Riverside Energy Park

Environmental Statement Technical Appendices

APPENDIX:

F.1

PLANNING INSPECTORATE REFERENCE NUMBER:

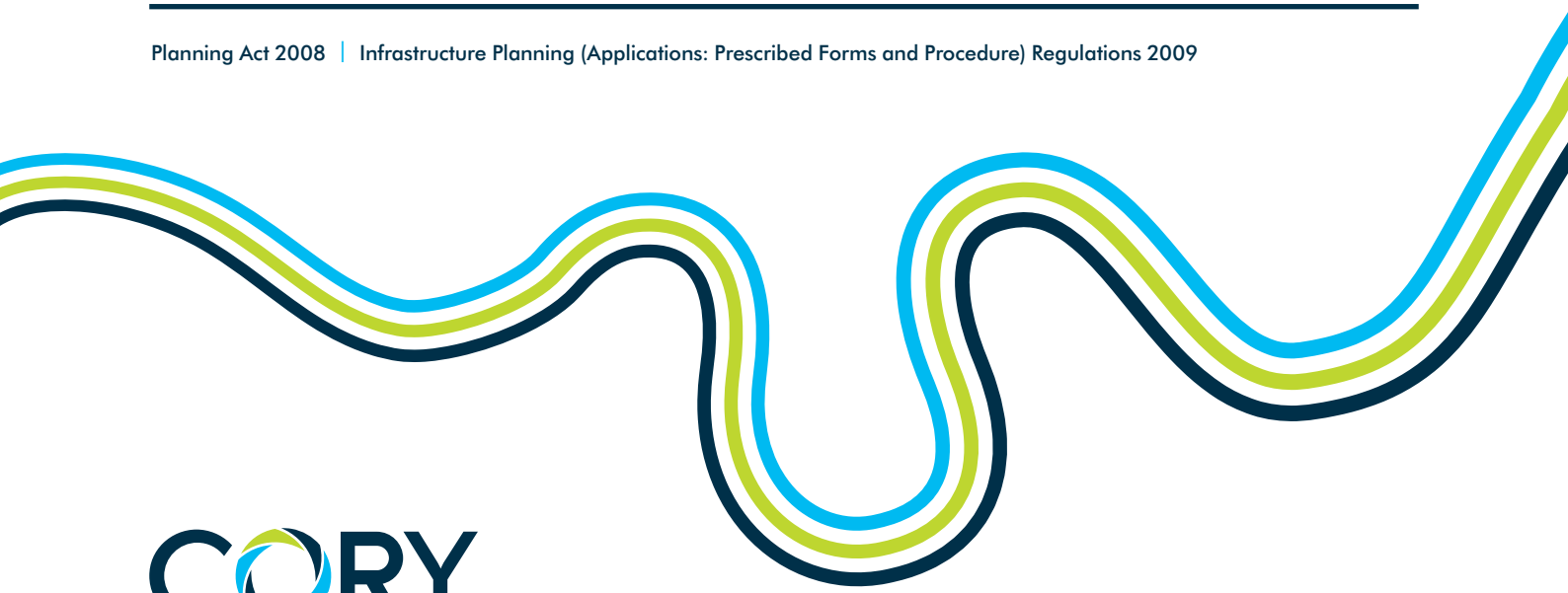
EN010093

DOCUMENT REFERENCE:

ARCHAEOLOGICAL DESK BASED ASSESSMENT

November 2018 | Revision 0 | APFP Regulation 5(2)(a)

Planning Act 2008 | Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009



CORY
RIVERSIDE ENERGY

Riverside Energy Park, London Borough of Bexley and associated Electrical Connection Route, Dartford, Kent
Heritage Desk Based Assessment
October 2018

Riverside Energy Park, London Borough of Bexley
Heritage Desk-Based Assessment
October 2018

Report
Heritage Desk-Based Assessment

Site
Riverside Energy Park, London Borough of Bexley

Client
Cory Environmental Holdings Ltd

Planning Authority
London Borough of Bexley

Site Centred At
549542, 180662

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Report Status
Final

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October 2018

Orion Ref
PN1545/12

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List of Plates

Timescales Used in This Report

Prehistoric

Palaeolithic	450,000 -12,000 BC
Mesolithic	12,000 - 4,000 BC
Neolithic	4,000 - 2,200 BC
Bronze Age	2,200 - 700 BC
Iron Age	700 - AD 43

Historic

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

Executive Summary

This heritage desk-based assessment considers Riverside Energy Park (REP), London Borough of Bexley and the Electrical Connection to Littlebrook substation, Dartford, Kent. (Figure 1). The assessment has been prepared to inform the Environmental Statement (ES) to be submitted in support of REP.

It forms an update to the previous desk-based assessment (Orion Heritage April 2018) produced to inform the Preliminary Environmental Information Report (PIER). The updated assessment considers minor alterations and refinements to the Application Boundary with regards to the Electrical Connection route options, the results of the updated deposit modelling (QUEST 2018b) and additional detail regarding the Proposed Development.

The assessment considers the archaeological and heritage constraints of the Application Site which comprises the following three areas:

- The REP site, approximately 7 hectares (ha) of land located approximately at (NGR) TQ 49467 80680, accessed off Norman Road, Belvedere, London Borough of Bexley DA17 6JY. This site is located immediately to the west of the existing Riverside Resource Recovery Facility (RRRF) constructed in 2011 by Cory.
- The line and terminus of the Electrical Connection, predominantly upon the existing road network through the areas of Erith, Crayford and Dartford to the existing connection point at the Littlebrook substation.
- Main Temporary Construction Compound, proposed on land to the immediate west of Norman Road.

The Proposed Development involves the construction of an integrated electrical generating station that will supply low carbon/renewable electricity. The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the 'Proposed Development'). As the generating capacity of REP will be in excess of 50 MWe capacity it is classified as a Nationally Significant Infrastructure Project (NSIP) under section 14 and 15 of the PA 2008 and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.

The Proposed Development will not require any marine works (as indicated in the initial EIA Scoping Report). The existing jetty and barges will be used and as a result no dredging works are proposed, nor will there be a need to install temporary structures within the marine environment. As such no effects to archaeology within the marine environment were assessed.

The assessment has been prepared on the basis of the information on REP and its construction as provided in Chapter 3 of the ES and the provisions of the DCO.

Non-designated heritage assets

The QUEST deposit model concluded that the archaeological potential of the REP site is considered **Low** on the basis of the likely depth of the sediments and findings from nearby archaeological investigations (QUEST 2018b). This assessment has similarly concluded **Low** potential for in situ occupation of prehistoric, Roman, early medieval, medieval and post-medieval periods. Therefore groundworks associated with the Proposed Development are not considered likely to disturb *in situ* archaeological remains.

The geoarchaeological deposit model identified two sequences of interest from the south-west of the Application Site: from the locations of BH04 (where a complex arrangement of mineral-rich and organic-rich/peat deposits was observed in the Lower Alluvium) and

between BH12 (where the peat was recorded at 3 m thick) and BH09/BH10 (where peat was entirely absent). The significance of these deposits is considered Local.

The deposit model (QUEST 2018b) indicates that the peat horizon is located 3 m below ground level, overlain by sterile Upper Alluvium and Made Ground deposits (QUEST 2018b, Figure 12, 13 and 14). As such physical impacts to the geoarchaeological deposits of interest is restricted to the excavation of the bunker, attenuation tank(s) and the -29 m AOD pile foundations within the Main REP Building. The bunker is located within the area which has been highlighted by QUEST of particular geo-archaeological interest. The Significance of these deposits is considered Local. The loss of these geoarchaeological deposits of interest is considered a medium adverse magnitude of impact due to the loss of research potential / significance. The significance of this effect is considered to be **Minor**.

It is recommended that two boreholes are excavated and retained for palaeoenvironmental assessment / analysis from the locations of BH04 and between BH12 and BH09/BH10 (QUEST 2018b, Figure 3). It is recommended that this is secured through the production of a written Written Scheme of Investigation (WSI), which itself will be secured by a requirement in the DCO.

The four Electrical Connection Options have been assessed. No significant effects to archaeology or heritage are anticipated. Localised areas of further archaeological work may be warranted depending on the final design. It is recommended that this is secured through the production of a written scheme of investigation (WSI) once the DCO has been made and the location and design of the cable route fixed. The production of the WSI will be secured by a requirement in the DCO.

No locally listed or non-designated built heritage assets are recorded within the Application Site.

Designated heritage assets

No statutory designations (Listed Buildings, Conservation Areas, Scheduled Ancient Monuments or World Heritage Sites) are located within the Application Site.

In light of the proposed Electrical Connection route being below ground and utilising the existing Littlebrook substation, there are no anticipated effects to the setting of designated and non-designated built heritage assets, through effects to their settings.

The assessment has identified the setting of the following designated and built heritage assets as being potentially sensitive to change within the REP site:

- The Crossness Conservation Area is located c.650 m west of the Application Site;
- Grade I listed Crossness Pumping Station (NHLE 1064241) c.800 m to the west of the Application Site;
- Two grade II listed workshops at Crossness Pumping Station (NHLE 1064216, 1250557), c. 760 m – 865 m to the west of the Application Site;
- A locally listed engine house at Crossness Sewage Treatment Work (GLHER MLO103261);
- The grade II listed jetty at Dagenham Dock (NHLE 1391706) 600 m to the north-west of the Application Site, on the northern bank of the Thames; and
- Scheduled and grade II listed Lesnes Abbey (NHLE 1002025, 1359415), c. 1.5 km south-west of the Application Site.

The Application Site forms part of the wider setting of these built heritage assets. However, the Application Site is considered to make a **Negligible** to **Minor** contribution to the significance of these monuments. The construction of REP, and the c.113 m Above Ordnance Datum (AOD) (maximum parameter) tall chimney stack, would result in a change in skyline behind the conservation area and listed / locally listed assets. Taking into consideration the

fact that Crossness Power Station had, until the 1950's, a chimney stack of 207 ft (63 m) and the highly industrialised character of the existing landscape, which includes similar stacks in the immediate vicinity and wind turbines to the north of the River Thames, the insertion of an additional chimney stack is considered to form a slight change in the wider skyline of these assets. In terms of the loss of significance of these monuments this is considered very **Slight / Low**.

1.0 Introduction

1.1 This heritage desk-based assessment considers Riverside Energy Park (REP), London Borough of Bexley and Electrical Connection to Littlebrook substation, Dartford, Kent. (Figure 1). The assessment has been instructed to inform an Environmental Statement (ES).

1.2 The assessment has been prepared on the basis of the information on REP and its construction as provided in Chapter 3 of the ES and the provisions of the DCO.

1.3 This assessment forms an update to the previous desk-based assessment (Orion Heritage April 2018) produced to inform a Preliminary Environmental Information Report (PEIR). The updated assessment considers alterations to the Application Boundary in regards to the Electrical Connection route options, the results of the updated deposit modelling (QUEST 2018b) and additional detail regarding the development proposal.

1.4 The previous desk-based assessment (Orion Heritage April 2018), draft deposit model (QUEST 2018a) and Written Scheme of Investigation for the Geoarchaeological Works (QUEST 2018c; Appendix D) were been submitted as part of the PEIR to the Archaeological Advisor and Conservation Officer to London Borough of Bexley and the Archaeological Advisor to Dartford Borough Council. Comments on the PEIR DBA are reported in the ES chapter and have been taken into account in producing this DBA, principally relating to the additional detail relating the ground disturbance resulting from the proposed development.

1.5 The Proposed Development involves the construction of an integrated electrical generating station that will supply low carbon/renewable electricity. The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the 'Proposed Development'). As the generating capacity of REP will be in excess of 50 MWe capacity it is classified as a Nationally Significant Infrastructure Project (NSIP) under section 14 and 15 of the PA 2008 and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.

1.6 The assessment considers the archaeological and heritage constraints of the Application Site which comprises the following three areas:

- The proposed REP site, approximately 7 hectares (ha) of land located approximately at (NGR) TQ 49467 80680, accessed off Norman Road, Belvedere, DA17 6JY. This site is located immediately to the west of the existing Riverside Resource Recovery Facility (RRRF) constructed in 2011 by Cory.
- The line of the four Electrical Connection route options, along the existing road network through the areas of Erith, Crayford and Dartford to the existing connection point at the Littlebrook substation.
- The Main Temporary Construction Compound, proposed on land to the immediate west of Norman Road.

1.7 In accordance with the Standard and Guidance for Historic Environment Desk Based Assessments (Chartered Institute for Archaeologists 2017), the assessment draws together available information on designated and non-designated heritage assets, topographic and land-use information so as to establish the potential for non-designated archaeological heritage assets within the Application Site and the potential effect on the significance of nearby designated heritage assets. The assessment includes the results of an examination of published and unpublished records and charts historic land-use through a map regression exercise.

1.8 As a result, the assessment enables relevant parties to assess the significance of heritage/archaeological assets on and close to the Application Site and considers the potential for hitherto undiscovered archaeological assets, thus enabling potential impacts on assets to be identified along with the need for design, civil engineering or archaeological solutions.

1.9 The study area used in this assessment is 1 km from the centre of the REP site and Littlebrook substation and along the Electrical Connection route (Figures 2 & 3).

Location, Topography and Geology

REP site

1.10 The REP site is irregular in shape and is predominately used by Cory as an ancillary area for the existing RRRF. The REP site includes the existing jetty in the River Thames which is currently used for delivery of waste and despatch of some by-products at the existing RRRF. The jetty will be used for the same purpose for the operation of REP.

1.11 Existing land uses of the REP site includes: ash storage containers; boundary fencing and associated lighting; circulation roads, compounds for the maintenance of operational plant machinery; car parking; and an on-site non-designated Wasteland Habitat Area (WHA).

1.12 A topographic survey of the REP site has been completed (Maltby Surveys Ltd 2018, 18/101/100/1-500) and indicates that the site is generally flat, located at approximately 1.5 m AOD with earthworks adjacent to the River Thames rising to c. 6 m AOD.

1.13 The underlying geology (BGS GeoIndex) of the REP site comprises London Clay Formation (clay, silt and sand) with Lambeth Group (clay, silt and sand) underlying the southern part of Norman Road. The superficial geology of the entire study area comprises alluvium (clay, silt and sand) associated with the River Thames floodplain.

1.14 A program of geoarchaeological fieldwork and updated deposit modelling was carried out by Quaternary Scientific (University of Reading) (QUEST 2018b). The updated deposit model for the REP site was based on the 16 new geotechnical borehole/records put down by Terra-Consult (2018) and a review of around 130 historical geoarchaeological, geotechnical and archaeological borehole / test-pit records, those put down across the REP site itself, and those taken from its immediate surroundings (QUEST 2018b; Figure 2). In addition, over 750 records were collated to examine key deposits across the wider area. The results of the deposit modelling are displayed in QUEST 2018b Figures 4 to 14; Figures 4 to 11 are updated surface elevation and thickness models for each of the main stratigraphic units. QUEST 2018b, Figures 12 to 14 are updated 2-dimensional transects across the REP site from south-west and west-east. The results of the deposit modelling indicate that the number and spread of the logs is sufficient to permit modelling with a high level of confidence across the entire REP site.

1.15 The full sequence of sediments recorded in the boreholes comprises:

- Made Ground: Between 1 and 4 m of Made Ground caps the Holocene alluvial sequence,
- Upper Alluvium – widely present: The uppermost unit in the Holocene alluvial sequence is the Upper Alluvium, the deposits of which comprise largely sterile clays and silty clays. These deposits are recorded in every record across the site and more widely across the modelled area (Appendix C, Figures 9 & 12-14). The Upper Alluvium generally ranges between 1 and 5 m in thickness, but occasionally reaches greater thicknesses where the Lower Alluvium and or Peat is absent. The deposition of the Upper Alluvium had the effect of infilling

the remaining inequalities in the relief of the floodplain, so that the surface of the Upper Alluvium (QUEST 2018b Figure 9) is remarkably level on land between +0 m and +2 m OD.

- Peat – widely present: Overlying the Lower Alluvium across the majority of records from the site is a bed of peat generally ranging in thickness between 1 and 2 m (QUEST 2018b, Figures 7 and 12-14). However, a greater thickness of 3 m was recorded in new geotechnical borehole BH12 within the south-western corner of the site. The greatest thickness of Peat is recorded in the south-eastern corner of the site, where an isolated record indicates 5m of Peat is preserved (QUEST 2018b, SM-BH322; Figure 13). The surface of the peat (QUEST 2018b, Figure 8) is fairly level between -1.0 m and -2.0 m OD.
- Lower Alluvium – widely present, frequently peaty: The Lower Alluvium rests directly on the Shepperton Gravel and is recorded in the majority of records across the site; it is however absent in various sequences (e.g. SM-BH19, TQ48SE306, SM-BH105, SM-BH104; QUEST 2018b, Figures 12-14). The surface of the Lower Alluvium (where recorded) generally rests between -3 m and -4 m OD (QUEST 2018b Figure 6), though individual records indicate heights ranging between -2 m and -8 m OD (QUEST 2018b, Figures 12-14). The thickness of the Lower Alluvium ranges from 1 m to 8 m; thicker occurrences are often present where the surface of the Shepperton Gravel lies at a lower level.
- Gravel (Shepperton Gravel): The modelling exercise indicates that the surface of the Shepperton Gravel is relatively even, ranging between -7.5 m and -9.5 m OD across the site, with a gradual decrease in height towards the north, east and south-west (QUEST 2018b, Figures 4 & 12-14). Beyond the southern margin of the site, this surface appears to rise gently to between -7 m and -6 m OD.

The Electrical Connection Options

1.16 There are four Electrical Connection Options to connect REP to the Littlebrook substation, Dartford, Kent, predominantly utilising the existing road network (Figure 1):

- Electrical Connection Option 1, connects to Eastern Way from the south-west corner of the REP site along an existing path along the western limit of Crossness Nature Reserve, then follows Bronze Age Way, Queens Road, Northend Road, Thames Road, University Way, Rob Dunn Way, Halcrow Avenue and Rennie Drive. Option 1 includes the following refinements to the Application Boundary since the publication of the PEIR:
    - (3) Area included to the front of Erith station and along an existing pedestrian route to allow an option to install cables avoiding a potential engineering constraint in the adjacent dual carriageway;
    - (4) Existing footway and bridge crossing immediately west of the A206 and east of the Erith Leisure Centre included to allow alternative means of crossing the existing railway, should this be preferable to using one of the existing road bridges. Cables would be trenched either side of the bridge and attached to the existing footbridge structure for support;
    - (5) Area included to the south of the existing A206 highway, between its junction with Crayford Way, and its junction with the A2026 to allow for alternative civil engineering techniques/solutions, for example localised horizontal directional drilling (HDD) under the River Cray, other watercourses and the existing railway line. The area also allows for trenched installation in those areas outside the current metalled highway;
    - (6) The areas north and south of the existing bridge crossing of the River Darent allow optional implementation of alternative civil engineering techniques/solutions (for example localised HDD) under the river in the event that a highway based crossing is not practicable. The area also allows for access and installation in the

event that cables are attached to the existing bridge. Further east the additional areas allow for trenching outside the highway, crossing of other watercourses and the exploration of using the existing opening that protects the existing strategic sewer under the A206 as a crossing point. Note that the area included to the southwest of the existing highway crossing of the River Darent would not be used as a location for trenchless installation techniques due to the presence of an existing inert landfill. This area would be used for access/laydown only if required to facilitate the installation of cables being installed across the existing highway structure.

- Electrical Connection Option 1A, connects to Eastern Way from the south-east corner of the REP site along Norman Road to Bronze Age Way. Includes the following changes to the Application Boundary:
  - (1) An area of verge extending towards the natural fenced boundary as demarked by green railings adjacent to Norman Road (north) to allow an option for trenched cable installation here rather than within the public highway;
  - (2) Areas either side of the existing Norman Road bridge to facilitate either the installation of a cable bridge/trough spanning the existing watercourse between banks, or to allow alternative civil engineering techniques / solutions (for example localised HDD) which could commence either within the additional areas, or within the existing boundary.
- Electrical Connection Option 2A, connects to Eastern Way via Option 1 or Option 1A then follows Anderson Way, Mulberry Way, Church Manorway, Lower Way, West Street, Erith High Street, Manor Road, Slade Green Road, Hazel Road, Moat Lane, Howbury Lane to connect with the A206 at which point it will follow connection route 1 and/or 2B.
- Electrical Connection Option 2B, utilises Option 1, 1A or 2A to the A206 roundabout with Joyce Green Lane and Central Road. Option 2B follows Joyce Green Way, along an existing pathway east and along an unnamed access road to Rennie Drive.

1.17 Two sub-stations, at the REP site and in Littlebrook are proposed to be utilised, connected by a trefoil of cables (3 cables laid together) carrying 3 circuits. The 'REP Electrical Interface point' is currently assumed to occur within the onsite substation on the high voltage side. The Littlebrook substation is located between Rennie Drive and Albion Road.

1.18 The majority of the Electrical Connection route is located on historic low lying reclaimed marshland, with the modern ground surface located at c. 5 m OD.

1.19 The underlying bedrock of the majority of the Electrical Connection route and terminus at Littlebrook substation is Lewes Nodular Chalk Formation (chalk), with Norman Road and the REP site located on Lambeth Group (sand, silt and clay). Two sections, at Erith and the north-west section of Bronze Age Way are located on Thanet Formation (sand). The superficial geology of the majority of the route is alluvium associated with the River Thames and River Darent floodplain, with areas of Taplow Gravel Member (sand and gravel) and Crayford Silt Member (clay and silt) around North End.

Main Temporary Construction Compound

1.20 Temporary laydown areas are proposed on land to the immediate west of Norman Road, which links the REP site with the A2016. These temporary areas are brownfield sites situated adjacent to existing industrial/commercial use buildings and are within 0.5 km of the REP site.

1.21 The Temporary areas are flat and located at c. 1 m AOD.

1.22 The Temporary areas are underlain by solid geology comprising Lambeth Group (clay, silt and sand) overlain by alluvium (clay, silt, sand and peat) associated with the River Thames floodplain.

2.0 Planning Background and Development Plan Framework

Overarching National Policy Statement for Energy (EN-1)

Historic environment

2.1 The construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment.

2.2 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. Those elements of the historic environment that hold value to this and future generations because of their historic, archaeological, architectural or artistic interest are called "heritage assets". A heritage asset may be any building, monument, site, place, area or landscape, or any combination of these. The sum of the heritage interests that a heritage asset holds is referred to as its significance.

2.3 Some heritage assets have a level of significance that justifies official designation. Categories of designated heritage assets are: a World Heritage Site; Scheduled Monument; Protected Wreck Site; Protected Military Remains, Listed Building; Registered Park and Garden; Registered Battlefield; and Conservation Areas.

2.4 There are heritage assets with archaeological interest that are not currently designated as scheduled monuments, but which are demonstrably of equivalent significance. These include:

- those that have yet to be formally assessed for designation;
- those that have been assessed as being designatable but which the Secretary of State has decided not to designate; and
- those that are incapable of being designated by virtue of being outside scope of the Ancient Monuments and Archaeological Areas Act 1979.

2.5 The absence of designation for such heritage assets does not indicate lower significance. If the evidence before the Secretary of State indicates to it that a non-designated heritage asset of the type described above may be affected by the Proposed Development then the heritage asset should be considered subject to the same policy considerations as those that apply to designated heritage assets

2.6 The Secretary of State should also consider the impacts on other non-designated heritage assets, as identified either through the development plan making process (local listing) or through the Secretary of State's decision making process on the basis of clear evidence that the assets have a heritage significance that merits consideration in its decisions, even though those assets are of lesser value than designated heritage assets.

2.7 Impacts on heritage assets specific to types of infrastructure are included in the technology-specific NPSs. The specific NPSs are EN-3 and EN-5. These NPSs are part of a suite of energy infrastructure NPSs and should be read in conjunction with EN-1.

National Planning Policy Framework (NPPF) & Planning Practice Guidance (PPG)

2.8 Government policy in relation to the historic environment is outlined in Section 16 of the National Planning Policy Framework (NPPF) (July 2018), entitled Conserving and Enhancing the Historic Environment. This provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development;
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
- Conservation of England's heritage assets in a manner appropriate to their significance; and
- Recognition of the contribution that heritage assets make to our knowledge and understanding of the past.

2.9 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term.

2.10 Paragraph 189 and 190 states that planning decisions should be based on the significance of the heritage asset and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to understand the potential impact of the proposal upon the significance of that asset.

2.11 The Proposed Development has no effect on any designated archaeological heritage assets or any assets that are demonstrably equivalent significance to designated assets, and consequently, the paragraphs of section 16 dealing with designated heritage assets do not apply in this case.

2.12 As all the heritage assets in question in this case are non-designated, paragraph 197 is relevant. This paragraph requires the decision-maker to take into account the effect on the significance of non-designated heritage assets and to take a balanced judgement having regard to the scale of harm or loss and the significance of the asset(s) potentially affected.

2.13 *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. Heritage asset includes designated heritage assets and assets identified by the local planning authority (including local listing).

2.14 *Archaeological Interest* is defined as a heritage asset which holds or potentially could hold evidence of past human activity worthy of expert investigation at some point.

2.15 *Designated Heritage Assets* comprise: World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Park and Gardens, Registered Battlefields and Conservation Areas designated under the relevant legislation.

2.16 *Significance* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

2.17 *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. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

2.18 The NPPF is supported by the Planning Policy Guidance (PPG). In relation to the historic environment, paragraph 18a-001 (Paragraph: 001 Reference ID: 18a-001-20140306) states that:

"Protecting and enhancing the historic environment is an important component of the National Planning Policy Framework's drive to achieve sustainable development (as

defined in Paragraphs 6-10). The appropriate conservation of heritage assets forms one of the 'Core Planning Principles'."

2.19 Paragraph 18a-002 (Paragraph: 002 Reference ID: 18a-002-20140306) makes a clear statement that any decisions relating to listed buildings and their settings and conservation areas must address the statutory considerations of the Planning (Listed Buildings and Conservation Areas) Act 1990 as well as satisfying the relevant policies within the National Planning Policy Framework and the Local Plan.

2.20 Paragraph 18a-013 (Paragraph: 013 Reference ID: 18a-013-20140306) outlines that the assessment of the impact of a proposed development on the setting of a heritage asset needs to take into account and be proportionate to the significance of the asset being considered and the degree to which the proposed development enhances or detracts from the significance of the asset and the ability to appreciate the significance.

2.21 The PPG outlines that although the extent and importance of setting is often expressed in visual terms, it can also be influenced by other factors such as noise, dust and vibration. Historic relationships between places can also be an important factor stressing ties between places that may have limited or no intervisibility with each other. This may be historic as well as aesthetic connections that contribute or enhance the significance of one or more of the heritage assets.

2.22 Paragraph 18a-013 concludes:
"The contribution that setting makes to the significance of the heritage asset does not depend on there being public rights or an ability to access or experience that setting. This will vary over time and according to circumstance. When assessing any application for development which may affect the setting of a heritage asset, local planning authorities may need to consider the implications of cumulative change. They may also need to consider the fact that developments which materially detract from the asset's significance may also damage its economic viability now, or in the future, thereby threatening its on-going conservation."

2.23 The key test in NPPF paragraphs 132-134 is whether a proposed development will result in substantial harm or less than substantial harm. However, substantial harm is not defined in the NPPF. Paragraph 18a-017 (Paragraph: 017 Reference ID: 18a-017-20140306) of the PPG provides additional guidance on substantial harm. It states:
"What matters in assessing if a proposal causes substantial harm is the impact on the significance of the heritage asset. As the National Planning Policy Framework makes clear, significance derives not only from a heritage asset's physical presence, but also from its setting. Whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the policy in the National Planning Policy Framework. In general terms, substantial harm is a high test, so it may not arise in many cases. For example, in determining whether works to a listed building constitute substantial harm, an important consideration would be whether the adverse impact seriously affects a key element of its special architectural or historic interest. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed."

2.24 Paragraph 134 of the NPPF outlines that where a proposed development results in less than substantial harm to the significance of a heritage asset, the harm arising should be weighed against the public benefits accruing from the proposed development. Paragraph 18a-020 of the PPG (Paragraph: 020 Reference ID: 18a-020-20140306) outlines what is meant by public benefits:
"Public benefits may follow from many developments and could be anything that delivers economic, social or environmental progress as described in the National Planning Policy Framework (Paragraph 7). Public benefits should flow from the proposed development. They should be of a nature or scale to be of benefit to the public at large and should not just be a private benefit. However, benefits do not

always have to be visible or accessible to the public in order to be genuine public benefits."

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

Regional and Local Planning Policy

The London Plan (adopted 2016)

2.26 The London Plan (adopted March 2016) includes Policy 7.8 which relates to heritage assets and archaeology:

Strategic

A. London's heritage assets and historic environment, including listed buildings, registered historic parks and gardens and other natural and historic landscapes, conservation areas, World Heritage Sites, registered battlefields, scheduled monuments, archaeological remains and memorials should be identified, so that the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping can be taken into account.

B. Development should incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology.

Planning decisions

C. Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate.

D. Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail.

E. New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.

LDF preparation

F. Boroughs should, in LDF policies, seek to maintain and enhance the contribution of built, landscaped and buried heritage to London's environmental quality, cultural identity and economy as part of managing London's ability to accommodate change and regeneration.

G. Boroughs, in consultation with English Heritage, Natural England and other relevant statutory organisations, should include appropriate policies in their LDFs for identifying, protecting, enhancing and improving access to the historic environment and heritage assets and their settings where appropriate, and to archaeological assets, memorials and historic and natural landscape character within their area.

Draft New London Plan showing Minor Suggested Changes (2018)

2.27 The Mayor published the Draft London Plan 2017 for consultation between 1st December 2017 and 2nd March 2018. A further Draft New London Plan showing Minor

Suggested Changes was published in August 2018. According to the published GLA timetable the draft plan will be examined in Winter 2018 and the final plan published by Winter 2019. The following draft policies relate to heritage:

Policy HC1 Heritage conservation and growth;
"A Boroughs should, in consultation with Historic England and other relevant statutory organisations, develop evidence that demonstrates a clear understanding of London's historic environment. This evidence should be used for identifying, understanding, conserving, and enhancing the historic environment and heritage assets, and improving access to, and interpretation of, the heritage assets, landscapes and archaeology within their area.

