



ENVIRONMENTAL STATEMENT: 6.3 APPENDIX 9-1: HISTORIC ENVIRONMENT DESK- BASED ASSESSMENT

DECARBONISATION

Cory Decarbonisation Project

PINS Reference: EN010128

March 2024

Revision A

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1. EXECUTIVE SUMMARY

- 1.1.1. WSP has been commissioned by Cory Environmental Holdings Limited to prepare a Historic Environment Desk-Based Assessment (HEDBA) for the Cory Decarbonisation Project (the 'Proposed Scheme'), to be located at Norman Road, Belvedere in the London Borough of Bexley (LBB).
- 1.1.2. This desk-based study assesses the impact on buried heritage assets (archaeological remains) and above ground heritage assets (structures and landscapes of heritage interest) within or immediately around the Site. It also considers the impact of the Proposed Scheme on the historic character and setting of designated assets within and beyond the Site (e.g. views to and from listed buildings and conservation areas). This document forms an appendix to **Chapter 9: Historic Environment (Volume 1)**.
- 1.1.3. There are no nationally designated (protected) heritage assets such as scheduled monuments or listed buildings within the Site Boundary. There are no locally listed assets within the Site Boundary.

1.2. ABOVE GROUND HERITAGE ASSETS

- 1.2.1. Above ground heritage assets that may be affected by the proposals comprise:
- **Crossness Pumping Station:** A mid-19th century pumping station comprising a Grade I listed building and two Grade II listed buildings, the closest of which is located 780m to the west of the Site Boundary. The buildings lie within the Crossness Conservation Area and, as a group, are of high heritage significance (value). The Pumping Station is on the Historic England Heritage at Risk Register;
 - **No. 4 Jetty and Approach at Dagenham Dock:** A Grade II listed building dating to the late-19th and early-20th centuries, located 750m to the northwest of the Site Boundary; and
 - **Belvedere Power Station Jetty (disused):** An undesignated jetty dating to the 1950s-60s of low heritage significance (value) in the northeast of the Site Boundary, within the River Thames.

1.3. BURIED HERITAGE ASSETS

- 1.3.1. The Proposed Scheme lies on the Thames floodplain, within an Archaeological Priority Area known to have a high level of preservation for archaeological and environmental remains due to the wet conditions of the underlying geology. Archaeological evaluation within the northern part of the Site revealed a typical deposit sequence over floodplain gravel of Neolithic to Iron Age alluvial deposits (intercalated clays and peat) covered by made ground associated with the former 20th century Borax Works. Within the alluvial deposits, the remains of fallen trees suggest a probably Bronze Age alder carr landscape (waterlogged and wooded terrain), though no evidence of archaeological activity (finds nor features) was recorded. Previous archaeological evaluation in the southwestern part of the Site

revealed thick peat deposits, containing small pieces of wood, and a number of driven timber posts considered to be of post-medieval date.

1.3.2. Buried heritage assets that may be affected by the Proposed Scheme comprise:

- **Previously unrecorded palaeoenvironmental remains:** There is a known potential for palaeoenvironmental remains to survive within the Site, based on previous investigations within the Site and surrounding area. It is likely that any environmental evidence within the lower part of the deposit sequence (e.g. within peat and the lower clay) would remain intact due to their depth. Such remains would be of **Medium** heritage significance (value).
- **Previously unrecorded prehistoric remains:** There is uncertain, but possibly low to moderate, potential for prehistoric remains. The area would have been suitable for a variety of subsistence activities as the riverside location would have provided opportunities for the exploitation of natural resources. Evidence of early prehistoric occupation and early/late prehistoric utilisation of the marshes (timber trackways, hulked vessels, etc.) would be of **High** heritage significance (value), if present.
- **Previously unrecorded Roman remains:** There is uncertain, but possibly low to moderate, potential for Roman remains. During this period the Site would have been prone to flooding but suitable for a variety of subsistence activities, as during the prehistoric period. Evidence of Roman utilisation of the marshes and industrial processes (salt, pottery and fish) would be of **High** heritage significance (value), if present.
- **Previously unrecorded medieval remains:** There is high potential for medieval remains associated with reclamation, drainage and water management. Remains associated with medieval reclamation and water management would be of **Low** heritage significance (value). Structural remains associated with flood defences (timber revetments for example) might be of **Medium** heritage significance (value), if present.
- **Previously unrecorded post-medieval and modern remains, recorded structures, field boundaries and drainage ditches:** There is high potential for post-medieval and modern (20th century) remains to survive within the Site, in the form of foundations of an 18th century powder house, along with 19th century and later anti-social and/or dangerous industrial activities. Elsewhere there is potential for evidence of reclamation, river and flood defences and water management including drainage ditches. Post-medieval industrial remains associated with reclamation, flood and river defence and water management would be of **Low** heritage significance (value).

1.3.3. Given the extent of the Site and the nature of the Proposed Scheme, which encompasses both a terrestrial and marine environment, the depth of archaeological deposits is anticipated to be highly variable. Past ground disturbance within the Site from mid-19th and 20th century developments may have compromised archaeological survival of shallow remains, particularly in the northern terrestrial part of the area of the Proposed Scheme (i.e. Riverside 1 and Riverside 2). The waterlogged conditions of the intertidal area within the Site and the former marshland, particularly where

alluvium is present, will have promoted organic preservation. The height of archaeological deposits and alluvium are likely to vary across the Site and will be buried at depth in some parts lying underneath modern made ground (which is typically 1.0m thick).

- 1.3.4. Elements of the Proposed Scheme which have the potential to have an impact on heritage assets include the demolition of structures, topsoil stripping, piled foundations, dredging, planting and other environmental mitigation, soft landscaping, the construction of access roads and the installation of services and drainage features. If the Belvedere Power Station Jetty (disused) is demolished as part of the Proposed Scheme, this would result in a total loss of the asset's heritage significance (value). Changes to the setting of the designated assets (listed buildings and conservation area) within the Study Area as a result of the Proposed Scheme are predicted to result in a less than substantial level of harm to their heritage significance (value).
- 1.3.5. Without mitigation, the level of harm to the heritage significance (value) of archaeological remains as a result of the Proposed Scheme would range from less than substantial to total loss of heritage significance (value). To mitigate this, a programme of archaeological mitigation is proposed post-DCO determination, which would be agreed in consultation with the Greater London Archaeology Advisory Service (GLAAS) and outlined in an Archaeological Mitigation Strategy. The scope and methodology for each phase of fieldwork will be presented in a specific Written Scheme of Investigation (WSI). All archaeological requirements in the form of additional surveys, where required, and final mitigation will be secured via requirements incorporated within the **Draft DCO (Document Reference 3.1)**.
- 1.3.6. The first stage would be an updated Geoarchaeological Deposit Model, extending an existing model for the northern part of the Site across the remainder of the Site. The model would identify areas of higher potential (e.g. Gravel highs beneath the alluvium) and be used to inform further evaluation, should this be required, along with any appropriate final mitigation strategy. This could comprise avoidance, in the unlikely event that nationally significant remains are identified, where this is warranted and feasible. It could also include targeted archaeological excavation and recording in advance of construction, where significant remains are present, and/or an archaeological watching brief during preliminary groundworks, to form preservation by record.
- 1.3.7. Regarding the marine/intertidal part of the Site, a foreshore survey (walkover or drone), is proposed, followed by the collection of magnetometry data, multi beam echo sounder and side scan sonar. The results will enable the formulation of any additional mitigation measures, if required.
- 1.3.8. Historic England Level 2 Historic Building Recording (descriptive record) is proposed prior to demolition of the Belvedere Power Station Jetty (disused) if this is undertaken as part of the Proposed Scheme.

2. INTRODUCTION

2.1.1. WSP has been commissioned by Cory Environmental Holdings Limited (hereafter referred to as the Applicant) to prepare a Historic Environment Desk-Based Assessment (HEDBA) for the Cory Decarbonisation Project, to be located at Norman Road, Belvedere in the London Borough of Bexley (LBB; National Grid Reference/NGR 549572, 180512; **Figure 1**). The following figures are also available in this Environmental Statement (ES):

- **Figure 1-1: Site Boundary Location Plan (Volume 2)**; and
- **Figure 1-2: Satellite Imagery of the Site Boundary Plan (Volume 2)**.

2.1.2. The Applicant intends to construct and operate the Proposed Scheme to be linked with the River Thames. It comprises of the following key components, which are described below, and further detail is provided within **Chapter 2: Site and Proposed Scheme Description (Volume 1)**:

- The Carbon Capture Facility (including its associated Supporting Plant and Ancillary Infrastructure): the construction of infrastructure to capture a minimum of 95% of carbon dioxide (CO₂) emissions from Riverside 1 and 95% of CO₂ emissions from Riverside 2 once operational, which is equivalent to approximately 1.3Mt CO₂ per year. The Carbon Capture Facility will be one of the largest carbon capture projects in the UK.
- The Proposed Jetty: a new and dedicated export structure within the River Thames as required to export the CO₂ captured as part of the Carbon Capture Facility.
- The Mitigation and Enhancement Area: land identified as part of the **Outline LaBARDS (Document Reference 7.9)** to provide improved access to open land, habitat mitigation, compensation and enhancement (including forming part of the drainage system and Biodiversity Net Gain delivery proposed for the Proposed Scheme) and planting. The Mitigation and Enhancement Area provides the opportunity to improve access to outdoor space and to extend the area managed as the Crossness Local Nature Reserve (LNR).
- Temporary Construction Compounds: areas to be used during the construction phases for activities including, but not limited to office space, warehouses, workshops, open air storage and car parking, as shown on the **Works Plans (Document Reference 2.3)**. These include the core Temporary Construction Compound, the western Temporary Construction Compound and the Proposed Jetty Temporary Construction Compound.
- Utilities Connections and Site Access Works: The undergrounding of utilities required for the Proposed Scheme in Norman Road and the creation of new, or the improvement of existing, access points to the Carbon Capture Facility from Norman Road.

- 2.1.3. Together, the Carbon Capture Facility (including its associated Supporting Plant and Ancillary Infrastructure), the Proposed Jetty, the Mitigation and Enhancement Area, the Temporary Construction Compounds and the Utilities Connections and Site Access Works are referred to as the 'Proposed Scheme'. The land upon which the Proposed Scheme is to be located is referred to as the 'Site' and the edge of this land referred to as the 'Site Boundary'. The Site Boundary represents the Order Limits for the Proposed Scheme as shown on the **Works Plans (Document Reference 2.3)**.

2.2. PURPOSE OF REPORT

- 2.2.1. For the purposes of this report, heritage 'significance', as defined in the Overarching National Policy Statement (NPS) for Energy (EN-1; Department of Energy & Climate Change, 2024) and the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government / MHCLG, revised 2023), will be referred to as 'heritage significance (value)' hereafter. This terminology is used to avoid confusion with Environmental Impact Assessment (EIA) terminology for the 'significance' of environmental effect.
- 2.2.2. This report provides a baseline of known or potential buried heritage assets (archaeological remains) and above ground heritage assets (structures and landscapes of heritage interest) within or immediately around the Site. These are identified as having a degree of heritage significance (value) meriting consideration in planning decisions and includes designated heritage assets and assets identified by the local planning authority (including locally listed buildings), and non-designated heritage assets.
- 2.2.3. Professional expert opinion has been used to assess heritage significance (value), based on historic, archaeological, architectural or artistic interest, considering past ground disturbance which may have compromised asset survival.
- 2.2.4. This report assesses the impact on buried heritage assets and above ground heritage assets within or immediately around the Site. It also considers the impact of the Proposed Scheme on the historic character and setting of designated assets within and beyond the Site Boundary (e.g. views to and from listed buildings and conservation areas). The report includes measures to mitigate any adverse effects (e.g. site-based investigation and/or design changes), where identified).
- 2.2.5. An assessment of the impact on the heritage significance (value) of known buried heritage remains through possible changes to setting has only been undertaken where there is sufficient information to establish the likely contribution of setting to heritage significance (value), and where the significance of the asset warranted this.

2.3. AIMS AND OBJECTIVES

- 2.3.1. The aim of this report is to assess the impact of the Proposed Scheme and to provide a suitable strategy to mitigate any adverse effects, if required, as part of a Development Consent Order (DCO) application to develop the Site. This aim is achieved through five objectives:

- identify the presence of any known or potential heritage assets that may be affected by the Proposed Scheme;
- describe the heritage significance (value) of such assets, in accordance with the NPS EN-1 (2024), the NPPF (2023) and relevant Historic England guidance (2017, 2019), considering factors which may have compromised asset survival;
- determine the contribution to which setting makes to the heritage significance (value) of the identified heritage assets;
- assess the likely impacts upon the heritage significance (value) of the assets arising from the Proposed Scheme; and
- provide recommendations for further investigation and/or mitigation where required, aimed at reducing or removing completely any adverse effects.

2.4. KEY HERITAGE CONSTRAINTS

- 2.4.1. The Site does not contain any nationally designated (protected) heritage assets such as scheduled monuments, listed buildings or registered parks and gardens. The Site does not lie within a conservation area. No locally listed buildings are situated within the Site Boundary.
- 2.4.2. The Site lies within an Archaeological Priority Area (APA), as defined by LBB. This is the Thamesmead and Erith Marshes Tier 3 APA. Tier 3 APA are typically defined by geological, topographical or land use consideration. The Erith Marshes Tier 3 APA is an area of marshland that would have been regularly flooded during the prehistoric period and ideal for the exploitation of natural resources including waterfowl, fish, wood and reeds. Prehistoric finds within the marshland mostly comprise flint tools, but typically there is potential for former forest or built wooden structures to be preserved (Historic England, 2020).
- 2.4.3. There are four listed buildings to the west and northwest of the Site. These are:
- Grade I listed mid-19th century Crossness Pumping Station, dating to 1865 and located 850m to the west of the Site Boundary (National Heritage List for England /NHLE ref: 1064241).
 - Grade II listed mid-19th century Workshop Range to South East of Main Engine House at Crossness Pumping Station, dating to the 1860s and located 780m to the west of the Site Boundary (NHLE ref: 1064216).
 - Grade II listed mid-19th century Workshop Range to South West of Main Engine House at Crossness Pumping Station, dating to the 1860s and located 900m to the west of the Site Boundary (NHLE ref: 1250557).
 - Grade II listed No. 4 Jetty and Approach at Dagenham Dock, dating to the late-19th and early-20th centuries and located 750m to the northwest of the Site Boundary (NHLE ref: 1391706).
- 2.4.4. The three listed buildings at Crossness Pumping Station are situated within the Crossness Conservation Area. Crossness Pumping Station is also on the Historic England Heritage at Risk Register (NHLE ref: 1064241).

3. LEGISLATIVE AND PLANNING FRAMEWORK

- 3.1.1. A list of the legislation, policy and guidance relevant to the assessment of the Historic Environment for the Proposed Scheme is provided below.

LEGISLATIVE BACKGROUND

Listed Buildings, Conservation Areas and Scheduled Monuments

- 3.1.2. The Infrastructure Planning (Decisions) Regulations 2010 Regulation 3 sets out matters to which the Secretary of State must have regard when deciding applications for development consent. It states that, when deciding an application which affects a listed building, conservation area or a scheduled monument, or its setting, the decision-maker must have regard to the desirability of preserving the asset or its setting or any features of special architectural or historic interest which it possesses.
- 3.1.3. The Planning (Listed Buildings and Conservation Areas) Act 1990 sets out the legal requirements for the control of development and alterations which affect listed buildings or conservation areas (including buildings of heritage interest which lie within a conservation area). Grade I are buildings of exceptional interest. Grade II* are particularly significant buildings of more than special interest. Grade II are buildings of special interest.
- 3.1.4. Arrangements for Handling Heritage Applications: Notification to Historic England and National Amenity Societies and the Secretary of State (England) Direction 2021, directs that in respect of applications for listed building consent, local planning authorities must consult Historic England for works; i) in respect of any Grade I or II* listed building; and (ii) for relevant works in respect of any Grade II listed building. The National Amenity Societies must be consulted where the partial or complete demolition of a listed building is proposed.
- 3.1.5. Also protected and requiring listed building consent, even if they are not specifically referred to in a statutory listing description, are 'curtilage buildings'. These are any object or structure within the curtilage of a principal building (listed building) which, although not fixed to the principal building, forms part of the land and has done so before 1st July 1948 and which is treated as part of the principal building by virtue of section 1(5)(b) of the Act.

PLANNING POLICY

Overarching National Policy Statement for Energy (EN-1)

- 3.1.6. The Overarching National Policy Statement (NPS) for Energy (EN-1; 2024) is part of a suite of NPSs issued by the Secretary of State for the Department for Energy Security & Net Zero (DESNZ). It sets out the Government's policy for delivering major energy infrastructure and is the primary basis for decision making.
- 3.1.7. Section 5.9 relates to the Historic Environment and sets out policy in relation to harm to the significance of heritage assets. Its requirements relating to the Historic Environment are broadly similar to those in NPPF (see below):

- *“The construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment” (paragraph 5.9.1);*
- *“The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, landscaped and planted or managed flora.” (Paragraph 5.9.2);*
- *“The applicant should ensure that the extent of the impact of the proposed development on the significance of any heritage assets affected can be adequately understood from the application and supporting documents.” (Paragraph 5.9.12);*
- *“Where the loss of significance of any heritage asset has been justified by the applicant on the merits of the new development and the significance of the asset in question, the Secretary of State should consider:*
 - *imposing a requirement in the Development Consent Order*
 - *requiring the applicant to enter into an obligation*
- *That will prevent the loss occurring until the relevant part of the development has commenced, or it is reasonably certain that the relevant part of the development is to proceed” (Paragraphs 5.9.19—20).*
- *“In considering the impact of a proposed development on any heritage assets, the Secretary of State should consider the particular nature of the significance of the heritage assets and the value that they hold for this and future generations.” (Paragraph 5.9.24);*
- *“Substantial harm to or loss of significance of a grade II Listed Building or a grade II Registered Park or Garden should be exceptional. Substantial harm to or loss of significance of assets of the highest significance, including Scheduled Monuments; Protected Wreck Sites; Registered Battlefields; grade I and II* Listed Buildings; grade I and II* Registered Parks and Gardens; and World Heritage Sites, should be wholly exceptional.” (Paragraphs 5.8.29—30);*
- *“Where the proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset the Secretary of State should refuse consent unless it can be demonstrated that the substantial harm to, or loss of, significance is necessary to achieve substantial public benefits that outweigh that harm or loss” (Paragraph 5.9.31); and*
- *“Where the proposed development will lead to less than substantial harm to the significance of the designated heritage asset, this harm should be weighed against the public benefits of the proposal, including, where appropriate securing its optimum viable use.” (Paragraph 5.9.32).*

National Planning Policy Framework

- 3.1.8. The National Planning Policy Framework (Ministry of Housing, Communities and Local Government, revised December 2023) sets out the Government's planning policies for England and provides guidance for planning authorities and developers on the conservation and investigation of heritage assets. The primary objective of the NPPF is to foster the delivery of sustainable development, not to prevent it.
- 3.1.9. The Historic Environment is specifically dealt with in Section 16 of the NPPF. The policies set out in the NPPF should be interpreted and applied locally to meet local objectives. The NPPF is designed to provide a clear framework to make sure that heritage assets are conserved or enhanced in a manner that is proportionate with their significance.
- 3.1.10. The NPPF sets out the importance of assessing the significance of heritage assets that may be affected by a proposal. Paragraph 200 of the NPPF states that local planning authorities, when determining applications, should require the applicant to *"describe the significance of any heritage assets affected, including any contribution made by their setting"*. Paragraph 200 goes on to state that *"the level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance"*.
- 3.1.11. 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)." Annex 2 also defines significance as "the value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting"*. Setting 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"*.
- 3.1.12. Paragraph 196 of the NPPF states that local planning authorities should consider the following when determining planning applications:
- *"the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation;*
 - *the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;*
 - *the desirability of new development making a positive contribution to local character and distinctiveness; and*
 - *opportunities to draw on the contribution made by the historic environment to the character of a place."*

- 3.1.13. Paragraphs 205 to 209 detail the notion that heritage assets can be harmed or lost through alterations, destruction, or from development within their setting. These paragraphs identify that this harm ranges from less than substantial to substantial. The emphasis should be on the conservation of designated heritage assets, regardless of whether any potential harm is considered to be substantial or less than substantial (paragraph 205). As a rule, the more important the heritage asset is, the greater the weight should be on its conservation. Assets of the highest significance are scheduled monuments, protected wreck sites, registered battlefields, Grade I and II* listed buildings, Grade I and II* registered parks and gardens, and World Heritage Sites (paragraph 206).
- 3.1.14. Paragraph 207 of the NPPF states that development consent should be refused where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, unless the application demonstrates that the proposed development will result in substantial public benefits that outweigh the harm or loss to the heritage asset. Where less than substantial harm is caused, this should also be weighed against the public benefits of the proposal.
- 3.1.15. With regard to applications concerning non-designated heritage assets “*a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset*” (paragraph 209).

The London Plan

- 3.1.16. The Spatial Development Strategy for Greater London (Greater London Authority, 2021) sets out a framework for how London will develop over the next 20-25 years and the Mayor’s vision for ‘Good Growth’. Policy HC1 of the London Plan is the key policy specific to the Historic Environment within Greater London, which states that:
- 3.1.17. “*A. Boroughs 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.*
- 3.1.18. *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:*
- *setting out a clear vision that recognises and embeds the role of heritage in place-making;*
 - *utilising the heritage significance of a site or area in the planning and design process;*
 - *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; and*

- *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.*

- 3.1.19. *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.*
- 3.1.20. *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.*
- 3.1.21. *E. Where heritage assets have been identified as being At Risk, boroughs should identify specific opportunities for them to contribute to regeneration and place-making, and they should set out strategies for their repair and reuse”.*
- 3.1.22. The London Plan also identifies Opportunity Areas (OA), including the Bexley Riverside OA within which the Site is situated. The Plan recognises Belvedere as having “*potential as a future District centre*”.

The Bexley Local Plan

- 3.1.23. The Bexley Local Plan, adopted on 26th April 2023, positively plans for sustainable development across the borough. It is essential to the delivery of the Council's other key plans and strategies, including the Bexley Plan, the Growth Strategy and the Connected Communities Strategy (London Borough of Bexley, 2023).
- 3.1.24. The following policies in the Local Plan are relevant to the Historic Environment:
- Policy SP6: Managing Bexley's Heritage Assets states that “*The Council will manage its heritage and archaeological assets, whilst seeking opportunities to make the most of these assets; including adapting to and mitigating the effects of climate change. This will enhance the local sense of place and support the revitalisation and development of the borough, including promoting the visitor economy.*” In part, this will be achieved by “*promoting the borough's heritage assets, such as Lesnes Abbey, Danson Mansion, Hall Place and Gardens, Crossness Beam Engine House and Red House*” and “*reviewing the status of existing and identifying new heritage and archaeological assets*”.
 - Policy DP14: Development affecting a heritage asset states that “*development proposals with the potential to directly or indirectly impact on a heritage asset or its setting should meet NPPF requirements to describe the significance of the asset and demonstrate how the proposal conserves or enhances the significance of the asset.*” With regard to archaeological evidence, the policy goes on to state that “*development proposals should be assessing the archaeological potential of sites*

and then retaining, in situ, archaeological evidence within sites, wherever possible. Where archaeological evidence cannot be retained, the appropriate levels of archaeological investigation and recording should be undertaken prior to the redevelopment of the site.”

London Environment Strategy

- 3.1.25. The London Environment Strategy (Greater London Authority, 2018) seeks to ensure that London will become a “zero carbon city by 2050” by setting out policies and proposals in seven policy areas to address environmental challenges, including the transition to a low carbon circular economy. The Mayor wants to ensure “*London’s businesses and workers are supported to be able to compete effectively in, and benefit from, this growing global market*”.
- 3.1.26. The London Environment Strategy contains the following policies and proposals in relation to the Historic Environment:
- Policy 5.1.2 Protect, conserve, and enhance the landscape and cultural value of London’s green infrastructure.
 - Proposal 5.1.2.a states that “*the Mayor will ensure that opportunities for a complementary relationship between cultural heritage and green infrastructure are fully explored in the interests of good place-making.*”

South East Inshore Marine Plan

- 3.1.27. The South East Inshore Marine Plan (Department for Environment, Food and Rural Affairs, 2021) area stretches from Felixstowe in Suffolk to west of Dover in Kent and incorporates the River Thames. The South East Inshore Marine Plan is intended to help to enhance and protect the marine environment and achieve sustainable economic growth while respecting local communities both within and adjacent to the marine plan area.
- 3.1.28. Policy SE-HER-1 relates to the Historic Environment:
- “*Proposals that demonstrate they will conserve and enhance the significance of heritage assets will be supported.*
 - *Where proposals may cause harm to the significance of heritage assets, proponents must demonstrate that they will, in order of preference:*
 - *avoid*
 - *minimise*
 - *mitigate*
 - *any harm to the significance of heritage assets.*
 - *If it is not possible to mitigate, then public benefits for proceeding with the proposal must outweigh the harm to the significance of heritage assets.”*

HERITAGE SECTOR GUIDANCE

- 3.1.29. The assessment has been carried out in accordance with the requirements of the NPS EN-1 (2024), the NPPF (2024) and to standards specified by the Chartered Institute for Archaeologists (CIfA, Dec 2020a, 2020b) and Historic England (Historic England, 2015, 2017).

Historic England Guidance

- 3.1.30. Historic England has published a series of Good Practice Advice (GPA). Those of most relevance are GPA2 - Managing Significance in Decision-taking (March 2015) and GPA3 - The Setting of Heritage Assets (2nd Edition) (December 2017).
- 3.1.31. GPA2 emphasises the requirement to having a knowledge and understanding of the significance of heritage assets likely to be affected by the development and that the *“first step for all applicants is to understand the significance of any affected heritage asset and, if relevant the contribution of its setting to its significance”* (paragraph 4). This information is also useful to the local planning authority in pre-application engagement with an applicant and ultimately in decision making (paragraph 7).
- 3.1.32. GPA3 provides advice on the setting of heritage assets. Setting is as defined in the NPPF (DLUHC, 2024) and forms the surroundings in which a heritage asset is experienced. Components of a setting can make positive or negative contribution to the significance of an asset and affect the ways in which it is experienced. GPA3 and the NPPF state that setting is not fixed and that it may change as the asset and its surrounding evolve. Setting can be extensive and can overlap with the setting of other heritage assets, particularly in urban areas or historic landscapes. While not limited to views, the contribution of setting to the significance of an asset is often expressed in this way, and paragraph 11 of GPA3 identifies those views that contribute to understanding the significance of assets, such as designed views those that were designed or where there are associations with other heritage assets.

Chartered Institute for Archaeologists Guidance

- 3.1.33. The baseline study has been undertaken in accordance with guidance published by the Chartered Institute for Archaeologists (CIfA), specifically the Standard And Guidance For Historic Environment Desk Based Assessment (CIfA, 2020).

4. SOURCES AND METHODOLOGY

4.1. DATA SOURCES

- 4.1.1. In order to determine the full Historic Environment potential of the Site, a broad range of standard documentary and cartographic sources, including results from any archaeological investigations within the Site Boundary and a 1km Study Area around it were examined in order to determine the likely nature, extent, preservation and heritage significance (value) of any known or possible heritage assets that may be present within or adjacent to the Site.
- 4.1.2. The Study Areas used for the above ground heritage asset settings assessment in **Chapter 9: Historic Environment (Volume 1)** of this Environmental Statement (ES) comprise:
- Designated above ground heritage assets up to 1km from the Site Boundary. This Study Area has been informed by a digital Zone of Theoretical Visibility (ZTV) model which indicates likely visibility of the Proposed Scheme within the surrounding area. Professional judgement has been applied when scoping designated heritage assets potentially affected through changes to setting and, where relevant, assets beyond the 1km Study Area have been considered. This is to ensure that the setting of designated heritage assets is taken into consideration. Details of the proposed digital ZTV are outlined in **Chapter 10: Townscape and Visual (Volume 1)**.
 - Non-designated above ground heritage assets up to 500m from the Site Boundary, specifically locally listed buildings.
- 4.1.3. Where relevant, there is reference to assets beyond these Study Areas, e.g. where such assets are particularly significant and/or where they contribute to current understanding of the historic environment.
- 4.1.4. **Table 1** below provides a summary of the key data sources.

Table 1: Data Sources Consulted

Source	Data	Comment
Historic England	National Heritage List for England (NHLE) (with information on statutorily designated heritage assets)	Statutory designations (scheduled monuments; statutorily listed buildings; registered parks and gardens; historic battlefields) can provide a significant constraint to development.
	Greater London Historic Environment Record (GLHER)	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources.

