

Land South of Crockenhill Road, St Mary Cray

EIA Scoping Report

ON BEHALF OF LANDS IMPROVEMENT HOLDINGS LTD

April 2025

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Summary

This Environmental Impact Assessment (“EIA”) Scoping Report requests that London Borough of Bromley (“LBB”) issue a Scoping Opinion pursuant to Regulation 15 of the Town and Country (Environmental Impact Assessment) Regulations 2017. This report outlines a comprehensive scope of work based on the previous experience of the assembled team of specialists and baseline studies of the Land south of Crockenhill Road, St Mary Cray (referred to in the EIA Screening Opinion and Direction as ‘Land South of Burrfield Drive, Waldens Road, Orpington’).

LBB and consultees are invited to consider the content of this Scoping Report and comment accordingly within the five week period prescribed by the Environmental Impact Assessment Regulations.

1. Introduction

- 1.1 This Environmental Impact Assessment (“EIA”) Scoping Report has been prepared by Nexus Planning on behalf of Lands Improvement Holdings Ltd (hereafter referred to as “the Applicant”). This Report provides preliminary environmental information about the existing site, Land south of Crockenhill Road, St Mary Cray (referred to in the EIA Screening Opinion and Direction as ‘Land South of Burrfield Drive, Waldens Road, Orpington’) (“the Site”) and the proposed development, and outlines the scope of information and key issues that the EIA process will need to examine.
- 1.2 The Applicant is intending to submit an outline planning application with all matters reserved except the principal means of access, for the construction on the Site of:
- a. Up to 350 dwellings;
 - b. A community hub;
 - c. Open space; and
 - d. Associated infrastructure.
- 1.3 Where relevant this report makes reference to the above proposals as the “Proposed Development”.
- 1.4 A Site Location Plan showing the Site boundary and surrounding area is provided at **Appendix 1.1**.

Requirement for Environmental Impact Assessment

- 1.5 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (“the Regulations”) require that before consent is granted for certain types of development, an EIA must be undertaken. The Proposed Development of the Site falls within Part 10(b) (urban development projects) of the table set out in Schedule 2 of the Regulations. Part 10(b) relates to ‘urban development projects’ where the Proposed Development includes greater than 150 dwellings or the overall site area exceeds 5 hectares. For such developments, EIA is required in situations where the development is likely to have significant effects on the environment by virtue of factors such as nature, size or location. In this case, the proposal is for up to 350 dwellings and would cover an area of 16 hectares of previously undeveloped agricultural land.
- 1.6 London Borough of Bromley (“LBB”) issued a Screening Opinion dated 28th January 2025 (ref: 24/04376/EIA) in relation to the Proposed Development advising that an Environmental Statement is required. The reasons for this include likely significant ecological effects on the Kynaston Wood Site of Importance for Nature Conservation (“SINC”) and from development on land in the Green Belt; and impacts relating to noise and air quality associated with construction activities.
- 1.7 Subsequently, the Applicant sought a Screening Direction from the Secretary of State. The written response, dated 5th March 2025, confirmed that it was considered that there was potential for likely significant heritage effects on the Kevington Hall and St Mary Cray Conservation Area; archaeological effects; ecological effects on Kynaston Wood SINC, Ruxley Gravel Pits Site of Special Scientific Interest (“SSSI”), Crofton Woods SSSI and Scadbury Park Local Nature Reserve; and highway impacts from operation and construction traffic. It also confirmed that there were no other issues that indicated a likelihood of there being significant environmental effects from the proposal and that there

are no cumulative developments to be considered. A copy of the Screening Direction Response is provided at **Appendix 1.2**.

The Purpose of Scoping in the EIA process

1.8 This report is provided in support of a request for a Scoping Opinion from LBB. Under part 4 regulation 15(2), the Applicant is required to provide the following information:

- a. A plan sufficient to identify the land;
- b. A brief description of the nature and purpose of the development, including its location and technical capacity;
- c. An explanation of the likely significant effects of the development on the environment; and
- d. Such other information or representation as the person making the request may wish to provide or make.

1.9 It is the purpose of the EIA Scoping Report to provide sufficient information for LBB to consider and consult with relevant stakeholders, so that their comments can be taken into consideration on the scope set out in this report.

Consultation to Date

1.10 Technical consultation directly related to the production of this EIA Scoping Report has included baseline data collection from organisations holding data records. Further details of the consultation undertaken during the preparation of this EIA Scoping Report are provided within topic specific sections.

1.11 It is expected that following receipt of this Scoping Opinion request, LBB will consult key statutory consultees.

1.12 The Applicant has already engaged in discussions with LBB, Greater London Authority ("GLA") and Transport for London ("TfL") and will continue to do so. The discussions have informed the Proposed Development to date and will continue to inform the final production of the Environmental Statement ("ES").

Structure of the Scoping Report

1.13 The remaining sections of this Scoping Report are set out as follows:

- a. **Section 2** provides an introduction to the Site and the Proposed Development;
- b. **Section 3** sets out the framework for the EIA process including an overview and summary of the technical, geographic, and temporal scope of the assessment;
- c. **Section 4** provides an overview of the intended structure of the ES;
- d. **Section 5** sets out the suggested scope of assessment with respect to specific topic areas, drawing upon data review and early site investigations;
- e. **Section 6** outlines the planning policy framework relevant to the Proposed Development;
- f. **Section 7** sets out the Archaeological and Built Heritage considerations and provides a scope of the relevant technical ES Chapter;
- g. **Section 8** sets out the Ecology considerations and provides a scope of the relevant technical ES Chapter;

- h. **Section 9** sets out the Transport considerations and provides a scope of the relevant technical ES Chapter; and
- i. **Section 10** provides a summary of the potential impacts to be assessed.

2. The Site & Proposed Development

The Existing Site

- 2.1 The Site comprises approximately 16 hectares of agricultural land, situated directly to the east of and adjacent to the settlement boundary at St Mary Cray. It gently slopes downward from the northern and southern boundaries to the lowest point, at the centre of the Site along the Public Right of Way ("PRoW") (ref. FP180) that bisects the Site in an east-west direction. Vegetation is limited to the hedgerows situated along the Site's boundaries.
- 2.2 The St Mary Cray Recreation Ground is located immediately west of the Site, residential development and Crockenhill Road are situated adjacent to the northern boundary, and residential development along Chelsfield Road and Cockmannings Road is located beyond the southern boundary. The eastern boundary of the Site is defined by the existing PRoW that bisects the Site in a north-south direction (ref. FP179). Accordingly, the Site is enclosed on three sides by the existing urban area.
- 2.3 St Mary Cray, which contains a wide range of services, facilities and a train station, is located within walking distance of the Site. Bus stops located immediately south of the Site on Cockmannings Road and to the north of the Site on Crockenhill Road provide frequent connections into St Mary Cray and to Orpington, respectively.

Designations

- 2.4 The Site is not subject to any landscape designations, and it is located more than 2.7km from the Kent Downs National Landscape to the east.
- 2.5 The Site itself is not subject to any ecological designations and does not contain any priority habitats. Existing vegetation is limited to the hedgerows situated along the Site's boundaries. The Kynaston Wood SINC is located approximately 500m to the east of the Site, the Ruxley Gravel Pits SSSI is approximately 2.2km to the north, Crofton Woods SSSI is approximately 3.1km west and Scadbury Park Local Nature Reserve is approximately 2.8km to the north west.
- 2.6 The Site lies approximately 260m east of the St. Mary Cray Conservation Area. The nearest listed building; Kevington Hall (Grade II*) is located approximately 130m north of the Site, north of Crockenhill Road. The Site is located within a Tier III archaeological priority area and that Roman and Saxon archaeological material as identified by the Greater London Archaeology Advisory Service ("GLAAS").
- 2.7 The Site is located within the Green Belt.
- 2.8 The Site is entirely located within Flood Zone 1, as defined by the Environment Agency Flood Risk Mapping. The mapping also indicates that there are limited areas within the northern portion of the Site that are subject to some surface water flood risk.
- 2.9 The current Site access point for agricultural vehicles is located off Cockmannings Road. There are four PRoW footpaths that cross the Site, including the FP179, which forms the eastern boundary and rounds along the southern boundary, before heading northwest through St Mary Cray Recreation Ground. FP180 crosses the Site horizontally and links FP179 in the east to St Mary Cray Recreation Ground in the west.

Planning History of the Site

- 2.10 The Site has no relevant planning history.

The Proposed Development

Construction

2.11 There are no buildings within the Site that would require demolishing and accordingly the Site is available for development without requiring the removal of any former structures. As a consequence, there would be little hindrance to bringing forward the Proposed Development of the Site within a relatively short period of time from consent.

Operation

2.12 The current description of development seeks outline planning permission for up to 350 dwellings with 50% affordable housing, a community hub, open space and associated infrastructure, with all matters reserved apart from site access.

2.13 An indicative concept plan has also been prepared for the Site and is included at **Appendix 2.1**.

2.14 It is anticipated that first occupations of the Proposed Development could occur by **2027**.

Decommissioning

2.15 This development is proposed to be operational in excess of 100 years and thereafter will comprise developed land in perpetuity; therefore, this assessment will not address decommissioning.

3. The EIA Framework

- 3.1 The ES will be prepared in accordance with statutory requirements and current guidance. In particular, the ES will be prepared with due consideration to:
- a. Town and Country Planning (Environmental Impact Assessment) Regulations 2017;
 - b. Department for Communities and Local Government (DCLG) 2006; Amended Circular on Environmental Impact Assessment. A Consultation Paper June 2006;
 - c. National Planning Practice Guidance: Environmental Impact Assessment (DCLG), updated 13th May 2020;
 - d. Institute of Environmental Management and Assessment (IEMA) Special Report – The State of Environmental Impact Assessment Practice in the UK, June 2011; and
 - e. Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Impact Assessment, 2006 Updates.

Scope of the EIA

Alternative Assessment

- 3.2 The EIA process provides an opportunity to influence the design evaluation of a development taking potential environmental constraints and opportunities into consideration before a final decision is taken on design. The alternatives that will be considered within the EIA include a 'Do Nothing' option and 'Alternative designs' scenario, which will summarise the evolution of the current design proposal.

Technical Scope

- 3.3 The EIA Regulations in Schedule 4, Part 5 requires a description of the likely significant effects of the Proposed Development on the environment resulting from, inter alia, the construction and existence of the development, the use of natural resources, the emission of pollutants, the risks of human health, cumulative effects, impact of the project on climate change and technologies and substances used.
- 3.4 As part of the EIA scoping process, issues that are identified as unlikely to give rise to significant environmental effects can be omitted (i.e. scoped out) of the EIA and addressed through a number of supporting technical reports as part of the planning application.
- 3.5 Those factors which are 'scoped in' would be dealt with within the ES through a description of the likely significant effects of the Proposed Development on the environment, covering any direct and indirect effects, together with any secondary, short, medium and long term, permanent and temporary, positive and negative effects of the development which may result from its existence, the use of natural resources, the emission of pollutants, the creation of nuisances, the elimination of waste and a description of the forecasting methods used to assess the effects on the environment.
- 3.6 Further to the above descriptions as required by the EIA Regulations in Schedule 4, Part 7, descriptions would be presented regarding the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

3.7 Informed by the Secretary of State Screening Direction, whereby potential for likely significant impact effects was considered, the following matters have been identified as the reasons for an EIA being necessary:

- Heritage – impacts on the Grade II* Kennington Hall, St Mary Cray Conservation Area and archaeological impacts;
- Ecology – impacts on the Ruxley Pitts Site of Special Scientific Interest (“SSSI”), Crofton Woods SSSI, Kynaston Wood SINC and Scadbury Park Local Nature Reserve; and
- Transport – construction and operational traffic impacts.

3.8 On the basis of the Screening Direction issued, a number of topic areas have been completely scoped out of the ES, including those outlined below. As such, these topics will be addressed in support of a planning application via separate (non-EIA) assessments. A list of the resulting application documentation that forms the proposed outline application is attached at **Appendix 3.1**.

Landscape and Visual Effects

- 3.9 As noted above, the Site is not subject to any landscape designations, and it is located more than 2.7km from the Kent Downs National Landscape to the east. The Screening Direction from the Secretary of State, dated 5th March 2025 (ref: PCU/EIASC/R/G5180/3360529), explicitly states that it is not considered there would be significant visual impacts on the National Landscape, given the distance between that and the Site. It is also noted that the St Pauls Cray Hill Country Park, located approximately 815m north of the Site, would not be impacted by the proposed development due to intervening development, as confirmed within the Screening Direction.
- 3.10 Within the Screening Direction, it states that the Site is located at the edge of existing urban development and sits at a point of transition between urban and rural local character.
- 3.11 It is important to highlight that as part of the Proposed Development, appropriate landscape buffers are incorporated along the eastern boundary to provide a sensitive edge to the Proposed Development.
- 3.12 Accordingly, it is not considered that the Proposed Development would have a significant adverse landscape or visual effects upon any nearby receptors, particularly following the introduction of inherent mitigation as part of the Proposed Development.
- 3.13 Given these considerations, it is concluded that the landscape and visual impacts of the Proposed Development would not result in likely significant effects on either the Kent Downs National Landscape or the St Paul’s Cray Hill Country Park. These impacts can be adequately addressed through a standalone Landscape and Visual Impact Assessment.

Air Quality

- 3.14 The Proposed Development itself will not generate pollutants that would adversely impact upon air quality. Some minor adverse impacts may arise during the construction phase, but these can be appropriately mitigated. Construction activities will be subject to legal and industry standards.
- 3.15 An Air Quality Assessment will be submitted to demonstrate the Proposed Development will not result in generation of or subject to, adverse impacts from pollutants.

Noise

- 3.16 It is considered that an acceptable noise environment can be created both within the dwellings themselves as well as with outdoor private amenity spaces. The Proposed Development would also be designed to ensure that the community provision proposed would not cause unacceptable impacts on the residential amenity of existing dwellings that adjoin the Site or proposed dwellings.
- 3.17 A Noise Impact Assessment will be submitted to demonstrate the Proposed Development will not result in generation of or subject to, adverse impacts from pollutants.

Hydrology and Drainage Strategy

- 3.18 The Site is located in Flood Zone 1 as defined by the EA Flood Map for Planning. However, the EA Flood Map highlights limited areas along the northern portion of the Site are at some risk of surface water flooding.
- 3.19 No built form is proposed within the areas of the Site that are identified to have some risk of surface water flooding and the Proposed Development will be underpinned by a comprehensive surface water drainage strategy. As demonstrated by the proposed concept plan, a series of infiltration basins are proposed to form part of this strategy. Source control features will be provided to further enhance water quality treatment prior to discharge.
- 3.20 Surface water run-off and foul water drainage will be managed on-site during the construction and operational phases. Sustainable drainage and appropriate drainage design would be considered, and appropriate drainage design details would be included within the planning application documents including the Flood Risk Assessment (FRA) and Drainage Strategy.
- 3.21 Any hazardous materials used on site during the construction phase will be placed in locations not susceptible to flooding.
- 3.22 The associated Sustainable Drainage Systems (SuDS) features will not only provide attenuation space but also provide enhanced water quality and biodiversity as well as amenity both when wet and dry.
- 3.23 The above measures are considered to constitute standard, best practice mitigation measures in accordance with all relevant legislation and result in no likely significant effects. As such, a site specific FRA and Drainage Strategy is being prepared in accordance with the MHCLG's NPPG: Flood Risk and Coastal Change guidance document and will be submitted in support of the forthcoming planning application at the Site.

Topics for inclusion within the Environmental Assessment

- 3.24 Table 3.1 below lists those topics considered relevant for inclusion in the Environmental Impact Assessment.

Table 3.1 Consultant team

Consultant	Topic
RPS Consulting Services Ltd	Archaeology and Heritage
Aspect Ecology	Ecology
SLR	Transport

- 3.25 The proposed scope of these chapters is set out in **Sections 7 - 9** of this Scoping Report.

Geographic Scope

3.26 The EIA covers the physical extent of the Site as shown in **Appendix 1.1**. The influence of many predicted impacts can extend beyond the immediate site boundary, for example, the effects on some species that are primarily located off-site but which may use the site for foraging. Where relevant, the geographic scope of the proposed topic areas is set out within **Sections 7 - 9** of this Scoping Report.

Temporal scope

3.27 As set out in **Section 2**, it is anticipated that the development could commence during **2026**, subject to swift planning approval, and the first occupations during **2027**, with a steady build-out rate thereafter. The assessment will not address decommissioning.

3.28 The assessment will be based on the comparison of qualitative and, where possible, quantitative projected impacts compared with current or recent baseline environmental conditions. Any significant changes expected in future baselines due to environmental trends will also be described qualitatively, or in certain cases calculated as quantitative future baseline to allow meaningful future year assessment.

3.29 Where it is recognised that the future baseline may change and there is uncertainty in the assessment, then this is addressed in the mitigation strategy by ensuring baseline conditions are reviewed in the future, as detailed applications come forward for each phase of the development, allowing potential impacts to be assessed and mitigation refined as the development phasing proceeds over the course of the development.

4. Structure of the ES

- 4.1 The ES for the Proposed Development will comprise a main document (Volume 1) together with the accompanying Appendices (Volume 2) and a Non-Technical Summary (NTS).
- 4.2 The main document will be divided into 10 chapters:

Table 4.1 ES Structure

Part One	
Chapter 1	Introduction
Chapter 2	Methodology
Chapter 3	The Existing Site
Chapter 4	Alternatives and Design Evolution
Chapter 5	The Proposed Development
Chapter 6	Planning Policy Framework

- 4.3 The second part of the ES describes the findings of the specialist environmental assessments of each topic. Each topic is assessed in relation to the environmental effects the Proposed Development will have on that topic and identifies mitigation measures that are required. The technical chapters are:

Table 4.2 ES Structure continued

Part Two	
Chapter 7	Archaeology and Heritage
Chapter 8	Ecology
Chapter 9	Transport
Chapter 10	Summary of Impacts

- 4.4 Topic specific technical reports will be produced. These provide detailed information, surveys or research upon which the assessment of environmental effects will be based. These would be included as Appendices (Volume 2) to the main volume.
- 4.5 A Non-Technical Summary (NTS) will be prepared as a separate report. It will summarise the findings of the ES in non-technical language.

5. Scope of Assessments

- 5.1 The EIA and technical studies will reflect current best practice and will be carried out in accordance with statutory guidance including the requirements for the contents of an ES. For the EIA to be an effective decision-making tool, the ES needs to focus on the most potentially significant environmental issues.
- 5.2 The scope of the proposed ES topics is set out in Sections 7 to 9 below.

6. Planning Policy Framework

- 6.1 The Site is located within the administrative area of London Borough of Bromley. Both adopted and emerging Development Plan documents, notably the Bromley Local Plan (2019) and the London Plan (2021), as well as the National Planning Policy Framework (2024), will be considered within this chapter.

7. Archaeology and Built Heritage

- 7.1 This section of the Scoping report will consider the likely significant effects of the Development on Archaeology and Built Heritage receptors. This section was prepared by RPS Consulting Services Ltd.

Baseline

Receptors

Archaeology

- 7.2 No relevant nationally significant designated assets lie on the Site.
- 7.3 Isolated finds dating to the Saxon period have been recorded during metal detecting on the Site. These finds most likely are a result of casual loss rather than evidence of potential occupation dating to this period.
- 7.4 A recent geophysical survey across the Site recorded no significant archaeological anomalies, although, some anomalies of unknown interest were identified. Green Waste which has been spread on the Site could potentially be masking further evidence of activity.
- 7.5 Based on available evidence the Site is considered to have a low to moderate potential for in situ evidence dating to the prehistoric periods and a moderate potential for evidence dating to the Roman period. Any archaeological evidence on the Site is considered likely to be of local to at most regional significance.

Built Heritage

- 7.6 No designated built heritage assets, such as listed buildings, are located within the Site. The Site does not lie within or adjacent to any conservation area. The Site does not contain any building included on the London Borough of Bromley's local list of formally identified non-designated built heritage asset. The Site does not contain any buildings or structures that may represent previously unidentified non-designated built heritage assets.
- 7.7 The St Mary Cray Village Conservation Area contains a number of Grade II listed buildings and one Grade II* listed building. The whole of the St Mary Cray Village Conservation Area is separated from the Site by modern built development.
- 7.8 To the east of the Site are four other Grade II listed buildings. One group of three is located c.400m to the north east and a single other building lies c.843m to the east. These buildings are unlikely to have any visual or experiential relationship with the Site as a result of intervening distance and visual barriers.
- 7.9 Potentially relevant receptors for Built Heritage will be identified through the undertaking of a Built Heritage Statement in accordance with Historic England's *GPA3: The Setting of Heritage Assets* (Dec. 2017). Potentially relevant Built Heritage receptors may include:
- a. The St Mary Cray Village Conservation Area;
 - b. Kevington Cottage, Grade II, NHLE ref.1359350;
 - c. Yew Tree Cottage, Grade II, NHLE ref. 1068847; and
 - d. Blueberry Farmhouse, Grade II, NHLE ref.1064348.

7.10 Other designated and non-designated Built Heritage Assets in the surrounds of the Site are separated from the Site by modern built development, other experiential barriers and significant intervening distance. As a result it is considered that other Built Heritage assets in the surrounds of the Site will not be affected by the Proposed Development.

Proposed Assessment Methodology

Archaeology

7.11 Initial baseline investigations will be undertaken and set out in an Archaeological Desk Based Assessment (DBA), which will be summarised in the chapter of the Environmental Statement.

7.12 The Archaeological DBA will be prepared in line with the following guidelines:

- The National Planning Policy Guidelines;
- Historic England's Good Practice Advice - GPA 1 The Historic Environment in Local Plans and GPA 2: Managing Significance in Decision-Taking in the Historic Environment;
- Historic England's Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment 2008 (new draft 2017); and
- 'Standard and Guidance for Historic Environment Desk-Based Assessments' (Chartered Institute for Archaeologists).

7.13 The DBA will include the following:

- Planning Policy Framework; i.e. National Planning Policy Framework section 16, the Bromley Local Plan Policy 46 - Scheduled Monuments and Archaeology;
- Geology and Topography;
- Data from a 500m buffer around the Site boundary (including any data within the Site) held on the Greater London Historic Environment Record and the National Monuments Record – this Study Area is considered appropriate to review the wider archaeological baseline environment and establish the archaeological potential within the Site by placing the Site within its broader archaeological context;
- Historic map and documentary evidence concentrating on the Site; and
- The results of a geophysical survey undertaken across the site by Sumo in February 2025.

7.14 A programme of Fieldwalking will be undertaken in addition to the DBA to support the EIA.

7.15 The results of the Archaeological DBA and the Fieldwalking will inform the necessity for any mitigation measures either through design in the scheme to avoid any impact or through preservation by record.

7.16 The Site preparation and construction works has the potential to have an adverse effect on known and as yet to be discovered non designated buried archaeological remains of a Local to Regional Importance. However, following a suitable programme of mitigation measures, it is likely that the significance of any adverse effect will be reduced to minor/neutral/negligible which is acceptable in EIA terms.

Built Heritage

7.17 A Built Heritage Statement will be undertaken in accordance with the provisions of the National Planning Policy Framework and Local Planning Policy in respect of Built Heritage matters. The Built Heritage Statement will accord

with the 5-step process of assessment set out in Historic England's *GPA3: The Setting of Heritage Assets* (Dec. 2017) as follows:

- Identify which heritage assets and their settings are affected;
- Assess the degree to which these settings and views make a contribution to the significance of a heritage asset(s) or allow significance to be appreciated;
- Assess the effects of the proposed development, whether beneficial or harmful, on the significance or on the ability to appreciate it;
- Explore ways to maximise enhancement and avoid or minimise harm; and
- Make and document the decision and monitor outcomes.

7.18 A 1km radius around the Site will be utilised in conjunction with a Site visit and walkover, to identify relevant Built Heritage assets for inclusion in the Built Heritage Statement.

Consultations to Date

7.19 No stakeholder consultation has been undertaken to date.

Approach to Cumulative Development

7.20 No approach to cumulative development will be necessary.

Construction

Archaeology

7.21 The Site preparation and construction works has the potential to have an adverse effect on potential non designated buried archaeological remains of a Local to Regional Importance. However, following a suitable programme of mitigation measures it is likely that the significance of any adverse effect will be reduced to minor/neutral/negligible which is acceptable in EIA terms.

Built Heritage

7.22 The Site preparation and construction works have the potential to incur a temporary alteration of the setting of relevant Built Heritage Assets that may affect their significance. Change to the setting to the relevant Built Heritage Assets in the construction/works phase may occur through noise, plant movement, dust and visual, experiential change. Assuming an appropriate Construction Environmental Management Plan however, and accounting for intervening distance and visual barriers between the Site and relevant Built Heritage Assets, it is considered highly unlikely that any effects on Built Heritage Receptors would be greater than neutral/negligible; such effects would not be significant in EIA terms.

Operation

Archaeology

7.23 There are no anticipated effects during the operation of the Development as all effects will have been mitigated ahead of or during the operational stage.

Built Heritage

7.24 The Proposed Development is considered highly unlikely to notably alter the present way in which any potentially relevant Built Heritage asset is appreciated or understood. It is considered that existing visual and experiential barriers and intervening distance will limit potential effects on potentially relevant Built Heritage Receptors to acceptable levels. No Built Heritage effects that are significant in EIA terms are anticipated.

Technical Appendices to Environmental Statement Chapter

7.25 The supporting Technical Appendices will comprise an Archaeological Desk Based Assessment, Built Heritage Statement and Archaeological Fieldwalking Report.

Key Issues/Technical Difficulties

Archaeology

7.26 The desk-based sources and the site-specific survey data examined will represent a comprehensive and robust sequence of datasets and observations, that allow for an assessment of the archaeological potential within the Site.

Built Heritage

7.27 Desk based sources and other research will be utilised as needed in the production of a Built Heritage Statement. The Built Heritage Statement will be informed by a Site and area walkover of publicly accessible spaces only, no access to private grounds and other spaces will be sought. This approach is proportionately comprehensive and robust in the undertaking of Built Heritage assessments.

Potential Environmental Effects

Archaeology

7.28 As discussed above, the Site preparation and construction works has the potential to have an adverse effect on potential non-designated buried archaeological remains of a Local to Regional Importance. However, following a suitable programme of mitigation measures, it is likely that the significance of any adverse effect will be reduced to minor/neutral/negligible which is acceptable in EIA terms.

Built Heritage

7.29 The Proposed Development will represent a change to the wider setting of several designated Built Heritage Assets. This change will however be very unlikely to incur an impact to the importance of the relevant Built Heritage Assets as their intrinsic architectural and historic interest will be unchanged, and the essential experience of them unchanged. No Built Heritage effects that are significant in EIA terms are anticipated as arising from the operation of the Proposed Development.

Mitigation Measures

Archaeology

7.30 Archaeological mitigation measures could follow planning consent secured by an appropriately worded condition. These works will comprise a programme of archaeological trial trenching in the first instance secured by a WSI submitted to and approved in writing by GLAAS who advise LBB on archaeological matters.

- 7.31 In the event that important remains are recorded during the trial trenching than a further programme of mitigation comprising excavation ahead of construction or archaeological monitoring during construction might be required. This work will be secured by a further WSI submitted to and approved in writing by GLAAS.

Built Heritage

- 7.32 Potential measures for Built Heritage mitigation will be explored through the design evolution of the Development.