B Development Plans and strategies should demonstrate a clear understanding of the historic environment and the heritage values of sites or areas and their relationship with their surroundings. This knowledge should be used to inform the effective integration of London's heritage in regenerative change by:

1) Setting out a clear vision that recognises and embeds the role of heritage in place-making.
2) Utilising the heritage significance of a site or area in the planning and design process.
3) Integrating the conservation and enhancement of heritage assets and their settings with innovative and creative contextual architectural responses that contribute to their significance and sense of place.
4) Delivering positive benefits that conserve and enhance the historic environment, as well as contributing to the economic viability, accessibility and environmental quality of a place, and to social wellbeing.

C Development proposals affecting heritage assets, and their settings, should conserve their significance, by being sympathetic to the assets' significance and appreciation within their surroundings. The cumulative impacts of incremental change from development on heritage assets and their settings, should also be actively managed. Development proposals should avoid harm and identify enhancement opportunities by integrating heritage considerations early on in the design process.

D Development proposals should identify assets of archaeological significance and use this information to avoid harm or minimise it through design and appropriate mitigation. Where applicable, development should make provision for the protection of significant archaeological assets and landscapes. The protection of undesignated heritage assets of archaeological interest equivalent to a scheduled monument should be given equivalent weight to designated heritage assets.

E Where heritage assets have been identified as being At Risk, boroughs should identify specific opportunities for them to contribute to regeneration and place-making, and they should set out strategies for their repair and re-use."

2.28 The draft London Plan also has policies regarding World Heritage Sites (Policy HC2) and Strategic and Local Views (Policy HC3). These are not relevant to the Project and are therefore not repeated.

The London Borough of Bexley Local Development Plan (2012)

2.29 The London Borough of Bexley Local Development Plan contains the following Core Strategy and Development Control policies relating to the historic environment (London Borough of Bexley 2012):

Policy CS19 - Heritage and archaeology

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 underpin the revitalisation and development of the borough, including promoting the visitor economy. This will be achieved by:

a *promoting the borough's heritage assets, such as Danson Mansion, Hall Place and Gardens, Crossness Beam Engine House and Red House;*

b *reviewing the status of existing and identifying new heritage and archaeological assets;*

c *conserving and enhancing the significance of heritage assets, their setting, and the wider historic environment, including statutorily listed buildings; locally listed buildings of architectural or historic interest, conservation areas, registered parks and gardens, and archaeological sites;*

d *protecting heritage assets from development that is likely to adversely impact on the significance, integrity, character or appearance of an asset or its setting;*

e *supporting historic restoration schemes through partnership working and seeking funding to enhance heritage and archaeological assets in an appropriate and sympathetic manner; and*

f *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.

Draft Bexley Local Plan

2.30 The current and next steps for producing the Local Plan are shown below:

- November 2017 to August 2018: Preparations of Local Plan preferred approach policies
- August 2018 - Consultation on preferred approach to Local Plan policies

2.31 The Local Development Scheme has been published, however there is no specific guidance relating to heritage.

The Kent Minerals and Waste Local Plan 2013-30 (2016)

2.32 The Kent Minerals and Waste Local Plan 2013-30 (KMWLP) was adopted in July 2016 and sets out the vision and strategy for waste management and mineral provision up until the year 2030. The following policies within the Kent Minerals and Waste Local Plan refer to heritage:

Policy DM 5 Heritage Assets
Proposals for minerals and waste developments will be required to ensure that Kent's heritage assets and their settings, including landscape, historic parks and gardens, historic towns, conservation areas, monuments, archaeological sites and features and defined heritage coastline,(136) are conserved in a manner appropriate to their significance. Proposals should result in no significant adverse impact on Kent's historic environment and, wherever possible, opportunities must be sought to maintain or enhance historic assets affected by the proposals. Minerals and/or waste proposals that would have an impact on a heritage asset will not be granted planning permission unless it can be demonstrated that there is an overriding need for development and any impacts can be mitigated or compensated for, such that there is a net planning benefit.

Policy DM 6 Historic Environment Assessment
Proposals for minerals and waste development that are likely to affect important heritage assets will only be granted planning permission following:

1. preliminary historic environment assessment, including field archaeological investigation where appropriate, to determine the nature and significance of the heritage assets
2. appropriate provision has been secured for preservation in situ, and/or archaeological excavation and recording and/or other historic environment recording as appropriate, including post-excavation analysis and reporting, archive deposition and access, and interpretation of the results for the local community, in accordance with the significance of the finds
3. agreement of mitigation of the impacts on the significance of the heritage assets, including their fabric, their setting, their amenity value and arrangements for reinstatement.

Dartford Development Policies Plan (2017)

2.33 The Dartford Development Policies Plan (2017) contains the following policies relating to the historic environment (Dartford Borough Council 2017):

Policy DP12: Historic Environment Strategy

1. *Development should contribute to the conservation and enjoyment of the Borough's historic environment. The Local Planning Authority will work with developers on strategies to realise this in the context of site heritage opportunities and constraints.*
2. *Where heritage may be at risk, landowners will be expected to work proactively with the Local Planning Authority in bringing forward proposals to preserve or enhance these assets, to facilitate their successful rehabilitation and seek their viable reuse consistent with their heritage value and special interest.*
3. *Development proposals which may affect the significance of heritage assets (both designated and non-designated) or their setting should demonstrate how these assets will be protected, conserved or enhanced as appropriate. Proposals should aim to reflect and interpret the historic character of a site and conserve its most significant historical and/or architectural aspects.*
4. *A heritage statement should accompany all planning applications affecting heritage assets. On archaeological sites, a desk-based assessment will be required as a minimum. Applications affecting designated heritage assets will be assessed under Policy DP13. Applications affecting non-designated assets will be assessed against the criteria below.*

Non-Designated Heritage Assets

5. *The Borough's non-designated heritage assets include:*
    - *a) Archaeological sites, including sites holding an interest as defined in the NPPF;*
    - *b) Applicable sites within Areas of Special Character, as defined on the Policies Map;*
    - *c) Sites with significant industrial heritage;*
    - *d) Land with historic landscape character;*
    - *e) Historic open space, parks and gardens.*
6. *Development proposals affecting non-designated heritage assets should establish the asset's significance. Development should conserve or enhance those aspects that have been identified as significant and, where possible, should seek to better reveal an asset's significance.*
7. *In determining planning applications affecting non-designated assets, the effect of the proposal on the asset's significance will be taken into account. A balanced judgement will be taken having regard to the significance of the heritage asset and the scale of any harm or loss of significance. Development resulting in a total loss of significance will not normally be permitted.*

Policy DP13: Designated Heritage Assets

1. *Designated heritage assets are an irreplaceable resource and should be conserved in a manner appropriate to their significance. A heritage statement should establish the significance of the heritage asset in order to enable the assessment the impact of a development proposal. Any harm or loss will require clear and convincing justification.*
2. *In determining planning applications, the Local Planning Authority will pay close regard to:*
    - *a) the significance of the heritage asset;*
    - *b) the desirability of maintaining and, where possible, enhancing significance; and*
    - *c) the desirability of ensuring viable uses are found for heritage assets, consistent with their conservation.*
3. *Where a proposal will lead to substantial harm or total loss of significance, permission will be refused unless it can be clearly demonstrated that the development is necessary for substantial public benefits to be achieved that will outweigh the harm or loss.*
4. *Where a proposal will lead to less than substantial harm, this will be weighed against the public benefits of the proposal.*

Listed Buildings

5. *Development proposals affecting statutorily listed buildings should have special regard to the desirability of preserving the building or its setting. Loss of or harm to a statutorily listed building or its setting will only be permitted in exceptional circumstances in line with clauses 3 and 4 above.*

Conservation Areas

6. *Development proposals affecting a conservation area should pay special attention to the desirability of preserving or enhancing the character or appearance of that area. Proposals that would result in harm or loss of significance will be determined in line with clauses 3 and 4 above.*
7. *The demolition of any building in a conservation area will only be permitted where it is clear that it will not adversely affect the character and appearance of the area.*

Guidance

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

2.34 The purpose of this document is to provide information to assist local authorities, planning and other consultants, owners, applicants and other interested parties in implementing historic environment policy in the NPPF and PPG. It outlines a 6 stage process to the assembly and analysis of relevant information relating to heritage assets potentially affected by a proposed development, as follows:

- Understand the significance of the affected assets;
- Understand the impact of the proposal on that significance;
- Avoid, minimise and mitigate impact in a way that meets the objectives of the NPPF;
- Look for opportunities to better reveal or enhance significance;
- Justify any harmful impacts in terms of the sustainable development objective of conserving significance and the need for change; and
- Offset negative impacts on aspects of significance by enhancing others through recording, disseminating and archiving archaeological and historical interest of the important elements of the heritage assets affected.

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

2.35 Historic England's Historic Environment Good Practice Advice in Planning Note 3 provides guidance on the management of change within the setting of heritage assets.

2.36 The document restates the definition of setting as outlined in Annex 2 of the NPPF. Setting is also described as being a separate term to curtilage, character and context; while it is largely a visual term, setting, and thus the way in which an asset is experienced, can also be affected by noise, vibration, odour and other factors. The document makes it clear that setting is not a heritage asset, nor is it a heritage designation, though land within a setting may itself be designated. Its importance lies in what the setting contributes to the significance of a heritage asset.

2.37 The Good Practice Advice Note sets out a five-staged process for assessing the implications of proposed developments on setting:

- Identification of heritage assets which are likely to be affected by proposals
- Assessment of whether and what contribution the setting makes to the significance of a heritage asset
- Assessing the effects of proposed development on the significance of a heritage asset
- Maximising enhancement and reduction of harm on the setting of heritage assets
- Making & documenting the decision and monitoring outcomes

3.0 The REP Site and Main Temporary Construction Compound Baseline

3.1 The REP site and Temporary Construction Compounds are located within an area of historic marshland on the southern banks of the River Thames. The Erith Marshes formed part of the alluvial floodplain of the River Thames which would have influenced archaeological and historic settlement patterns. Documentary sources indicate that from the end of the 12th century the Lesnes Abbey was responsible for draining areas of the marshland through the construction and maintenance of stretches of river wall. This led to the creation of agricultural lands, although it is unlikely to have been 'stable' enough for permanent habitation and as such significant archaeological evidence from this period is not considered likely. Subsequent phases of repairs and reclamation work are recorded by Elizabeth I in 1561 and William Burrel in 1606, however the area remained largely absent of large scale development until the 1950's. The exception to this is a number of industrial sites which are recorded on 19th century mapping: Manure Works, Thames Fish, Guano & Oil Works and the 20th century Borax Works.

3.2 The locations of sites mentioned in the text are shown on Figures 2 and 3.

Previous Archaeological Investigations

3.3 A program of geoarchaeological fieldwork and updated deposit modelling was carried out by Quaternary Scientific (University of Reading) of the REP site (QUEST 2018b). This integrated a total of 11 geotechnical boreholes and 5 test-pits were put down by Terra-Consult in April/May 2018. The boreholes were put down using a cable percussion rig, and three were (at least in part) monitored by Quaternary Scientific (BH03, BH04 & BH05). A Written Scheme of Investigation for the geoarchaeological works was submitted and agreed with the Archaeological Advisor to London Borough of Bexley (QUEST 2018c; Appendix D).

3.4 The following intrusive investigations have occurred within or adjacent to the REP site which inform the baseline of the REP site;

- Geotechnical monitoring took place at the former Belvedere Power Station on Norman Road, Bexley (GLHER ELO8957, Lawson-Price Environmental 2004). The investigation area included the Application Site and the area to the east.
- A nine trench archaeological evaluation was completed in advance of the area immediately east of the Application Site (GLHER ELO7727, Pre-Construct Archaeology 2008).
- In October 2011 Quaternary Scientific used geoarchaeological borehole data, from the Crossness site in Erith, to create a deposit model. The Application Site formed the western limits of the total investigation area (GLHER ELO12672, Quaternary Scientific 2011).

3.5 The following investigations have occurred within the vicinity of the REP site and therefore inform the baseline:

- Museum of London Archaeology Service. 1993. Borax works, Belvedere, Bexley: An Archaeological Assessment (GLHER ELO8962).
- Lawson-Price Environmental. 1994. Appendices to Archaeological Desk Based Assessment of Land at the Former Borax Works, Lower Belvedere in the London Borough of Bexley. 2 (GLHER ELO8967).
- Pre-Construct Archaeology. 2006. An Archaeological Desk Top Assessment on Land at Norman Road, Belvedere, Bexley (GLHER ELO7130).

Archaeological and Historical Background

Undated

3.6 The GLHER records no undated finds or features within the Application Site. A total of two undated assets are recorded within the wider study area: an assemblage of finds including antler fragments, mollusc shells, fossil, nuts, wood fragments including silver birch were recovered from Belvedere Power Station (GLHER MLO10939) and an undated ditch recorded during a watching brief at Norman Road (GLHER MLO71205).

Early Prehistoric

3.7 The REP site is located on the Estuarine Thames floodplain forming part of the Erith Marshes which occupies the eastern end of the area of floodplain which rises to higher ground at the southern edge of the marshes. The REP site falls within the Archaeological Priority Area for Thameside (GLHER DLO36895). Mesolithic, Neolithic and Bronze Age occupation has been found associated with localised high areas of gravels, with environmental data sealed in wetland deposits.

3.8 A number of geoarchaeological investigations have occurred within the vicinity of the REP site including analysis of the geoarchaeological sequence at the Former Borex Works, in advance of the existing Cory Plant. This phase of works included the litho- and bio-stratigraphical analysis of column and bulk samples from three trenches and sedimentary logs from an additional six trenches and 42 boreholes from on and around the Former Borax Works, including some from within the current application site. The analysis recorded the formation of peat and fen woodland which represented periods of stable conditions in the Mesolithic period and subsequent periods of flooding and stabilisation in the Late Mesolithic and Bronze Age periods. Woodland flora and fauna was characterised through biostratigraphic analysis, including for example the colonisation and decline of yew woodland, decline of elm and lime woodland. Human exploitation of the wetland woodland is evidenced by the recovery of dung beetles within the biostratigraphic record which would have fed on the dung of large domesticated animals, namely cattle, sheep and horse (QUEST forthcoming). No early prehistoric cultural material was recovered during the geoarchaeological works or earlier nine trench evaluation (PCA 2008).

3.9 Evidence of early prehistoric environment, in the form of buried peat horizons dating from the Early Mesolithic to Bronze Age periods have been recorded during

archaeological investigations within the 1 km study area around the REP site. This includes a thick peat horizon 200 m west of Norman Road (GLHER MLO99168), at Crabtree Manorway North (GLHER MLO106545; QUEST 2012), c. 400 m east of the REP site and at Norman Park, 860 m south-east of the REP site (GLHER MLO71431; MOLAS 1997).

3.10 Analysis of boreholing samples from Norman Park indicated that this site was a semi-terrestrial fen carr woodland and semi-aquatic reed or sedge swamp during the Middle Holocene (5000-2000 BC). It was prone to flooding, and areas of free standing water formed. There was dry woodland and shrubland situated nearby (GLHER MLO99174). The archaeological investigations at Norman Park also recovered an Early Mesolithic to Early Neolithic crested blade (GLHER MLO71430). The investigation concluded that the location and depth of the peat horizon, in comparison with nearby sites means that it was too low lying for human exploitation in the prehistoric period and the find was not an indicator of in situ occupation. Peat horizons were also recorded between Eastern Way and Anderson Way, to the south and east of Norman Park, during a watching brief by Compass Archaeology between 2001 and 2002 (GLHER MLO77912).

3.11 The investigations at the Crossness Sewage Treatment Works (PCA 2007), west of Norman Road recorded a buried peat horizon and a remnant of a preserved forest which may date to the Late Mesolithic (GLHER MLO99168). This is the earliest known colonisation of yew woodland on the southbank of the Thames (APA 1). A deposit model created in 2011 by QUEST indicates that the peat is likely to be spread over the whole area.

3.12 A dugout canoe, dated to the Neolithic period, was found in 1885 in peat layers at the Erith Marshes. There is no recorded evidence of earlier, Palaeolithic, or later, Neolithic or Bronze Age occupation within 1 km of the REP site, although significant occupation evidence along the route of Bronze Age Way was recorded in advance of the road construction (RPS 1995), which will be discussed in more detail in relation to the Electrical Connection route below. Similarly, there are no Iron Age finds or features within the Application Site or study area, with known settlement sites at Charlton and Woolwich, some distance to the west of the REP site.

3.13 The deposit model (QUEST 2018b) indicates that the surface of the Shepperton Gravel is relatively even, ranging between -7.5 m and -9.5 m OD across the site, with a gradual decrease in height towards the north, east and south-west (QUEST 2018b, Figures 4 & 12-14). Beyond the southern margin of the site, this surface appears to rise gently to between -7 m and -6 m OD. The Gravel represents the Shepperton Gravel which was deposited during the Late Glacial (MIS2; 15,000 to 10,000 BP) and comprises the sands and gravels of a high-energy braided river system which, while it was active would have been characterised by longitudinal gravel bars and intervening low-water channels in which finer-grained sediments might have been deposited. Such a relief pattern would have been present on the valley floor at the beginning of the Holocene when a lower-energy fluvial regime was being established.

3.14 The deposit model (QUEST 2018b) does not identify key relief features within the REP site itself, but notes a number of features within the wider study area: a large linear depression cut into the Shepperton Gravel surface (up to -11.2 m OD) and extending west to east or north-west to south-east across the Alchemy Park site and an uneven surface of the Shepperton Gravel has been identified on the Crossness Sewage Works site adjacent to the river; potentially representing north-south aligned channels draining towards the Thames, separated by more elevated ridges of gravel (Green et al., 2011).

3.15 The deposit model recorded a sequence of Lower Alluvium, Peat and Upper Alluvium overlying the Shepperton Gravels. Radiocarbon dating of the sequences from nearby sites such as Alchemy Park (Batchelor et al., 2016), Pirelli Works (Young et al., 2012) and

Imperial Gateway (Batchelor et al., 2008b) suggest the Lower Alluvium began accumulating during the early to middle Holocene around 7000 cal BP (late Mesolithic; Figure 13). Deposition took place during a time when the main course of the Thames was probably confined to a single meandering channel. The richly-organic nature of the Lower Alluvium, with evidence of localised and short-lived, probably episodic peat accumulation suggests that this was a period during which the valley floor was occupied by a network of actively migrating channels, with a drainage pattern on the floodplain that was still largely determined by the relief on the surface of the underlying Shepperton Gravel.

3.16 The widespread occurrence of Peat above the Lower Alluvium indicates a general transition to a more stable valley floor, possibly associated with falling relative sea level and slight incision of the main channel of the Thames, encouraging the development of semi-terrestrial conditions across most of the floodplain. Radiocarbon dating of sequences from the Former Borax Works site (Batchelor et al. 2008a) and nearby sites such as Alchemy Park (Batchelor et al., 2016), Pirelli Works (Young et al., 2012), Imperial Gateway (Batchelor et al., 2008b) and Crossness Sewage Works (Batchelor et al., 2006) suggest that the peat began accumulating during the middle Holocene around the time of the transition from the Mesolithic to Neolithic cultural period, and continued until the Bronze Age; a period of around 3000 years.

3.17 The uppermost unit in the Holocene alluvial sequence is the Upper Alluvium, the deposits of which comprise largely sterile clays and silty clays.

3.18 The geoarchaeological deposit model (QUEST 2018b) concluded that archaeological potential of the REP site is considered **Low** on the basis of the likely depth of the sediments and findings from nearby sites. Even in the absence of the archaeological remains, the sediments have the potential to contain further information on the past landscape, through the assessment/analysis of palaeoenvironmental remains (e.g. pollen, plant macrofossils and insects) and radiocarbon dating. Following the results of the geoarchaeological fieldwork and updated deposit modelling, sequences in the following areas were identified of particular interest: BH04 (where a complex arrangement of mineral-rich and organic-rich/peat deposits was observed in the Lower Alluvium) and between BH12 (where the peat was recorded at 3 m thick) and BH09/BH10 (where peat was entirely absent).

Roman

3.19 The GLHER records no Roman finds or features within the Application Site or study area, although a single unstratified rim sherd of a fresh sandy greyware necked jar dated AD 60-160 was recorded from above the peat in Trench 1 (PCA 2008, 23). Antiquarian Spurrell wrote of numerous findspot of Roman date within the marshland, particularly at Crossness (Spurrell 1889).

3.20 Beyond the 1 km study area a Roman dump layer was recorded at Church Manorway and evidence of Roman land management was recorded at Summerton Way (PCA 2008). Further afield, Roman settlement sites are recorded at the Woolwich Arsenal in 1856 (Wigfall, 1997, P.1), at Welling (Garrod & Philp, 1992) and the route of the Roman road of Watling Street (modern day A207) c. 5 km to the south of the REP site.

Early Medieval / Anglo-Saxon

3.21 The first documented mention of Erith was in 695 within a charter gating certain lands, forty pieces at Swanscombe and Erith. Early medieval origins area are further suggested by place name evidence of locations such as Erith (Earyth) and Lesnes (Loisnes), which derive from Old English (e.g. Anglo-Saxon) elements (Gelling, 1984).

3.22 There is presently no evidence to suggest significant activity within the REP site during this period. As evidenced by the geo-archaeological evidence from land at Norman Road (PCA 2008) and the subsequent geoarchaeological analysis (QUEST,

forthcoming), which recorded substantial alluvium deposits overlying the prehistoric horizons, the REP site was likely to be characterised by marshland during this period. There is no direct evidence that the marshes were being utilised, occupied or managed during this period.

Medieval

3.23 Erith was described as a fishing village in the Domesday Survey of 1086, held by Odo, Bishop of Bayeux. The REP site is likely to have been located within the manor of Lesnes, (e.g. modern day Abbey Wood and part of Thamesmead), which gave its name to the surrounding 'hundred' (administrative area during the early medieval and medieval periods).

3.24 The Domesday Book records Lesnes (Loisnes) as a moderately sized manor assessed at sixty villagers, three small holders, two salves and three cottagers, with the land owned by Bishop Odo of Bayeaux. The land was granted to Richard De Lucy in the 12th century, who founded Lesnes Abbey in 1178 (Abbey of St. Mary & St. Thomas the Martyr), on a site c. 1.5 km south-west of the Application Site (NHLE 1002025).

3.25 The Abbey was a relatively small foundation, comprising only twelve Cannons and an Abbott in AD 1178. As the landowner, the Abbey was responsible for the draining of areas of the marshland and the construction and maintenance of stretches of the river wall / embankments from c. 1230 onwards. Historical Sources record floods throughout the medieval period (Wigfall, 1997) – possibly suggesting the river wall was not consistently maintained or was not sufficient for purpose.

3.26 Several 'mud walls' or embankments of possible medieval date have been excavated along the Thames foreshore, for example at Foulness and Faversham and at the former Deptford Power Stations (PCA 2008). No evidence of buried medieval embankments were recorded during the 2008 evaluation (PCA 2008) or other archaeological investigations in the area.

3.27 As evidenced by the geo-archaeological evidence from land at Norman Road (PCA 2008) and the subsequent geoarchaeological analysis (QUEST, forthcoming), which recorded substantial alluvium deposits overlying the prehistoric horizons, the REP site was likely to be characterised by marshland during this period. The land may have been drained and used for agricultural purposes, however it is unlikely to have been 'stable' enough for permanent habitation and as such significant archaeological evidence from this period is not considered likely.

Post-Medieval / Modern

3.28 Lesnes Abbey continued into the early 16th century, until it was suppressed in AD 1524 by Thomas Wolsey after he obtained papal permission to close any monastery with less than eight Cannons – Lesnes having five Cannons and an Abbott by this time (Wigfall, 1997, 2). The Abbey's land was subdivided and sold onto private hands and Royal hands. Possibly as a result of general neglect and the absence of maintenance works provided by the Abbey, the river wall / embankments burst in 1537 resulting in over 2000 acres of land being 'reclaimed by the river' (Jarvis, 1983), a large percentage of which remained 'underwater' for the following c. 30 years (Wigfall, 1997, 3).

3.29 Elizabeth I commissioned repairs and reclamation works in 1561 and by 1587, resulting in c. 1000 acres of marshland in Plumstead, Lesnes and Erith being drained. Further works upon the river wall were undertaken by William Burrel in 1606 (Jarvis 1983, 2), with further maintenance and improvements throughout the 17th and 18th centuries. More phases of land reclamation over the wider locality of the marshland was undertaken during the latter half of the post-medieval period, continuing into the modern period, with demolition rubble from bombing raids during the First and Second World War being used as fill material.

3.30 The 1778 'Map of the Hundred of Little and Lesness and Dartford and Wilmington' illustrates the drainage of the marshes for agricultural purposes. The river wall / embankment is illustrated slightly south of the foreshore, which is the only structure within the Application Boundary (Figure 4). A small structure is noted to the west of the Application Site which may represent the powder magazine, '*Erith Magazine*' which is annotated on the 1801 Ordnance Survey (Figure 5). Although not within the Application Boundary, an 1867 plan of powder plant (Plate 2) provides detail of the river wall, associated watch box, the River Thames foreshore and jetty at this location. The line of Norman Road is illustrated on these early 19th century maps. The road name 'Picardy Manorway' is depicted on the 1843 Tithe Map (not illustrated) which record the Application Site as being agricultural.

3.31 Between 1843 (Tithe Map, not illustrated) and 1869 (Figure 6) a manure works has been constructed on the site of the existing Cory RRRF. This is recorded as *Brown's Glue and Manure Works adjoining Bevington's Manure Works* undertook glue manufacture from boiling the clippings of hides used by tanners, horses' hoofs, etc. into scutch, treated at the Bevington Works. The Manure Works comprise a complex of buildings predominately to the east of the Application Site. By 1897 (Figure 7) the site has been further industrialised, Belvedere Mills has been constructed to the east, the New Marsh Tavern and Thames Fish, Guano and Oil Works are located within the Application Site.

3.32 The Thames Fish, Guano & oil works was later known as the Belvedere Guano Works, or Belvedere Fish Guano Works. It processed imported guano for fertilizer and was extended in 1883 (Bexley Archives (LAER/DC/4/5/2)). The site was eventually taken over by the chemical manufacturer Borax Consolidated in 1899. The Borax was transported by river to be processed. The works had its own power generation plant from 1926. Production ended in 1990. Manor Wharf, an L shaped jetty running 22.5 m from bank and reached by a bridge was originally constructed for the Belvedere Fish Guano Works in 1908 and was rebuilt in 1946. Terraced housing lines Norman Road to the south, presumably to house workers on the various industrial sites.

3.33 The Erith Marshes remained absent of large scale development until the 1950s. Following the decision to sell off parts of the Woolwich Arsenal estate by the Ministry of Defence in 1953, and the availability of other land within the marsh, new areas of land were able to be opened up and exploited for urban expansion; needed to combat the demand for new housing, new jobs, and wide spread slum clearance in the post-war era.

3.34 The GLHER records no post-medieval or modern finds or features within the REP site. A line of nine timber fence posts were identified during investigations at Crossness Sewage Works to the west of Norman Road (GLHER MLO105918).

3.35 The GLHER records no finds within or adjacent to the Temporary Laydown area to the west of Norman Road. A review of historic map sources indicates that the northern part of the Temporary Laydown area was occupied by 'Orient House' from c. 1910 (Figure 8) to c. 1938 (Figure 9). From 1960-69 (Figure 10) the site was occupied by electrical works. These have been demolished and the area is vacant.

Past Impacts, Summary of identified / potential archaeological assets and statement of significance

3.36 The available evidence has been assessed in an attempt to determine the nature and extent of any previous impacts upon any potential below ground archaeological deposits, which may survive within the bounds of the Proposed Development site.

3.37 This assessment has been informed by a geoarchaeological deposit model using historic and recently excavated borehole data (**Appendix F.2** to the ES). A watching

brief was undertaken during the recent excavation of geotechnical boreholes. An overarching method statement for the Stage 1 geoarchaeological works has been completed. No additional pre-determination works were requested by the Archaeological Advisor to London Borough of Bexley or Dartford Borough Council during consultation.

3.38 Existing land uses of the REP site includes: ash storage containers; boundary fencing and associated lighting; circulation roads, compounds for the maintenance of operational plant machinery; car parking; and on-site non-designated Wasteland Habitat Area (WHA).

3.39 The archaeological evaluation prior to the construction of the RRRF recorded 19th and 20th century made ground deposits associated with the consolidation of the area in advance of development. Elements likely to have related to the former 20th century Borax Works were observed in several trenches. However, due to the elevated levels of contaminants within the made ground, no further investigations were made. No evidence of revetment of the river's edge were recorded during the evaluation (PCA 2008, 25).

3.40 The geoarchaeological deposit modelling (QUEST 2018b) has confirmed that the REP site is underlain by similar sedimentary sequences to elsewhere in the Lower Thames Valley, with Late Devensian Shepperton Gravel overlain by a tripartite sequence of Holocene Lower Alluvium, Peat and Upper Alluvium, buried beneath modern Made Ground. The Upper Alluvium is generally sterile with the Peat horizon recorded c. 3m below current ground surface. The geoarchaeological deposits have the potential to contain further information on early prehistoric past landscapes through the assessment / analysis of paleoenvironmental remains (e.g. pollen, plant macrofossils and insects) and radio carbon dating. The deposit modelling identified two sequences of interest from the south-west of the Application Site: from the locations of BH04 (where a complex arrangement of mineral-rich and organic-rich/peat deposits was observed in the Lower Alluvium) and between BH12 (where the peat was recorded at 3 m thick) and BH09/BH10 (where peat was entirely absent), the significance of these deposits is considered local; geoarchaeological deposits of significance to warrant preservation in situ are not expected.