Source	Data	Comment
	National Record of the Historic Environment (NRHE)	National database maintained by Historic England. Not as comprehensive as the HER but can occasionally contain additional information. Accessible via PastScape website.
LBB	Archaeological Priority Area	Area of interest identified by the local authority. There is likely to be a requirement for archaeological investigation (initially a desk-based assessment) as part of any planning process.
	Conservation Area	An area of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.
	Locally Listed Building	Building of local importance designated by the local planning authority due to architectural and/or historic significance and a positive contributor to the character of an area. Whilst not statutorily protected, a building's inclusion on the list means that it is a material consideration in the planning process.
British Geological Survey (BGS)	Solid and Drift Geology Digital Map	Subsurface deposition, including buried geology and topography, can provide an indication of potential for early human settlement, and potential depth of archaeological remains.
	Online BGS Geological Borehole Record Data	
United Kingdom Hydrographic Office (UKHO)	Marine Wrecks and Obstructions Data	Data set of recorded charted, uncharted, live and dead wrecks and obstructions from around the world.
Groundsure	Ordnance Survey Maps (from the 1st edition (1860–70s) to present day)	Provides a good indication of past land use and impacts which may have compromised archaeological survival. Provides an indication of the possible date of any buildings within the Site.
Bexley Local Studies and Archive Centre	Historic Maps (e.g. Tithe, enclosure, estate), Published Journals and Local History	Baseline information on the historic environment.

Source	Data	Comment
Internet	Web-published local history	Many key documentary sources, such as the Victoria County History, the Survey of London, and local and specialist studies are now published on the web and can be used to inform the archaeological and historical background. The Archaeological Data Service includes an archive of digital fieldwork reports.
	Archaeological Data Service	
Various	Previous Geotechnical Data from Adjacent Schemes	The information can be very useful in enhancing understanding of the nature and depth of natural geology (see above) and any made ground, whether it is modern or of potential archaeological interest.
The Applicant	Topographical Survey Data	Survey data can provide an indication of the impact of past land use, e.g. ground raising or lowering, which is useful for understanding possible truncation and likely depth of archaeological remains.
WSP	Bathymetry Data	Bathymetry data is used in marine archaeology to create images and models of underwater surfaces. This can be used to identify areas of archaeological potential and to determine the likely depth of archaeological remains.

4.1.5. **Figure 3** shows the location of known historic environment features within the Study Area, as identified by the sources above, the walkover, or during the course of research carried out for this assessment. These have been allocated a unique 'assessment' reference number (**A1, 2**, etc.), which is listed in a gazetteer in **Annex A** and is referred to in this report. Archaeological Priority Areas are not shown. All distances quoted in the text are approximate (within 5m).

4.2. CONSULTATIONS

4.2.1. Consultation via email has taken place with the Archaeology Advisor at GLAAS. GLAAS generally supported the proposed mitigation strategy outlined in **Section 10** of this report. A summary of the consultation which has taken place to date is included in **Section 9.3 of Chapter 9: Historic Environment (Volume 1)**.

4.3. WALKOVER

4.3.1. The assessment included a walkover carried out on the 3rd of March 2023 to determine the topography of the Site and existing land use, the nature of the existing buildings, identify any visible heritage assets (e.g. structures and earthworks) and assess factors that may have affected the survival or condition of any known or potential assets.

- 4.3.2. The walkover also extended beyond the Site Boundary for the purposes of scoping built heritage assets and their intervisibility with the Proposed Scheme, as required by Historic England guidance (Historic England, 2017) and for the settings assessment.
- 4.3.3. Due to its location on a private road, the Grade II listed No. 4 Jetty and Approach at Dagenham Dock, which is situated approximately 750m to the northwest of the Site Boundary on the opposite side of the River Thames to the Site, could not be accessed during the walkover. As a result, photographs of this heritage asset could only be taken from the opposite side of the River Thames. The view from this asset towards the Site could not be photographed.
- 4.3.4. The internal areas of Crossness Sewage Treatment Works were not accessed during the walkover. As it was concluded that this was not necessary to assess the contribution of setting to baseline heritage significance (value), the locally listed 'police box' style concrete structures located here were also not accessed.
- 4.3.5. The site walkover did not extend to the intertidal foreshore due to health and safety constraints, although the foreshore was viewed at low tide from the England Coast Path (FP3/NCN1).

4.4. ASSESSING ARCHAEOLOGICAL POTENTIAL

- 4.4.1. **Section 6** of this report presents an assessment of archaeological potential for each chronological period, based on the archaeological and historical background of the area, its geology, topography and hydrology, the likelihood for evidence of past activity, and considering past disturbance which may have affected survival. For example, the Site may have high potential for activity of a particular period, but with a low level of survival. **Section 6** also includes professional opinion on likely heritage significance (value), where there is low to moderate, or higher, potential for remains to be present. Where potential is low, heritage significance (value) is not assessed, as this implies that remains from the period are not present.

4.5. ASSESSING HERITAGE SIGNIFICANCE (VALUE)

- 4.5.1. NPS EN-1 (DESNZ, 2024) defines heritage assets as those elements of the historic environment that hold value to this and future generations because of their historic, archaeological, architectural or artistic interest (paragraph 5.9.3). Heritage significance (value) derives not only from a heritage asset's physical presence, but also from its setting. The determination of the heritage significance (value) is based on statutory designation and/or professional judgement against these heritage values (which are also identified in Historic England Statements of Heritage Significance (Historic England, 2019).
- 4.5.2. Each asset is evaluated against these criteria on a case-by-case basis. Unless the nature and exact extent of buried archaeological remains within any given area has been determined through prior investigation, heritage significance (value) is often uncertain.

- 4.5.3. In relation to significant heritage assets, the assessment considers the contribution which the historic character and setting makes to the overall heritage significance (value) of the asset.
- 4.5.4. **Table 2** below gives examples of the heritage significance (value) of designated and non-designated heritage assets.

Table 2: Heritage Significance (value) of Heritage Assets

Heritage Asset Description	Heritage Significance (value)
World Heritage Sites	Very High
Scheduled Monuments Grade I Listed Buildings Grade II* Listed Buildings Grade II Listed Buildings with exceptional qualities in fabric, historical association, and/or association/group value with heritage assets of high heritage significance (value) Protected Wrecks Registered Battlefield Conservation Areas containing very important (Grade I / II*) listed buildings Grade I and II* Registered Parks and Gardens Protected heritage landscapes (e.g. ancient woodland or historic hedgerows, heritage Sites of Special Scientific Interest) Burial grounds Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of national importance.	High
Grade II Listed Buildings which can be shown to have qualities in their fabric or historical association of regional importance only Conservation Areas containing primarily Grade II listed or Locally Listed Buildings Grade II Registered Parks and Gardens Locally Listed Buildings Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of regional importance.	Medium
Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of local importance.	Low
Item with no significant heritage value or interest	Negligible
Heritage assets that have a clear potential, but for which current knowledge is insufficient to allow heritage significance (value) to be determined.	Uncertain

4.6. ASSESSING HARM

- 4.6.1. Professional judgement is used to consider the impact (the magnitude of change) of future development on the heritage significance (value) of known heritage assets. This is assessed in NPS EN-1 (DESNZ, 2024) and NPPF (DLUHC, 2023) terms as 'no harm', 'less than substantial harm', 'substantial harm' or 'total loss of significance' (value).

5. HISTORIC ENVIRONMENT BASELINE

5.1. SITE LOCATION

- 5.1.1. **Chapter 2: Site and Proposed Scheme Description (Volume 1)** of this Environmental Statement (ES) provides an overview of the Site location and surroundings. The Site Boundary is located off Norman Road, Belvedere in the London Borough of Bexley (NGR 549572, 180512; **Figure 1**).
- 5.1.2. The Site Boundary falls within the historic parish of Erith, which lay within the county of Kent prior to being absorbed into the administration of LBB in 1965.

5.2. TOPOGRAPHY

- 5.2.1. Topography can provide an indication of suitability for settlement, and ground levels can indicate whether the ground has been built up or truncated, which can have implications for archaeological survival (see **Section 5.6**).
- 5.2.2. The Site is located on the modern waterfront of the southern bank of the River Thames, within a former wide floodplain of the estuarine Thames. Formerly, the floodplain comprised localised areas of gravel highs interwoven by wetland, marsh and channels. As sea and river levels rose over the last ten thousand years, the floodplain would have been inundated with increasing frequency, infilling channels with alluvium and overtopping the islands from the prehistoric period onwards. Evidence for prehistoric and early historic human occupation is therefore most likely on areas of higher ground (Historic England, 2020), and structures relating to channel management, fishing, fowling and environmental remains preserved in areas of lower ground. During the medieval period, wetlands were drained and reclaimed to be used as pasture.
- 5.2.3. The topography of the area is relatively flat. Based on available topographic survey data, current ground level within the low-lying undeveloped part of the marsh lies at around 1.0m Above Ordnance Datum (AOD). The existing Riverside 1 development lies at 1.2m to 2.0m AOD, suggesting around 0.2–1.0m of ground raising. The river wall is an artificial embankment at around 6.0m AOD. Ditches within the Site reach elevations of –1.0m OD (Maltby Surveys, 2021, drawing no. 21/110/100-Overview) (**Figure 17**).

5.3. GEOLOGY AND SOILS

- 5.3.1. Geology can provide an indication of suitability for early settlement, and potential depth of remains. A summary of the geology and soils present within the Site is presented below. Further information is presented in **Chapter 17: Ground Conditions and Soils (Volume 1)** of this Environmental Statement (ES).
- 5.3.2. British Geological Survey (BGS) data records the bedrock geology of the Site as London Clay Formation in the north and Lambeth Group Clay, Silt and Sand in the south (**Figure 4**). Both are Palaeogene deposits (c 50 million years Before Present/BP) that pre-date human evolution and have no archaeological potential. The

Site lies on the estuarine Thames floodplain, and superficial deposits are mapped as alluvium (clay, silt, sand and peat). Alluvium dates to the Holocene (the current warm stage covering the last ten thousand years of human history) and overlies Shepperton Gravel. Made ground is also recorded across much of the terrestrial part of the Site.

- 5.3.3. Staircases of river terraces are important archives of climate driven change (sediment supply, discharge, or base level that result in channel incision or aggradation) and tectonically driven long term uplift that results in channel incision (Merritts, 2007), and provide a stratigraphic framework for regional geochronology and correlation. The Thames terraces have been extensively studied (Gibbard, 1985; 1994; Bridgland, 1994; 1995; Bridgland et al, 1995), and the Shepperton Gravel is known to be the first (lowest and youngest) terrace in the sequence, deposited during the last ice age (the Devensian). Channel incision took place during the coldest part of the Devensian (when base levels were low) and gravel deposition took place during deglaciation (15,000 –10,000 BP).
- 5.3.4. The topography of the gravel surface therefore forms the ‘template’ for subsequent Holocene sedimentation. Holocene sedimentation in the Thames estuary is characterised by a series of changes in river levels, or relative sea level (RSL) as deglaciation (ice melt) raised sea levels globally.
- 5.3.5. In the 1970s, Devoy undertook seminal work on the sediments at the typesite^a of Tilbury (Devoy, 1979). Five phases of marine transgression (Thames I-V) represented by clay/silt units were identified, and five marine regressions (Tilbury I-V) represented by peat units. He constructed two age-altitude curves of relative sea level movement, one for Tilbury (outer estuary) and one for Crossness, Dartford and Broadness (inner estuary). The model suggests RSL rise in the following periods:
- Early Mesolithic period (RSL rise from –25.5m to –8.9m OD);
 - Late Mesolithic/Early Neolithic periods (RSL rise from –10.1m to –5.0m OD);
 - throughout the Bronze Age (RSL rise to between –1.4m and –2.5m OD);
 - Middle Iron Age; and (RSL rise to 0.4m AOD); and
 - beginning of the 4th century AD.
- 5.3.6. Bates’ (1999) modelling of progressive inundation broadly agrees with Devoy’s model but emphasises that local conditions will have been an important factor influencing sediment deposition. Bates ascribed ages to datums from various sites in the Lower Thames estuary and suggests the following submergence of the gravel topography (these levels and dates will vary to some extent in an upstream-downstream direction and with distance away from the contemporary river channels):
- Submerged to –15m OD by c 8300 BP;
 - Submerged to –12m OD by 7750 BP;
 - Submerged to –8m OD by 6670 BP;

^a A term used to define a distinct archaeological culture or period.

- Submerged to –4m OD by 5610 BP; and
- Submerged to –3m OD by 5340 BP.

- 5.3.7. Subsequent work examined the unrepresentative nature of the typesite (Sidell, 2003) and suggested a tripartite model for the estuarine Thames between the City of London to the border with Kent and Essex. This comprises an initial Early Holocene RSL rise (marine transgression) followed by a slowing in the rate of RSL rise and concurrent expansion of freshwater peat (wood peat and then alder carr) from c 6800–5000 BP (Neolithic and Bronze Age), and lastly a second marine transgression starting at approximately 3500 BP and still in progress today (Iron Age onwards).
- 5.3.8. In 2022, Quaternary Scientific (Quest) produced a Geoarchaeological and Palaeoenvironmental Analysis Report for Riverside 2 and the surrounding area. The work entailed a review and collation of nearly 150 geotechnical logs to create an archaeological deposit model. Ground investigation was also undertaken in the foreshore part of the Site in 2007 (Soil Mechanics, 2007). The number and spread of the geotechnical logs meant that the deposit model was produced with a high level of confidence. The deposit model provides a valuable insight into the subsurface topography and the nature of the deposits in the northern terrestrial part of the Site. There is currently insufficient borehole data to extend the model across the southern part of the Site. The report provided the following summary of the geology of the northern part of the Site and its immediate vicinity, that compares well with the tripartite model (Sidell, 2003):
- 5.3.9. “In summary, the Shepperton Gravel was deposited during the late Devensian (ca. 15-10,000 years ago). Following a hiatus in deposition of at least ca. 3000 years, several metres of Lower Alluvium were deposited relatively rapidly under tidal lagoon, and later supratidal environment. Peat formed from around 4800 to 3500-3250 years ago, most likely under freshwater conditions and supporting the growth of alder dominated woodland, with evidence for the colonisation of yew, and later elm woodland. The peat was overlain by silty clay deposits of the Upper Alluvium, accumulating once again in a supratidal environment as a consequence of both sea level rise and deforestation on the dryland.” (Quaternary Scientific, 2022)
- 5.3.10. The Shepperton Gravel rests on London Clay bedrock between –12.0m and –14.0m OD across the northern part of the Site. Towards the centre and south of the Site, however, the gravel thickens and reaches bedrock at up to –20.0m OD. This change in thickness could represent the infill of a former Pleistocene channel. The height of the gravel surface is relatively even across the Site, ranging between –6.0m and –9.5m OD but gradually decreasing in height towards the north and east. In the southern part of the Site, this surface rises gently to between –7.0m and –6.0m OD. **Figure 5** shows the Shepperton Gravel surface across the Site and surrounding area (Quest, 2022).

- 5.3.11. The surface of Lower Alluvium lies at between -3.0m and -4.0m OD and frequently contains detrital wood or plant remains. The overlying peat ranges in thickness across the Site from 1.0m to 3.0m (with a surface height between -1.0m and -2.0m). Peat represents the development of Neolithic and Bronze Age sedge fen/reed swamp, associated with RSL stabilisation. A number of geotechnical logs did not contain peat, particularly in eastern parts of the Site, perhaps due to deeper active channels where the gravel topography is low (-9m OD, **Figure 5**) and a west-east channel may traverse the Site. **Figure 6** shows the peat thickness across the Site in the deposit model, with red stars indicating boreholes where peat was apparently absent.
- 5.3.12. The Upper Alluvium generally ranges between $1\text{--}5\text{m}$ thick (greater thickness are recorded in the Thames channel), and blankets the floodplain, meaning the surface of the Upper Alluvium is generally level at approximately $1\text{--}3\text{m}$ AOD (7). Where untruncated, Upper Alluvium is predicted to lie between -0.1m and -6.0m OD beneath modern made ground.
- 5.3.13. Made ground ($1\text{--}4\text{m}$ thick) caps the alluvial sequence in parts of the Site, with greater thicknesses at the northern end.
- 5.3.14. The following is a summary of the level of superficial geology within the northern terrestrial part of the Site (i.e. the Riverside 1, Riverside 2 and East Paddock land parcels):
- Current ground level within the undeveloped part of the marsh lies at around 1.0m AOD and Riverside 1 lies at 1.2m to 2.0m AOD. The river wall is an artificial embankment at around 6.0m AOD. Ditches within the Site reach elevations of -1.0m OD;
 - Modern made ground is present in the northern part of the Site in the area of Riverside 1 and Riverside 2, and along the eastern part of the Site where the electrical substation was previously located. The made ground is typically 1.0m thick;
 - The top of untruncated upper alluvium in the northern part of the Site lies at 1.0m to -1.0m OD (up to 3.0m below ground level (m bgl) in the Riverside 1 and Riverside 2 areas of the Site);
 - A layer of peat, representing the rotted vegetation of a former dry land surface (radiocarbon dated to the late Neolithic to Bronze Age) lies across the northern part of the Site and is thicker in the northeast. The top of the peat lies at -1.0m to -3.0m OD (2.0m to 5.0m bgl depending on whether modern made ground is present); and
 - The top of untruncated Shepperton Gravel that defines the subsurface topography in the northern part of the Site lies at -6.0m to -10.0m OD (7.0m to 12.0m bgl depending on whether modern made ground is present). The deeper levels reflect the palaeochannel in the eastern part of the Site.
- 5.3.15. The higher areas, where peat is encountered, and which might have been suitable for occupation and other activities in the prehistoric, are located in the northwestern and central parts of the Site. The potential for the southern half would need to be clarified with an extension of the deposit model to this area.

- 5.3.16. Early prehistoric remains might potentially be encountered at the base of the alluvial sequence and cut into the underlying Gravel. Mesolithic to Bronze Age remains would be around the level that peat is recorded. During the Iron Age and Roman period the Site was likely prone to regular inundation with rising water levels. Medieval and post-medieval remains, following drainage and reclamation of the marsh, would be at the upper part/cut into the top of the alluvial sequence.

5.4. OVERVIEW OF PAST ARCHAEOLOGICAL INVESTIGATIONS

- 5.4.1. Although a limited number of archaeological investigations have been undertaken within the Site, the area is relatively well understood, with 51 recorded investigations within the 1km Study Area (shown on **Figure 3**). These include watching briefs, geoarchaeological surveys, trial trench evaluations and targeted excavations. Those investigations undertaken within the Site are discussed first in this section.
- 5.4.2. In addition to the geotechnical investigations discussed above, geotechnical monitoring within the Site was undertaken in 1994 (**A1b**), and Quest used geoarchaeological borehole data to create a deposit model of the western part of the Site and land to the west in 2011 (**A1c**). The model identified layers of alluvium and peat.
- 5.4.3. An archaeological trial trench evaluation was undertaken within the northern part of the Site in 2007 (**A1a**). Nine 4.0m x 4.0m trenches were excavated and shored to enable archaeological investigation to a depth of 5.0—6.0m bgl. Mechanical excavation was subsequently undertaken to reach a depth of 9.0m bgl. The evaluation revealed an alluvial sequence including a band of over Gravel and capped by modern made ground (**Section 5.3**) (**Figure 2**). Column and bulk samples were taken from each trench and the peat assessed as likely to be Early Neolithic to Iron Age in date.
- 5.4.4. A single unstratified rim sherd of a Roman greyware necked jar, dated to AD 60–160, was recovered from the top of the alluvial sequence. No other archaeological remains were encountered. It was concluded that the lack of archaeological evidence predating the post-medieval period may indicate the Site's unsuitability for human occupation due to wet, marshy conditions, although it is noted here that the nine trenches represent a less than 1% sample of the current Site and may not be reflective of the potential for prehistoric and Roman remains. Made ground dating to the 19th and 20th centuries was encountered in all of the trenches, and elements likely relating to the former 20th century Borax Works were identified. These could not be investigated further due to contaminants within the made ground. No evidence of a medieval revetment or sea wall was encountered.
- 5.4.5. Within the alluvial deposits, the remains of fallen trees suggest a probably Bronze Age alder carr landscape (waterlogged and wooded terrain). A geoarchaeological study of borehole data at the Middleton Jetty to the north (prior to construction) revealed a comparable tripartite stratigraphic sequence (Pre-Construct Archaeology, 2008).

- 5.4.6. In 2007, an archaeological evaluation was undertaken at three locations in and around Crossness Sewage Treatment Works to the west of the Site, and a single 10m x 2m trench was excavated in the southwestern corner of the Site (**A1i**). A peat layer was identified at between –1.6m OD and –2.1m OD, and a lens of clayey silt was identified within this layer, potentially representing a short period of marine transgression. The peat layer was sealed by a darker layer of peat (of ~0.58m thickness) which contained small pieces of wood. A “*mid yellowish brown*” deposit overlay this and may relate to the medieval and post-medieval utilisation and drainage of the marshes. This layer had a thickness of between 0.8m and 1.2m. Overlying this was a topsoil layer, which had a thickness of between 0.5m and 0.8m. No evidence of human activity was encountered (Pre-Construct Archaeology, 2007).
- 5.4.7. Groundworks subsequently undertaken at that location revealed several driven timber posts, which were archaeologically evaluated in 2010. Of the nine posts which were unearthed, only one remained in-situ in a vertical position. The top of this post was located 0.6m bgl. The posts were generally in good condition and measured between 1.5m and 2.4m in length and 0.1m and 0.2m in width. They had been squared off and tapered at their base to form a sharp point, although there was no evidence of prehistoric-type axe marks. The posts were arranged in a straight line on a north-northeast to south-southwest alignment, indicative of a fence line which likely continues beyond the excavated site. It was concluded that the posts are most likely to be of post-medieval origin (Pre-Construct Archaeology, 2010).
- 5.4.8. A watching brief carried out in 1997 10m to the southeast of the Site Boundary (**A20**) revealed a Mesolithic or Early Neolithic broken crested blade made of flint in the lower sand. Core sampling and analysis of environmental samples undertaken here in 2008 (**A11**) showed that this site was a semi-terrestrial fen carr woodland and a semi-aquatic reef or sedge swamp during the Middle Holocene (5000-2000 BC). The results of a borehole survey and geoarchaeological assessment in 2014 (**A29**) provide a useful palaeoenvironmental context for archaeology in the local area. However, no archaeological remains or artefacts were recovered from the core samples.
- 5.4.9. Deposit modelling was undertaken for a site at Burt’s Wharf to the immediate south of the Site in 2016 (**A9**) which showed that it has a similar geoarchaeological makeup to others in the Lower Thames valley. Based on the likely depth of sediments, the archaeological potential of the Site was considered to be low. A geoarchaeological survey was carried out here in 2020, the results of which determined that the Pleistocene floodplain gravel consists of underlying deposits of archaeological interest.
- 5.4.10. In 1995 a watching brief took place 40m to the southeast of the Site Boundary (**A12**). A peaty layer was identified, although this proved not to be a peat horizon and no datable features or finds were recovered.
- 5.4.11. A watching brief undertaken 60m to the west of the Site Boundary in 1997 (**A35**) revealed a backfilled ditch of unknown date.

- 5.4.12. Trial trenching undertaken at Crossness Sewage Treatment Works and Crossness LNR revealed a preserved prehistoric forest 970m to the west of the Site Boundary which may date to the Late Mesolithic (**A15**). Well preserved peat deposits were encountered across the site and evidence of episodic flooding events was identified.
- 5.4.13. In 1885 a logboat of probable Bronze Age date was found 800m to the east of the Site Boundary (**A21**). A polished flint axehead and scraper of possible Neolithic date were found inside the boat, though it is stated in the HER entry that these may be later forgeries. There is no further information in the entry to confirm this. A series of archaeological investigations have been carried at this location between 2007 and 2012, comprising geoarchaeological evaluations, borehole surveys, a watching brief and geophysical surveys. A possible Early Neolithic timber trackway was identified along with a peat deposit of Bronze Age date.
- 5.4.14. Early Bronze Age peat deposits assessed by pollen analysis were encountered during an auger survey 940m to the south of the Site Boundary in 1993 (**A10**). No archaeological features were identified during a trial trench evaluation here in the same year.
- 5.4.15. A pollen assessment was undertaken on samples from boreholes in 1994, 600m to the west of the Site Boundary (**A32**), which provided an approximate date later than 6,500 BC for the base of the sediment sequence.
- 5.4.16. A watching brief carried out in 1995-96 along Bronze Age Way 250m to the southeast of the Site Boundary (**A16**) revealed a section of a Bronze Age hurdle-built trackway and worked wood. Extensive evidence of a Late Mesolithic flint industry was identified below the peat and fragments of Neolithic pottery were also recovered.
- 5.4.17. Organic mud encountered with wood and plant fragments during an evaluation undertaken 320m to the southeast of the Site Boundary in 1996 (**A17**) were radiocarbon dated to the Mesolithic. A borehole survey carried out here in the same year (**A18**) revealed fluvial gravels overlaid by Neolithic to Iron Age peat. A possible Mesolithic land surface was identified during an auger survey carried out 900m to the east of the Site Boundary in 2005 (**A14**). A Bronze Age woodland and Iron Age meadow land were also identified.
- 5.4.18. In 2005 a trial trench evaluation was undertaken 370m to the southeast of the Site Boundary (**A25**). Although no archaeological finds or features of note were encountered, peat deposits dating from the Mesolithic to the Bronze Age were recorded.
- 5.4.19. A watching brief and geoarchaeological evaluation undertaken on land 300m to the east of the Site Boundary between 2015 and 2018 (**A7**) revealed a peat landscape thought to represent marshy woodland, perhaps dated to the Bronze Age with alluvial or tidal clays encountered possibly marking post-medieval land reclamation.

- 5.4.20. In 2012 geoarchaeological fieldwork and deposit modelling were undertaken for land 330m to the east of the Site Boundary (**A8**), which showed potential for palaeobotanical and zooarchaeological remains. The deposit sequence also suggested the presence of Mesolithic and later Neolithic to Bronze Age semi-terrestrial land surfaces that are comparable with the tripartite model (Sidell, 2003).
- 5.4.21. Geoarchaeological investigations undertaken at Alchemy Park 270m to the east of the Site Boundary between 2016 and 2018 (**A24**) revealed a deep west-east orientated palaeochannel. Peat dated from the Late Mesolithic to the Bronze Age was recorded.
- 5.4.22. A possible Bronze Age peat deposit was revealed during a watching brief 680m to the south of the Site Boundary in 2001 (**A19**) along with two undated linear features thought to be drainage ditches or natural water channels. During a watching brief undertaken 110m to the southeast of the Site Boundary in 2001-02 (**A26**), evidence was encountered for yew colonisation which possibly spread to the peatland from the Early Bronze Age.
- 5.4.23. A series of archaeological investigations were undertaken 270m to the southwest of the Site Boundary between 2003 and 2006, comprising two trial trench evaluations and a watching brief (**A13**). Two levels of peat were recorded, and one deposit contained several Roman finds. The peat deposits were radiocarbon dated to between the Late Mesolithic and the Bronze Age. A ditch, likely related to the post-medieval draining and division of Erith Marsh, was recorded.
- 5.4.24. Deposit modelling of geotechnical work undertaken 230m to the west of the Site Boundary in 2016 (**A36**) identified intertidal creeks of the late prehistoric period which have scoured away deposits from earlier periods.
- 5.4.25. The results of these investigations, along with other known sites and finds within the Study Area, are discussed by period, below. The date ranges below are approximate.

5.5. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

PREHISTORIC (800,000 BC–AD 43)

- 5.5.1. **Section 6.3** of this appendix describes the sediment sequence and time periods relevant to the Site, and it is clear that Lower (800,000–250,000 BP) and Middle (250,000–40,000 BP) Palaeolithic deposits are not present within the Site. The Shepperton Gravel was laid down during the late Devensian (late Upper Palaeolithic c. 40,000–12,000 BP), and although flint tools dating to this period have been found in the vicinity of the town of Erith to the southeast of the Site there are no known Palaeolithic finds within the Study Area.
- 5.5.2. The Early Holocene Mesolithic hunter-gatherer communities inhabited a largely wooded environment (10,000–4000 BC) and river valleys and coastlines would have been favoured in providing a predictable source of food (from hunting and fishing) and water, as well as a means of transport and communication. Evidence of activity is characterised by flint tools rather than structural remains.

