography in the Beam Hill area of Outwoods.
MST18399	SK 2403 2524	Post-Medieval	A former National School built of red brick with Gothic windows and a bellcote. The school opened in 1846, but was converted to an institute in 1876.
MST19182	SK 2164 2536	Medieval / Post-Medieval	A north-south aligned linear feature interpreted as a probable former field boundary of post-medieval date, identified on aerial photography in an area to the east of Anslow.
MST19183	SK 2284 2564	Medieval	The earthwork remains of medieval ridge and furrow identified on aerial photography to the east of Upper Outwoods Farm.
MST19184	SK 2308 2545	Medieval	The earthwork remains of medieval ridge and furrow identified on aerial photography to the south of Kitling Greaves Lane.

Identifier	Grid Reference	Period	Name
MST19185	SK 2398 2551	Medieval	The earthwork remains of medieval ridge and furrow, identified on aerial photography on the outskirts of Horninglow. This area has now been built over and no trace of the ridge and furrow survives.
MST19382	SK 2388 2670	Post-Medieval	A small, isolated farmstead originally laid out around a regular U-plan courtyard. The farmstead appears to have been established in the late 19th century and is still extant, although now altered with the southern range (of the U-plan) having been removed and a new wing built to the west. The farm buildings have been converted to domestic use.
MST19383	SK 2160 2554	Post-Medieval	Anslow Park Farm. A farmstead laid out around a series of regular courtyards, which may have been extant by the late 18th century and which certainly existed by the mid 19th century. The farmstead is extant although has undergone some alteration with the farm buildings now converted to domestic use. The 19th century multi-yard plan form is, however, still legible.
MST19389	SK 2242 2550	Post-Medieval	Site of Outfarm and Later Farmstead. The site of an isolated outfarm comprising main regular plan yard with main L-plan range. The outfarm was extant by the mid 19th century, but by the early to mid 20th century had been replaced by a full farm complex.
MST20870	SK 2377 2609	Medieval	The earthwork remains of ridge and furrow, evidence of medieval and later ploughing, identified on aerial photography and LiDAR survey data in the area to the north of Harehedge Lane.
MST22027	SK 2366 2556	Post-Medieval	A probably mid 19th century cast iron boundary post situated on the former Burton upon Trent Borough Boundary.
MST22327	SK 2451 2603	Post-Medieval	A mid 18th century turnpike Road, connecting Ashby de La Zouch with Woodville, Burton upon Trent and Tutbury.
MST22572	SK 2360 2733	Post-Medieval	A mid to late 19th century two storey house of painted stucco under a hipped slate roof. Originally constructed as a double fronted detached house, though much altered and extended over time. The house has been recorded under several names including Oak Tree Cottage, Oak Cottages, White House and Apple Acres.
MST22573	SK 2357 2733	Modern	A Second World War air raid shelter in the grounds of Apple Acres.
MST22574	SK 2361 2732	Post-Medieval	A veteran oak tree located in the grounds of Apple Acres. The tree is estimated to predate the house (which is of mid to late 19th century date) by several centuries.
MST22575	SK 2358 2735	Post-Medieval	A possible late 19th century outbuilding located in the grounds of Apple Acres. The outbuilding has been converted to a garage.

Identifier	Grid Reference	Period	Name
MST22576	SK 2358 2734	Post-Medieval	Documentary evidence for a possible late 19th century outbuilding located in the grounds of Apple Acres.
MST22577	SK 2358 2734	Post-Medieval	Documentary evidence for a possible late 19th century outbuilding located in the grounds of Apple Acres.

Archaeological Interventions (Staffordshire Historic Environment Record)

Identifier	Grid Reference	Name
EST1939	SK 2398 2528	An archaeological desk based assessment of Chestnuts Farm, Horninglow, Burton upon Trent.
EST2329	SK 2463 2416	A historic character assessment of Burton-upon-Trent as part of an Extensive Urban Survey of Staffordshire.
EST973	SK 2346 2566	An archaeological survey and evaluation of ridge and furrow on land off Tutbury Road, Outwoods.
EST972	SK 2346 2566	An archaeological desk-based assessment at Kitling Greaves Lane, Horninglow, Outwoods, Burton upon Trent.
EST2370	SK 2359 2730	A desk based assessment of Apple Acres, Knowles Hill, Rolleston on Dove, November 2013.



Legend

- 1km Study Area
- Site Boundary
- HER Monument Points
- HER Event Points
- HER Monument Polylines
- HER Monument Polygons
- HER Event Polygons

0 80 160 320 480 640 800

Metres

RAE	KH	March 2017	V1
Created:	Checked:	Date:	Version:

Arndale Court
Headingley
Leeds
LS6 2UJ

TEL: +44 (0)113 2787111
FAX: +44 (0)113 2750623
e-mail: enviro@wyg.com

Sheet Size: **A3** Scale of Original: **1:11,000**

Client: Gladman Developments Ltd

Project: Land North of Beamhill Road, Burton on Trent

Title: Recorded Heritage Sites and Archaeological Interventions

Office:	Project No:	Figure No:
4154	A101663	2

Legend

- 1km Study Area
- Site Boundary

HLCType

- Broadleaved Plantation
- Sports Fields
- Large Irregular Fields
- Other Plantation
- Miscellaneous Floodplain Fields
- Golf Course
- Very Large Post-War Fields
- Other Parkland
- Post-1880s Settlement
- Planned Enclosure
- Pre-1880s Settlement
- Reorganised Piecemeal Enclosure
- Redeveloped Pre-1880s Settlement
- Piecemeal Enclosure

0 80 160 320 480 640 800

Metres

RAE	KH	March 2017	V1
Created:	Checked:	Date:	Version:

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Sheet Size: **A3** Scale of Original: **1:11,000**

Client: Gladman Developments Ltd

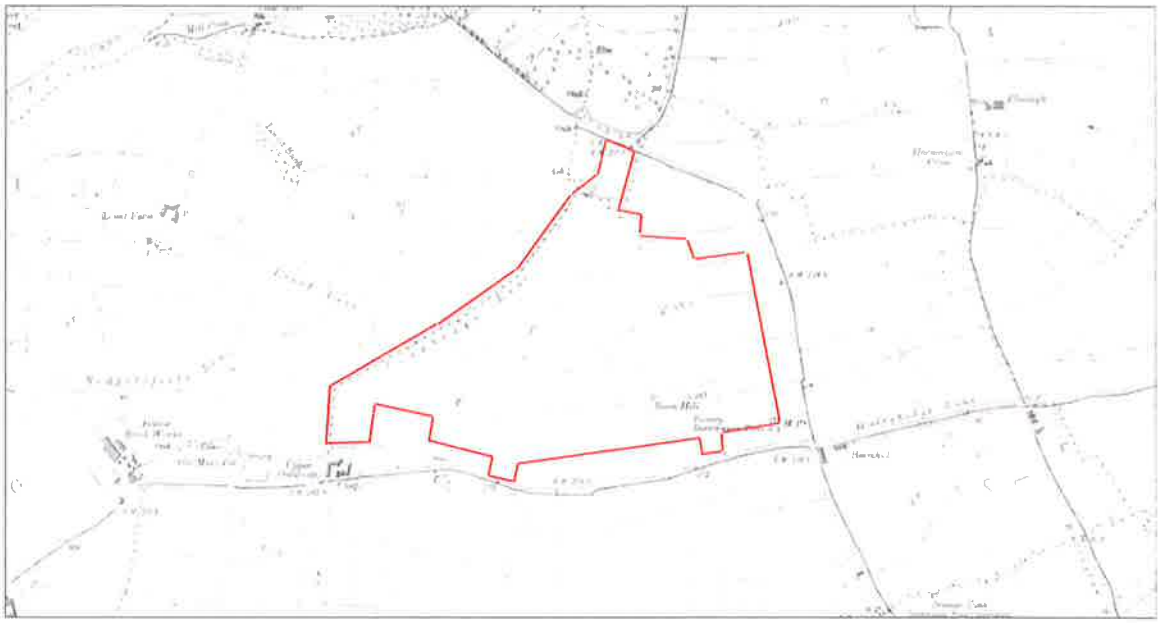
Project: Land North of Beamhill Road, Burton on Trent