Appendices to Scoping Report

- 7.33 **Appendix 7.1:** Archaeological Desk Based Assessment

8. Ecology

- 8.1 A Screening Direction has been received from the Secretary of State, outlining that an EIA is required. With regards to ecology, Natural England has advised ‘the proposed development has potential likely significant effects on statutorily designated nature conservation sites or landscapes and further consideration is required.’ As such, an assessment will be undertaken of the likely significant effects of the development on ecological designations.

Baseline

Receptors

- 8.2 Four off-site receptors of relevance to ecology have been identified within the screening response received, as set out below in Table 8.1.

Table 8.1 Off-site ecological receptors

Suite Name	Distance and Direction	Description
Ruxley Gravel Pits SSSI	2.2km to the north of the site	The SSSI is designated for its area of relatively undisturbed open water, supporting a high diversity of habitats and species; including a variety of insects and breeding wetland birds.
Crofton Woods SSSI	3.1km to the west of the site	The SSSI is designated as it forms an extensive area of ancient woodland on London Clay and is amongst the largest woods of this kind in Greater London. It supports a rich variety of ancient woodland trees, shrubs and herbs, as well as a diverse community of woodland bird species.
Scadbury Park LNR	2.8km to the north west of the site	A park supporting woodland and grassland with designated walking routes.
Kynaston Wood SINC	0.3km to the east of the site	Designated for its ancient woodland, with associated flora and fauna.

SSSI = Site of Special Scientific Interest (national designation, statutory)

LNR = Local Nature Reserve (national designation, statutory)

SINC = Site of Importance for Nature Conservation (local designation, non-statutory)

- 8.3 The Screening Direction identifies that the Site is ‘within Natural England’s Impact Risk Zones for potential impacts on protected sites’. However, the IRZ that the Site is located within in does not apply to residential development.

Proposed Assessment Methodology

Collection of Baseline Data

- 8.4 Aspect Ecology is in the process of undertaking a suite of survey work at the Site in order to inform the upcoming planning application. A survey of the Site, informed by both Phase 1 and the UK Habitat Classification system methodologies and a condition assessment, were undertaken in July 2024. The habitats on-site are mostly of negligible ecological value, comprising arable fields, with habitats of elevated ecological value within the context of the Site, such as hedgerows, scrub and woodland, present around the field boundaries.

- 8.5 Furthermore, Phase 2 survey work for Badger has been undertaken, whilst surveys for foraging and commuting bats, reptiles, Great Crested Newt and breeding birds are to be undertaken throughout 2025.

Approach to Cumulative Development

- 8.6 The Screening Direction from the Secretary of State states '...there are no cumulative developments which the Secretary of State considers should be taken into account'. As such no cumulative effects will need to be considered within the EIA.

Technical Appendices to Environmental Statement Chapter

- 8.7 The results of the survey work undertaken prior to submission will be set out in a Baseline Ecological Appraisal report, which will form an appendix to an Ecology ES chapter. As it is anticipated that the Phase 2 surveys will extend beyond submission, the results of the outstanding survey work will be set out within a separate technical note to be submitted during the determination period. The planning application will also be accompanied by a Biodiversity Net Gain assessment.

Key Issues/Technical Difficulties

- 8.8 With regards to the Site itself, the Screening Direction received has not identified any on-site receptors. On-site habitats are largely unconstrained with regards to biodiversity, with all features of ecological value located at the field boundaries. A sensitive layout has been developed which allows all habitats of elevated value to be retained (with the exception of losses to small sections of the internal hedgerows to facilitate access). Whilst the results of the Phase 2 survey work are still to be confirmed at this stage, on the basis of the habitats present on-site, it is anticipated that the faunal use of the Site is likely to be concentrated around the boundary features, such that impacts upon such species will readily be able to be avoided/mitigated as appropriate.
- 8.9 As set out at paragraph 8.2, the Screening Direction received has only identified potential impacts upon off-site receptors, such that the key issues relate to the potential impacts upon the surrounding designations set out in Table 8.1.

Potential Environmental Effects

- 8.10 With regards to ecology, the Screening Direction identifies a potential adverse impact upon Ruxley Gravel Pits SSSI, setting out that 'it is considered based on the available information that there is the potential that the open land within the site may support breeding birds associated with the SSSI. Information currently provided regarding species on the site is limited, meaning this cannot be ruled out.'
- 8.11 The Screening Direction also identifies potential adverse impacts upon Kynaston Wood SINC, stating 'given the potential for hydrological links between the development site and the SINC, there is a potential for significant ecological effects on the site itself and the sites in the immediate vicinity.'
- 8.12 In addition, the Screening Direction mentions Crofton Woods SSSI and Scadbury Park LNR as designations present within the vicinity of the Site, albeit no specific impact pathways have been identified with regards to these designations.

Construction

- 8.13 Potential impacts on local designations during construction is largely limited to pollution, such as through contaminated run-off.

- 8.14 With regards to Kynston Woods SINC, as set out above, the Screening Direction identifies the potential for hydrological links between the Site and the designation. There is also potential hydrological connectivity between the Site and Ruxley Gravel Pits SSSI via the River Cray. However, the Site is located at lower elevations to adjoining farmland in the east, whilst overland flows from the Site are directed to the west and south west, and therefore hydrologically the Site is not considered to be directly linked to either the SINC or the SSSI. Further, within the Site itself, there are existing shallow field drains which are overgrown and from current observations flow in a westerly direction and have limited connectivity or direct connectivity to either the River Cray or its immediate associated drainage network.
- 8.15 All other designations in the surrounding area are sufficiently well separated from the Site, such that no impacts arising from the construction phase of the development are anticipated on nearby designations.

Operation

- 8.16 With regards to Ruxley Gravel Pits SSSI, the Screening Direction identifies that 'the open land within the site may support breeding birds associated with the SSSI'. The citation for the SSSI states:

"Reasons for Notification:

Ruxley Gravel Pits are one of the few areas of relatively undisturbed open water in Greater London south of the Thames. They contain a high diversity of habitats and species; the variety of insects and breeding wetland birds are also notable features."

- 8.17 It should be noted that the citation specifically states that it is designated for its breeding wetland birds, and whilst the list of the breeding bird species included within the citation is not exhaustive, it lists specifically wetland species, including Little Ringed Plover, Great Crested Grebe, Little Grebe, Tufted Duck, Reed Bunting, Reed Warbler and Sedge Warbler. The most recent assessment of the condition of the SSSI unit recorded probable or confirmed breeding Great Crested Grebe, Mute Swan, Mallard, Tufted Duck, Moorhen, Coot, Kingfisher, Reed Warbler, Garden Warbler and Long Tailed Tit.
- 8.18 Whilst some wetland species, such as Lapwing and some Geese species, do nest or graze in open arable habitats, no such species are listed within the citation or were recorded during the most recent assessment of the condition of the SSSI unit. As such, it is considered unlikely that the Site provides supporting habitat for any species specifically associated with the SSSI. Regardless, as set out above, breeding bird surveys are scheduled to be conducted at the Site between April-June 2025, which will provide further information on the species assemblage using the Site.
- 8.19 With regards to hydrological impacts upon the surrounding designations, as set out above, there is unlikely to be hydrological links between the Site and the SINC or SSSI.
- 8.20 With regards to the other designations, as discussed previously, these are well removed from the Site, separated by existing developed areas. Whilst the Site does fall within an IRZ, this does not relate to residential development, and the Screening Direction also does not identify any impact pathways that could affect these designations. As such it is considered unlikely that they will be affected by the Proposed Development at the Site.

Mitigation Measures

Construction

- 8.21 Although no specific impact on nearby designations has been identified, standard pollution prevention measures will be implemented during construction which will serve to prevent polluted run-off from leaving the Site.
- 8.22 Otherwise, general construction safeguards will be adhered to, including tree and hedgerow protection, nesting bird checks if required, mammal safeguards, and any other mitigation measures identified to be required during the on-going Phase 2 survey work, in order to safeguard the retained habitats and any protected species on-site.

Operation

- 8.23 As set out above, further surveys for breeding birds are to be undertaken, to clarify the species assemblage present. Based on the habitats on-site, and the surrounding urban environment, this is expected to largely comprise an assembly of common and widespread species using the boundary habitats, whilst the open arable habitats may support declining farmland species. As set out at paragraph 8.18, it is considered highly unlikely that the Site supports wetland species associated with Ruxley Gravel Pits SSSI. The results of the surveys will allow an assessment of the likely impacts of the development upon breeding birds, with proportional mitigation measures proposed as necessary.
- 8.24 As discussed, there is unlikely to be hydrological links between the Site and Kynston Woods SINC or Ruxley Gravel Pits SSSI. In any event, embedded within the design for the Proposed Development is the provision of strategic SuDS features throughout the Site to attenuate and control surface water discharge. These strategic SuDS features will be enhanced to treat surface water flows and reinforced with the provision of on plot SuDS features throughout, so water quality is managed in accordance with regulatory requirements and design best practice. Additionally, flood mitigation storage is proposed within the proposed development in order to alleviate the flood risk to the existing properties downstream. Therefore, the potential effect from flooding and surface water quality is considered to be negligible to minor beneficial.
- 8.25 Otherwise, the remainder to the Phase 2 survey work will inform the mitigation measures to be implemented on-site to safeguard the retained habitats and associated faunal species. Such measures will likely include a sensitive lighting plan to prevent light-spill onto the retained boundary habitats and safeguard nocturnal species using these features, and new habitat creation to compensate for any minor losses to the habitats on-site, such as the hedgerows, etc.

9. Transport

9.1 It is considered that there is the potential for likely significant effects relating to transport and access and so this topic shall be ‘**scoped in**’ to the EIA. The Transport Assessment will be undertaken by SLR.

9.2 The Transport ES chapter shall:

- Define the transport baseline conditions;
- Identify relevant transport receptors;
- Assess:
 - The potential for transport impacts throughout the enabling and construction works and as a result of the completed development, and the resultant transport effects of both;
 - The likely significant transport effects;
 - Any required mitigation or monitoring to address any likely significant adverse transport effects and residual effects; and
 - The potential for cumulative effects in relation to transport together with other agreed upon permitted development schemes in the surrounding area.

Baseline

Current Baseline Conditions

9.3 The Site is bound to the south by the residential roads of Chelsfield Road / Cockmannings Road and to the north by Crockenhill Road. To the west, the Site is bound by residential properties and St Mary Cray Recreation Ground, which has no restricted opening times and provides onward PRow connections towards St Mary Cray High Street with overhead street lighting. To the east, the Site is bound by a PRow, beyond which lies another open field.

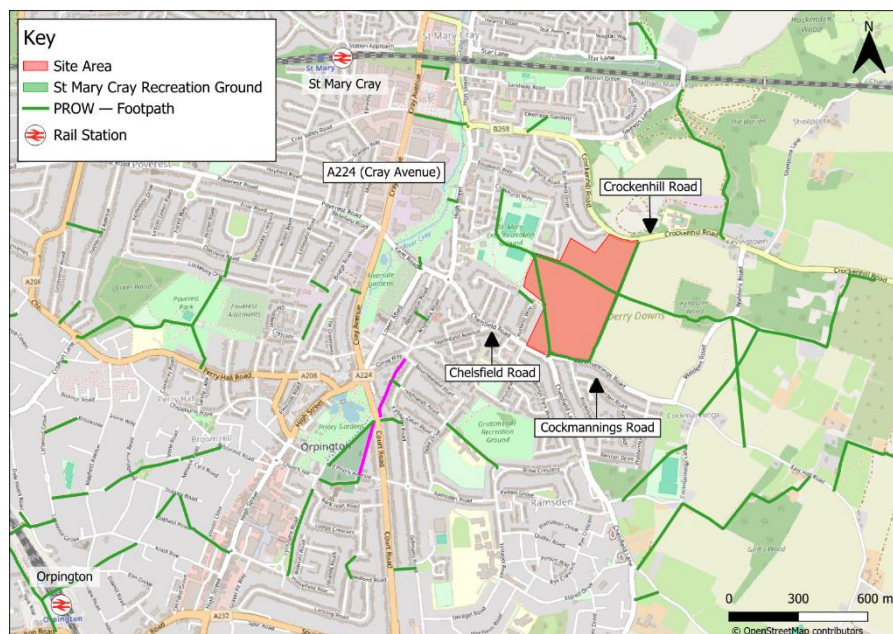
Existing Site Accessibility

Walking and Cycling

9.4 To the south, Chelsfield Road and Cockmannings Road have footways provided on both sides of the carriageway. To the north, there is no footway provided along the Site boundary on the south side of Crockenhill Road. However, there is a footway provided on the northern side of the carriageway.

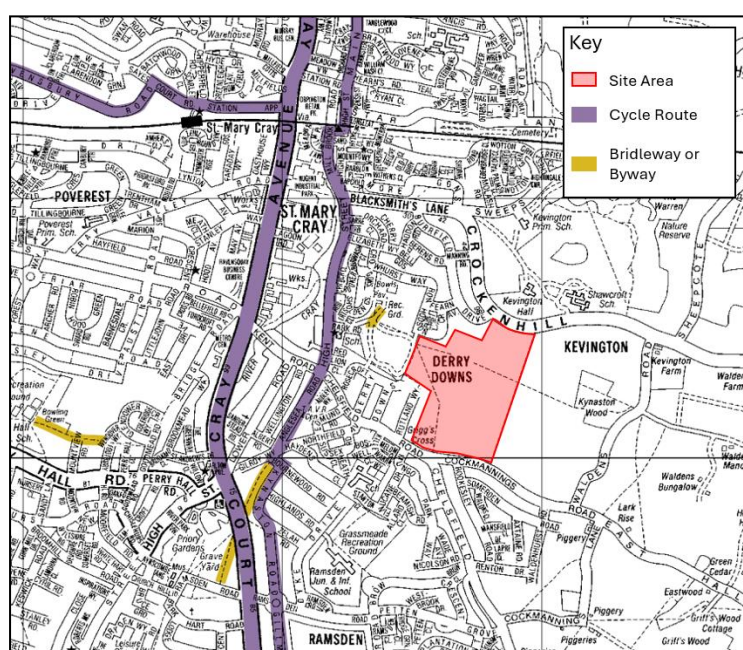
9.5 There are four PRow footpaths that cross the Site, including the FP179, which forms the eastern boundary and routes along the southern boundary, before heading north west through St Mary Cray Recreation Ground. FP180 crosses the site horizontally and links with the FP179 in the east and the west at St Mary Cray Recreation Ground. Figure 9.1 below provides a summary of the PRow within the vicinity of the Site.

Figure 9.1 Public Rights of Way Summary



- 9.6 The existing PROWs illustrated in Figure 9.1 are proposed to be retained.
- 9.7 There is an off-street cycleway provided in the vicinity of the Site on Cray Avenue, to the west of the Site. This is a segregated cycleway provided alongside the footway on the western side of the carriageway on Cray Avenue. There is also an on-street cycleway marked on the southbound lane of Cray Avenue. The cycleways on Cray Avenue link north towards Springvale Retail Park, and south towards Orpington High Street and Orpington Rail Station. A plan of the local cycle routes is shown at Figure 9.2.

Figure 9.2 Local Cycle Routes (Adapted from LBB's Cycle Map)



- 9.8 The Site is therefore connected to existing pedestrian and cyclist infrastructure to provide onward access to existing facilities and amenities.

Bus Connectivity

- 9.9 Existing bus stops are located on the Site boundary to the north and south of the Site, with bus stops located on Chelsfield Road, Cockmannings Road, and Crockenhill Road. These stops serve several bus routes which provide access to locations within St Mary Cray and Orpington, as well as wider destinations such as Hayes and Dartford.
- 9.10 The R4, R6 and 353 bus services are operated by TfL, whereas the 477 service is operated by Arriva. The TfL services have a peak weekday frequency of one service every 20-30 minutes, while the Arriva service has a peak weekday frequency of one service every 60-minutes.

Local Rail Services

- 9.11 The Site is located a circa 25-minute (1.8km) walk or 7-minute cycle from St Mary Cray Rail Station. This station is served by the Thameslink and southeastern rail services, providing connections to London Victoria, Sevenoaks, Gillingham, Ramsgate, and Welwyn Garden City.
- 9.12 Additionally, Orpington Rail Station is located to the south east of the Site and is accessible by all the bus routes summarised above, with journey times between 15-20 minutes. Walking and cycling journey times are around 40-minutes and 12-minutes respectively.
- 9.13 Orpington Rail Station is also served by the Thameslink and southeastern rail services, though these services are more frequent and provide links to a wider range of destinations including London Charing Cross, London Blackfriars, London Cannon Street, Tunbridge Wells, and Luton.

Public Transport Accessibility Level (PTAL)

- 9.14 The PTAL rating of a Site is a widely recognised way to measure connectivity to the public transport network in London.
- 9.15 Access points are taken into consideration within the PTAL calculation if they are within certain walk distance thresholds of the Site; bus stops will be considered if within a maximum of 640m from the Site and rail/tube stations will be taken into account if within a maximum of 960m from the Site. The highest level of accessibility is given a PTAL rating of 6b, whereas the lowest level of accessibility is given a PTAL of 0.
- 9.16 A PTAL assessment using the TfL land use planning PTAL assessment tool WebCAT has been undertaken and identifies the Site as having a PTAL rating of 1a.
- 9.17 It is considered that there are opportunities to introduce TfL bus facilities on-site by either diverting and/or extending existing routes to enhance the PTAL of the Site. Further information is set out later in this document.

Highway Network

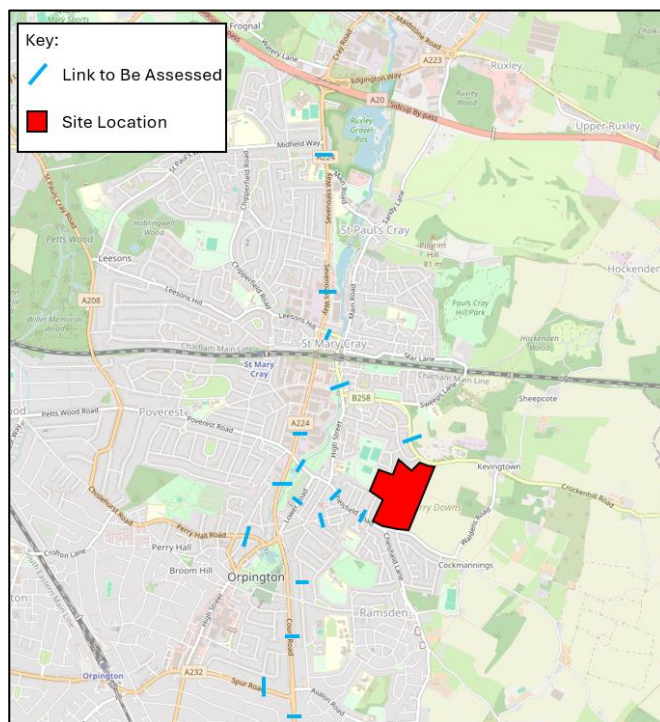
- 9.18 To the south of the Site, Cockmannings Road and Chelsfield Road both run in an east-west alignment, with the two joining at a roundabout junction, west of the southern access point. Both roads have a 30mph posted speed limit and are single-carriageway, two-way routes. Chelsfield Road links west to the A224 (Cray Avenue) a single-carriageway,

two-way route with a 40mph posted speed limit. The A224 runs in a north-south alignment and provides strategic links to the wider highway network, linking north to the A20 and south to the A21.

9.19 To the north, Crockenhill Road has a 30mph posted speed limit in the vicinity of the site. There is a footway provided on the northern extent of the carriageway along the site boundary. This is a single-carriageway, two-way route which links west into St Mary Cray and east towards Crockenhill and further east to the M25.

9.20 The emerging network study area is shown below.

Figure 9.3 Emerging Study Area



Future Surveys

9.21 At this stage it is the intention to make use of the baseline data available from DfT and/or the London Atmospheric Emissions Inventory (LAEI) dataset managed by the Greater London Authority (GLA) and Transport for London (TfL). Alongside this, Manual Classified Count (MCC) for turning movements and queues at junctions during weekday traffic peak periods (to provide classification) and Automated Traffic Count (ATC) surveys for 24 hours, seven days a week will be undertaken (to provide volume, speed and classification) of the highway network as shown above.

Future Baseline Conditions

9.22 As part of the EIA/ Transport Assessment scoping studies key stakeholders will be asked to advise on committed improvements that will change the transport baseline. These may be walking, cycling, public transport or highways improvements. Alongside these, any committed changes to the local area will also be included.

Receptors

9.23 The traffic and transport impacts of the Proposed Development will be assessed in line with the Institute of Environmental Management and Assessment (“IEMA”) guidelines and informed by scoping discussions with the LBB and TfL.

9.24 The scope of the transport assessment will include consideration of:

- The sensitivity of each receptor;
- Assessment Year and Time;
- Temporal Scope; and
- Magnitude of Change.

Potential Sensitive Receptors

9.25 Sensitive receptors that have been identified which are relevant to transport within the study area will be based on the principles set out within Table 9.1.

9.26 The sensitivity of affected receptors will be considered on a scale of high, medium, low or very low. The sensitivity of a road can be defined by the vulnerability of the user groups who may use it, e.g. elderly people, or children.

9.27 A sensitive area may be where pedestrian activity may be high, for example in the vicinity of a school or where there is already an accident issue. It also takes account of the existing nature of the road e.g. an existing ‘A’ road is likely to have a lower sensitivity than a minor residential road as it is already used by a larger volume of traffic therefore a small increase would have a smaller change in the nature of the road.

Table 9.1 Sensitivity of Receptors

Receptor Type	Receptor Sensitivity
Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident clusters, retirement homes, roads without footways that are used by pedestrians	High
Traffic flow sensitive receptors: congested junctions, doctors’ surgeries, hospital, shopping areas with roadside frontage, roads with narrow footways, recreation facilities	Medium
Receptors with some sensitivity to traffic flow: place of worship, public open space, tourist attractions and residential areas with adequate footway provision	Low
Receptors with low sensitivity to traffic flows and those sufficiently distance from affected roads and junctions: links where no pedestrian activity occurs and where there is no provision for pedestrians. For example, strategic roads such as motorways and trunk roads or rural roads where there are no pedestrian-generating land uses within the vicinity	Very Low

9.28 A review of each highway link within the study area in relation to the key factors which affect the sensitivity of that link will be undertaken.

9.29 The scope of the highway network assessed will be agreed with LBB and TfL.

9.30 For the purpose of the Transport ES chapter, this is likely to include assessment of flows on the following roads in the vicinity of the Site, subject to agreement with LBB and TfL:

- Chelsfield Road;
- Kent Road;
- Lower Road;
- Northfield Avenue;
- Kynaston Road;
- Court Road (A224);
- Spur Road (A232);
- Perry Hall Road (A208);
- Cray Avenue (A224);
- Crockenhill Road;
- High Street (Between Blacksmith Lane and Station Road);
- Station Road; and
- Sevenoaks Way (A224).

Assessment of Effects

9.31 Under the IEMA guidelines, it is recommended that the impacts of major developments are considered under each category:

- Severance of communities
- Road vehicle driver and passenger delay
- Non-motorised user delay
- Non-motorised amenity
- Fear and intimidation on and by road users
- Road user and pedestrian safety

9.32 The IEMA guidance states that the *“guidelines are not intended to extend to the wider (multi-modal) transport movement impacts of development projects (e.g. public transport and pedestrian comfort levels of safety). Typically, non-motorised impacts (both beneficial and negative) are assessed within a formal ‘Transport Assessment’, which would inform a traffic and movement (or equivalent) chapter of an ES/EIA Report.”*

9.33 In relation to public transport, the effects of any changes in bus flows will be assessed within the traffic-based assessment. In terms of rail, there will be no environmental effects of additional passengers using these services. The predicted demand for the use of these services will be reviewed to ensure that they can accommodate increases generated by the Proposed Development and whether there is a need for additional bus services. No physical changes are proposed to the rail stations as part of the Proposed Development.

9.34 For clarity the topics not covered within the ES chapter will be:

- Hazardous loads – in relation to hazardous loads, as there are no expected movements within either the construction or operational phases of development of such material.

Methodology

9.35 The methodology for the assessment of transport impacts will utilise weekday annual average daily traffic (AADT) flows, to reflect the peak operational demand of the Proposed Development. The assessment will utilise observed traffic flows, presenting the actual peak hours to assess the peak traffic impact on the operational highway network.

Screening

9.36 The assessment will be undertaken in accordance with the IEMA Guidelines and will also be used within the ES chapter. Within the IEMA Guidelines, two broad rules are suggested which can be used as a screening process to limit the scale and extent of the assessment which in turn assists in identifying links which need to be assessed. These comprise:

1. Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
2. Include highway links of high sensitivity where traffic flows have increased by 10% or more.

9.37 Where the predicted increase in traffic flows is lower than the above thresholds, the IEMA Guidelines suggest the significance of the effects can be stated to be negligible and further detailed assessments are not warranted. Furthermore, increases in traffic flows below 10% are generally considered to be insignificant in environmental terms given that daily variations in background traffic flow may vary by this amount.

Assessment

9.38 The traffic and transport impacts of the Proposed Development will be assessed in line with the IEMA guidelines and informed by scoping discussions with LBB and TfL.

9.39 The scope of the transport assessment will include consideration of:

- The sensitivity of each receptor;
- Assessment Year and Time;
- Temporal Scope; and
- Magnitude of Change.

Assessment Years

9.40 The ES chapter will assess the following scenarios:

- Baseline;
- Baseline plus Construction;
- Core Assessment: Future Baseline; and
- Core Assessment: Future Baseline plus Development.

9.41 The year used for each assessment year is currently subject to future technical discussions with LBB/TfL.

9.42 The description of each of the scenarios is set out below for further information.

Construction Assessment Scenarios

9.43 The construction assessment will provide an understanding of the performance of the local highway network on the day of peak construction along with construction related transport movements.

9.44 At this time, a detailed construction methodology has not been produced, but this will be undertaken over the coming period and the assessment will assess the movements of materials by all relevant modes on the transport network.

Core Assessment Scenarios

- 9.45 The Core Assessment Scenarios provide an understanding of the performance of the local highway network with the known committed developments and infrastructure improvements (i.e. those with planning permission) included. The committed developments will be informed by the relevant local authorities. This is the assessment that any planning application should be assessed against to determine the required infrastructure and is the future baseline.
- 9.46 As part of the core assessment, a multi modal trip generation assessment will be undertaken to identify the quantum of movements by mode by time as a result of the development and these will then be assigned to the transport network and assessed against the future baseline.

Assessment Times

- 9.47 The ES chapter will assess the following time periods for each scenario:

- AM Peak Hour;
- PM Peak Hour; and
- 24 Hour AADT.

Temporal Scope

- 9.48 The temporal scope of the study is essential to consider within the assessment and will identify whether the resultant effects of the Proposed Development will be permanent or temporary in nature and categorised as follows:
- Permanent – these are effects that will remain even when the Proposed Development is complete, although these effects may be caused by environmental changes that are permanent or temporary; and
 - Temporary – these are effects that are related to environmental changes associated with an activity and that will cease when that activity finishes (construction activity). Temporary effects can be further categorised by the time period of which they will last; short-term (0-2 year impact), medium-term (3-5 year impact) and long-term (5-10 year impact).