- 5.5.3. The Thames estuary experienced rising river levels throughout the Holocene as the climate warmed and global ice melt raised sea levels (see reference to tripartite sequence in **Section 5.3** above). Rapid river level rise caused a marine transgression in the Mesolithic. This stabilised in the Neolithic to Bronze Age periods when peat formed and was followed by renewed RSL rise in the late prehistoric (Iron Age onwards) characterised by alluvial clay/silt deposition.
- 5.5.4. Evidence of Late Mesolithic forest, representing the earliest known colonisation of yew woodland on the southern bank of the Thames during the Late Holocene (6,203 BP), was found during trial trenching 970m to the west of the Site Boundary (**A15**). A Mesolithic bone awl was found within one of the peat layers demonstrating local human presence.
- 5.5.5. A significant number of prehistoric flint tools have been recovered within the Thamesmead and Erith Marshes APA, many of which date to the Mesolithic. During the construction of Bronze Age Way 250m to the southeast of the Site Boundary in 1995-96 (**A16**), evidence of a likely tool production centre was found within peat. The flint scatter of more than 3,000 artefacts included tranchet axes, cores, flakes, scrapers and awls (Historic England, 2020). A broken crested flint blade, which is either Mesolithic or Early Neolithic in date, was found during a watching brief 10m to the southeast of the Site Boundary in 1997 (**A20**). Due to its depth and location, however, the blade is not considered to be an indicator of human activity in this location. The number of microlith assemblages recorded across Kent suggests that there was a marked increase in population during the Later Mesolithic (Scott, 2004).
- 5.5.6. The Neolithic (4000–2200 BC) is usually seen as the time when the hunter-gatherer lifestyle gave way to farming and settled communities, concomitant with forest clearance for crop cultivation and construction of monuments. Pollen records indicate forest clearance over large areas of the British Isles during this period.
- 5.5.7. There are no Neolithic finds or features recorded within the Site. Within the Study Area large timbers which possibly formed part of an Early Neolithic trackway (**A21**) were recorded during an excavation 650m to the east of the Site Boundary in 2007 and a complete Neolithic carinated bowl was found during works at Bronze Age Way 250m southeast of the Site Boundary in 1995-96 (**A16**; Historic England, 2020).
- 5.5.8. The Bronze Age (2200–600 BC) is characterised by technological change, when copper and then bronze eventually replaced flint and stone as the main material for everyday tools. It is seen as a period of increasing social complexity and organised landscapes, probably due to increasing pressure on available resources. A considerable expansion in settlement in the Thames valley took place during the Bronze Age, with newly established communities farming the land and making the most of access to overseas trade. Evidence from elsewhere in Kent shows that the estuary foreshore was considered ideal for settlement (Yates, 2004).

- 5.5.9. No Bronze Age finds or features are recorded within the Site though remains are recorded within the Study Area. A Bronze Age logboat was found in two fragments during ditch digging through peat 800m to the east of the Site Boundary in 1885 (**A21**). A polished flint axe and scraper, possibly of Neolithic date, were found inside the boat, although these have since been interpreted as possible forgeries (see paragraph 5.4.13). Worked wood and a section of a Bronze Age hurdle-built trackway were found in deep peat deposits during a watching brief 250m to the southeast of the Site Boundary in 1995-96 (**A16**). Timber structures such as these would have enabled access across boggy marshland. A number of well preserved examples have been found elsewhere on both sides of the River Thames (MoLAS, 2005).
- 5.5.10. As part of the palaeoenvironmental analysis undertaken by Quest in 2022, samples of twigs and sedge remains from the boreholes drilled within the Site were taken for radiocarbon dating. The results indicate that the Lower Alluvium began to accumulate during the Late Mesolithic, while the accumulation of peat began between the late Neolithic and Neolithic-Bronze Age transition. Twig wood from the organic material within the Upper Alluvium was radiocarbon dated to the Late Bronze Age.
- 5.5.11. Results of pollen analysis indicate that during the formation of the Lower Alluvium, alder dominated the wetland environment. The transition to peat is characterised by a decline of lime, elm, pine and hazel and an increase of sedges and ferns. An expansion of yew woodland on the floodplain surface also likely took place at this time. With the deposition of the Upper Alluvium came a transition from a freshwater peat to saltmarsh conditions (Quest, 2022). Possible prehistoric antler fragments, shells, nuts and wood fragments (**A51**) were recorded at a depth of 8.5–9.4m, 150m to the south of the Site Boundary.
- 5.5.12. Buried peat horizons dating from the Early Mesolithic to Bronze Age periods have been recorded across the Study Area and provide evidence of what the prehistoric environment would have been like, representing the terrestrial or semi-terrestrial land surfaces during these periods (Historic England, 2020). These have been recorded 120m, 370m and 320m to the southeast of the Site Boundary (**A11, A25, A17**), 940m to the south (**A10**), 680m to the south (**A19**), 270m to the west (**A13**), 690m and 940m to the east (**A39, A14**), 260m to the east (**A24**), and 380m to the northeast (**A27**). Evidence for yew tree colonisation, which likely spread to the peatland from the Early Bronze Age, was encountered during a watching brief 200m to the southeast of the Site Boundary in 2001-02 (**A26**).
- 5.5.13. Due to the intertidal marshland landscape within the Site, permanent occupation of the Site would have been challenging and likely limited to areas of higher ground and along the edges of river channels. Nonetheless, the marshland would have provided many opportunities for fishing, hunting, collecting reeds, wood and salt production.
- 5.5.14. This would have been possible during periods of slowing, stabilised or falling RSL when the landscape was more accessible, and possibly suitable for exploitation or semi-permanent occupation. Activities such as fowling, grazing, fishing and pottery manufacture are more likely to have occurred during these periods (Museum of London Archaeology Service, 2008).

- 5.5.15. During the Iron Age (800 BC–AD 43), the climate deteriorated with wetter, colder weather. The period is characterised by expanding population, which necessitated the intensification of agricultural practices and the utilisation of marginal land. Hillforts were established in lowland Britain, linked to tribal land ownership.

ROMAN (AD 43–410)

- 5.5.16. Britain was conquered by Rome in the early 1st century AD and the city of *Londinium* was established 16km to the west of the Site Boundary. *Londinium* required resources from surrounding areas and a network of roads was built to facilitate a smooth flow of trade into and out of the city. Watling Street, which is situated 4.5km to the south of the Site Boundary, would likely have been one of the first Roman Roads to have been built in *Cantium* (Kent). This was an important route, connecting *Londinium* to the logistics base of *Rutupiae* (Richborough). Another Roman Road ran 3km to the north of the Site Boundary, eastwards out of *Londinium* (Andrews, 2004).
- 5.5.17. Caesar described *Cantium* as “*thickly studded with farmsteads*”. Indeed, major population growth in the Late Iron Age meant that a great deal of land in the county would have been under cultivation. During the Roman period, most of the population would have lived in isolated farmsteads comprising circular or rectangular huts. However, *Cantium* became the industrial heartland of *Britannia* in the early Roman period, with iron and pottery production being particularly important (Andrews, 2004).
- 5.5.18. An unstratified rim sherd of Roman greyware pottery was recovered from the top of the alluvial sequence during a trial trench evaluation within the Site in 2007 (**A1a**). This artefact, which was dated to AD 60–160, was not located within a discrete feature and was likely deposited by water action (Pre-Construct Archaeology, 2008). A local enthusiast, J. Spurrell, noted unspecified “*Roman remains*” on the intertidal zone of the River within the Site in 1885 (**A1f**). A field investigation at this location in 1964 found nothing of archaeological interest to confirm the documentary reference.
- 5.5.19. There are limited other Roman finds and features recorded in the Study Area with evidence of occupation mainly found on areas of higher ground. The most significant area of occupation was excavated at Summerton Way, Thamesmead 1.5km to the west of the Site Boundary in 1997. Evidence for 3rd and 4th century field systems and land divisions recorded here suggests that the area was used for farming (Andrews, 2004). Although the location of the contemporary Roman settlement associated with this farmstead is unknown, it is possible that it is close to Crossness Sewage Treatment Works based on antiquarian records of pottery, building material and a cinerary urn containing bones being uncovered during the digging of the southern outfall sewer around 800m to the west of the Site Boundary in 1865 (**A89**). Roman finds were identified in a peat deposit during a trial trench evaluation 270m to the west of the Site Boundary in 2006, although they may not have been in-situ (**A13**). The GLHER description of this evaluation does not provide any further detail on the nature and extent of these finds.

- 5.5.20. Further evidence of Roman settlement has been found at Erith on higher ground to the south of the Site and on the opposite side of the Thames at Rainham. Roman finds recovered during works in Rainham 1km to the east of the Site Boundary in 1961 include cooking pot sherds, fragments of mortaria, the decorated rim of a buff vessel and the screw neck of a flagon, all of which were dated to the 1st century AD (A44). Based on these finds and the use of Roman building material in the construction of the nearby church of St Helen and St Giles, it is possible that there was a Roman settlement at Rainham ferry (Lewis, 2008).
- 5.5.21. The Romans drained fenland in several parts of the country using engineering technology developed in the Mediterranean, and it is possible that attempts were made to drain the low-lying areas in and around the Site. This might have involved the construction of banks along the edge of mudflats. Evidence of salt making industry, which likely started in the Iron Age, has been found in similar marshes elsewhere in Kent and Essex in the form of earthwork mounds that would have been used for salt evaporation (Museum of London Archaeology Service, 2008).
- 5.5.22. The depth of the Roman archaeological evidence recorded in this area suggests that the level of the Thames was significantly lower by the end of the Roman period than it is at present, and the termination of activity here around this time was probably due to a marine transgression which is marked by approximately 4m of alluvial flood deposits (Museum of London Archaeology Service, 2008).

EARLY MEDIEVAL (AD 410–1066)

- 5.5.23. Following the withdrawal of the Roman army from England in the early 5th century AD the whole country fell into an extended period of socio-economic decline. In the 9th and 10th centuries, the Saxon Minster system began to be replaced by local parochial organisation, with formal areas of land centred on nucleated settlements served by a parish church.
- 5.5.24. According to the Anglo-Saxon Chronicle, Kent was claimed by the Anglo-Saxons shortly after a battle at Crayford, 6.5km to the southeast of the Site Boundary, in AD 455 (Levick, 2021). It is likely that a Saxon church existed in the village of Erith 2km to the southeast of the Site Boundary.
- 5.5.25. The name Erith is mentioned as early as AD 677 (as “*Earhyth*”) and is thought to mean “*muddy or gravelly landing-place*” (Mills, 2011). Erith is likely to have arisen as a settlement due to its suitability as a small port, since boats could only moor in places where the River cut into the gravel at this time.
- 5.5.26. The parish was also known by the name Lesnes during this period, deriving from the old British word for pastures, although Erith eventually became the official name for the parish (Hasted, 1797).
- 5.5.27. During this period the Site would likely have comprised marginal marshland resulting from rising river levels. There are no Early Medieval finds or features recorded within the Site or Study Area.

MEDIEVAL (AD 1066–1540)

- 5.5.28. During this period the Site would have lain within the manor of Lesnes (Humphery Smith 1984), which also gave its name to the surrounding 'hundred' (early medieval administrative area). The parish later became known as Erith, of which the village core would have been situated approximately 2.5km to the southeast of the Site Boundary. Based on the distance from the known foci of settlement, the Site is likely to have lain on the periphery of the estate in what was low-lying marshland.
- 5.5.29. The parish was under the ownership of Azor de Lesneie at the time of the Domesday Book of 1086. It was then given to William the Conqueror's half-brother, Odo, Bishop of Bayeux and Earl of Kent. Following Odo's imprisonment for planning a military expedition to Italy, William seized his English estates and the ownership of the parish of Erith reverted to the crown (Hasted, 1797).
- 5.5.30. Richard de Lucy acquired ownership of the parish in the 12th century. Richard founded the Augustinian Abbey at Lesnes (**A96**), the remains of which lie 1.6km to the southwest of the Site Boundary (Hasted, 1797). The abbot and convent of Lesnes Abbey built sea walls in the Plumstead marshes approximately 3 to 4km to the west of the Site Boundary between 1230 and 1240.
- 5.5.31. Prior to the draining and reclamation of the marshland in the medieval period, a large inlet, which was the mouth of a large creek, was located an unknown distance to the west of the Site Boundary. By the end of the 13th century, much of the marshland had been reclaimed in order to create suitable land for rearing animals and cultivating crops (Hasted, 1797). Much of the Erith Marshes, and likely the Site, were managed by the monks of the Abbey. This marshland was therefore likely reclaimed around the same time, protected from the River and tides by manmade embankments. It is known that in 1338, 244 acres of arable marshland around Erith belonged to the holding of Giles de Badlesmere and were valued at 36 pence per acre. This made the marshland six times more valuable per acre than arable land on neighbouring uplands, showing how fertile the alluvial marsh soils were (Galloway, 2010).
- 5.5.32. The reclamation of the Erith Marshes likely took place in stages, with several sea walls being built successively. It is therefore probable that different parts of the Site were reclaimed at different times, with the northernmost terrestrial part of the Site potentially reclaimed in the late medieval or early post-medieval period. J. Spurrell supposedly saw the oldest of a network of medieval river walls 650m to the south of the Site Boundary in 1885, which he believed may have dated to the 13th century (**A70**; Spurrell, 1885). A network of drainage ditches would have divided the marshland into individual parcels. Within these, activities such as arable cultivation and animal husbandry would have taken place. This landscape may also have been used for brick and pottery manufacture. However, the marshland was still regularly flooded, occasionally laying the pasture to waste (Museum of London Archaeology Service, 2005).

- 5.5.33. Norman Road, which runs along the eastern part of the Site, was originally called Picardy Manorway, named after the manor house of Picardy. Although the exact location of a medieval manor house of Picardy is unknown, Picardy House is shown 1km to the south of the Site Boundary on the Erith tithe map of 1843 (**Figure 10**) and was likely on the site of, or close to, the original house. The trackway would have served both as a flood defence and also as a raised driveway, used for transporting livestock between the marshland and the higher ground to the south (Museum of London Archaeology Service, 2005).
- 5.5.34. A 14th century dagger was found during the construction of a house 950m to the southeast of the Site Boundary (**A65**).
- 5.5.35. A stop for the Long Ferry, which was mentioned in a document from 1531, was likely situated off Ferry Lane 950m to the east of the Site Boundary (**A48**).

POST-MEDIEVAL (AD 1540–1900)

- 5.5.36. During the Tudor Period, King Henry VIII established a naval dockyard at Erith, 2.5km to the southeast of the Site Boundary. The *Henry Grâce à Dieu*, which at the time was the largest warship in the world, was launched at Erith in 1514. The area between Woolwich to the west of the Site and Erith to the southeast subsequently became a significant military and naval centre, frequently used for weapons testing (Dear and Kemp, 2006).
- 5.5.37. In 1524 Cardinal Wolsey suppressed Lesnes Abbey along with many other monasteries with fewer than eight canons. The Abbey's land was subsequently divided and sold. However, the embankments along the Thames repeatedly burst in the following years. Thomas Cromwell, who at this time was legal secretary to Cardinal Wolsey, wrote in 1529 following a visit to the flooded Lesnes marshland: "*I have been at Lysenes where I saw one of the most pyteous and greuous sightes that ever I saw... concernyng the breche out of the Thames into the marshes at Lyesnes, which be all ouerflowen and drowned*" (Galloway, 2010). The embankments again burst in the 1530s and much of the marshland was reclaimed by the River Thames for a number of years. It is likely that these floods occurred partially as a result of the cessation of maintenance by the tenants of Lesnes Abbey, who in the 15th century had paid four pence per acre for the maintenance of the marsh defences. Following Cardinal Wolsey's fall from power, the Lesnes marshlands belonged to the royal family (Galloway, 2010).
- 5.5.38. A map of 1588 (not reproduced) shows the location of two breaches of the embankments which had occurred between Erith and Woolwich. The larger of the two, labelled "*the great Breache*" appears to have taken place in and around the Site and had not been repaired by this date. J. A. Galloway (2010) argues that this is likely to have been referring to a flooding event in 1530 when the Thames breached the marsh walls at Plumstead, Lesnes and Erith. According to a petition to Parliament in 1561, 2,000 acres of land in Erith, Plumstead and Lesnes had been "*laid waste by breaches and inundations of the Thames*" during the previous 30 years (Galloway, 2010).

- 5.5.39. Repairs were eventually made in the 17th century and a set-back wall was built around the hole which had been scoured out by tidal waters during the breach (Galloway, 2010). This area is visible on the Erith tithe map of 1843 (**Figure 10**) and the Ordnance Survey 1st edition 6": mile map of 1866-69 to the immediate east of the Site (**Figure 11**).
- 5.5.40. Frequent storms and floods along the River Thames likely resulted in numerous shipwrecks during this period. An unknown number of wooden sailing vessels were lost during the Great Storm of 1703, although it is likely to have been several hundred. An English wherry (cargo boat) was wrecked in this part of the Thames following a collision and the wreck site has tentatively been recorded as 360m to the west of the Site Boundary (**A92**). The wreck of a wooden vessel which collided with ice in the Thames in 1709 is also recorded in this location (**A93**). A total of 85 documented maritime wreck events, dating from 1654 to 1940, have been recorded in the Thames without an exact location and some of these may have occurred within the Study Area (**A94**). These include sailing vessels, wherries, cargo vessels, barges, lighters, passenger vessels, paddle steamers, schooners and military training ships.
- 5.5.41. The Andrews, Dury and Herbert 1769 map of Kent (**Figure 8**) shows a sea wall crossing through the northern part of the Site which likely forms part of the existing modern defences. A "Powder House" is shown within the Site. Although not labelled, two structures are shown here on Hasted's 1798 map of Bexley and Dartford (not reproduced; Bexley Archive ref. RT/2/9/52). The remainder of the Site comprised marshland on both maps, some of which was divided by linear drainage ditches. The Ordnance Survey Drawing of 1799 (**Figure 9**) shows the building within, or to the immediate west of, the Site labelled "Erith Magazine".
- 5.5.42. The Erith tithe map of 1843 (**Figure 10**) shows three small buildings within the western corner of the Site. According to the tithe apportionment, these were a "House & Garden" and a "Magazine & Grounds", owned by Pigeon and Wilks. "Magazine Marsh" was situated to the south of this. A pier appears to have been attached to the magazine. The sea wall running across the Site is described as a "wall slip" owned by J. Renshaw and another "Magazine & Ground" was situated to the immediate south of the easternmost part of the Site, with an associated pier encroaching into the Site. A "Cottage & Garden" was located to the south of this magazine. The remainder of the Site is described as grass and arable land under several different ownerships. The marshland was used for farming and reed growing into the 19th century.
- 5.5.43. Post-medieval timber driven posts were discovered during groundworks in the southwestern corner of the Site in 2007 (**A1i**) and a possible backfilled ditch of unknown date was identified during a watching brief 140m to the west of the Site Boundary in 1997 (**A35**). These likely relate to the agricultural use of the Site.
- 5.5.44. It is recorded that 750 barrels of gunpowder contained within a magazine in this area exploded in 1864, which was supposedly heard from 40 miles away (Kentish Chronicle, 1864). It is possible that this was one of the magazines to the west of the Site. A nearby magazine and two barges transporting gunpowder also exploded in the incident, which resulted in at least 12 deaths. According to an article in the Kentish Chronicle, "there was scarcely a house that had not suffered more or less" in the

districts of Erith, Belvedere and Plumstead, with windows and shutters blown out in many (Kentish Chronicle, 1864). Part of the river wall was breached as a result of the explosion and several barges were destroyed. Approximately two thousand troops and navvies were required to rebuild the embankment (Kentish Chronicle, 1864).

- 5.5.45. The opening of the North Kent Railway in 1849 (**A87**) 640m to the south of the Site Boundary accelerated the rate of industrialisation in the area, with factories subsequently being constructed alongside the Thames in the following decades.
- 5.5.46. Prior to construction and operation of the Crossness Sewage Treatment Works in 1865, untreated sewage was discharged continuously into the Thames, frequently travelling upstream to the city centre and resulting in cholera outbreaks. At Crossness Sewage Treatment Works, the sewage was pumped into the river just after high tide and carried out into the North Sea. A large underground reservoir was constructed so the sewage could be stored until high tide. The Crossness Sewage Works was designed by Sir Joseph Bazalgette, the chief engineer of London's Metropolitan Board of Works, and architect Charles Henry Driver to solve London's sanitation problem. Bazalgette was also responsible for the sewage works on the north side of the River at Barking.
- 5.5.47. When it opened in the mid-19th century, the Crossness Sewage Treatment Works comprised 6.5 acres of storage tanks and the Grade I listed Victorian Romanesque style engine house (850m to the west of the Site Boundary), which houses four beam engines designed by James Watt & Son (**A3**; Cherry and Pevsner, 1983). Other buildings at the works included workshops, outbuildings and houses for the workmen. A 63m tall chimney, in the form of a campanile, formerly stood within the sewage works site. The two workshop ranges either side of the engine house were built between 1862-65 by William Webster to Bazalgette and Driver's designs and both are Grade II listed (**A2, A4**). Untreated sewage was initially discharged directly into the river, but sedimentation channels were introduced in 1887 to separate the solid sludge from the liquid effluent. Only the latter was discharged into the River Thames thereafter.
- 5.5.48. The Ordnance Survey 1st edition 6": mile map of 1866-69 (**Figure 11**) shows the terrestrial part of the Site mostly comprising parcels of land within Erith Marshes divided by various ditches and trackways. The southwestern corner of the Site appears to have been marshland. *Picardy Manor Way* (now Norman Road) is labelled on this map. The road ran along the eastern part of the Site and led to a *Manure Works* at the northern end of the terrestrial part of the Site, where glue manufacture was also undertaken. This comprised approximately six buildings adjacent to the sea wall and two small piers. A pier was also located on the easternmost part of the sea wall within the Site. Three terraced houses sat 60m to the south of the Manure Works, just off *Picardy Manor Way*. Another building, possibly another house, sat to the west of these. A road or trackway with an east-west alignment met *Picardy Manor Way* in the centre of the Site and joined a number of other paths in the western part of the Site. A footpath passed through the southern and northwestern parts of the Site. The house, magazine (labelled "*Powder Magazine*") and pier shown on the 1843 tithe map remained in the western part of the Site. The surrounding landscape is broadly similar

to that of the Site, mostly comprising marshland and drainage ditches. More powder magazines were situated along the foreshore to the east and a floodgate is labelled 1.2km to the east of the Site Boundary.

- 5.5.49. The Ordnance Survey 2nd edition 6": mile map of 1895 (**Figure 12**) shows that the works at the northern end of the terrestrial part of the Site had expanded, with the main building enlarged, two large buildings constructed to the west and a small number of ancillary buildings constructed around them. The works are now labelled "*Belvedere Mills*". Two additional piers had been erected off the sea wall to the north of these works and a footpath also ran along the route of the sea wall. The empty plot to the east of Belvedere Mills is labelled "*Bovril. Disused.*" In the northwestern corner of the terrestrial part of the Site, the "*Thames Fish, Guano, & Oil Works*" had been constructed and was used to process imported guano (seabird excrement) for fertiliser (Bexley Archive ref. LAER/DC/4/5/2). These were all anti-social and/or dangerous activities located well away from any settlement centres. Further terraced housing had been built to the south of Belvedere Mills, likely for the workers. *Orient House* had been constructed off *Picardy Manor Way* within the centre of the Site along with two ancillary buildings. A small number of new field boundaries and/or ditches are shown on this map in the southern and western parts of the Site.
- 5.5.50. The Grade II listed No. 4 Jetty and Approach at Dagenham Dock, located approximately 750m to the northwest of the Site Boundary, was constructed between 1899 and 1903 for Samuel Williams & Sons Ltd (**A5**). The jetty was built to designs by L. G. Mouchel & Partners and is one of Britain's earliest surviving reinforced-concrete structures. Four early 20th century concrete structures, similar in style to police boxes, are located at the Crossness Sewage Treatment Works and are locally listed buildings (**A46**). The closest of these is situated 450m to the west of the Site Boundary.

MODERN (1901–PRESENT)

- 5.5.51. During the 20th century the Site and surrounding area retained a mix of industrial and agricultural uses reflecting the marginal location of the Site.
- 5.5.52. Borax Consolidated, a chemical manufacturer, took the site over in 1899, with borax being transported to the processing plant by river. By the Ordnance Survey 3rd edition 6": mile map of 1907 (**Figure 13**), Belvedere Mills had expanded further. Three buildings had been constructed in the east and the westernmost large building had been extended. A new road had been laid to the east of the works, presumably to provide access to these new buildings. A Beer House is shown to the south of the works. The Ordnance Survey 25": mile map of 1909 (not reproduced) has labelled this building as "*Marsh Tavern*" and shows allotment gardens to the south, adjacent to the terraced houses. Cranes are also labelled on the piers to the north, and the mills are labelled "*Belvedere Mills (Borax)*".
- 5.5.53. A rectangular plan structure had also been constructed to the west at the Belvedere Fish Guano Works. A footbridge is shown which probably connected the footpath to the south of the works to that along the sea wall. To the south, a large rectangular plot had been laid out to the north of Orient House and a small ancillary structure, possibly

a shed, had been constructed to the west. Based on the tree symbols depicted within it, the square plot of land between the ancillary structures and Orient House was likely used as an orchard. Another footbridge is labelled in the western corner of the Site, leading to the pier there. A lighthouse had been constructed 200m to the east of the Site Boundary and a significant amount of industrial development had taken place in the southeastern part of the Study Area, mostly at a “*Cable Construction Works*”. Residential development was also beginning to take place 300m to the south of the Site Boundary off Picardy Manorway.

- 5.5.54. The only change within the Site on the 1938 1:10,000 scale Ordnance Survey map (not reproduced) is the apparent removal of the pier in its northeastern section. The Ford car factory at Dagenham had been constructed 400m to the north of the Site Boundary across the Thames by this time.
- 5.5.55. The Ordnance Survey 1:10,000 scale map of 1966–69 (**Figure 14**) shows significant change within the Site and its immediate vicinity. The works in the northern part of the Site had expanded and were now simply labelled “*Mill*”. Existing buildings had been extended and several new buildings had been constructed. The Fish Guano Works is no longer labelled, and other buildings had been demolished in this part of the Site, including the Marsh Tavern and some of the terraced houses to the southeast. The magazine, pier and house in the western corner of the Site had apparently been demolished and the Great Breach Outfall had been constructed here.
- 5.5.56. **Figure 14** also shows construction of the Belvedere Power Station Jetty (disused) (**A1g**) within the Thames in the northern part of the Site. The 180m long jetty remains extant within the Site but is disused. It was likely used as a fuelling jetty for the power station. Other structures constructed along the foreshore within the Site comprise a pontoon and small jetty in the west and two wharfs, one in the western half and a larger one in the easternmost part of the Site. In the southern part of the Site, a large electrical substation had been constructed to the west of Norman Road. At least five pylons are shown in the western part of the Site. Orient House and its associated and ancillary structures and garden had been demolished by this time, and this area now comprised a spoil/slag heap or a landfill site, bounded to the north, south and west by roads/tracks and drains. The footpath in the southern half of the Site had been realigned and two field boundaries/ditches had been removed. The path and drainage ditch which currently bound the Site to the west first appear on this map.
- 5.5.57. Considerable development had also taken place to the immediate east of the Site Boundary. Belvedere Power Station was built here between 1954 and 1960 (**A1h**). This is labelled as “*Works*” on the map, comprising several large buildings and a depot. Four of these buildings encroached onto the eastern part of the Site. An access road to these new works had been constructed to the east of and parallel to Norman Road. To the west, the Crossness Sewage Treatment Works had expanded significantly. The modern sewage treatment plant began operation in 1963, making use of large reinforced concrete primary sludge digestion tanks (Cherry and Pevsner, 1983). A fleet of boats was used to transport the solid sludge out to sea for disposal until 1998 (Museum of London Archaeology Service, 2005).

- 5.5.58. The Ordnance Survey 1: 2,500 scale maps 1957–62 and 1970 (not reproduced) show houses including “*Moore House*” and “*Borax Cottage*” within the northern part of the Site amongst the industrial buildings. The latter, however, was demolished by the time of the 1970 map. A tennis court is also shown to the east of Norman Road in the northern part of the Site.
- 5.5.59. Fewer changes are shown within the Site on the Ordnance Survey 1:10,000 scale map of 1973-74 (not reproduced). A rectangular plan industrial building in the northwestern part of the Site, first shown on the 1966–69 map (**Figure 14**), was demolished and another was constructed to its north. A drain running westerly from Norman Road was shortened and a larger drain had been constructed in the southwestern part of the Site.
- 5.5.60. The Great Breach Pumping Station on the western boundary of the Site is first shown on the Ordnance Survey 1:10,000 scale map of 1983–85 (not reproduced). To the immediate south of the Site, the A2016 Picardy Manorway had been constructed. The Ordnance Survey 1:10,000 scale map of 2002 (not reproduced) shows that all but one of the industrial buildings in the northern part of the Site had been demolished following the closure of the Borax works in 1990, although the Belvedere Power Station buildings in the eastern extent of the Site remained. Two more smaller depot buildings had been constructed to the west. A new drain at the southern end of the Site, to the south of the substation, is shown on this map. A small number of pylons appear to have been removed from the southern part of the Site by this time. Belvedere Power Station to the east of the Site was demolished in 1993-94.
- 5.5.61. Historical satellite imagery (not reproduced) shows that work on Riverside 1, and its associated Middleton Jetty, in the northern part of the Site began in 2008 (**Figure 22**, **Figure 23** and **Figure 24**) and that the electrical substation in the southern part of the Site was demolished in around 2010–11^b. The extant warehouse in the southern part of the Site to the west of Norman Road, which is currently used by Munster Joinery UK Limited, was erected sometime between 2015 and 2017 (**Figure 19**, **Figure 20**). Plots of land to the north of this (currently named Borax North and Borax South) were previously used as laydown areas and were subsequently stripped of topsoil (**Figure 15** and **Figure 16**). A large pond is now situated to the southwest of Munster Joinery (**Figure 21**).
- 5.5.62. The wreck site of a tugboat named the Regency is recorded within the northern end of the Site within the River Thames (**A1e**). The boat was sunk by a mine while towing barges during the Second World War, resulting in the death of one crew member and one lighterman. The wreck was raised from this location in 1970. An unclassified ‘obstruction’, identified in 1998, is recorded on the UKHO database on the foreshore within the Site (**A1d**). This is recorded as a ‘dead’ obstruction, meaning it has not been found in recent surveys, potentially because it has been buried in mobile sediments or because it is no longer there. Submerged ground tackle remains were

^b This is referring to the large substation situated here from the mid-20th century to 2010-11, rather than the existing small substation in the southeastern corner of the Site.

identified 40m to the north of the Site Boundary after the removal of a mooring buoy in 1999 (**A83**).