Title: Historic Landscape Characterisation

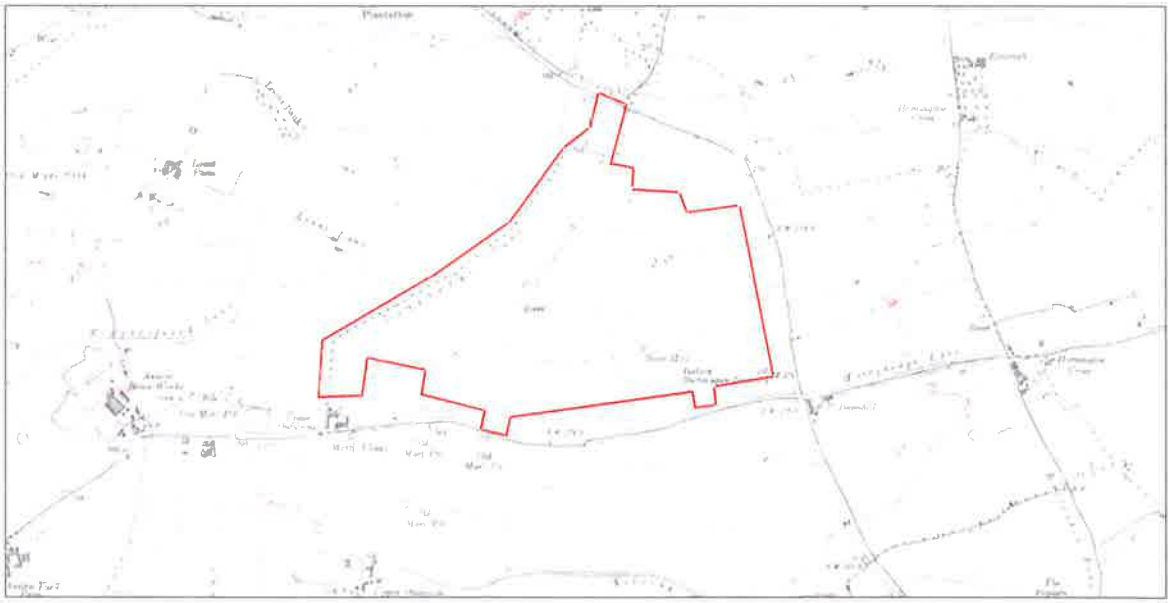
Office:	Project No:	Figure No:
4154	A101663	3

Appendix F – Historic Mapping

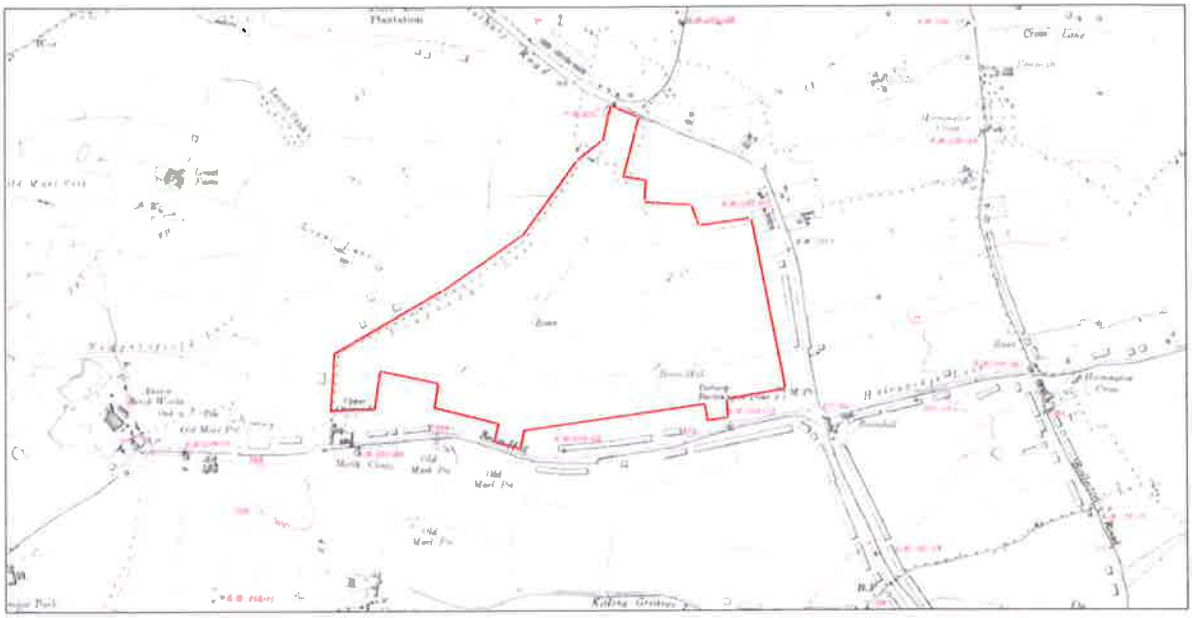
1905 Ordnance Survey Plan



1925 Ordnance Survey Plan



1948 Ordnance Survey Plan



Appendix G – Report Conditions

Archaeological Appraisal, Land to the north of Beamhill Road, Burton upon Trent, Staffordshire

This report is produced solely for the benefit of Gladman Developments Ltd. and no liability is accepted for any reliance placed on it by any other party unless specifically agreed by us in writing.

This report is prepared for the proposed uses stated in the report and should not be relied upon for other purposes unless specifically agreed by us in writing. In time technological advances, improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of WYG using reasonable skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented accordingly within the scope for this report.

Reliance has been placed on the documents and information supplied to WYG by others, no independent verification of these has been made by WYG and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst reasonable skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal, budget and weather related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.

March 2017

WYG Environment Planning Transport Ltd

BRBS/01

LAND NORTH OF BEAMHILL ROAD, BURTON UPON TRENT, STAFFORDSHIRE

GEOPHYSICAL SURVEY

commissioned by WYG
on behalf of Gladman Developments Ltd

September 2017

HEADLAND ARCHAEOLOGY

REGISTERED ORGANISATION CIfA

LAND NORTH OF BEAMHILL ROAD, BURTON UPON TRENT, STAFFORDSHIRE

GEOPHYSICAL SURVEY

commissioned by WYG
on behalf of Gladman Developments Ltd

September 2017

This report adheres to the quality standard of ISO 9001:2008

PROJECT INFO:

HA Job No. **BRBS/01** / NGR **SK 2300 2634** / Parish **Outwoods** / Local Authority **Staffordshire** / OASIS Ref. **headland5-296218**

PROJECT TEAM:

Project Manager **Alistair Webb** / Author **David Harrison** / Fieldwork **Kevin Heaton, Mark Evans, Nick Adams, Ross Bishop** / Graphics **Beata Wieczorek-Oleksy, Caroline Norrman, David Harrison**