Determining the Magnitude of Change

- 9.49 The IEMA has published Guidance Notes No:1 Guidelines for the Environmental Assessment of Road Traffic (2023) commonly referred to as the IEMA guidelines. The guidelines provide a thorough approach to the assessment of environmental effects of traffic associated with proposed major developments.
- 9.50 Under the IEMA guidelines, it is recommended that the impacts of major developments are considered under each category:
- Severance of communities;
 - Road vehicle driver and passenger delay;
 - Non-motorised user delay;
 - Non-motorised amenity;
 - Fear and intimidation on and by road users; and
 - Road user and pedestrian safety.
- 9.51 The following paragraphs cover each of the impacts that will be considered within the ES chapter and how the magnitude of change has been derived.

Severance of Communities

- 9.52 Severance is defined as the perceived division that can occur within a community when it becomes separated by major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.
- 9.53 The measurement and prediction of severance is extremely difficult, and there are no predicative formulae that give simple relationships between traffic factors and levels of severance. Relevant factors that need to be considered in determining whether severance is likely to be an important issue include road width, traffic flow, speed, the presence of crossing facilities and the number of movements across the affected route.
- 9.54 The IEMA guidelines state that “*changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively.*” It is advised that these broad indicators should be used with care and regard paid to specific local conditions. These indicators will be used as the basis of assessing the significance of the effect, along with the application of professional judgement to take account of local conditions and the character of each link.

Road Vehicle Driver and Passenger Delay

- 9.55 IEMA guidelines note that driver delay to non-development traffic can occur at several points on the network, although the effects are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.
- 9.56 The assessment of driver delay will normally be based on the technical work reported within the Transport Assessment, which generally focuses on conditions in the network peak periods, with highway mitigation defined to ensure conditions with the development are not materially worse than would otherwise have been the case without the development and mitigation. These assessments will be summarised in the ES chapter where necessary and used to determine the significance of the effect, whilst applying professional judgement.

Non-motorised User Delay

- 9.57 The IEMA guidelines state that the assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads.
- 9.58 IEMA guidelines note that changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility and general physical conditions of the development site.
- 9.59 The IEMA guidelines refer to a report published by the Transport Research Laboratory (“TRL”) as providing a useful approximation for determining pedestrian delay. The TRL research concluded that mean pedestrian delay was found to be 8 seconds at flows of 1,000 vehicles per hour and just below 20 seconds at 2,000 vehicles per hour for various types of crossing condition.
- 9.60 However, the IEMA guidelines state that given the range of local factors and conditions that can influence pedestrian delay, it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect.

9.61 A two-way flow of 1,400 vehicles per hour has been adopted as a lower threshold for assessment (equating to a mean 10 second delay for a link with no pedestrian facilities) in the TRL report. Below this flow pedestrian delay is unlikely to be a significant factor and therefore will be discounted from further assessment. This flow will be used to determine which links require further assessment, taking into account the characteristics of each link i.e. motorways and trunk roads with no pedestrian facilities and where pedestrians are not permitted will not be assessed. These will be assessed in further detail and professional judgement will be used to determine the significance of the effect on each link.

Non-motorised User Amenity

9.62 The IEMA guidelines define pedestrian amenity as “*the relative pleasantness of a journey.*” The guidelines also state that amenity is considered to be affected by traffic flow, traffic composition, pavement width/separation from traffic, and fear and intimidation. The IEMA guidelines refer to TfL’s Healthy Streets Indicators for further information about factors which influence non-motorised amenity.

9.63 The guidelines suggest a tentative threshold for judging the significance of change in pedestrian amenity where traffic flow/ HGV flow is halved or doubled, which would be considered a high change in magnitude. A change of less than half or double would be low and will therefore be discounted from further assessment. These thresholds will be used as the basis of assessing the significance of the effect along with professional judgement. Links where pedestrians are not permitted i.e. motorways, trunk roads etc. and where there is no pedestrian facilities will not be taken forward for further assessment.

Fear and Intimidation

9.64 Fear and Intimidation can be summarised as the impact that all moving objects has on people. It is dependent on the:

- Total volume of traffic;
- Heavy vehicle composition;
- Speed that these vehicles are passing;
- Proximity of traffic to people; and
- Level of protection – i.e. narrow footways.

9.65 It is noted that there are no commonly agreed thresholds for estimating these levels of danger – hence of fear and intimidation – from known traffic and physical conditions.

9.66 However, the IEMA Guidelines have introduced a weighting system to help assessors provide a first approximation of the likelihood of pedestrian fear and intimidation based on average traffic flow, total 18-hour heavy vehicle flow and average vehicle speed. A combination of the following provides a degree of hazard score.

Table 9.2 Fear and Intimidation Degree of Hazard

Average traffic flow over 18-hour day – all vehicles/hour 2-way (a)	Total 18-hour heavy vehicle flow (b)	Average vehicle speed (mph) (c)	Degree of hazard score
+1,800	+3,000	>40	30
1,200-1,800	2,000-3,000	30-40	20
600-1,200	1,000-2,000	20-30	10

<600	<1,000	<20	0
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9.67 The total score from all three elements is combined to provide a 'level' of fear and intimidation, as shown below.

Table 9.3 Levels of Fear and Intimidation

Level of Fear and Intimidation	Total Hazard Score (a) + (b) + (c)
Extreme	71+
Great	41-70
Moderate	21-40
Small	0-20

9.68 The magnitude of impact is then approximated with reference to the changes in the level of fear and intimidation from baseline conditions, as described in Table 9.4.

Table 9.4 Fear and Intimidation Magnitude of Impact

Magnitude of Impact	Change in Step/Traffic Flows (AADT) From Baseline Conditions
High	Two step changes in level
Medium	One step change in level but with: >400 vehicles increase in average 18-hour all vehicles/hour 2-way flows; and/or >500 heavy vehicle increase in total 18-hour heavy vehicle flow
Low	One step change in level with: <400 vehicles increase in average 18-hour all vehicles/hour 2-way flows; and/or <500 heavy vehicle increase in total 18-hour heavy vehicle flow
Negligible	No change in step changes

9.69 In line with the 2023 IEMA Guidelines, the above methodology has been adopted within this assessment.

Road User and Pedestrian Safety

9.70 The IEMA guidelines do not include a definition in relation to safety, stating only that the impact assessment should present calculated changes in levels of the roads' intrinsic safety and the estimated annual reduction in fatal or serious injuries. The guidelines state that *"it is recommended that the traffic and movement expert engages with the relevant authorities to determine the best approach for determining the significance of road safety effects."* Additionally, the standard and prescribed Road Safety Audits (GG 119 – Road Safety Audit DMRB) should be used to review the road safety attributes of any proposed engineering changes in the adopted highway prior to submission.

9.71 Based on the above, the assessment of road user and pedestrian safety will be based on a review of publicly available collision data to determine whether there are any existing safety concerns and whether the Completed Development or Construction phases will exacerbate these.

Summary of Magnitude of Change Derivation

9.72 Based on the definitions of each impact identified above, a summary of the criteria that have been used to determine magnitude of change from the baseline conditions as a result of the Proposed Development are set out in Table 9.5.

9.73 It should also be noted, however, that the absolute effect is also important e.g. the total flow of traffic or HGVs on a link. This is because an increase of 100% in the traffic flow on a road is likely to lead to an insignificant impact if the existing flows are low. Where this is applicable, professional judgement will be applied, and commentary will be clearly provided within the ES chapter.

Table 9.5 Definitions of Magnitude of Change

	Very Low	Low	Medium	High
Severance of Communities	Change in total traffic or HGV flows of less than 30%	Change in total traffic or HGV flows of 30-60%	Change in total traffic or HGV flows of 60-90%	Change in total traffic or HGV flows over 90%
Non-motorised User Delay	Two-way traffic flows < 1,400 vehicles per hour	A judgement based on the road links with two-way traffic flow exceeding 1,400 vehicles per hour in the context of the individual characteristics		
Non-motorised Amenity	Change in total traffic or HGV < 100%	A judgement based on the routes with > 100% change in the context of their individual characteristics		
Fear and Intimidation on and by Road Users	No change in step changes	One step change in level with: <400 vehicles increase in average 18-hour all vehicles/hour 2-way flows; and/or <500 heavy vehicle increase in total 18-hour heavy vehicle flow	One step change in level but with: >400 vehicles increase in average 18-hour all vehicles/hour 2-way flows; and/or >500 heavy vehicle increase in total 18-hour heavy vehicle flow	Two step changes in level
Road Vehicle Driver and Passenger Delay	A judgement based on the volume of traffic, HGV composition, proximity to people and the level of protection and summarised in the ES chapter			
Road User and Pedestrian Safety	A judgement based on quantitative analysis as set out in the Transport Assessment and summarised in the ES chapter			

Determining the Significance of Effects

9.74 Appropriate criteria will be used to determine whether the potential transportation effects of the Proposed Development are significant or not. The following terms have been used to define the significance of the effects:

- **Major effect:** where the Proposed Development is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity. This effect is considered to be 'Significant';
- **Moderate effect:** where the Proposed Development is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability. This effect is considered more likely to be 'Significant' but will be subject to professional judgement;

- **Minor effect:** where the Proposed Development is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the proposed development is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change. This effect is considered less likely to be 'Significant' but will be subject to professional judgement; and
- **Negligible:** where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change. This effect is 'Insignificant.'

9.75 The significance of the effect is judged on the relationship of the magnitude of impact to the assessed sensitivity and/or importance of the receptor. The predicted significance of the impacts is summarised in Table 9.6.

Table 9.6 Significance Evaluation Matrix

Magnitude of Change	Receptor Sensitivity			
	High	Medium	Low	Very Low
High	Major (Significant).	Major (Significant).	Moderate (Significant or not significant).	Minor (Not significant).
Medium	Major (Significant).	Moderate (Significant or not significant).	Minor (Not significant).	Minor (Not significant).
Low	Moderate (Significant or not significant).	Minor (Not significant).	Minor (Not significant).	Negligible (Not significant).
Very Low	Minor (Not significant).	Minor (Not significant).	Negligible (Not significant).	Negligible (Not significant).

9.76 Potential effects are therefore concluded to be of negligible, minor, moderate or major significance. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'. Major significance effects are considered to be significant in terms of EIA guidance. Moderate significance effects require further investigation to determine whether they are significant in terms of EIA guidance.

Summary of Transport Topics Scoped In

9.77 The following topics will be assessed for the construction and operational phases:

- Severance of communities;
- Road vehicle driver and passenger delay;
- Non-motorised user delay;
- Non-motorised amenity;
- Fear and intimidation on and by road users; and
- Road user and pedestrian safety.

9.78 Table 9.7 summarises the transport and access effects identified for inclusion in the assessment.

Table 9.7 Transport and Access Effects

Receptors	Effects	Scoped In
Local Roads	Net change in traffic patterns; daily link flows; traffic speed; effect on personal injury accidents	✓
Pedestrians and Cyclists	Net change in traffic and effect on severance, delay and amenity for pedestrians and cyclists. Effect on personal injury accidents.	✓

9.79 The effects of the receptors will be considered in light of the impact of the cumulative impacts of the scheme, including identified committed developments.

9.80 Any required mitigation as a result of the effects of the Proposed Development will ensure that predicted transport demands are safely accommodated.

Indicative Appendices to Transport ES Chapter

9.81 Authors' Career Experience.

9.82 Transport Assessment.

9.83 Construction Logistics Plan.

10. Summary of Impacts

10.1 A summary of the overall impacts and the proposed scope of the EIA is provided in the table below:

Topic	Potential Impact	Scoped In	Scoped Out
Archaeology and Built Environment	Potential impacts on: - The St Mary Cray Village Conservation Area; - Kevington Cottage, Grade II, NHLE ref.1359350; - Yew Tree Cottage, Grade II, NHLE ref. 1068847; - Blueberry Farmhouse, Grade II, NHLE ref.1064348; and - Archaeological impacts.	Yes	
Ecology	Potential impacts on: - Ruxley Gravel Pits SSSI; - Crofton Woods SSSI; - Scadbury Park LNR; and - Kynaston Wood SINC.	Yes	
Transport	Potential impacts on: - Severance of communities; - Road vehicle driver and passenger delay; - Non-motorised user delay; - Non-motorised amenity; - Fear and intimidation on and by road users; and - Road user and pedestrian safety.	Yes	
Landscape and Visual	It is concluded that the landscape and visual impacts of the Proposed Development would not result in likely significant effects on either the Kent Downs National Landscape or the St Paul's Cray Hill Country Park.		Yes
Air Quality	The Proposed Development itself will not generate pollutants that would adversely impact upon air quality		Yes
Noise	It is considered that an acceptable noise environment can be created both within the dwellings themselves as well as with outdoor private amenity spaces. The Proposed Development would also be designed to ensure that the community provision proposed would not cause unacceptable impacts on the residential amenity of existing dwellings that adjoin the Site.		Yes
Hydrology and Drainage	The Site is located in Flood Zone 1 and it is concluded that appropriate flood risk mitigation can be incorporated into the Proposed Development.		Yes



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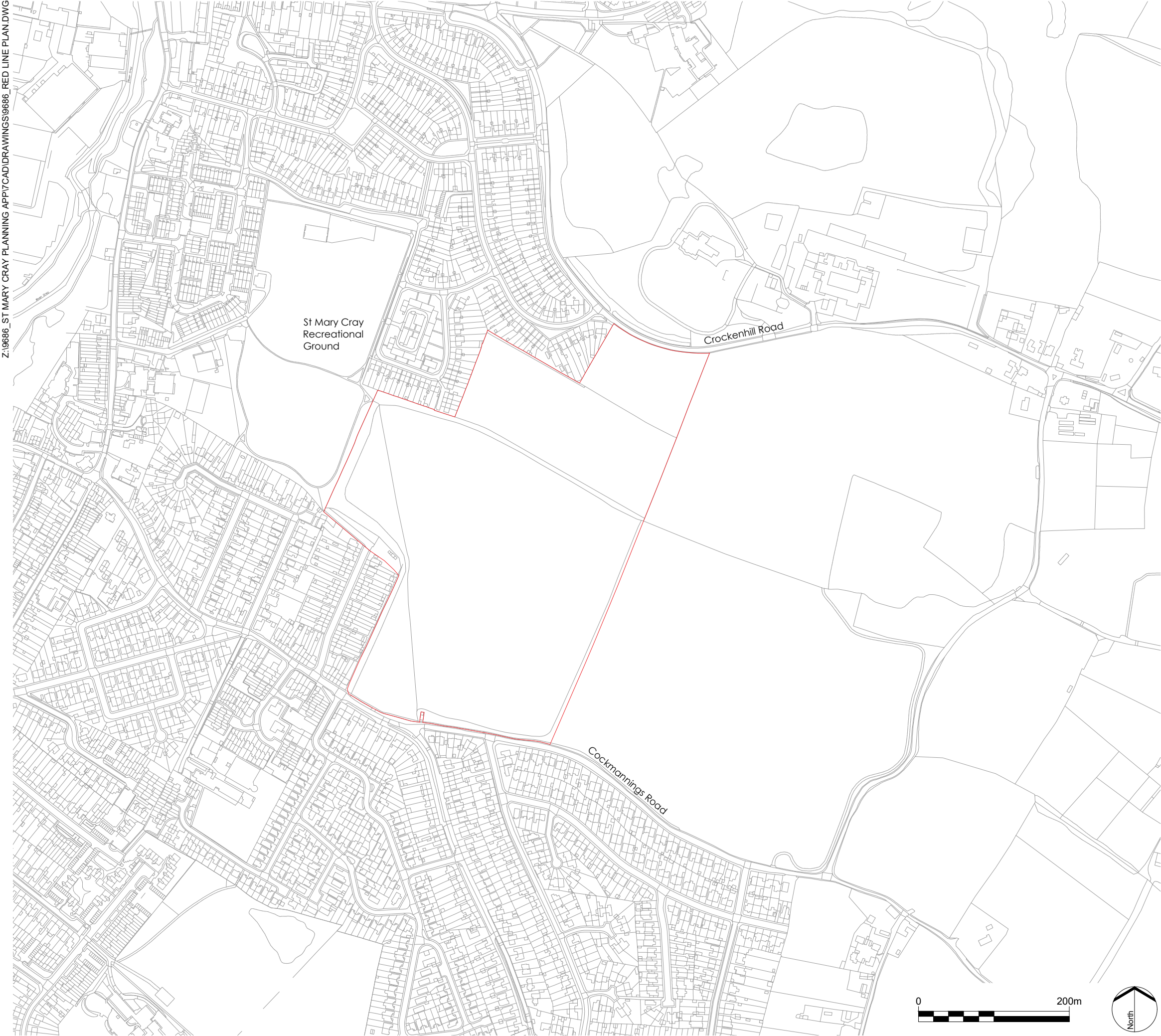
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Appendix 1.1

Site Location Plan

Z:\9686_ST MARY CRAY PLANNING APP\7CAD\DRAWINGS\9686_RED LINE PLAN.DWG



LEGEND

Site Boundary

REV. DESCRIPTION APP. DATE

LD&DESIGN

PROJECT TITLE
St Mary Cray

DRAWING TITLE
Red Line Plan

ISSUED BY	London	T: 020 7467 1470
DATE	14.11.2024	DRAWN EC
SCALE@A3	1:5,000	CHECKED EC
STATUS	Sketch	APPROVED TP

DWG. NO 9686_SK001

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Sources Ordnance Survey

Appendix 1.2

Secretary of State Screening Direction



Ministry of Housing,
Communities &
Local Government

Hywel James
Nexus Planning
Suite 2 Apex Plaza
3 Forbury Road
Reading
RG1 1AX

By email only: h.james@nexusplanning.co.uk

Please ask for: Florence Hewett
Tel: 0303 444 8050
Email: florence.hewett@communities.gov.uk
Your ref: 24/04376/EIA
Our ref: PCU/EIASCR/G5180/3360529
Date: 5 March 2025

Dear Hywel James

**Request for a Screening Direction
Town and Country Planning (Environmental Impact Assessment) Regulations 2017
Proposal for 350 dwellings (50% affordable), with a 4G full sized football pitch and
community hub**

I refer to your request dated 11 February 2025, made under 6(10) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017(S.I. 2017/571) ("the 2017 Regulations") for the Secretary of State's screening direction on the matter of whether or not the above development is 'EIA development' within the meaning of the 2017 Regulations.

The above development falls within the description at paragraph 10 (b) [urban development projects] of Schedule 2 to the 2017 Regulations and is located close to sensitive areas, namely Ruxley Gravel Pits Site of Special Scientific Interest, and Crofton Woods Site of Special Scientific Interest. Since the proposal exceeds the threshold in column 2 of the table in Schedule 2 of the 2017 Regulations, the Secretary of State considers your client's proposal to be 'Schedule 2 development' within the meaning of the 2017 Regulations.

Having taken into account the selection criteria in Schedule 3 to the 2017 Regulations the Secretary of State considers that the development is likely to have significant effects on the environment, see the attached written statement which gives the reasons for direction as required by 5(5) of the EIA Regulations.

Accordingly, in exercise of the powers conferred on her by regulation 7(5) of the 2017 Regulations, the Secretary of State hereby directs that the proposed development described in your client's request and the documents submitted with it, **is 'EIA development'** within the meaning of the 2017 Regulations.

Planning Casework Unit
Ministry of Housing, Communities & Local Government
23 Stephenson Street
Birmingham
B2 4BH

Tel: 0303 444 8050
Email: pcu@communities.gov.uk

Any application for planning permission for this development must be accompanied by an Environmental Statement. Under regulation 2 of the 2017 Regulations, an Environmental Statement must contain, for the purpose of assessing the likely impact on the environment, the information specified in that regulation. I recommend that you refer to the Regulations before and during the preparation of the Statement.

I am sending a copy of this letter and written statement to the London Borough of Bromley.

Yours sincerely,

M Hale

Mike Hale
Decision Officer

This decision was made by officials on behalf of the Secretary of State, and signed on her behalf

Town & Country Planning (EIA) Regulations 2017
Secretary of State Screening Direction – Written Statement

Application name:	Land South of Burrfield Drive, Orpington
SoS case reference:	PCU/EIASC/R/G5180/3360529
Schedule and category of development:	Schedule 2: 10 (b) urban development projects where ii) the development includes more than 150 dwellings

Full statement of reasons as required by 5(5)(a) of the 2017 EIA Regulations including conclusions on likelihood of significant environmental effects.

The development is considered to be Schedule 2 development as it is a type of project identified in paragraph 10b of Column 1 and exceeds the threshold of 150 dwellings in Column 2.

The Secretary of State has considered whether the above proposal is likely to have significant environmental effects. She has undertaken this screening taking into account the criteria set out in Schedule 3 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. In doing so she considers the main matters to be addressed are those set out in Planning Practice Guidance (PPG) where the following are indicated as main matters relevant in the consideration of development in this category: Physical scale of such developments, potential increase in traffic, emissions and noise. In addition biodiversity impacts (species and habitats) and heritage are also considered main matters in this case.

Schedule 3 selection criteria for Schedule 2 development refers:

1 (a) – (f) regarding characteristics of development

The proposal is at the screening request stage and as such, limited relevant information is available in addition to the initial LPA Screening Opinion and developer request. However, a range of consultation responses associated with the LPA Screening Opinion request are available, and consultation has been undertaken with Historic England in addition to those comments provided with the LPA opinion.

The proposal is for development of a greenfield site to construct a proposed 350 dwellings, of which the requestor states 50% will be affordable. The proposals also include a 4G full sized football pitch and community hub. The submitted information indicates that vehicular and pedestrian access will be provided from Crockenhill Road to the north and Cockmannings Road to the south. The requestor states that the development will provide a landscape buffer along the eastern boundary of the Site to contain development from the wider landscape.

The proposal is significantly below the indicative threshold of 1000 dwellings set out in the PPG and the Secretary of State considers that the size and design of the development as a whole is unlikely to result in significant effects.

Whilst this will inevitably comprise a physical change to the locality, given the characteristics of the development, the receiving environment and the nature of the likely impacts, the Secretary of State does not consider that a significant environmental effect is likely in terms of the use of natural resources, the production of waste or the risk of major accidents and/or disasters relevant to the development concerned.

2 (a)-(c) (i) – (viii) regarding location of development

The site comprises approximately 16 hectares of agricultural land. For the purposes of this assessment the environmental baseline is that the entire site comprises of an undeveloped area of agricultural land (graded as urban, i.e. not best and most versatile). The location of the development is not within an environmentally sensitive area as defined in Part 1 of the EIA Regulations and does not sit within a designated site for nature conservation. It does however sit within Natural England's Impact Risk Zones for potential impacts on protected sites.

The protected areas in the wider vicinity of the site:

- Ruxley Gravel Pits SSSI approximately 2.2km north of the site
- Crofton Woods SSSI approximately 3.1km west of the site

The LPA state that towards the East of the site is a site of Importance for Nature Conservation (SINC), Kynaston Wood.

There is also a Local Nature Reserve (LNR), Scadbury Park, approximately 2.8km north west of the site.

The site is not in a designated landscape area, but The Kent Downs National Landscape is located approximately 2.7km south east of site. There is also a country park (St Pauls Cray Hill) approximately 815m north of the site. It is not considered that there would be significant visual impacts on the National Landscape given the distance between this and the site. Any views from the National Landscape which include the site will experience this as part of the existing urban development edge in St Mary Cray and Orpington. The National Landscape was not identified by Natural England in their LPA consultation response. Furthermore, due to intervening development it is not considered that the country park would be impacted by the proposed development.

The site is located at the edge of existing urban development and sits at a point of transition between urban and rural local character. Its context to the west, south and north-west is low-density residential, with agricultural land to the east and parkland associated with Kevington Hall (now an events venue) to the north.

The site when developed will be visible to users of Crockenhill Road and Chelsfield/Cockmannings Road, as well as the footpaths which pass through or close to the site (FP179, FP180). Views of the site will also be visible to residents of existing residential properties around the site – e.g. at Burrfield Drive and Rutland Way. Views from the recreation ground will also be impacted.

The site is within Flood Zone 1 for rivers and the sea, with some surface water flood risk in limited areas within the site.

There are no World Heritage Sites close to the site.

The nearest Registered Park and Garden is Priory Gardens, Orpington (Grade II) which is approximately 730m south-west of the site. The nearest Conservation Area is St Mary Cray, approximately 260m west of the site. The nearest listed building is Kevington Hall (Grade II*), approximately 130m north of the site, north of Crockenhill Road. Other listed buildings are clustered in Kevington to the east, and along St Mary Cray High Street to the west.

As identified by the Greater London Archaeology Advisory Service (GLAAS) in their LPA consultation response, the site is located within a Tier III archaeological priority area and that Roman and Saxon archaeological material has been recorded to indicate possible archaeological potential.

The requestor states that a Heritage Assessment will be prepared 'to determine the potential and likely importance of any non-designated heritage assets. The report will also consider the impact of the Proposed Development on the significance of any potential assets.'

3(a) –(e) regarding characteristics of potential impact

The Secretary of State has considered the likely significant effects of the development on the environment in relation to the characteristics of the development and the location of the development with regard to the impact of the development on the factors specified in regulation 4(2), taking into account—

- (a) the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
- (b) the nature of the impact;
- (c) the transboundary nature of the impact;
- (d) the intensity and complexity of the impact;
- (e) the probability of the impact;
- (f) the expected onset, duration, frequency and reversibility of the impact;
- (g) the cumulation of the impact with the impact of other existing and/or approved development;
- (h) the possibility of effectively reducing the impact.

The Secretary of State considers that the main impacts of the development once operational will be highways impacts, ecological impacts, and heritage impacts.

Heritage Impact

Taking into account the comments of Historic England, as well as those provided to the LPA by GLAAS, overall, the Secretary of State does consider that potential significant effects on cultural heritage in respect of both heritage assets and archaeology are likely.

Historic England comments indicate that from the information given, there may be a significant impact on the historic environment - in particular, Kevington Hall and St Mary Cray Conservation Area. They consider that EIA is required in relation to the historic environment.

GLAAS conclude that the site has potential to produce significant and possibly nationally important archaeology, and is located within an area which has proved to be multi-period archaeologically highly sensitive. They consider the proposal should be assessed through Environmental Impact Assessment including fieldwalking and geophysical survey.

Taking these consultee comments into account, and given the limited information regarding the details of development, including any proposed mitigation, the Secretary of State considers that impacts on the settings of listed buildings and the Conservation Area may be significant in EIA terms.

Given the archaeological potential associated with the site, as set out by GLAAS, the Secretary of State considers archaeological effects may also be significant.

Ecological Impact

Natural England's advice is that, on the basis of the material supplied with the consultation, the proposed development has potential likely significant effects on statutorily designated nature conservation sites or landscapes and further consideration is required.

Natural England advise that the development has the potential for adverse effects on Ruxley Gravel Pits SSSI. While the nature of these effects is not set out in their response, it is considered based on the available information that this may include impacts on habitat associated with species which use the SSSI.

The designation describes the SSSI as one of the few areas of relatively undisturbed open water in Greater London south of the Thames. It states that they contain a high diversity of habitats and species; the variety of insects and breeding wetland birds are also notable features.

Taking the consultee comments into account, it is considered based on the available information that there is the potential that the open land within the site may support breeding birds associated with the SSSI. Information currently provided regarding species on the site is limited, meaning this cannot be ruled out.

The LPA in their opinion state that given the potential for hydrological links between the development site and the SINCE, there is a potential for significant ecological effects on the site itself and the sites in the immediate vicinity. The LPA also reference the Green Belt in this context, but this is not an ecological designation and is not considered relevant to this assessment.

Given the limited information submitted with the request, limiting the ability to identify mitigation, and the potential for impacts on both national and local designated ecological sites, it is considered that significant effects on ecological receptors cannot be ruled out, and should be further assessed through Environmental Impact Assessment.