3.41 The REP site is located on the River Thames flood plain, known historically as the Erith Marshes and was not reclaimed and settled until the mid-20th century. The potential for previously unrecorded finds or features is considered as follows:

- Historical sources indicate the location of the river embankment of possible medieval or post-medieval date parallel to the River Thames foreshore. No evidence of buried medieval embankments were recorded during the 2008 evaluation (PCA 2008) or other archaeological investigations in the area. In light of this and groundworks associated with the modern development of the site, there is considered **Low** potential for such features to survive within the Application Boundary.
- Low Potential for previously unrecorded *significant* activity (e.g. *in-situ* settlement, occupation, industrial etc.) dating to the Roman, early medieval, medieval or post medieval periods. The site lies within the Erith Marshes which was not reclaimed until the mid-20th century. There is no evidence that significant occupation was possible prior to this; should evidence survive it is considered likely to be fragmentary and of local significance. There is potential for foundations and footings to survive associated with 19th / 20th century industrial development of the site. Such features were identified in the 2008 evaluation, however, were highly contaminated and not investigated further.

3.42 The Main Temporary Construction Compound area is also located on the River Thames flood plain, and was not reclaimed and settled until the mid-20th century. The site was

occupied by electrical works in the latter half of the 20th century. Based on the available information, there is considered to be a:

- High potential for geoarchaeological deposits which have the potential to contain further information on early prehistoric past landscapes through the assessment / analysis of paleoenvironmental remains (e.g. pollen, plant macrofossils and insects) and radio carbon dating. These deposits survive at depth and in light of the superficial groundworks anticipated in this area, the underlying geoarchaeological deposits will not be impacted by the redevelopment works in this area.
- Based on historic settlement patterns and modern development within the area, there is considered **Low** potential for previously unrecorded *significant* activity (e.g. *in-situ* settlement, occupation, industrial etc.) dating to the Roman, early medieval, medieval or post medieval periods.

Designated and Built Heritage Assets

Introduction

3.43 This section will consider the potential effects of development within the Application Site on the significance of designated and built heritage assets, including through effects to their settings. This will include heritage assets within the Application Site, and those in the surrounding area, whose setting may be affected.

3.44 Heritage assets and potential impacts will be assessed using best practice, including that set out in Historic England's Good Practice Advice Note 3, The Setting of Heritage Assets (2017). The heritage assets which require assessment have been selected with reference to the National Heritage List for England (NHLE) database held by Historic England, as well as conservation areas, locally listed assets and non-designated heritage assets recorded by the GLHER and LPA.

3.45 The study area for the settings assessment is centred on the permanent works in the area adjacent / around RRRF north of Norman Road, rather than the entire Application Boundary. In light of the electrical connection being underground, significant effects during operation associated with the electrical connection are unlikely and were scoped out. The Inspectorate agreed with this assessment (January 2018). The appearance / form of the Littlebrook substation connection was not available during the production of the initial Scoping Opinion. It will utilise an existing sub-station at Littlebrook, as this will result in limited change to the mass and appearance of the sub-station no significant effects to built heritage assets in the vicinity will result and no further assessment is considered necessary.

3.46 Historic England guidance regarding the setting of Heritage Assets (2017) states that the first of the five-step assessment is to identify which heritage assets and their assets are affected. The following study area has been chosen for the heritage impact assessment. This has been defined based on professional judgement and experience of potential likely significant direct and indirect effects likely to arise from the Proposed Development:

- The inner study area - A radius of 1 km from the boundary of the permanent works in the area adjacent / around Riverside Resource Facility (RRRF) north of Norman Road which has been used for assessing indirect effects on all non-designated and designated heritage assets. It is considered that it is within this area that REP has the highest potential to impact upon the significance of designated and non-designated heritage assets;
- The wider study area - A radius of 2.5 km from the boundary of the permanent works in the area adjacent / around Riverside Resource Facility (RRRF) north of Norman Road, which has been used for assessing indirect (primarily visual) effects on Scheduled Monuments, Grade I and Grade II* Listed Buildings, Conservation Areas and Registered Parks and Gardens. A review of designated assets between 2.5 km and 5 km from the boundary of permanent

works identified no heritage assets considered sensitive to change by the Proposed Development. This wider settings assessment will take place within the ES.

3.47 The scheduled and grade II listed Lesnes Abbey (NHLE 1002025, 1359415), c. 1.5 km south-west of the Application Site has been identified during the scoping stage. These remains are located on an area of high ground with views north towards the River Thames which include the Application Site. Final assessment of the effect of the Proposed Development is reported in the ES.

3.48 Viewpoints for the TVIA will include viewpoints from the Crossness Power Station and Conservation Area and Lesnes Abbey. These will be considered in the Environmental Statement.

3.49 Not all designated heritage assets within this radius required full assessment for impacts on an individual basis; where a heritage asset has been excluded, a clear justification is provided, for example if the asset is sufficiently far, and well screened from the study area. Also, not all assets will require the same level of assessment. As set out in paragraph 128 of the NPPF, the level of detail will be sufficient to inform the nature and degree of effect of development within the study area on the significance of the heritage asset in question.

3.50 No statutory designations (Listed Buildings, Conservation Areas, Scheduled Ancient Monuments or World Heritage Sites) are located within the Application Boundary. No locally listed or non-designated built heritage assets are recorded within the Application Boundary.

3.51 The following designated and built heritage assets are located within the study area:

- The Crossness Conservation Area is located c.650 m west of the Application Site;
- Grade I listed Crossness Pumping Station (NHLE 1064241) c.760 m to the west of the Application Site;
- Two grade II listed workshops at Crossness Pumping Station (NHLE 1064216, 1250557), c. 770 m – 880 m to the west of the Application Site;
- A locally listed engine house at Crossness Sewage Treatment Work (GLHER MLO103261);
- The grade II listed jetty at Dagenham Dock (NHLE 1391706) 600 m to the north-west of the Application Site, on the northern bank of the River Thames;
- Four locally listed 20th century concrete Police Boxes (GLHER MLO103263), c. 400 – 750 m west of the Application Site and
- The scheduled and grade II listed Lesnes Abbey (NHLE 1002025, 1359415), c. 1.5 km south-west of the Application Site.

3.52 The distribution of designated and built heritage assets in relation to the study area can be found in Figures 3.

Designated / Listed Building Assets that do not require detailed assessment

3.53 Due to the scale, distance and intervening landscape the four locally listed 20th century concrete Police Boxes (GLHER MLO103263), c. 400 – 750 m west of the Application Site do not require further assessment: given the lack of intervisibility it is clear that no harm to their significance would result from the Proposed Development.

3.54 The scheduled and grade II listed Lesnes Abbey (NHLE 1002025, 1359415), c. 1.5 km south-west of the Application Site.

Assessment of designated heritage assets, including assessment of significance, setting and relationship to Application Site

Grade I listed Crossness Pumping Station (NHLE 1064241)

3.55 The listing description states:
Opened 4 April 1865. Engineer: Joseph Bazalgette. Two storeys, yellow brick. Three-one-three bays divided by pilasters; the windows simple Romanesque style with 3 round headed lights. Machicolated cornice between the pilasters, cornice across all above this. Punctuated capped parapet. Three jointed one storey parallel gabled ranges at right angles to main block. The gable ends have black round arches containing a three light window (each with round head). Circular window in tympanum side elevation with series of joined round headed windows. Interior: Important cast iron architectural treatment and 4 colossal beam engines by James Watt and Co.

3.56 In 1856 the Metropolitan Board of Works was established to respond to typhoid and cholera outbreak resulting from polluted drinking water in the city. The Crossness Works were created to create a sewage system that would prevent sewage being disposed of into the River Thames near the areas where the city was densely populated. Joseph Bazalgette was appointed Chief Engineer and was later to be knighted in 1874. Crossness Pumping Station comprises the Beam Engine House, Boiler House, and Triple Expansion Engine House. The Beam Engine House contains the fourth largest surviving rotative beam engines in the country built by James Watt and Co. and later altered by Benjamin Goodfellow. The building design was in the then popular Victorian Romanesque style, with Byzantine and Norman elements, with a mansard roof with small lucarnes on both frontages. The northern frontage of the original building contains a magnificent central doorway in a Norman style above which was a large turreted gable with a clock facing the river. The interior of the Beam Engine House was also highly ornamental incorporating, in the centre, an octagonal framework supported on cast iron pillars with foliated capitals. The 11 feet 6 inch diameter Southern Outfall sewer fed into a 6.5 acre reservoir to the south of the main buildings. This was covered by a brick vaulted roof on 644 solid brick piers, which acted as a balancing tank for over 17 million gallons of sewage which was then discharged into the ebbing tide.

3.57 Although some of the main architectural features of the Beam Engine House complex have been altered or removed, the Beam Engine House, outbuildings and curtilage remain of the "*highest architectural quality and form the prime industrial heritage site in South East London*" (Bexley 2009). Alterations to the Beam Engine House include alterations to the roof and the demolition of the tall chimney stack to the east in the 1950s.

3.58 The pumping station sits within a designed / functional landscape which extends to 37 acres and includes the spaces around the buildings, the green space of the grass covered sunken reservoir, a spacious entrance drive. The relationship with the River Thames is integral, the position chosen to allow the release of sewage into the River Thames, away from the densely populated areas, at hightide to be carried downstream and out to sea (Bexley 2009).

3.59 The significance of this listed asset related to its historical, architectural and evidential value which will not be impacted by the proposed redevelopment within the Application Site. The principal setting of the building comprises the designed / functional landscape in which it is located (and covered by the conservation area). The Application Site lies c. 760 m south-east of the grade I listed pumping station. From the Thames Path the existing RRRF and chimney stack forms part of the distant skyline to the rear of this complex of buildings. Taking into consideration the degree of separation between the listed asset and the Proposed Development site and the industrialised character of the intervening area (occupied by the modern Crossness Sewage Plant) the Application Site makes a Minor contribution to the setting or significance of the Pumping Station: it forms part of the skyline of the area when viewing the building complex from the west.

Two grade II listed workshops at Crossness Pumping Station (NHLE 1064216, 1250557)

3.60 The listing descriptions for the two workshops is similar, with the location difference compared to the engine house noted:

Built 1862-5 by Contractor William Webster to designs of Sir Joseph Bazalgette and Charles Henry Driver. Flemish bond yellow brick with gauged red brick dressings and Portland Stone to kneelers and buttresses; gabled slate roof with glazed rooflights. Rectangular plan. Each 3-bay gable end has stone-coped gable with moulded kneelers: plank double doors set in semi-circular arched architrave with raised imposts and dog-tooth hood mould set within similar blind recessed arch flanked by recessed panels; doorway flanked by similar blind arches set in square-headed recessed bay with carved stone corbels to arcaded frieze and dentilled dog-tooth cornice. North wall of 12 bays has similar blind arches set in similar square-headed recessed bays, and 2 inserted C20 entries. South wall of 24 bays has offset buttresses dividing recessed bays each of which has similar frieze and cornices. Interior: 12-bay wrought-iron roof.

3.61 The setting and significance of these listed assets is similar to that discussed previously. The principal setting of the buildings comprises the designed / functional landscape in which it is located (and covered by the conservation area). The significance of these assets relate to their historical, architectural and evidential value which will not be impacted by proposed redevelopment within the Application Site. The two grade II listed workshops at Crossness Pumping Station (NHLE 1064216, 1250557), are located c. 770 m – 880 m to the west of the Application Site. From the Thames Path the RRRF building and existing chimney stack at Norman Road forms part of the skyline to the rear of this complex of buildings. Taking into consideration the relative low-lying character of the buildings and the industrialised character of the intervening area (occupied by the modern Crossness Sewage Plant) the Application Site makes a **Minor** contribution to the setting or significance of these assets: it forms part of the skyline of the area when viewing the building complex from the west.

Locally listed engine house at Crossness Sewage Treatment Work (GLHER MLO103261)

3.62 The engine house is described in the GLHER as a single storey industrial building, the date, design and materials being contemporary with the aforementioned Crossness sewage treatment works. The structure is constructed of yellow stock brick with red brick detailing. The windows, doorways, roof and timber vent are discussed in the monument description (GLHER MLO103261). The history, setting and significance of this asset is similar to that discussed previously. The significance of this asset relates to its historical, architectural and evidential value which will not be impacted by proposed redevelopment within the Application Site. The principal setting of the buildings comprises the designed / functional landscape in which it is located (and covered by the conservation area). Being single storey the building is not visible from outside the conservation area.

3.63 Taking into consideration the relative low-lying character of the building, the enclosed character of the immediate environment of the buildings provided by the surrounding vegetation and the industrialised character of the intervening area (occupied by the modern Crossness Sewage Plant) the Application Site makes a **Negligible** contribution to the setting or significance of these assets: it forms part of the skyline of the area when viewing the building complex from the west.

The grade II listed jetty at Dagenham Dock (NHLE 1391706) 600 m to the north-west of the Application Site, on the northern bank of the River Thames

3.64 The listing description for the grade II listed jetty at Dagenham Dock states that the coaling jetty was constructed in 1899-1903, for Samuel Williams & Sons Ltd. Built to designs by L. G. Mouchel & Partners, British agents for Hennebique's patent reinforced-concrete constructional system. The original jetty was extended by one bay in 1906-7,

to designs by Arthur E. Williams. The jetty is about 500 ft (150 m) long, parallel to north bank of the River Thames in front of Dagenham Dock. The original reinforced-concrete structure of the 13-bay jetty is largely intact, though obscured by mid-20th century additions. Both jetty and approach have disused tracks for cranes and railway wagons.

3.65 The jetty is located on the northern bank of the River Thames c. 950 m north-west of the Application Site. The setting of the jetty primarily relates to the Dagenham Docks which it serviced and more generally forms part of the mercantile history of the River Thames. Taking into consideration the intervening distance the Application Site makes a **Minor** contribution to the setting or significance of these assets: it forms part of the distant skyline of the jetty when located on the view or viewing the jetty from Dagenham.

Crossness Conservation Area

3.66 A Conservation Area Appraisal has been published for Crossness (Bexley 2009). This appraisal discusses the history, special character and appearance of the conservation area, location and setting of the conservation area. The building and interrelated functional spaces are described of the 'highest architectural quality and form the prime industrial heritage site in South East London' (Bexley 2009).

3.67 The Application Site lies c. 650 m east of the conservation area. From the Thames Path the RRRF building and existing chimney stack forms part of the skyline to the rear of this complex of buildings. Taking into consideration the distance and industrialised character of the intervening area (occupied by the modern Crossness Sewage Treatment Works) the Application Site makes a minor contribution to the setting or significance of the conservation area: it forms part of the skyline of the area when viewing the conservation area from the west.

4.0 Proposed Development at the REP site and Main Temporary Construction Compound and Predicted Impact on Archaeological Assets

Site Conditions

4.1 Existing land uses of the REP site includes: ash storage containers; boundary fencing and associated lighting; circulation roads, compounds for the maintenance of operational plant machinery; car parking; and on-site non-designated Wasteland Habitat Area (WHA).

The Proposed Development

4.2 REP would be constructed on land immediately adjacent to Cory's existing RRRF, within the London Borough of Bexley and would complement the operation of the existing facility. It would comprise an integrated range of technologies including: waste energy recovery, anaerobic digestion, solar panels and battery storage. The main elements of REP would be as follows:

- Energy Recovery Facility (ERF): to provide thermal treatment of Commercial and Industrial (C&I) residual (non-recyclable) waste with the potential for treatment of (non-recyclable) Municipal Solid Waste (MSW);
- Anaerobic Digestion facility: to process food and green waste. Outputs from the Anaerobic Digestion facility would be transferred off-site for use in the agricultural sector as fertilizer or as an alternative, where appropriate, used as a fuel in the ERF to generate electricity;
- Solar Photovoltaic Installation: to generate electricity. Installed across a wide extent of the roof of the Main REP Building;
- Battery Storage: to store and supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the Main REP building;
- On Site Combined Heat and Power (CHP) Infrastructure: to provide an opportunity for local district heating for nearby residential developments and businesses. REP would be CHP Enabled with necessary on site infrastructure included within the REP site.

4.3 The assessment has been prepared on the basis of the information on REP and its construction as provided in Chapter 3 of the ES and the provisions of the DCO.

4.4 The following provides an outline of the development impacts which are estimated based on current information and may be subject to change. The ground slab within the Main REP Building buildings is anticipated to require a 0.5 m cut in ground level with drilling of piles to a depth of c. -29 m from this level. The exception to this is the proposed excavation of the bunker and attenuation tank(s). The location and detail of the attenuation tanks is not known at the time of writing. At the time of writing the bunker is located in the south-west of the proposed building and measures approximately 1,500 m^2 and requires an c.8 m reduction in ground level. The roads and landscaping is anticipated to require raising of the existing ground level by approximately 1 m.

4.5 The 'REP Electrical Interface point' is currently assumed to occur within the onsite substation on the high voltage side.

4.6 The Proposed Development will not require marine works (as indicated in the initial scoping report). The existing jetty and barges will be used and as a result no dredging works are proposed, nor will there be a need to install temporary structures within the marine environment.

The Proposed Development Main Temporary Construction Compound

4.7 The assessment has been prepared on the basis of the information on REP and its construction as provided in Chapter 3 of the ES and the provisions of the DCO.

4.8 The onsite and offsite laydown composition is anticipated to comprise construction of site roads; pedestrian path; laydown, storage and preassembly areas; car parking areas; container compound; office and welfare compound; and preassembly and laydown areas. This would require superficial re-surfacing only.

Potential Impacts on Non-Designated Heritage Assets

4.9 The QUEST deposit model concluded that the archaeological potential of the site is considered **Low** on the basis of the likely depth of the sediments and findings from nearby sites (QUEST 2018b). This assessment has similarly concluded **Low** potential for in situ occupation of prehistoric, Roman, early medieval, medieval and post-medieval periods. Therefore groundworks associated with the Proposed Development are not considered likely to disturb *in situ* archaeological remains.

4.10 The geoarchaeological deposit model identified two sequences of interest from the south-west of the Application Site: from the locations of BH04 (where a complex arrangement of mineral-rich and organic-rich/peat deposits was observed in the Lower Alluvium) and between BH12 (where the peat was recorded at 3 m thick) and BH09/BH10 (where peat was entirely absent), The significance of these deposits is considered Local.

4.11 These identified sequences are located within the footprint of the proposed building where 0.5 m ground reduction is required prior to the excavation of piles to a depth of -29 m AOD. Ground reduction up to 8 m AOD may be required within the area of the bunker. Ground reduction within the area of the attenuation tank(s) has not yet been finalised. Taking into consideration the survival of the Holocene sequence beyond the proposed building footprint and the Application Site, the loss of these geoarchaeological deposits of interest is considered a medium adverse magnitude of impact due to the loss of research potential / significance. The significance of this effect is considered **Minor**.

Potential Impacts on Designated and Built Heritage Assets

4.12 No statutory designations (Listed Buildings, Conservation Areas, Scheduled Ancient Monuments or World Heritage Sites) are located within the Application Site. No locally listed or non-designated built heritage assets are recorded within the Application Boundary.

4.13 The assessment has identified that the setting of the following designated and built heritage assets as being potentially sensitive to change within the Application Site:

- The Crossness Conservation Area is located c.650 m west of the Application Boundary;
- Grade I listed Crossness Pumping Station (NHLE 1064241) c.760 m to the west of the Application Boundary;
- Two grade II listed workshops at Crossness Pumping Station (NHLE 1064216, 1250557), c. 770 m – 880 m to the west of the Application Boundary;
- A locally listed engine house at Crossness Sewage Treatment Work (GLHER MLO103261);
- The grade II listed jetty at Dagenham Dock (NHLE 1391706) 600 m to the north-west of the Application Boundary, on the northern bank of the River Thames;
- Four locally listed 20th century concrete Police Boxes (GLHER MLO103263), c. 400 – 750 m west of the Application Boundary and
- The scheduled and grade II listed Lesnes Abbey (NHLE 1002025, 1359415), c. 1.5 km south-west of the Application Boundary.

4.14 The Application Site forms part of the wider setting of these built heritage assets. However, the Application Site is considered to make a **Negligible** to **Minor** contribution to the significance of these monuments. The construction of the proposed energy plant, and the c.113 m AOD (maximum parameter) tall chimney stack, will result in a change in skyline behind the conservation area and listed / locally listed assets. Taking into consideration the fact that Crossness Power Station had, until the 1950s a chimney stack of 207 ft (63 m) and the highly industrialised character of the existing landscape, which includes similar stacks in the immediate vicinity and wind turbines to the north of the River Thames, the insertion of an additional chimney stack is considered to form a slight change in the wider skyline of these assets. In terms of the loss of significance of these monuments this is considered very **Slight / Low**.

5.0 The Electrical Connection Options Baseline

5.1 To export electricity to the electricity distribution network owned and operated in the region by UK Power Networks a new 132 kilovolt (kV) cable (i.e. underground) connection to Littlebrook substation. This section will consider the connection route beyond the REP site and the Littlebrook substation.

5.2 The 'REP Electrical Interface point' is currently assumed to occur within the onsite substation on the high voltage side. The Littlebrook substation is located between Rennie Drive and Albion Road.

5.3 The Electrical Connection would comprise a trefoil of cables (3 cables laid together to comprise a single 3-phase circuit), buried in a cable trench typically 450 mm wide and with 900 mm cover (except where there is potential for trenchless installation or a localised deeper trench to be required to pass below a specific constraint) when laid under highway footways and carriageways, with jointing pits approximately every 500 m along the route. To provide 900 mm typical cover, with c. 160 mm diameter ducts and 50 mm duct bedding, the excavation required would typically be 1.2 m deep. The Electrical Connection Options generally follow existing carriageway routes.

5.4 There are four Electrical Connection Options to connect REP and the Littlebrook Substation, Dartford Kent, predominately utilising existing road systems (Figure 1). It is the Applicant's intention that only a single route to the Connection Point will ultimately be granted within the final REP DCO. These are described in paragraph 1.16.

Electrical Connection Option 1

5.5 The north-western route of the Electrical Connection Option 1 is located within an Area of High Archaeological Potential: AHAP 1 Thameside. The area covers the area of historic marshland which extends from the River Thames foreshore to the southern base of the natural east-west ridge bisecting the borough. The area has high potential for prehistoric finds and features based on identified in situ Mesolithic flint working sites and subsequent prehistoric occupation evidence.

5.6 Immediately north of Bronze Age Way is a further Area of High Archaeological Potential: 2 Erith. The area is concentrated on the medieval and early-medieval settlement at Erith and includes land around St John the Baptist Church.

5.7 The GLHER and KHER record a number of finds and features along or adjacent to the line of the Electrical Connection Option 1. In addition to the aforementioned Mesolithic flint working sites, *in situ* a Palaeolithic flint working site (GLHER MLO102836) is recorded and a Bronze Age trackway (GLHER MLO71817) and a fragment of a Bronze Age boat (GLHER MLO71820). These were excavated in advance of the construction of the road. The Electrical Connection route is proposed to a building which is recorded on the KHER: an electrical / military installation constructed pre-1945 (KHER TQ 57 NE 1035). The KHER records two sites at the roundabout to the south of this building: medieval buildings at Littlebrook (KHER TQ 57 NE 36) and a circular enclosure (KHER TQ 57 NE 1033). The remaining finds and features will be discussed by period below.

5.8 In June 2018, through ongoing engineering investigation and information received from local highway authorities relating to the Electrical Connection, specific locations were identified where the Application Boundary required extending to facilitate the installation of the Electrical Connection. This includes alterations to the route of Option 1 by Erith station (3); by the footbridge and railway crossing east of Erith Sports Centre (4); south of the A206 bridge over the River Cray (5) and north and south of the A206 by the River Darent and the Darent Salt Marshes (6).

5.9 A desk-based assessment of areas (3) and (4) identified no known designated / non-designated assets and high potential for historic ground disturbance due to railway construction (analysis of historic OS mapping).

5.10 A review of historic OS mapping at the River Cray (5) indicates that a 19th century flour mill lay to the north of the A206 and the water power was harnessed in this area with a series of leats and dams. There is no evidence on later maps or readily available satellite imagery that such features survive within the proposed areas of works. A site walkover of the area was undertaken at low tide in August 2018 (Plate 7 and 8). The site walkover indicated that the west bank of the River Cray has been reinforced with modern concrete. A line of wooden stakes was noted adjacent to the concrete edge interpreted as modern in date. The eastern edge had no formal revetment and was overgrown with vegetation. No historic features were identified as part of the site walkover.

5.11 A number of non-designated assets are recorded along the edge of the River Darent and the Darent Salt Marshes (6), however none fall within the Application Boundary. A modern wharf (KHER TQ 57 NW 1048) on the Darent is recorded immediately south of Application Boundary and a circular enclosure of unknown date is recorded north of the Application Boundary in the centre of the Dartford Salt Marshes (KHER TQ 57 NW 1030). A number of WWII features are recorded further to the north of the Application Boundary. A site walkover of these areas was undertaken in August 2018 to inspect the area for previously unrecorded heritage assets. The site walkover was undertaken at low tide (Plate 9 – 12). It is noted that the area included to the southwest of the existing highway crossing of the River Darent would not be used as a location for trenchless installation techniques due to the presence of an existing inert landfill. This area would be used for access/laydown only if required to facilitate the installation of cables being installed across the existing highway structure.

5.12 The locations of sites mentioned in the text are shown on Figure 2.

Previous Archaeological Investigations

5.13 The following intrusive investigation have occurred within or adjacent to the Electrical Connection Option 1:

- The line of the Bronze Age Way was subject to an archaeological watching brief in advance of road construction. Excavations in deep peat deposits revealed worked wood and a section of a hurdle-built trackway, which were confirmed as Bronze Age in date. Systematic sampling of sand below the peat during construction work identified and extensive late Mesolithic flint industry, debitage suggesting the manufacture of tranchet axes. Preliminary carbon dating of peat sealing fragments of Grimston-Lyles Hill type pottery indicate and unusually early Neolithic date for this (GLHER ELO2738; RPS 1997).
- The southern part of Queens Road and Northend Road forms part of a larger survey of Crayford Silt Complex outlining the Palaeolithic potential of the underlying brickearth and suggestions for mitigation measured associated with future development in the area (GLHER ELO8563).
- By University Way the KHER records an excavation of 107-117 West Gate Road in 1980, which revealed an undated drainage ditch (KHER EKE3845).
- The KHER records a 1970s excavation at Joyce Hill Hospital which recorded the site of a cropmark (KHER EKE3879; TQ 57 NW 41).

5.14 The following intrusive investigations have occurred within or adjacent to the Littlebrook substation site:

- Desk based assessment of Littlebrook Business Park (Scott Wilson Kirkpatrick & Co Ltd 2003; EKE10933)

- Proposed Development of Land at Littlebrook Power Station: Environment and Impact Assessment (Oxford Archaeology 2003) (2016/153);
- EIA at Littlebrook power station (National Grid Transco PLC 2005) (2005/127)
- Littlebrook Business Park ES (Scott Wilson 2003) (2011/84);
- Littlebrook Power Station, Dartford: A geoarchaeological report (Museum of London 2014) (2014/276);
- Littlebrook Power Station, Dartford: A geoarchaeological report (Museum of London 2015) (2016/20);
- English Heritage advice report: Littlebrook Power Station, Dartford (English Heritage 2015) (2015/81); and
- Long Reach STW Dartford Palaeoenvironmental Analysis (ARCA 2014) (2014/763).

Non-Designated Heritage Assets

Undated

5.15 A total of five undated finds or features are recorded within the limits of the Electrical Connection route. Four of these form a group of KHER entries at University Way: an undated enclosure (KHER TQ 57 NW 1030); an undated ring ditch (KHER TQ 57 NW 48), an undated ditch (KHER TQ 57 NW 41) an undated earthwork (KHER TQ 57 NW 17) and a circular enclosure on the roundabout on Rennie Drive (KHER TQ 57 NE 1033). These lie within the line of the road and are features recorded in advance of road construction.

5.16 The KHER records the location of a circular enclosure to the north of the Application Boundary, east of the River Darent, within the Dartford Salt Marshes (KHER TQ 57 NW 1030). This feature is not recorded on early cartographic sources (OS 1885-95 1:2,500, 1897 1:2,500, 1909 1:2,500, 1938 1:2,500, 1963-64 1:2,500; not illustrated). A review of readily available historic aerial photography (Google Earth 1940 – 2018) does not reveal a clear feature at this location and it is noted that it is located within the location of an irrigation ditch constructed between 1990 and 2003. No evidence of earthworks were noted during the August 2018 site walkover.

5.17 Various undated features are recorded within the wider study area, which includes undated features recorded during archaeological investigations and features identified from aerial photographic studies. None of these features have been assessed as being likely to extend within the line of the Electrical Connection route or terminus.

Prehistoric

5.18 The line of the Electrical Connection runs through an area of known prehistoric occupation, covered by an Area of Archaeological Potential (APA 1). The area is described as 'very dynamic' from the Mesolithic through to the Bronze Age (APA 1). Deep peat deposits would have formed semi-terrestrial land surfaces with opportunities for exploitation of natural resources in the prehistoric periods, such as waterfowl and fish, and wood, reeds and other resources. Occupation areas and evidence for human activity are often found on areas of higher gravel areas or along the liminal edges of river channels.

5.19 The Electrical Connection route runs through one of the most archaeologically significant sites in the borough, if not the region. The 1994 – 5 investigations, in advance of the construction of Bronze Age Way recorded an *in situ* flint scatter of over 3,000 artefacts, including cores, flakes, axes, scrappers and awls, along with a substantial quantity of burnt flint and charcoal that is believed to be a hearth. It is likely that this scatter, found within a pear deposit, represents a tool production centre. The area continued to be exploited in the Neolithic and Bronze Ages and evidence of human occupation and settlement in these periods is well represented. The 1995 watching brief by RPS also recorded a Bronze Age trackway (GLHER MLO71817) and a fragment of a Bronze Age boat (GLHER MLO71820). Prehistoric peat has also been

identified at a number of locations within and adjacent to the Electrical Connection route (GLHER MLO72388, MLO98214, MLO71431, MLO77509).

5.20 The following provides an overview of the prehistoric finds or features, by period, within or immediately adjacent to the Electrical Connection route. A large Palaeolithic site is recorded at Perry Street / Thames Road (GLHER MLO10897), adjacent to the Electrical Connection route. In 1880 a working floor of a Levallois flake industry was identified at this site; the recovery of numerous pieces of animal bone and worked flint was also identified as a kill site. A background scatter of Palaeolithic material, for example at Queens Road (GLHER MLO8467) and south of Northend Road (GLHER MLO13156) indicates occupation from this period within the vicinity of the cable trench.