Approved by **Alistair Webb**

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HEADLAND ARCHAEOLOGY

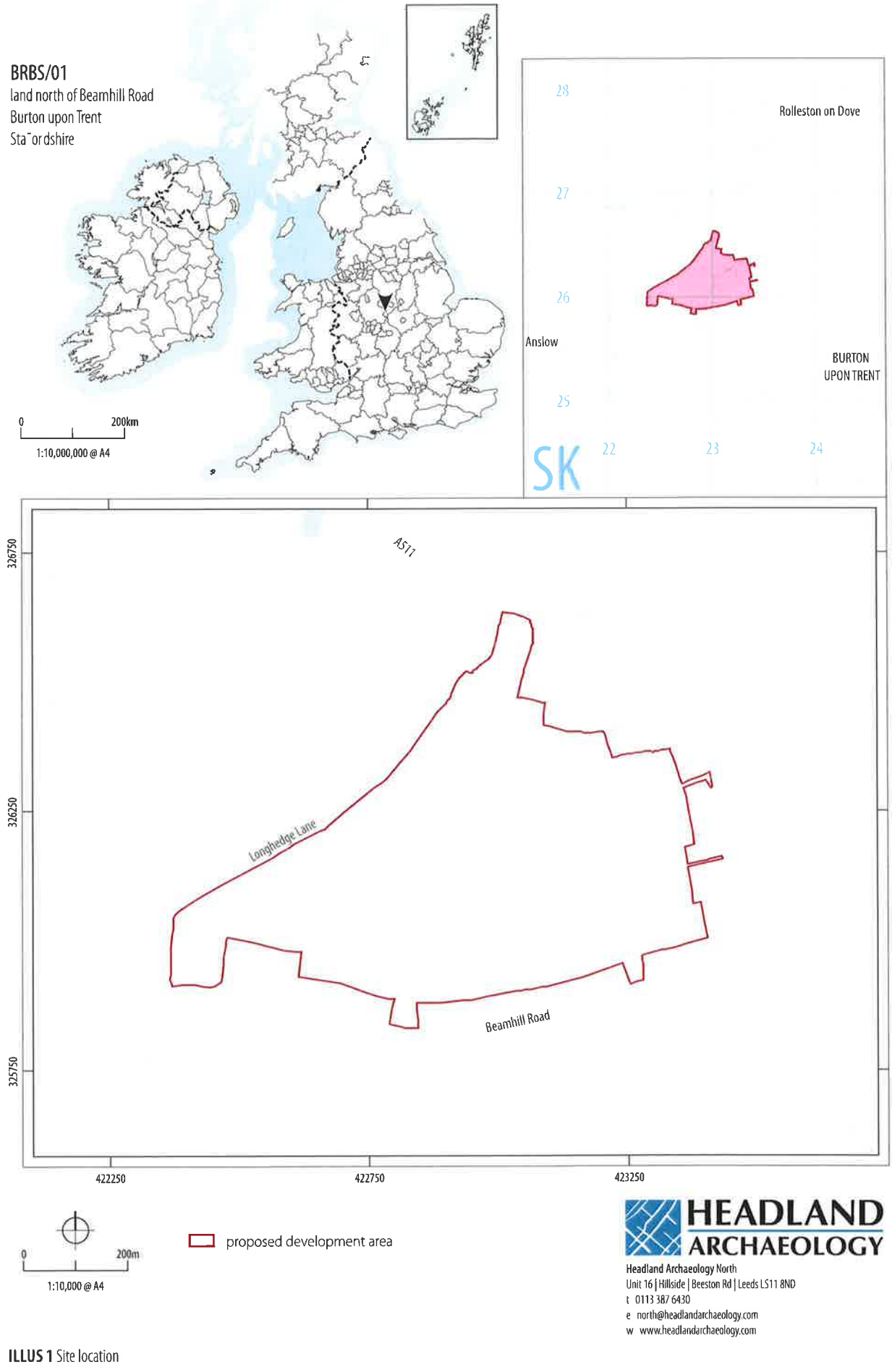
PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey of a 40 hectare site, north-west of Burton upon Trent, to inform planning proposals for a proposed residential development. The survey has successfully evaluated the site identifying anomalies consistent with medieval and post-medieval agricultural activity which is also recorded on the Staffordshire HER and which had been identified in an earlier desk-based Archaeological Appraisal. This activity may be of local historical significance but is unlikely to be considered as having any more than a low archaeological value. No anomalies of definite archaeological potential have been identified by the survey with only a single isolated cluster of anomalies being ascribed any archaeological potential. These may be due to soil-filled archaeological features although a topographical and/or agricultural origin is considered more likely. Modern agricultural activity restricted the survey area locally and also resulted in large areas of magnetic disturbance across the southern part of the site. This disturbance could mask the response from archaeological features, if present, within these areas. However, on balance, considering the absence of archaeological anomalies across the rest of the site, this is thought to be unlikely and overall the archaeological potential of the site is considered to be low.

CONTENTS

LIST OF ILLUSTRATIONS

BRBS/01
land north of Beamhill Road
Burton upon Trent
Sta˜ordshire



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ILLUS 1 Site location

LAND NORTH OF BEAMHILL ROAD, BURTON UPON TRENT, STAFFORDSHIRE

GEOPHYSICAL SURVEY

1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by WYG (The Consultant), on behalf of Gladman Developments Ltd, to undertake a geophysical (magnetometer) survey of land north of Beamhill Road, Burton upon Trent, Staffordshire, where a residential development is being proposed. The survey was carried out in order to inform planning proposals by assessing the heritage potential of the proposed development area (PDA) and therefore the impact of the proposed development on the historic environment.

The work was undertaken in accordance with a Written Scheme of Investigation (Harrison 2017) which was submitted to and approved by the Consultant, and with guidance contained in the National Planning Policy Framework (DCLG 2012). All work was undertaken in line with current best practice (Chartered Institute for Archaeologists 2014, English Heritage 2008).

The survey was carried out between August 21st and August 23rd 2017.

1.1 SITE LOCATION, LAND-USE AND TOPOGRAPHY

The PDA comprised thirty one fields (F1-F31) within an irregularly-shaped block of agricultural land to the north-west of Burton upon Trent, Staffordshire, centred at SK 2300 2634 (see Illus 1). It is bound to the south by Beamhill Road and residential development, Tutbury Road (A511) and residential development to the east, and Longhedge Lane and agricultural land to the north and west.

At the time of the survey the site was under a mix of grazed pasture and un-grazed fields used for chicken farming (see Illus 2–5). Survey was restricted within the north of F25 by a chicken shed and at the perimeters of most of the fields by overgrown vegetation. F6–F9 and F27–F31 were subdivided into horse paddocks. Of the 40ha PDA, approximately 30ha were available for survey.

A low hill (Beam Hill) rises within the south of the PDA from 84m above Ordnance Datum (AOD) at Beamhill Road to 90m AOD in F25. From here the land falls away gently to 68m AOD in the north of the PDA and 85m AOD in the west.

1.2 GEOLOGY AND SOILS

The underlying bedrock geology comprises Mercia Mudstone. No superficial deposits are recorded over the majority of the site with localised Glaciofluvial sands and gravels recorded in F24 and F25 on top of Beam Hill (NERC 2017).

The soils are mainly classified in the Soilscape 18 association being characterised as slowly permeable, seasonally wet loams and clays. In the lower-lying northern part of the site, the soils are classified in the Soilscape 8 association, characterised as slightly acid loams and clays with impeded drainage (Cranfield University 2017).

2 ARCHAEOLOGICAL BACKGROUND

An Archaeological Appraisal (WYG 2017) has identified that there are no previously recorded designated heritage assets within the PDA and concluded that it is not anticipated to contain any previously unrecorded archaeological remains of national significance.

Two non-designated heritage assets (MST5553 and MST17266) are recorded on the Staffordshire Historic Environment Record (HER). These comprise the earthwork remains of ridge and furrow. Whilst these are considered significant at a local level, as a historic landscape feature indicative of the medieval agricultural use of the site, their overall heritage value is considered to be low.

2

3

4

ILLUS 2 Field 7, looking west **ILLUS 3** Field 12, looking north-east **ILLUS 4** Field 18, looking north-east

3 AIMS, METHODOLOGY AND PRESENTATION

The general aim of the geophysical survey was to provide sufficient information to establish the presence/absence, character and extent of any archaeological remains within the PDA. This will therefore enable an assessment to be made of the impact of the proposed development on any sub-surface archaeological remains, if present.