Highways Impact

Limited information on traffic generation, impact and mitigation is provided with the request. The site will have two accesses, from Crockenhill Road and Cockmannings Road.

Planned routeing for construction vehicles or plans for a Travel Plan are not supplied. There is the potential that construction vehicles will use routes through the centres of Orpington and/or St Mary Cray which due to their built-up nature are likely to be susceptible to congestion at peak times.

Similarly, operational traffic will be generated by the residential, community and recreation uses which is also likely to impact on these local centres. Consultation comments from TfL state that the Public Transport Access Level (PTAL) ranges from 1a to 1b, on a scale of 0 to 6b where 6b is highest. This suggests the potential for significant traffic generation from private vehicles. Similarly the Highways consultee comments provided to the LPA state that the site has a very low (0/1) PTAL so a large percentage of trips are likely to be by car.

The requestor states that generated traffic impacts will be assessed as part of a Transport Assessment.

Given the scale of development, operational traffic impacts may not be significant in EIA terms. However, this cannot be fully assessed at this stage based on the available information. TfL state in their consultation comment that the environmental and social implications of this trip generation should be assessed in the EIA, for example impacts on congestion and bus operations, road safety, air quality, severance and noise. Given this, it is considered that there may be significant effects which should be assessed through EIA.

Similarly, at this stage, significant effects from construction traffic cannot be ruled out due to the limited information and the proximity to established urban centres. The LPA's highways consultee comments that the construction phase will have an impact, particularly in terms of construction vehicles. They state that there is no information about the number of vehicles but it is likely to be over a significant period.

Other matters

Given the mitigation proposed and having considered all available information, there are no other issues amongst those not specifically addressed above which indicate a likelihood of there being significant environmental effects from this proposal.

As set out in PPG, each proposal should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. PPG indicates that only

existing or approved applications ought to be considered. In this case, there are no cumulative developments which the Secretary of State considers should be taken into account.

Overall conclusions

The Secretary of State has had regard to the characteristics of the development, the location of the development and the types and characteristics of potential impacts as set out above and considers that the proposed development has the potential to give rise to significant effects such that EIA is required. In reaching this view she has carefully considered the information put forward by the applicant, the views of the LPA and all consultation responses.

This direction does not affect any duties of the requestor under other legislation, including The Conservation of Habitats and Species Regulations 2017.

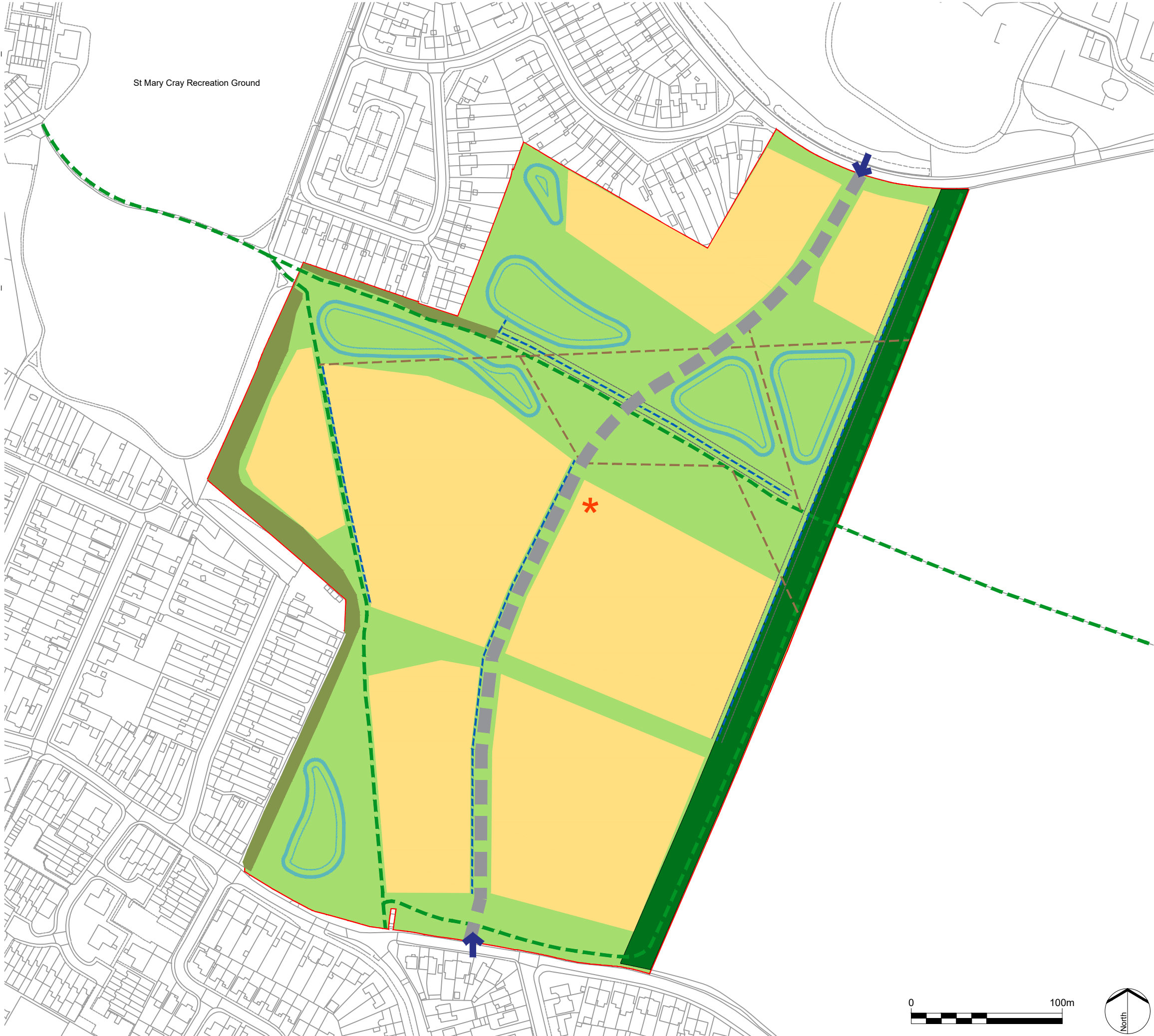
Is an Environmental Statement required?	Yes
---	-----

Name	Florence Hewett
Date	5 March 2025

Appendix 2.1

Concept Plan

Z:\9686_ST MARY CRAY PLANNING APP\7CAD\DRAWINGS\9686_SK002.DWG



St Mary Cray Recreation Ground

LEGEND

Red Line Boundary

Vehicular Access

Primary Vehicular Route

Public Right of Way

New paths

Residential Development

Community Hub

Open Space (includes areas of informal play, footpaths and cycleways and areas for drainage)

Existing Vegetation

Proposed woodland belt

Proposed Attenuation Basin

Proposed Swale

REV.	DESCRIPTION	APP.	DATE
------	-------------	------	------

LD̂DESIGN

PROJECT TITLE
LAND SOUTH OF BURRFIELD DRIVE
ST MARY CRAY

DRAWING TITLE
Concept Masterplan

ISSUED BY	London	T: 020 7467 1470
DATE	Feb 2024	DRAWN SB
SCALE@A3	1:2,500	CHECKED NL
STATUS	Sketch	APPROVED TP

DWG. NO 9686_SK002B

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Sources Ordnance Survey

Appendix 3.1

Application Document List

Item No.	Requirement
National Requirements	
1	Correct application fee
2	Site location plan and block plan.
3	Ownership certificates.
4	Design and Access Statement
Local Requirements	
5	Suite of plans including indicative masterplan and parameter plan.
6	Environmental Statement (including Transport Assessment, Baseline Ecological Appraisal Report, Archaeological Desk Based Assessment, Built Heritage Statement and Archaeological Fieldwalking Report)
7	CIL Form
8	Fire Statement
9	Site photographs
10	Accommodation Schedule (Indicative)
11	Affordable Housing Statement
12	Air Quality Assessment and Air Quality Positive Statement
13	Biodiversity Statement (incl. BNG minimum information requirements) and Species Surveys
14	Circular Economy Statement
15	Delivery and Servicing Plan
16	Energy Strategy
17	Flood Risk Assessment
18	Foul Sewage and Surface Water Drainage Assessment

Item No.	Requirement
19	Green Infrastructure and Landscaping Strategy
20	Land Contamination Assessment
21	Landscape / Townscape and Views Impact Assessment
22	Noise Assessment
23	Draft Heads of Terms
24	Planning Statement
25	Statement of Community Involvement
26	Travel Plan
27	Tree Survey and Arboricultural Implications Report
28	Social Infrastructure Statement
29	Healthy Streets and Active Travel Zone Assessment

Appendix 7.1

Archaeological Desk Based Assessment

ARCHAEOLOGICAL DESK BASED ASSESSMENT

Land at St Mary Cray, East, London Borough of Bromley

794-PLN-HER-00980
St Mary Cray East
2
February 2025

Quality Management					
Version	Status	Authored by	Reviewed by	Approved by	Date
Version 1	Final	Suzanne Gailey			
Version 2	Final	Suzanne Gailey			

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EXECUTIVE SUMMARY

- The site at St Mary Cray East has been assessed for its below ground archaeological potential
- The proposed development will not impact on any designated archaeological assets.
- This assessment has concluded that the Site has a low to moderate potential for buried remains dating to the prehistoric periods and a moderate potential for evidence dating to the Roman periods. Any buried archaeological remains on the site are likely to be of local to at most regional significance.
- As the surviving field boundaries are of local heritage interest it is recommended that where possible they are retained within the future development.
- A geophysical survey of the site has recorded no anomalies of confirmed archaeological interest.
- It is therefore concluded that archaeology will not constrain any future development of the site and all further mitigation measures could follow planning consent secured by an appropriately worded condition.

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Appendix 1 – HER Location Plan (GLHER 2024)

Appendix 2 – Geophysical Survey Report (Sumo 2025)

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- Figure 4: 1841 St Mary Cray Tithe Map
- Figure 5: 1868 Ordnance Survey
- Figure 6: 1895 Ordnance Survey
- Figure 7: 1907 Ordnance Survey
- Figure 8: 1931 Ordnance Survey
- Figure 9: 1966 Ordnance Survey
- Figure 10: 2024 Aerial Photograph (GoogleEarth)

1 INTRODUCTION AND SCOPE OF STUDY

- 1.1 This below ground archaeological desk-based assessment has been prepared by RPS Consulting on behalf of Lands Improvement Holdings Ltd.
- 1.2 The subject of this assessment, also known as the study site, is land at St Mary Cray East, London Borough of Bromley. The site is centred at TQ 47700 67267 (Fig. 1).
- 1.3 Lands Improvement have commissioned RPS to establish the archaeological potential of the site and to provide guidance on ways to address any archaeological constraints identified.
- 1.4 In accordance with relevant policy and guidance on archaeology and planning, and in accordance with the 'Standard and Guidance for Historic Environment Desk-Based Assessments' (Chartered Institute for Archaeologists October 2020), this assessment draws together the available archaeological, topographic and land-use information in order to clarify the archaeological potential of the site.
- 1.5 This desk-based assessment comprises an examination of evidence on the Greater London Historic Environment Record (GLHER), and other sources, and includes the results of a comprehensive map regression exercise.
- 1.6 This assessment thus enables relevant parties to assess the archaeological potential of various parts of the site and to consider the need for design, civil engineering, and archaeological solutions to the archaeological potential identified.

2 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

- 2.1 In March 2012, the government published the National Planning Policy Framework (NPPF), which was most recently revised in December 2024. The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014 and has since been periodically updated.
- 2.2 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

National Planning Policy

- 2.3 Section 16 of the NPPF, entitled 'Conserving and Enhancing the Historic Environment' provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:
- Delivery of sustainable development;
 - Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
 - Conservation of England's heritage assets in a manner appropriate to their significance; and
 - Recognition of the contribution that heritage makes a contribution towards our knowledge and understanding of the past.
- 2.4 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 207 states that planning decisions should be based on the significance of the heritage asset and that the level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal upon the significance of that asset.
- 2.5 *Heritage Assets* are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing).
- 2.6 Annex 2 also defines *Archaeological Interest* as a heritage asset which holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point.
- 2.7 A *Nationally Important Designated Heritage Asset* comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.
- 2.8 *Significance* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.
- 2.9 *Setting of a heritage asset* is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

- 2.10 In short, government policy provides a framework which:
- Protects nationally important designated Heritage Assets;
 - Protects the settings of such designations;
 - In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions;
 - Provides for the excavation and investigation of sites not significant enough to merit *in-situ* preservation.
- 2.11 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance and make the interpretation publicly available. Key elements of the guidance relate to assessing harm. An important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.
- 2.12 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

Local Planning Policy

London Plan

- 2.13 The proposed development has been assessed against relevant policies in the London Plan (March 2021). Chapter 7 'Heritage and Culture' contains relevant policies. Of particular relevance to archaeological sites within Greater London is policy HC1 as follows:

POLICY HC1 HERITAGE CONSERVATION AND GROWTH

- A. BOROUGHES SHOULD, IN CONSULTATION WITH HISTORIC ENGLAND, LOCAL COMMUNITIES AND OTHER STATUTORY AND RELEVANT ORGANISATIONS, DEVELOP EVIDENCE THAT DEMONSTRATES A CLEAR UNDERSTANDING OF LONDON'S HISTORIC ENVIRONMENT. THIS EVIDENCE SHOULD BE USED FOR IDENTIFYING, UNDERSTANDING, CONSERVING, AND ENHANCING THE HISTORIC ENVIRONMENT AND HERITAGE ASSETS, AND IMPROVING ACCESS TO, AND INTERPRETATION OF, THE HERITAGE ASSETS, LANDSCAPES AND ARCHAEOLOGY WITHIN THEIR AREA.**
- B. DEVELOPMENT PLANS AND STRATEGIES SHOULD DEMONSTRATE A CLEAR UNDERSTANDING OF THE HISTORIC ENVIRONMENT AND THE HERITAGE VALUES OF SITES OR AREAS AND THEIR RELATIONSHIP WITH THEIR SURROUNDINGS. THIS KNOWLEDGE SHOULD BE USED TO INFORM THE EFFECTIVE INTEGRATION OF LONDON'S HERITAGE IN REGENERATIVE CHANGE BY:**

1. SETTING OUT A CLEAR VISION THAT RECOGNISES AND EMBEDS THE ROLE OF HERITAGE IN PLACE-MAKING
 2. UTILISING THE HERITAGE SIGNIFICANCE OF A SITE OR AREA IN THE PLANNING AND DESIGN PROCESS
 3. INTEGRATING THE CONSERVATION AND ENHANCEMENT OF HERITAGE ASSETS AND THEIR SETTINGS WITH INNOVATIVE AND CREATIVE CONTEXTUAL ARCHITECTURAL RESPONSES THAT CONTRIBUTE TO THEIR SIGNIFICANCE AND SENSE OF PLACE
 4. DELIVERING POSITIVE BENEFITS THAT CONSERVE AND ENHANCE THE HISTORIC ENVIRONMENT, AS WELL AS CONTRIBUTING TO THE ECONOMIC VIABILITY, ACCESSIBILITY AND ENVIRONMENTAL QUALITY OF A PLACE, AND TO SOCIAL WELLBEING.
- C. DEVELOPMENT PROPOSALS AFFECTING HERITAGE ASSETS, AND THEIR SETTINGS, SHOULD CONSERVE THEIR SIGNIFICANCE, BY BEING SYMPATHETIC TO THE ASSETS' SIGNIFICANCE AND APPRECIATION WITHIN THEIR SURROUNDINGS. THE CUMULATIVE IMPACTS OF INCREMENTAL CHANGE FROM DEVELOPMENT ON HERITAGE ASSETS AND THEIR SETTINGS SHOULD ALSO BE ACTIVELY MANAGED. DEVELOPMENT PROPOSALS SHOULD AVOID HARM AND IDENTIFY ENHANCEMENT OPPORTUNITIES BY INTEGRATING HERITAGE CONSIDERATIONS EARLY ON IN THE DESIGN PROCESS.
- D. DEVELOPMENT PROPOSALS SHOULD IDENTIFY ASSETS OF ARCHAEOLOGICAL SIGNIFICANCE AND USE THIS INFORMATION TO AVOID HARM OR MINIMISE IT THROUGH DESIGN AND APPROPRIATE MITIGATION. WHERE APPLICABLE, DEVELOPMENT SHOULD MAKE PROVISION FOR THE PROTECTION OF SIGNIFICANT ARCHAEOLOGICAL ASSETS AND LANDSCAPES. THE PROTECTION OF UNDESIGNATED HERITAGE ASSETS OF ARCHAEOLOGICAL INTEREST EQUIVALENT TO A SCHEDULED MONUMENT SHOULD BE GIVEN EQUIVALENT WEIGHT TO DESIGNATED HERITAGE ASSETS.
- E. WHERE HERITAGE ASSETS HAVE BEEN IDENTIFIED AS BEING AT RISK, BOROUGHSHOULD IDENTIFY SPECIFIC OPPORTUNITIES FOR THEM TO CONTRIBUTE TO REGENERATION AND PLACE-MAKING, AND THEY SHOULD SET OUT STRATEGIES FOR THEIR REPAIR AND RE-USE.

London Borough of Bromley

- 2.14 The relevant Development Plan framework is provided by the Bromley Local Plan which was adopted in January 2019 and is currently under review. It contains the following relevant policy:

Policy 46

Scheduled Monuments and Archaeology

Planning permission will not be granted for development that would adversely affect Scheduled Ancient Monuments or other Nationally Important Archaeological Sites, involve significant alterations to them or harm their settings.

When considering planning applications for development involving excavation or other ground works the Council will require that:

Within the defined Areas of Archaeological Significance, a written statement of the likely impact is submitted in the form of an archaeological assessment (which can be desk based); where necessary information cannot be obtained by other means, an archaeological field evaluation should be carried out prior to determination;

At sites of potential archaeological importance (as defined below), where permanent preservation in situ is not justified, provision shall be made for an appropriate level of investigation and recording to be undertaken by a recognised archaeological organisation before any development commences.

Where investigations indicate that in situ preservation is inappropriate, excavation and recovery should be carried out by a reputable archaeological body, before development commences. Any such investigations shall be in accordance with a detailed scheme to be approved in advance by the Council and the results shall be subsequently published.

Where in situ preservation is appropriate, suitable designs, land uses and management strategies will be required, and any archaeological strategy that the Council may produce in the future should be promoted.

- 2.15 No designated heritage assets lie on the Site. The closest Listed Building is Kevington County Primary School which is Grade II* Listed and lies approximately 200m north-east of the study site. Built heritage matters will not be considered further in this assessment.
- 2.16 The site lies within an Archaeological Priority Area (Upper Clay Valley and Floodplain) as defined by the Local Planning Authority's archaeological advisors at GLAAS (Greater London Archaeological Advisory Service). This area has been defined due to its perceived potential for remains dating to the Prehistoric, Roman, Medieval and Post Medieval periods.
- 2.17 In line with relevant planning policy and guidance, this desk based assessment seeks to clarify the site's archaeological potential and the need or otherwise for additional mitigation measures.

3 GEOLOGY AND TOPOGRAPHY

Geology

- 3.1 The solid geology at the site is recorded as Thanet Beds (Sand) with a band of Lewes Nodular Chalk formation crossing the centre of the site (BGS online 2024). No superficial geology is recorded.

Topography

- 3.2 The Site forms part of the Derry Downs to the east of St Mary Cray. It comprises gently sloping ground from the centre of the site at c55m AOD rising to approximately 60m AOD in the north and south.
- 3.3 No water courses lie on or close the site. The River Cray flows approximately 500m to the west of the study site.

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND WITH ASSESSMENT OF SIGNIFICANCE

Timescales used in this report

Prehistoric

Palaeolithic	900,000 -	12,000 BC
Mesolithic	12,000 -	4,000 BC
Neolithic	4,000 -	2,500 BC
Bronze Age (including Chalcolithic)	2,500 -	800 BC
Iron Age	800 -	AD 43

Historic

Roman	AD 43 -	410
Saxon/Early Medieval	AD 410 -	1066
Medieval	AD 1066 -	1485
Post Medieval	AD 1486 -	1799
Modern	AD 1800 -	Present

Introduction

- 4.1 What follows comprises a review of known archaeological assets within a 500m radius of the study site (Appendix 1) also referred to as the study area, held on the Greater London Historic Environment Record (HER), together with a historic map regression exercise charting the development of the study area from the 18th century onwards until the present day. The results of a recent geophysical survey of the Site has also been used to inform this assessment.
- 4.2 This chapter reviews the available archaeological/historical evidence for the study site and the surrounding area, and, in accordance with NPPF, considers the potential for any as yet to be discovered archaeological evidence on the study site prior to any assessment of any later development or below ground impacts
- 4.3 Chapter 5 subsequently considers the site conditions, later development and below ground impacts, and whether the proposed development is likely to impact archaeological assets and potential archaeological assets identified below.

Previous Archaeological Work

- 4.4 A geophysical survey of the site was undertaken in January 2025 (Appendix 2). No anomalies interpreted as being of definite archaeological interest were recorded. Responses of uncertain origin have been detected in the survey which have probably been caused by natural or agricultural processes. Two former field boundaries and a service pipe were identified (Sumo 2025).

Prehistoric – Palaeolithic, Mesolithic, Neolithic, Bronze Age and Iron Age

- 4.5 No evidence of Palaeolithic activity has been recorded within a 500m radius of the study site.
- 4.6 A Neolithic flake, Mesolithic scraper and pot-boiler were found in a field adjacent to the site approximately 200m east of the study site (141271 TQ4800467305)
- 4.7 No other evidence of prehistoric activity has been recorded within a 500m radius of the study site however within the wider landscape a focus of prehistoric activity has been recorded within the Cray Valley to the west of the Site. The area around Poverest Road has been identified as a possible Mesolithic lithic working site due to the flintwork found there during archaeological excavations (MLO676, TQ469 678) and Mesolithic finds have also been found on Lower Road.
- 4.8 The site's location away from the River Cray suggest it was unlikely to have been a focus for activity during these periods however the higher ground may have been favoured for strategic occupation such as funerary activity overlooking the river valley.
- 4.9 Overall based on the available evidence the site is considered to have a low to moderate archaeological potential for significant evidence of occupation dating to the prehistoric periods.

Roman

- 4.10 A Roman coin, brooch and knife handle was identified during metal detecting the field adjacent to the site approximately 75m east of the study site (103993 TQ4780467004).
- 4.11 Roman pottery sherds were found at the Recreation ground approximately 250m west of the study site (115250 TQ4727567505).
- 4.12 Further evidence of Roman activity has been identified within St Mary Cray to the west of the study site. In particular Fordcroft Roman Villa, is a substantial Roman building complex located approximately 700m west of the study site, now a nationally significant designated Scheduled Monument. The villa was winged and included a bath house. Occupation extended from the 2nd to the 4th century and there is some suggestion of 'squatter' occupation into the 5th century.
- 4.13 The site's location on higher ground away from the natural water source may have made it a favoured location for agricultural land rather than settlement activity although the presence of finds in proximity to the site does suggest that evidence of occupation cannot be entirely ruled out. Overall the archaeological potential for significant settlement evidence is considered to be moderate.

Anglo-Saxon/Early Medieval & Medieval

- 4.14 The earliest reference to St Mary Cray is in the Domesday Book of 1086. By 1270 the area was known as 'Seynte Mary Cray', with settlement focussed on the High Street to the west of the study site.
- 4.15 During the early Anglo Saxon period, an extensive inhumation and cremation cemetery was established alongside the Fordcroft Roman villa, with approximately 75 burials having been excavated during the twentieth and twenty first centuries. This area is now part of the Scheduled Monument, c.700m west of the study site and does suggest that a significant population was settled at St Mary Cray during this period. Evidence of Saxon and Medieval occupation has been encountered within the historic core of the town.
- 4.16 Saxon finds comprising a Bronze strapend and a fragment of two coins were found during metal detecting. The HER records the findspot as within the north-western boundary of the study site (126738/152754 TQ4762467405).

- 4.17 A concentration of silver coins from within an area of around 40m were found during metal detecting. The HER records the findspot as lying just outside the south-eastern boundary of the Study site. It is considered possible that these coins formed part of a hoard that had been spread out by ploughing (144439 TQ4776567004).
- 4.18 A Medieval brooch was found whilst metal detecting the adjacent field approximately 750m east of the study site (101348 TQ4810467004). A Medieval seal was also found approximately 75m east of the study site (137931 TQ4790467305).
- 4.19 The finds identified within the Site most likely represent casual loss rather than evidence of potential occupation dating to these periods and it is likely that the site comprised agricultural land within the hinterland of the settlement at St Mary Cray. Overall a low to moderate potential is considered for evidence dating to these periods with evidence of agricultural activity more likely to be represented.

Post Medieval & Modern (including map regression exercise)

- 4.20 During the later Post Medieval and Modern periods, our understanding of settlement, land-use and the utilisation of the landscape is enhanced by cartographic and documentary sources, which can give additional detail to data contained within the HER.
- 4.21 During the Post Medieval period the site comprised open agricultural land to the south-west of Kevington House some distance to the east of the historic core of St Mary Cray (Fig. 2). There was no change by the late 18th century (Fig. 3).
- 4.22 The St Mary Cray tithe map of 1841 (Fig. 4) records the site in more detail comprising a series of agricultural fields.
- 4.23 There was no change by the late 19th century (Figs 5 and 6) and during the 20th century the site continued to comprise agricultural fields (Fig. 7 and 8).
- 4.24 Bomb damage records (Bombsight) record that 6 High Explosive bombs were dropped in the south of the site between 1940 and 1941 (Cockmanning Road). A further bomb was dropped in the north of the site (Crockenhill Road). The geophysical survey across the site did not identify any evidence of bomb damage (Appendix 2).
- 4.25 By the 1960s St Mary Cray had expanded eastwards and the land to the west had been turned into recreation ground (Fig. 9). There has been no subsequent change to the study site apart from the removal of field boundaries (Fig. 10).
- 4.26 Consequently, the potential for significant settlement evidence dating to these periods is considered to be low. The extant field boundaries date from the 19th century or earlier and as such have some local heritage interest.

Assessment of Significance

- 4.27 Existing national policy guidance for archaeology (the NPPF as referenced in section 2) enshrines the concept of the 'significance' of heritage assets. Significance as defined in the NPPF centres on the value of an archaeological or historic asset for its 'heritage interest' to this or future generations.
- 4.28 No relevant nationally significant designated heritage assets as defined in the NPPF are recorded within the study site.
- 4.29 Isolated finds dating to the Saxon period have been recorded during metal detecting across the Site. These finds most likely are a result of casual loss rather than evidence of potential occupation dating to this period.