5.21 A Mesolithic flint scatter was located in a peat deposit on Bronze Age Way during a series of watching briefs by RPS in 1995. The scatter was spread over a large area and comprised over 3000 pieces of flintwork and over 51 kg of burnt flint. The location of a hearth was indicated by an area of burnt sand in association with a dense assemblage of burnt flints (GLHER 71814).

5.22 Direct evidence for Neolithic occupation within the line of the cable trench is evidenced by a scatter of Neolithic pottery recovered from Bronze Age way during the aforementioned 1995 watching brief at Bronze Age Way (GLHER MLO71816). Geoarchaeological work at Church Manorway (Pirelli Works, recorded land surfaces from the Early Mesolithic to the Late Iron Age. The presence of large timbers dating to the Early Neolithic was suggested as a possible timber trackway dating to the Neolithic period (GLHER MLO99178).

5.23 Archaeological investigations at Joyce Green Lane (KHER EKE8417) and Bondfield Walk (KHER EKE8205), towards the eastern end of the Electrical Connection route have identified a small prehistoric pit, and undated ditch and a sub-circular enclosure, identified previously by aerial photographs, and a linear ditch were excavated. Only a small number of residual artefacts were recovered from the archaeological evaluation at land adjacent to University Way and Joyce Green Cemetery (KHER EKE10368).

5.24 As with Erith Marshes, the Littlebrook substation is located on the alluvial floodplain of the River Thames. Changes in sea level associated with the formation and retreat of glaciers resulted in the former landscapes, comprising early prehistoric semi-terrestrial peat horizons, accumulation of estuarine muds and clay and intertidal salt marshes. The geoarchaeological potential of the area has assessed in various desk based assessments (Scott Wilson 2003), and intrusive geoarchaeological investigations in the vicinity of power station. The 2015 MOLA geoarchaeological works in Zone A of Littlebrook substation recorded Late Devensian Shepperton gravels overlain by 15 m thick peat and alluvium deposits reaching to approximately -12 m OD. With the exception of BH1, the top of the alluvial and peat deposits of interest were recorded between 4 m – 7.20 m below ground surface. Several landsurfaces were encountered through the deposits, including Tilbury I and Tilbury III peats (Mesolithic and Neolithic/Bronze Age deposits respectively).

Late Prehistoric – Romano-British

5.25 The river terraces in the Crayford area were extensively exploited in the prehistoric period, with the first signs of definite settlement dating to the Iron Age. Two separate settlements have been identified in the area of Crayford, at Iron Mill Lane (1993 archaeological investigation) and Hall Place (2007 investigation). The subsequent Roman settlement grew around the crossing point of Watling Street (London to Canterbury Roman Road) and the River Cray. A possible villa was excavated in the 1950s, the foundations of Roman buildings and a number of cremation burials and inhumations in the area, which is identified as an Area of High Archaeological Potential (AHAP 12; Crayford).

5.26 The site of an Early Iron Age or Romano-British cremation cemetery is reported to have been located to the east of Burnham Road (KHER TQ 57 NW 24) based on an account from 1945 associated with a gravel pit. No physical evidence has, however, been recovered.

5.27 Residual Roman coins have also been recovered between the A206 and Cornwall Road towards the east of the cable route (KHER TQ 57 NW 17).

5.28 Limited land reclamation of the Littlebrook area may have occurred from the Roman period, although limited Roman occupation evidence is recorded in the KHER within the study area of the Littlebrook substation.

Early Medieval/Medieval

5.29 The Grade II* listed St John the Baptist Church (GLHER MLO107276) is located to the immediate north of Bronze Age Way (although the GLHER records it within the line of Bronze Age Way) and has served as a place of worship for Erith since at least the Norman times, the stone and flint building dating largely from the Twelfth century, although there may be some earlier elements. The church was altered and expanded throughout the medieval period, and heavily restored in the 19th century. Archaeological excavations have uncovered evidence of a 13th century occupation event and medieval oak buildings along West Street, and the predecessor of the Cross Keys public house, on the High Street, dates to the 1590s. This area is identified as an Area of High Archaeological Potential (AHAP 12: Crayford).

5.30 Works in advance of the construction of Bronze Age Way, have revealed substantial medieval masonry remains, in the area now bounded by Bronze Age Way, Jessett Close and West Street. The remains, which may date to the mid-13th century, consist of a substantial and high status building of flint, chalk and dressed sandstone, in part underpinned with timber sleeper-plates providing foundation support in the marshy ground. A further wall was recorded to the north-west, which may be part of the same building or complex. These remains have been preserved *in situ* at a height of 2.6 m OD beneath the new road (GLHER MLO71819; Figure 2a). A review of current ground heights in the vicinity of these remains (OS 1977 1:10,000) indicates the walls are overlain by 1.8 m of modern overburden.

5.31 Littlebrook was mentioned in 10th century records when Alfege gave two-thirds of his lands in Littlebroc, with other property, to the Cathedrals of Canterbury and Rochester. This land was later withheld by Leofsune, who had married the widow of Eadric, Alfege's nephew, but the archbishop later recovered it for Canterbury and Rochester in a trial held at Erhede (Crayford). Around 988, Littlebrook came into the possession of Ethelred, and in 995 he gave Stone and Littlebrook to Godwyn, Bishop of Rochester. Stone, along with other properties owned by Rochester Cathedral, was subsequently seized by Odo, Bishop of Bayeux, but in 1076 these were recovered by Archbishop Lanfranc, at the King's command at an Assembly at Penenden Heath, and were restored to Bishop Gundulf and Rochester Cathedral (Hasted 1778).

5.32 The 1086 Domesday Survey recorded the ownership of Stone (Estanes) by the Bishop of Rochester and also Littlebrook (but unrecorded). There were 12 smallholders, 11 ploughs, a mill, a fishery, woodland and sixty pigs.

5.33 Littlebrook is referred to in later charters as Littlebroc and Lytlanbroce and was once part of the Manor of Stone. A reference to the Manor in 1255 refers to 'fourteen acres of meadow or grass on the marsh'. Around 1300 the Manor of Littlebrooke was held from the Bishop by Laurence Brooke. In 1340 the land passed to John de Northwood for a further twenty-five years until he died in 1365. By 1402 the land had passed to John Loffwyke, and when he died, passed to the Apylton family until the death of Lady Appleton in 1719. The manor was then bought by the Stone family.

5.34 In 1883 the archaeologist and antiquarian F.C.J Spurrell reported the discovery of some Anglo Saxon graves at Littlebrook and in 1885 mapped a complex of embankments at Littlebrook, known as 'The Walls' (Plate 4). Spurrell believed that the earthworks were the remains of a system of tide walls mentioned in a charter of King Ethelred in AD 995 and possibly indicate the presence of an early medieval harbour. The 'Tide Walls' were believed to be entirely destroyed by the construction of the Littlebrook power station, although it is possible that below ground remains survive. The tide walls were mapped in the 2005 Scott Wilson Environmental Statement, the south-east corner of the embankments run along the line of Rennie Road, along the line of the proposed cable trench.

5.35 At the site of the roundabout on Rennie Road, the site of a medieval settlement in the area known as Pond Field (KHER TQ 57 NE 36) by Harold Mair. In 1972 an excavation of the site revealed a rectangular building measuring 8.5 m x 8 m (Plate 5). The walls were formed by several courses of mortared chalk and flint. The site at Littlebrook has now been partially destroyed, although an area of it still survives buried under the recently widened embankment which carries the road traffic out to the power station.

Post-medieval/Modern

5.36 The KHER records a number of post-medieval finds or features within or near Electrical Connection route. This includes the site of a possible salt works immediately south of the Littlebrook Power Station (KHER TQ 57 NW 1032) and a wharf recorded on early 20th century mapping by the crossing of the River Darent (KHER TQ 57 NW 1048). The wharf is recorded on OS sources from 1897 to 1964 (not illustrated). It is noted that the feature is not recorded following construction of the A206. No evidence of the wharf or other standing structures was noted during the August 2018 site walkover (Plate 9).

5.37 A review of cartographic sources indicates that the area north of the A206 within the Dartford Salt Marshes was recorded as a saltings in the early 20th century. It is noted that late 19th century record the banks which form the area of the salting, therefore the date of construction of the banks is not known, however the area was recorded as marsh land, rather than a salting, in the late 19th century (OS 1885-95 1:2,500).

5.38 The Littlebrook site in Dartford has been used for power generation since the late 1930's. The first power station was originally coal-fired and was later turned to burn fuel oil. It was constructed in the early 1930's with generation commencing in 1939, remaining in use till it closed in 1973. A second station was commissioned in 1949, also originally coal-fired later converted to burn fuel-oil, was operational until 1975. Both of these original station buildings remain extant though both are stripped of generating equipment. An application to list the power station was rejected in 2015 (Historic England).

Past Impacts, summary of identified / potential archaeological assets and statement of significance

5.39 The available evidence has been assessed in an attempt to determine the nature and extent of any previous impacts upon any potential below ground archaeological deposits, which may survive within the bounds of the Application Site.

5.40 The utilisation of existing road surfaces indicates that the excavation of the majority of Electrical Connection Option 1 to a depth of 1.2 m will disturb modern deposits associated with the construction of the existing roads. The connection from the south-west corner of the REP site to Eastern Way along the western limit of Crossness Nature Reserve, is located on gravel paths rather than public highways; horizontal truncation for this stretch is likely to be more superficial. Similarly, the proposed works by the

River Cray (5) and the River Darrent and the Dartford Salt Marshes (6) is on similarly undisturbed ground.

5.41 Electrical Connection Option 1 is located within the Thames floodplain and an area of high geoarchaeological potential. The sequence of deposits at the REP site comprises Lower Alluvium, Peat, Upper Alluvium and Made Ground. Made Ground of 1 m – 4 m depth is recorded overlying the Holocene sequence, which indicates that the excavation of the 1.2 m deep cable trench along the aforementioned connection along the western limit of Crossness Nature Reserve will disturb modern made ground / reclamation deposits only and Upper Alluvium only. The potential for fragmentary pre-modern deposits and residual material culture cannot be ruled out entirely, however buried remains of significance that would preclude development are not expected.

5.42 The results of a review of the HER, cartographic sources and a site walkover at the River Cray (5) identified no historic structures associated with the river management within the Application Site. There is medium potential for previously unrecorded sub-surface deposits or finds associated with the historic development of the River Cray, however there are likely to be truncated along the western edge due to modern development. There are likely to date from the post-medieval period and be of local interest. There is generalised potential for underlying geoarchaeological deposits of interest, however buried remains of significance that would preclude development are not expected.

5.43 The results of a review of the HER, cartographic sources and a site walkover at the River Darent and the Dartford Salt Marshes (6) identified no river management structures associated with the River Darent within the Application Site, but identified post-medieval ditch systems involved with the management of the Salt Marshes (i.e., edge of 20th century saltings). The following features on the HER fall adjacent to the Application Boundary and the assessment has concluded that there is **Low** potential for sub-surface remains associated with these to survive within the Application Boundary due to modern disturbance: the modern wharf (KHER TQ 57 NW 1048) on the Darent and the circular enclosure of unknown date is recorded north of the Application Boundary in the centre of the Dartford Salt Marshes (KHER TQ 57 NW 1030). There is medium potential for previously unrecorded sub-surface deposits or finds associated with the management of the Darent and the Salt Marshes. These may date from the prehistoric and historic periods and be of local interest. There is generalised potential for underlying geoarchaeological deposits of interest, however buried remains of significance that would preclude development are not expected.

5.44 Geoarchaeological deposits within the Littlebrook substation are expected to lie c. 4 m – 7.20 m below ground surface (MOLA 2015). Anticipated ground works associated with the Proposed Development will not impact these buried early prehistoric horizons.

5.45 A large portion of the cable trench route is located along the line of existing road surfaces, which was archaeologically monitored in 1997 (RPS). Medieval masonry is known to have been left in situ near the West School Site (RPS 1997) (GLHER MLO71819; Figure 2a) and the medieval settlement at Littlebrook, Pond Farm (KHER TQ 57 NE 36; Figure 2c). The masonry walls near West School (GLHER MLO71819; Figure 2a), are overlain by 1.8 m of modern overburden. As such the excavation of the cable trench will not disturb these remains. The medieval settlement at Littlebrook (KHER TQ 57 NE 36; Figure 2c) has been partially destroyed, with partial survival on the eastern limit of Rennie Road. It is recommended that the cable trench is positioned along the western edge of Rennie Road to avoid this area of *in situ* archaeology.

Designated and Built Heritage Assets

5.46 No statutory designations (Listed Buildings, Conservation Areas, Scheduled Ancient Monuments or World Heritage Sites) are located within the Application Boundary. No

locally listed or non-designated built heritage assets are recorded within the Application Boundary.

5.47 In light of the proposed Electrical Connection route being below ground, anticipated effects to the setting of designated and non-designated built heritage assets are restricted to temporary effects during construction.

Electrical Connection Option 1A

5.48 Electrical Connection Option 1A, connects to Eastern Way from the south-east corner of the REP site along Norman Road to Bronze Age Way.

5.49 This route is located within the Area of High Archaeological Potential: AHAP 1 Thameside. There are no GLHER finds, features or events recorded within or adjacent to this route.

5.50 In June 2018, through ongoing engineering investigation and information received from local highway authorities relating to the Electrical Connection, specific locations were identified where the Application Boundary required extending to facilitate the installation of the Electrical Connection. This includes alterations to the route of Option 1A at the verge immediately south of Riverside Resource Recovery Limited (RRRL) (1) and at the junction between Norman Road and Picardy Manorway (2).

5.51 The two aforementioned areas contain no known designated / non-designated assets. They are located within an Area of High Archaeological Potential (AHAP) with high potential for underlying geoarchaeological deposits of interest and prehistoric occupation evidence. The deposit model indicates that the peat horizon is located 3 m below ground level, overlain by sterile Upper Alluvium and Made Ground deposits (Appendix D; Figure 14). As such the excavation of the cable trench will not impact the geo-archaeological deposits of interest. However, trenchless installation techniques at the junction between Norman Road and Picardy Manorway (2) may impact the buried Holocene sequence depending on the final design.

Previous Archaeological Investigations

5.52 None recorded within the route of Option 1A.

Non-Designated Heritage Assets

5.53 None recorded within the route of Option 1A.

Past Impacts, summary of identified / potential archaeological assets and statement of significance

5.54 The available evidence has been assessed in an attempt to determine the nature and extent of any previous impacts upon any potential below ground archaeological deposits, which may survive within the bounds of the Electrical Connection option.

5.55 There are no known designated or non-designated archaeological remains along the route of Option 1A. Excavation of the proposed cable trench, 450 mm wide and generally 1.2 m deep, is likely to disturb modern made ground associated with the existing road routes only.

5.56 The deposit model (QUEST 2018) indicates that the peat horizon is located 3 m below ground level, overlain by sterile Upper Alluvium and Made Ground deposits (Appendix D; Figure 14). As such the excavation of the cable trench will not impact the geo-

archaeological deposits of interest. However, trenchless installation techniques at the junction between Norman Road and Picardy Manorway (2) may impact the buried Holocene sequence depending on the final design. These deposits are considered of Local Significance and buried remains of significance that would preclude development are not expected. The potential for fragmentary early prehistoric residual material culture cannot be ruled out entirely, however buried remains of significance that would preclude development are not expected.

Designated and Built Heritage Assets

5.57 No statutory designations (Listed Buildings, Conservation Areas, Scheduled Ancient Monuments or World Heritage Sites) are located within the Application Boundary. No locally listed or non-designated built heritage assets are recorded within the Application Boundary.

5.58 In light of the proposed Electrical Connection route being below ground, anticipated effects to the setting of designated and non-designated built heritage assets are restricted to temporary effects during construction.

Electrical Connection Option 2A

5.59 Electrical Connection Option 2A, connects the REP site to Eastern Way via the start of Option 1 or Option 1A then follows Anderson Way, Mulberry Way, Church Manorway, Lower Way, West Street, Erith High Street, Manor Road, Slade Green Road, Hazel Road, Moat Lane, Howbury Lane to connect with the A206 at which point it will follow connection route 1 or 2B.

5.60 Part of the route is located within the Area of High Archaeological Potential: AHAP 1 Thameside and the Area of High Archaeological Potential: AHAP 4 Crayford Marshes and River Darent.

Previous Archaeological Investigations

5.61 None recorded within the route of Option 2A.

Non-Designated Heritage Assets

5.62 The GLHER records the following finds and features adjacent to this route: a Neolithic flint axe found in a dugout boat (possibly a forgery) close to the Church Manorway part of the route (GLHER MLO33082); peat horizons have been recorded during a watching brief adjacent to the cable route at Green Level Pumping Station (GLHER MLO040009); Early Mesolithic to Bronze Age flint scatter, hearth and lithic working site (GLHER MLO71814) and a hurdle trackway (GLHER MLO71817) close to the junction with Bronze Age Way; St John the Baptist Churchyard (GLHER MLO107276); 'West Stoff' (GLHER MLO26433) is a medieval to post-medieval house on West Street; an Iron Age to Romano-British coin (GLHER MLO10906) and a Roman objects of Bronze and pottery on Erith High Street (GLHER MLO26451); a scatter of Neolithic to Bronze Age flints at Slade Green Relief Road (GLHER MLO59772); a Palaeolithic flake (GLHER MLO7076) and a post-medieval landfill site on Howbury Lane (GLHER MLO72463).

5.63 The archaeological and historical background is largely similar to that of Electrical Connection route 1. The line of the Electrical Connection runs through an area of known prehistoric occupation, covered by an Area of Archaeological Potential (APA 1). The area is described as 'very dynamic' from the Mesolithic through to the Bronze Age (APA 1). The Holocene sequence has been investigated at a number of sites in the vicinity of the proposed cable route, including the Pirelli Works (Young *et al* 2012) and Alchemy Park (Batchelor and Young 2015; Batchelor et al 2016), close to the Thames

foreshore. The Erith foreshore also has the remains of a well-preserved Neolithic to Iron Age paleolandscape, which is exposed at low tide.

5.64 The Electrical Connection route runs through one of the most archaeologically significant sites in the borough, if not the region. The 1994 – 5 investigations, in advance of the construction of Bronze Age Way recorded an *in situ* flint scatter of over 3,000 artefacts, including cores, flakes, axes, scrappers and awls, along with a substantial quantity of burnt flint and charcoal that is believed to be a hearth. It is likely that this scatter, found within a peat deposit, represents a tool production centre. The area continued to be exploited in the Neolithic and Bronze Ages and evidence of human occupation and settlement in these periods is well represented. The 1995 watching brief by RPS also recorded a Bronze Age trackway (GLHER MLO71817) and a fragment of a Bronze Age boat (GLHER MLO71820). Prehistoric peat has also been identified at a number of locations within and adjacent to the Electrical Connection route (GLHER MLO72388, MLO98214, MLO71431, MLO77509).

5.65 As with Electrical Connection route 1 the area is rich in Palaeolithic, Mesolithic and Neolithic finds and features, along the full length of the Electrical Connection route.

Late Prehistoric – Romano-British

5.66 There is limited physical evidence for Iron Age occupation within the study area of Electrical Connection route 2A. Romano-British evidence comprises a number of residual finds spots and the site of a cremation cemetery (GLHER MLO13214), c. 220 m east of Slade Green Road. The assemblage of pottery fragments came from 20 vessels, five of which held cremations. This falls within the Crayford Marshes and River Darent Archaeological Priority Area (AHAP 4).

Early Medieval/Medieval

5.67 The first documented mention of Erith was in 695 within a charter gating certain lands, forty pieces at Swanscombe and Erith (Burrow undated). Erith was described as a fishing village in the Domesday Survey of 1086. Manor and church were given to Westminster abbey during the reign of Edward the confessor, but the Domesday survey of 1086 records them as being held by Odo, Bishop of Bayeux. Henry VIII granted the manor to the Countess of Shrewsbury, and in 1748 it was in the hands of John Wheatley.

5.68 The Grade II* listed St John the Baptist Church (GLHER MLO107276) is located to the immediate north of Bronze Age Way (although the GLHER records it within the line of Bronze Age Way) and has served as a place of worship for Erith since at least the Norman times, the stone and flint building dating largely from the Twelfth century, although there may be some earlier elements. The church was altered and expanded throughout the medieval period, and heavily restored in the 19th century. Archaeological excavations have uncovered evidence of a 13th century occupation event and medieval oak buildings along West Street, and the predecessor of the Cross Keys public house, on the High Street, dates to the 1590s. This area is identified as an Area of High Archaeological Potential (AHAP 12: Crayford).

5.69 The scheduled remains of Howbury Moated Manor (NHLE 1001986) are located 300 m to the east of Electrical Connection route 2A, at Slade Green. The place name 'Hoobury' was first recorded in the 9th century and derives from the Saxon 'hoo', meaning a spur of land jutting into water and 'bury', which is a mound of earth or embankment surrounded by water. The medieval manor dates to the 11th century and consist of a wet moat and ashlar walls surrounding a moated platform. The moat and surrounding area is registered as an Archaeological Priority Area (AHAP 5).

Post-medieval/Modern

5.70 In 1797 Edward Hasted described Erith as "*consisting of one small street of houses, which leads to the water side*", and mentions two annual fairs. In 1808 the opening of

the Sand Pits at Fraser Road provided a new industry and ballasting of light sailing ships. From 1864 industry rapidly developed, including the ordnance factory of Vickers, Sons & Maxim, Callender's Cable & Construction Co Ltd, oil refiners, saw mills and many small chemical industries (Barrow, undated).

5.71 The GLHER records a number of post-medieval / modern finds or features along the route of Electrical Connection route 2A. These include designated and non-designated built heritage features, landfill sites, boats and riverine features along the Thames foreshore and WWII defences.

Past Impacts, summary of identified / potential archaeological assets and statement of significance

5.72 The available evidence has been assessed in an attempt to determine the nature and extent of any previous impacts upon any potential below ground archaeological deposits, which may survive within the bounds of the Electrical Connection Options.

5.73 The GLHER records a number of finds and features adjacent to this route (see paragraph 5.58). These sites were recorded prior / during the construction of the roads and there is **Low** potential for associated material to survive within the road corridor.

5.74 Excavation of the proposed cable trench, 450 mm wide and 1.2 m deep, is likely to disturb modern made ground associated with the existing road routes only. The potential for fragmentary pre-modern deposits and residual material culture cannot be ruled out entirely, however buried remains of significance that would preclude development are not expected.

Designated and Built Heritage Assets

5.75 Electrical Connection Option 2A passes through two Conservation Areas: The Erith Riverside Conservation Area and the Oak Road, Slade Green Conservation Area. The following listed buildings are located adjacent to the proposed connection route: Grade II* listed Parish Church of St John the Baptist and the grade II listed 28 and 30 Erith High Street. The locally listed Railway Tavern is located adjacent to the proposed cable route at Slade Green.

5.76 In light of the proposed Electrical Connection route being below ground, anticipated effects to the setting of designated and non-designated built heritage assets are restricted to temporary effects during construction.

Electrical Connection Option 2B

5.77 Electrical Connection Option 2B, utilises Option 1, 1A or 2A to the A206 roundabout with Joyce Green Lane and Central Road. Option 2B follows Joyce Green Way, along an existing pathway east and along an unnamed access road to Rennie Drive (all within Dartford, Kent).

Previous Archaeological Investigations

5.78 The KHER records the following archaeological investigations within or immediately adjacent to the route of Option 2B. The site of an Anglo-Saxon burial ground was excavated by the South London Field Studies Society (KHER EKE4780; TQ 57 NE 9). A total of seven or eight skeletons and a few small fragments of Saxon pottery were found near Littlebrook Farm, Dartford in 1883. A second investigation is recorded at the site of the roundabout on Rennie Road. The 1972 investigation by Harold Mair recorded the site of a medieval settlement in the area known as Pond Field (KHER TQ 57 NE 36). The site at Littlebrook has now been partially destroyed, although an area of it still

survives buried under the recently widened embankment which carries the road traffic out to the power station, i.e. on the eastern limit of the Rennie Road application area.

Non-Designated Heritage Assets

5.79 The KHER records the following finds and features within or adjacent to this route: the Joyce Green Infectious Diseases Hospital (KHER TQ 57 NW 45); the site of an Anglo-Saxon burial ground was excavated by the South London Field Studies Society (KHER EKE4780; TQ 57 NE 9), a possible linear cropmark (KHER TQ 57 NE 127); the site of three undated ring ditches (KHER TQ 57 NE 1028; TQ 57 1034; TQ 57 1027), the site of a post-medieval gravel pit (KHER TQ 57 NE 1038).

Prehistoric

5.80 Archaeological investigations at Joyce Green Lane (KHER EKE8417) and Bondfield Walk (KHER EKE8205), towards the eastern end of the Electrical Connection route have identified a small prehistoric pit, and undated ditch and a sub-circular enclosure, identified previously by aerial photographs, and a linear ditch were excavated. Only a small number of residual artefacts were recovered from the archaeological evaluation at land adjacent to University Way and Joyce Green Cemetery (KHER EKE10368).

5.81 As with Erith Marshes, the Littlebrook substation is located on the alluvial floodplain of the River Thames. Changes in sea level associated with the formation and retreat of glaciers resulted in the former landscapes, comprising early prehistoric semi-terrestrial peat horizons, accumulation of estuarine muds and clay and intertidal salt marshes. The geoarchaeological potential of the area has assessed in various desk based assessments (Scott Wilson 2003), and intrusive geoarchaeological investigations in the vicinity of power station. The 2015 MOLA geoarchaeological works in Zone A of Littlebrook substation recorded Late Devensian Shepperton gravels overlain by 15 m thick peat and alluvium deposits reaching to approximately -12 m OD. With the exception of BH1, the top of the alluvial and peat deposits of interest were recorded between 4 m – 7.20 m below ground surface. Several landsurfaces were encountered through the deposits, including Tilbury I and Tilbury III peats (Mesolithic and Neolithic/Bronze Age deposits respectively).

Late Prehistoric – Romano-British

5.82 The site of a Romano-British cremation cemetery is recorded near Joyce Green (KHER TQ 57 NW 7), c. 150 m north of the Electrical Connection route. The site comprised several Roman urn burials 'consisting of small groups of urns here and there', were found in the late 19th century when gravel pits were first opened at Joyce Green.

5.83 Limited land reclamation of the Littlebrook area may have occurred from the Roman period, although limited Roman occupation evidence is recorded in the KHER within the study area of the Littlebrook substation.

Early Medieval/Medieval

5.84 Littlebrook was mentioned in 10th century records when Alfege gave two-thirds of his lands in Littlebroc, with other property, to the Cathedrals of Canterbury and Rochester. This land was later withheld by Leofsune, who had married the widow of Eadric, Alfege's nephew, but the archbishop later recovered it for Canterbury and Rochester in a trial held at Erhede (Crayford). Around 988, Littlebrook came into the possession of Ethelred, and in 995 he gave Stone and Littlebrook to Godwyn, Bishop of Rochester. Stone, along with other properties owned by Rochester Cathedral, was subsequently seized by Odo, Bishop of Bayeux, but in 1076 these were recovered by Archbishop Lanfranc, at the King's command at an Assembly at Penenden Heath, and were restored to Bishop Gundulf and Rochester Cathedral (Hasted 1778).

5.85 The 1086 Domesday Survey recorded the ownership of Stone (Estanes) by the Bishop of Rochester and also Littlebrook (but unrecorded). There were 12 smallholders, 11 ploughs, a mill, a fishery, woodland and sixty pigs.

5.86 Littlebrook is referred to in later charters as Littlebroc and Lytlanbroce and was once part of the Manor of Stone. A reference to the Manor in 1255 refers to 'fourteen acres of meadow or grass on the marsh'. In 1340 the land passed to John de Northwood for a further twenty-five years until he died in 1365. By 1402 the land had passed to John Loffwyke, and when he died, passed to the Apylton family until the death of Lady Appleton in 1719. The manor was then bought by the Stone family.

5.87 In 1883 the archaeologist and antiquarian F.C.J Spurrell reported the discovery of some Anglo Saxon graves at Littlebrook and in 1885 mapped a complex of embankments at Littlebrook, known as 'The Walls' (Plate 4). Spurrell believed that the earthworks were the remains of a system of tide walls mentioned in a charter of King Ethelred in AD 995 and possibly indicate the presence of an early medieval harbour. The 'Tide Walls' were believed to be entirely destroyed by the construction of the Littlebrook power station, although it is possible that below ground remains survive. The tide walls were mapped in the 2005 Scott Wilson Environmental Statement, the south-east corner of the embankments run along the line of Rennie Road, along the line of the proposed cable trench.

5.88 At the site of the roundabout on Rennie Road, the site of a medieval settlement in the area known as Pond Field (KHER TQ 57 NE 36) by Harold Mair. In 1972 an excavation of the site revealed a rectangular building measuring 8.5 m x 8 m (Plate 5). The walls were formed by several courses of mortared chalk and flint. The site at Littlebrook has now been partially destroyed, although an area of it still survives buried under the recently widened embankment which carries the road traffic out to the power station, i.e. on the eastern limit of the application area along Rennie Road.

5.89 A review of historic mapping records industrial activity in the eastern limit of the route: the 1898-1899 Ordnance Survey (Figure 16) records 'old gravel pits' and 'Joyce Green gravel pits'. The Joyce Green Hospital is first recorded on the 1910 Ordnance Survey (Figure 17) until 1983-87 (Figure 21). Following its demolition the area was redeveloped with housing and the road along which the electrical cable is proposed was constructed.

Past Impacts, summary of identified / potential archaeological assets and statement of significance

5.90 The available evidence has been assessed in an attempt to determine the nature and extent of any previous impacts upon any potential below ground archaeological deposits, which may survive within the bounds of the Electrical Connection route options.

5.91 The KHER records the following finds and features within or adjacent to this route: the Joyce Green Infectious Diseases Hospital (KHER TQ 57 NW 45); the site of an Anglo-Saxon burial ground was excavated by the South London Field Studies Society (KHER EKE4780; TQ 57 NE 9), a possible linear cropmark (KHER TQ 57 NE 127); the site of three undated ring ditches (KHER TQ 57 NE 1028; TQ 57 1034; TQ 57 1027), the site of a post-medieval gravel pit (KHER TQ 57 NE 1038). These sites were recorded prior to the construction of the roads and there is **Low** potential for associated material to survive within the road corridor.