The specific archaeological objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to therefore model the presence/absence and extent of any buried archaeological features; and
- to prepare a report summarising the results of the survey.

3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney & Gater 2003). Further information

5

ILLUS 5 Field 25, looking south-west

on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses (swaths) 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. Terrasurveyor V3.0.32.4 (DWConsulting) software was used to process and present the data.

3.2 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:10,000. Illus 2–5 inclusive are site condition photographs. Illus 6 is a 1:4,000 scale survey location plan showing the GPS swath data. The Staffordshire HER data is shown in Illus 7 overlying the six inch Ordnance Survey (OS) map (1888–1913), also at 1:4,000. The processed greyscale data and an overall interpretation plot are also presented at 1:4,000 on Illus 8 and Illus 9. Detailed data plots of the fully processed data (greyscale), the minimally processed data (XY traceplot) and an accompanying interpretative plot of the two sectors into which the site is divided, are presented at a scale of 1:2,500 in Illus 10 to Illus 15 inclusive.

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. Data processing details are presented in Appendix 4. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 5.

The survey methodology, report and any recommendations comply with the Written Scheme of Investigation (Harrison 2017) and guidelines outlined by Historic England (English Heritage 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations from Ordnance Survey mapping are reproduced with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.

4 RESULTS AND DISCUSSION

Despite the presence of overgrown vegetation at many of the field boundaries, generally, the ground conditions across the PDA were good and the overall quality of the data collected was good

throughout. The survey has detected little change in levels of background magnetic variation across the PDA except with F16, F17 and F18 (see below). Against this background, numerous anomalies have been identified. Those anomalies with modern, agricultural or geological origins are discussed first followed by those anomalies with a possible archaeological cause. All are discussed below and cross-referenced to specific anomalies on the interpretative drawings, where appropriate.

4.1 FERROUS AND MODERN ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris is common on most sites, often being present as a consequence of manuring or tipping/infilling.

Broad areas of high magnitude magnetic disturbance within the south of the PDA are caused by the close proximity to agricultural buildings and machinery and to areas of dumping. Within the north of F24 the disturbance corresponds to the site of a former chicken shed, whereas the disturbance within the west of F22, F24 and F27 is likely to be caused by modern dumped material within the topsoil. Magnetic disturbance around the field edges is due to ferrous material within or close to the adjacent field boundaries and is of no archaeological interest.

4.2 AGRICULTURAL ANOMALIES

Analysis of historic OS mapping indicates that the division and layout of land within the PDA has changed little over the last 130 years (see Illus 7). With the exception of the addition of farm access tracks, farm buildings and paddocks, only one boundary has been removed from within F13. The former boundary has not been detected as a magnetic anomaly which may indicate a low level of magnetic contrast within the prevailing soils, or perhaps more likely, that the former boundary comprised a hedge rather than a ditch.

Numerous parallel linear and curvilinear trend anomalies have been identified across the PDA. Slightly curvilinear, broadly-spaced parallel trend anomalies have been recorded throughout F12, F13 and F15, aligned parallel with the extant field boundaries. These anomalies correspond to the undesignated heritage assets (MST5553 and MST17266) on the Staffordshire HER and are caused by the medieval and post-medieval practice of ridge and furrow cultivation. The anomalies are caused by the contrast between the former ridges and the soil-filled furrows. More closely-spaced parallel linear trends within the south-west of F12 and across the eastern part of the PDA are caused by modern cultivation.

The three, parallel, evenly-spaced, east/west aligned linear trends within F16 are characteristic of modern field drains.

Elsewhere, occasional isolated linear trends have been identified on a variety of alignments across the PDA. All of these are aligned parallel with the surrounding field boundaries and are therefore ascribed an agricultural interpretation, probably being due to ploughing.

4.3 GEOLOGICAL ANOMALIES

As discussed, a variable magnetic background has been identified across the PDA resulting in a plethora of localised low magnitude discrete anomalies. These are caused by localised variations in the depth and composition of the soils. The anomalies increase in frequency within F16, F17 and F18, probably as a result of increased agricultural activity and associated with the close proximity of Spinney Farm.

4.4 POSSIBLE ARCHAEOLOGICAL ANOMALIES

A cluster of anomalies has been identified within the centre of F14 which are notable for their high magnitude relative to the prevailing discrete geological anomalies. It is possible that the anomalies are caused by soil-filled pits and an archaeological origin should be considered. However, the cluster is located at the base of a north-facing slope and it is equally possible that the anomalies are caused by the natural accumulation of material at the base of the slope.

5 CONCLUSION

The survey has successfully evaluated the proposed development site identifying anomalies which are consistent with the medieval and post-medieval agricultural landscape as recorded on the Staffordshire HER and which has been identified in an earlier desk-based Archaeological Appraisal. These anomalies may be of local historical significance but are unlikely to be considered as any more than low archaeological value. No anomalies of definite archaeological potential have been identified by the survey with only a single isolated cluster of anomalies being ascribed limited archaeological potential. These may be due to soil-filled archaeological features although a topographical and/or agricultural origin is considered more likely. Modern agricultural activity restricted survey locally and also resulted in large areas of magnetic disturbance across the southern part of the site. This disturbance could mask the response from archaeological features, if present, within these areas, although on balance, considering the absence of archaeological anomalies across the rest of the site, this is thought to be unlikely. Overall the archaeological potential of the site is considered to be low, corroborating the results of the Archaeological Appraisal.

6 REFERENCES

Chartered Institute for Archaeologists (CIfA) 2014 *Standard and guidance for archaeological geophysical survey* (Reading) http://www.archaeologists.net/sites/default/files/CIfAS&GGeophysics_1.pdf accessed 13 September 2017

Cranfield University 2017 *Cranfield Soil and Agrifood Institute Soilscapes* www.landis.org.uk/soilscapes/ accessed 13 September 2017

Department of Communities and Local Government (DCLG) 2012 ***National Planning Policy Framework*** https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf accessed 13 September July 2017