- 5.5.63. The Historic England National Marine Heritage Record (NMHR) records a total of 19 early 20th century aircraft crashes within the wider area (**A95**). These date between 1927 and 1944 and are recorded in the River Thames without an exact location. As such it is uncertain how many of these actually lie within the Study Area. The vast majority of these, however, were likely shot down over the Thames Estuary. These include a Vickers Virginia, Supermarine Spitfires, Hawker Hurricanes, a Bristol Blenheim, a Blackburn Roc and a North American Mustang.
- 5.5.64. At the time of writing, Riverside 2 is being constructed in the northern terrestrial part of the Site; Borax North and Borax South are again being used as temporary construction compounds.

5.6. FACTORS AFFECTING ARCHAEOLOGICAL SURVIVAL

- 5.6.1. Past ground disturbance within the Site from mid-19th and 20th century developments may have compromised archaeological survival, e.g. building foundations, identified primarily from historic maps, site walkover survey, and information on the likely depth of deposits.
- 5.6.2. Given the extent of the Site and the nature of the Proposed Scheme, which encompasses both the terrestrial and marine environment, archaeological survival is anticipated to be highly variable.
- 5.6.3. The waterlogged conditions of the intertidal part of the Site and the marshland within which much of the Site is located, particularly where alluvium is present, are conducive to high levels of preservation of organic materials, including any wooden structures. Prehistoric wooden trackways, for example, have been discovered in this part of the Thames estuary and where prehistoric remains are present, these could be buried at substantial depth, at the interface between peat and upper clay.

PREDICTED LEVEL OF ARCHAEOLOGY

- 5.6.4. The level of superficial geology within the Site is summarised in **Section 5.3**.
- 5.6.5. Between the top of the superficial deposits and the current ground level is modern made ground and undated made ground. The latter may potentially contain remains of archaeological interest (i.e. significant artefacts within ground raising deposits). According to the deposit model, the thickness of made ground ranges from 0.0 – 2.0m across the northern terrestrial part of the Site.
- 5.6.6. The height of archaeological deposits is likely to vary across the Site, with peat deposits buried at depth in some parts and eroding out of the foreshore or very near surface in the intertidal area. Within the intertidal and marine parts of the Site, potential archaeological finds or features would be present at riverbed level, which varies across the Site, or submerged within wet alluvium at a greater depth.

- 5.6.7. The higher areas, where peat is encountered, and which might have been suitable for occupation and other activities in the prehistoric, are located in the northwestern (Riverside 2 plot) and central (Borax North, Borax South and Crossness LNR land parcels) parts of the Site. The potential for the southern half would need to be clarified with an extension of the deposit model to this area.
- 5.6.8. Early prehistoric remains might potentially be encountered at the base of the alluvial sequence and cut into the underlying Gravel. Mesolithic to Bronze Age remains would be around the level that peat is recorded. During the Iron Age and Roman period, the Site was likely prone to regular inundation with rising water levels. Medieval and post-medieval remains, following drainage and reclamation of the marsh, would be at the upper part/cut into the top of the alluvial sequence.

PAST IMPACTS AND IMPLICATIONS FOR ARCHAEOLOGICAL SURVIVAL

- 5.6.9. Archaeological survival is anticipated to be varied across the Site. It will be high in the undeveloped areas and variable in the developed areas. With the former, the lack of past development suggests a full sequence of archaeological remains.
- 5.6.10. Archaeological survival in the northern terrestrial part of the Site, which has seen significant 19th and 20th century industrial and residential development, is expected to be low for near-surface remains due to the increased thickness of made ground. The same is expected to be true in the southeastern part of the Site where the former electrical substation was situated. Across the Site, the level of survival for earlier remains (i.e. palaeoenvironmental and/or prehistoric remains) will be high. The foundations of works buildings and tanks dating to the 20th century will have compromised the survival of deeper, earlier, remains, within the footprint of concrete piled foundations; the severity of this impact is dependent on pile size and density, which is not currently known. Late 19th century and early 20th century buildings here may also have had very deep brick footings or timber pile foundations.
- 5.6.11. The primary impact from modern buildings derives from foundations, areas of hardstanding, and site preparation/historic demolition which would have partially truncated or removed potential shallow remains within the footprint of the works. The construction of roads, jetties, piers and pylons and the excavation of drains and for services would also likely have involved the truncation and/or removal of any near-surface archaeological remains in these locations. Made ground was encountered in all of the trenches excavated in the northern part of the Site in 2007, including elements likely related to the former Borax Works (Pre-Construct Archaeology, 2008). Archaeological survival of near-surface remains is also expected to be low for the Borax North and Borax South areas to the west of Norman Road, which were previously used as laydown areas and have recently been stripped of topsoil again as part of the Riverside 2 development (**Figure 15** and **Figure 16**). However, building foundations would have had minimal impact on potential archaeological remains preserved at substantial depths.

- 5.6.12. Ground remediation is known to have taken place in parts of the Site (i.e. Borax North and Borax South) and was possibly carried out within other previously industrial parts of the Site (**Figure 18**). Ground remediation would in effect have truncated the natural alluvium, removing any medieval, post-medieval or modern remains present within the upper, shallow soils. Earlier remains are likely to remain intact below this level of truncation, since a deep layer of alluvium extends below the made ground (modern fill following the ground remediation).
- 5.6.13. The southwestern part of the Site and much of the area to the west of the northern end of Norman Road appear to have remained largely free from modern disturbance (with the exception of the West Paddock which has been excavated to create a wetland habitat for birds). Archaeological survival of medieval/post-medieval remains that might be at the top of the alluvial sequence is therefore expected to be higher in these parts of the Site.
- 5.6.14. With respect to the intertidal foreshore and channel, archaeological survival is uncertain. Erosion, both natural and resulting from activities such as propeller wash and anchoring, in the Thames are likely to have impacted the archaeological resource within the intertidal and marine zones of the Site. Localised dredging for the Middleton Jetty in the form of injection dredging is known to have occurred within the Site but there are currently no records of large-scale capital dredging undertaken by the PLA in this area. Elsewhere, deposition may have occurred which would bury and thus preserve archaeological remains. The extent to which intertidal action has eroded/scoured out or buried possible archaeological remains is not currently known.

6. BURIED HERITAGE ASSETS: STATEMENT OF HERITAGE SIGNIFICANCE (VALUE)

6.1. PALAEOENVIRONMENT

- 6.1.1. *The Site has high potential for palaeoenvironmental remains.*
- 6.1.2. The Site is located on the River Thames floodplain within a Tier 3 APA defined as an area having a good preservation for palaeoenvironmental remains. Within the Site, the remains of fallen trees were found within alluvial deposits during an excavation in 2007, and pollen analysis suggested an alder carr wetland, with nearby dryland on the interfluves to the south dominated by oak, lime, hazel and heather (Pre-Construct Archaeology, 2008).
- 6.1.3. It is likely that any environmental evidence within the lower part of the deposit sequence (e.g. within peat and the lower clay) would remain intact due to their depth. Alluvium (clay/silt) and peat deposits may contain well preserved environmental remains. Minerogenic deposits such as alluvial silts and clays have potential for the preservation of diatoms, ostracods and molluscs, the assessment of which can provide information on the salt or freshwater nature of deposits. Peat deposits preserve pollen, seeds and plant fragments, and can also be dated by radiocarbon techniques, important for establishing the chronology for the depositional sequence. It is likely that environmental evidence is present within Holocene alluvium.
- 6.1.4. Palaeoenvironmental remains would be of **Medium** heritage significance (value) due to the likelihood of organic preservation and peat. Such remains have evidential value for the past environment in which prehistoric and later people lived with heritage significance (value) deriving from archaeological interest.

6.2. PREHISTORIC

- 6.2.1. *The Site has uncertain, but possibly low to moderate, potential to contain prehistoric remains.*
- 6.2.2. The Site would have been inundated as a result of marine transgression during the Mesolithic. During the early prehistoric, parts of the Site would have been dry ground suitable for permanent occupation, as suggested by the presence of peat. By the Iron Age the Site would have been prone to flooding. The area would have been suitable a variety of subsistence activities as the riverside location would have provided opportunities for the exploitation of natural resources. Such remains would be deeply buried at the base of the alluvial sequence (7.0—12.0m bgl). A trial trench evaluation in the northern part of the Site revealed no evidence of human activity, although this represents a small sample (less than 1%) of the overall current Site area and may not be reflective.
- 6.2.3. *There is uncertain, but possibly low, potential for the remains of boats and other marine assets of prehistoric date in the intertidal and marine parts of the Site.*

6.2.4. Evidence of early prehistoric occupation and early/late prehistoric utilisation of the marshes (timber trackways, hulked vessels etc.) would be of **High** heritage significance (value), if present, derived from archaeological interest. The Archaeological Priority Areas Appraisal for LBB states that the value of the Tier 3 APA within which the Site is located is “*particularly high for the prehistoric periods*” (Historic England, 2020).

6.3. ROMAN

6.3.1. *The Site has uncertain, but possibly low to moderate, potential to contain Roman remains.*

6.3.2. During this period the Site would have been prone to flooding but suitable for a variety of subsistence activities, as during the prehistoric period. In some parts of the Lower Thames estuary production of salt (from evaporation), fish processing and pottery manufacture (using alluvial clay) was carried out in the intertidal marsh. Such remains would be deeply buried at the base of the alluvial sequence (7.0—12.0m bgl). A trial trench evaluation in the northern part of the Site revealed a single Roman pottery sherd, although this represents a small sample (less than 1%) of the overall current Site area and may not be reflective.

6.3.3. Although a sherd of Roman greyware pottery was recovered from the top of the alluvial sequence during a trial trench evaluation within the Site in 2007, this artefact was not located within a discrete feature and was likely deposited by water action. None of the unspecified ‘Roman remains’ identified onsite by a local enthusiast in 1885 were found during a field investigation at this location in 1964. In the surrounding area, evidence of occupation has mainly been found on areas of high ground, including the Roman field systems 1.5km to the west of the Site Boundary. It is possible that there was also a Roman settlement close to Crossness to the west of the Site.

6.3.4. *There is uncertain, but possibly low, potential for the remains of boats and other marine assets of Roman date in the intertidal and marine parts of the Site.*

6.3.5. Evidence of Roman utilisation of the marshes and industrial processes (salt, pottery and fish) would be of **High** heritage significance (value), if present, derived from archaeological interest.

6.4. EARLY MEDIEVAL

6.4.1. *The Site has low potential to contain early medieval remains.*

6.4.2. There are no heritage assets dating to this period recorded within the Study Area. However, it is possible that flood management and land reclamation in the former marsh began during this period.

6.4.3. *There is low potential for the remains of boats and other marine assets of early medieval date in the intertidal and marine parts of the Site.*

6.5. MEDIEVAL

- 6.5.1. *The Site has high potential to contain medieval remains associated with reclamation, drainage and water management.*
- 6.5.2. Norman Road is a flood defence embankment and drove road that is likely to have origins in this period. Much of the marshland was reclaimed and managed from at least the 13th century to create suitable land for rearing animals and cultivating crops, and 14th century records show that the fertile alluvial marsh soils here were particularly valuable. The reclamation of the marshes likely took place in stages, with several sea walls being built successively. It is likely that different parts of the Site were reclaimed at different times throughout the medieval and post-medieval periods. J. Spurrell supposedly saw the oldest of a network of medieval river walls 650m to the south of the Site in 1885, which he believed may date to the 13th century (Spurrell, 1885). Any surviving medieval archaeological remains within the Site will likely relate to its reclamation and agricultural utilisation, such as field boundaries, droveways and drainage ditches. Evidence of medieval sea walls and embankments may also survive, including repairs after breaches, although no such evidence was encountered during excavations in the northern terrestrial part of the Site (Pre-Construct Archaeology, 2008). There is also a potential for evidence of medieval brick and pottery manufacture.
- 6.5.3. *There is uncertain, but possibly low, potential for the remains of wrecks, former jetties and other marine assets of medieval date in the intertidal and marine parts of the Site.*
- 6.5.4. Remains associated with medieval reclamation and water management would be of **Low** heritage significance (value). Structural remains associated with flood defences (e.g. timber revetments) might be of **Medium** heritage significance (value), if present, derived from archaeological and historic interest.

6.6. POST-MEDIEVAL

- 6.6.1. *The Site has high potential to contain post-medieval remains.*
- 6.6.2. Evidence relating to the continued maintenance and repair of the sea wall and the agricultural utilisation of the Site may survive. Field boundaries and drainage ditches, for example, are shown on historic mapping from this period and timber driven posts of likely post-medieval date have previously been excavated in the southwestern part of the Site.
- 6.6.3. The earliest available map to show a sea wall within the Site is the Andrews, Dury and Herbert 1769 map of Kent (**Figure 8**). This shows the wall crossing the northern part of the Site, along the line of the existing modern defences. However, as discussed above, the reclamation of the marshland likely took place in stages, with several sea walls being built successively. There is therefore a potential for early post-medieval sea wall remains to survive within the Site. If present, any earlier river walls would be buried within the River channel.

- 6.6.4. *There is low to moderate potential for the remains of wrecks, former jetties, barge beds and other marine assets of post-medieval date in the intertidal and marine parts of the Site.*
- 6.6.5. Within the foreshore and river channel, there is potential for remains of camp sheds (barge beds), jetties, and possibly hulked vessels. Remains of wooden sailing vessels lost during the Great Storm of 1703, for example, may survive at riverbed level or below.
- 6.6.6. Remains associated with post-medieval industry, reclamation, flood and river defence and water management would be of **Low** heritage significance (value), derived from archaeological and historic interest.

6.7. MODERN

- 6.7.1. *The Site has high potential to contain modern remains.*
- 6.7.2. Historic mapping shows buildings and structures within the Site from the mid-to-late-19th century, including the Manure Works, Belvedere Mills, the Fish Guano Works, the Borax Works, the Belvedere Power Station, an electrical substation and associated infrastructure, houses, piers, jetties, pontoons, wharfs and the sea wall. Made ground was encountered in all of the trenches excavated in the northern part of the Site in 2007, including elements likely related to the former Borax Works (Pre-Construct Archaeology, 2008).
- 6.7.3. Industrial remains dating to the modern period have been demolished across the Site following recent development and site stripping. As such, any surviving remains would be limited to wall footings and other foundations of **Low** heritage significance (value), derived from archaeological and historic interest. No modern features were identified during the Site walkover carried out for this assessment.
- 6.7.4. *There is uncertain, but possibly low to moderate, potential for the remains of wrecks, former jetties, barge beds and other marine assets of modern date in the intertidal and marine parts of the Site.*
- 6.7.5. The wreck site of a tugboat named the Regency is recorded at the northern end of the Site within the Thames, although the wreck was raised from this location in 1970. The UKHO records a 'dead' unclassified 'obstruction' on the foreshore within the Site, meaning it has not been found in recent surveys, potentially because it has been buried in mobile sediments or because it is no longer there. The heritage significance (value) of potential wrecks, jetties and other marine assets would depend on their nature and extent, but in all likelihood would be **Low**.

7. ABOVE GROUND HERITAGE ASSETS: STATEMENT OF HERITAGE SIGNIFICANCE (VALUE)

- 7.1.1. Following Step 1 of the Historic England guidance (Historic England, 2017), **Table 3** below indicates which heritage assets have been scoped out of the assessment as their heritage significance (value) would not be affected at all by the Proposed Scheme, in terms of material changes to their setting and how the asset is understood and appreciated. This is based on the distance of the asset from the Site Boundary; the asset’s location, scale and orientation, and the nature, extent and scale of intervening built form, vegetation and topography between asset and the Site.
- 7.1.2. The assets scoped out in **Table 3**: are not assessed further in **Chapter 9: Historic Environment (Volume 1)** of this Environmental Statement (ES).

Table 3: Setting of Heritage Assets: Assets Scoped Out

Assessment ref.	Name	Rationale for exclusion
A46	Crossness Sewage Treatment Works (Early 20th Century Police Boxes)	<ul style="list-style-type: none"> Four locally listed early 20th century concrete structures, similar in style to police boxes, are located at the Crossness Sewage Treatment Works, the closest of which is situated 450m to the west of the Site Boundary. These non-designated heritage assets are defined and experienced by their relationship to each other and to the surrounding industrial landscape. While the Proposed Scheme may be visible in the long view out from the assets towards the east, this view does not contribute to the assets’ heritage significance (value). The Proposed Scheme would not affect the relationship of the assets to each other or to the surrounding industrial landscape. The Proposed Scheme would not result in a material change to the assets’ setting or heritage significance (value).
A96	Lesnes Abbey	<ul style="list-style-type: none"> The surviving remains of the Augustinian Abbey of St Thomas the Martyr, now known as Lesnes Abbey, is a scheduled monument (NHLE ref: 1002025) and listed Grade II (NHLE ref: 1359415). The abbey was founded in 1178 and suppressed by Cardinal Wolsey in 1524. The building was subsequently converted into a mansion, which was demolished in 1844. The remains, which are situated 1.6km to the southwest of the Site Boundary, include upstanding stone walls, foundations and archaeological remains relating to the use and history of the abbey. The upstanding

Assessment ref.	Name	Rationale for exclusion
		<p>remains of the abbey are Grade II listed. The Abbey church to the south is included in the scheduling.</p> <ul style="list-style-type: none"> The assets at Lesnes Abbey are defined and experienced by their relationship to each other and to the surrounding landscape, particularly Lesnes Abbey Woods to the south. A digital ZTV model prepared by shows that the Absorber Column(s) would be visible in the long view from the northern and western parts of the scheduled monument towards the northeast. It can be assumed that the Proposed Jetty would also be visible in this view. However, views towards the Site do not contribute to the assets' heritage significance (value). The Proposed Scheme would not affect the relationship of the assets to each other or to the surrounding landscape. The Proposed Scheme would not result in a material change to the assets' setting or heritage significance (value).

7.2. ABOVE GROUND HERITAGE ASSETS WITHIN THE SITE

7.2.1. There is one above ground heritage asset within the Site. This is the Belvedere Power Station Jetty (disused), which is a non-designated heritage asset.

BELVEDERE POWER STATION JETTY (DISUSED)

7.2.2. The Belvedere Power Station Jetty (disused) (**A1g**) in the northeast of the Site (**Figure 25**) first appears on the 1966-69 6": mile Ordnance Survey map (**Figure 14**) and was likely constructed between 1954 and 1960 as a fuelling jetty along with the rest of the power station to the immediate east of the Site. The Jetty is disused at the time of writing and may be demolished as part of the Proposed Scheme. This will be confirmed during the detailed design stage for the Proposed Scheme.

7.2.3. The Jetty's heritage significance (value) is derived from its historic interest as the last surviving element of the former Belvedere Power Station. It is a good example of a post-war industrial jetty, constructed of both concrete and timber. A two-storey brick-built structure sits on the centre of the Jetty and a metal loading bridge with concrete supports connects it to the land. Two octagonal plan concrete and timber dolphins are situated off both ends of the Jetty. The Ordnance Survey 1: 1,250 scale map of 1963-64 (not reproduced) shows that the dolphins were used to house navigation lights. Cranes and bollards are also labelled on the Jetty on this map.

7.2.4. As a non-designated heritage asset of local importance, the Jetty is an asset of **Low** heritage significance (value).

- 7.2.5. The Jetty is defined and experienced by its industrial location and its visual and functional relationship with the River Thames. The Jetty is located on the southern foreshore of the River Thames, where it is visible from the north foreshore and the England Coast Path (FP3/NCN1) along the south bank. Although its historic setting has been diminished by the demolition of the associated Belvedere Power Station, the Jetty retains its relationship with the River Thames and the surrounding industrial landscape. The setting of the Jetty makes a medium contribution to the asset's heritage significance (value).

7.3. ABOVE GROUND HERITAGE ASSETS BEYOND THE SITE BOUNDARY

CROSSNESS PUMPING STATION

- 7.3.1. There are four separate designated heritage assets at Crossness Sewage Treatment Works, the closest of which is approximately 780m to the west of the Site Boundary, comprising three listed buildings and a Conservation Area (**Figure 26**). Further detail is provided in **Section 5.5** above.

Workshop Range to South East of Main Engine House (A2)

- 7.3.2. Workshop Range to South East of Main Engine House at Crossness Pumping Station (**A2**) dates to the 1860s and built by William Webster to the designs of Sir Joseph Bazalgette and Charles Henry Driver. The building is constructed of yellow brick in a Flemish bond.
- 7.3.3. The asset has historic and architectural interest as a component part of a Victorian pumping station, designed to improve the disposal of sewage required by the ever-growing population of London. Its historic interest is enhanced by its connection to Bazalgette. It was listed at Grade II in 1990 (NHLE ref: 1064216). As a Grade II listed building it is a heritage asset of **Medium** heritage significance (value), although it is associated with a Grade I listed building described below.

Crossness Pumping Station (A3)

- 7.3.4. Crossness Pumping Station (**A3**) dates to 1865 and was built to the designs of Sir Joseph Bazalgette. The building is of two storeys and constructed of yellow brick. It contains four beam engines by James Watt and Co, which were converted from single to twin cylinders in 1909-10 (Cherry and Pevsner, 1983). The asset has high historic and architectural interest as an outstanding example of a Victorian pumping station, designed to improve the disposal of sewage and meet the needs of the ever-growing population of London. Its historic interest is enhanced by its connection to Bazalgette. It was listed at Grade I in 1970 (NHLE ref: 1064241). As a Grade I listed building it is a heritage asset of **High** heritage significance (value).

Workshop Range to South West of Main Engine House (A4)

- 7.3.5. Workshop Range to South West of Main Engine House at Crossness Pumping Station (**A4**) is a Grade II listed building dating to the 1860s and built by William Webster to the designs of Sir Joseph Bazalgette and Charles Henry Driver. The building is constructed of yellow brick in a Flemish bond. The asset has historic and architectural interest as a component part of a Victorian pumping station, designed to improve the disposal of sewage required by the ever growing population of London. Its historic interest is enhanced by its connection to Bazalgette. It was listed at Grade II in 1990 (NHLE ref: 1250557). As a Grade II listed building it is a heritage asset of **Medium** heritage significance (value), although it is associated with a Grade I listed building described above.

Crossness Conservation Area (A6)

- 7.3.6. Crossness Conservation Area (**A6**) incorporates the three listed buildings at the mid-Victorian sewage works. Other significant heritage assets within the Conservation Area include the brick vaulted subterranean reservoir, the storm water pumping station, the centrifugal engine house and the precipitation engine house. The conservation area was designated in 1997 and is described by LBB as “*South East London’s most important site for industrial archaeology*” (LBB, 2009). As a Conservation Area, it is a heritage asset is of **Medium** heritage significance (value).
- 7.3.7. The setting of the Conservation Area is defined by its relationship to the listed buildings at Crossness Sewage Treatment Works and by the relationship of these buildings to each other. The setting of the asset is defined by its location on the Thames riverside and the surrounding remnants of the original rural landscape. The Conservation Area’s most significant views are outlined in the Conservation Area Appraisal and Management Plan (LBB, 2009). These include: those from the River Thames and the England Coast Path (FP3/NCN1) towards the listed buildings; the view from Crossness Pumping Station to the south; the view from the open space to the west towards the Conservation Area; and the view to the northeast along the entrance driveway towards the listed buildings. However, the concrete river flood defence wall (which stands 2.5 – 3m AOD) to the north of the listed buildings obscures historic views of the River Thames. As stated in the Conservation Area Appraisal and Management Plan, this wall has ‘*partially severed*’ the link between the buildings and the river (LBB, 2009). Therefore, taken overall, the asset’s setting makes a medium contribution to its heritage significance (value).
- 7.3.8. This view eastward towards the Proposed Scheme is interrupted by intervening industrial buildings and chimney stacks (**Figure 27, 28**) and therefore is not considered to make a significant contribution to the heritage significance (value) of the Conservation Area, nor the Grade II listed buildings within it.

NO. 4 JETTY AND APPROACH

- 7.3.9. No. 4 Jetty and Approach, formerly at Samuel Williams and Company, Dagenham Dock (**A5**), was constructed between 1899 and 1903 to designs by L. G. Mouchel & Partners and extended in 1906-07 (**Figure 29, Figure 30**). The asset, which is located 750m to the northwest of the Site Boundary, has historic interest as being among Britain's earliest surviving reinforced-concrete structures which uses Samuel Williams' patented system for the horizontal casting of reinforced-concrete piles. It was listed at Grade II in 2006 (NHLE ref: 1391706). As a Grade II listed building it is a heritage asset of **Medium** heritage significance (value).
- 7.3.10. The setting of No. 4 Jetty and Approach is experienced by its industrial location at Dagenham Dock on the north bank of the River Thames. The asset is defined by its relationship to the wider group of jetties, warehouses and other industrial buildings at Dagenham Dock. The jetty's setting makes a medium contribution to its heritage significance (value), as it retains its historical relationship to the River Thames to the south and the industrial landscape of Dagenham Dock to the north. The Proposed Scheme would be visible in long views out from the asset towards the southeast. However, this view does not contribute to the asset's heritage significance (value).

8. IMPACT ASSESSMENT

8.1. INTRODUCTION

- 8.1.1. This section assesses the likelihood for the Proposed Scheme to have an impact on the heritage significance (value) of buried and above ground heritage assets. Below ground impacts include anything that would cause ground disturbance, such as preliminary ground works, site strip, topsoil removal, demolition, remediation, landscaping, planting, excavation for basements, foundations, services, drainage and lighting.
- 8.1.2. The Proposed Scheme could have an impact on the heritage significance (value) of above ground heritage assets, due to changes to their setting.
- 8.1.3. Where appropriate, the terminology of the NPS EN-1 and NPPF is used to assess the impact of the proposals on heritage assets – whether total loss of heritage significance (value), substantial harm, less than substantial harm or no harm.

8.2. OUTLINE OF THE PROPOSALS RELEVANT TO THE ASSESSMENT

- 8.2.1. The Proposed Scheme comprises the Carbon Capture Facility, the Proposed Jetty, the Mitigation and Enhancement Area, the Temporary Construction Compounds and Utilities Connections and Site Access Works.
- 8.2.2. The proposed Carbon Capture Facility will comprise the construction of new plant and structures, together with supporting infrastructure. The tallest components would be located in the northern part of the Site, including the Absorber Column(s) and Stack(s).
- 8.2.3. All foundations would be piled following site-wide ground raising for flood defence. Further works include planting and excavation for drainage and services. The Proposed Scheme also includes construction of a new export structure (the Proposed Jetty) in the north of the Site, located within the River Thames, and would contain a loading platform, mooring dolphins and associated access.
- 8.2.4. Proposals for the Mitigation and Enhancement Area will be subject to detailed co-ordination and negotiation with the landowner(s). Potential environmental improvements to this area could include rewetting of the soils through alterations to the ditch network, tree planting, wetland habitat creation and scrapes. Raised walkways across the area, an attenuation pond, a car park and an outdoor classroom area have also been proposed.
- 8.2.5. Three Temporary Construction Compounds will be used during construction, two for terrestrial works and one specifically for the construction activities related to the Proposed Jetty and Belvedere Power Station Jetty (disused). The core Temporary Construction Compound will be used during construction for uses including, but not limited to, construction activities, site offices, welfare, warehouses, workshops, open air storage and car parking. Following completion of the construction works, the land in the core Temporary Construction Compound will be utilised as part of the Caborn Capture Facility.

- 8.2.6. The Belvedere Power Station Jetty (disused) (**A1g**) may be retained or demolished as part of the Proposed Scheme. This will be confirmed at a later stage of the Proposed Scheme.
- 8.2.7. **Chapter 2: Site and Proposed Scheme Description (Volume 1)** of this Environmental Statement (ES) provides a detailed description of the proposals. The proposed layout of the Proposed Scheme is shown on the **Works Plans (Document Reference 2.3)**.