5.92 The utilisation of existing road surfaces indicates that the excavation of the majority of Electrical Connection Option 2B to a depth of 1.2 m will disturb modern deposits associated within the construction of the existing roads. The eastern portion of the

Option 2B, is located on gravel paths rather than public highways; horizontal truncation for this stretch is likely to be more superficial.

5.93 There are no known features within this part of the Electrical Connection route. There is potential for fragmentary prehistoric, Roman, medieval and post-medieval deposits and residual material, however buried remains of significance that would preclude development are not expected.

Designated and Built Heritage Assets

5.94 No designated or non-designated built heritage assets are recorded within or immediately adjacent to the Electrical Connection Option 2B (Figure 3).

6.0 Proposed Development of the Electrical Connection Options and Predicted Impact on Archaeological Assets

The Proposed Development

6.1 To export electricity to the electricity distribution network owned and operated in the region by UK Power Networks, a new 132 kV cable (i.e. underground) connection to Littlebrook substation (with other possible reinforcement works to be advised by UK Power Networks after completing study). The 'connection' comprises a trefoil of cables (3 cables laid together) carrying 3 circuits.

6.2 The Electrical Connection route: REP would be connected to the existing National Electrical Transmission System ('NETS') via a new 132 kV distribution network connection, the route options for which (shown in Figure 1.3, of the ES) are located within the London Borough of Bexley and Dartford Borough Council, to a new substation within the REP site.

6.3 In consultation with UK Power Networks ('UKPN'), the Applicant has considered differing Electrical Connection route options to connect to the existing Littlebrook substation located south east of REP.

6.4 Final Electrical Connection route options have been included within the Application Boundary. Only a single route will be constructed and confirmed once ongoing physical and engineering investigations are completed.

6.5 The Electrical Connection would comprise a trefoil of cables (3 cables laid together to comprise a single 3-phase circuit), buried in a cable trench typically 450 mm wide and with 900 mm cover (except where there is potential for trenchless installation or a localised deeper trench to be required to pass below a specific constraint) when laid under highway footways and carriageways, with jointing pits approximately every 500 m along the route. To provide 900 mm typical cover, with c. 160 mm diameter ducts and 50 mm duct bedding, the excavation required would typically be 1.2 m deep. The proposed Electrical Connection Options generally follow existing carriageway routes.

6.6 At Littlebrook substation the connection point will be fitted to existing gas insulated switchgear (GIS) which has already been constructed between Rennie Drive and Albion Road. Works around the substation will consist of the installation and connection of 132 kV cables, however no external building works would be required.

6.7 There are four Electrical Connection Options to connect the REP site and the Littlebrook substation, Dartford Kent, predominately utilising existing road systems (Figure 1). These are described in paragraph 1.16.

Potential Impacts

6.8 Taking into consideration the utilisation of existing road routes and infrastructure at the Cory and Littlebrook sites the following potential impacts are identified:

	Known or potential Non-Designated Archaeological Remains	Potential Impacts on Non-Designated Archaeological Assets	Designated and Built Heritage Assets
Electrical Connection route 1	The connection from the south-west corner of the REP site to Eastern Way along the western limit of Crossness Nature Reserve, is located on gravel paths rather than public highways;	The utilisation of existing road surfaces indicates that the excavation of the majority of Electrical Connection Option 1 to a general depth of 1.2 m will disturb modern	In light of the Electrical Connection route being below ground, anticipated effects to the setting of

	horizontal truncation for this stretch is likely to be more superficial. The deposit model (QUEST 2018) indicates that the peat horizon is located 3m below ground level, overlain by sterile Upper Alluvium and Made Ground deposits (QUEST 2018, Figure 12, 13 and 14). As such the excavation of the cable trench along the edge of the Crossness Nature Reserve will not impact the geo-archaeological deposits of interest. The potential for fragmentary pre-modern deposits and residual material culture cannot be ruled out entirely, however buried remains of significance that would preclude development are not expected. Low potential for previously unrecorded finds or features due to the utilisation of existing road systems. Consideration of the alterations to the route of Option 1 identified no known heritage assets that would be impacted by the proposed development at the River Cray (5). There is medium potential for previously unrecorded sub-surface deposits or finds associated with the historic development of the River Cray, however there are likely to be truncated along the western edge due to modern development. These are likely to date from the post-medieval period and be of local interest. There is generalised potential for underlying geoarchaeological deposits of interest, however buried remains of significance that would preclude development are not expected. The results of a review of the HER, cartographic sources and a site walkover at the River Darent and the Dartford Salt Marshes (6)	deposits associated within the construction of the existing roads. The excavation of the cable trench and HDD may result in the occasional removal of pre-modern deposits and residual material culture of Local Significance. This is considered a negligible magnitude of impact and negligible effect; not significant in EIA terms.	designated and non-designated built heritage assets are restricted to temporary effects during construction.

	identified no river management structures associated with the River Darent within the Application Site, but identified post-medieval ditch systems involved with the management of the Salt Marshes (i.e. edge of 20th century saltings). There is medium potential for previously unrecorded sub-surface deposits or finds associated with the management of the Darent and the Salt Marshes. These may date from the prehistoric and historic periods and be of local interest. There is generalised potential for underlying geoarchaeological deposits of interest, however buried remains of significance that would preclude development are not expected. The Kent Historic Environment Record records *in situ* medieval remains under the eastern embankment of Rennie Road, associated with Pond Farm, Littlebrook. Positioning of the cable trench along the western edge of Rennie Road would be advisable, if possible, to avoid disturbance of associated non-designated archaeological remains.		
Electrical Connection route 1A	Low potential for previously unrecorded finds or features due to the utilisation of existing road systems. The potential for fragmentary pre-modern deposits and residual material culture cannot be ruled out entirely, however buried remains of significance that would preclude development are not expected. The deposit model (QUEST 2018b) indicates that the peat horizon is located 3 m below ground level, overlain by sterile Upper Alluvium and Made Ground deposits. As such the excavation of the cable trench along the edge of Norman Road and the Crossness Nature	The utilisation of existing road surfaces indicates that the excavation of Electrical Connection Option 1A to a general depth of 1.2 m will disturb modern deposits associated within the construction of the existing roads. The excavation of the cable trench and HD may result in the fragmentary removal of pre-modern deposits and residual material culture of Local Significance. This is considered a negligible magnitude of impact and negligible effect; not significant in EIA terms.	In light of the Electrical Connection route being below ground, anticipated effects to the setting of designated and non-designated built heritage assets are restricted to temporary effects during construction.

	Reserve will not impact the geo-archaeological deposits of interest. However, trenchless installation techniques at the junction between Norman Road and Picardy Manorway (2) may impact the buried Holocene sequence depending on the final design. These deposits are considered of Local Significance and buried remains of significance that would preclude development are not expected.		
Electrical Connection route 2A	Low potential for previously unrecorded finds or features due to the utilisation of existing road systems. The potential for fragmentary pre-modern deposits and residual material culture cannot be ruled out entirely, however buried remains of significance that would preclude development are not expected.	The utilisation of existing road surfaces indicates that the excavation of Electrical Connection Option 2A to a depth of 1.2 m will disturb modern deposits associated within the construction of the existing roads. The excavation of the cable trench may result in the fragmentary removal of pre-modern deposits and residual material culture of Local Significance. This is considered a negligible magnitude of impact and negligible effect; not significant in EIA terms.	In light of the Electrical Connection route being below ground, anticipated effects to the setting of designated and non-designated built heritage assets are restricted to temporary effects during construction.
Electrical Connection route 2B	Low potential for previously unrecorded finds or features due to the utilisation of existing road systems. The potential for fragmentary pre-modern deposits and residual material culture cannot be ruled out entirely, however buried remains of significance that would preclude development are not expected.	The utilisation of existing road surfaces indicates that the excavation of Electrical Connection Option 2B to a depth of 1.2 m will disturb modern deposits associated within the construction of the existing roads. The eastern portion of the Option 2B, is located on gravel paths rather than public highways; horizontal truncation for this stretch is likely to be more superficial. The excavation of the cable trench may result in the fragmentary removal of pre-modern deposits and residual material culture of Local Significance. This is considered a negligible magnitude of impact and negligible effect; not significant in EIA terms.	In light of the Electrical Connection route being below ground, anticipated effects to the setting of designated and non-designated built heritage assets are restricted to temporary effects during construction.

6.9 The following sections are located away from the existing road system and have potential for previously unrecorded sub-surface archaeological remains of Local Significance: the section of Electrical Connection route 1 south of the A206 bridge over the River Cray, identified as '(5)' on Figure 2; the section of Electrical Connection route 1 by the River Darent and the Dartford Salt Marshes (6), Figure 2; the section of Electrical Connection route 1A at the junction between Norman Road and Picardy Manorway (2), Figure 2 and the section of Electrical Connection route 2B (between where it leaves Electrical Connection route 1 to chainage 0.5 km – see Figure 2, which is located on a gravel path rather than public highway. There is potential for pre-modern deposits and residual material culture of local heritage significance within these areas. Buried remains of significance that would preclude development are not expected.

6.10 The excavation of the cable trench in these areas, including HDD, may result in the fragmentary removal of pre-modern deposits and residual material culture of local heritage significance. Buried remains of significance that would preclude development are not expected. Further works within these areas is recommended to be defined in a Written Scheme of Investigation (WSI) to be submitted to and approved by the relevant planning authority prior to commencement of the authorised development. The need for a WSI, if required, is secured in Requirement 7 of the draft DCO (**Document Reference 3.1**).

7.0 Summary and Conclusions

7.1 This heritage desk-based assessment considers Riverside Energy Park (REP), London Borough of Bexley and Electrical Connection to Littlebrook substation, Dartford, Kent. (Figure 1). This desk-based assessment has been instructed to inform an Environmental Statement (ES).

7.2 This desk-based assessment forms an update to the previous desk-based assessment (Orion Heritage April 2018) produced to inform a Preliminary Environmental Information Report (PEIR). The updated assessment considers alterations to the Application Boundary in regards to the Electrical Connection route options, the results of the updated deposit modelling (QUEST 2018b) and additional detail regarding the development proposal.

7.3 This desk-based assessment considers the archaeological and heritage constraints of the Application Boundary which comprises the following three areas:

- The proposed REP site, approximately 7 hectares (ha) of land located approximately at (NGR) TQ 49467 80680, accessed off Norman Road, Belvedere, London Borough of Bexley DA17 6JY. This site is located immediately to the west of the existing Riverside Resource Recovery Facility (RRRF) constructed in 2011 by Cory.
- The line and terminus of the Electrical Connection, predominantly along the existing road network through residential areas of Erith, Crayford and Dartford to the existing connection point at the Littlebrook substation.
- Main Temporary Construction Compound, proposed on land to the immediate west of Norman Road.

7.4 The Proposed Development involves the construction of an integrated electrical generating station that will supply low carbon/renewable electricity. The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the 'Proposed Development'). As the generating capacity of REP will be in excess of 50 MWe capacity it is classified as a Nationally Significant Infrastructure Project (NSIP) under section 14 and 15 of the PA 2008 and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.

7.5 The Proposed Development will not require marine works (as indicated in the initial scoping report). The existing jetty and barges will be used and as a result no dredging works are proposed, nor will there be a need to install temporary structures within the marine environment. As such no effects to archaeology within the marine environment were assessed.

7.6 The assessment has been prepared on the basis of the information on REP and its construction as provided in Chapter 3 of the ES and the provisions of the DCO.

Non-designated heritage assets

7.7 The QUEST deposit model concluded that the archaeological potential of the REP site is considered **Low** on the basis of the likely depth of the sediments and findings from nearby sites (QUEST 2018b). This assessment has similarly concluded **Low** potential for in situ occupation of prehistoric, Roman, early medieval, medieval and post-medieval periods. Therefore groundworks associated with the Proposed Development are not considered likely to disturb *in situ* archaeological remains.

7.8 The geoarchaeological deposit model identified two sequences of interest from the south-west of the Application Site: from the locations of BH04 (where a complex

arrangement of mineral-rich and organic-rich/peat deposits was observed in the Lower Alluvium) and between BH12 (where the peat was recorded at 3 m thick) and BH09/BH10 (where peat was entirely absent). The significance of these deposits is considered Local.

7.9 The deposit model (QUEST 2018b) indicates that the peat horizon is located 3 m below ground level, overlain by sterile Upper Alluvium and Made Ground deposits (QUEST 2018, Figure 12, 13 and 14). As such physical impacts to the geoarchaeological deposits of interest is restricted to the excavation of the bunker, attenuation tank(s) and the pile foundations within the main REP building. The bunker is located within the area which has been highlighted by QUEST of particular geo-archaeological interest. The loss of these geoarchaeological deposits of interest is considered a medium adverse magnitude of impact due to the loss of research potential / significance. The significance of this effect is considered **Minor**.

7.10 It is recommended that two boreholes are retained for palaeoenvironmental assessment / analysis from the locations of BH04 and between BH12 and BH09/ BH10 (QUEST 2018b, Figure 3). It is recommended that this is secured through the production of a written scheme of investigation (WSI) once the DCO has been made.

7.11 The four Electrical Connection Options have been assessed. No significant effects to archaeology or heritage are anticipated. The following sections are located away from the existing road system and have potential for previously unrecorded sub-surface archaeological remains of Local Significance: the section of Electrical Connection route 1 south of the A206 bridge over the River Cray (5); the section of Electrical Connection route 1 by the River Darent and the Dartford Salt Marshes (6); the section of Electrical Connection route 1A at the junction between Norman Road and Picardy Manorway (2) and the section of Electrical Connection route 2B (between where it leaves Electrical Connection route 1 to chainage 0.5 km – see ES **Figure 5.2**) which is located on a gravel path rather than public highways. Localised areas of further archaeological work may be warranted depending on the final design. It is recommended that this is secured through the production of a written scheme of investigation (WSI) once the DCO has been made and the location and design of the cable route fixed.

7.12 No locally listed or non-designated built heritage assets are recorded within the Application Boundary.

Designated heritage assets

7.13 No statutory designations (Listed Buildings, Conservation Areas, Scheduled Ancient Monuments or World Heritage Sites) are located within the Application Boundary.

7.14 In light of the proposed Electrical Connection route being below ground and utilising an existing sub-station at Littlebrook substation, there are no anticipated effects to the setting of designated and non-designated built heritage assets, through effects to their settings.

7.15 The assessment has identified that the setting of the following designated and built heritage assets as being potentially sensitive to change within the Application Site:

- The Crossness Conservation Area is located c.650 m west of the Application Boundary;
- Grade I listed Crossness Pumping Station (NHLE 1064241) c.760 m to the west of the Application Boundary;
- Two grade II listed workshops at Crossness Pumping Station (NHLE 1064216, 1250557), c. 770 m – 880 m to the west of the Application Boundary;
- A locally listed engine house at Crossness Sewage Treatment Work (GLHER MLO103261);

- The grade II listed jetty at Dagenham Dock (NHLE 1391706) 600 m to the north-west of the study site, on the northern bank of the River Thames;
- Four locally listed 20th century concrete Police Boxes (GLHER MLO103263), c. 400 – 750 m west of the study site and
- The scheduled and grade II listed Lesnes Abbey (NHLE 1002025, 1359415), c. 1.5 km south-west of the Application Site.

7.16 The study site forms part of the wider setting of these built heritage assets. However, the study site is considered to make a **Negligible** to **Minor** contribution to the significance of these monuments. The construction of REP, and the c.113 m AOD (maximum parameter) tall chimney stack, will result in a change in skyline behind the conservation area and listed / locally listed assets. Taking into consideration the fact that Crossness Power Station had, until the 1950s a chimney stack of 207 ft (63 m) and the highly industrialised character of the existing landscape, which includes similar stacks in the immediate vicinity and wind turbines to the north of the River Thames, the insertion of an additional chimney stack is considered to form a slight change in the wider skyline of these assets. In terms of the loss of significance of these monuments this is considered very **Slight / Low**.

Sources

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Kent History Centre (KHC)

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Heritage Gateway - www.heritagegateway.org.uk

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Pastscape - www.pastscape.org.uk

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1973 medieval tiled hearth from Littlebrook

1986 Site plan of Pond Field, Littlebrook

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Cartographic / Archival Material

1869 – 1870 OS 1:10,560 scale map, REP site

1898 – 1899 OS 1:10,560 scale map, REP site

1910 OS 1: 10,560 scale map, REP site

1938 OS 1: 10,560 scale map, REP site

1961-69 OS 1: 10,000 scale map, REP site

1975-76 OS 1: 10,000 scale map, REP site

1993-96 OS 1: 10,000 scale map, REP site

2017 OS 1:10,000 scale map, REP site

1769 Andrews and Drury map of Kent

1826 Volume of maps of the levels surveyed by W. Hubbard of Dartford

1898 – 1899 OS 1:10,560 scale map, Littlebrook site

1910 OS 1: 10,560 scale map, Littlebrook site

1938 OS 1: 10,560 scale map, Littlebrook site

1961 OS 1: 10,000 scale map, Littlebrook site

1974-77 OS 1: 10,000 scale map, Littlebrook site

1983-87 OS 1: 10,000 scale map, Littlebrook site

2017 OS 1:10,000 scale map, Littlebrook site

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1662 View of Erith, produced by Jonas Moore in 1662. Ref: BL Maps.Crace I

1900 Photograph of Belvedere Dock and Jetty, with plan of Belvedere Mills on reverse. Ref: BA PHBEL/13/6

1829 Plan of Erith Marshes Ref: BA ANSHA/4/4

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APPENDIX A - GAZETTEER OF ARCHAEOLOGICAL ASSETS (Figure 2)

In order to understand the nature and extent of the surrounding archaeological resource, a study area of a 1km radius from the site centre was adopted. The following gazetteer represents all of the entries from the Greater London Historic Environment Record; deletions of HER entries with the same number in different locations has only occurred if not relevant to the site. Intrusive event entries have been included within this gazetteer where no associated monument reference. Where previously unrecorded heritage assets are identified, these will be given an Orion reference e.g. (Orion X), otherwise these will be referenced by the Greater London Historic Environment Record, Kent Historic Environments Record or English Heritage reference number.

Abbreviations:

GLHER: Greater London Historic Environments Record
MONUID: Greater London Historic Environments Record monument identification reference number
KHER: Kent Historic Environments Record

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO10939	BELVEDERE POWER STATION	FINDSPOT; FINDSPOT	UNKNOWN
MLO26449	ERITH	FOREST	UNKNOWN
MLO67437	CRESENT ROAD (NO 19-25)/MANOR ROAD (NO 61-65), ERITH, BEXLEY, LONDON {UNDATED FEATURES}	POST HOLE	UNKNOWN
MLO71205	NORMAN RD	DITCH	UNKNOWN
MLO72308	56 PEARESWOOD RD SLADE GREEN	CHALK PIT	UNKNOWN
MLO75296	LOWER ROAD [FORMER BELVEDERE FOOTBALL GROUND], BELVEDERE, NORTH BEXLEY, KENT {UNDATED DITCHES}	DITCH	UNKNOWN
MLO7809	SLADE GREENNW OF HOWBURY HOUSE	BARROW	UNKNOWN
MLO102836	SOUTH ROAD/COLYERS LANE [ERITH PITS] ERITH, BEXLEY {MAMMALIAN FOSSILS AND PALAEOLITHIC LITHIC ARTEFACTS}	LITHIC WORKING SITE; KILL SITE	LOWER PALAEOLITHIC
MLO102864	WHITEHALL LANE/BRIDGE ROAD [SLADES GREEN PIT/FURNER'S NEW PIT/NORTH END PIT] NORTH END, BEXLEY {PALAEOLITHIC TOOL MANUFACTURE AND KILL SITE}	KILL SITE; LITHIC WORKING SITE	LOWER PALAEOLITHIC
MLO102867	NORTH END ROAD/COLYERS LANE [NORRIS' BRICKEARTH PIT] NORTH END, BEXLEY {PALAEOLITHIC KILL SITE AND TOOL MANUFACTURE}	KILL SITE; LITHIC WORKING SITE	LOWER PALAEOLITHIC
MLO102946	WHITEHALL LANE/HOWBURY LANE [TALBOT'S PIT] NORTH END, BEXLEY {PALAEOLITHIC TOOL WORKSHOP}	LITHIC WORKING SITE	LOWER PALAEOLITHIC
MLO102535	IRON MILL LANE [BARNES CRAY PRIMARY SCHOOL], LONDON, DA1 {PREHISTORIC FLINT/DEBITAGE, PREHISTORIC? LINEARS}	FIELD BOUNDARY?; LINEAR FEATURE; ARTEFACT SCATTER	LOWER PALAEOLITHIC TO MEDIEVAL

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO102864	WHITEHALL LANE/BRIDGE ROAD [SLADES GREEN PIT/FURNER'S NEW PIT/NORTH END PIT] NORTH END, BEXLEY {PALAEOLITHIC TOOL MANUFACTURE AND KILL SITE}	KILL SITE; LITHIC WORKING SITE	LOWER PALAEOLITHIC
MLO7076	MOAT LANE, SLADE GREEN, BEXLEY {PALAEOLITHIC FLAKE}	FINDSPOT	PALAEOLITHIC
MLO7873	HOWBURY FARM, SLADE GREEN {LITHIC IMPLEMENT}	FINDSPOT	PALAEOLITHIC
MLO8466	ERITH	FINDSPOT	PALAEOLITHIC
MLO10897	PERRY STREET/THAMES ROAD [STONEHAMS PIT] CRAYFORD, BEXLEY {PALAEOLITHIC WORKING FLOOR/KILL SITE}	KILL SITE; LITHIC WORKING SITE	PALAEOLITHIC
MLO10931	CRAYFORD	FINDSPOT; FINDSPOT	PALAEOLITHIC
MLO13156	NORTH END	FINDSPOT; FINDSPOT	PALAEOLITHIC
MLO23113	CRAYFORD RD	LITHIC WORKING SITE	PALAEOLITHIC
MLO26938	ERITH	FINDSPOT	PALAEOLITHIC
MLO6686	ERITH	FINDSPOT	PALAEOLITHIC
MLO7075	ERITH	FINDSPOT	PALAEOLITHIC
MLO7076	MOAT LANE, SLADE GREEN, BEXLEY {PALAEOLITHIC FLAKE}	FINDSPOT	PALAEOLITHIC
MLO8290	NORTHEND	OCCUPATION SITE	PALAEOLITHIC
MLO8446	ERITH	FINDSPOT	PALAEOLITHIC
MLO8465	BEXLEY ROAD [ERITH GARDENS], ERITH, BEXLEY {PALAEOLITHIC AXE}	FINDSPOT	PALAEOLITHIC
MLO8467	NORTHUMBERLANDHEATH	FINDSPOT	PALAEOLITHIC
MLO8468	ERITH	FINDSPOT	PALAEOLITHIC
MLO102533	IRON MILL LANE [THE BARNES CRAY PRIMARY SCHOOL], LONDON, DA1 {PALAEOLITHIC HANDAXE}	FINDSPOT	MIDDLE PALAEOLITHIC TO UPPER PALAEOLITHIC
MLO71430	PICARDY MANORWAY [NORMAN PARK], BELVEDERE, BEXLEY {MESOLITHIC TO EARLY NEOLITHIC BLADE}	FINDSPOT	EARLY MESOLITHIC TO EARLY NEOLITHIC
MLO71430	PICARDY MANORWAY [NORMAN PARK], BELVEDERE, BEXLEY {MESOLITHIC TO EARLY NEOLITHIC BLADE}	FINDSPOT	EARLY MESOLITHIC TO EARLY NEOLITHIC
MLO71814	BRONZE AGE WAY, ERITH, BEXLEY {MESOLITHIC FLINT SCATTER}	FLINT SCATTER; HEARTH; PEAT; LITHIC WORKING SITE	EARLY MESOLITHIC TO LATE BRONZE AGE
MLO99178	CHURCH MANORWAY, [PIRELLI WORKS], ERITH, {PREHISTORIC	ALLUVIUM; TRACKWAY	EARLY MESOLITHIC TO LATE IRON AGE

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
	SURFACES AND POSSIBLE NEOLITHIC TIMBER TRACKWAY}		
MLO103989	MULLBERRY WAY/CHURCH MANORWAY [GREEN LEVEL PUMPING STATION], ERITH, BEXLEY, DA8 {MESOLITHIC/NEOLITHIC PEAT DEPOSIT}	PEAT	EARLY MESOLITHIC TO LATE NEOLITHIC
MLO106545	CRABTREE MANORWAY NORTH, BELVEDERE, BEXLEY {MESOLITHIC TO BRONZE AGE PEAT}	PEAT	LATE MESOLITHIC TO LATE BRONZE AGE
MLO98214	CRABTREE MANORWAY SOUTH, BELVEDERE, DA17 {PREHISTORIC PEAT}	PEAT	LATE MESOLITHIC TO LATE BRONZE AGE
MLO99174	IMPERIAL WAY, [LAND AT], BELVEDERE, {LATE MESOLITHIC TO EARLY BRONZE AGE ENVIRONMENT}	PEAT; FLOOD DEPOSIT; ALLUVIUM; COLLUVIUM	LATE MESOLITHIC TO MIDDLE IRON AGE
MLO24245	ERITH	FINDSPOT	MESOLITHIC
MLO26867	ERITH	FINDSPOT; FINDSPOT	MESOLITHIC
MLO26868	ERITH	FINDSPOT	MESOLITHIC
MLO26869	ERITH	FINDSPOT; FINDSPOT	MESOLITHIC
MLO26870	ERITH	FINDSPOT	MESOLITHIC
MLO26871	ERITH	FINDSPOT; FINDSPOT; FINDSPOT	MESOLITHIC
MLO26872	ERITH	FINDSPOT; FINDSPOT	MESOLITHIC
MLO26873	ERITH	FINDSPOT; FINDSPOT	MESOLITHIC
MLO26874	ERITH	FINDSPOT	MESOLITHIC
MLO26875	ERITH	FINDSPOT; FINDSPOT	MESOLITHIC
MLO26878	ERITH	FINDSPOT; FINDSPOT	MESOLITHIC
MLO26937	ERITH	FINDSPOT	MESOLITHIC
MLO27025	ERITH	FINDSPOT	MESOLITHIC
MLO27026	ERITH	FINDSPOT	MESOLITHIC
MLO27048	ERITH	FINDSPOT	MESOLITHIC
MLO27051	ERITH	FINDSPOT; FINDSPOT; FINDSPOT	MESOLITHIC
MLO99168	THAMESMEAD, [CROSSNESS SEWAGE TREATMENT WORKS], {SITE OF LATE MESOLITHIC BURIED FOREST}	PEAT; SUBMARINE FOREST	MESOLITHIC
MLO33082	ERITH MARSHES	FINDSPOT; FINDSPOT	EARLY NEOLITHIC TO POST MEDIEVAL

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO33083	ERITH MARSHES	FINDSPOT; FINDSPOT	EARLY NEOLITHIC TO POST MEDIEVAL
MLO22885	PERRY ST CHALKPITS (NEAR)	MINE; DENE HOLE	NEOLITHIC
MLO23163	ERITH HIGH STREET [RIVER THAMES], ERITH, BEXLEY {NEOLITHIC AXE}	FINDSPOT	NEOLITHIC
MLO26859	PRICES WORKSOFF,NEAR ERITH MARSHES	FINDSPOT	NEOLITHIC
MLO26861	ERITH REACH	FINDSPOT	NEOLITHIC
MLO26862	ERITH	FINDSPOT	NEOLITHIC
MLO7079	BARNES CRAY RD	FINDSPOT	NEOLITHIC
MLO71816	BRONZE AGE WAY, ERITH, BEXLEY, KENT {NEOLITHIC POTTERY}	FINDSPOT	NEOLITHIC
MLO76529	CORINTHIAN QUAY, CHURCH MANORWAY, ERITH, BEXLEY, KENT {PEAT DEPOSIT}	PEAT	NEOLITHIC
MLO8470	CRAYFORD	FINDSPOT	NEOLITHIC
MLO8470	CRAYFORD	FINDSPOT	NEOLITHIC
MLO8470	CRAYFORD	FINDSPOT	NEOLITHIC
MLO59772	MANOR ROAD [SLADE GREEN RELIEF ROAD], SLADE GREEN, BEXLEY {FLINT SCATTER}	FLINT SCATTER	EARLY NEOLITHIC TO EARLY BRONZE AGE
MLO71180	HOLLYWOOD ROAD, SLADE GREEN, BEXLEY {PREHISTORIC PIT}	PIT	EARLY NEOLITHIC TO LATE BRONZE AGE
MLO71181	HOLLYWOOD WAY, SLADE GREEN, BEXLEY {PEAT LAYER}	PEAT	EARLY NEOLITHIC TO LATE BRONZE AGE
MLO103990	MULLBERRY WAY/CHURCH MANORWAY [GREEN LEVEL PUMPING STATION], ERITH, BEXLEY, DA8 {BRONZE AGE PEAT DEPOSIT}	PEAT	BRONZE AGE
MLO1957	PERRY ST	FINDSPOT; FINDSPOT	BRONZE AGE
MLO26863	ERITH, (NEAR), RIVER THAMES {BRONZE AGE BRONZE BLADE}	FINDSPOT	BRONZE AGE
MLO26936	ERITHNEAR	FINDSPOT	BRONZE AGE
MLO27024	ERITHNEAR	FINDSPOT	BRONZE AGE
MLO6833	ERITH MARSHES LOGBOAT	BOAT UNCLASSIFIED	BRONZE AGE
MLO71817	BRONZE AGE WAY, ERITH, BEXLEY, KENT {BRONZE AGE TRACKWAY}	TRACKWAY; STAKE; SURFACE	BRONZE AGE
MLO72388	CORINTHIAN ROAD/ST FRANCIS ROAD, ERITH, BEXLEY, KENT, DA8 {BRONZE AGE PEAT}	PEAT	BRONZE AGE