- 4.30 The recent geophysical survey across the site recorded no significant archaeological anomalies although some anomalies of unknown interest were identified. Green Waste which has been spread on the site could potentially be masking further evidence of activity.
- 4.31 Based on available evidence the site is considered to have a low to moderate potential for in situ evidence dating to the prehistoric periods and a moderate potential for evidence dating to the Roman periods. The potential for significant evidence dating to all other past periods of human activity is considered to be low. Any archaeological evidence on the Site is considered likely to be of local to at most regional significance.
- 4.32 Extant field boundaries are considered to be of local significance.
- 4.33 As identified by desk-based work, archaeological potential by period and the likely significance of any archaeological remains which may be present within the study site is summarised in table form below:

Period:		Identified Archaeological Potential and Likely Significance (if present):
Prehistoric		Low to moderate potential for evidence of activity and occupation, Low (Local) to Moderate (Regional) Significance;
Roman		Moderate potential for evidence of activity and occupation, Low (Local) Significance;
Anglo-Saxon & Medieval		Low potential for evidence of activity and occupation, evidence of agricultural activity possible Low (Local) Significance;
Post Medieval & Modern		Low potential for evidence of activity and occupation, evidence of agricultural activity possible. Low (Local) Significance. Extant field boundaries are of local Significance

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

Site Conditions

- 5.1 The study site currently comprises an agricultural field currently under arable cultivation. A public footpath crosses the Site (Fig. 10)
- 5.2 Centuries of past ploughing will have had a widespread below ground impact. The impact of any World War II bomb damage and clearance will have been substantial and removed any archaeological potential from within its footprint.

Proposed Development

- 5.3 It is proposed to develop the site with residential development and associated landscaping and infrastructure.

Review of Potential Development Impacts on Archaeological Assets

- 5.4 The proposed development will not impact on any designated archaeological assets.
- 5.5 The proposed development has the potential to impact as yet to be discovered archaeological assets of a likely local to at most regional significance.
- 5.6 It is recommended that where possible the extant field boundaries are retained within the future development.

6 SUMMARY AND CONCLUSIONS

- 6.1 In accordance with relevant government planning policy and guidance, a desk based assessment has been undertaken to clarify the below ground archaeological potential of the study area.
- 6.2 No designated heritage assets lie on the Site. The Site does lie within an Archaeological Priority Area as defined by the Local Planning Authority and their archaeological advisors at GLAAS.
- 6.3 The recent geophysical survey across the site recorded no significant archaeological anomalies although some anomalies of unknown interest were identified. Green Waste which has been spread on the site could potentially be masking further evidence of activity.
- 6.4 Based on available evidence the site is considered to have a low to moderate potential for in situ evidence dating to the prehistoric periods and a moderate potential for evidence dating to the Roman periods. The potential for significant evidence dating to all other past periods of human activity is low. Any archaeological evidence on the Site is considered likely to be of local to at most regional significance. Extant field boundaries are considered to be of local significance.
- 6.5 The proposed development has the potential to impact buried archaeological remains of a likely local to at most regional significance. It is recommended that where possible the extant field boundaries are retained within the future development.
- 6.6 It is therefore concluded that archaeology will not constrain any future development of the site and all further mitigation measures could follow planning consent secured by an appropriately worded condition.

Sources Consulted

General

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Greater London Historic Environment Record

The National Archive

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Domesday Online – <http://www.domesdaybook.co.uk/>

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Cartographic

1766 Rocque

1787 John Corris

1841 Tithe Map

1861-71 Ordnance Survey

1894 Ordnance Survey

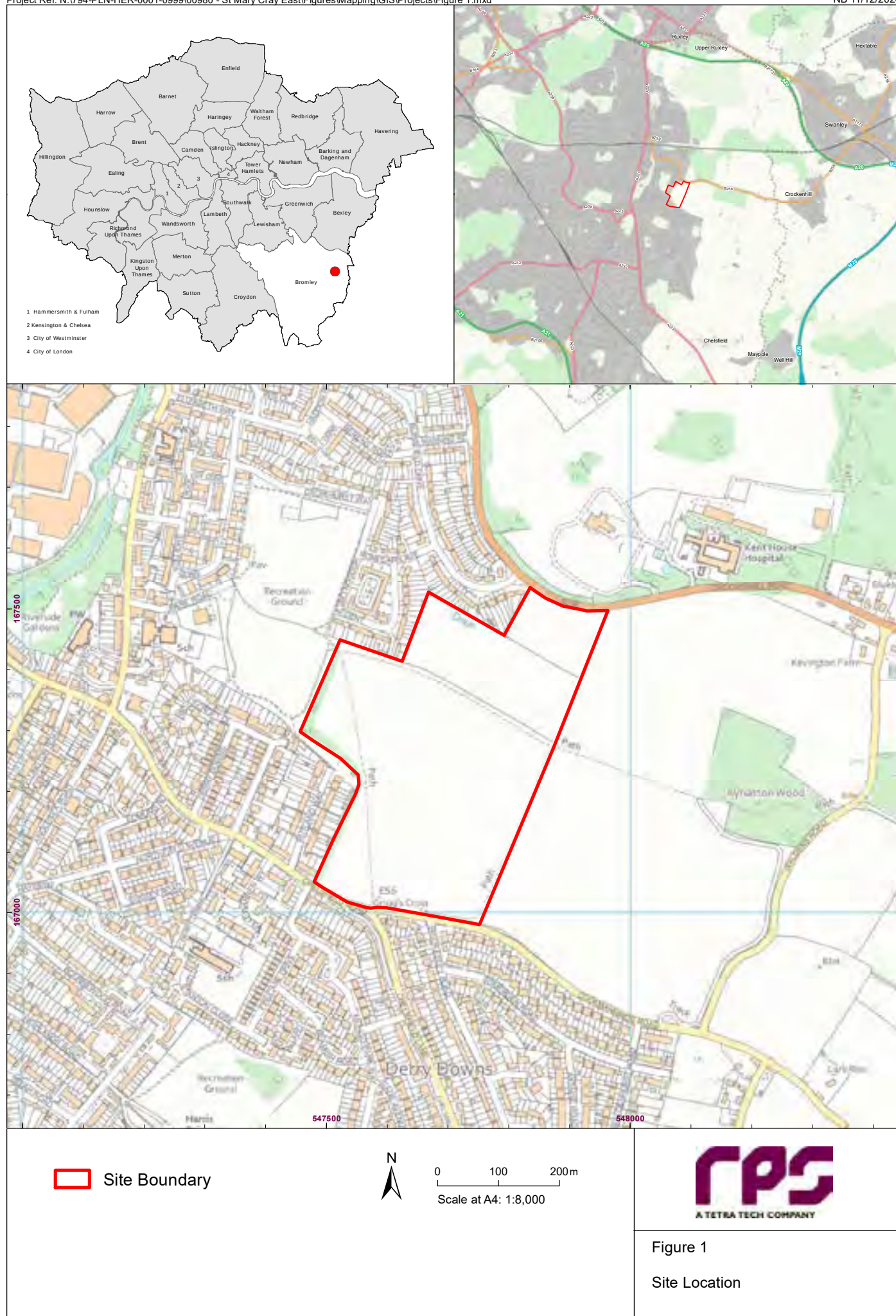
1916 Ordnance Survey

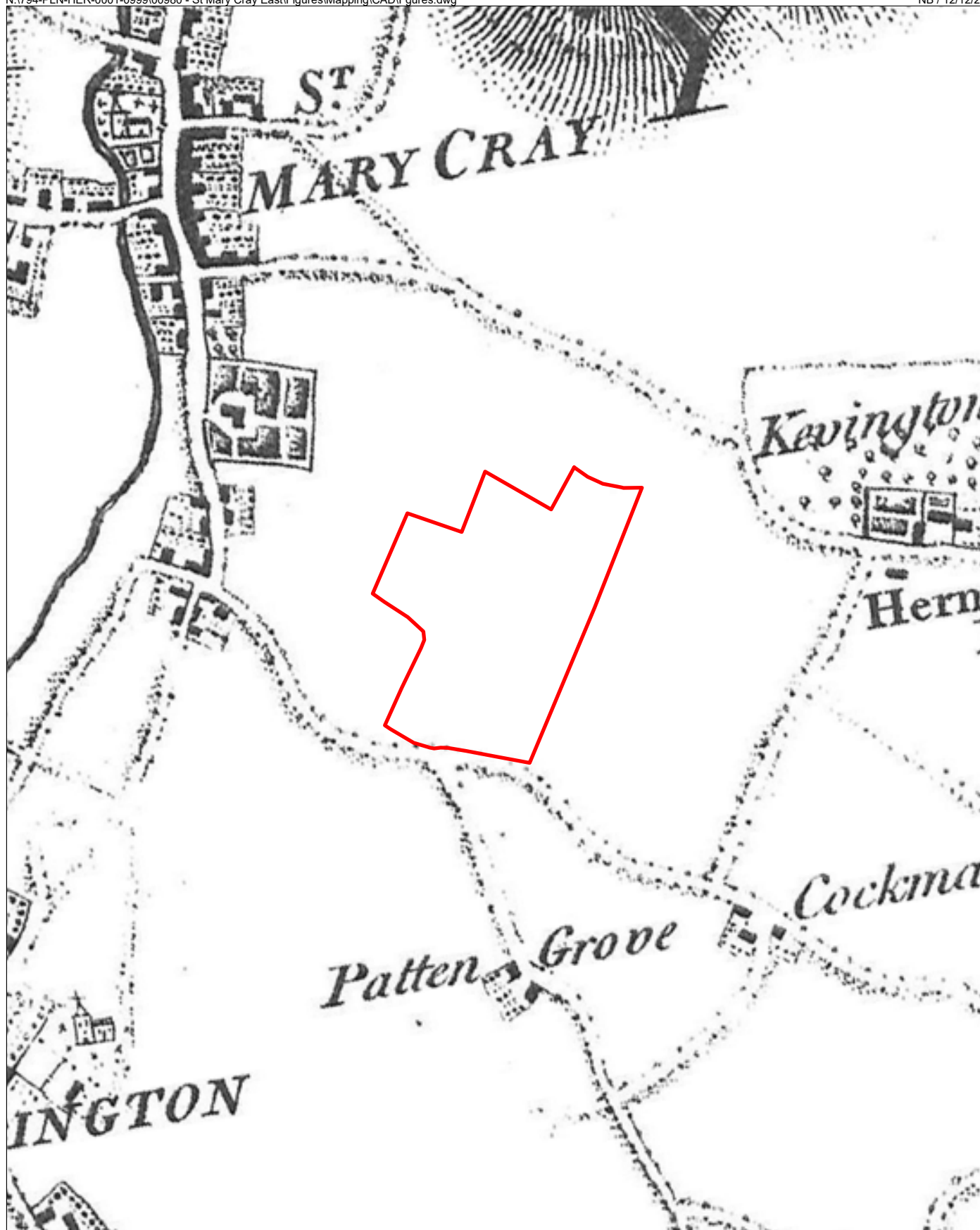
1952 Ordnance Survey

1968 Ordnance Survey

1989 Ordnance Survey

FIGURES





 Site Boundary (approximate)

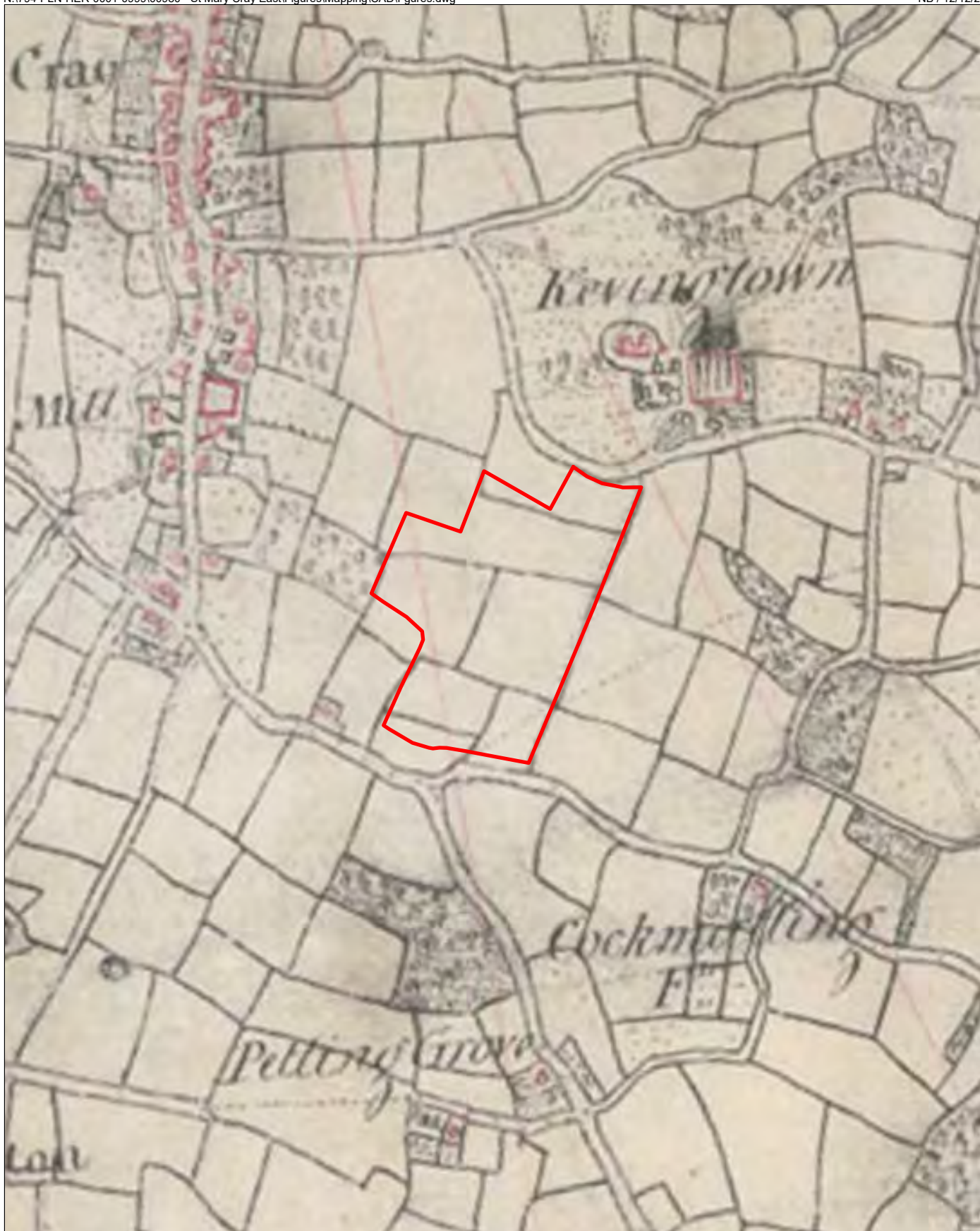


0 100 200m
Scale at A4: 1:10,000



Figure 2

1769 Andrews and Dury Map



 Site Boundary (approximate)