8.3. CONSTRUCTION PHASE IMPACTS

- 8.3.1. Elements of the construction phase with the potential to lead to impact could include the following:

Demolition of Existing Structures

- 8.3.2. If required as part of the Proposed Scheme, the demolition of the Belvedere Power Station Jetty (disused) (**A1g**) would be undertaken either manually or mechanically using large hydraulic equipment. All concrete and brick will be crushed into rubble, and the potential to reuse within the Proposed Scheme considered. Piles will be cut down to below the bed level (**Chapter 2: Site and Proposed Scheme Description (Volume 1)**). The impact of pile probing and the removal of other buried obstructions, such as foundations, would depend on the size and density of the existing intrusions, which is currently uncertain, but such work can have a considerable archaeological impact in disturbing adjacent remains, equating to **substantial harm** to, or **total loss** of, heritage significance (value).
- 8.3.3. If the demolition of the Belvedere Power Station Jetty (disused) (**A1g**) is required as part of the Proposed Scheme, this would involve a **total loss** of the heritage asset's heritage significance (value). The heritage significance (value) of this non-designated heritage asset is **Low**, based on the asset's historic, archaeological and architectural interest. Demolition of the Belvedere Power Station Jetty (disused) is considered as the worst case scenario.
- 8.3.4. The demolition of the modern Munster Joinery steel-frame structure building within the central part of the Site is required as part of the Proposed Scheme. The nature of its foundations is not known but they are not expected to be deep based on the foundations used for other similar buildings. The impact of this demolition on any below ground heritage asset within the footprint of the structure would likely involve **less than substantial harm** to the heritage significance (value) of the asset(s), based on the likely shallow depth of foundations which would need to be removed.

Preliminary Works/Enabling Works/Topsoil Strip

- 8.3.5. Works carried out as part of the initial site set up, including preliminary site stripping and demolition, the installation of site fencing and welfare facilities, are assumed for the purposes of this assessment to cause ground disturbance to a maximum depth of 0.4m below ground level (m bgl).

- 8.3.6. It is assumed for the purposes of this assessment that topsoil would be removed within areas proposed for construction activity (where not currently occupied by stripped compounds). This does not apply to the Mitigation and Enhancement Area, where no new operational infrastructure associated with the Carbon Capture Facility or Proposed Jetty is proposed to be located. Site stripping (prior to ground raising) is likely to extend to a maximum depth of 0.4m bgl.
- 8.3.7. The removal of topsoil would expose any archaeological remains that may be present immediately beneath the topsoil. These may then be affected by movement of vehicles and plant involved in demolition and construction activities, for example through rutting and compaction. In addition, it is possible that topsoil removal without archaeological supervision may result in overstripping, which would have an effect upon archaeological remains located beneath the topsoil, or understripping, where archaeological features are concealed beneath a thin layer of topsoil but are then exposed and unprotected from subsequent demolition and construction activities.
- 8.3.8. Topsoil stripping may therefore involve the partial or complete removal of any near-surface archaeological remains, resulting in a **substantial level of harm** to, or **total loss** of, the heritage significance (value) of the heritage asset(s). However, the potential for archaeological remains of significance (value) to survive at this depth is considered to be low. Installation of Temporary Construction Compounds and fencing is likely to entail fairly shallow ground disturbance only. As such the impacts are considered **negligible**.

Ground Raising and Cuttings

- 8.3.9. Across most of the proposed Carbon Capture Facility land area, ground raising is likely to be required to a future ground level of 2.8m AOD (minimum) as a flood protection measure, requiring in the region of 3.0m of fill in some areas. In localised areas, cuttings of up to 1.0m are likely to be required to account for road access to Norman Road.
- 8.3.10. Ground raising would involve the burial (and preservation) of any archaeological remains beneath the deposited material. Localised cuttings are likely to partially or completely remove any archaeological remains located up to 1.0m bgl, while deeper remains would be unaffected.
- 8.3.11. While ground raising would involve the preservation of archaeological remains, localised cuttings may involve the partial or complete removal of any near-surface archaeological remains, resulting in a **substantial level of harm** to, or **total loss** of, the heritage significance (value) of the heritage asset(s). However, on the basis of the baseline data gathered, the potential for archaeological remains of high heritage significance (value) to be present at shallow depths is considered to be low.

Proposed Carbon Capture Facility, Piled Foundations

- 8.3.12. All proposed structures within the Site would have piled foundations. It is assumed that precast concrete driven piles would be used for the foundations of most proposed structures. Bored piles may be required in areas sensitive to noise and vibration. All piles are likely to have a depth of 12m and a likely diameter of 0.6m, apart from those used for the Absorber foundation, which are likely to be 0.8m in diameter. Precast concrete driven piles have been assumed, and bored piles may be required in areas sensitive to noise and vibration.
- 8.3.13. Any archaeological remains within the footprint of each pile would be removed as the pile is driven downwards. The severity of the impact would therefore depend on the pile size, type and pile density. Where the piling layout is particularly dense, it is in effect likely to make any surviving archaeological remains, potentially preserved between each pile, inaccessible in terms of any archaeological investigation in the future.
- 8.3.14. The insertion of pile caps and connecting ground beams, along with the excavation of a pile guide trench, are likely to extend no more than 1.0–1.5m bgl and would remove any archaeological remains within the footprint of these works to this depth.
- 8.3.15. Piling may therefore involve the partial or complete removal of archaeological or deeply buried palaeoenvironmental remains, resulting in a partial loss of heritage significance (value). For palaeoenvironmental remains, environmental/topographic information would remain preserved in between the piles (even where the piling layout is particularly dense), resulting in **less than substantial harm** to heritage significance (value).

Perimeter Sheet Pile

- 8.3.16. A piled wall is proposed which will enclose the perimeter of the Site. The proposed perimeter sheet piled wall is estimated to be approximately 12m in length and it is likely that approximately 10m of this would be below existing ground level.
- 8.3.17. Based on their narrow size, sheet piles have highly localised areas of impact. Therefore, the level of harm to the heritage significance (value) of buried archaeological or deeply buried palaeoenvironmental remains resulting from the installation of sheet piles across the Proposed Scheme is considered to be **less than substantial**.

Proposed Jetty Piled Construction and Foundations

- 8.3.18. The Proposed Jetty will be formed of a concrete reinforced deck supported by steel piles. Breasting Dolphins will be positioned either side of a Loading Platform, comprising two fender cones arranged vertically with fender panels. The fenders will be supported by tubular steel pipes. Mooring Dolphins will also be positioned either side of the Loading Platform. The Access Trestle will connect the Loading Platform to land and will be supported by tubular steel pipes. The berthing of Cory tug boats will be facilitated via a landing pontoon which will be located at the rear of the Proposed

Jetty. The envisaged form of construction is a proprietary pontoon restrained by piles for vessel access at various state of tides.

- 8.3.19. To reduce the extent of dredging required, a sheet pile retaining wall equipped with a timber capping beam will be installed. The wall will be positioned under the Loading Platform at the edge of the berth pocket and run between the outer Mooring Dolphins towards the river bank. The top of the capping beam will approximately be at the existing riverbed level (**Chapter 2: Site and Proposed Scheme Description (Volume 1)**).
- 8.3.20. Any palaeoenvironmental or marine archaeological remains within the footprint of each pile would be removed as the pile is driven downwards. Piling may therefore involve the partial or complete removal of archaeological or deeply buried palaeoenvironmental remains, resulting in a **substantial level of harm** to, or **total loss** of, the heritage significance (value) of the heritage asset(s). However, the area of impact from the installation of the sheet pile retaining wall will be highly localised due to its narrow size, equating to **less than substantial harm** to the heritage significance (value) of any heritage asset(s).
- 8.3.21. Any construction activities on the foreshore (e.g. barge spud legs used during the construction of the Proposed Jetty) may result in damage to soft foreshore deposits (where present). This would equate to a **substantial level of harm** to, or **total loss** of, the heritage significance (value) of any heritage asset(s) present.

Capital Dredging

- 8.3.22. A minimum water depth will be required to provide vessels access to the Proposed Jetty at all states of tide. Dredging will therefore be required to provide access to/from the River Thames shipping channel to the Proposed Jetty, including the creation of a berthing pocket for the berthing of vessels at all times. Capital dredging deepens and lowers the channel bed, entirely removing any remains within the dredge area. The proposed maximum dredging depth is likely to be -10.5m Chart Datum.
- 8.3.23. Dredging may therefore involve the partial or complete removal of buried/submerged archaeological remains, resulting in a **substantial level of harm** to, or **total loss** of, the heritage significance (value) of any heritage asset(s) present.

Construction of Access Roads

- 8.3.24. The Proposed Scheme will require new access roads connecting to Norman Road, and internal site roads within the Carbon Capture Facility. The proposed heavy duty access roads are likely to be approximately 0.5m thick and would predominantly be constructed within raised artificial ground.
- 8.3.25. The construction of access roads is therefore unlikely to have an impact on any archaeological remains, as they would either be preserved under the raised artificial ground or will have been damaged/removed during the initial topsoil strip.

Installation of Services and Drainage Features

- 8.3.26. The majority of electrical cables are assumed to be installed above ground. Localised service trenches including proposed cable routes are likely to be installed at depths between 0.7-1.0m bgl. Where existing utilities corridors are used (e.g. along Norman Road), this would result in no archaeological impact.
- 8.3.27. Extensive dewatering works are not anticipated to be required in relation to site attenuation. Across the Site Boundary, proposed surface water drain pipes are likely to be installed along with 1.0m deep modular storage tanks.
- 8.3.28. The impacts from such works would be highly localised and are unlikely to lead to a significant impact. The level of harm to the heritage significance (value) of any heritage asset(s) resulting from such impacts is therefore likely to be **less than substantial**.

Environmental Mitigation and Soft Landscaping

- 8.3.29. Proposed environmental improvements in the Mitigation and Enhancement Area could include rewetting of the soils through alterations to the ditch network, tree planting, wetland habitat creation and scrapes. Raised walkways across the area, an attenuation pond, a car park and an outdoor classroom area have also been proposed.
- 8.3.30. Ground disturbance from new planting is assumed for the purposes of this assessment and is likely to extend to a depth of 1.0–1.5m bgl, to take into account space for the tree bowl and root action. This would entirely remove or severely disturb any archaeological remains at the tree location. The excavation of ditches and ponds would also involve the removal/disturbance of archaeological remains.
- 8.3.31. Environmental mitigation and soft landscaping activities may therefore involve the partial or complete removal of any near-surface archaeological remains, resulting in a **substantial level of harm** to, or **total loss** of, the heritage significance (value) of the heritage asset(s). However, on the basis of the baseline data gathered, the potential for archaeological remains of heritage significance (value) to be present at this depth is considered to be low. Based on the likely superficial and localised nature of these works, extensive impacts are considered unlikely.

8.4. OPERATION PHASE IMPACTS

Maintenance Dredging

- 8.4.1. Periodic maintenance dredging will be required to ensure the Proposed Jetty remains operational at all states of tide. This would remove accumulated silt above the channel bed and any artefacts within it, equating to **substantial harm** to, or **total loss** of, the heritage significance (value) of the heritage asset(s). However, provided the maintenance dredging is no deeper than the original construction phase capital dredge, there would be **no additional impact**.

Scour

- 8.4.2. The addition of the piles for the Proposed Jetty and other structures may alter the fluvial regime and introduce scouring during the operational phase of the Proposed Scheme. This can create substantial holes in the riverbed and in effect could remove archaeological deposits (e.g. palaeoenvironmental remains) or remove waterlogged assets from their depositional context.
- 8.4.3. Modelling has been undertaken showing the predicted levels of accretion and deposition in the Site after a spring neap cycle (**Appendix 11-4: Coastal Modelling Studies (Volume 3)**). A significant increase in siltation (0.1 to 0.3m) around the Proposed Jetty is predicted. No significant erosion of silt material is predicted. On this basis, it is considered unlikely that archaeological and palaeoenvironmental remains would be impacted as a result of scour caused by the presence of the Proposed Jetty.
- 8.4.4. The level of harm resulting from any scour will be lower in scale than the preceding capital dredge (which would likely remove or disturb any archaeological remains present prior to the operational phase of the Proposed Scheme). The level of harm to the heritage significance (value) of the heritage asset(s), such as palaeoenvironmental remains or possible marine assets, would be **less than substantial**.

Belvedere Power Station Jetty (disused) (A1g)

- 8.4.5. In the event that the Belvedere Power Station Jetty (disused) (**A1g**) is retained, the setting of this heritage asset would change as a result of the Proposed Scheme. The Proposed Jetty and parts of the Carbon Capture Facility would be visible in views out from and towards the asset. The access bridge connecting the Proposed Jetty to Riverside 1 would pass over the Belvedere Power Station Jetty (disused) as shown on the **Work Plans (Work No. 4B)**. The Proposed Scheme would introduce a new built form into the setting of this heritage asset which would affect its relationship with the River Thames. However, it would not impact its relationship to its riverside location or to the surrounding industrial landscape. If the Belvedere Power Station Jetty (disused) is retained (with modifications), the Proposed Scheme would result in **less than substantial harm** to the asset through changes to the asset's setting.

Crossness Pumping Station

Workshop Range to South East of Main Engine House (A2)

- 8.4.6. The Workshop Range to South East of Main Engine House (**A2**) is located approximately 780m to the west of the Site Boundary. As a Grade II listed building, the Workshop Range is a heritage asset of **Medium** heritage significance (value), deriving from architectural and historic interest.
- 8.4.7. Parts of the Proposed Scheme, including the Absorber Column(s) and Stack(s) and the Proposed Jetty, would be visible in the long views out from the asset towards the east. This view, which is interrupted by intervening industrial buildings and chimney stacks, does not make a significant contribution to the asset's heritage significance (value) (**Figure 27, Figure 28**). The digital ZTV shows that, at ground level, the

Absorber Column(s) and Stack(s) would be visible when glimpsed in views between the structures (see **Figure 10-3: Visual Assessment Plan (Volume 2)**).

Photomontages showing what the Proposed Scheme would look like in views to the east from Crossness Pumping Station are also included in **Appendix 10-4: Photomontages (Volume 3)**. Whilst it would not be visually prominent, the Absorber Column(s) and Stack(s) and the wider Carbon Capture Facility would still constitute new built form in the wider landscape.

- 8.4.8. The level of harm to the heritage significance (value) of the Workshop Range to South East of Main Engine House Crossness Pumping Station resulting from changes to its setting caused by the Proposed Scheme is considered to be **less than substantial**.

Crossness Pumping Station (A3)

- 8.4.9. Crossness Pumping Station (**A3**) is located approximately 850m to the west of the Site Boundary. As a Grade I listed building, Crossness Pumping Station is a heritage asset of **High** heritage significance (value), deriving from architectural and historic interest (**Figure 26**).
- 8.4.10. Parts of the Proposed Scheme, including the Absorber Column(s) and Stack(s) and the Proposed Jetty, would be visible in the long views out from the asset towards the east. This view, which is interrupted by intervening industrial buildings and chimney stacks, does not contribute to the asset's heritage significance (value) (**Figure 27**, **Figure 28**). The digital ZTV prepared also shows that the tallest feature of the Proposed Scheme, the Absorber Column(s) and Stack(s), which would be a maximum of 113m in height, would not be visually intrusive in views out from the asset at ground level towards the Site. Photomontages showing what the Proposed Scheme would look like in views to the east from Crossness Pumping Station are also included in **Appendix 10-4: Photomontages (Volume 3)**.
- 8.4.11. The level of harm to the heritage significance (value) of Crossness Pumping Station resulting from changes to its setting caused by the Proposed Scheme is considered to be **less than substantial**.

Workshop Range to South West of Main Engine House (A4)

- 8.4.12. The Workshop Range to South West of Main Engine House Crossness Pumping Station (**A4**) is located 900m to the west of the Site Boundary. As a Grade II listed building, the Workshop Range is a heritage asset of **Medium** heritage significance (value), deriving from architectural and historic interest.
- 8.4.13. Parts of the Proposed Scheme, including the Absorber Column(s) and Stack(s) and the Proposed Jetty, would be visible in the long views out from the asset towards the east. This view, which is interrupted by intervening industrial buildings and chimney stacks, does not contribute to the asset's heritage significance (value) (**Figure 27**, **Figure 28**). The digital ZTV shows that, at ground level, the Absorber Column(s) and Stack(s) would be visible when glimpsed in views between the structures. Photomontages showing what the Proposed Scheme would look like in views to the east from Crossness Pumping Station are also included in **Appendix 10-4: Photomontages (Volume 3)**. Whilst it would not be visually prominent, the Absorber

Column(s) and Stack(s) and wider Carbon Capture Facility would still constitute new built form in the wider landscape.

- 8.4.14. The level of harm to the heritage significance (value) of the Workshop Range to South West of Main Engine House Crossness Pumping Station resulting from changes to its setting caused by the Proposed Scheme is considered to be **less than substantial**.

Crossness Conservation Area (A6)

- 8.4.15. Crossness Conservation Area (**A6**) is situated approximately 700m to the west of the Site Boundary and is a heritage asset of **Medium** heritage significance (value), deriving from architectural and historic interest.
- 8.4.16. Parts of the Proposed Scheme, including the Absorber Column(s) and Stack(s) and the Proposed Jetty, would be visible in the long views out from the Conservation Area towards the east. This view, which is interrupted by intervening industrial buildings and chimney stacks, does not make a significant contribution to the asset's heritage significance (value) (**Figure 27, Figure 28**). The digital ZTV shows that the Absorber Column(s) and Stack(s) would be visible from much of the southern part of the Conservation Area at ground level, but less visible from the northern part where the listed buildings are located. Photomontages showing what the Proposed Scheme would look like in views to the east from Crossness Pumping Station are also included in **Appendix 10-4: Photomontages (Volume 3)**. Whilst it would not be visually prominent, the Absorber Column(s) and Stack(s) and the wider Carbon Capture Facility would still constitute new built form in the wider landscape.
- 8.4.17. The level of harm to the heritage significance (value) of the Crossness Conservation Area resulting from changes to its setting caused by the Proposed Scheme is considered to be **less than substantial**.

No. 4 Jetty and Approach (A5)

- 8.4.18. No. 4 Jetty and Approach (**A5**) is situated approximately 750m to the northwest of the Site Boundary. As a Grade II listed building, No. 4 Jetty and Approach is a heritage asset of **Medium** heritage significance (value), which derives from its architectural and historic interest (**Figure 29**).
- 8.4.19. The Proposed Scheme would be visible in long views out from the asset towards the southeast (**Figure 30**). The digital ZTV shows that the Absorber Column(s) and Stack(s) would be visible from this asset at ground level. However, this view does not contribute to the asset's heritage significance (value). Photomontages showing what the Proposed Scheme would look like in views to the east from Crossness Pumping Station are also included in **Appendix 10-4: Photomontages (Volume 3)**.
- 8.4.20. The level of harm to the heritage significance (value) of the No. 4 Jetty and Approach resulting from changes to its setting caused by the Proposed Scheme is considered to be **less than substantial**.

9. CONCLUSION

- 9.1.1. This document forms an appendix to **Chapter 9: Historic Environment (Volume 1)** and provides an impact assessment on buried heritage assets and above ground heritage assets. It also considers the impact of the Proposed Scheme on the historic character and setting of designated assets within and beyond the Site (e.g. views to and from listed buildings and conservation areas).
- 9.1.2. The Site does not contain any nationally designated (protected) heritage assets such as scheduled monuments, listed buildings or registered parks and gardens. The Site does not lie within a conservation area and no locally listed buildings are situated within the Site Boundary.
- 9.1.3. The closest designated assets to the Site comprise a group of three listed buildings and a conservation area associated with the mid-19th century Crossness Pumping Station, including the Grade I listed pumping station itself (**A3**), located approximately 850m to the west of the Site.
- 9.1.4. Given the extent of the Site and the nature of the Proposed Scheme, which encompasses both a terrestrial and marine environment, archaeological survival is anticipated to be highly variable. Past ground disturbance within the Site from mid-19th and 20th century developments may have compromised archaeological survival, particularly in the northern part of the Site. The waterlogged conditions of the intertidal part of the Site and the marshland within which much of the Site is located, particularly where alluvium is present, are conducive to high levels of preservation of organic materials. The height of archaeological deposits is likely to vary across the Site, with modern made ground capping the full alluvial sequence.
- 9.1.5. Elements of the Proposed Scheme which have the potential to have an impact on heritage assets include the demolition of structures, topsoil stripping, piled foundations, dredging, planting and other environmental mitigation, soft landscaping, the construction of access roads and the installation of services and drainage features.
- 9.1.6. **Table 4** below summarises the predicted impact of the Proposed Scheme on asset heritage significance (value). Any evaluation and subsequent mitigation required, which can include archaeological fieldwork (preservation by record) or mitigation by design (avoidance/preservation in-situ), would be outlined in an Archaeological Mitigation Strategy, in agreement with the relevant stakeholders. The scope and methodology for each phase of fieldwork will be presented in a specific WSI. This work and any additional mitigation measures may need to be completed prior to construction commencement. Any additional mitigation to be carried out during the construction phase itself, rather than pre-construction, would be included in the full CoCP(s). All Historic Environment mitigation in the form of additional surveys, where required, and final mitigation will be secured via requirements incorporated within the **Draft DCO (Document Reference 3.1)**.

9.1.7. The Archaeological Mitigation Strategy would reduce the level of harm to the heritage significance (value) of any heritage assets potentially affected by the Proposed Scheme. Where the level of harm is considered to be ‘total loss of heritage significance (value)’ or ‘substantial’ in the table below, this would be reduced to ‘less than substantial’ or ‘negligible’ through the implementation of the Archaeological Mitigation Strategy. It is possible that the level of harm may be further reduced as the design of the Proposed Scheme is refined during the detailed design stage. The table also includes the known or likely asset heritage significance (value).

Table 4: Predicted Impacts on Known or Possible Heritage Assets Prior to Mitigation (Construction and Operation Phases)

Known or Potential Heritage	Heritage Significance (Value)	Impact of Proposals on Asset Significance (Value)
Above Ground Heritage Assets		
Belvedere Power Station Jetty (disused) (A1g)	Low	Total loss of asset heritage significance (value) (if demolished)
Belvedere Power Station Jetty (disused) (A1g)	Low	Less than substantial harm to asset heritage significance (value) (if retained) as a result of changes to asset setting
Workshop Range to South East of Main Engine House at Crossness Pumping Station (A2)	Medium	Less than substantial harm to asset heritage significance (value) as a result of changes to asset setting
Crossness Pumping Station (A3)	High	
Workshop Range to South West of Main Engine House at Crossness Pumping Station (A4)	Medium	
Crossness Conservation Area (A6)	Medium	
No. 4 Jetty and Approach at Dagenham Dock (A5)	Medium	
Below Ground Heritage Assets (Potential Archaeological Remains)		
Previously Unrecorded Palaeoenvironmental Remains (high potential)	Such remains would be of Medium heritage significance (value).	Less than substantial harm to asset heritage significance (value) as a result of pile

Known or Potential Heritage	Heritage Significance (Value)	Impact of Proposals on Asset Significance (Value)
		foundations, dredging and scour
Previously Unrecorded Prehistoric and Roman Remains (uncertain, but possibly low to moderate, potential)	Such remains would be of High heritage significance (value).	Less than substantial harm to asset heritage significance (value) as a result of pile foundations, environmental mitigation etc.
Previously Unrecorded Medieval Remains (high potential)	Such remains would be of Low or Medium heritage significance (value), depending on nature and extent.	Less than substantial harm to asset heritage significance (value) as a result of topsoil stripping, pile foundations, environmental mitigation etc.
Previously Unrecorded Post-medieval and Modern Remains, recorded structures, field boundaries and drainage ditches (high potential)	Such remains would be of Low heritage significance (value).	Less than substantial harm to asset heritage significance (value) as a result of topsoil stripping, pile foundations, environmental mitigation etc.

9.2. RECOMMENDATIONS

MARINE/INTERTIDAL

9.2.1. For the marine/intertidal part of the Site, the proposed survey strategy comprises:

- foreshore walkover at very low tide to identify archaeological features and/or an Unmanned Aerial Vehicle (UAV) survey of the foreshore;
- magnetometry data;
- multi beam echo sounder (MBES); and
- side scan sonar (SSS).

- 9.2.2. The results of the survey analysis will enable an appropriate mitigation strategy to be prepared for any significant archaeological remains that could be affected. The surveys and any subsequent mitigation required would be outlined in the Archaeological Mitigation Strategy post-DCO determination, to be approved by LBB in consultation with GLAAS. The scope and methodology will be presented in a specific Written Scheme of Investigation (WSI). Each WSI would need to be prepared and approved by LBB in consultation with GLAAS prior to construction commencing.
- 9.2.3. Although rare, in the unlikely event that archaeological remains of very high (National) heritage significance (value) are identified, there may be a requirement, where practicable in the consented design, for their preservation in-situ.
- 9.2.4. The scope and methodology for any evaluation and subsequent mitigation would need to be outlined in specific archaeological WSI, in agreement with the relevant stakeholders. This work and any additional mitigation measures may need to be completed prior to construction commencement. Any additional mitigation during the construction phase itself, rather than pre-construction, would be included in the full CoCP(s). Mitigation could take the form of targeted excavation (preservation by record) and for remains of known low heritage significance (value), an archaeological watching brief may be required (for instance during the excavation of the berth dredge channel). This would ensure that archaeological remains were not removed without record.

TERRESTRIAL

- 9.2.5. The potential for shallow surviving archaeological remains (i.e. later medieval, post-medieval or modern) across the Site is high, particularly for those associated with reclamation, water management, food defence and industrial use of the Site. The potential for deeply buried prehistoric/Roman remains of high heritage significance (value) (i.e. floodplain features such as fishtraps/trackways/jetties) is uncertain, but possibly low to moderate. As the main impact is limited to piling for the Carbon Capture Facility structures, trial trench investigation is not considered appropriate, nor practicable, to clarify the depth and heritage significance (value) of archaeological deposits within the Site, as remains of heritage significance (value) would extend to a greater depth than standard evaluation trenching would reach.
- 9.2.6. Within the terrestrial part of the Site, the impacts on below-ground remains will be removed or offset through a programme of archaeological mitigation post-determination, to be agreed in consultation with GLAAS, and presented in a Written Scheme of Investigation setting out the scope and methodology for the work.
- 9.2.7. The first stage would be an update to the existing Geoarchaeological Deposit Model that would be extended to cover the whole Site (including the marine and intertidal areas within the Site). This would build on the existing information on buried sediments to map the subsurface topography in those parts of the Site not currently covered, providing an insight into the prehistoric terrain beneath any superficial deposits of made ground and alluvium along with information on hydrology, vegetation, and past landscape.

- 9.2.8. The model would be used to inform further evaluation, should this be required, along with any additional mitigation measures. This could comprise avoidance in the unlikely event that nationally significant remains are identified, where this is warranted and feasible (considering consent will have been granted). It could also include targeted archaeological excavation and recording in advance of construction, where significant remains are present, and/or an archaeological watching brief during preliminary groundworks, to form preservation by record. Any additional evaluation and/or mitigation measures which may be required following the production of the model would be included in the Archaeological Mitigation Strategy or the full CoCP(s), depending on whether they would take place before or during construction.
- 9.2.9. As part of the mitigation strategy, a programme of community engagement may also be required in order to disseminate the results of the investigations. This would depend on the results of the initial surveys and ongoing consultation with GLAAS.

HISTORIC BUILDING RECORDING

- 9.2.10. Should the Belvedere Power Station Jetty (disused) be demolished, it is recommended that an Historic England Level 2 Historic Building Recording is undertaken prior to demolition. Level 2 recording comprises a descriptive record where the structure will be seen, described, and photographed. It will include a drawn record, photography and a written record. This will ensure that an accurate record of the Belvedere Power Station Jetty (disused) is archived with the GLHER and Archaeology Data Service for future research and understanding of heritage significance (value). The work will be carried out in accordance with Historic England's 2016 Guidance note 'Understanding Historic Buildings: a guide to good recording practice'.

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Bexley Local Studies and Archive Centre

British Geological Survey

Greater London Historic Environment Record

Historic England designation data

CARTOGRAPHIC SOURCES

Ordnance Survey mapping from the 1st edition to the present day.

Annex A

HISTORIC ENVIRONMENT GAZETTEER

The table below represents a gazetteer of known Historic Environment sites and finds within the Study Area. Each entry has an assessment (A) reference number. The gazetteer should be read in conjunction with **Figure 3: Historic Environment Features Map** within **Annex B**.