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO75298	LOWER ROAD [FORMER BELVEDERE FC FOOTBALL GROUND], BELVEDERE, NORTH BEXLEY, KENT {BRONZE AGE PEAT DEPOSIT}	PEAT	BRONZE AGE
MLO77509	BRONZE AGE WAY [GUNN'S INTERNATIONAL TRANSPORT], ERITH, BEXLEY {BRONZE AGE PEAT}	PEAT; ALLUVIUM	BRONZE AGE
MKE58802	IRON AGE COPPER ALLOY COIN	FINDSPOT	IRON AGE
MLO10937	ERITH HIGH STREET	FINDSPOT	IRON AGE
MLO25981	PERRY ST	SETTLEMENT	IRON AGE
MLO64005	IRON MILL LANE, CRAYFORD, BEXLEY {IRON AGE OCCUPATION}	PIT; SHAFT; DITCH; POST HOLE	IRON AGE
MLO7872	ERITH	FINDSPOT	IRON AGE
MLO10906	ERITH HIGH STREET	FINDSPOT	LATE IRON AGE TO ROMAN
MLO10944	ERITH	FINDSPOT	LATE IRON AGE TO ROMAN
MLO59771	MANOR ROAD [SLADE GREEN RELIEF ROAD], SLADE GREEN, BEXLEY {IRON AGE POTTERY}	FINDSPOT	MIDDLE IRON AGE TO LATE IRON AGE
MLO103980	MANOR ROAD, ERITH, BEXLEY, DA8 2AJ {PEAT DEPOSIT}	PEAT	PREHISTORIC
MLO59767	MOAT LANE	FINDSPOT	PREHISTORIC
MLO63008	MOAT LANE [HOWBURY PARK], SLADE GREEN, BEXLEY, LONDON {BURNT AND WORKED FLINT}	FLINT SCATTER	PREHISTORIC
MLO59773	MANOR ROAAD [SLADE GREEN RELIEF ROAD], SLADE ROAD, BEXLEY {PREHISTORIC PEAT}	PEAT	PREHISTORIC
MLO104009	CHURCH MANOR WAY [GREEN LEVEL PUMPING STATION], LONDON, DA8 {PEAT DEPOSIT}	PEAT	PREHISTORIC
MLO67435	CRESCENT ROAD (NO 19-25)/MANOR ROAD (NO 61-65), ERITH, BEXLEY {PREHISTORIC FLINTS}	FINDSPOT	PREHISTORIC
MLO6841	CRAYFORD BRICKEARTHS	FINDSPOT	PREHISTORIC
MLO71431	PICARDY MANORWAY [NORMAN PARK], BELVEDERE, BEXLEY {PREHISTORIC PEAT}	PEAT	PREHISTORIC
MLO71431	PICARDY MANORWAY [NORMAN PARK], BELVEDERE, BEXLEY {PREHISTORIC PEAT}	PEAT	PREHISTORIC
MLO73671	CHURCH ROAD/PEMBROKE ROAD/SANDCLIFF ROAD, ERITH, BEXLEY {DUMP OF FIRE CRACKED FLINTS}	FLINT SCATTER; WATER CHANNEL; SETTLEMENT?; HEARTH?; DITCH?	PREHISTORIC
MLO73672	CHURCH ROAD/PEMBROKE ROAD/SANDCLIFF ROAD, ERITH, BEXLEY {ROMAN BOX FLUE}	FINDSPOT; FINDSPOT	PREHISTORIC
MLO77912	EASTERN WAY/PICARDY MANORWAY/ANDERSON WAY, BELVEDERE, BEXLEY, KENT {PEAT DEPOSITS}	PEAT	PREHISTORIC

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO77912	EASTERN WAY/PICARDY MANORWAY/ANDERSON WAY, BELVEDERE, BEXLEY, KENT {PEAT DEPOSITS}	PEAT	PREHISTORIC
MKE97522	LATE PREHISTORIC RING DITCH, TEMPLE HILL, DARTFORD	BARROW?, SETTLEMENT?, ROUND HOUSE (DOMESTIC)?, RING DITCH?	LATER PREHISTORIC
MLO26451	ERITH HIGH ST	FINDSPOT	ROMAN
MLO26455	ERITH	FINDSPOT	ROMAN
MLO43680	PERRY ST CHALK PITS	DENE HOLE	ROMAN
MLO7205	CRAYFORD	INHUMATION	ROMAN
MLO77722	CHURCH MANOR WAY [BICC CABLES SPORTSGROUND] {DUMP LAYER}	DUMP LAYER	ROMAN
MLO8456	ERITH	FINDSPOT	ROMAN
MLO8489	IRON MILL LA	DENE HOLE	ROMAN
MLO13214	28 JENNINGTREE RD	CREMATION CEMETERY	ROMAN
MLO24588	THAMES EMBANKMENT	FINDSPOT	ROMAN
MLO59766	MOAT LANE	FINDSPOT	ROMAN
MLO7078	SLADE GREEN	FINDSPOT	ROMAN
MLO26439	ERITH	FINDSPOT	EARLY MEDIEVAL/DARK AGE
MLO10942	ERITH RIVERSIDE	FINDSPOT; FINDSPOT	MEDIEVAL
MLO1845	PERRY ST	FIELD SYSTEM	MEDIEVAL
MLO26434	BELVEDERE	FINDSPOT	MEDIEVAL
MLO59862	WEST ST	OCCUPATION SITE	MEDIEVAL
MLO71819	BRONZE AGE WAY, ERITH, BEXLEY {MEDIEVAL WALL}	WALL; FOUNDATION TRENCH; STRUCTURE?	MEDIEVAL
MLO8431	BELVEDERE STATION	FLOOD DEFENCES; EMBANKMENT	MEDIEVAL
MLO34413	WHITEHALL LA	MOAT	MEDIEVAL
MLO59769	MOAT LANE	FINDSPOT	MEDIEVAL
MLO64511	MOAT LANE [HOWBURY PARK], SLADE GREEN, BEXLEY, LONDON {UNSTRATIFIED MEDIEVAL AND POST MEDIEVAL POTTERY}	FINDSPOT	MEDIEVAL TO POST MEDIEVAL
MLO107276	WEST STREET, ERITH, [ST JOHN THE BAPTIST CHURCHYARD], BEXLEY, DA8	CHURCHYARD; GRAVE MARKER; LYCH GATE	MEDIEVAL TO MODERN

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
	1AX {MEDIEVAL PARISH CHURCHYARD}		
MLO26433	WEST STOFF	HOUSE; HOUSE	MEDIEVAL TO POST MEDIEVAL
MLO71598	CRESENT ROAD [ERITH DEEP WATER WHARF], BEXLEY, LONDON, DA8 {16TH CENTURY DITCH}	CHANNEL; DITCH; POST HOLE	MEDIEVAL TO POST MEDIEVAL
MKE44035	DARTFORD AND CRAYFORD NAVIGATION	RIVER NAVIGATION	POST MEDIEVAL
MKE44036	NORTH KENT RAILWAY	RAILWAY	POST MEDIEVAL
MKE44037	DARTFORD LOOP LINE	RAILWAY	POST MEDIEVAL
MKE58064	POST MEDIEVAL SILVER FINGER RING	FINDSPOT	POST MEDIEVAL
MKE83779	STANHAM FARM (STONEHAM)	FARMSTEAD	POST MEDIEVAL
MKE83780	FARMSTEAD SOUTH OF LONGREACH TAVERN PUBLIC HOUSE	FARMSTEAD	POST MEDIEVAL
MKE83781	SPRING GATE	FARMSTEAD	POST MEDIEVAL
MKE83782	OUTFARM IN JOYCE GREEN	FARMSTEAD	POST MEDIEVAL
MKE83783	JOYCE GREEN FARM	FARMSTEAD	POST MEDIEVAL
MKE83784	TEMPLE FARM	FARMSTEAD	POST MEDIEVAL
MKE83888	COTTON FARM	FARMSTEAD	POST MEDIEVAL
MKE83889	OUTFARM NORTH WEST OF COTTON FARM	FARMSTEAD	POST MEDIEVAL
MKE83890	LITTLEBROOK FARM	FARMSTEAD	POST MEDIEVAL
MKE83891	MARSH STREET	FARMSTEAD	POST MEDIEVAL
MLO105918	EASTERN WAY [CROSSNESS SEWAGE WORKS], ERITH, BEXLEY {POST MEDIEVAL FENCE POSTS}	POST; FENCE	POST MEDIEVAL
MLO25687	ERITH	GUN EMPLACEMENT	POST MEDIEVAL
MLO67438	CRESCENT ROAD (NO 19-25)/MANOR ROAD (NOS 61-65), ERITH, BEXLEY, LONDON {POST MEDIEVAL DITCH}	DITCH	POST MEDIEVAL
MLO68262	THAMES RD (NEAR)	ANTI AIRCRAFT GUN POST	POST MEDIEVAL
MLO68264	SOMERSET RD (NEAR)	ANTI AIRCRAFT GUN POST	POST MEDIEVAL
MLO71820	BRONZE AGE WAY, ERITH, BEXLEY, KENT {POST MEDIEVAL BOAT}	BOAT UNCLASSIFIED	POST MEDIEVAL
MLO71869	IRON MILL LANE, CRAYFORD, BEXLEY, LONDON {16TH CENTURY IRON MILL}	MILL	POST MEDIEVAL
MLO72463	HOWBURY LA	LANDFILL SITE	POST MEDIEVAL
MLO72464	WHITEHALL LA	LANDFILL SITE	POST MEDIEVAL
MLO72465	CRAYDENE RD	LANDFILL SITE	POST MEDIEVAL

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO72467	DRUMMOND CLO	LANDFILL SITE	POST MEDIEVAL
MLO72468	TWIGG CLOOFF	LANDFILL SITE	POST MEDIEVAL
MLO72469	BARNET CLO	LANDFILL SITE	POST MEDIEVAL
MLO72470	NORTHEND RD	LANDFILL SITE	POST MEDIEVAL
MLO72471	NORTHEND RD	LANDFILL SITE	POST MEDIEVAL
MLO72472	NORTHEND RD	LANDFILL SITE	POST MEDIEVAL
MLO72475	KENNETT RD	LANDFILL SITE	POST MEDIEVAL
MLO72476	GASCOYNE DRIVE	LANDFILL SITE	POST MEDIEVAL
MLO73673	CHURCH ROAD/PEMBROKE ROAD/SANDCLIFF ROAD, ERITH, BEXLEY {POST MEDIEVAL DUMPING}	DUMP; DITCH	POST MEDIEVAL
MLO73960	WALNUT TREE RD	TOWN HALL	POST MEDIEVAL
MLO75807	WEST STREET, [VIC INDUSTRIAL PARK], ERITH, {SIX EARLY 19TH CENTURY BARGES}	WATERCRAFT	POST MEDIEVAL
MLO98266	BEXLEY THAMES FORESHORE, (ABANDONED VESSEL?)	BOAT UNCLASSIFIED	POST MEDIEVAL
MLO10896	WHITEHALL LANE	MANOR HOUSE; MOATED SITE	POST MEDIEVAL
MLO59770	MOAT LANE	FINDSPOT	POST MEDIEVAL
MLO72464	WHITEHALL LA	LANDFILL SITE	POST MEDIEVAL
MLO72473	MOAT LA	LANDFILL SITE	POST MEDIEVAL
MLO72474	LEYCROFT GDNS	LANDFILL SITE	POST MEDIEVAL
MLO72483	THAMES RD OFF	LANDFILL SITE	POST MEDIEVAL
MLO72485	MANOR RD ERITH WORKS	LANDFILL SITE	POST MEDIEVAL
MLO98261	BEXLEY THAMES FORESHORE, (ABANDONED VESSEL)	BOAT UNCLASSIFIED	POST MEDIEVAL
MLO98262	BEXLEY THAMES FORESHORE, (ABANDONED SHIP RUBBER, POSSIBLE SITE OF VESSEL)	BOAT UNCLASSIFIED	POST MEDIEVAL
MLO98263	BEXLEY THAMES FORESHORE, (ABANDONED VESSEL OR BARGE BED?)	BARGE BED?	POST MEDIEVAL
MLO98264	BEXLEY THAMES FORESHORE, (ABANDONED BARGE?)	BOAT UNCLASSIFIED	POST MEDIEVAL
MLO98265	BEXLEY THAMES FORESHORE, (ABANDONED VESSEL?)	BOAT UNCLASSIFIED	POST MEDIEVAL
MLO79189	WALLHOUSE ROAD, LOWER FARM, SLADE GREEN {POST MEDIEVAL BARN SITE OF}	TIMBER FRAMED BARN; AISLED BARN	POST MEDIEVAL TO MODERN
MLO98252	BEXLEY THAMES FORESHORE, ("LADY MARY")	WRECK	POST MEDIEVAL TO MODERN

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO98254	BEXLEY THAMES FORESHORE, (ABANDONED SKIFF)	WRECK	POST MEDIEVAL TO MODERN
MLO100759	MITCHELL CLOSE, BELVEDERE, BEXLEY, DA17 {19TH CENTURY LAMP COLUMNS},	LAMP POST	POST MEDIEVAL TO MODERN
MLO102816	AVENUE ROAD, [ERITH RECREATION GROUND], ERITH, BEXLEY, DA8 {LATE 19TH CENTURY PUBLIC PARK}	BOWLING GREEN; TENNIS COURT; ATHLETICS TRACK; CHILDRENS PLAYGROUND; GATE LODGE; PUBLIC PARK; SPORTS CENTRE	POST MEDIEVAL TO MODERN
MLO103972	NORTHEND ROAD [THE HARROW], SLADE GREEN, BEXLEY, DA8 2BS {FORMER 19TH CENTURY PUB}	PUBLIC HOUSE; CELLAR	POST MEDIEVAL TO MODERN
MLO107147	LESNEY PARK ROAD, [OAKHURST], ERITH, {OAKHURST RED CROSS HOSPITAL DURING WORLD WAR ONE}	COUNTRY HOUSE; AUXILIARY HOSPITAL; ORTHOPAEDIC DEPARTMENT	POST MEDIEVAL TO MODERN
MLO107257	VICTORIA ROAD, ERITH, [CHRIST CHURCH, ERITH], BEXLEY, DA8 3AN {LATE 19TH CENTURY CHURCHYARD}	CHURCHYARD	POST MEDIEVAL TO MODERN
MLO71373	BRONZE AGE WAY, ERITH, BEXLEY, KENT {19TH -20TH CENTURY FEATURES}	FOUNDATION TRENCH; CESS PIT; SOAKAWAY; POST	POST MEDIEVAL TO MODERN
MLO78252	STONEWOOD ROAD, ERITH, BEXLEY, DA8 {19TH CERNURY RAILWAY AND COBBLED SURFACE}	RAILWAY; COBBLED SURFACE; MAKEUP LAYER; GULLY; RAILWAY	POST MEDIEVAL TO MODERN
MLO99175	WEST STREET, [VIC INDUSTRIAL PARK], ERITH, {MID 19TH CENTURY RIVER WALL AND LATER WHARF}	WATERCRAFT; FLOOD DEFENCES; WHARF	POST MEDIEVAL TO MODERN
MLO100720	THAMES ROAD, [EQUITY ESTATES - FORMER DUSSEK CAMPBELL LIMITED], CRAYFORD, BEXLEY, DA1 {1920'S OFFICE}	OFFICE; HIPPED ROOF; STRING COURSE; BAY WINDOW; DORMER WINDOW; CLOCK TOWER; WEATHER VANE	MODERN
MLO100924	AVENUE ROAD, ERITH, BEXLEY, DA8 {1930'S SPORTS PAVILION}	SPORTS PAVILION	MODERN
MLO102832	ERITH ROAD, [FRANKS PARK], BELVEDERE, BEXLEY, DA17 {20TH CENTURY PUBLIC PARK}	PUBLIC PARK; CHILDRENS PLAYGROUND	MODERN
MLO107239	MAYPLACE ROAD EAST, [BARNEHURST GOLF CLUB], BEXLEYHEATH, BEXLEY, DA7 6JU {EARLY 20TH CENTURY GOLF COURSE}	GOLF COURSE; RECREATION GROUND; BOWLING GREEN; SPORTS GROUND; FLOWER GARDEN; COMMEMORATIVE GARDEN	MODERN
MLO102532	IRON MILL LANE [THE BARNES CRAY PRIMARY SCHOOL], LONDON, DA1 {SECOND WORLD WAR AIR RAID SHELTER}	AIR RAID SHELTER	WORLD WAR TWO
MLO64087	MAYPLACE AVENUE/PERRY STREET FARM, CRAYFORD	BARRACKS; ANTI AIRCRAFT BATTERY	WORLD WAR TWO

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
MLO68305	CRAYFORD {SITE OF WW2 HEAVY ANTI-AIRCRAFT BATTERY}	ANTI AIRCRAFT BATTERY	WORLD WAR TWO TO MODERN
MLO105596	CRAYFORD MARSHES.	PILLBOX	WORLD WAR TWO TO MODERN
MLO100907	WALLHOUSE ROAD, SLADE GREEN, ERITH, BEXLEY, DA8 {WORLD WAR TWO ANCILLARY BUILDINGS}	BUILDING	WORLD WAR TWO TO MODERN

KENT HER

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
TQ 57 NW 47	UNDATED CURVILINEAR FEATURE, JOYCE GREEN	LINEAR FEATURE	UNDATED
TQ 57 NW 48	UNIDENTIFIED POSSIBLE RING DITCH, JOYCE GREEN	RING DITCH	UNDATED
TQ 57 NW 101	UNDATED DITCH, BARNWELL ROAD, DARTFORD	DITCH	UNDATED
TQ 57 NW 38	UNIDENTIFIED LINEAR FEATURE AND PIT, JOYCE GREEN	LINEAR EARTHWORK, PIT	UNDATED
TQ 57 NW 41	CROPMARK, CIRCULAR DITCHES, BY JOYCE HILL HOSPITAL	DITCH	UNDATED
TQ 57 NW 1050	STAKES AND BOULDERS, DARENT CREEK	UNCLASSIFIED SITE	UNDATED
TQ 57 NW 1051	STAKES AND BOULDERS, DARENT CREEK	UNASSIGNED	UNDATED
TQ 57 NE 127	POSSIBLE LINEAR CROPMARK	FIELD BOUNDARY, SITE	UNKNOWN
TQ 57 NE 1042	POSSIBLE REMAINS OF SALT WORKS/BARROWS	SITE, SITE	UNKNOWN
TQ 57 NW 1045	GRID PATTERN IN FIELD/SQUARE FEATURE	FEATURE, SITE	UNKNOWN
TQ 57 NW 1046	RIG AND FURROW (?)	WATERCOURSE, SITE	UNKNOWN
TQ 57 NE 1039	UNIDENTIFIED PATTERN IN FIELD	FEATURE, SITE	UNKNOWN
TQ 57 NE 1037	QUARRY PITS	QUARRY, SITE	UNKNOWN
TQ 57 NW 1036	CIRCULAR DEPRESSION, JOYCE GREEN	HOLLOW, SITE	UNKNOWN
TQ 57 NW 1035	THREE CIRCULAR PITS IN SALTMARSH, BY DARENT CREEK	PIT, SITE	UNKNOWN
TQ 57 NE 1036	FORMER FIELD BOUNDARY	FIELD BOUNDARY, SITE	UNKNOWN
TQ 57 NW 1030	CIRCULAR ENCLOSURE	ENCLOSURE, SITE	UNKNOWN
TQ 57 NW 1029	RECTILINEAR ENCLOSURE	ENCLOSURE, SITE	UNKNOWN
TQ 57 NE 1034	RING DITCH	RING DITCH, SITE	UNKNOWN

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
TQ 57 NE 1033	CIRCULAR ENCLOSURE	ENCLOSURE, SITE	UNKNOWN
TQ 57 NW 1024	DRAINAGE PATTERN IN FIELD	FEATURE, SITE	UNKNOWN
TQ 57 NE 1030	THREE BARROWS/RING DITCHES	FEATURE, SITE	UNKNOWN
TQ 57 NE 1029	POSSIBLE PIT CLUSTER	PIT CLUSTER, SITE	UNKNOWN
TQ 57 NE 1028	RING DITCH	RING DITCH, SITE	UNKNOWN
TQ 57 NE 1027	RING DITCH	RING DITCH, SITE	UNKNOWN
TQ 57 NE 1026	LINEAR EARTHWORKS FOLLOWING LINE OF FORMER FIELD BOUNDARY	FIELD BOUNDARY, SITE	UNKNOWN
TQ 57 NE 1025	CURVILINEAR CROPMARK	FEATURE, SITE	UNKNOWN
TQ 57 NE 1023	GROUP OF THREE QUARRY PITS	QUARRY, SITE	UNKNOWN
TQ 57 NE 1022	GRID PATTERN IN FIELD	FEATURE, SITE	UNKNOWN
TQ 57 NW 1019	PIT	PIT, SITE	UNKNOWN
TQ 57 NW 1018	RING DITCH	RING DITCH, SITE	UNKNOWN
TQ 57 NW 1013	PIT GROUP	PIT CLUSTER, SITE	UNKNOWN
TQ 57 NW 1011	REMAINS OF SALT WORKINGS	SALT WORKS, SITE	UNKNOWN
TQ 57 NW 1010	FIELD BOUNDARY	FIELD BOUNDARY, SITE	UNKNOWN
TQ 57 NW 1009	PITS	PIT, SITE	UNKNOWN
TQ 57 NE 1014	RING DITCH	RING DITCH, SITE	UNKNOWN
TQ 57 NW 1031	PIT CLUSTER, BY DARENT CREEK	PIT CLUSTER, SITE	UNKNOWN
TQ 57 NW 1028	PIT ALIGNMENT, JOYCE GREEN	PIT ALIGNMENT, SITE	UNKNOWN
TQ 57 NE 110	TT5 TWO PIECES OF WORKED FLINT	FLINT SCATTER	PREHISTORIC?
TQ 57 NE 111	ONE PIECE OF WORKED FLINT TT17	FLINT SCATTER	PREHISTORIC?
TQ 57 NW 94	PROBABLE PIT, BONDFIELD WALK, DARTFORD	PIT	PREHISTORIC
TQ 57 NE 1000	DARTFORD TUNNEL, PALAEOLITHIC HANDAXE FOUND DURING CONSTRUCTION	FINDSPOT	LOWER PALAEOLITHIC TO MIDDLE PALAEOLITHIC
TQ 57 NE 1101	ENVIRONMENTAL INFORMATION DISCOVERED DURING GEOARCHAEOLOGICAL WORK AT LONG REACH SEWAGE TREATMENT WORKS 2010-2013	SITE	EARLY MESOLITHIC TO MODERN
TQ 57 NW 56	LINEAR DITCH FOUND ON LAND AT JOYCE GREEN LANE, DARTFORD	LINEAR EARTHWORK, FLINT SCATTER	BRONZE AGE

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
TQ 57 NW 57	RING DITCH FOUND ON LAND AT JOYCE GREEN LANE, DARTFORD	FLINT SCATTER, RING DITCH	BRONZE AGE
TQ 57 NW 24	EARLY IRON AGE OR ROMANO-BRITISH CREMATION CEMETERY (SITE OF)	CREMATION CEMETERY	EARLY IRON AGE TO ROMAN
TQ 57 NW 100	PREHISTORIC PIT/POST-HOLE, BARNWELL ROAD, DARTFORD	PIT, DITCH	LATER PREHISTORIC
TQ 57 NW 7	ROMAN CREMATIONS, NEAR JOYCE GREEN	CREMATION CEMETERY	ROMAN
TQ 57 NW 17	THREE ROMAN COINS, FROM GARDEN AT TEMPLE HILL, DARTFORD	FINDSPOT, SITE	ROMAN
TQ 57 NE 8	LITTLEBROOK WALLS ANGLO-SAXON EARTHWORKS	EARTHWORK	EARLY MEDIEVAL OR ANGLO-SAXON
TQ 57 NE 9	SITE OF AN ANGLO-SAXON BURIAL GROUND	CEMETERY	EARLY MEDIEVAL OR ANGLO-SAXON
TQ 57 NW 1062	WOODEN STAKES IN CRAYFORD CREEK	STRUCTURE?	EARLY MEDIEVAL OR ANGLO-SAXON TO MODERN
TQ 57 NE 34	REMAINS OF THIRTEENTH AND FOURTEENTH CENTURY BUILDINGS	BUILDING	MEDIEVAL
TQ 57 NE 36	MEDIEVAL BUILDINGS, LITTLEBROOK	SETTLEMENT	MEDIEVAL
TQ 57 NW 96	JOYCE'S FARM (SITE)	FARM	MEDIEVAL TO MODERN
TQ 57 NW 1063	WOODEN STAKES IN THE BANK OF CRAYFORD CREEK	SEA DEFENCES?	MEDIEVAL TO POST MEDIEVAL
TQ 57 NW 95	SITE OF TEMPLE FARM	FARM	POST MEDIEVAL
MKE83779	STANHAM FARM (STONEHAM)	FARMSTEAD	POST MEDIEVAL
MKE83782	OUTFARM IN JOYCE GREEN	FARMSTEAD	POST MEDIEVAL
MKE83783	JOYCE GREEN FARM	FARMSTEAD	POST MEDIEVAL
MKE83784	TEMPLE FARM	FARMSTEAD	POST MEDIEVAL
MKE83889	OUTFARM NORTH WEST OF COTTON FARM	FARMSTEAD	POST MEDIEVAL
MKE83890	LITTLEBROOK FARM	FARMSTEAD	POST MEDIEVAL
TQ 57 NE 96	EARLY 19TH CENTURY CESS PIT	CESS PIT	POST MEDIEVAL
MKE83891	MARSH STREET	FARMSTEAD	POST MEDIEVAL
TQ 57 NW 104	POST-MEDIEVAL FIELD BOUNDARIES, JOYCE GREEN, DARTFORD	FIELD BOUNDARY	POST MEDIEVAL
TQ 57 NW 1001	IRON MILLS	METAL WORKING SITE, SITE	POST MEDIEVAL
TQ 57 NE 1038	GRAVEL PIT	GRAVEL PIT, SITE	POST MEDIEVAL

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
TQ 57 SE 277	NORTH KENT RAILWAY	RAILWAY	POST MEDIEVAL
TQ 57 NW 113	DARTFORD AND CRAYFORD NAVIGATION	RIVER NAVIGATION	POST MEDIEVAL
TQ 47 SE 6	DARTFORD LOOP LINE	RAILWAY	POST MEDIEVAL
TQ 57 SW 103	FORMER SITE OF THE PRIORY WORKS TANNERY	TANNERY	POST MEDIEVAL TO MODERN
TQ 57 NE 1075	WOODEN STAKES IN FORESHORE, LONG REACH, THAMES	UNASSIGNED	POST MEDIEVAL TO MODERN
TQ 57 NE 1076	STONE COLUMNS, POSSIBLY FROM LONDON BUILDINGS BOMBED IN WORLD WAR II, LONG REACH, THAMES	COLUMN	POST MEDIEVAL TO MODERN
TQ 57 NW 1061	WOODEN STAKES AND PLANK WITH TREENAILS CRAYFORD CREEK	STRUCTURE?	POST MEDIEVAL TO MODERN
TQ 57 NE 1045	UNIDENTIFIED CIRCULAR DEFENSIVE(?) FEATURE	FEATURE, SITE	POST MEDIEVAL TO MODERN
TQ 57 NW 1034	JETTY, DARENT CREEK	JETTY, SITE	POST MEDIEVAL TO MODERN
TQ 57 NW 1033	RECLAIMED SALTMARSH, CRAYFORD CREEK	LAND RECLAMATION, SITE	POST MEDIEVAL TO MODERN
TQ 57 NE 1035	ELECTRICITY/MILITARY INSTALLATION	SITE, SITE	POST MEDIEVAL TO MODERN
TQ 57 NW 1027	ABANDONED(?) BARGE, DARENT CREEK	WRECK, SITE	POST MEDIEVAL TO MODERN
TQ 57 NW 1025	OBELISK MARKED ON 1ST ED. OS	OBELISK, SITE	POST MEDIEVAL TO MODERN
TQ 57 NW 1017	SMALL BOAT, DARENT CREEK	WRECK, SITE	POST MEDIEVAL TO MODERN
TQ 57 NE 1015	BASIN, ON THE THAMES, LONG REACH	TIDAL BASIN, SITE	POST MEDIEVAL TO MODERN
TQ 57 NW 1012	WHARF NOT ON MODERN OS	WHARF	POST MEDIEVAL TO MODERN
TQ 57 NW 45	JOYCE GREEN HOSPITAL (SITE OF)	INFECTIOUS DISEASES HOSPITAL, GENERAL HOSPITAL	MODERN
TQ 57 NW 46	ORCHARD HOSPITAL, JOYCE GREEN, DARTFORD	INFECTIOUS DISEASES HOSPITAL, MILITARY HOSPITAL, INFECTIOUS DISEASES HOSPITAL	MODERN
TQ 57 NW 1047	EARTHWORK - WEST KENT MAIN SEWER	EARTHWORK, SITE	MODERN

GLHER MONUID / ORION REF.	NAME	MONUMENT TYPE	PERIOD
TQ 57 NE 83	LONG REACH HOSPITAL, JOYCE GREEN	HOSPITAL	MODERN
TQ 57 NW 1048	WHARF	WHARF, SITE	MODERN
TQ 57 NE 84	LITTLEBROOK POWER STATION, DARTFORD	POWER STATION	MODERN
TQ 57 NW 1049	WHARF (3RD ED OS), DARENT CREEK	WHARF, SITE	MODERN
TQ 57 NW 102	RIVER HOSPITALS TRAMWAY, JOYCE GREEN	TRAMWAY	MODERN
TQ 57 NE 112	GEORGE VI PILLAR BOX, FARNOL ROAD / HENDERSON DRIVE	PILLAR BOX	MODERN
TQ 57 NW 97	JOYCE GREEN EXPLOSIVES WORKS	GUNPOWDER WORKS	MODERN
TQ 57 NW 114	GEORGE V PILLAR BOX, BURNHAM ROAD / CHATSWORTH ROAD	PILLAR BOX	MODERN
TQ 57 NW 54	EXPLOSIVE STORES (SECOND WORLD WAR ?), JOYCE GREEN	MAGAZINE, SITE	MODERN
TQ 57 NW 55	20TH CENTURY EXPLOSIVE STORES, BY DARTFORD MARSHES	MAGAZINE, SITE	MODERN
TQ 57 NW 1064	ORCHARD MILITARY CONVALESCENT HOSPITAL, DARTFORD	HOSPITAL	MODERN
TQ 57 NW 1052	POSSIBLE DERELICT EXPLOSIVE STORE BY UNIVERSITY ROAD	EXPLOSIVES STORE	MODERN
TQ 57 NE 1044	JETTY	JETTY, SITE	MODERN
TQ 57 NE 1043	JETTY	JETTY, SITE	MODERN
TQ 57 NE 1040	OVAL ENCLOSURE, DARTFORD MARHSES	OVAL ENCLOSURE, SITE	MODERN
TQ 57 NW 1032	PIT GROUP/SALT WORKS, BY CRAYFORD CREEK	SALT WORKS?, SITE	MODERN
TQ 57 NW 1026	BUILDING, DARENT CREEK	BUILDING, BUILDING	MODERN
TQ 57 NE 1031	BARROWS/QUARRY PITS, DARTFORD MARSHES	FEATURE, SITE	MODERN
TQ 57 NE 1020	JETTY	JETTY	MODERN
TQ 57 NE 1016	JETTY, LONG REACH ON THE THAMES	JETTY	MODERN
TQ 57 NE 1069	QUEEN ELIZABETH II BRIDGE, DARTFORD	SUSPENSION BRIDGE	MODERN
TQ 57 NE 1102	DARTFORD CROSSING TUNNELS	ROAD TUNNEL, ROAD TUNNEL	MODERN TO UNKNOWN

GAZETTEER OF EVENTS (KENT)

In order to understand the nature and extent of the surrounding archaeological resource, a study area of a 750m radius from the Study Site boundary was adopted. The following gazetteer represents all of the intrusive event entries from the Greater London Historic Environment Record. These are ordered chronologically.