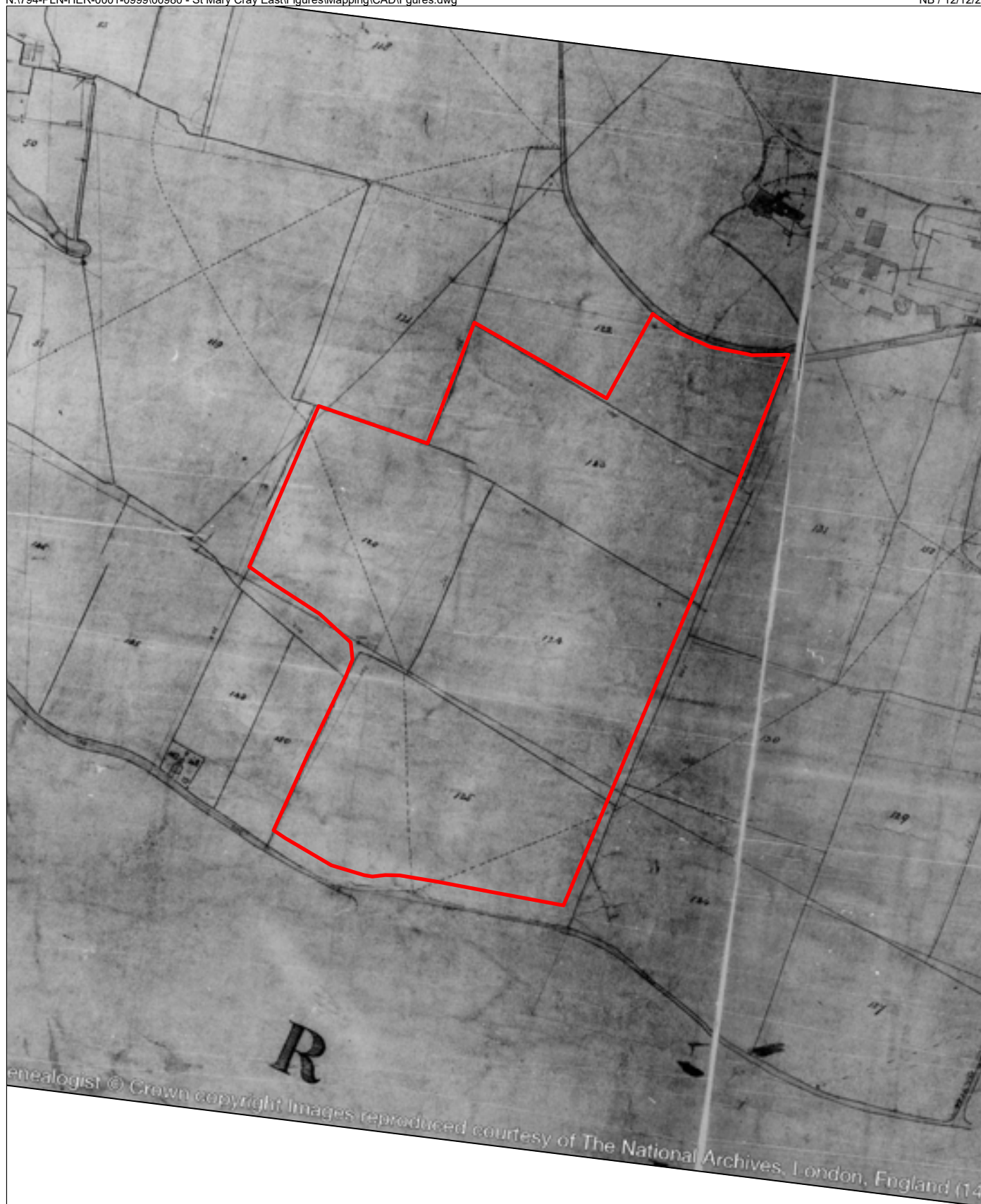


0 100 200m
Scale at A4: 1:10,000



Figure 3

1798 Ordnance Survey Drawing



 Site Boundary

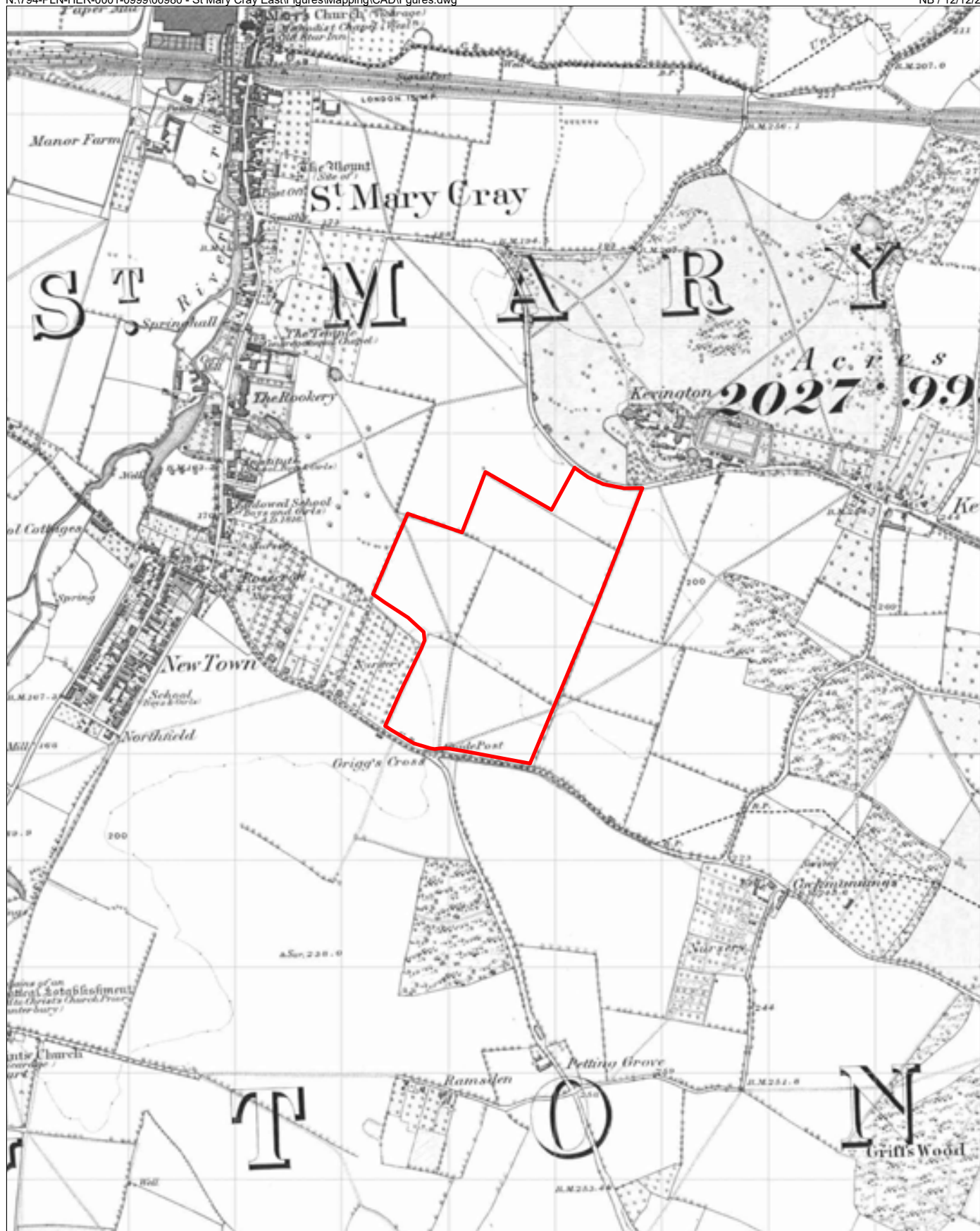


0 50 100m
Scale at A4: 1:5,000



Figure 4

1841 St Mary Cray Tithe Map



 Site Boundary

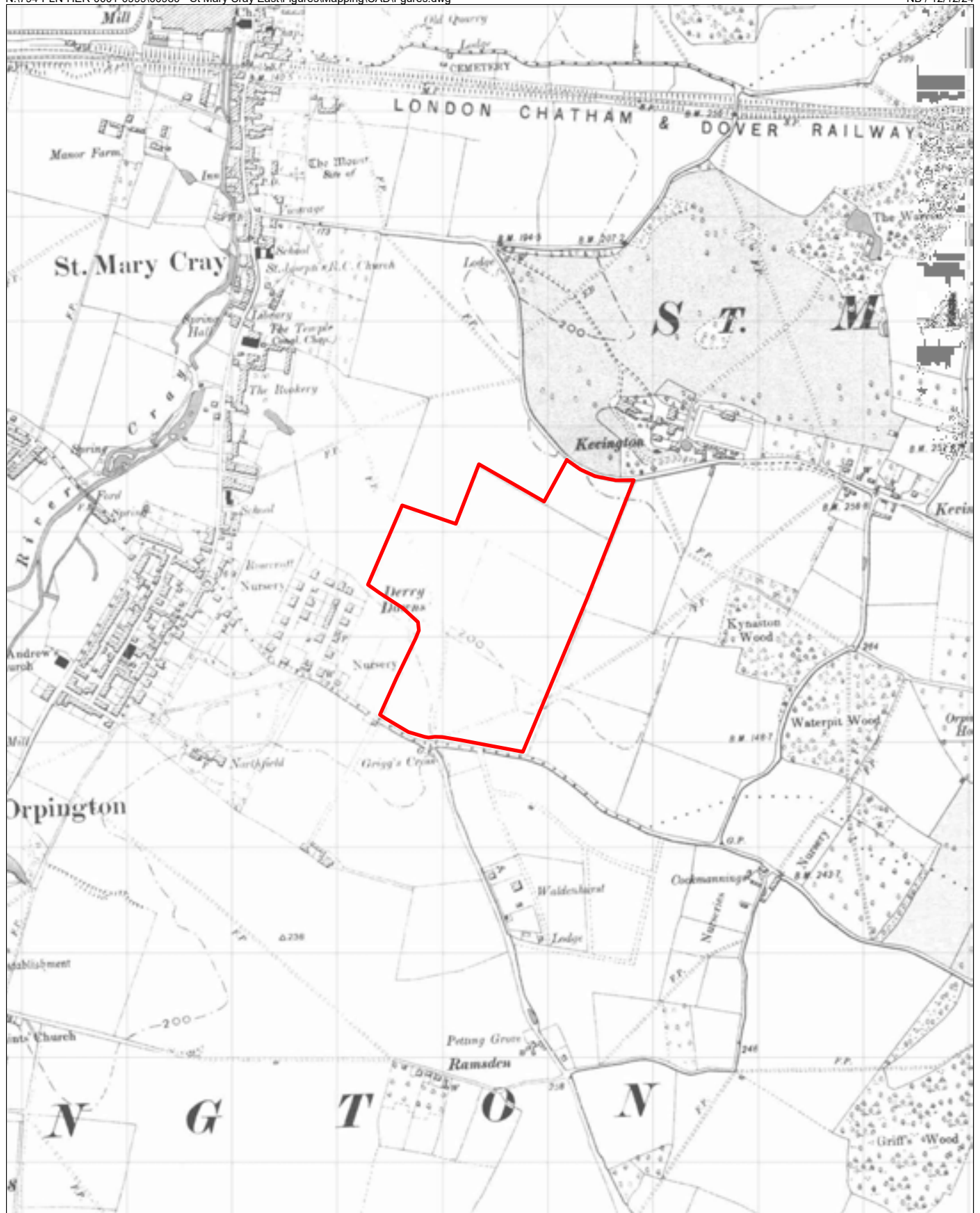


0 100 200m
Scale at A4: 1:10,000

rps
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Figure 5

1868 Ordnance Survey Map

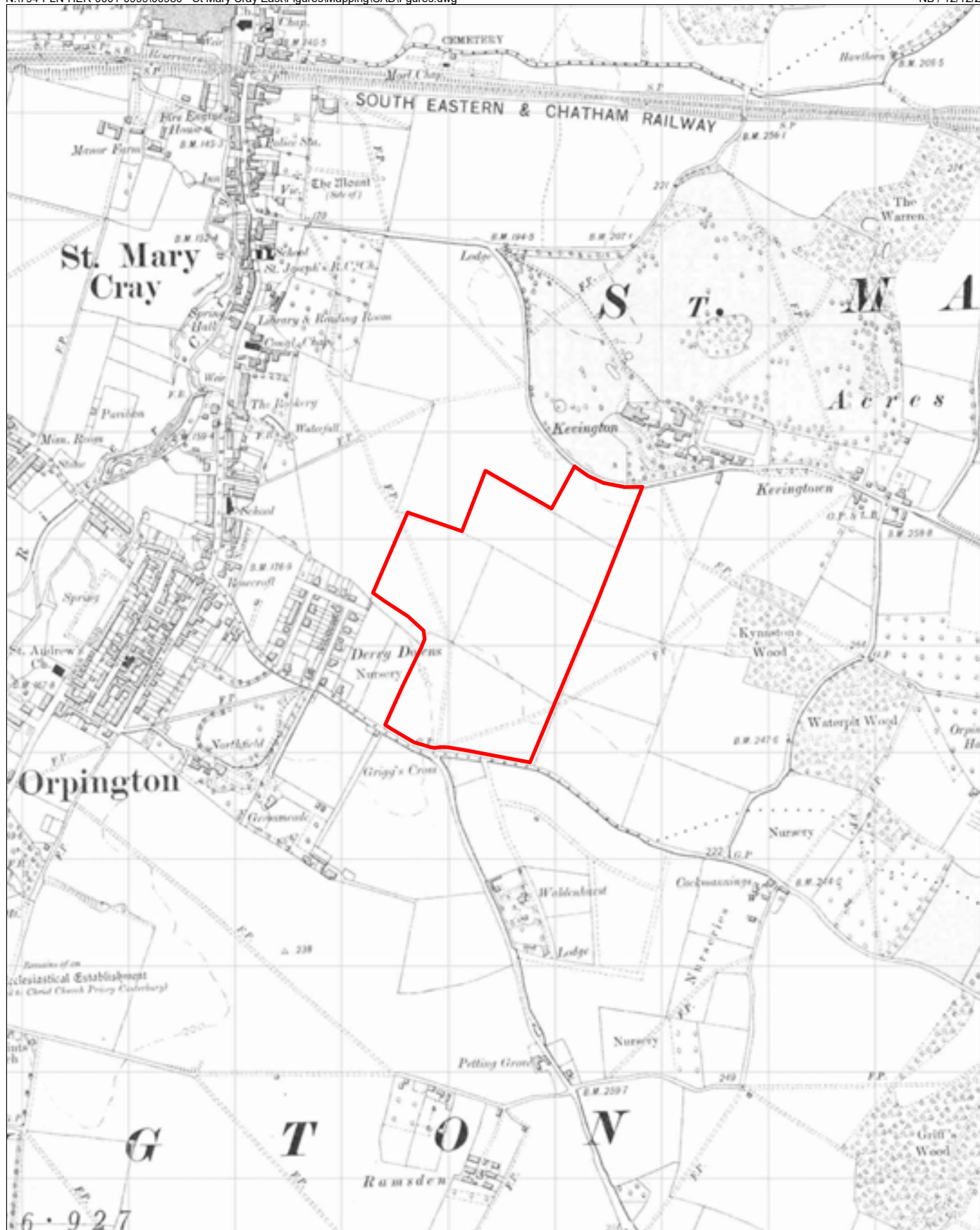


0 100 200m
Scale at A4: 1:10,000



Figure 6

1895 Ordnance Survey Map



 Site Boundary

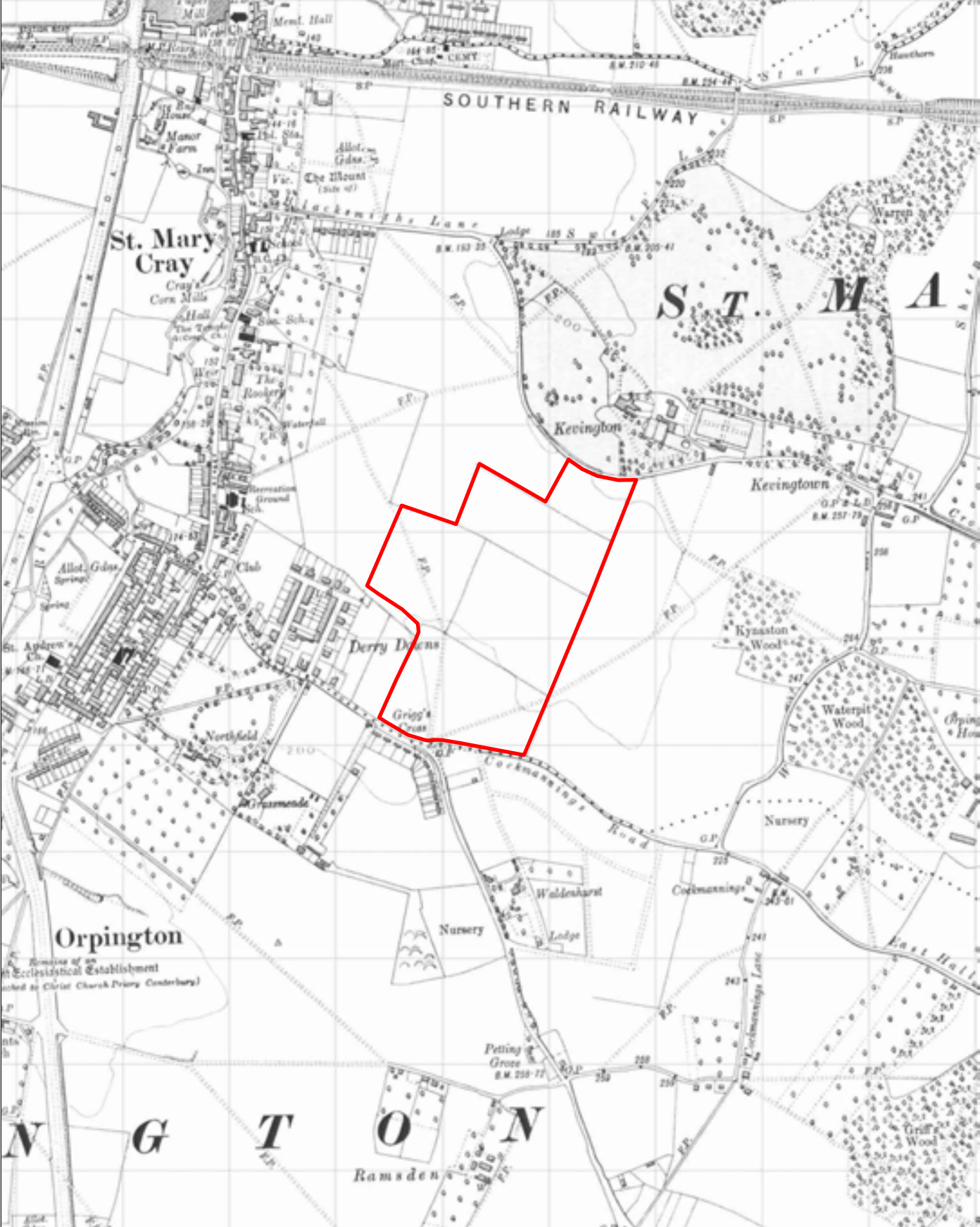


0 100 200m
Scale at A4: 1:10,000

rps
A TETRA TECH COMPANY

Figure 7

1907-1908 Ordnance Survey Map



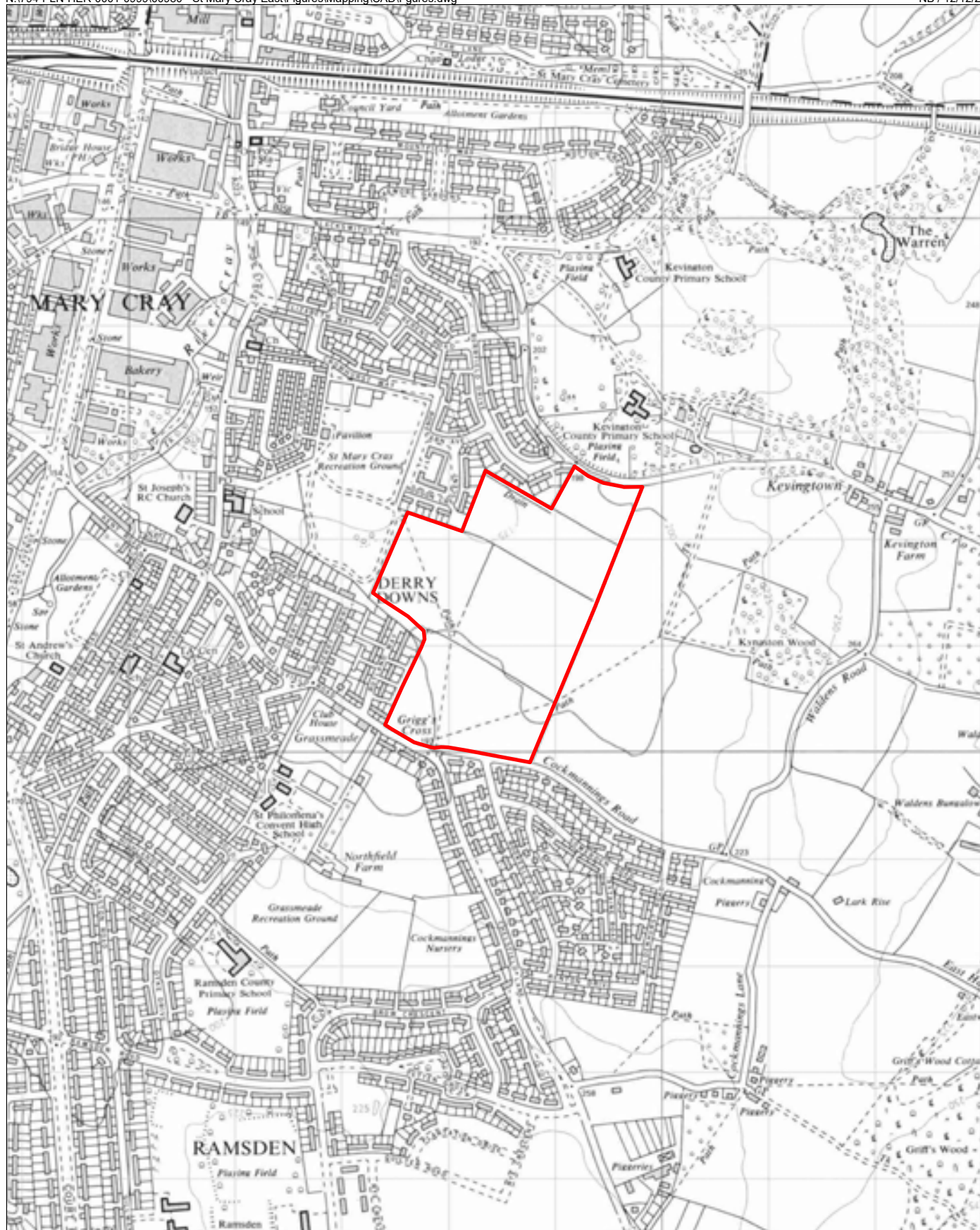
 Site Boundary



0 100 200m
Scale at A4: 1:10,000



Figure 8
1931 Ordnance Survey Map



 Site Boundary



0 100 200m
Scale at A4: 1:10,000

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Figure 9

1966 Ordnance Survey Map



 Site Boundary



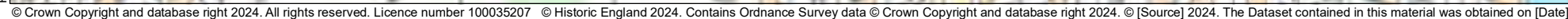
0 50 100m
Scale at A4: 1:5,000



Figure 10

2024 Aerial Photograph (Google Earth)

Appendix 1
HER Location Plan
(GLHER 2024)



 Site Boundary

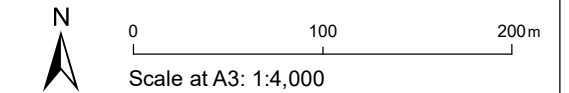
 500m search radius

HER Features

78019: Upper Cray Valley

76541: Upper Cray Valley and Flood Plain

HER Events



HER Plot

Appendix 2
Geophysical Survey Report (Sumo 2025)

Survey Report 19040: Land at St Mary Cray, East, London Borough of Bromley

Survey dates	22-24 January 2025
Field co-ordinator	Robert Knight BA MA
Field Team	Amy Allinson MSc Simon Lobel BSc Liam Brice-Bateman BA
Report Date	03 February 2025
CAD Illustrations	Thomas Cockcroft MSc MCIfA
Report Author	Thomas Cockcroft MSc MCIfA
Project Manager	Thomas Cockcroft MSc MCIfA
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Appendix A	Technical Information: Magnetometer Survey Methods, Processing and Presentation
Appendix B	Technical Information: Magnetic Theory
Appendix C	OASIS Data Collection Sheet
Appendix D	Data Management Plan & Archive Selection Strategy

3 SURVEY TECHNIQUE

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

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

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

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

4 EXECUTIVE SUMMARY OF RESULTS

- 4.1 A magnetometer survey of 15.5 hectares of land at St Mary Cray, East, London Borough of Bromley has not recorded any magnetic anomalies that could be interpreted as being of definite archaeological interest. Responses of uncertain origin have been detected in the survey which have probably been caused by natural or agricultural processes. Two former field boundaries and a service pipe have been marked in Area 3 along with natural bands of increased response. Elevated levels of 'background noise', particularly in the south-east, have been recorded are due to the spreading of green waste.

5 INTRODUCTION

- 5.1 **SUMO GeoSurveys** was commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by **RPS** on behalf of **Lands Improvement Holdings Ltd.**

5.2 Site Details

NGR / Postcode	TQ 47713 67237 / BR5 4BS
Location	The site is located 3km south-west of Swanley and 2km north-east of Orpington. The survey area is bounded to the north by Crockenhill Road (B258) and to the south by Chelsfield Road / Cockmannings Road.
HER	Greater London HER
OASIS Ref. No.	sumogeop1-531250
District	Bexley and Bromley GL Assembly Const
Parish	n/a
Topography	Flat
Land Use	Arable
Geology (BGS 2025)	Bedrock: Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation - Chalk. Thanet Formation – Sand
	Superficial: None recorded
Soils (CU 2025)	Soilscape 6: Freely draining slightly acid loamy soils
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	15.5 ha

5.3 *Archaeological Background*

- 5.3.1 An archaeological desk-based assessment has been carried out by RPS (2024) for the site and this notes that no previous archaeological work has taken place on the site. The following notes are a summary of the findings:
- 5.3.2 No evidence of Palaeolithic activity has been recorded within a 500m radius of the study site. A Neolithic flake, Mesolithic scraper and pot-boiler were found in a field adjacent to the site approximately 200m east (141271). No other evidence of prehistoric activity has been recorded within a 500m radius of the study site. The area around Poverest Road has been identified as a possible Mesolithic lithic working site due to the flintwork found there during archaeological excavations (MLO676) and Mesolithic finds have also been found on Lower Road. Overall based on the available evidence the site is considered to have a low to moderate archaeological potential for significant evidence of occupation dating to the prehistoric periods.
- 5.3.3 A Roman coin, brooch and knife handle was identified during metal detecting the field adjacent to the site approximately 75m to the east (103993). Roman pottery sherds were found at the

Recreation ground approximately 250m to the west (115250). Further evidence of Roman activity has been identified within St Mary Cray to the west of the study site. In particular Fordcroft Roman Villa, is a substantial Roman building complex located approximately 700m to the west. Overall, the archaeological potential for significant settlement evidence is considered to be moderate.

- 5.3.4 The earliest reference to St Mary Cray is in the Domesday Book of 1086. By 1270 the area was known as 'Seynte Mary Cray', with settlement focussed on the High Street. During the early Anglo Saxon period, an extensive inhumation and cremation cemetery was established alongside the Fordcroft Roman villa, with approximately 75 burials having been excavated during the twentieth and twenty first centuries. Evidence of Saxon and Medieval occupation has been encountered within the historic core of the town. Saxon finds comprising a Bronze strapend and a fragment of two coins were found during metal detecting. The HER records the findspot as within the north-western boundary (126738/152754). A concentration of silver coins from within an area of around 40m were found during metal detecting. The HER records the findspot as lying just outside the south-eastern boundary. It is considered possible that these coins formed part of a hoard that had been spread out by ploughing (144439). A Medieval brooch was found approximately 750m to the east (101348). A Medieval seal was also found approximately 75m east of the site (137931 TQ4790467305). Overall a low to moderate potential is considered for evidence dating to these periods with evidence of agricultural activity more likely to be represented.
- 5.3.5 During the Post Medieval period the site comprised open agricultural land to the south-west of Kevington House some distance to the east of the historic core of St Mary Cray. There was no change by the late 18th century. Bomb damage records (Bombsight) record that 6 High Explosive bombs were dropped in the south of the site between 1940 and 1941 (Cockmanning Road). A further bomb was dropped in the north of the site (Crockenhill Road).

5.4 ***Aims and Objectives***

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

6 **RESULTS**

- 6.1 *The survey has been divided into three survey areas (Areas 1-3).*

6.2 ***Probable / Possible Archaeology***

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

6.3 ***Uncertain***

- 6.3.1 A few discrete anomalies plus linear and curvilinear trends have been recorded in the survey which have been assigned to the category of *Uncertain*. They generally lack the defined morphology of responses that would ordinarily warrant an archaeological interpretation. The anomalies have probably been caused by variations in the underlying geology, agricultural processes or deeply buried ferrous debris.

6.4 ***Former Field Boundary – Corroborated***

- 6.4.1 Two linear anomalies are visible in Area 3 which correspond with the routes of former field boundaries which are visible on several editions of historic mapping and 1945 aerial imagery (see Figures 5 & 6).

6.5 **Natural / Geological**

- 6.5.1 Amorphous bands of increased response have been plotted in the north-west of Area 3 which have been caused by variations in the underlying geology.

6.6 **Green waste**

- 6.6.1 Much of the present survey area, in particular the south-east, appears to have been affected by Green Waste, which has resulted in spurious anomalies or 'noise' in the data. such waste can have a marked effect on the results from magnetic surveys and has been recognised as a potential complicating issue for some time (Gerrard *et al* 2015).

6.7 **Service**

- 6.7.1 A linear dipolar ferrous response in the south-east of Area 3 marks the route of an underground service pipe.

6.8 **Ferrous / Magnetic Disturbance**

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

7 **DATA APPRAISAL & CONFIDENCE ASSESSMENT**

- 7.1 Historic England Table 4 (EH 2008) states that the typical magnetic response on the local soils / geology is variable. The results from this survey indicate the presence of former field boundaries; consequently, there is no *a priori* reason why archaeological features would not have been detected. However, the increased levels of background 'noise' which has been caused by the spreading of green waste may have masked any weaker anomalies of interest, if present.

8 **CONCLUSION**

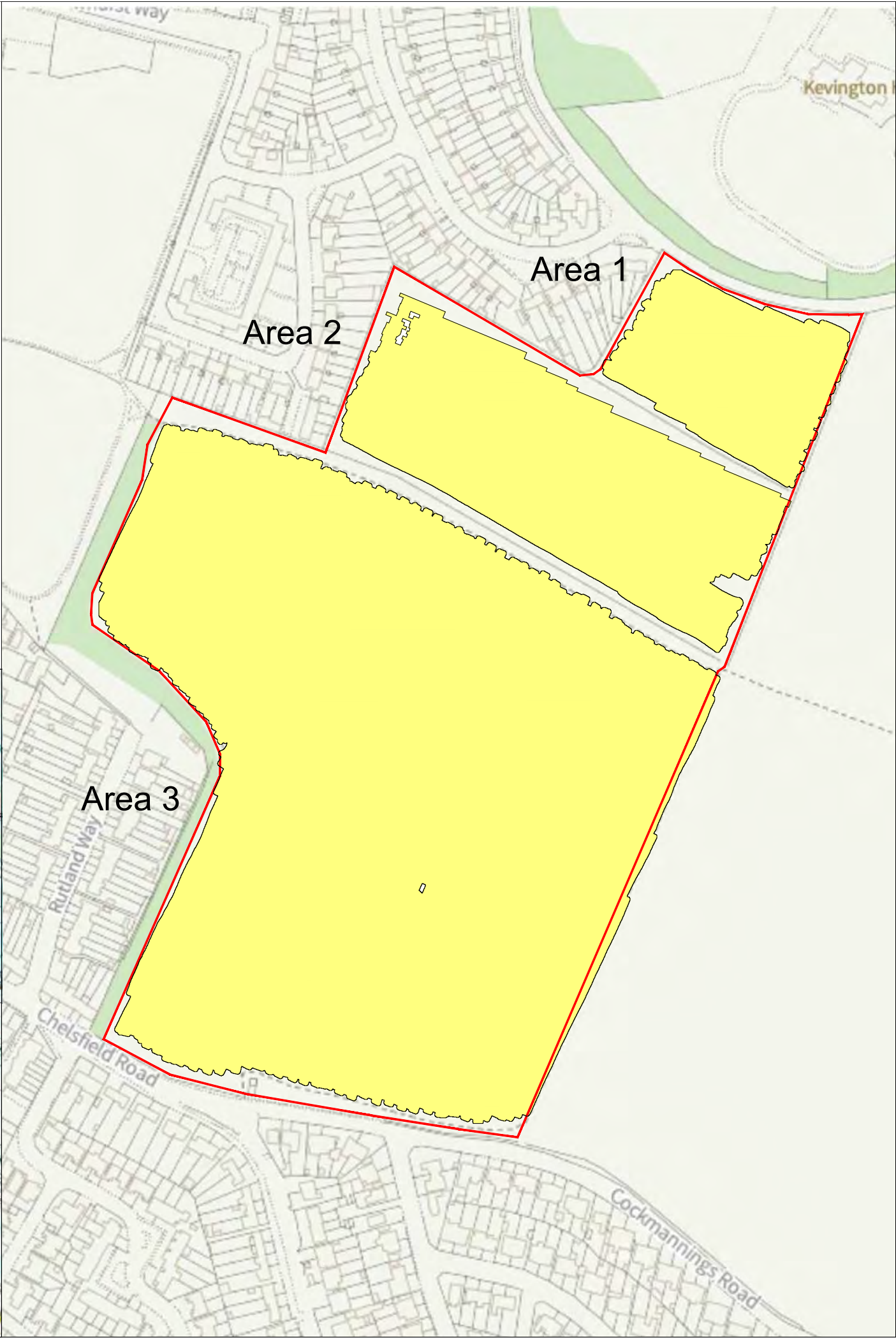
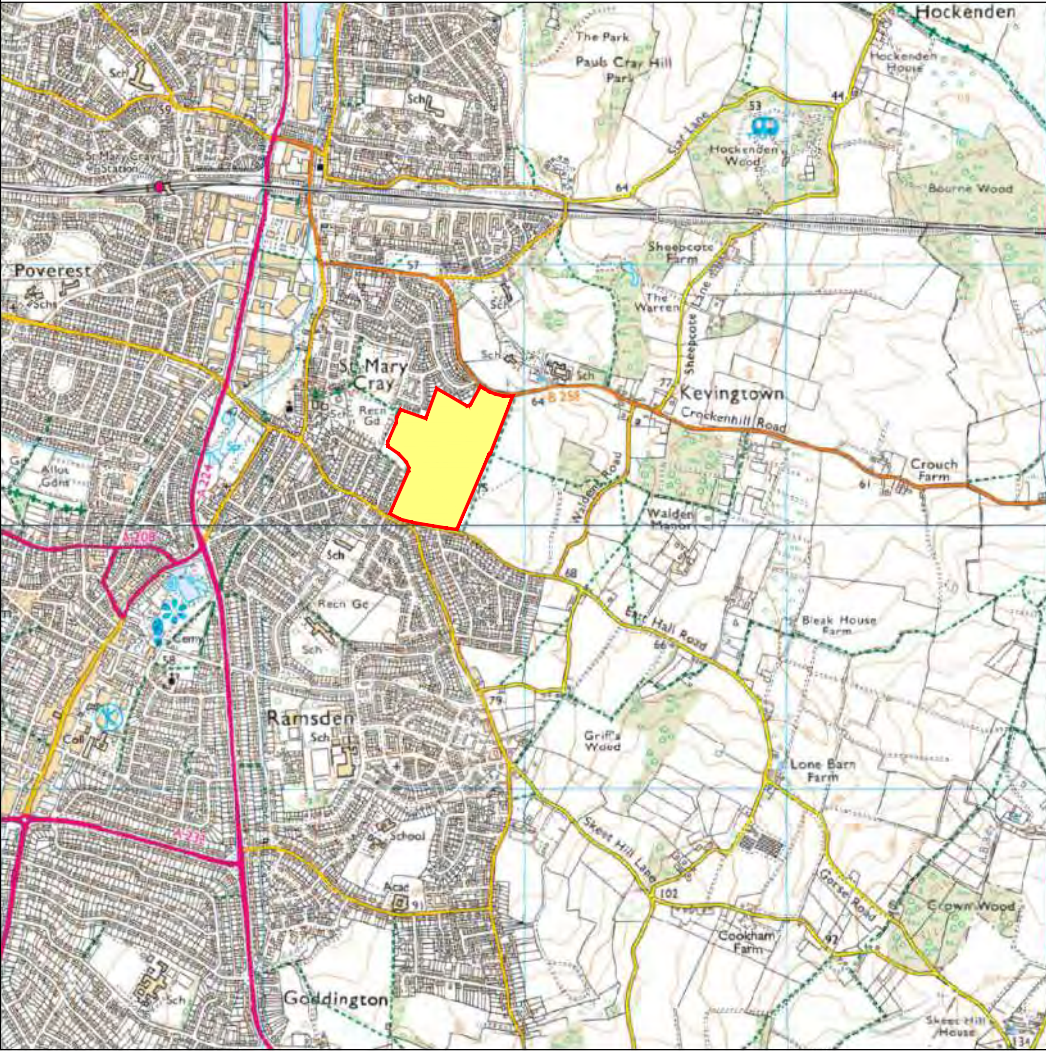
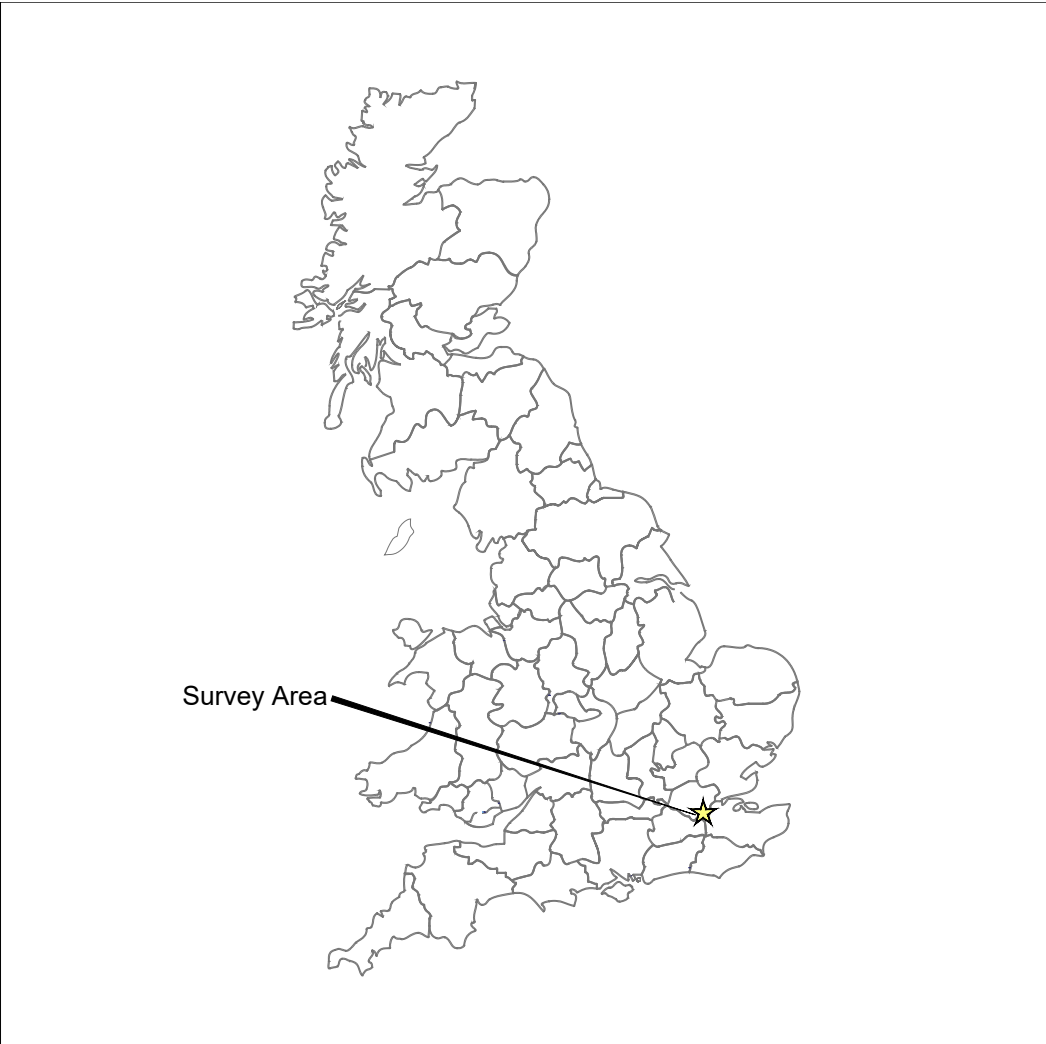
- 8.1 The magnetometer survey has not recorded any magnetic responses that could be interpreted as being of definite archaeological interest. A few discrete anomalies and trends of uncertain origin have been marked which have probably been caused by variations in the underlying geology or agricultural processes. Two former field boundaries and a service pipe have been identified in Area 3 along with bands of increased response which have a natural origin. Raised levels of 'background noise' has been recorded across the magnetic data which has been caused by the spreading of green waste.