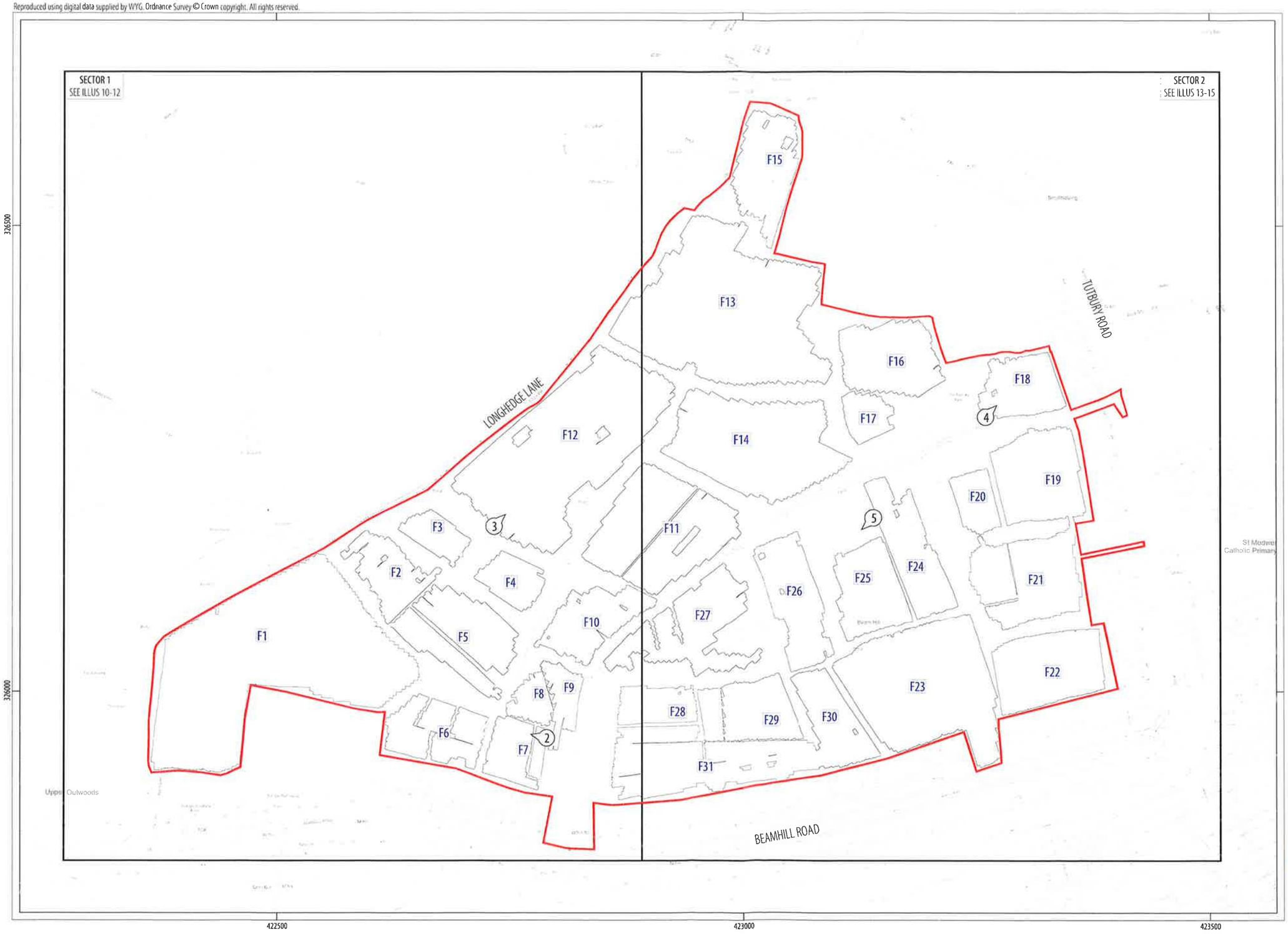
English Heritage 2008 ***Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines*** (2nd edn) http://content.historicengland.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf accessed 13 September 2017

Gaffney, C & Gater, J (2003) ***Revealing the Buried Past: Geophysics for Archaeologists*** Stroud

Harrison, S 2017 ***Land to the north of Beamhill Road, Burton Upon Trent, Staffordshire: Written Scheme of Investigation for Geophysical Survey*** [unpublished client document] Headland Archaeology, Ref. BRBS/01

Natural Environment Research Council (NERC) 2017 ***British Geological Survey*** http://www.bgs.ac.uk/ accessed 13 September 2017

WYG 2017 ***Land to the north of Beamhill Road, Burton upon Trent, Staffordshire: Archaeological Appraisal*** [unpublished client document] WYG, Ref A101663



proposed development area
GPS swaths
location and direction of ILLUS 2-5

0 100m
1:4,000 @ A3

PROJECT BRBS/01
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Staffordshire
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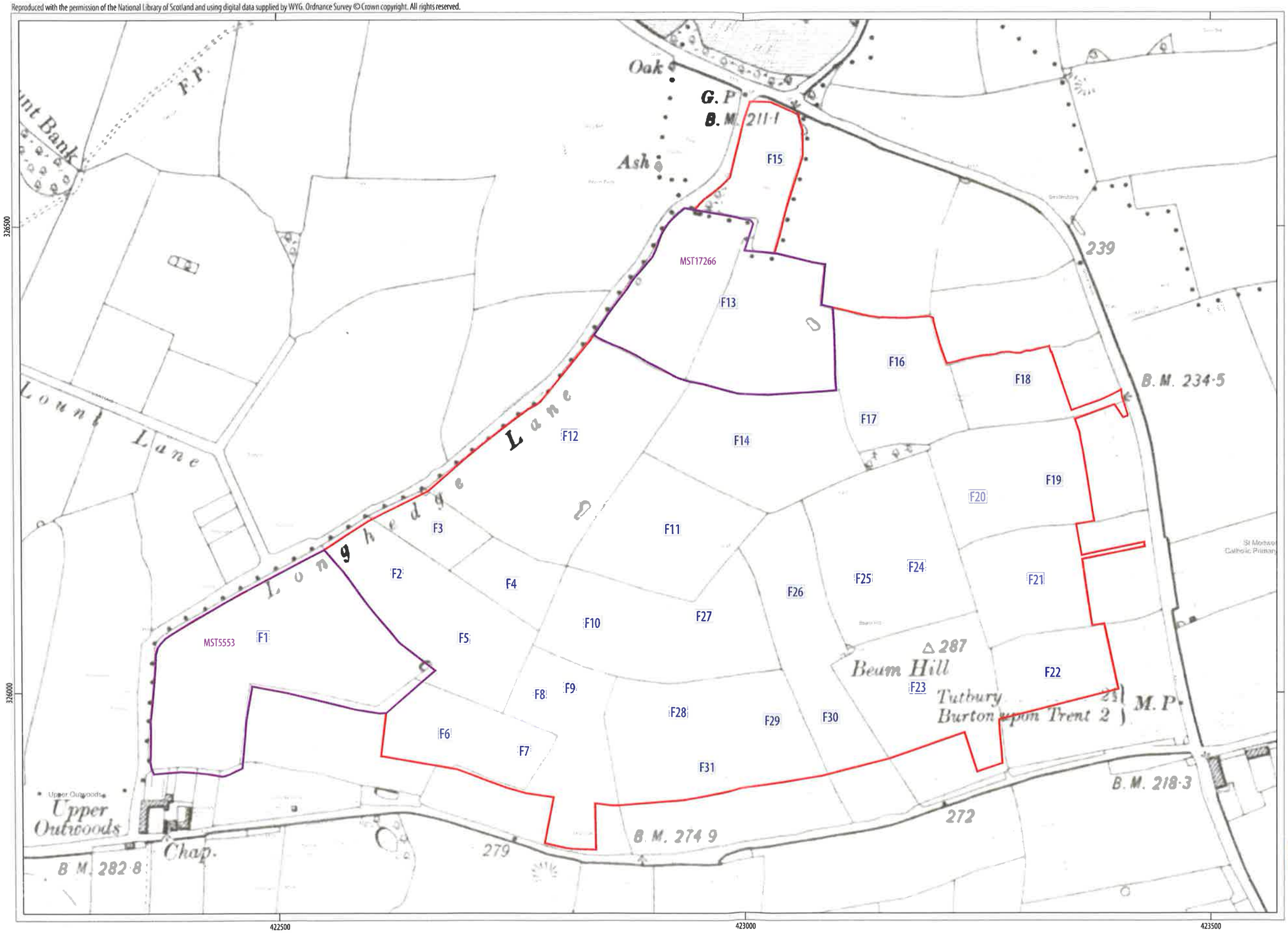
Illus 6 Survey location showing GPS swaths