These entries correspond to the mapping in Figures 2.

Abbreviations:
GLHER: Greater London Historic Environments Record
EVUID: Greater London Historic Environments Record events identification reference number

LABEL	NAME	MONUMENT TYPE
EKE4780	LITTLEBROOK POWER STATION (NEAR)	EXCAVATION
EKE10059	WATCHING BRIEF AT ST EDMUND'S CHURCH, DARTFORD	WATCHING BRIEF
EKE10368	EVALUATION OF LAND ADJACENT TO UNIVERSITY WAY AND JOYCE GREEN CEMETERY, DARTFORD	EVALUATION
EKE10369	WATCHING BRIEF: PRIORY WORKS, SANDPIT ROAD, DARTFORD	WATCHING BRIEF
EKE10932	EVALUATION OF BOREHOLES	GEOTECHNICAL SURVEY
EKE10933	DESK BASED ASSESSMENT OF LITTLEBROOK BUSINESS PARK	DESK BASED ASSESSMENT
EKE10955	WATCHING BRIEF AT LITTLEBROOK POWER STATION, MANOR WAY DARTFORD - AND EWX9158	WATCHING BRIEF
EKE11633	TEST PITTING TO EVALUATE THE PALAEOLITHIC POTENTIAL AT THE SITE OF THE FORMER DARTFORD PAPER MILL	EVALUATION
EKE12905	WATCHING BRIEF DURING PHASE 1 WORKS, JOYCE GREEN QUARRY	WATCHING BRIEF
EKE14058	GEOARCHAEOLOGICAL BOREHOLE SURVEY (ARCA 2013) - AND EKE11759, EKE8239	GEOARCHAEOLOGICAL BOREHOLE SURVEY
EKE14636	RESEARCH ARCHIVE REPORT: AN IRON AGE SETTLEMENT, ROMAN SHRINE AND EARLY ANGLO-SAXON CEMETERY AT ST EDMUND'S CHURCH, TEMPLE HILL, DARTFORD, KENT.	
EKE14680	BOREHOLE SURVEY: FORMER GLAXOSMITHKLINE SITE, DARTFORD, KENT	BOREHOLE SURVEY
EKE15014	LITTLEBROOK POWER STATION, DARTFORD, KENT, DA1. GEOARCHAEOLOGICAL POST-EXCAVATION ASSESSMENT AND UPDATED PROJECT DESIGN	BOREHOLE SURVEY
EKE3845	107-117 WESTGATE ROAD	EXCAVATION
EKE3879	JOYCE HILL HOSPITAL	EXCAVATION
EKE3884	POND FIELD, LITTLEBROOK	EXCAVATION
EKE4849	AWATCHING BRIEF ON LAND ADJACENT UNIVERSITY WAY AND JOYCE GREEN CEMETERY, DARTFORD	WATCHING BRIEF

LABEL	NAME	MONUMENT TYPE
EKE4849	AWATCHING BRIEF ON LAND ADJACENT UNIVERSITY WAY AND JOYCE GREEN CEMETERY, DARTFORD	WATCHING BRIEF
EKE8379	GROUND INVESTIGATION AT UNIVERSITY WAY, DARTFORD FOR CALFORD SEADEN PARTNERSHIP	GEOTECHNICAL SURVEY
EKE8390	EVALUATION ON LAND NEXT TO UNIVERSITY WAY, DARTFORD	EVALUATION
EKE8417	TRENCHING EVALUATION AT JOYCE GREEN LANE, DARTFORD	EVALUATION
EKE8571	WATCHING BRIEF AT WASTE WATER TRANSFER STATION, SANDPIT ROAD, DARTFORD	WATCHING BRIEF
EKE8589	EVALUATION AT JOYCE GREEN LANE, TEMPLE HILL, DARTFORD	EVALUATION
EWX9113	ENVIRONMENTAL IMPACT ASSESSMENT AT LITTLEBROOK 400KV SUBSTATION	ENVIRONMENTAL IMPACT ASSESSMENT
EWX9158	GEOTECHNICAL BOREHOLES AT DARTFORD TUNNEL, LITTLEBROOK SITE	BOREHOLE SURVEY

APPENDIX B - GAZETTEER OF BUILT HERITAGE ASSETS (Figure 3)

The following gazetteer represents all known designated assets (listed buildings, scheduled monuments, conservation areas, registered parks and gardens, registered battlefields) and areas identified as of importance in local planning policy.

Abbreviations:

NHLE: National Heritage List for England

DLO: Greater London Historic Environments Record designated asset identification reference number

MONUID: Greater London Historic Environments Record monument identification reference number

NHLE REF.	NAME	DESIGNATION / GRADE
NHLE 1064241	CROSSNESS PUMPING STATION AND SEWAGE WORKS (SOUTHERN OUTFALL WORKS), BEXLEY {19TH CENTURY PUMPING STATION}	I
NHLE 1064216	WORKSHOP RANGE TO SOUTH EAST OF MAIN ENGINE HOUSE CROSSNESS PUMPING STATION	II
NHLE 1064208	COAL DUTY BOUNDARY MARKER (ON THE EAST SIDE OF RAILWAY LINE, NORTH SIDE OF STANHAM RIVER)	II
NHLE 1064227	28 AND 30, ERITH HIGH STREET	II
NHLE 1188549	CHRIST CHURCH	II*
NHLE 1188560	PARISH CHURCH OF ST JOHN THE BAPTISH	II*
NHLE 1250557	WORKSHOP RANGE TO SOUTH WEST OF MAIN ENGINE HOUSE CROSSNESS PUMPING STATION	II
NHLE 1255449	ERITH LIBRARY	II
NHLE 1391706	JETTY NUMBER 4 AND APPROACH, FORMERLY AT SAMUEL WILLIAMS AND COMPANY, DAGENHAM DOCK	II
DLO35499	'4 CONCRETE 'POLICE' BOXES AT CROSSNESS SEWAGE TREARTMENT WORKS	LLB
MLO103261	BELVEDERE ROAD, [CROSSNESS SEWAGE TREATMENT WORKS], ABBEY WOOD {LATE 19TH CENTURY INDUSTRIAL BUILDING}	LLB

APPENDIX C - Plates

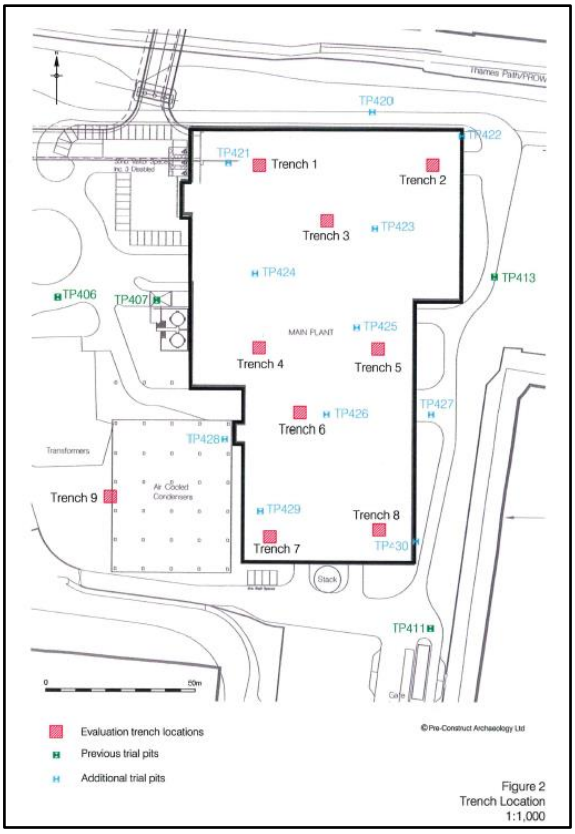

Plate 1: Trench Plan at the Former Borax Works PCA 2008

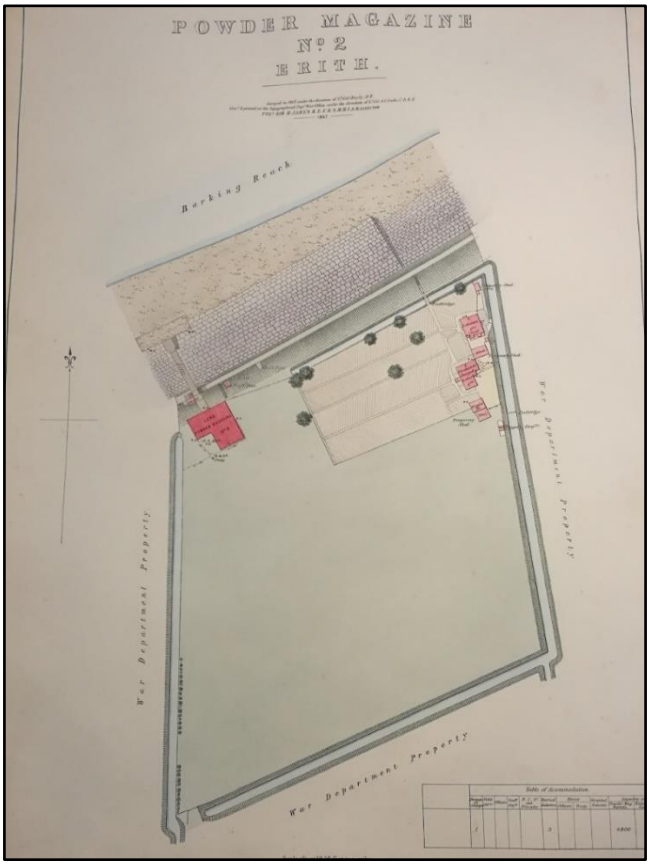

Plate 2: 1867 Plan of the Powder Magazine to the west of the site

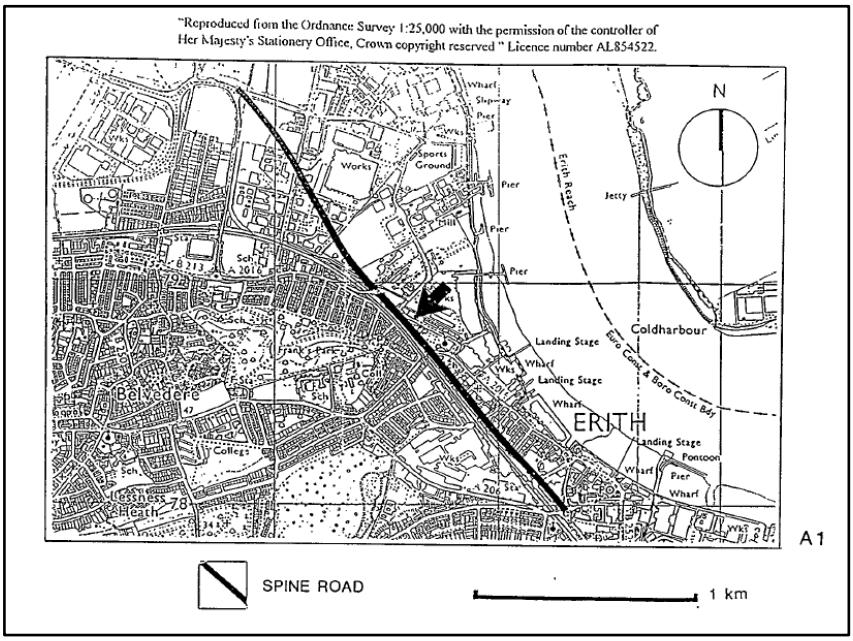

Plate 3: Plan of the 1994/1995 watching brief of Bronze Age Way (RPS 1995)

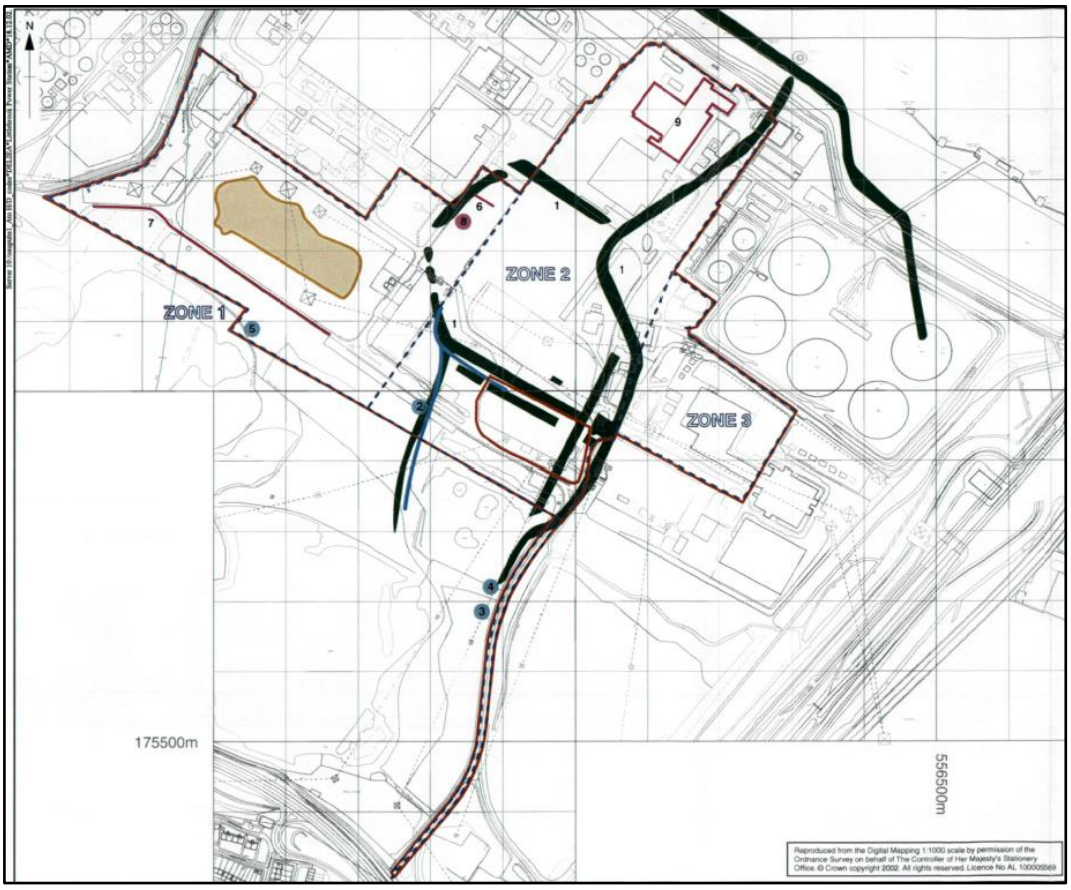

Plate 4: 'Tide Walls' identified by Spurrell (1889)

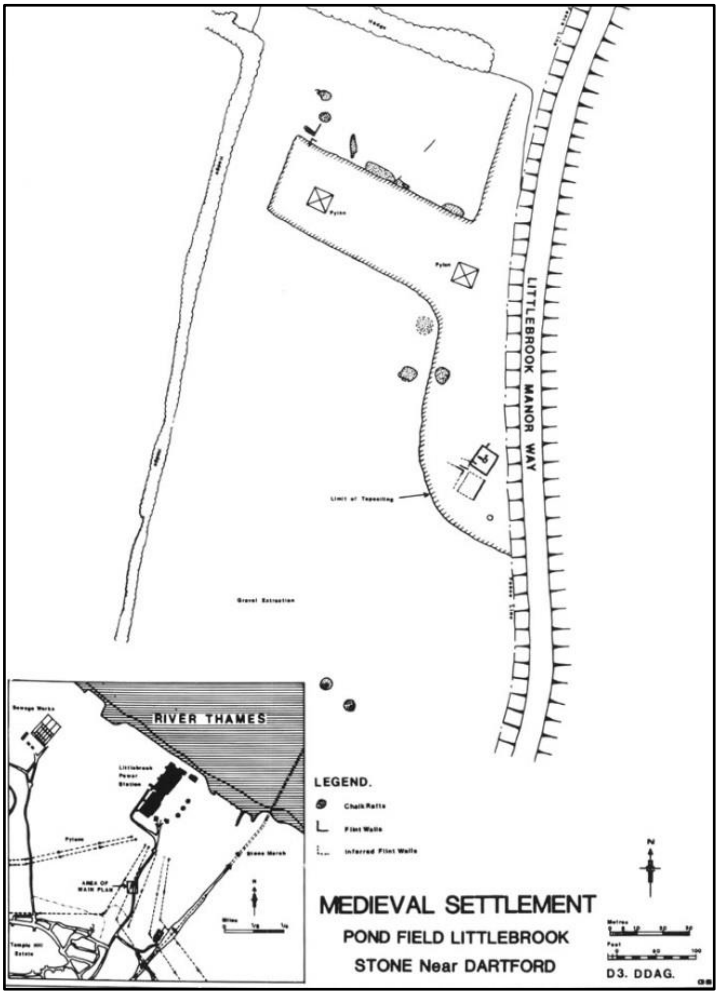

Plate 5: Pond Field Littlebrook Excavation (KHER TQ 57 NE 36)

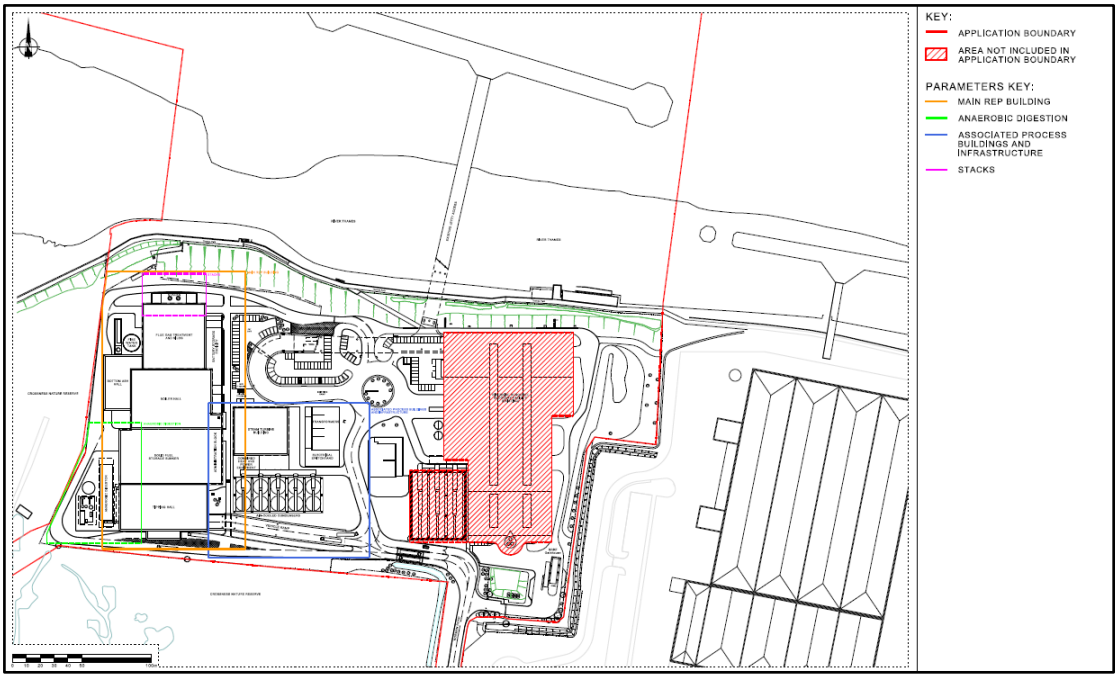

Plate 6: Illustrative Site Layout and Parameters Plan

Plate 7: West bank of River Cray south of A206 bridge

Plate 8: East bank of River Cray south of A206 bridge

Plate 9: River Darent south of A206 bridge

Plate 10: River Darent north of A206 bridge

Plate 11: Dartford Salt Marshes from A206 bridge by River Darent (dir. east)

Plate 12: Dartford Salt Marshes (dir. west)

APPENDIX D – GEOARCHAEOLOGICAL & PALAEOENVIRONMENTAL WRITTEN SCHEME OF INVESTIGATION (QUEST 2018c) (overleaf)

QUEST
QUATERNARY SCIENTIFIC

University of Reading

RIVERSIDE ENERGY PARK, LONDON BOROUGH OF BEXLEY

Geoarchaeological & Palaeoenvironmental Written Scheme of Investigation

NGR: TQ 495, 806

Date: 6th April 2018

Written by: Dr C.R. Batchelor

QUEST, School of Archaeology, Geography and Environmental Science, Whiteknights, University of Reading, RG6 6AB

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CONTENTS

1. PLANNING CONTEXT

This document is provided as part of the Riverside Energy Park Development Consent Order (DCO) application. Cory Riverside Energy (Cory) is applying to the Secretary of State (SoS) under the Planning Act 2008 (PA 2008) for powers to construct, commission and operate an integrated Energy Park (the Proposed Development), to be known as Riverside Energy Park (REP), consisting of complementary energy generating development, with an electrical output of up to 96 megawatts (MWe) along with an associated Electrical Connection.

As REP will be in excess of 50 MWe capacity it is classified as a Nationally Significant Infrastructure Project (NSIP) under the section 14 of the Planning Act 2008 (PA 2008), and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.

Cory must submit a DCO application to the Planning Inspectorate (PINS) who will first decide whether to accept the application. If accepted, PINS will examine the application in accordance with the relevant National Policy Statements (NPSs) which outline the need for energy infrastructure and the issues to be considered. The relevant NPSs include: NPS EN-1 (Overarching Energy Policy), NPS EN-3 (Renewable Energy Supply from Waste) and NPS EN-5 (Electricity Networks Infrastructure).

PINS will make a recommendation to the Secretary of State (SoS) as to whether or not the application should be approved. Should the SoS approve the application then the DCO will be made authorising the construction, commissioning and operation of REP.

REP would be developed on land immediately adjacent to Cory's existing Riverside Resource Recovery Facility (RRRF), within the London Borough of Bexley and would complement the operation of the existing facility. It would comprise an integrated range of technologies including; waste energy recovery, waste anaerobic digestion, solar panels and battery storage. The main elements of REP are described below:

- Energy Recovery Facility (ERF): to provide thermal treatment of Commercial and Industrial (C&I) residual waste (post-recycling) with the potential for treatment of municipal solid waste (MSW);
- Solar Photovoltaic Installation: to be integrated across a wide extent of the roof;
- Battery Storage: to supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the main REP building;
- Anaerobic Digestion Facility: outputs from the anaerobic digestion facility would be used as a fuel in the ERF to generate electricity or alternatively transferred off-site for use in the agricultural sector as fertilizer or as an alternative, where necessary, used as a fuel in the ERF to generate electricity;
- Solar Photovoltaic Installation: to be integrated across a wide extent of the roof;
- Battery Storage: to supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the main REP building;

- Combined Heat and Power Connection ('CHP'): REP would be CHP enabled with necessary infrastructure within the REP site included. The heat connection could service nearby residential developments such as the Thamesmead area;
- The Electrical Connection Route: REP would be connected to the existing National Electrical Transmission System ('NETS') via a new 132 kilovolt (kV) distribution network connection, within the London Borough of Bexley and Dartford Borough Council, and a new substation within the REP site. In consultation with UK Power Networks ('UKPN') Cory are currently considering Electrical Connection route options to connect to the existing National Grid Littlebrook Power Station substation located south east of REP. All Electrical Connection options have been included within the Indicative Application Boundary at this stage. A single Electrical Connection route will be confirmed through consultation with UKPN and included in the DCO application;
- Delivery of waste to REP: the majority of waste will be delivered to REP by barge from Waste Transfer Stations (WTS) along the River Thames, utilising the existing jetty as per the existing RRRF. The remainder would be delivered by road. The proportions of the total to be delivered by road and river will be determined through further assessment work and details included in the DCO application; and
- Removal of by-products from REP: Incinerator Bottom Ash (IBA) would be transported by river to the existing IBA Facility at the Port of Tilbury for treatment/recycling, and then onward use as secondary aggregate in the construction sector. Air Pollution Control Residues (APCR) would be taken off site by road in sealed containers to be treated/recycled for use as a construction material.

This document provides a Written Scheme of Investigation (WSI) for the staged geoarchaeological investigations at REP. The study site is centred on (NGR) 549542, 180662 (Figure 1). The stages of geoarchaeological investigations include:

- Stage 1: Production of a geoarchaeological deposit model using historic borehole data; monitoring of additional boreholes and production of revised deposit model
- Stage 2: Subject to the conclusions of the Stage 1 works, Stage 2 works may be recommended and may include the identification, assessment and analysis of key Holocene sequences and publication of findings.

This Written Scheme of Investigation covers the Stage 1 works. A separate Written Scheme of Investigation for Stage 2 works will be produced subject to the recommendations resulting from the deposit modelling and following discussions between Orion Heritage, the client and Historic England.

The Proposed Development includes the construction of a 0.9m deep and 0.45m wide electrical connection trench to Littlebrook Power Station substation. There are currently four electrical cable options (Figure 1). This report is concerned primarily with the REP site only; a Temporary Laydown Area on Norman Road, the Electrical Connection Route options and Electrical Connection Point at

Littlebrook Power Station substation, Dartford have been scoped out due to the depth of groundworks in these areas.

The Proposed Development constitutes a project falling within the definition of a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 by virtue of building, commissioning and operating an onshore generating station with an energy generating capacity of greater than 50 MWe. Consent for the Proposed Development therefore requires a Development Consent Order (DCO) and the process of EIA is governed by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

An Environmental Impact Assessment (EIA) Scoping Report has been prepared by Peter Brett Associates LLP (PBA) on behalf of Cory in relation to the Proposed Development (PBA 2017) and a Heritage Desk Based Assessment (Orion Heritage 2018). This document has been produced following consultation with Historic England / GLAAS.

2. OVERARCHING GOAL OF RESEARCH IN THE LOWER THAMES VALLEY

The REP site (NGR: *centred on* NGR TQ 496 807) (Figures 1 & 2) provides an opportunity to test the hypotheses generated by previous studies in this part of the Lower Thames Valley, such as on the Former Borax Works site (Batchelor *et al.*, 2008a) and adjacent Alchemy Park (Batchelor & Young, 2016; Batchelor *et al.*, 2016), former NuFarm (Young *et al.*, 2012a), Imperial Gateway (Batchelor *et al.*, 2008b), Crossness Sewage Works (Green *et al.*, 2011) and Pirelli Works (Young *et al.*, 2012b) sites. Through such investigation, we can enhance the geoarchaeological model for this part of the Lower Thames Valley during the Middle to Late Holocene, permitting comparison and integration with neighbouring records. This will enable a detailed reconstruction of spatial and temporal variations in the environment, and make a significant contribution to achieving the overarching goal of the research programme.

The long-term goal of our research programme in the Lower Thames Valley is to compile a high-resolution spatial-temporal model of the changing environment of the wetland and dryland during the Middle and Late Holocene (last 7000 years). This integrated model, we propose, should be generated by the compilation of environmental archaeological records from intercalated alluvial and peat sequences (wetland), and archaeological stratigraphy (wetland and dryland). Individual recording sites should be analysed at high resolution to provide a detailed three-dimensional spatial reconstruction of changing environmental conditions, which, coupled with the archaeological records, will permit micro-scale (local) and meso-scale (regional) modelling of the interactions (e.g. economic and dietary activities) between human groups and their environment. In particular, we need to continue to source information on floodplain development, channel migration and abandonment, marine incursion, terrestrialisation (peat and soil formation), vegetation structure and composition (both wetland and dryland), animal husbandry, cultivation, and the exploitation of wild plants and animals.

The REP site offers the potential to provide detailed records of spatial and temporal changes in the environment due to the known presence of alluvial and peat sequences. The stratigraphic boundaries between alluvium and peat indicate highly significant successions from aquatic to semi aquatic, and then semi terrestrial to fully terrestrial ecosystems. These successions result in changes in the composition and diversity, and potential availability to humans, of plant and animal resources. However, our records from the Lower Thames Valley (Batchelor, 2009; Branch *et al.*, 2012; Green *et al.*, 2014) indicate significant changes in environmental conditions, in particular vegetation structure and composition, *during* the main period of Middle Holocene peat formation. These changes occurred due to: (1) natural succession and human impact, and (2) episodic fluvial inundation of the peat surface prior to the main period of marine incursion (alluviation). Recording these changes enables us to address questions relating to human adaptability and survivability against a background of changing environmental conditions, and human modification of the natural environment.