9 REFERENCES

- BGS 2025 *Geology of Britain Viewer*, British Geological Survey, website:
(<http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps>)
- ClfA 2020 *Standard and Guidance for Archaeological Geophysical Survey*. 2014 amended 2020. ClfA Guidance note. Chartered Institute for Archaeologists, Reading
https://www.archaeologists.net/sites/default/files/ClfAS%26GGeophysics_3.pdf
- CU 2025 *The Soils Guide*. www.landis.org.uk. Cranfield University, UK. website:
<http://mapapps2.bgs.ac.uk/ukso/home.html>
- EAC 2016 *EAC Guidelines for the Use of Geophysics in Archaeology*, European Archaeological Council, Guidelines 2.
- EH 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage, Swindon (now withdrawn, but used for evaluating suitability of soil types)
- RPS 2024 *Archaeological Desk Based Assessment Land at St Mary Cray, East, London Borough of Bromley*. RPS unpublished report.

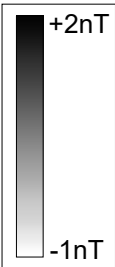
10 ARCHIVE

- 10.1 The minimally processed data, data images, XY traces and a copy of this report are stored in **SUMO GeoSurveys'** digital archive, on an internal RAID configured NAS drive in the Midlands Office. These data are also backed up to the Cloud for off-site storage.
- 10.2 The Grey Literature will be archived with OASIS and the relevant HER within a period of 12 months.



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	Survey Areas	
		
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Client: RPS		
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley		
Scale: NOT TO SCALE		Fig No: 01



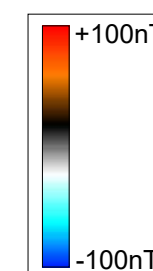
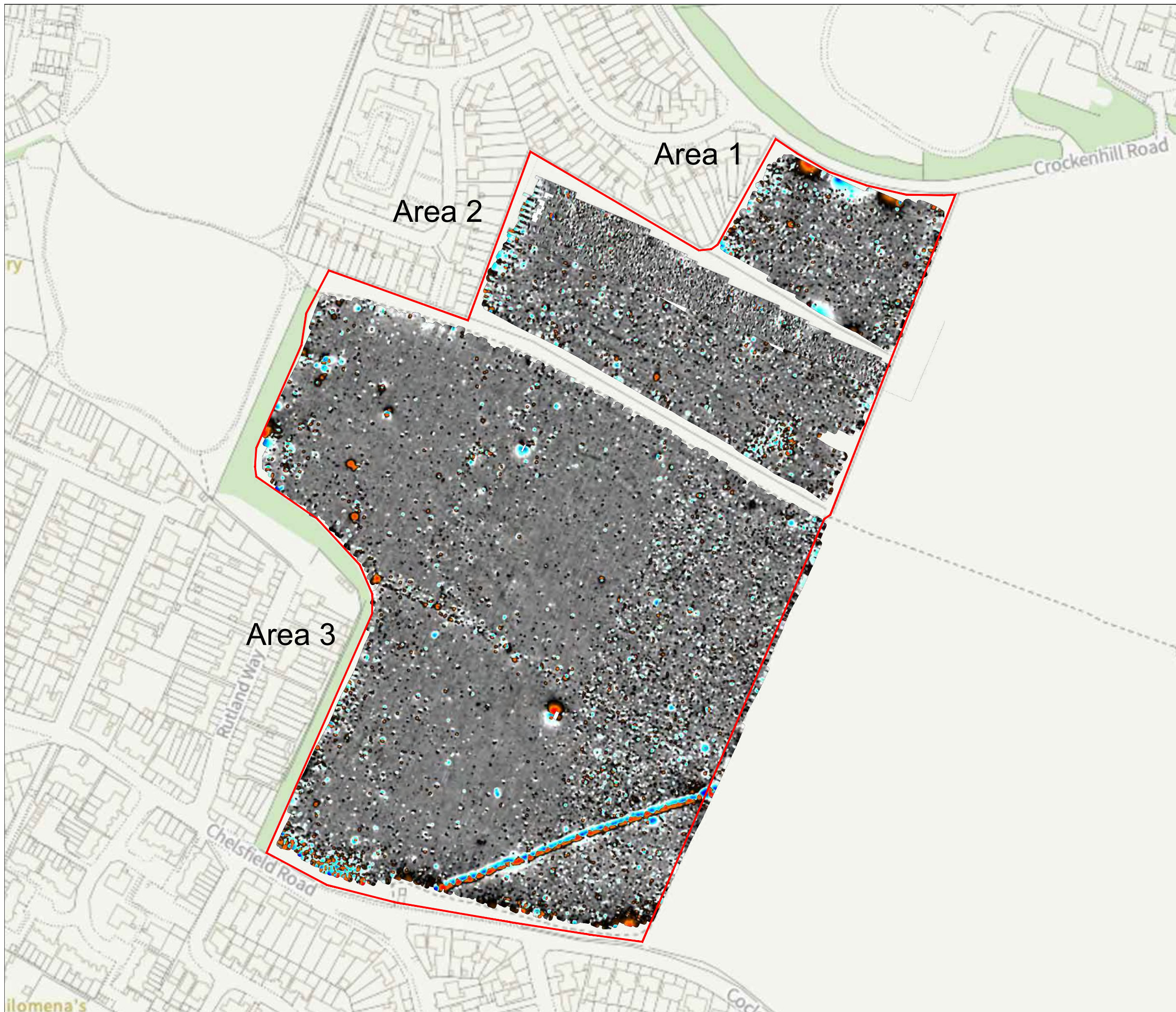
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Magnetometer Survey - Greyscale Plots

Client:
RPS

Project:
19040 - Land at St Mary Cray, East, London
Borough of Bromley

Scale:
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metres
1:2500 @ A3

Fig No:
02



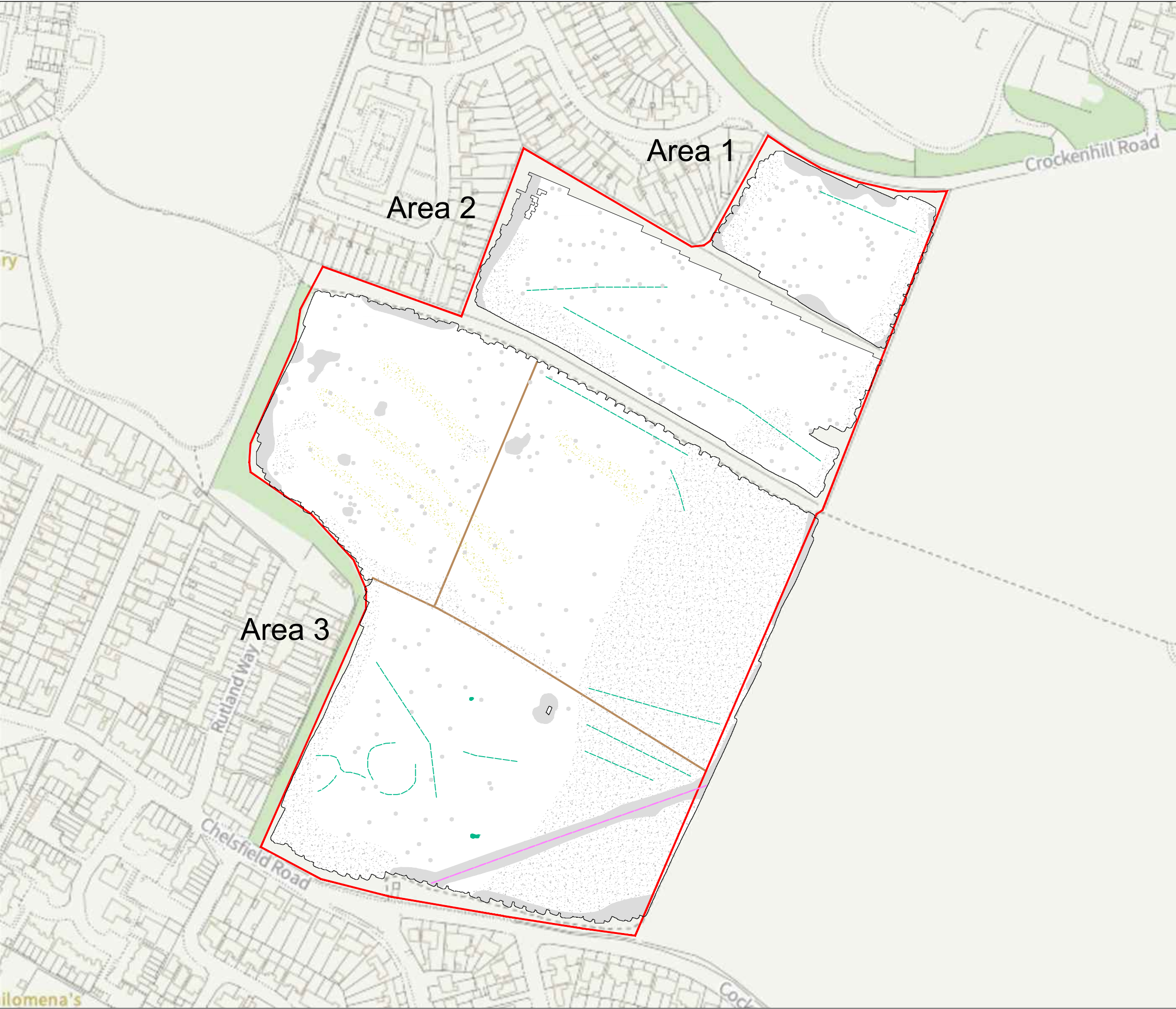
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Client:
RPS

Project:
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Borough of Bromley

Scale:
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1:2500 @ A3

Fig No:
03

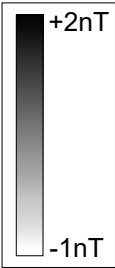
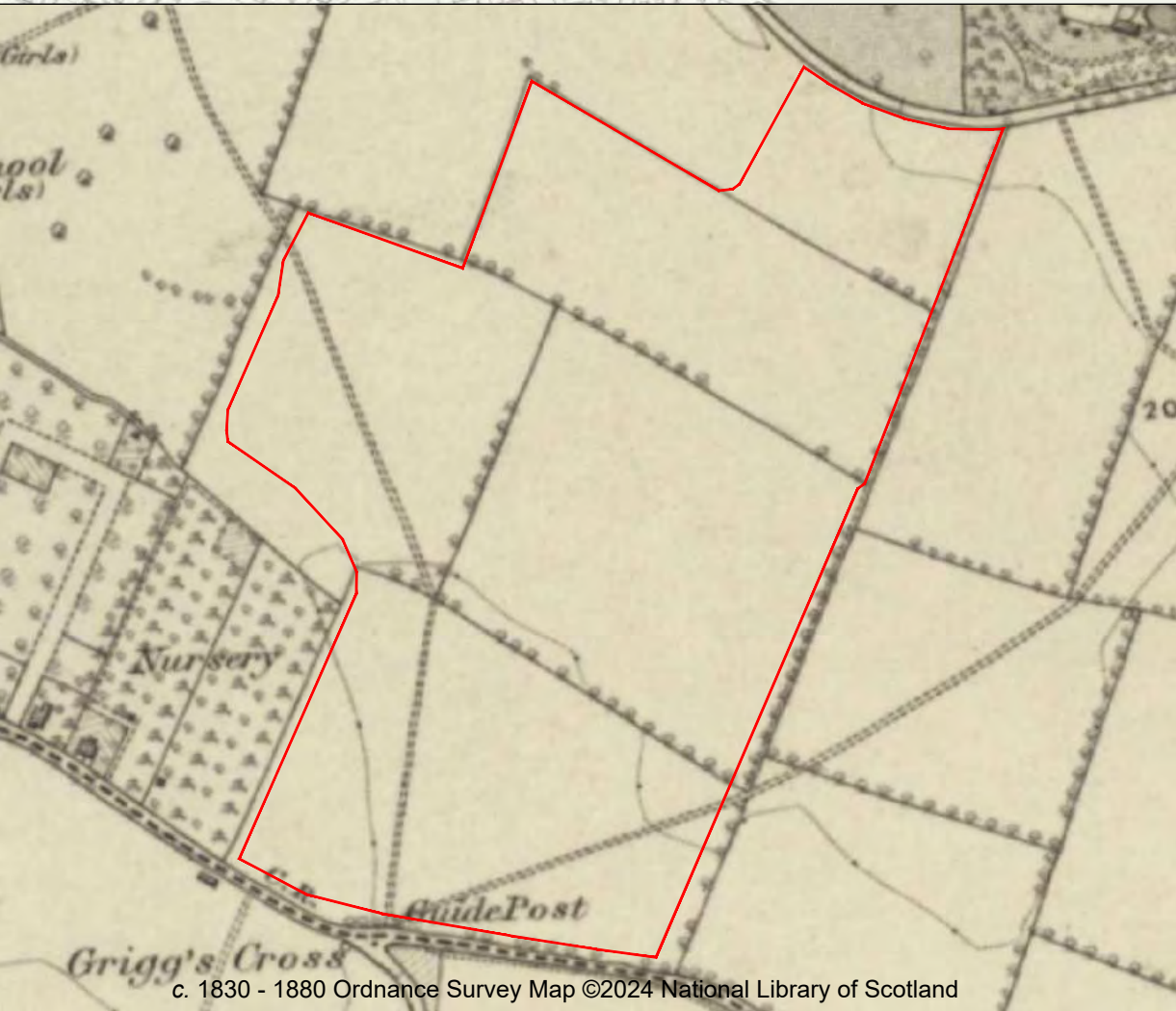
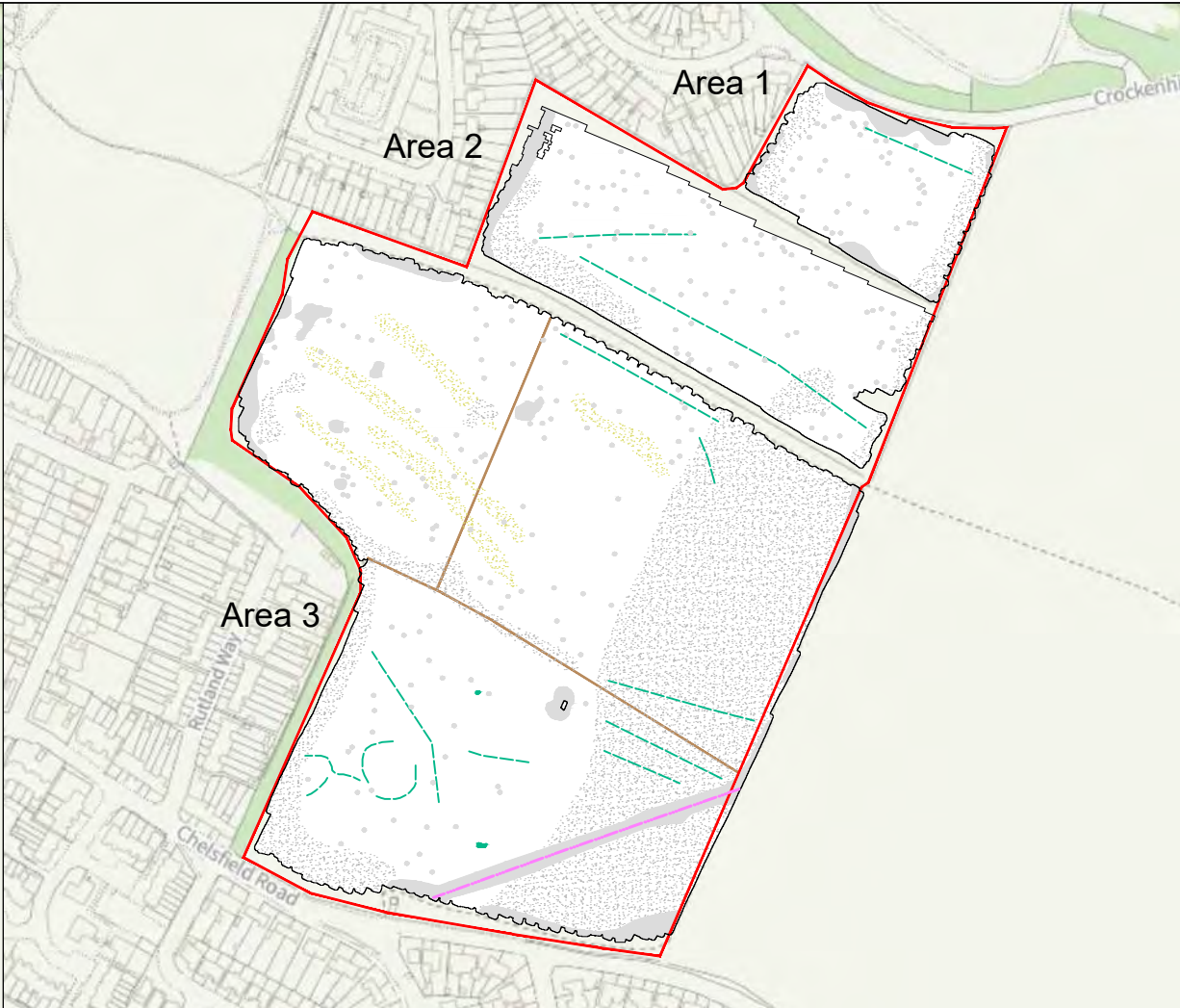
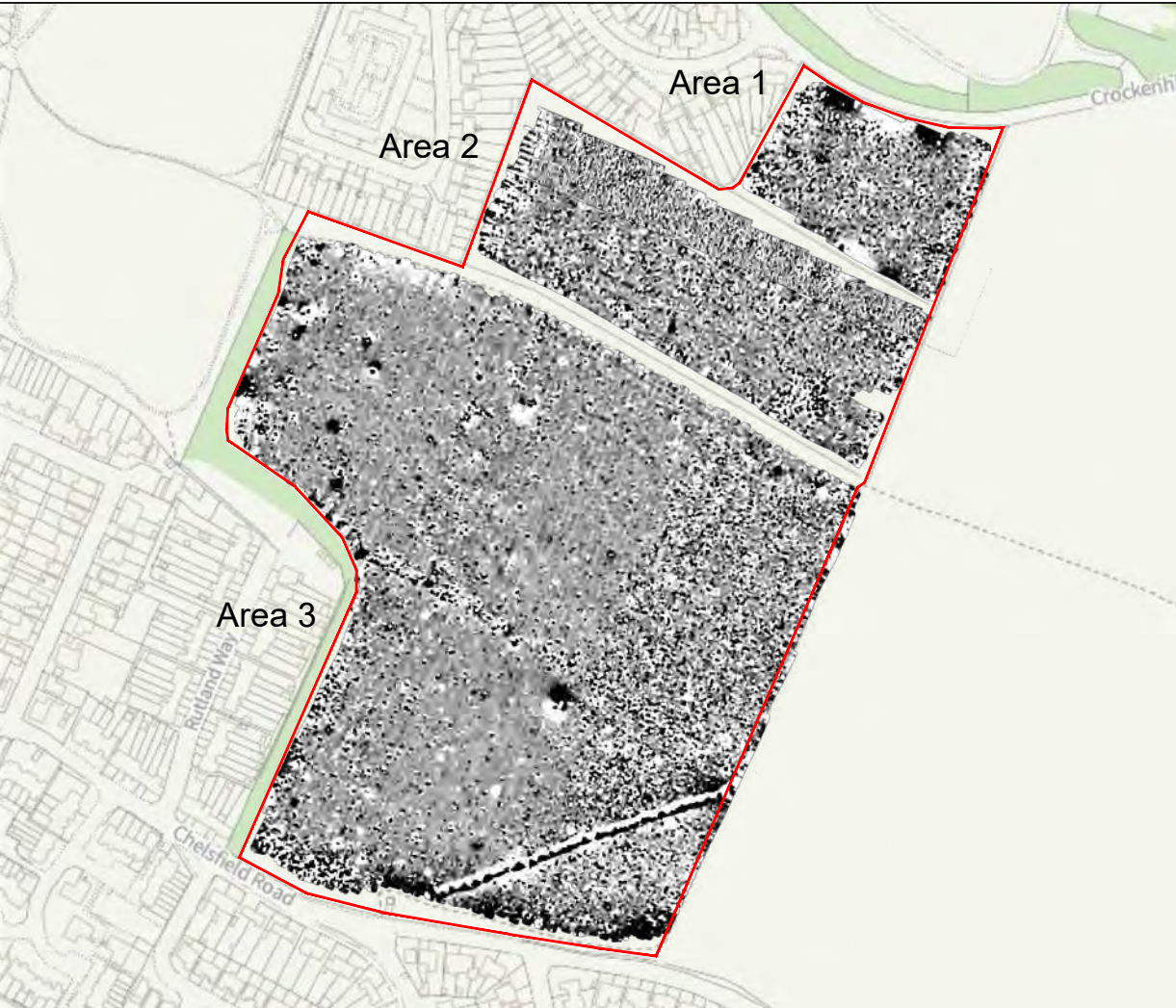


KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Natural (e.g. geological / pedological)
	Magnetic disturbance
	Service
	Ferrous



Title: Magnetometer Survey - Interpretation	
Client: RPS	
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley	
Scale: 0 125 metres 1:2500 @ A3	Fig No: 04

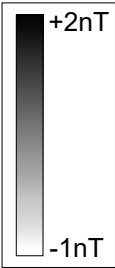
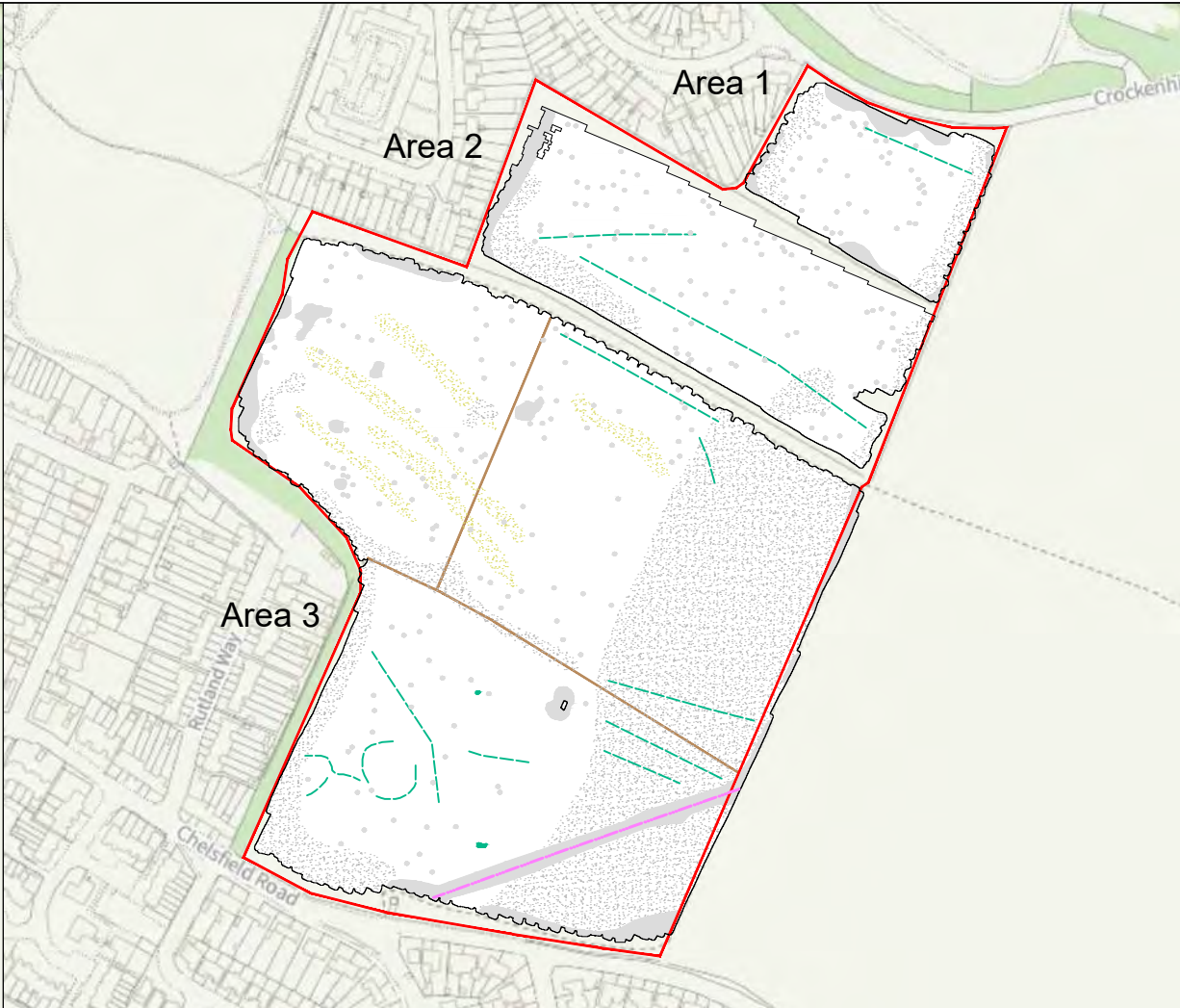
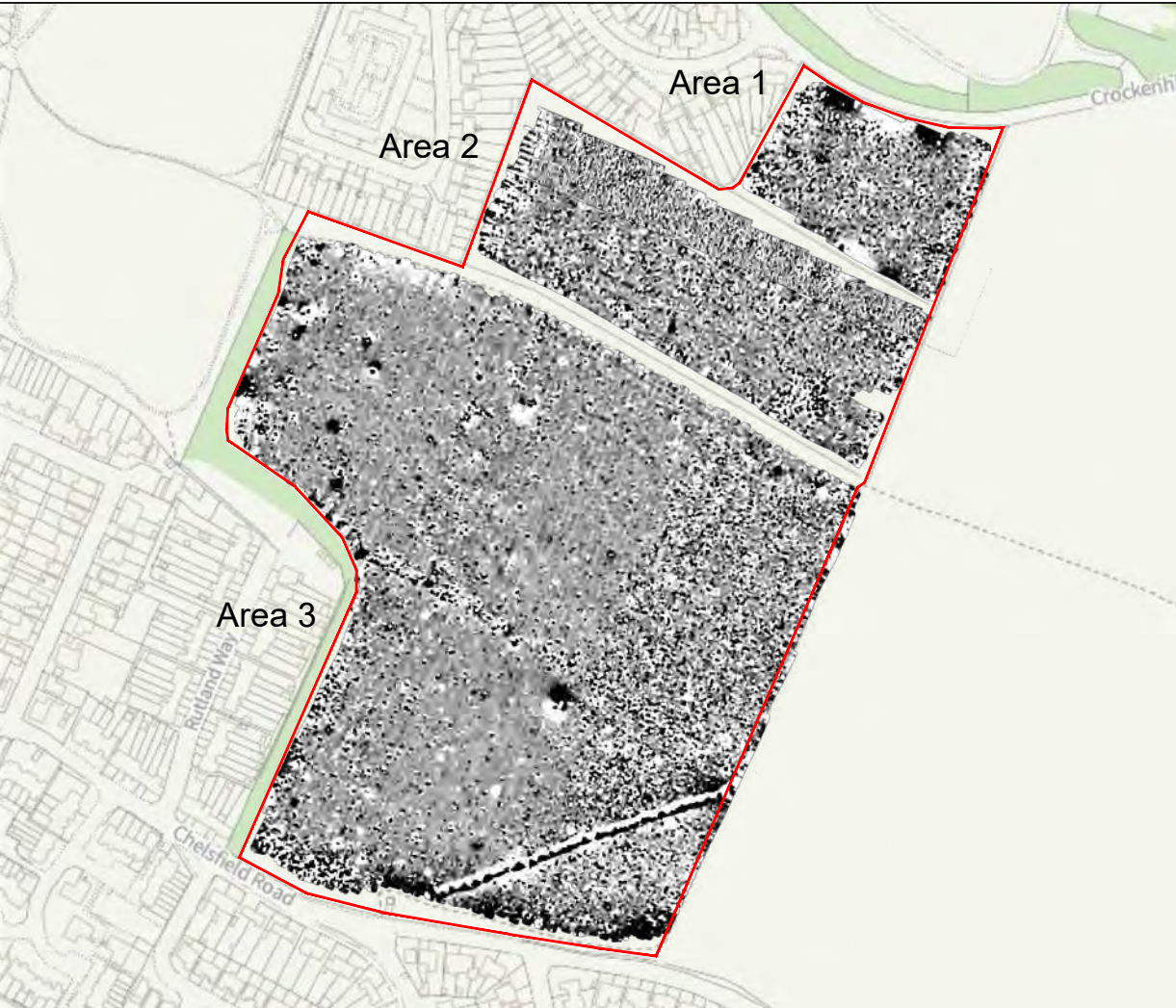