ABBREVIATIONS:

HER - Historic Environment Record

NHLE - National Heritage List for England

NRHE - National Record of the Historic Environment

UKHO - United Kingdom Hydrographic Office

Table 5: Historic Environment Gazetteer

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A1a	Trial Trench at Norman Road Trial trench evaluation by Pre-Construct Archaeology in 2007, comprising nine trenches. A single rim sherd of Roman pottery was found. The peat is likely to be of early Neolithic to Iron Age in date.	Early Neolithic – Iron Age Roman	156002
A1b	Geotechnical Survey at Former Belvedere Power Station Geotechnical monitoring by Lawson Price Environmental in 1994. The works did not disturb any archaeological deposits.	None	168633
A1c	Geomorphological Survey at Crossness Quaternary Scientific used geoarchaeological borehole data to create a deposit model in 2011. The model identified layers of naturally deposited alluvium and peat.	None	160508
A1d	Obstruction UKHO Wreck/Obstruction. Obstruction/ruin identified in 1998.	Unknown	13389
A1e	Regency wreck site UKHO Wreck/Obstruction. Wreck site of the Regency, a tug boat which was sunk by a mine off Dagenham while towing barges during the Second World War. One crew member and one lighterman were lost. The wreck was raised in 1970.	Modern	69978
A1f	Roman remains 'Roman remains' noted in the river off Brown's Manure Works in 1885. Field investigation in 1964 found nothing at the location.	Roman	408168
A1g	Belvedere Power Station Jetty Likely constructed between 1954 and 1960 as a fuelling jetty along with the rest of Belvedere Power Station.	Modern	N/a

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A1h	Belvedere Power Station Belvedere Power Station was built in 1954-60 and demolished in 1993-4.	Modern	965443
A1i	Trial Trench at Eastern Way Trial trench evaluation by Pre-Construct Archaeology in 2007. A 10m x 2m trench excavated to a depth of -2.1m below ground level within Crossness LNR revealed thick peat deposits containing small pieces of wood. A number of driven timber posts were uncovered here during groundworks and examined by Pre-Construct Archaeology in 2010. These were considered to be of post-medieval date.	Post-medieval	156640 124456 166321 130184
A2	Workshop Range to South East of Main Engine House Crossness Pumping Station Grade II listed workshop range, built in 1862-65 by William Webster to the designs of Sir Joseph Bazalgette and Charles Henry Driver.	Post-medieval	1064216
A3	Crossness Pumping Station Grade I listed pumping station, built to the designs of Sir Joseph Bazalgette and completed in 1865.	Post-medieval	1064241
A4	Workshop Range to South West of Main Engine House Crossness Pumping Station Grade II listed workshop range, built in 1862-65 by William Webster to the designs of Sir Joseph Bazalgette and Charles Henry Driver.	Post-medieval	1250557
A5	No. 4 Jetty and approach, formerly at Samuel Williams and Company, Dagenham Dock Grade II listed coaling jetty, built in 1899-1903 for Samuel Williams & Sons Ltd. and extended in 1906-07. The jetty is one of Britain's earliest surviving reinforced-concrete structures.	Modern	1391706

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A6	<p>Crossness Conservation Area</p> <p>Conservation area incorporating the mid-Victorian Crossness Pumping Station complex. This conservation area includes three listed buildings.</p>	Post-medieval	4840
A7	<p>Watching Brief and Geoarchaeological Evaluation at Anderson Way and Bronze Age Way</p> <p>A watching brief and a geoarchaeological evaluation by Canterbury Archaeological Trust between 2015 and 2018. One of the earliest identified phases was a peat horizon and a solid wooden object, which is thought to be the trunk of a fallen tree. A series of interdigitated peats and inorganic silts were thought to represent early Holocene marshy woodland and alluvial flooding or tidal inundation. Alluvial or tidal clays are thought to mark late Holocene marine transgression or deliberate post-medieval land reclamation.</p>	Prehistoric Post-medieval	152205 153694
A8	<p>Auger Survey and Deposit Modelling at Crabtree Manorway North</p> <p>Geoarchaeological fieldwork and deposit modelling by Quaternary Scientific in 2012. Six boreholes were located across the site, which showed that the site has potential for paleobotanical and zooarchaeological remains. The deposit sequence suggested the presence of Mesolithic and later Neolithic to Bronze Age semi-terrestrial land surfaces.</p>	Prehistoric	152663 123606
A9	<p>Geoarchaeological Deposit Modelling and Borehole Survey at Burt's Wharf</p> <p>Geoarchaeological deposit modelling at Burt's Wharf by Quaternary Scientific in 2016. The model shows that the site has a similar geoarchaeological make-up to others in the Lower Thames valley. On the basis of the likely depth of sediments, the archaeological potential of the site was considered low.</p> <p>A geoarchaeological survey was carried out here by the Museum of London Archaeology in 2020. The results determined that the Pleistocene floodplain gravel consist of underlying deposits of archaeological interest. This layer of floodplain gravels was overlain by a 7.5m layer of Holocene floodplain deposits.</p>	None	153427 155352

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A10	Auger Survey, Monolith Sampling and Trial Trenching at 109-137 Abbey Road Auger survey, monolith sampling and trial trench evaluation by Wessex Archaeology in 1993. Peat deposits were dated by pollen assessment to the Early Bronze Age.	Early Bronze Age	153662 114505
A11	Core Sampling at Imperial Gateway Specialist environmental archaeological assessment by ArchaeoScape in 2008. Boreholing was undertaken and data from previous boreholes included. Analysis of samples indicated that the site was a semi-terrestrial fen carr woodland and semi-aquatic reed or sedge swamp during the Middle Holocene.	Late Mesolithic – Early Bronze Age	154580 130931
A12	Watching Brief at Fisher’s Way Watching brief by Museum of London Archaeology Service in 1995. No datable features or finds were recovered.	None	154796
A13	Trial Trench and Watching Brief at East Thamesmead Business Park Trial trench evaluation by Oxford Archaeology in 2003. No archaeological deposits were uncovered. Oxford Archaeology conducted a watching brief here in 2005. No archaeological finds or features were recorded. Oxford Archaeology conducted another trial trench evaluation here in 2006. Two levels of peat were recorded. One deposit contained a number of Roman finds, although it is not known if they were in-situ. The peat deposits were radio-carbon dated to the Late Mesolithic to Bronze Age. A ditch was encountered, likely to be associated with the post-medieval draining and division of Erith Marsh.	Late Mesolithic – Bronze Age Roman Post- medieval	155628 164867 165900 135476 108224
A14	Auger Survey at former Murex site, Ferry Lane Geoarchaeological evaluation by the Museum of London Archaeology Service in 2005. A possible land surface was identified of a Mesolithic date, along with a Bronze Age woodland and Iron Age meadow land.	(Likely) Mesolithic Bronze Age Iron Age	156056 108098

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A15	<p>Trial Trench and Timber Sampling at Eastern Way</p> <p>Trial trench evaluation by Pre-Construct Archaeology in 2007. A remnant of a preserved prehistoric forest was revealed which may date to the Late Mesolithic. This represents the earliest known colonisation of yew woodland on the southern bank of the Thames during the Late Holocene. One of the peat layers contained a Mesolithic bone awl.</p>	Late Mesolithic	156640 124456
A16	<p>Watching Brief at Bronze Age Way</p> <p>Watching brief in 1995-96. Within the deep peat deposits, worked wood and a section of a hurdle-built trackway were revealed. These were confirmed as Bronze Age in date. Systematic sampling of sand below the peat identified extensive Late Mesolithic flint industry, suggesting the manufacture of tranchet axes. Carbon dating of fragments of pottery indicate a Neolithic date. The investigations also recorded caves, possibly used as air raid shelters in the Second World War.</p>	Late Mesolithic Neolithic Bronze Age (Likely) Modern	156673
A17	<p>Evaluation at Silvertown West Radiocarbon Dating</p> <p>Evaluation undertaken in 1996. Involved analysis of organic material. Dark grey/brown organic mud encountered with wood and plant fragments within grey sands and gravels of the Shepperton Terrace. Radiocarbon date of 10,310 before present.</p>	Mesolithic	157743
A18	<p>Borehole Survey at Royal Victoria Dock</p> <p>Borehole survey in 1996. Fluvial gravels were overlaid by Neolithic to Iron Age peat. Above ephemeral peat of the medieval period was upcast from the dock excavations of the 1850s.</p>	Neolithic Iron Age Medieval Post-medieval	158274

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A19	<p>Watching Brief at former Football Ground</p> <p>Watching brief by Museum of London Archaeology Service in 2001. Two undated linear features were recorded which may be drainage ditches or natural water channels. A probable Bronze Age peat deposit was uncovered and a number of woody inclusions were also present within the deposit.</p>	Unknown (Likely) Bronze Age	158889 112734 142275
A20	<p>Watching Brief at Norman Park</p> <p>Watching brief by Museum of London Archaeology Service in 1997. A Mesolithic or Early Neolithic broken crested blade made of flint was recovered from the lower sand in one of the test pits. The location and depth of the site was considered to be too low lying for human exploitation in the prehistoric period, so the blade is not considered to be an indicator of any activity.</p>	Mesolithic / Early Neolithic	159602 102736 108850
A21	<p>Surveys at Church Manorway and Green Level Pumping Station</p> <p>A logboat thought to date to the Bronze Age was found here in 1885 during ditch digging through peat. A polished flint axehead and scraper were found inside the boat. These are possibly of Neolithic date, although they may be forgeries.</p> <p>Geoarchaeological evaluation, a borehole survey and a watching brief by the Museum of London Archaeology Service between 2007 and 2010. The basal deposits across the site consisted of the Late Pleistocene floodplain gravels, overlain by Early Holocene fluvial sands. These areas would have been favourable to Early Mesolithic hunter-gatherers. Large timbers were recorded suggesting a timber structure forming part of a possible Early Neolithic trackway. A peat deposit dating from the Bronze Age was also found.</p> <p>Geophysical survey, borehole survey, ground penetrating radar survey, geotechnical test pits and core sampling by Fugro Engineering Services in 2008.</p> <p>An environmental archaeological assessment was undertaken by Quest here in 2012 and six boreholes were sunk.</p>	(Likely) Neolithic Bronze Age	160042 163584 120813 161322 161732 161986 107656 143658 168791 149413 147071 148482 206874

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A22	Geomorphological Survey at Veridion Park Geoarchaeological deposit modelling by Quaternary Scientific in 2012/13. The model identified a sequence of natural gravel overlain by two layers of peat separated and sealed by alluvial deposits.	None	160294
A23	Watching Brief at Beam Reach Watching brief by the Museum of London Archaeology Service between 2006 and 2007. No archaeological features or deposits were recorded.	None	161588
A24	Borehole Survey at Alchemy Park Geoarchaeological investigations by QUEST between 2016 and 2018. A deep west-east orientated palaeochannel was revealed. Peat was dated from the Late Mesolithic to the Bronze Age.	Late Mesolithic – Bronze Age	162064 163789
A25	Trial Trench at Crabtree Manorway South Trial trench evaluation by the Museum of London Archaeological Services in 2005. No archaeological features or finds of note were discovered. Peat deposits dating from the Mesolithic to the Bronze Age were recorded.	Mesolithic – Bronze Age	162545 96924
A26	Watching Brief at Eastern Way/Picardy Manorway/Anderson Way Watching brief by Compass Archaeology in 2001-02. Groundworks monitored for a distance of 1.25km. Evidence for yew colonisation was encountered, which may have spread to the peatland from the Early Bronze Age.	(Likely) Bronze Age	162868 140215
A27	Heritage Activity at Biossence (East London) Limited Borehole survey by the Museum of London Archaeology in 2013. The boreholes provided a record of the landscape change from the Mesolithic through to the medieval period.	Mesolithic	163332

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A28	Field Observation (Monitoring) at Rainham Marsh Local Nature Reserve Archaeological monitoring of groundworks by Essex County Council in 2010. No archaeological remains were observed within the deposits.	None	163496
A29	Borehole Survey and Geoarchaeological Assessment at Marston's Brewery Borehole survey and geoarchaeological assessment by Wessex Archaeology in 2014. No archaeological remains or artefacts were recovered from the core samples, but the sequences have good potential to inform our knowledge of the landscape in prehistory.	None	164152
A30	Evaluation at 85 Ferry Lane Evaluation in 1991. Piling of foundations by continuous auguring identified no archaeological features. Extensive peat deposits were sampled.	None	166819
A31	Watching Brief at Poppy Close Watching brief by Pre-Construct Archaeology in 2001. No archaeological features were exposed and the deposits were largely sterile.	None	166984
A32	Pollen Assessment at Crossness Sewage Works Pollen assessment carried out by the Archaeological Palynology Unit on samples from boreholes in 1994. The results approximately date the base of the boreholes to post-6,500 BC. The upper units of the boreholes are likely post-500 BC.	Prehistoric	167298
A33	Borehole Survey at Stolthaven Dagenham Limited Geotechnical investigations by the Museum of London Archaeology in 2014.	None	167523
A34	Borehole Survey at Crabtree Manorway North and Bronze Age Way Window sampling by Wardell Armstrong in 2017. A deposit model was also created. The geoarchaeological and palaeoenvironmental potential of the deposits was found to be limited.	None	167586

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A35	Watching Brief at Thames Water Sewage Treatment Works Watching brief by Pre-Construct Archaeology in 1997. The site did not show any significant archaeological deposits and only one possible feature was visible. This was a backfilled ditch of unknown date.	Unknown	167754 136217
A36	Heritage Activity at Belvedere Road Monitoring and deposit modelling of geotechnical work by the Museum of London Archaeology in 2016. The report found the sediments on the site to represent intertidal creeks of the late prehistoric/historic period which have scoured away deposits from earlier periods. The boreholes contained neither natural deposits of high palaeoenvironmental value, nor artefactual remains.	None	168606
A37	Assessment at Rainham Road South Historical overview of the surviving physical evidence of the unfinished Victorian Romford Canal by Oxford Archaeological Unit in 2001. The on site assessment found that only very limited evidence of the former canal survived, and apparently none of the structures previously referred to were still in existence.	Post-medieval	168692 210681
A38	Borehole Survey at Bronze Age Way and Anderson Way Geoarchaeological evaluation and palaeoenvironmental assessment by Dalcour Maclaren in 2020.	None	169709
A39	Watching Brief at Merchant Waste Treatment Plant Watching brief by Pre-Construct Archaeology in 2011. The alluvial deposits were overlain by approximately 3m of modern made ground. The peat deposits were thought to date back into the post-glacial prehistoric period.	Prehistoric	169757
A40	Deposit Modelling at Picardy Manorway and Bronze Age Way Archaeological and palaeoenvironmental deposit modelling by Wardell Armstrong in 2017.	None	170519

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A41	<p>Barlow Way South Rainham Geoarchaeological Fieldwork and Deposit Modelling Report</p> <p>Geoarchaeological fieldwork and deposit modelling by Touchstone Archaeology in 2022. The results of the investigation reveal a sequence of Holocene alluvium and peat overlain by a substantial thickness (ca. 8-12m) of made ground consequent of artificial ground raising.</p>	None	212028
A42	<p>14 Lower Park Road (Victorian Semi Detached House)</p> <p>Locally listed building. Unusual semi-detached 'back to back' two storey with attic residential property in yellow brick with red dressings. Mid-19th century in date.</p>	Post-medieval	96077
A43	<p>85 Ferry Lane (Buried Land Surface of Uncertain Date)</p> <p>Extensive peat deposits of unknown date were sampled.</p>	Unknown	100081
A44	<p>Murex Works Rainham (Roman Findspot)</p> <p>Unspecified works near here in 1961 revealed fragments of Roman pottery, including fragments of mortaria, cooking pot sherds, the screw neck of a flagon and the decorated rim of a buff vessel. All finds were dated to the 1st century AD. Based on these finds and the Roman building material reused in the construction of the nearby church of St Helen and St Giles, a Roman settlement may be sited at Rainham ferry. It may have been a causeway and quay in this period.</p>	Roman	102325 111068
A45	<p>23 Picardy Road (Victorian Semi Detached House)</p> <p>Locally listed building. Mid-19th century 'back to back' house of two storeys in yellow brick with unusual mix of windows to symmetrical facade.</p>	Post-medieval	103365
A46	<p>Crossness Sewage Treatment Works (Early 20th Century Police Box)</p> <p>Locally listed buildings. Four early concrete 'police' style boxes at Crossness Sewage Works. Use and date of construction unknown.</p>	Modern	104049

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A47	Manor Way (Second World War Anti Aircraft Gun Post) Site of Second World War Light Anti-Aircraft guns, positioned to defend Vulnerable Point no. 116, the Murex works at Rainham.	Modern	104336
A48	Ferry Lane (Late Medieval Ferry Crossing) Stop for Long Ferry in around 1279/1850s. Mentioned by name in 1531. Ferry from Erith to Rainham in 1890s.	Medieval	104823
A49	8 Halt Road (Victorian Semi-Detached House) Locally listed building. One of a pair of semi-detached houses constructed circa 1860. It is built from yellow and red brick, with stucco and a gabled concrete tile roof.	Post-medieval	110818
A50	Crossness Sewage Treatment Works (Victorian Pump House) Locally listed building. Storm water pumping house at Crossness Sewage Treatment Works. Built probably in the early 20th Century in a similar style to earlier neighbouring buildings.	Modern	110885
A51	Belvedere Power Station (Findspot & Findspot of Uncertain Date) Antler fragments, mollusc shells, fossil, nuts and wood fragments including silver birch.	(Likely) Prehistoric	115038
A52	St Augustine's School (Victorian School) Locally listed building. St Augustine's School, Belvedere was built in the 1890's and appears to have initially been a boys' school.	Post-medieval	116411
A53	Eleanor Villas, 17-18 Lower Park Road, Belvedere, Bexley (Victorian Semi Detached House) Locally listed buildings. A pair of semi-detached houses known as Eleanor Villas that were built in the 1870s.	Post-medieval	116575 116989

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A54	Rainham Marshes (Early 20th Century Firing Range) 20th century rifle range built on park of Rainham Marsh. Shown in use on the 1915 and 1951 Ordnance Survey Maps. Date of construction and closure not known but sometime between 1910 and 1967.	Modern	117265
A55	Manor Way (Post Medieval Waste Disposal Site) Site of landfill taken from British Geological Survey data supplied to the Environment Agency. It is not known whether this site was made or worked land, and the date of infill is unknown, although all are of 19th/20th century date.	Post-medieval / modern	120128
A56	Methodist Chapel (Victorian Methodist Chapel) Locally listed building. The Methodist Chapel at 12 Picardy Road, Belvedere was constructed in 1876 by Habershon & Pite.	Post-medieval	120265
A57	The Chequers (Georgian Public House) The Chequers Public House at 51 Picardy Road, Belvedere was built in the mid-19th century.	Post-medieval	121902
A58	Ferry Lane (Post Medieval Waste Disposal Site) Site of Salamons Way Industrial Area landfill site taken from British Geological Survey data supplied to the Environment Agency. It is not known whether this site was made or worked land. The date of infill is unknown, although all materials are of 19th/20th century date.	Post-medieval	121999
A59	Sweetloves Bay Rainham (Post Medieval Well) Artesian well found in a clump of trees near the beam river.	Post-medieval	122196
A60	7 Halt Road (Victorian Semi-Detached House) Locally listed building. One of a pair of semi-detached houses built in the 1860s. It is constructed from yellow and red brick with stucco and a gabled concrete tile roof.	Post-medieval	132549

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A61	The Belvedere (Victorian Public House) Locally listed building. Public house built circa 1860. It has three storeys with walls of yellow brick, a rendered and rusticated ground floor and rendered details, and a hipped slate roof.	Post-medieval	133225
A62	Franks Park (Early 20th Century Public Park) 20th Century public park, created after 1920, on the former woodland grounds of Belvedere Park estate. It is named after Frank Beadle, a local philanthropist, who donated money for its purchase by Erith Council.	Modern	133347
A63	Crossness Sewage Treatment Works (Victorian Boiler House) Locally listed building. Single storey former engine house and boiler house complex built in 1891. Built of yellow stocks with red brick detailing.	Post-medieval	134449
A64	Hornchurch Marshes (Post Medieval Waste Disposal Site) Site of landfill taken from British Geological Survey data supplied to the Environment Agency. It is not known whether this site was made or worked land, and the date of infill is unknown, although all materials are of 19th/20th century date.	Post-medieval	136393
A65	Belvedere (Medieval Findspot) 14th century dagger found during the construction of a property.	Medieval	137244
A66	Mitchell Close (Georgian Lamp Post) Locally listed structures. Four 19th century cast iron lamp columns are located on Mitchells Close, Belvedere.	Post-medieval	138509
A67	15 Lower Park Road (Georgian Semi Detached House) Locally listed building. Unusual semi-detached 'back to back' two storey with attic residential property in yellow brick with red dressings. Mid-19th century in date.	Post-medieval	138831

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A68	Site of Dagenham Ice House (Post Medieval Icehouse) The Dagenham Ice House was built to serve the Barking fishery trade. It was presumably demolished in the 1850s or 1860s, after the collapse of the Barking fishery trade.	Post-medieval	138942
A69	Frog Island (Second World War Anti Aircraft Gun Post) Site of Light Anti-Aircraft guns, positioned to defend Vulnerable Point no. 116, the Murex works at Rainham.	Modern	139713
A70	Belvedere Station (Medieval Flood Defences & Embankment) Oldest of a network of river walls seen by J. Spurrell in 1885.	Medieval	140382
A71	Chequers Lane (Post Medieval House & Clubhouse) Erected in c.1714-20 for John Perry while working on the breach sewers commission meeting place.	Post-medieval	142523
A72	6 Picardy Road (Victorian Semi-Detached House) Locally listed building. Unusual mid-19th century semi-detached 'back to back' two storey dwelling in yellow brick with a few red brick courses. Symmetrical frontage features sash windows and oddly-placed gabled dormer.	Post-medieval	142909
A73	Ferry Larainham (Tudor Public House) First mentioned in 1531. By 1769 it had become the French Horn and the Three Crowns in 1772. It was rebuilt in 1834.	Post-medieval	148471
A74	Site of House (Post Medieval House) One of two cottages. This one was used as a holiday home by the Fry family between 1824 and 1833.	Post-medieval	150852
A75	Remains of mooring UKHO Wreck/Obstruction. Ground tackle remains identified in 1999.	Unknown	57500

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A76	Part of mooring UKHO Wreck/Obstruction. Part of mooring identified in 2010.	Unknown	79605
A77	Mooring buoy and ground tackle UKHO Wreck/Obstruction. Mooring buoy and ground tackle identified in 1998. The buoy has been removed but the ground tackle remains.	Unknown	56983
A78	Marine obstruction UKHO Wreck/Obstruction identified in 1978.	Unknown	12937
A79	Marine obstruction UKHO Wreck/Obstruction identified in 1978.		12967
A80	Mooring tackle UKHO Wreck/Obstruction. Mooring tackle identified in 1998/99. A buoy was also removed from this location.	Unknown	13387 57499
A81	Mooring tackle UKHO Wreck/Obstruction. Mooring tackle identified in 1998. A buoy was also removed from this location.	Unknown	13388
A82	Ruined jetty UKHO Wreck/Obstruction. Foul ground around the end of ruined jetty identified in 1999.	Unknown	57501
A83	Ground tackle UKHO Wreck/Obstruction. Ground tackle remains here after the removal of a mooring buoy in 1999.	Unknown	57847
A84	Marine obstruction UKHO Wreck/Obstruction identified in 1978.	Unknown	12961

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A85	Wreckage UKHO Wreck/Obstruction. Area of wreckage located by a diver in 1999.	Unknown	57783
A86	Remains of barges UKHO Wreck/Obstruction. Remains of at least three barges sticking out of the mud, identified from aerial photography/satellite imagery taken in 1973.	Unknown	12965
A87	North Kent Railway The South Eastern Railway Company's North Kent Line was constructed between the North Kent East Junction near London Bridge via Lewisham, Woolwich, Erith and Dartford to Gravesend. It was fully opened in 1849. The company wanted to extend its operation to Dover, but its plans were thwarted in 1855 by the London Chatham and Dover Railway (the Chatham Line), built by the East Kent Railway Company between 1853-8.	Post-medieval	1357891
A88	Dagenham National Cartridge and Box Repair Factory A First World War National Cartridge and Box Repair Factory was established at Dagenham Dock in 1916 (exact location uncertain). The factory repaired cartridge cases and ammunition boxes under the direct control of the Ministry of Munitions.	Modern	1573416
A89	Roman finds Roman pottery, mortar and tiles along with a cinerary urn containing bones were found circa 1865 near the 'southern outfall'.	Roman	408165
A90	Belvedere Station A Railway station on the North Kent Railway: the line opened in 1849 but the station is believed to have been added in 1859.	Post-medieval	508177
A91	Erith Heavy Anti Aircraft Battery General location of the site of a First World War heavy anti aircraft battery at Erith explosives works which was armed with a 4-inch gun in 1916 and a 3-inch gun in 1917.	Modern	1473931

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A92	English wherry wreck 1703 wreck of an English wherry which was wrecked in the River Thames following a collision during the Great Storm. An unknown number (likely several hundred) of other wooden sailing vessels of this type were lost in this incident.	Post-medieval	1432276
A93	1709 wreck 1709 wreck of at least one craft which foundered in the Thames after being " <i>cut to pieces</i> " by the ice in the " <i>late frost</i> " at a time when the Thames was frozen over above Woolwich. Such a vessel is likely to have been a sailing craft, constructed of wood.	Post-medieval	1481701
A94	Thames maritime wrecks A number of documented wreck events have been recorded in the Thames, some of which may have occurred in this general location. These include sailing vessels, wherries, cargo vessels, barges, lighters, passenger vessels, paddle steamers, schooners and military training ships which sank between 1654 and 1940.	Post-medieval Modern	1248964 897420 901985 1206465 1248963 1434856 1252886 896291 896227 1458778 1438625 1187545 1327047 1210100 1408364 893716

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
			897568
			896804
			1206445
			1481903
			893768
			1355418
			1438626
			898500
			893706
			1183592
			1315344
			893757
			893736
			896290
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			1368699
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			896912
			1187292
			1329224

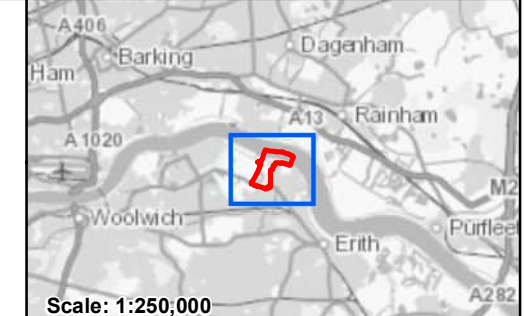
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			896261
			1206506
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			896220
			1483356
			1336174
			898487
			1254808
			1408351
			1432277
			1434843
			1438267
			1368540
			893714
			1443079
			893726
			1366169
			893772
			1434866
			1187412

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
			1210107
			1206425
			893728
			1368684
			1368539
			1443080
			1442925
			1187453
			897555
			1210114
			1187542
			1183614
			897418
			1344534
			1438268
			893742
			1210046
			897486
			896805
			893756
			1206385
			893720
			1207651

Assess. (A) ref.	Description	Period	HER / NHLE / NHRE / UKHO ref.
A95	<p>Thames aircraft crashes</p> <p>A number of documented aircraft crashes have been recorded in or near to the Thames, some of which may have occurred in this general location. The vast majority, however, were shot down over the Thames Estuary.</p> <p>These include a Vickers Virginia, Supermarine Spitfires, Hawker Hurricanes, a Bristol Blenheim, a Blackburn Roc and a North American Mustang which crashed between 1927 and 1944.</p>	Modern	1329119 1320803 1318828 1323824 1325438 1323448 1324381 1319322 1320067 1323943 1323919 1319084 1323441 1320731 1340673 1328491 1323936 1320807 1322702
A96	<p>Lesnes Abbey</p> <p>Scheduled monument which includes Augustinian Abbey of St Thomas the Martyr, now known as Lesnes Abbey, surviving as upstanding stone remains and archaeological remains. It is situated on low-lying ground at the northern edge of Lesnes Abbey Woods.</p>	Medieval	1002025