Illus 7 Survey location showing Staffordshire HER data overlying 1888–1913 six inch OS map

proposed development area

-1.0 nT 2.0

0 100m

1:4,000 @ A3

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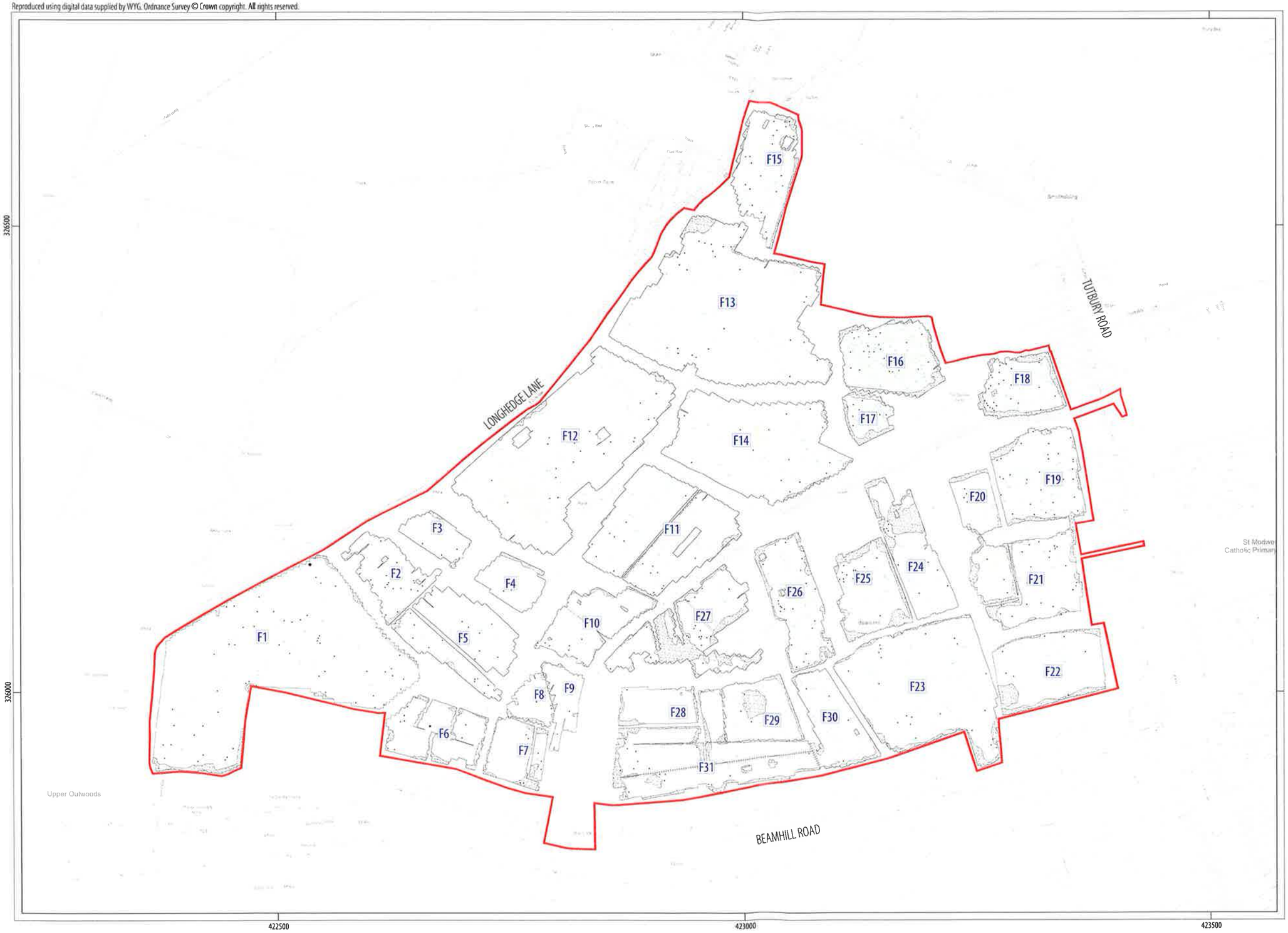
Illus 8 Overall processed greyscale magnetometer data



proposed development area

TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	fence
linear trend	ridge and furrow
linear trend	field drain
linear trend	agricultural
magnetic enhancement	geology
magnetic enhancement	archaeology?

0 100m
1:4,000 @ A3

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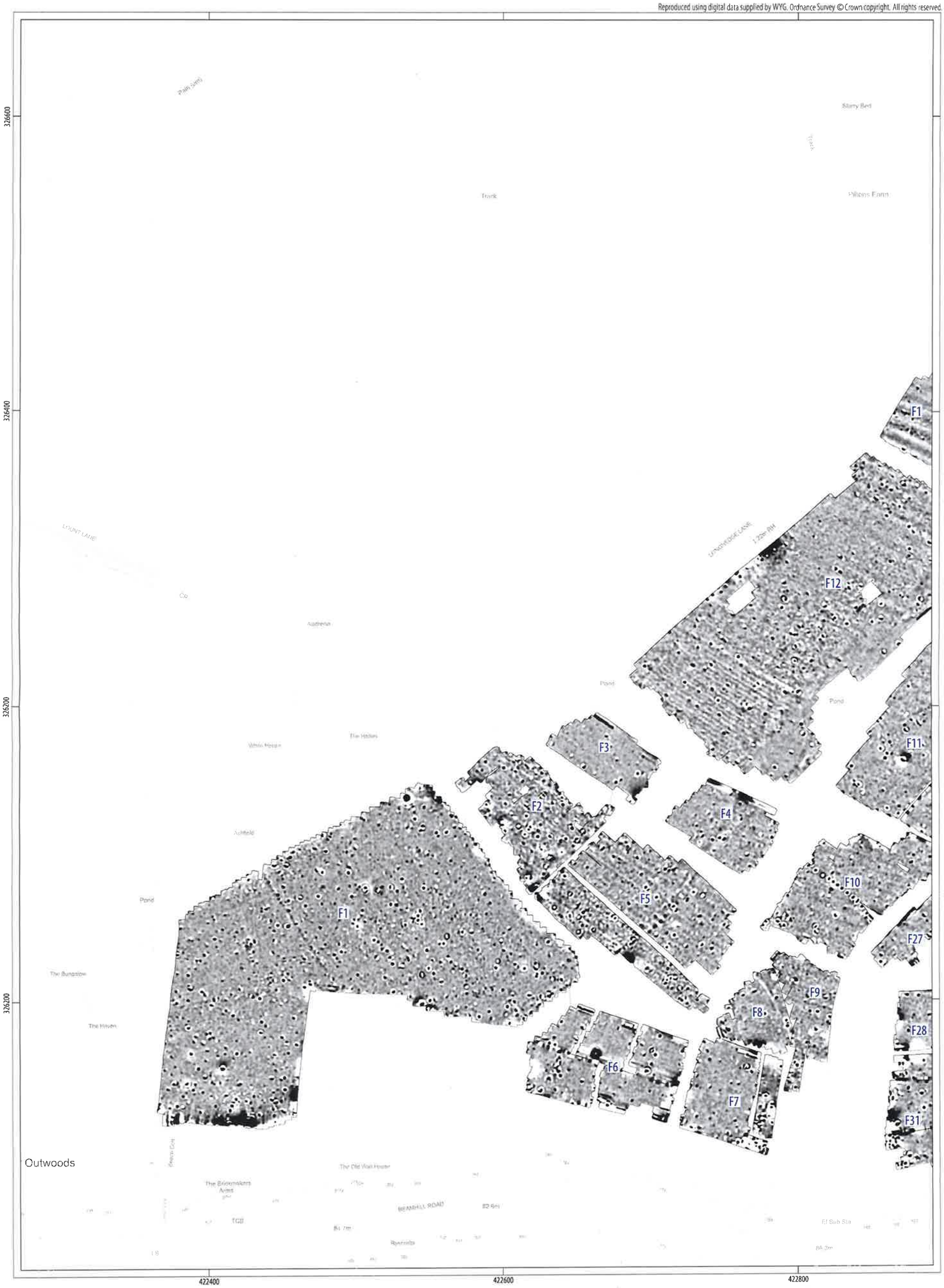
Illus 9 Overall interpretation of magnetometer data