KEY

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	Former field boundary (corroborated)
	Natural (e.g. geological / pedological)
	Magnetic disturbance
	Service
	Ferrous



Title: Greyscale Plots / Interpretation / 1830-1880 Ordnance Survey Map / 1841 St Mary Cray Tithe Map (RPS 2024)	
Client: RPS	
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley	
Scale: NOT TO SCALE	Fig No: 05

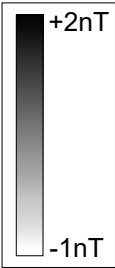
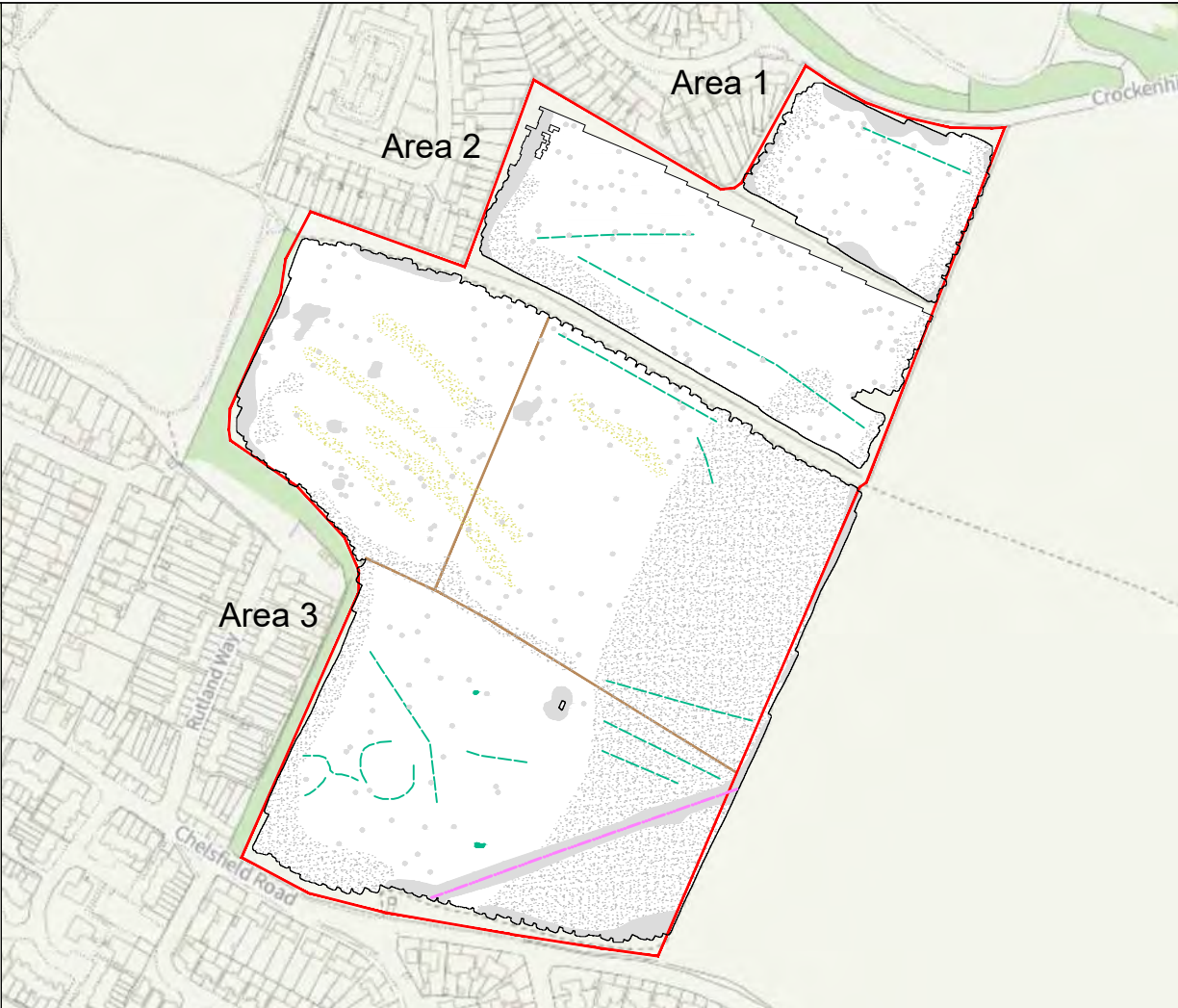
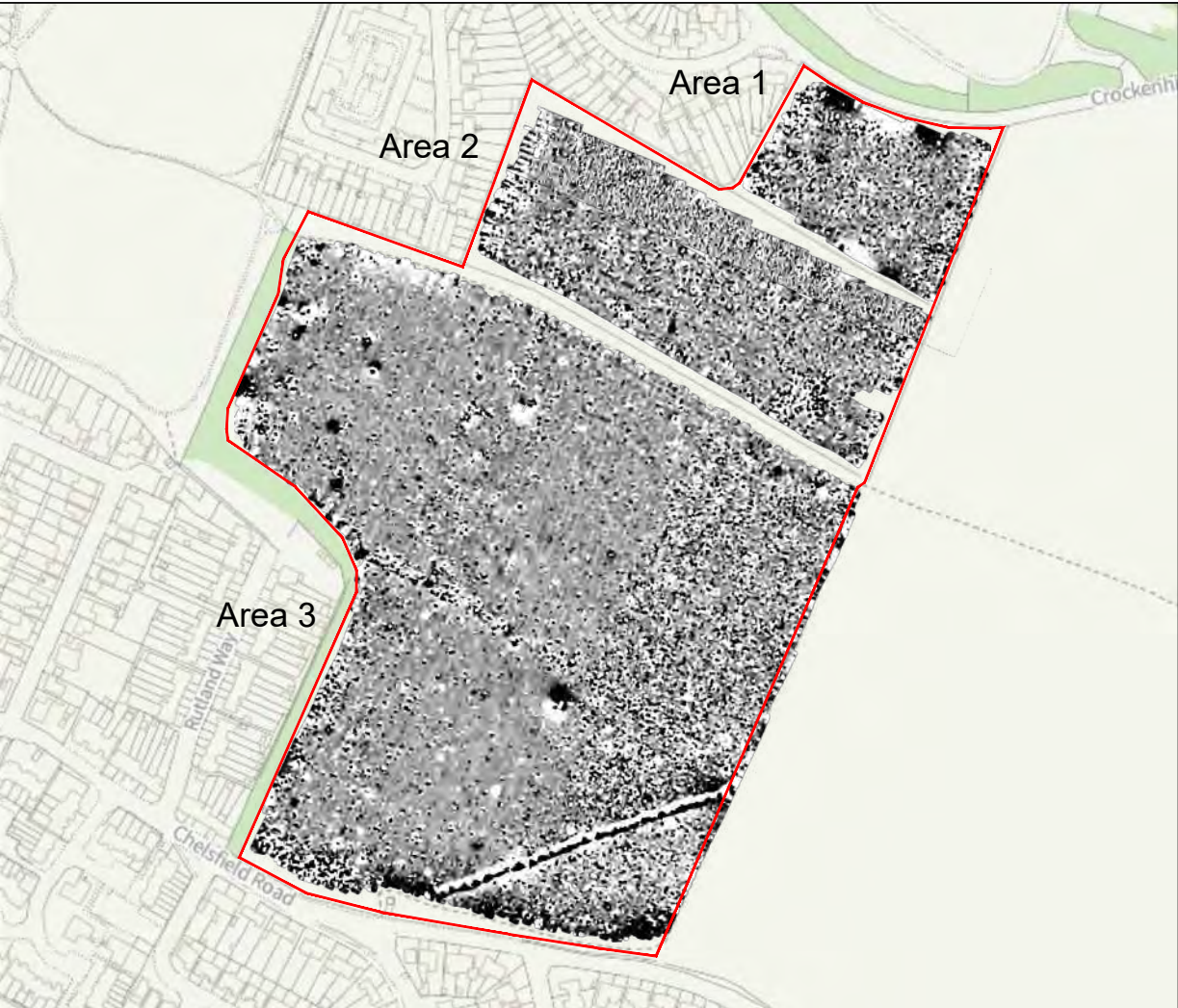


KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Natural (e.g. geological / pedological)
	Magnetic disturbance
	Service
	Ferrous



Title: Greyscale Plots / Interpretation / 1892-1914 Ordnance Survey Map / 1945 Aerial Image	
Client: RPS	
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley	
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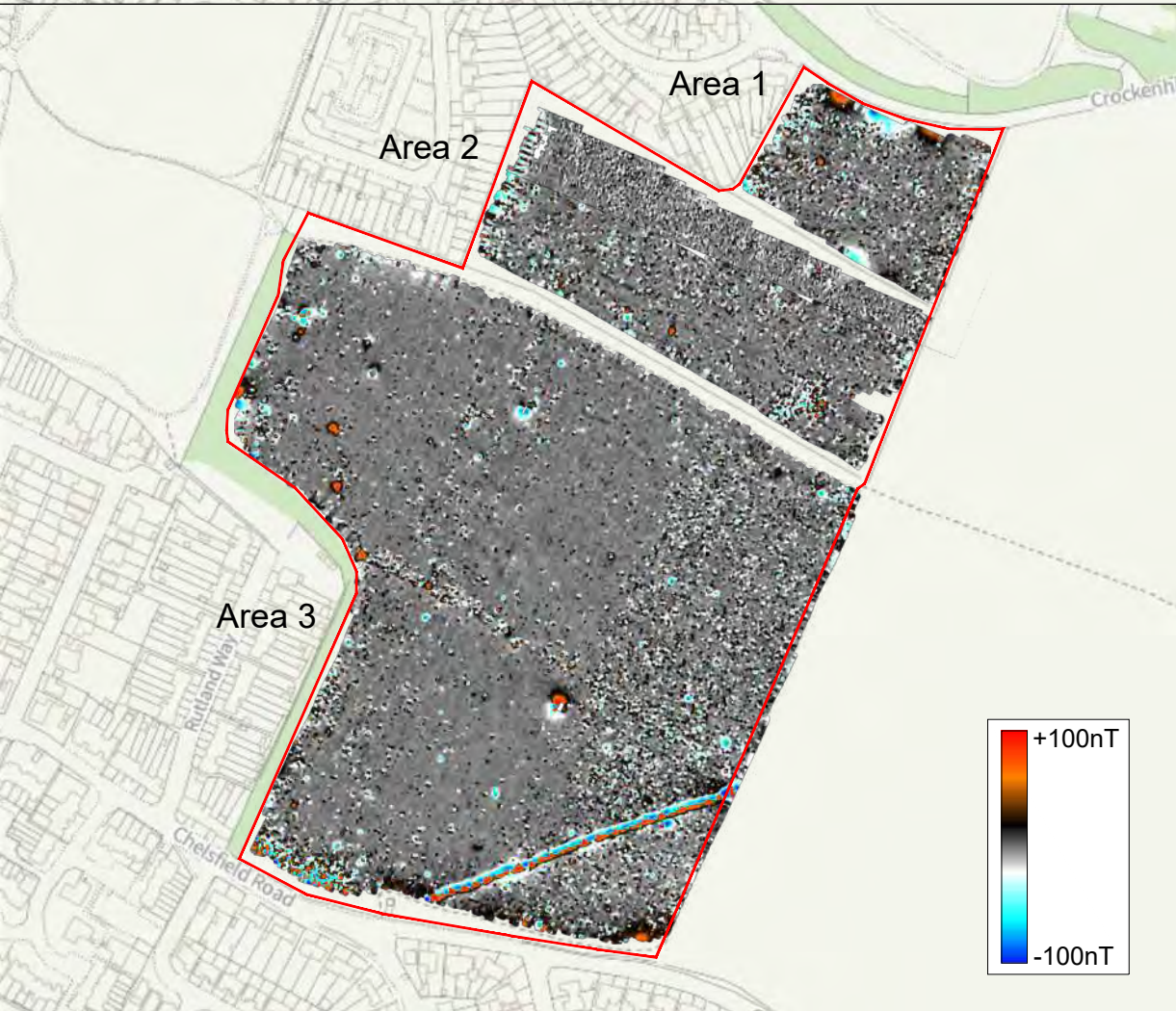
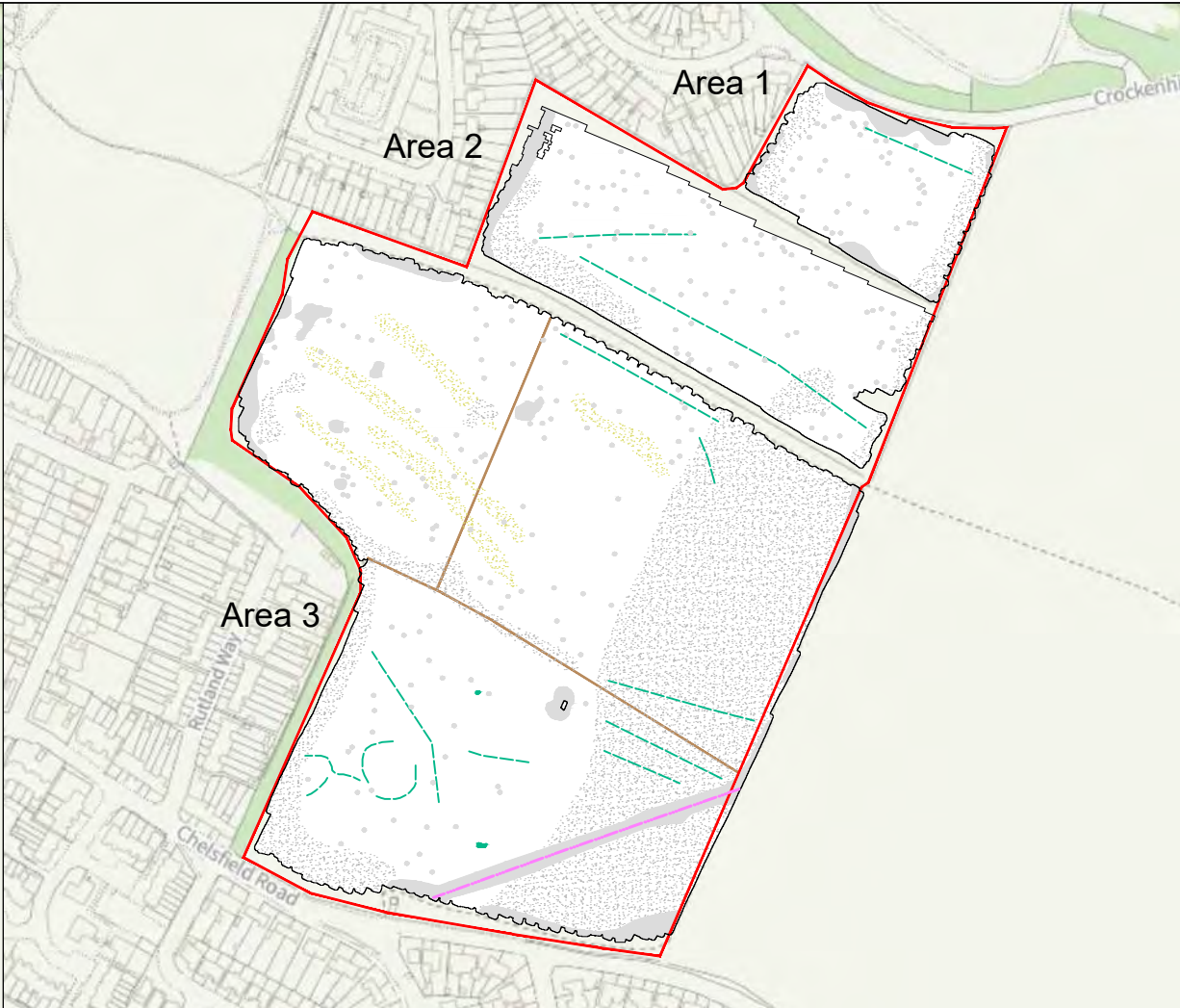
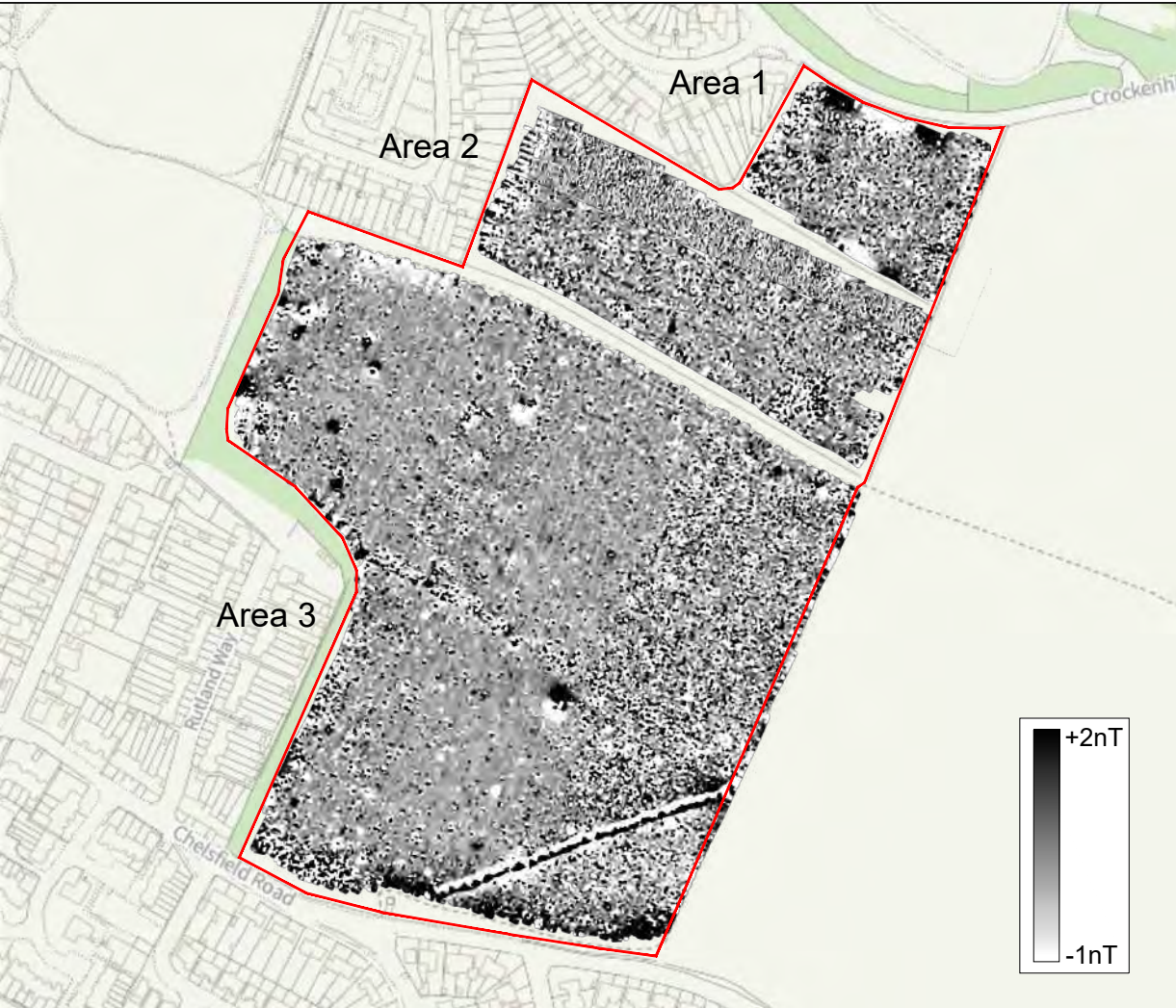


KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Natural (e.g. geological / pedological)
	Magnetic disturbance
	Service
	Ferrous



Title: Greyscale Plots / Interpretation / 2010 (bottom left) & 2024 (bottom right) Aerial Imagery	
Client: RPS	
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley	
Scale: NOT TO SCALE	Fig No: 07



KEY

	Uncertain Origin (discrete anomaly / trend / increased response)
	Former field boundary (corroborated)
	Natural (e.g. geological / pedological)
	Magnetic disturbance
	Service
	Ferrous



Title: Greyscale and Colour Plots / Interpretation / LIDAR Data Plot	
Client: RPS	
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley	
Scale: NOT TO SCALE	Fig No: 08



Title: Minimally Processed Data - Greyscale Plots	
Client: RPS	
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley	
Scale: 0 125 metres 1:2500 @ A3	Fig No: 09



Title: XY Trace Plots (clipped at +/-15nT)	
Client: RPS	
Project: 19040 - Land at St Mary Cray, East, London Borough of Bromley	
Scale: 0 125 metres 1:2500 @ A3	Fig No: 10

Appendix A - Technical Information: Magnetometer Survey Method

Grid Positioning

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

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

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

Instrumentation:

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

Bartington Grad 601-2

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

Bartington Cart System

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

MACS Cart System (Foerster)

A multi-sensor array cart system (MACS) utilising 4 Foerster 4.032 Ferex CON 650 gradiometers, spaced at 1m intervals, with a control unit and data logger was used for the magnetic survey. Each data point is geographically referenced using an on-board RTK GNSS system. Readings will be taken at 0.125m centres along traverses 1.0m apart.

Data Processing

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

Display

Greyscale/
Colourscale Plot

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

Interpretation Categories

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

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

Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.

Uncertain Origin

Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of *Possible Archaeology / Natural* or (in the case of linear responses) *Possible Archaeology / Agriculture*; occasionally they are simply of an unusual form.

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

Appendix B - Technical Information: Magnetic Theory

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

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

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

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

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

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

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

Appednix C - OASIS Summary

OASIS ID (UID)	sumogeop1-531250
Project Name	Geophysical Survey, Magnetometry Survey at Land at St Mary Cray, East, London Borough of Bromley
Sitename	Land at St Mary Cray, East, London Borough of Bromley
Sitecode	19040
Project Identifier(s)	19040
Activity type	Geophysical Survey, Magnetometry Survey, MAGNETOMETRY SURVEY
Planning Id	
Reason For Investigation	Planning requirement
Organisation Responsible for work	SUMO Geophysics Ltd.
Project Dates	22-Jan-2025 - 24-Jan-2025
Location	Land at St Mary Cray, East, London Borough of Bromley NGR: TQ 47701 67281 LL: 51.38536574958427, 0.12119884061313 12 Fig: 547701,167281
Administrative Areas	Country: England County/Local Authority: Bromley Local Authority District: Bromley Parish: Bromley, unparished area
Project Methodology	A temporary grid system was established over the site and marked out using canes. The location of the grid will was set out using an RTK GPS system theoretically accurate to some 0.01m and referenced to OS co-ordinates. Hand Held: Data was collected using a Bartington Grad 601-2. The instrument consists of two paired sensors (see below) and readings are logged at 0.25m centres along traverses 1.0m apart across 30m grids. Two sensors mounted 1m horizontally apart and very accurately aligned to nullify the effects of the earth's magnetic field. Cart: Data was also collected using a cart carrying four paired Bartington magnetic sensors. Four sensors mounted 1m horizontally apart and very accurately aligned to nullify the effects of the earth's magnetic field. Each data point is geographically referenced using an on-board Trimble RTK survey grade GPS system. Readings will be taken at 0.125m centres along traverses 1.0m apart. The collection of data provides an appropriate methodology balancing cost and time with resolution as per Historic England guidelines. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background.

Project Results	The magnetometer survey has not recorded any magnetic responses that could be interpreted as being of definite archaeological interest. A few discrete anomalies and trends of uncertain origin have been marked which have probably been caused by variations in the underlying geology or agricultural processes. Two former field boundaries and a service pipe have been identified in Area 3 along with bands of increased response which have a natural origin. Raised levels of 'background noise' has been recorded across the magnetic data which has been caused by the spreading of green waste.
Keywords	Field Boundary - POST MEDIEVAL - FISH Thesaurus of Monument Types Pipeline - 20TH CENTURY - FISH Thesaurus of Monument Types
Funder	Private or public corporation RPS
HER	Greater London HER - unRev - STANDARD
Person Responsible for work	Thomas Cockcroft
HER Identifiers	
Archives	

Report generated on: 29-01-2025:1519

Appendix D – Data Management Plan & Archive Selection Strategy

Data Management Plan

Project ID / OASIS ID

SUMO-19040 / sumogeop1-531250

Project Name

Land at St Mary Cray, East, London Borough of Bromley

Project Description

Detailed magnetic survey over approx. 15.5ha

Client

RPS

Project Manager

Thomas Cockcroft

Field Leader

Date DMP created

04.12.2024

Date DMP last updated

29.01.2025

Version

2

Technique - data

Detailed magnetic survey.

Manual – cart - other

Cart / Handheld magnetometers.

Documentation and metadata

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

Data storage, access and back-up

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

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

Archive Selection Strategy

Digital Data

Selection

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

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

De-selected digital data

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

Documents

Not applicable – no archive

Materials

Not applicable – no archive



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