Annex B

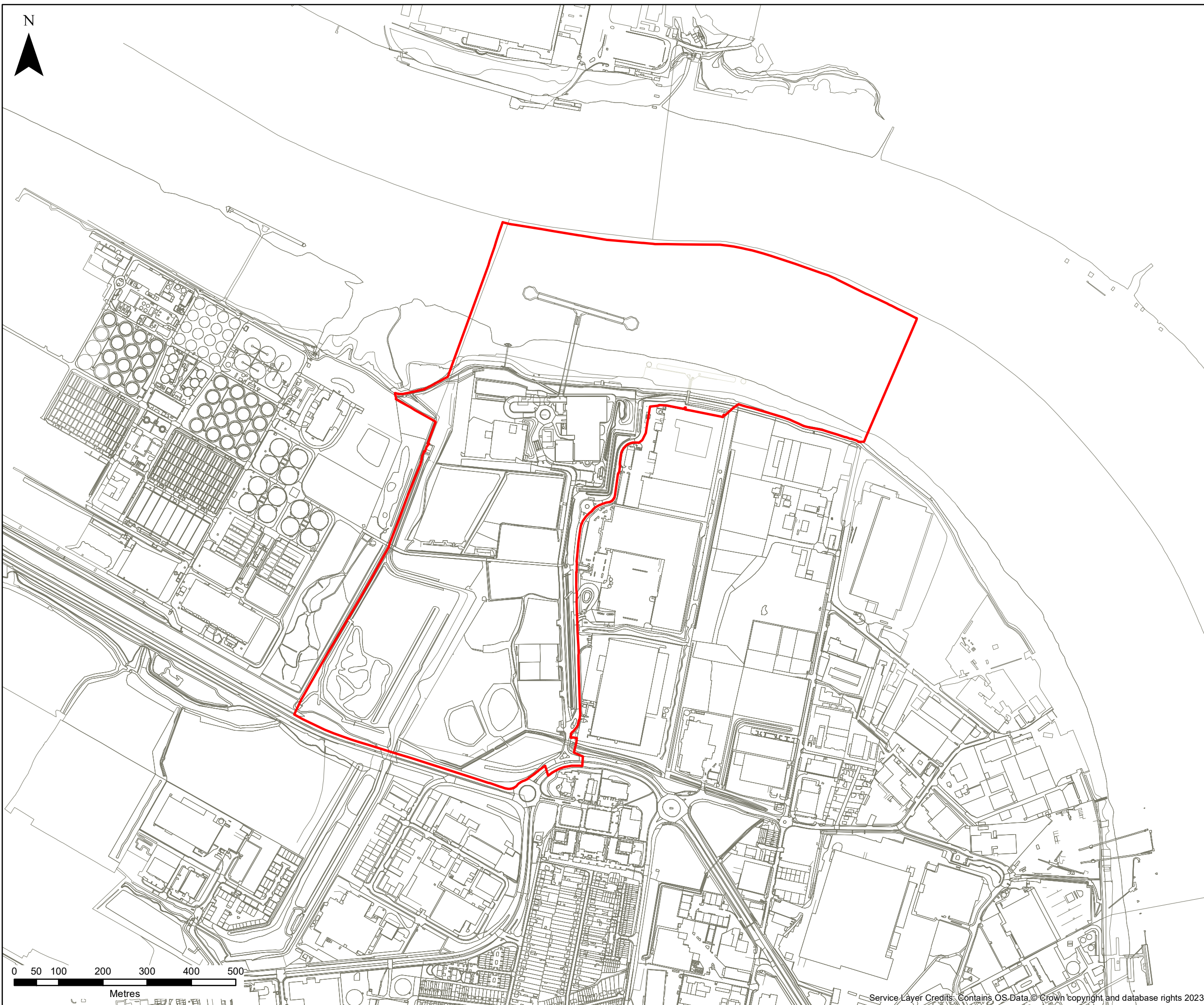
FIGURES



Scale: 1:250,000

Legend

 Site Boundary



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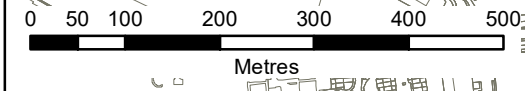
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**FIGURE 1
SITE LOCATION PLAN**

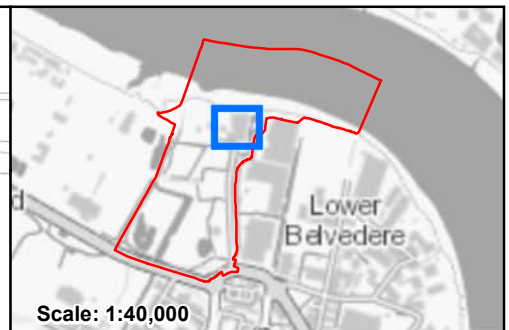
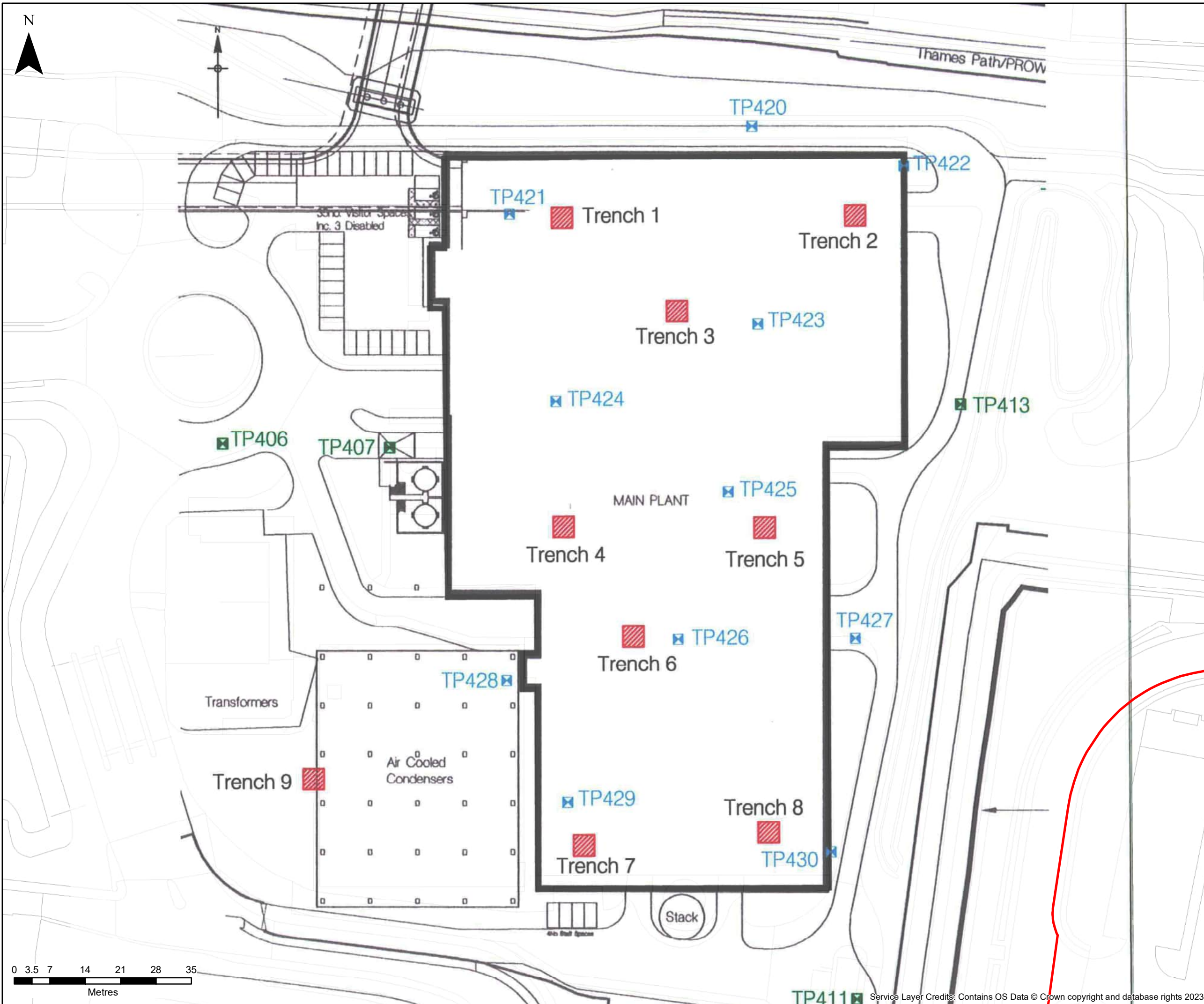
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DRAWING NUMBER: 1





Scale: 1:40,000

Legend

Site Boundary

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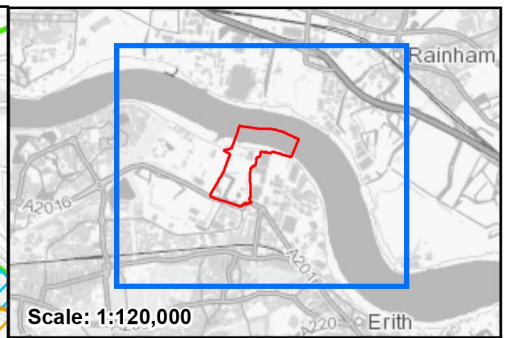
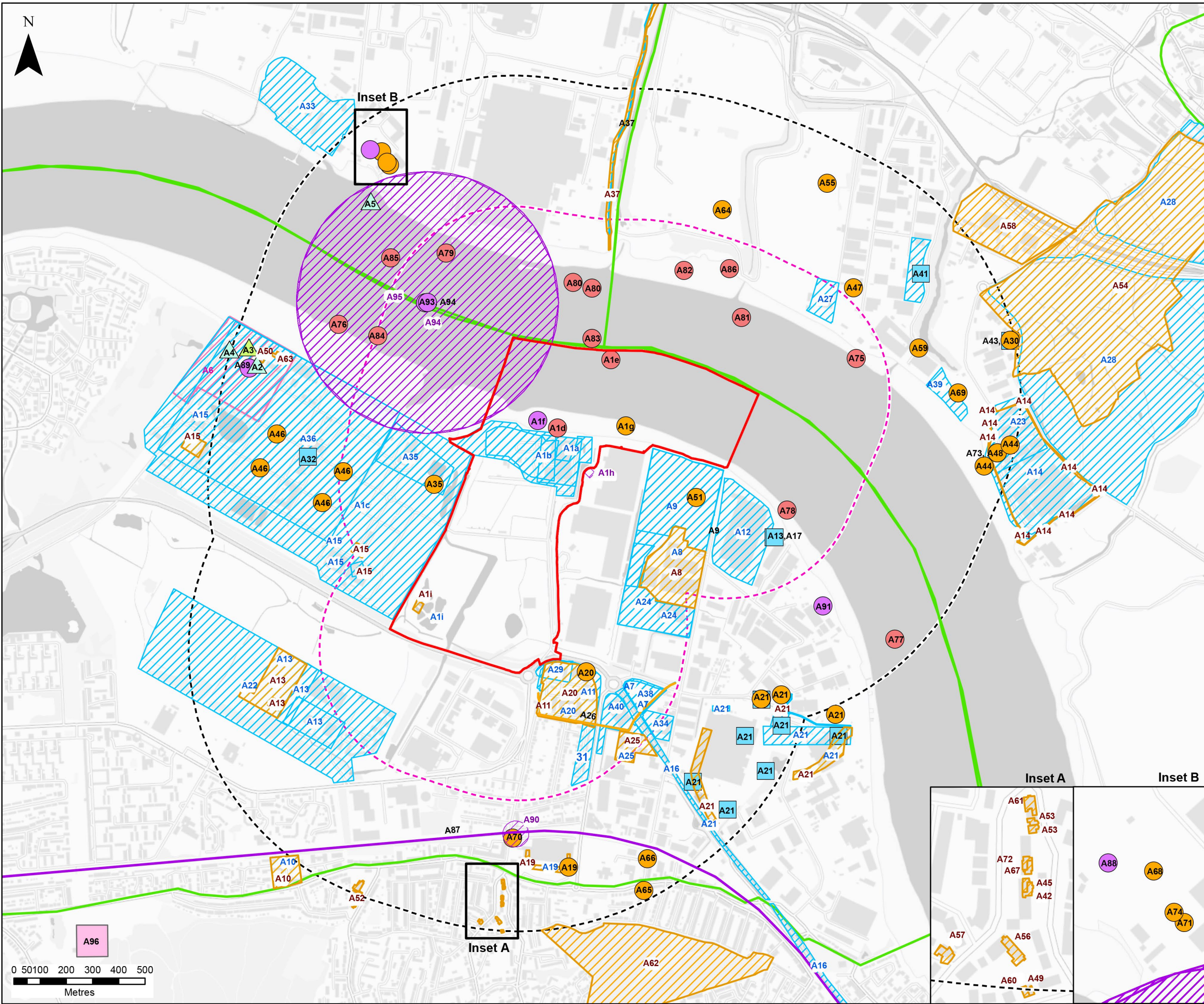
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FIGURE 2 - TRENCH PLAN FOR 2007 ARCHAEOLOGICAL TRIAL TRENCH EVALUATION IN THE NORTHERN PART OF THE SITE BOUNDARY (A1A: PRE-CONSTRUCT ARCHAEOLOGY, 2008, LAND AT NORMAN ROAD (NORTH), BELVEDERE, LONDON BOROUGH OF BEXLEY - AN ARCHAEOLOGICAL EVALUATION)

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1:700	3/1/2024	P01

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Scale: 1:120,000

Legend

- Site Boundary
- 500m Study Area
- 1km Study Area
- Scheduled Monument
- Grade I Listed Building
- Grade II Listed Building
- Conservation area
- Heritage at risk
- Archaeological feature/findspot (point)
- Archaeological feature/findspot (line)
- Archaeological feature/findspot (area)
- Previous archaeological investigation (point)
- Previous archaeological investigation (line)
- Previous archaeological investigation (area)
- Archaeological priority area
- United Kingdom Hydrographic Office site (point)
- National Record of Historic Environment site (point)
- National Record of Historic Environment site (line)
- National Record of Historic Environment site (area)

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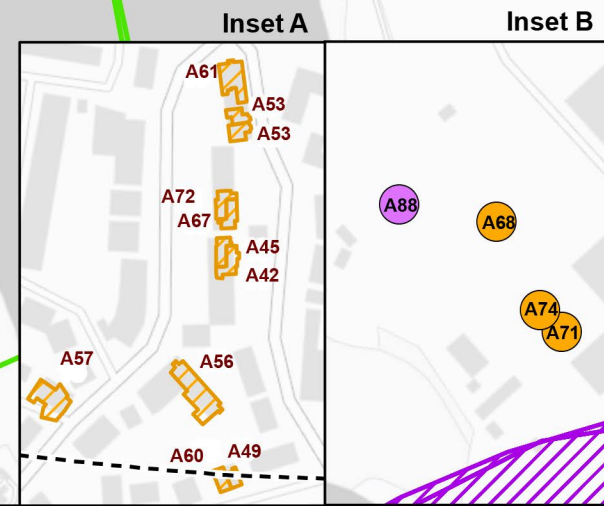
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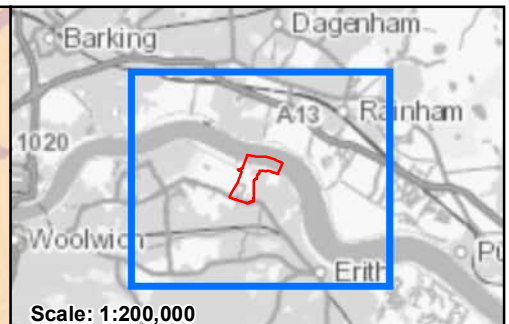
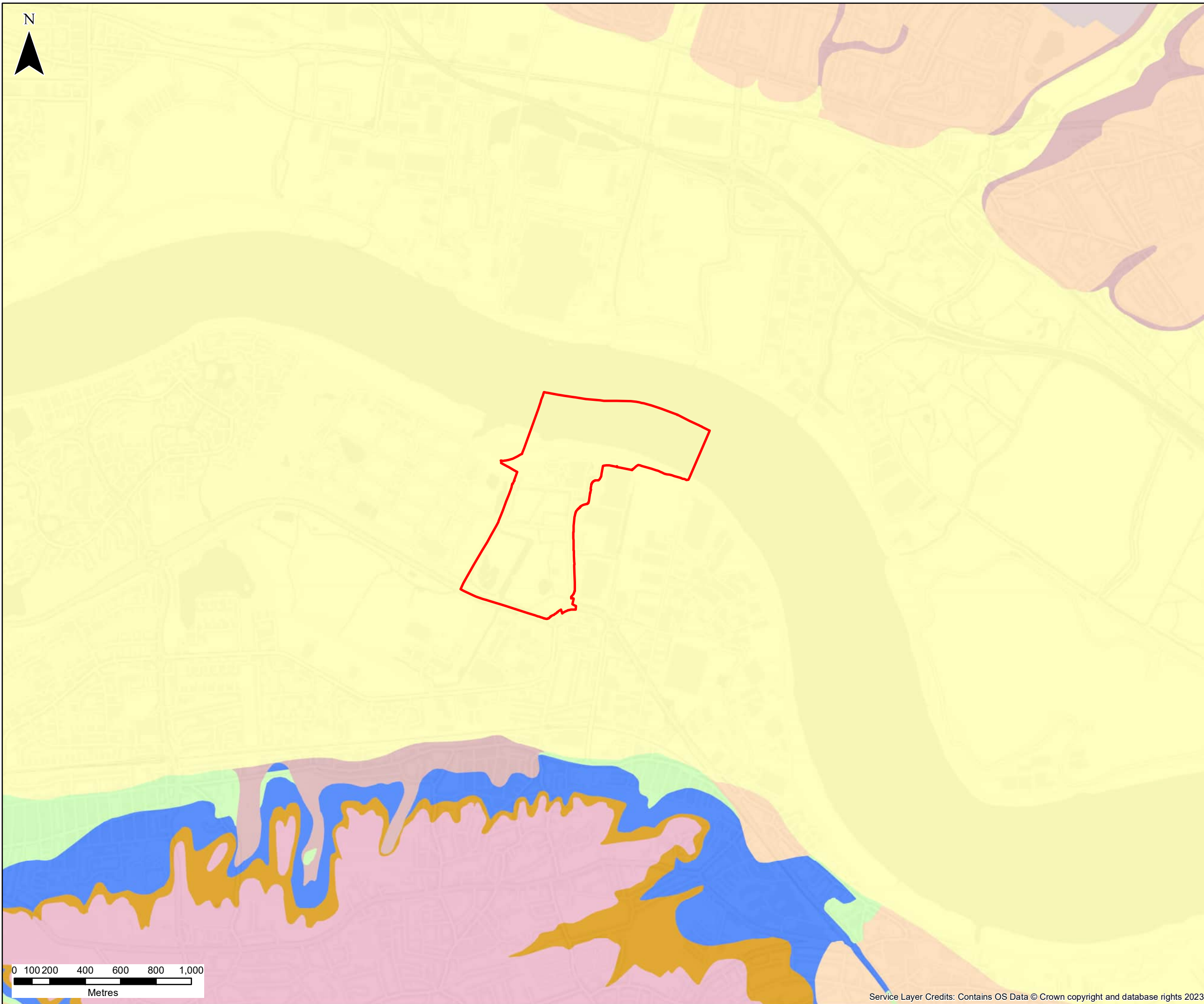
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FIGURE 3
HISTORIC ENVIRONMENT FEATURES MAP

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- Legend**
- Site Boundary
 - Superficial deposits**
 - Alluvium - Clay, silt, sand and peat
 - Taplow Gravel Member - Sand and gravel
 - Head - Clay, silt, sand and gravel
 - Bedrock Geology**
 - Thanet Formation - Sand
 - Lambeth Group - Sand, silt and clay
 - Harwich Formation - Sand and gravel

Note:
Bedrock geology key is not included, as superficial deposit is completely overlying the bedrock geology

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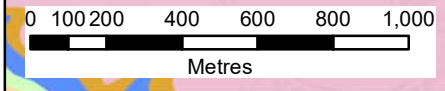
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FIGURE 4
GEOLOGY MAP
(BRITISH GEOLOGICAL SURVEY)

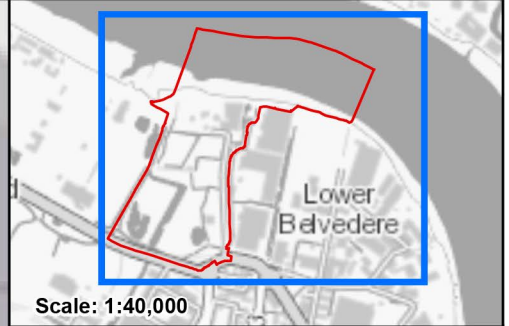
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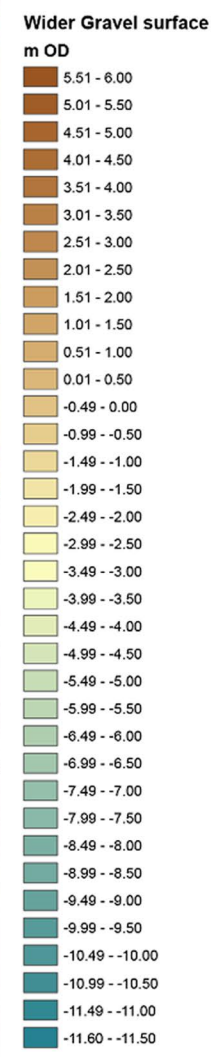
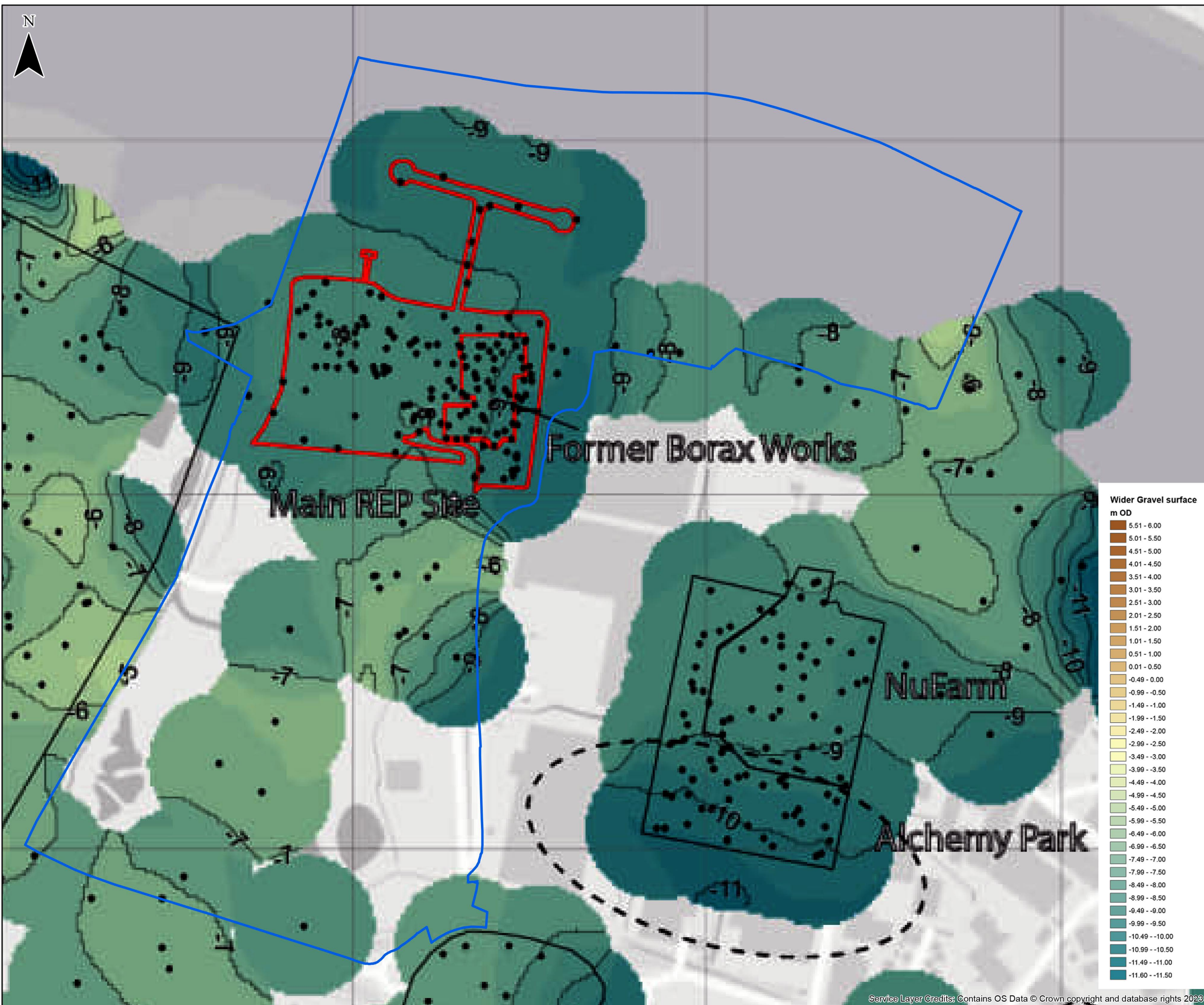




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Legend

- Site Boundary
- Site Boundary from Riverside Energy Park DCO application (separate scheme under construction)



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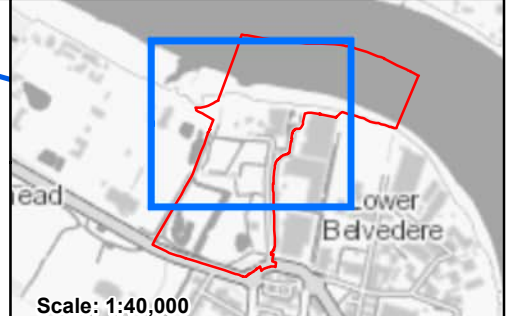
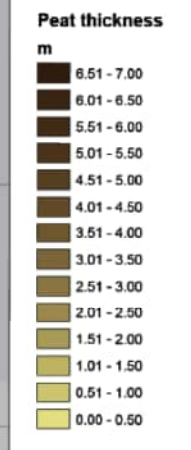
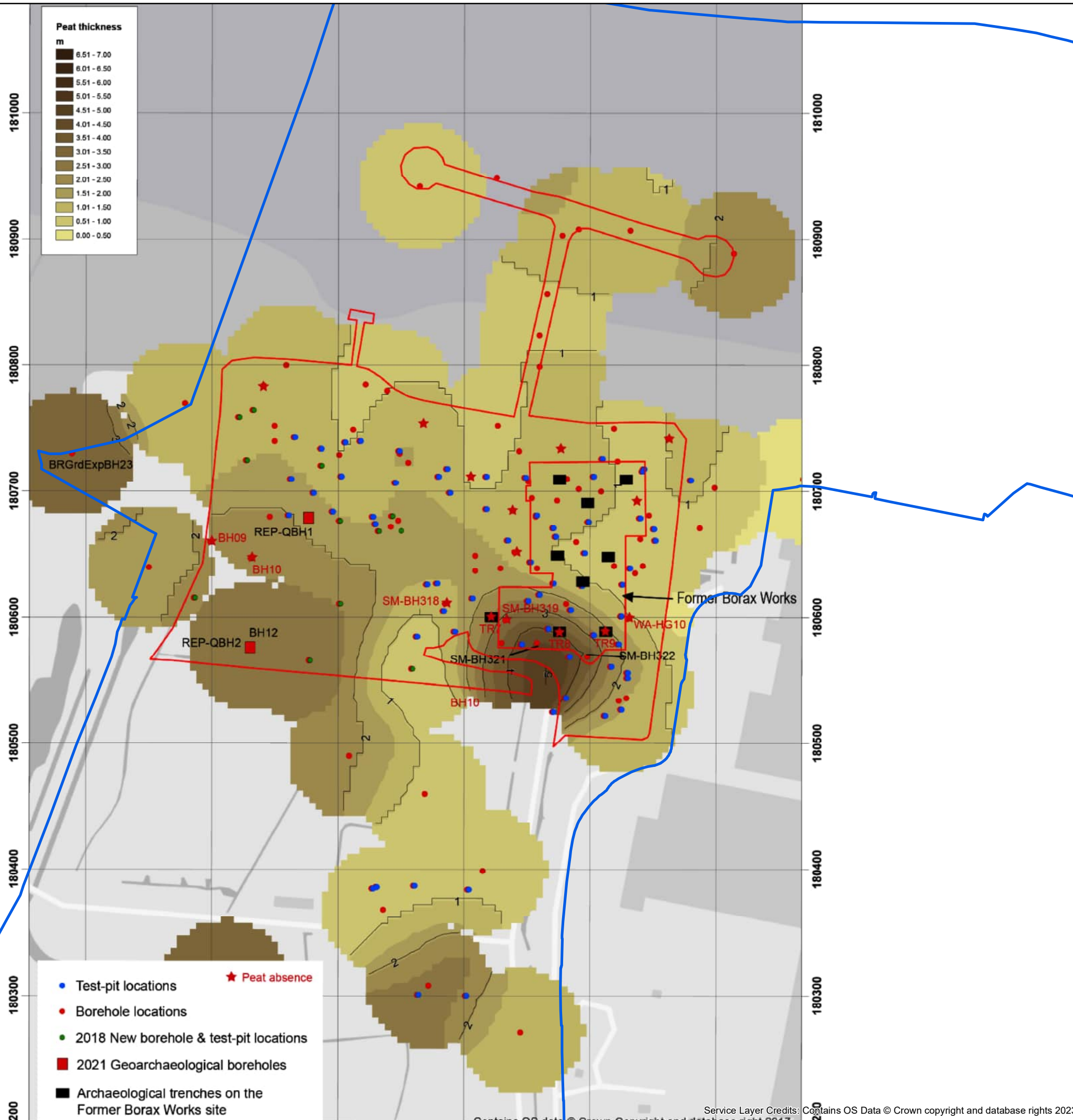
DRAWING TITLE:
FIGURE 5 - GEOARCHAEOLOGICAL DEPOSIT MODEL - TOP OF THE SHEPPERTON GRAVEL (M OD) (SOURCE: QUEST QUATERNARY SCIENTIFIC (QUEST), 2022, RIVERSIDE ENERGY PARK, LONDON BOROUGH OF BEXLEY - GEOARCHAEOLOGICAL & PALAEOENVIRONMENTAL ANALYSIS REPORT)

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DRAWING NUMBER: 5



Legend

- Site Boundary
- Site Boundary from Riverside Energy Park DCO application (separate scheme under construction)