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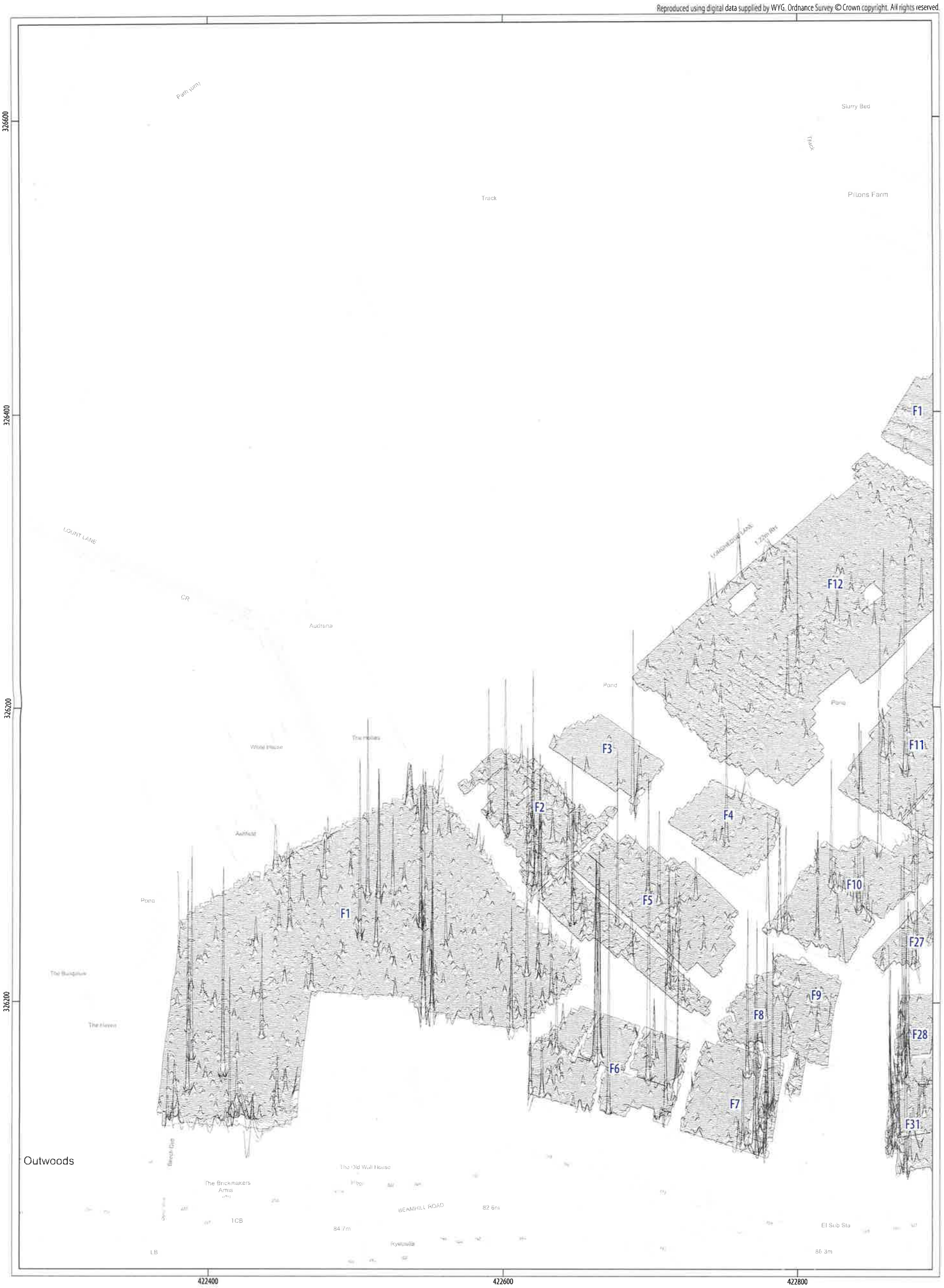
ILLUS 10 Processed greyscale magnetometer data; Sector 1



15.0nT/cm

0 50m
1:2,500 @ A3

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Staffordshire

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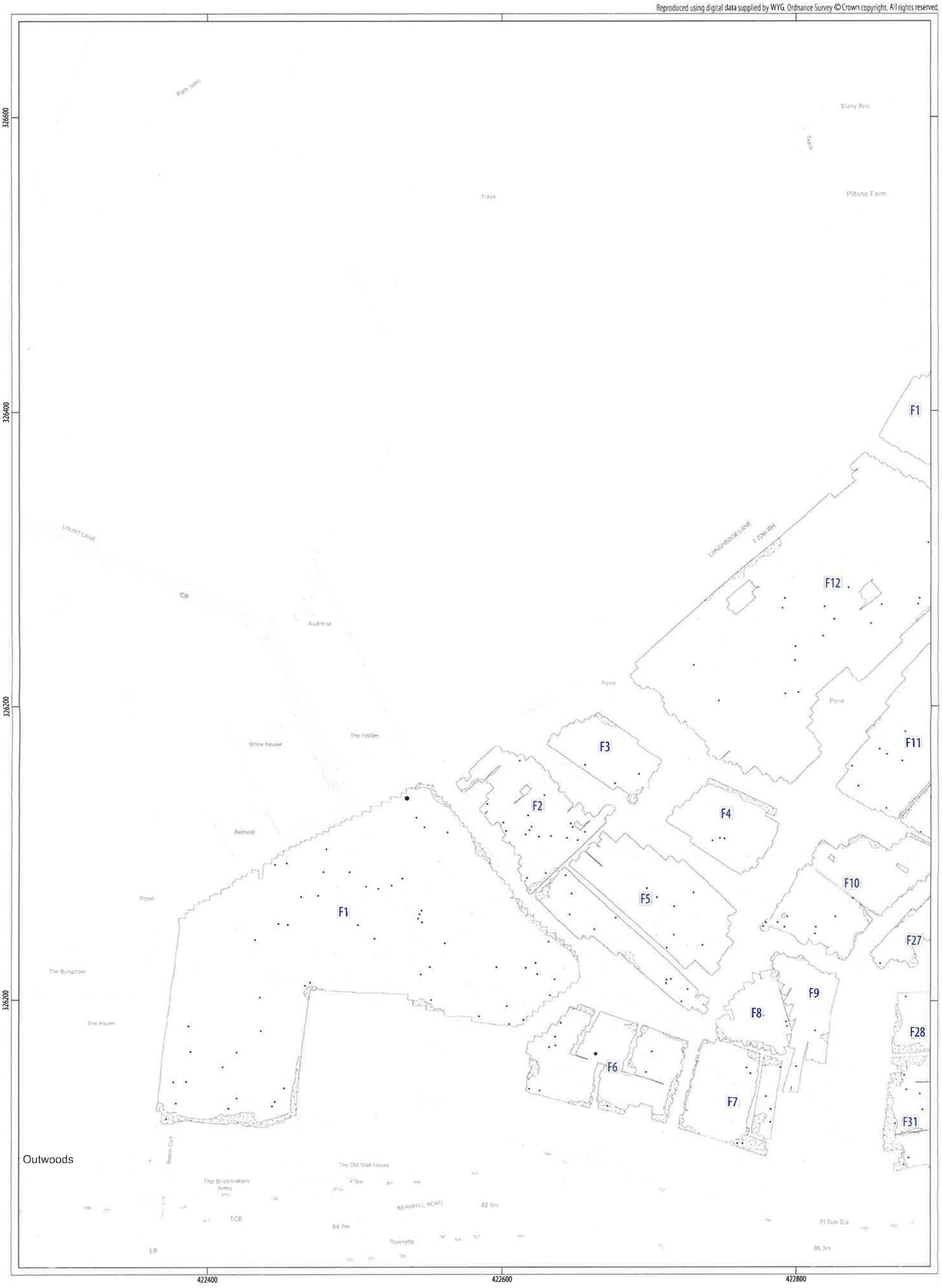
ILLUS 11 XY trace plot of minimally processed magnetometer data; Sector 1



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	fence
linear trend	ridge and furrow
linear trend	agricultural
magnetic enhancement	geology

0 50m
1:2,500 @ A3

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ILLUS 12 Interpretation of magnetometer data; Sector 1

-1.0 nT 2.0

0 50m

1:2,500 @ A3

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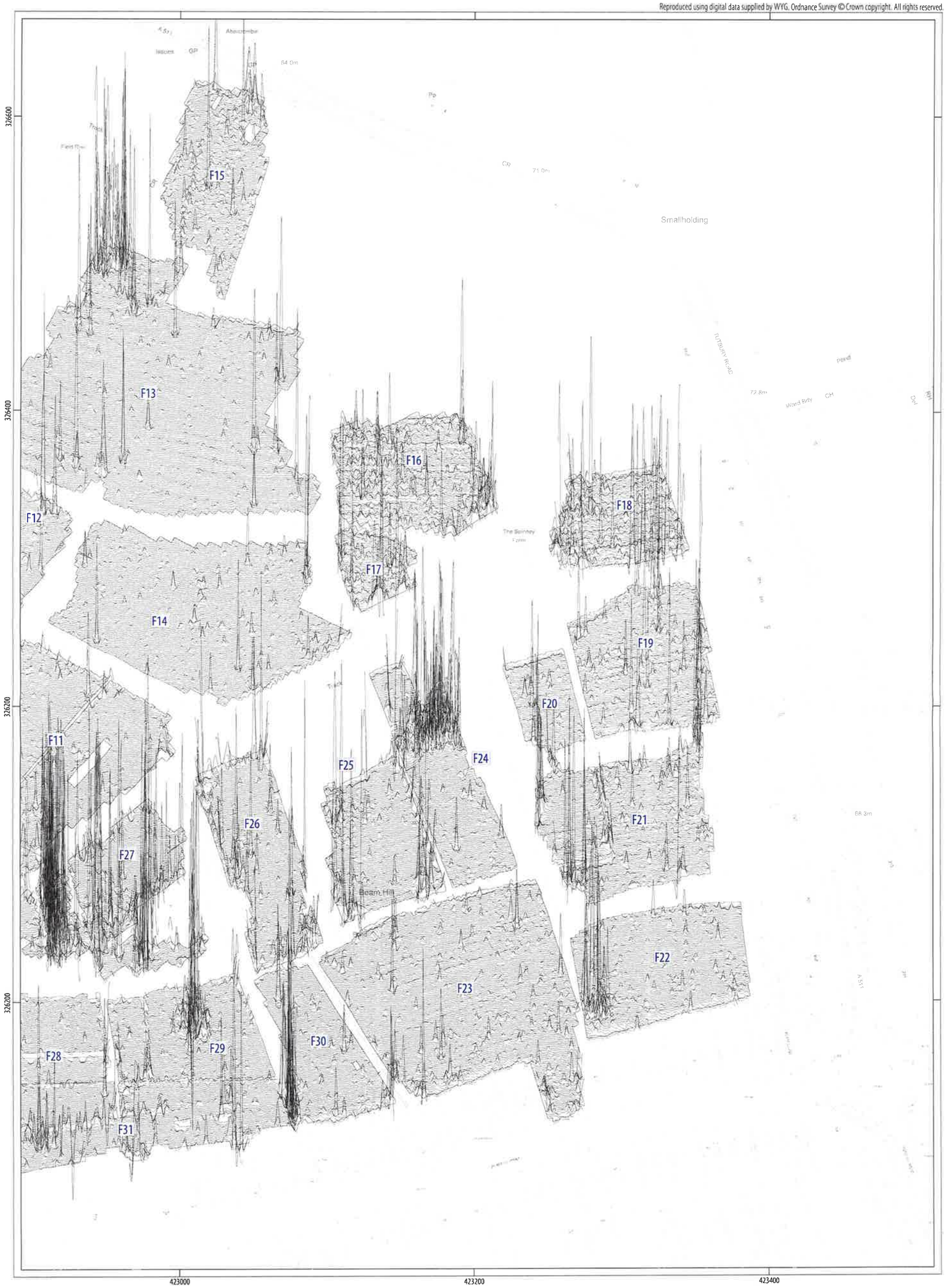
ILLUS 13 Processed greyscale magnetometer data; Sector 2



15.0nT/cm

0 50m

1:2,500 @ A3

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Staffordshire

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ILLUS 14 XY trace plot of minimally processed magnetometer data; Sector 2

TYPE OF ANOMALY	INTERPRETATION	TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material	magnetic enhancement	geology
magnetic disturbance	ferrous material	magnetic enhancement	archaeology?
dipolar linear	fence		
linear trend	ridge and furrow		
linear trend	agricultural		
linear trend	field drain		

0 50m
1:2,500 @ A3

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Staffordshire

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ILLUS 15 Interpretation of magnetometer data; Sector 2

7 APPENDICES

APPENDIX 1 MAGNETOMETER SURVEY

Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

Types of magnetic anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes) These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report.

The project will be archived in-house in accordance with recent good practice guidelines (http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3). The data will be stored in an indexed archive and migrated to new formats when necessary. In addition, the raw data will be deposited with the Archaeology Data Service (ADS) in accordance with Devon County Council's Specification for Geophysical Survey.

APPENDIX 4 DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) in order to maximise the clarity and interpretability of the archaeological anomalies.

The data has also been clipped to remove extreme values and to improve data contrast.

APPENDIX 5 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-296218

PROJECT DETAILS

Project name	Land north of Beamhill Road, Burton upon Trent
Short description of the project	Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey of a 40 hectare site, north-west of Burton upon Trent, to inform planning proposals for a proposed residential development. The survey has successfully evaluated the site identifying anomalies consistent with medieval and post-medieval agricultural activity which is also recorded on the Staffordshire HER and which had been identified in an earlier desk-based Archaeological Appraisal. This activity may be of local historical significance but is unlikely to be considered as having any more than a low archaeological value. No anomalies of definite archaeological potential have been identified by the survey with only a single isolated cluster of anomalies being ascribed any archaeological potential. These may be due to soil-filled archaeological features although a topographical and/or agricultural origin is considered more likely. Modern agricultural activity restricted the survey area locally and also resulted in large areas of magnetic disturbance across the southern part of the site. This disturbance could mask the response from archaeological features, if present, within these areas. However, on balance, considering the absence of archaeological anomalies across the rest of the site, this is thought to be unlikely and overall the archaeological potential of the site is considered to be low.
Project dates	Start: 21-08-2017 End: 23-08-2017
Previous/future work	Not known / Not known
Any associated project reference codes	BRBS-01 - Contracting Unit No.
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 5 - Character undetermined
Monument type	N/A None
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Methods & techniques	"Geophysical Survey"
Development type	Housing estate
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application
Solid geology (other)	Mercia Mudstone
Drift geology	ALLUVIUM
Techniques	Magnetometry

PROJECT LOCATION

Country	England
Site location	STAFFORDSHIRE EAST STAFFORDSHIRE OUTWOODS Land north of Beamhill Road, Burton upon Trent
Study area	30 Hectares
Site coordinates	SK 2300 2634 52.833759968873 -1.6585574619095250 01 N 001 39 30 W Point

PROJECT CREATORS

Name of Organisation	Headland Archaeology
Project brief originator	WYG
Project design originator	Headland Archaeology
Project director/manager	Webb, A.

Project supervisor	Bishop, R
Type of sponsor/funding body	Developer

PROJECT ARCHIVES

Physical Archive Exists?	No
Digital Archive recipient	In house
Digital Contents	"Survey"
Digital Media available	"Geophysics","Survey"
Paper Archive Exists?	No

PROJECT BIBLIOGRAPHY 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Land north of Beamhill Road, Burton upon Trent, Staffordshire: Geophysical Survey
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