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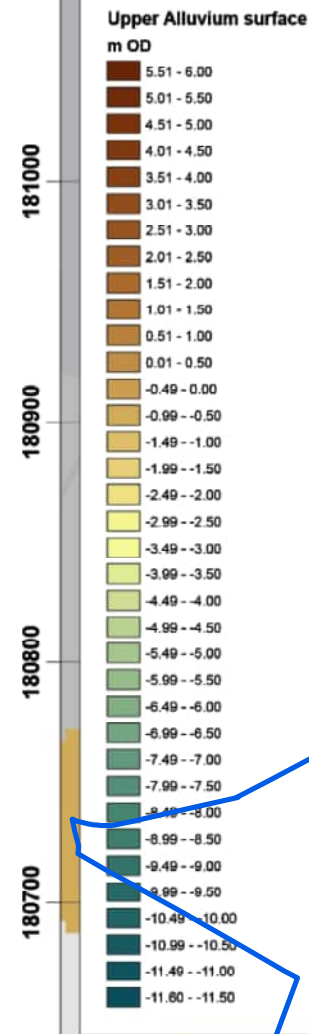
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FIGURE 6 - GEOARCHAEOLOGICAL DEPOSIT MODEL - THICKNESS OF PEAT (M) (SOURCE: QUEST QUATERNARY SCIENTIFIC (QUEST), 2022, RIVERSIDE ENERGY PARK, LONDON BOROUGH OF BEXLEY - GEOARCHAEOLOGICAL & PALAEOENVIRONMENTAL ANALYSIS REPORT)

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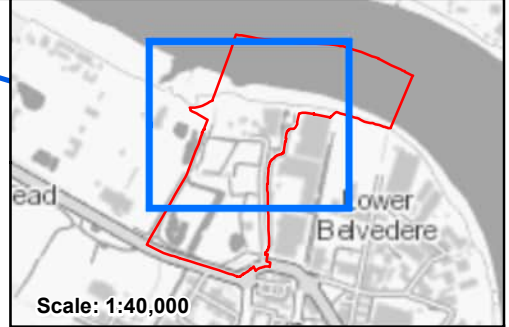
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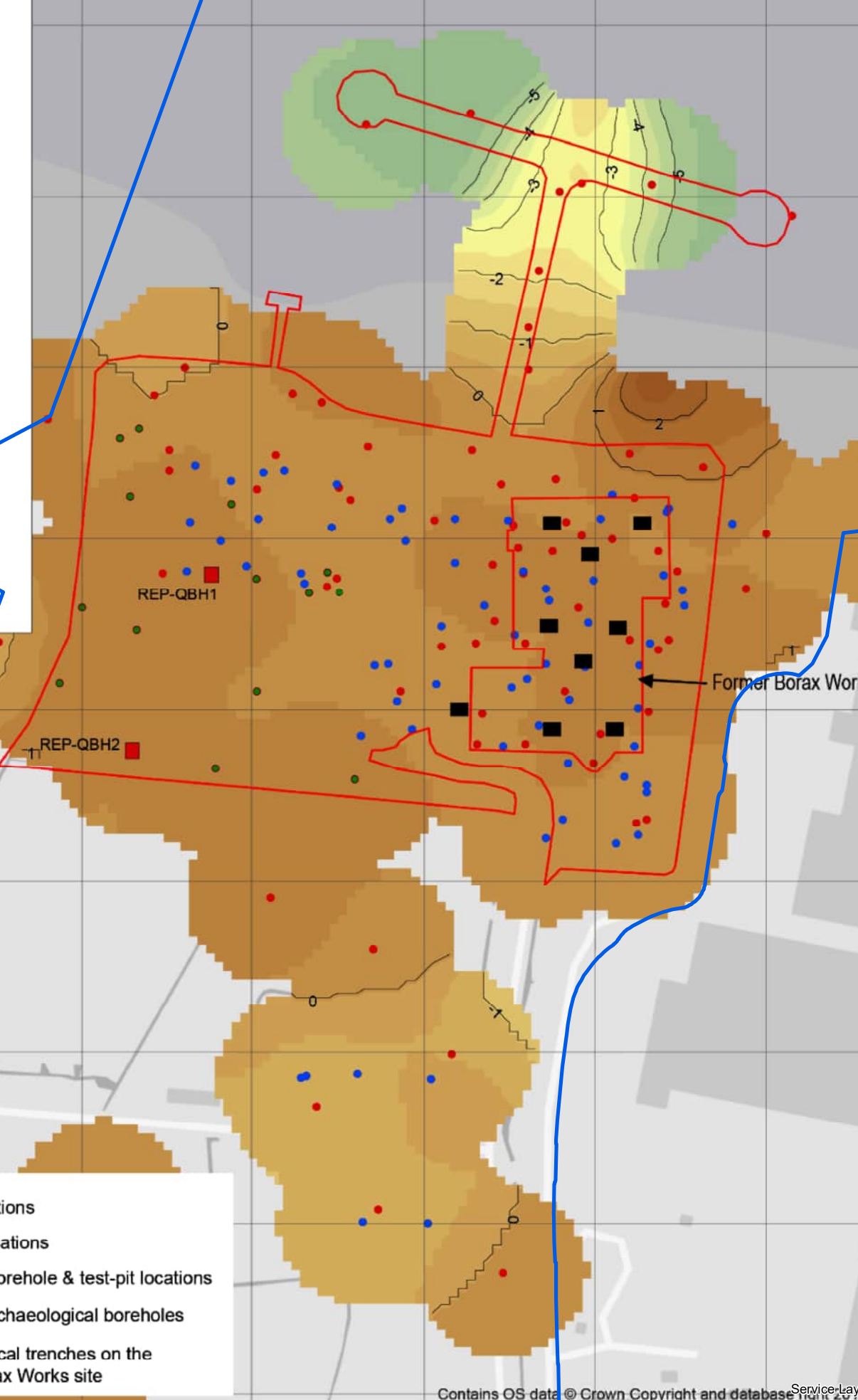
- Test-pit locations
- Borehole locations
- 2018 New borehole & test-pit locations
- 2021 Geoarchaeological boreholes
- Archaeological trenches on the Former Borax Works site



- Legend**
- Site Boundary
 - Site Boundary from Riverside Energy Park DCO application (separate scheme under construction)

181000
180900
180800
180700
180600
180500
180400
180300
180200

181000
180900
180800
180700
180600
180500
180400
180300
180200



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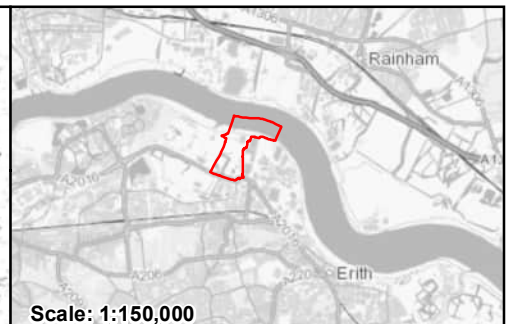
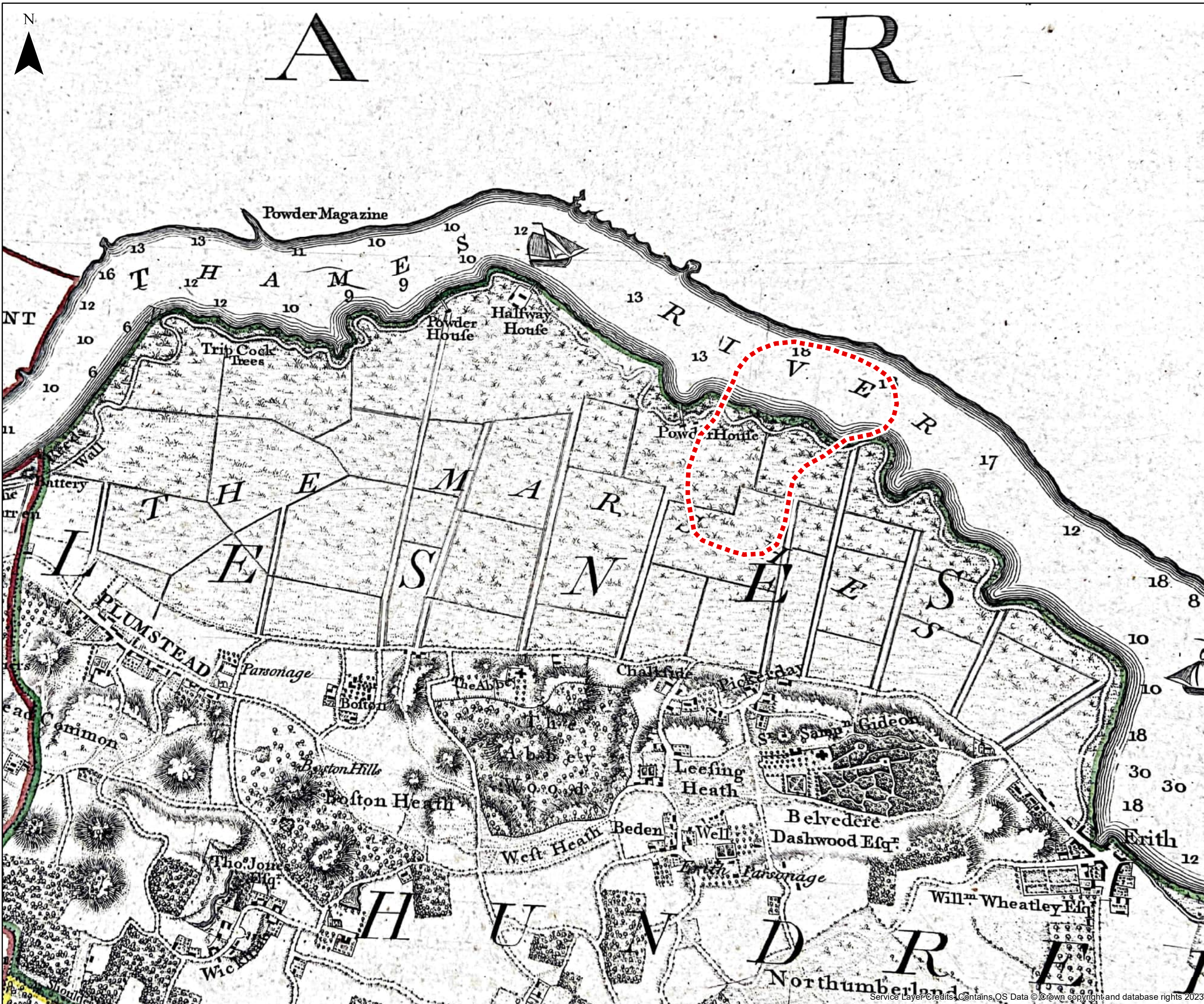
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FIGURE 7 - GEOARCHAEOLOGICAL DEPOSIT MODEL - TOP OF THE UPPER ALLUVIUM (M OD)
(SOURCE: QUEST QUATERNARY SCIENTIFIC (QUEST), 2022, RIVERSIDE ENERGY PARK, LONDON BOROUGH OF BEXLEY - GEOARCHAEOLOGICAL & PALAEOENVIRONMENTAL ANALYSIS REPORT)

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Legend

 Approximate site location

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FIGURE 8 – THE ANDREWS, DURY AND HERBERT MAP OF KENT, 1769 (© BEXLEY ARCHIVE REF. CSSLS/B/2/2)

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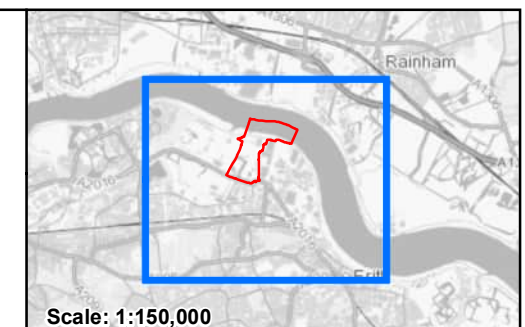
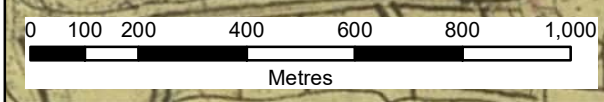


Marsh of *Holly House*
way
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ine




Edge of map excerpt

Harrow
Abbey
Wood
Belvedere
Chapel
Hollyhill
Tame



Scale: 1:150,000

Legend

 Site Boundary

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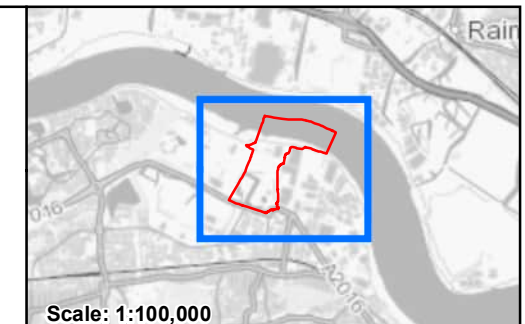
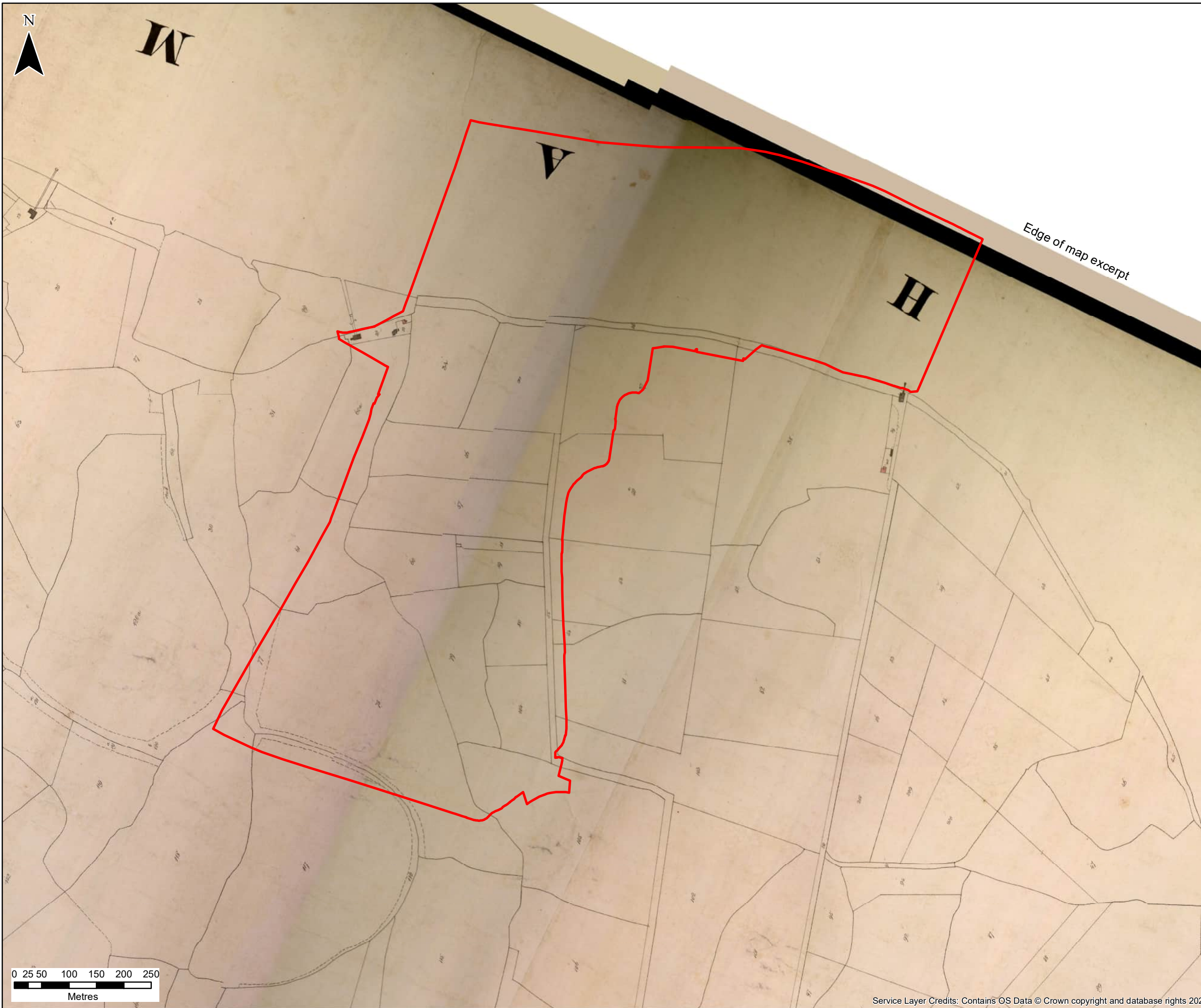
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FIGURE 9 – ORDNANCE SURVEY DRAWINGS – WOOLWICH, 1799 (© BRITISH LIBRARY, MAPS OSD 130)

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Scale: 1:100,000

Legend

Site Boundary

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FIGURE 10
ERITH TITHE MAP OF 1843 (BEXLEY
ARCHIVE REF. PA137/27/A/1)

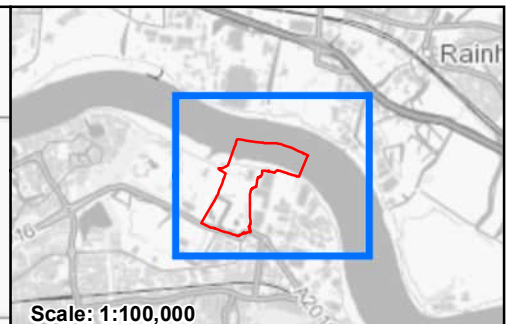
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Scale: 1:100,000

Legend

Site Boundary

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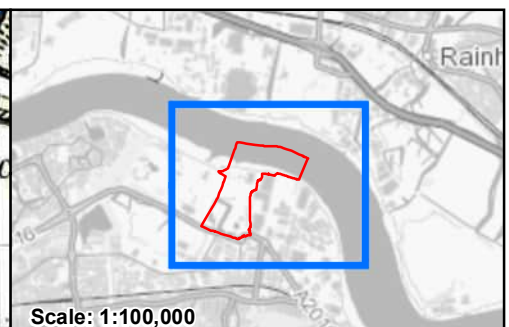
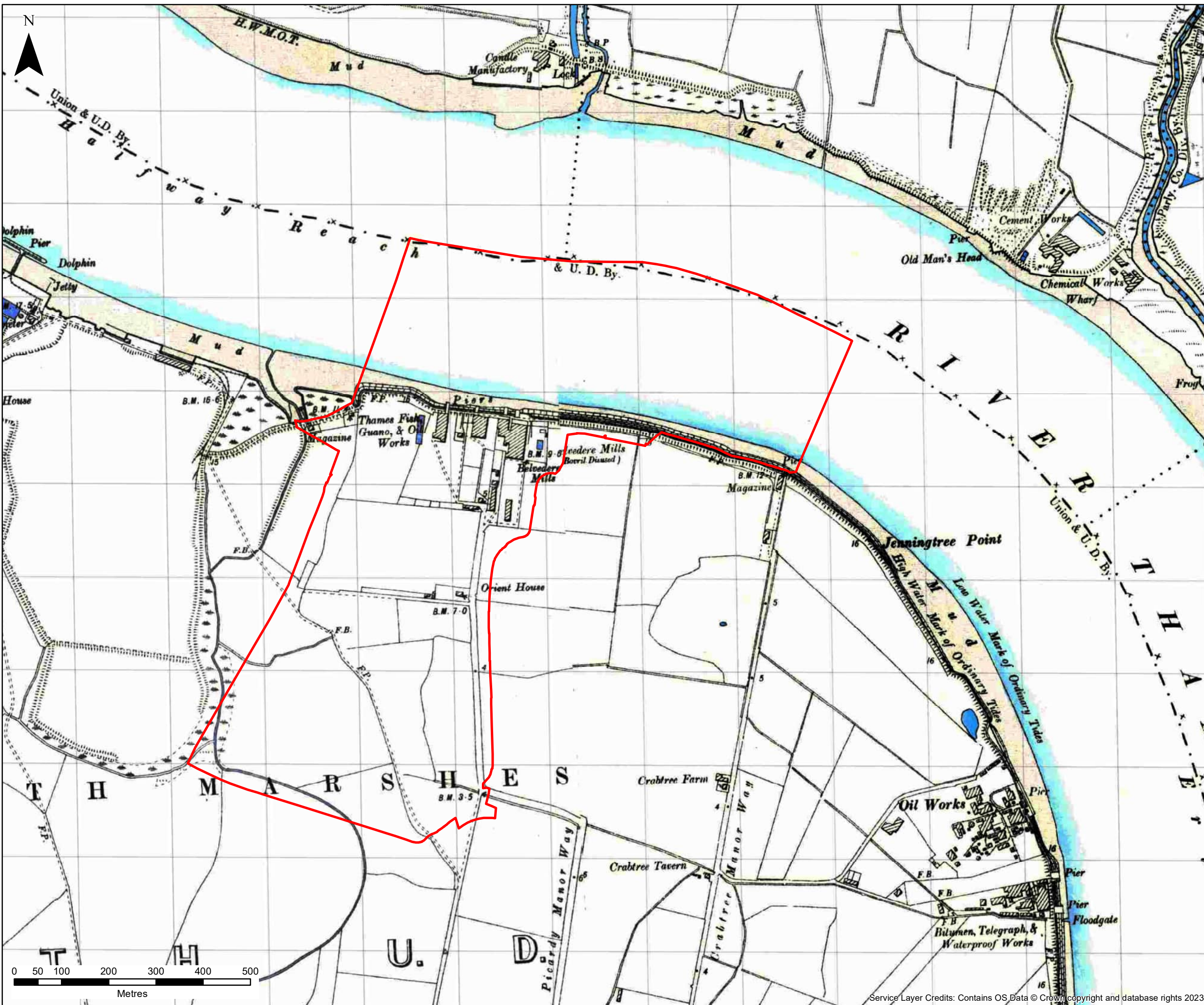
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FIGURE 11
ORDNANCE SURVEY 1ST EDITION 6"
MILE MAP OF 1866-69 (NOT TO SCALE)

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Legend
 Site Boundary

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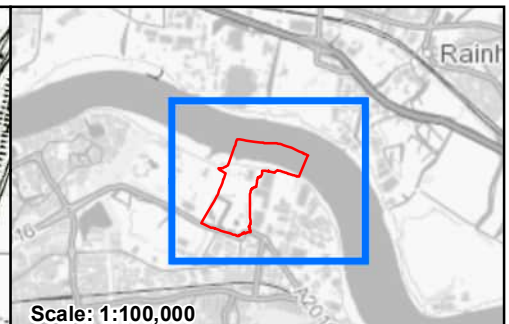
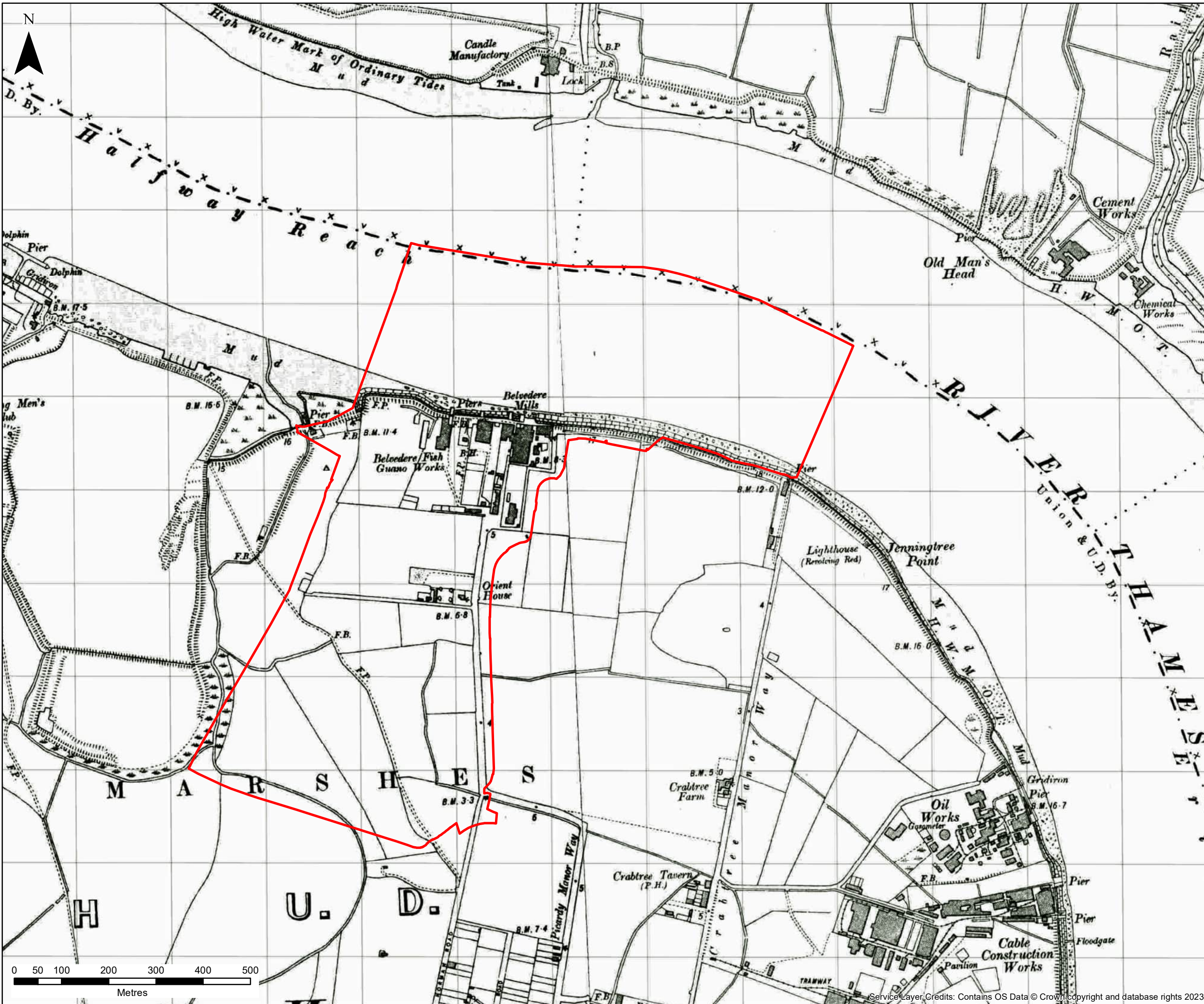
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 FIGURE 12
 ORDNANCE SURVEY 2ND EDITION 6":
 MILE MAP OF 1895 (NOT TO SCALE)

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Scale: 1:100,000

Legend

Site Boundary

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FIGURE 13
ORDNANCE SURVEY 3RD EDITION 6"
MILE MAP OF 1907 (NOT TO SCALE)

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SCALE @ A3 SIZE: 1:7,500		DATE: 3/4/2024	REVISION: P01

DRAWING NUMBER: 13



Figure 15



Figure 16



Figure 15
Northwest facing view showing the North Borax Laydown Area within the Site Boundary (WSP 2023)

Figure 16
Northwest facing view showing the South Borax Laydown Area within the Site Boundary (WSP 2023)



Figure 17



Figure 18



Figure 17

Southwest facing view showing a ditch on the southern boundary of the South Borax Laydown Area within the Site Boundary (WSP 2023)

Figure 18

West facing view from Norman Road showing ground remediation work taking place in the Creekside area within the Site Boundary (WSP 2023)



Figure 19



Figure 20



Figure 19

West facing view from Norman Road showing the Munster Joinery warehouse within the Site Boundary (WSP 2023)

Figure 20

West facing view from Norman Road showing the area of hardstanding to the south of Munster Joinery within the Site Boundary (WSP 2023)



Figure 21



Figure 22



Figure 21

Northeast facing view showing the large pond in the southern part of the Site Boundary and the Munster Joinery warehouse in the background (WSP 2023)

Figure 22

North facing view from the southern part of the Site Boundary showing the existing Riverside 1 facility and the Middleton Jetty (WSP 2023)



Figure 23



Figure 24



Figure 23

Southeast facing view showing construction work taking place at the northern end of the Site Boundary to the west of the Riverside 1 facility (WSP 2023)

Figure 24

Northeast facing view showing the Middleton Jetty (WSP 2023)



Figure 25



Figure 26



Figure 25

Northeast facing view showing the disused Belvedere Power Station Jetty (WSP 2023)

Figure 26

South facing view showing the Grade I listed main engine house and the Grade II listed workshop ranges at Crossness Pumping Station (WSP 2023)



Figure 27



Figure 28



Figure 27

Southeast facing view from Crossness Pumping Station towards the Site Boundary, showing the existing Riverside 1 facility (WSP 2023)

Figure 28

Northwest facing view from the southern part of the Site Boundary towards Crossness Pumping Station (WSP 2023)



Figure 29



Figure 30



Figure 29

North facing view from Crossness Pumping Station across the River Thames showing the Grade II listed Jetty Number 4 at Dagenham Dock (WSP 2023)

Figure 30

Northwest facing view from the northern end of the Site Boundary showing the Grade II listed Jetty Number 4 at Dagenham Dock (WSP 2023)



DECARBONISATION

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