3. SITE CONTEXT

A desk-based geoarchaeological deposit modelling report has been prepared in tandem with this report (Batchelor, 2018), which provides a detailed context for the site. In summary, over 130 logs were inspected and evaluated, together with records from nearby archaeological/geoarchaeological investigations. The depth, thickness and nature of each major sedimentary unit was extracted and entered into geological modelling software, from which a series of topographic surface and thickness maps were produced. The results of the deposit modelling indicate that the sediments recorded at the REP site are similar to those recorded elsewhere in the Lower Thames Valley, with Late Devensian Shepperton Gravel overlain by a tripartite sequence of Holocene Lower Alluvium, Peat and Upper Alluvium, buried beneath modern Made Ground. However, due to an absence of borehole records, our knowledge and understanding of the sedimentary sequence is limited across the south-western part of the REP site.

It was therefore recommended that a program of targeted geoarchaeological monitoring is carried out on forthcoming geotechnical site investigations to enable the production of a complete deposit model for the area of investigation (Figure 2).

On the basis of the likely depth of the sediments and findings from nearby sites, the archaeological potential of the REP site is considered low; although, this cannot be confirmed until a deposit model is produced. However, even in the absence of archaeological remains, the sediments have the potential to contain further information on the past landscape, through the assessment/analysis of palaeoenvironmental remains (e.g. pollen, plant macrofossils and insects) and radiocarbon dating.

4. AIMS & OBJECTIVES

Seven significant research aims relevant to the geoarchaeological investigations at the REP site are outlined here:

1. To clarify the nature of the sub-surface stratigraphy across the REP site;
2. To provide a complete deposit model for the REP site
3. To ascertain evidence for any significantly high (or low points in the Shepperton Gravel surface.
4. To clarify the nature, depth, extent and date of any alluvium and peat deposits
5. To investigate whether the sequences contain any artefact or ecofact evidence for prehistoric or historic human activity
6. To investigate whether the sequences contain any evidence for natural and/or anthropogenic changes to the landscape (wetland and dryland)
7. To integrate the new geoarchaeological record with other recent work in the local area for publication in an academic journal

In order to address the first two of these aims, the following objectives are proposed during the pre-planning stage:

1. To monitor selected geotechnical boreholes being put down across the site by Terra Consulting. The ideal boreholes for monitoring would be BH1, BH2, BH4 & BH8 as these represent a good spatial distribution across this area of the site; however, there is room for flexibility depending upon the program of works and BH3, BH5 and BH10 would be suitable alternative locations.
2. To use the stratigraphic data from the new locations, and existing records to produce a n updated deposit model of the major depositional units across the site.

5. METHODOLOGY - FIELD INVESTIGATIONS, DEPOSIT MODELLING & REPORTING

In order to address the first two aims and objectives of the project, the following methods will be employed:

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5.1 Twelve new geotechnical boreholes are due to be put down across the site by Terra Consulting. A selection of these will be monitored by a qualified geoarchaeologist. The ideal boreholes for monitoring would be BH1, BH2, BH4 & BH8 as these represent a good spatial distribution across this area of the site; however, there is room for flexibility depending upon the program of works and BH3, BH5 and BH10 would be suitable alternative locations.

5.2 Detailed laboratory-based description of the geoarchaeological or geotechnical borehole sequences using the Tröels-Smith (1955) procedure for the description of sediments, noting composition, colour boundary types (sharp or diffuse) and degree of humification. The results will be used to contribute to the existing deposit model for the site (Batchelor, 2018) and our understanding of the site formation processes and depositional environment.

5.3 Integration of the new geoarchaeological borehole records and any relevant existing geotechnical records to produce a site-wide model of the stratigraphic architecture. This

deposit model will be created using Rockworks deposit modelling software and Adobe Illustrator and will assist in the reconstruction of site formation and transformation processes, such as alluvial sedimentation and peat formation.

5.4 Following the results of the deposit modelling, a report will be produced including the following sections:

- Introduction
  (inclusive of site location and borehole location figures)
- Methods
- Results and interpretation of the geoarchaeological fieldwork and deposit modelling
  (inclusive of borehole description tables and figures, topographic surface and thickness models and cross sections)
- Discussion
  (inclusive of appropriate tables and figures)
- Conclusions and recommendations for assessment
- References

6. MITIGATION - FIELD INVESTIGATIONS, LABORATORY-BASED ASSESSMENT & REPORTING

6.1 A separate Written Scheme of Investigation for Stage 2 works will be produced subject to the recommendations of the deposit modelling and following discussions between the client, Orion Heritage and Historic England. The following provides an indication of mitigation objectives:

3. To retrieve geoarchaeological borehole sequences from select locations across the site for laboratory-based investigation (number/location to be decided on the basis of objective 2)
4. To carry out an environmental archaeological assessment of selected borehole core samples incorporating: (1) range finder radiocarbon dating to determine the approximate chronology of any periods of peat formation recorded within the borehole samples; (2) assessment of their archaeobotanical content, and (3) recommendations for further environmental archaeological investigations (if necessary).
5. To carry out environmental archaeological analysis (if necessary) incorporating the recommendations made during the assessment.
6. To publish the results of the site investigations in an academic journal, either as a standalone site, or integrating the results of other nearby investigations.

Figure 1: The Riverside Energy Park site and associated zones of construction. The geoarchaeological works focuses on the permanent works in the area adjacent / around Riverside Resource Recovery Facility (RRRF) north of Norman Road, rather than the entire application boundary.

Figure 2: Proposed Geotechnical borehole locations

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Application Boundary
(1) Additional Areas included in Application Boundary
1,1A,2A,2B Electrical Route Options

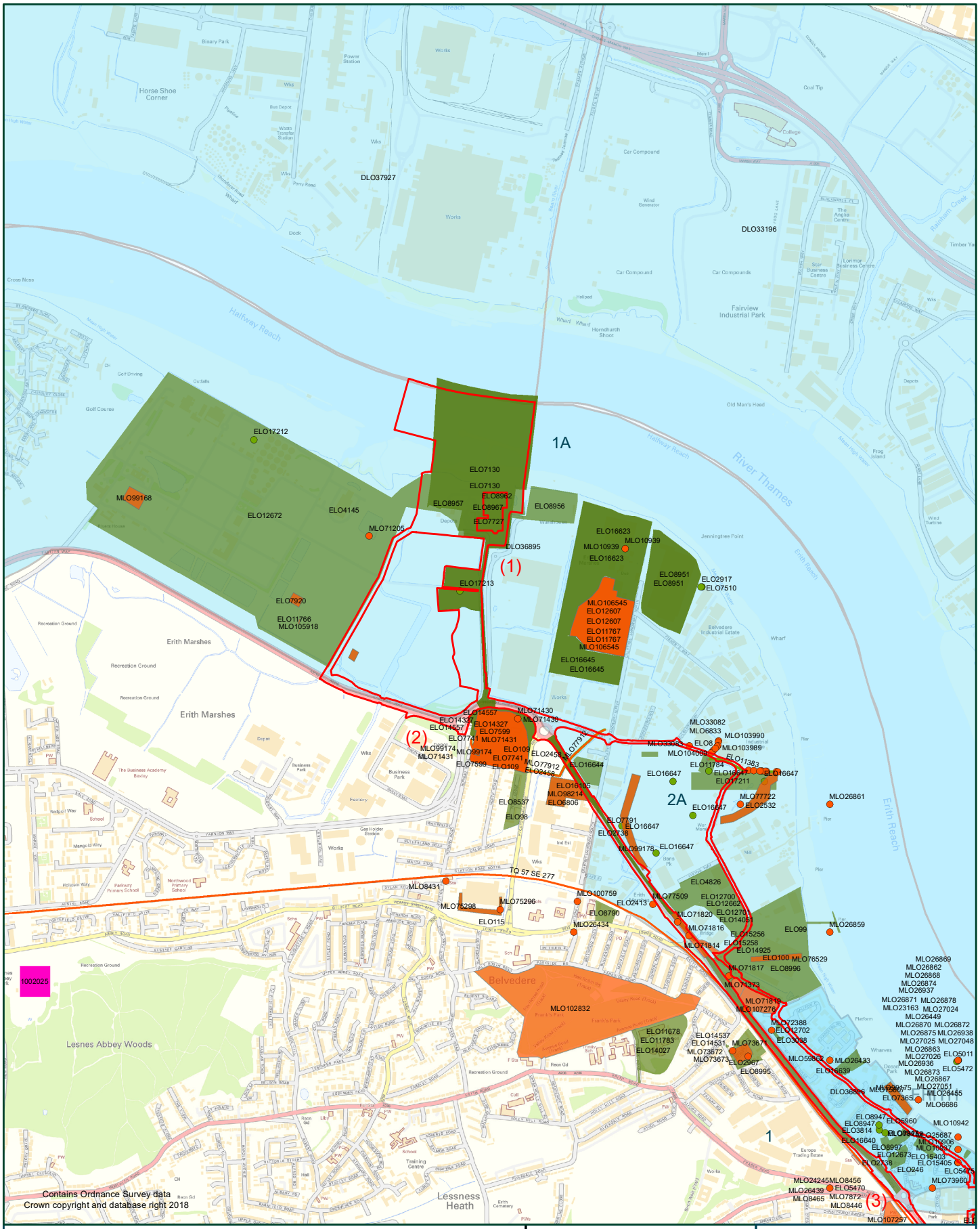
1:40,000 at A4

0 1,250m

N

CORY RIVERSIDE ENERGY

Title:
Fig.1: Application Boundary
Address:
Riverside Energy Park, London Boroughs of Bexley and Dartford



Application Boundary
GHLER monument point
GHLER monument line
GHLER monument polygon
GHLER event point
GHLER event line
GHLER event polygon
Scheduled Monument
Archaeological Priority Areas

1:20,000 at A4

0 650m

N

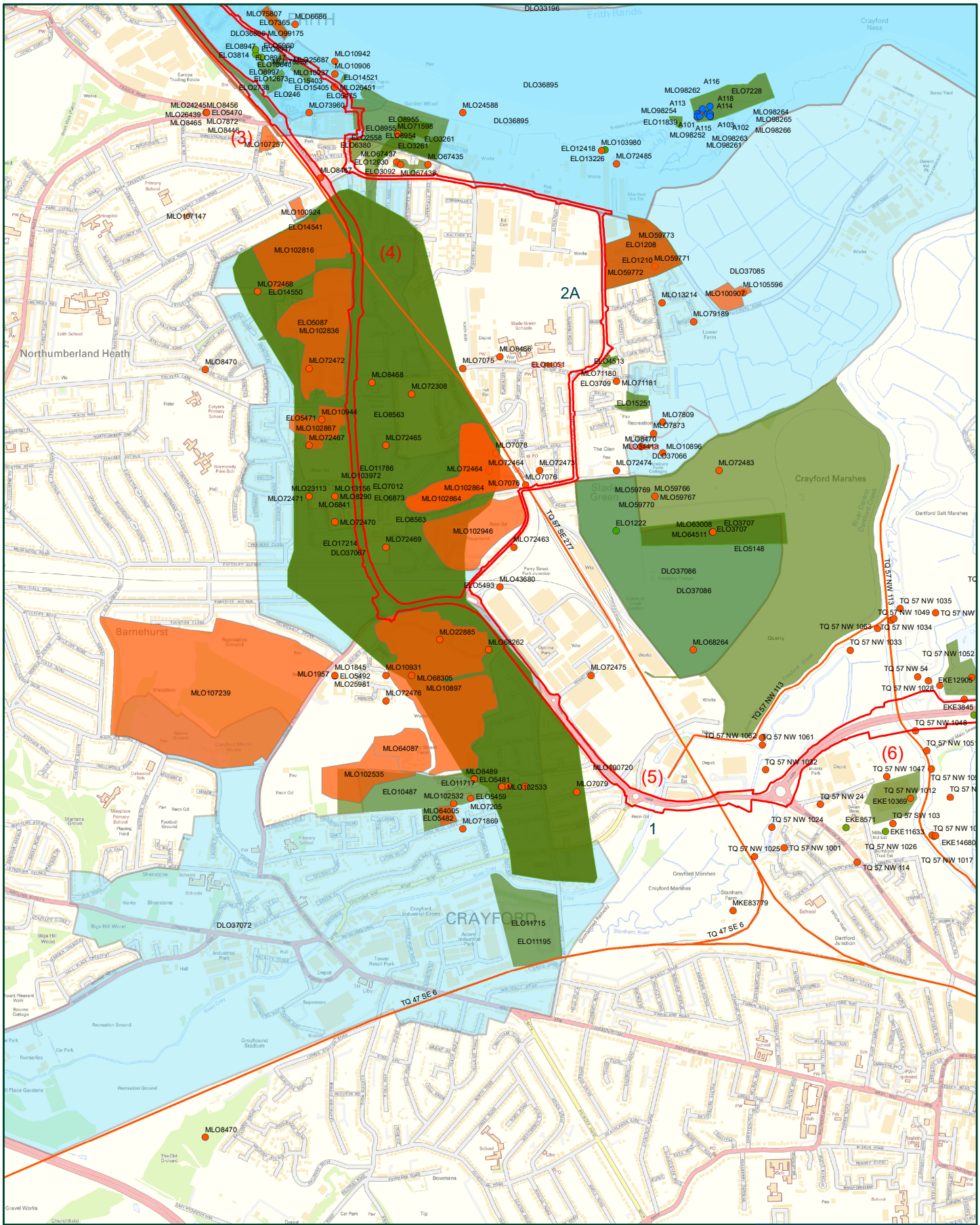
Title:

Fig.2a: Location of Archaeological Assets and Archaeological Priority Areas

Address:

Riverside Energy Park, London Boroughs of Bexley and Dartford

CORY RIVERSIDE ENERGY



Application Boundary
GHLER monument point
GHLER monument line
GHLER monument polygon
GHLER event point
GHLER event line
GHLER event polygon
Thames Archaeological Survey
Archaeological Priority Areas

1:20,000 at A4

0 650m

N

CORY RIVERSIDE ENERGY

Title:

Fig.2b: Location of Archaeological Assets and Archaeological Priority Areas

Address:

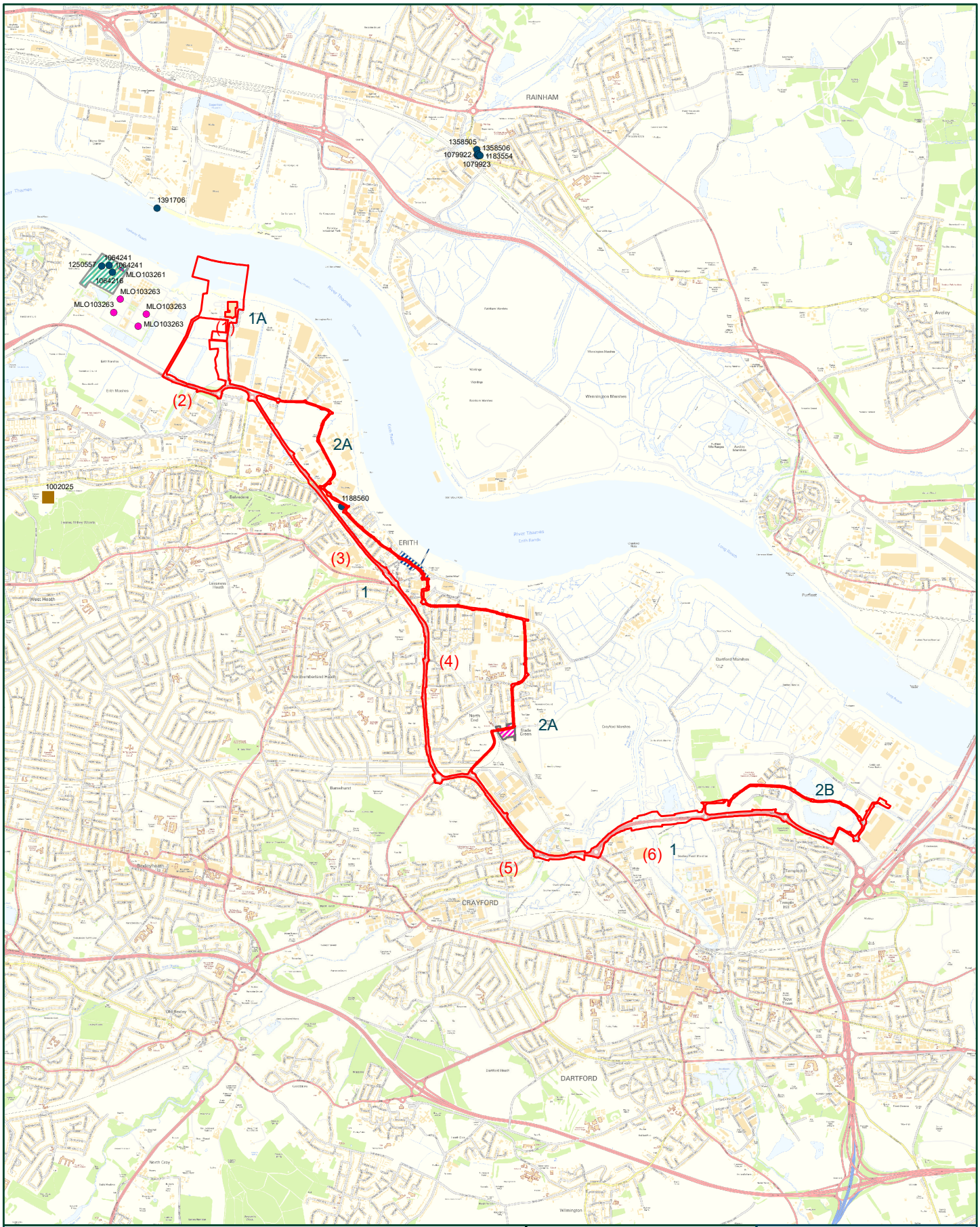
Riverside Energy Park, London Boroughs of Bexley and Dartford

Title:

Fig. 2c: Location of Archaeological Assets and Archaeological Priority Areas

Address:

Riverside Energy Park, London Boroughs of Bexley and Dartford



Application Boundary
Listed Building
Locally Listed Building
1,1A,2A,2B Electrical Route Options

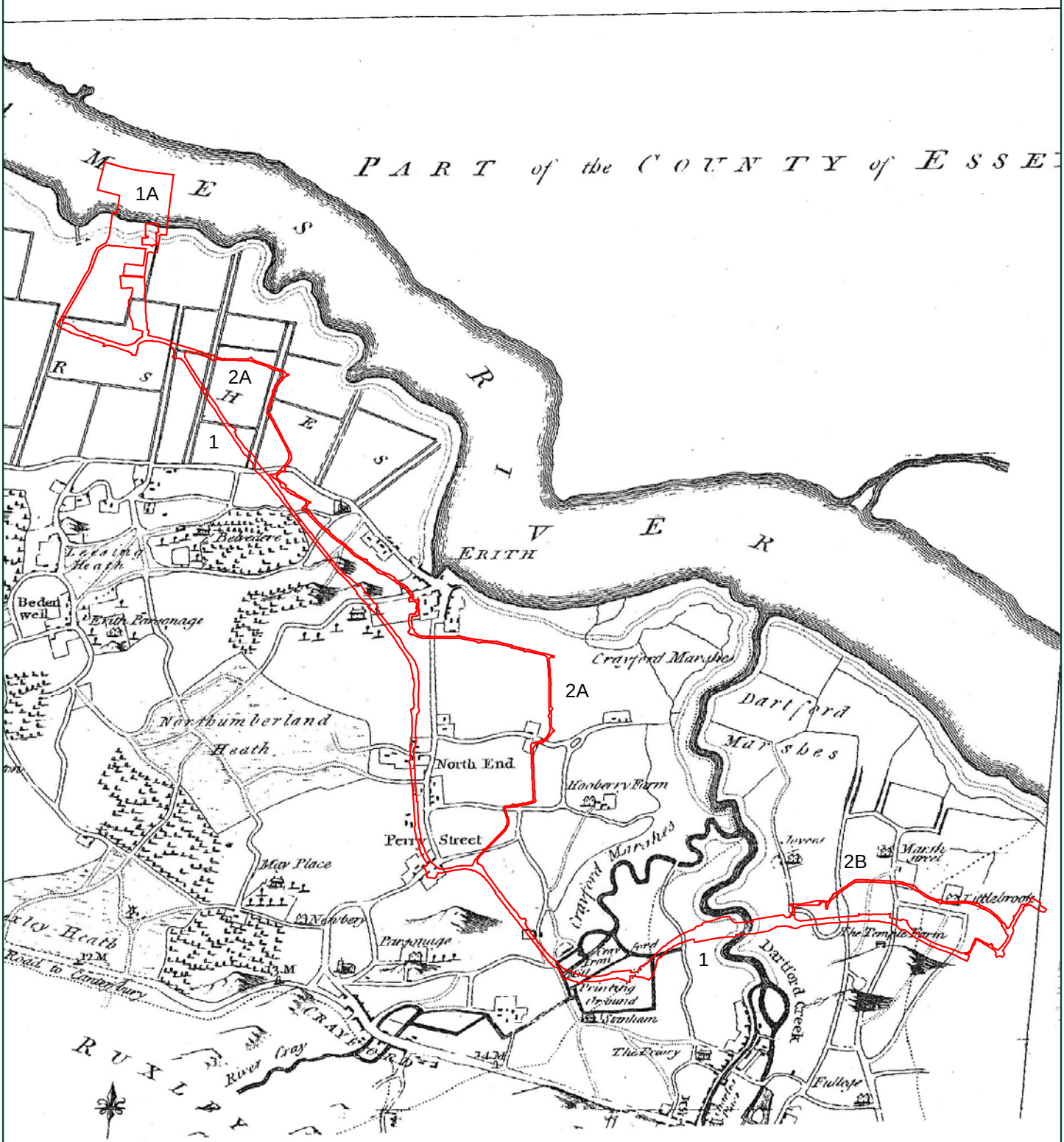
Crossness Conservation Area
Oak Road Conservation Area
Erith Riverside Conservation Area
Scheduled Monument

1:50,000 at A4
0 1,500m

Title:
Fig.3: Location of designated and built heritage assets in settings assessment
Address:
Riverside Energy Park, London Boroughs of Bexley and Dartford

N

CORY RIVERSIDE ENERGY



Approximate location of Application Boundary

1:40,000 at A4

0 1,200m

N

Title:

Fig.4: Extract from 'A Map of the Hundred of Little and Lesness, and Dartford and Wilmington' Edward Hasted; 1778

Address:

Riverside Energy Park, London Borough of Bexley

Approximate location of Application Boundary

1:20,000 at A4

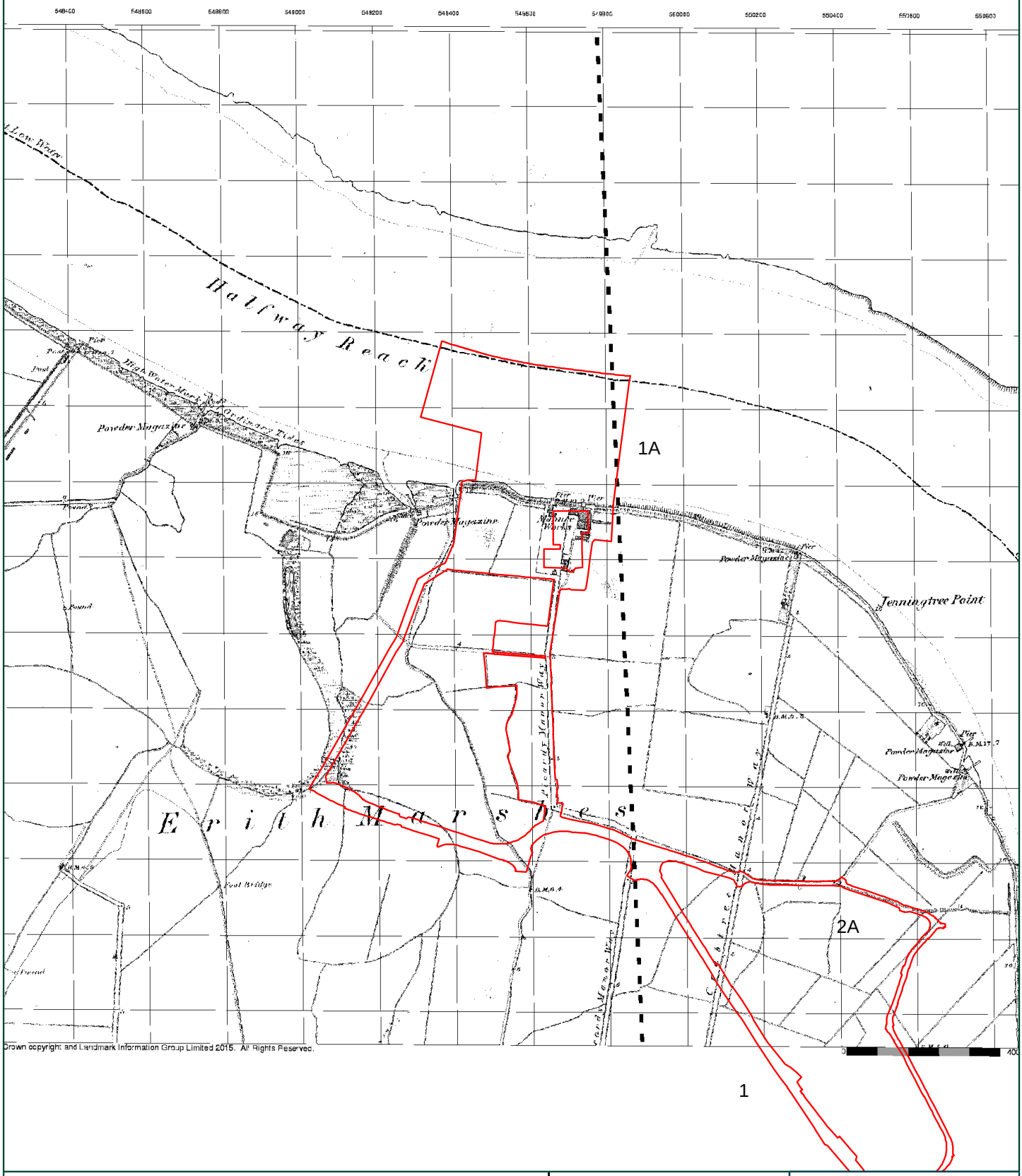
0 650m

Title:
Fig.5: Extract from "The County of Kent in 1801, Ordnance Survey of Great Britain', REP Site

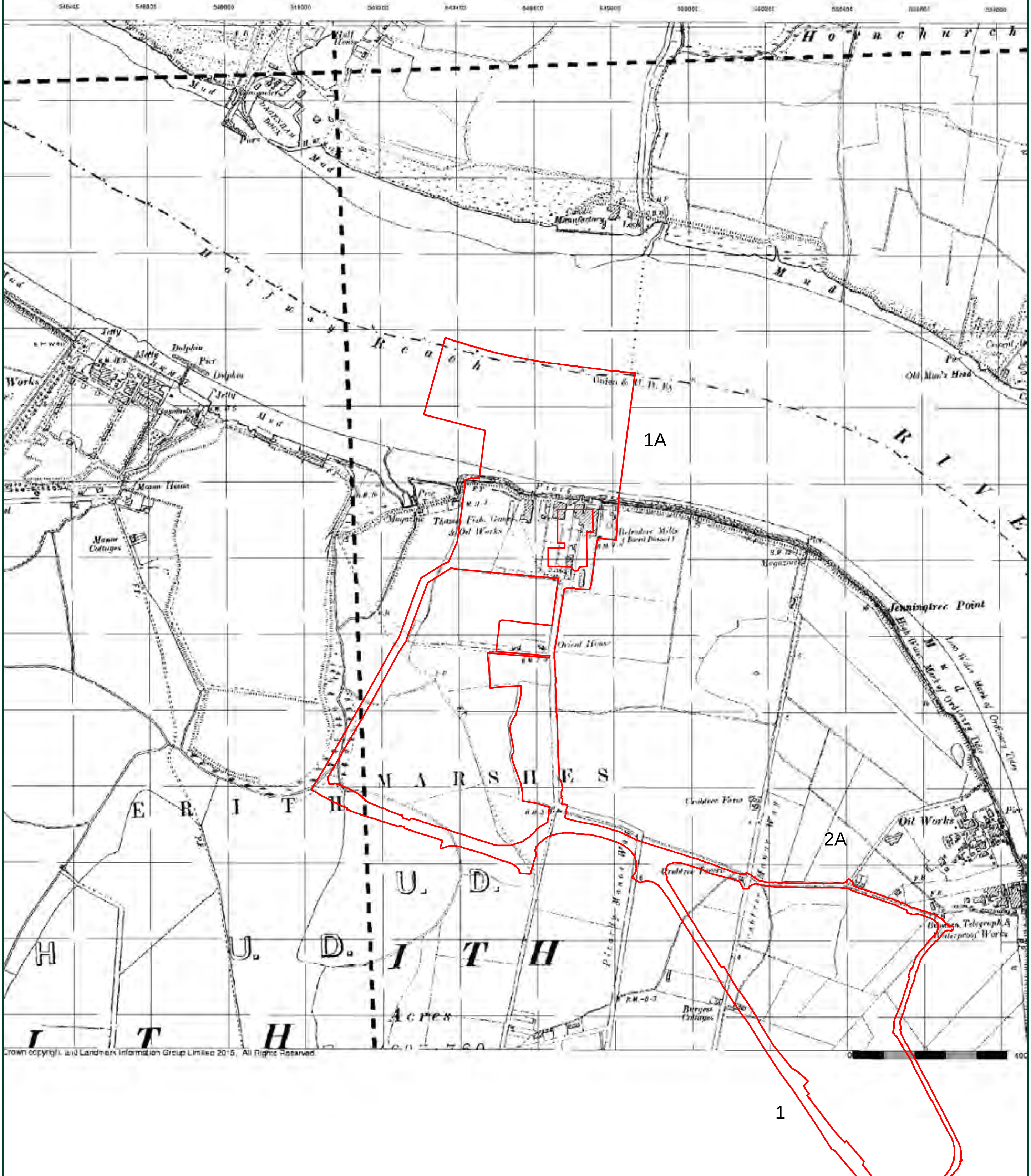
Address:
Riverside Energy Park, London Borough of Bexley

N

orion.



Title:
Fig.6: 1869-1870 OS 1:10,560 scale map, REP site
Address:
Riverside Energy Park, London Borough of Bexley



Application Boundary

1:14,000 at A4

0 450m

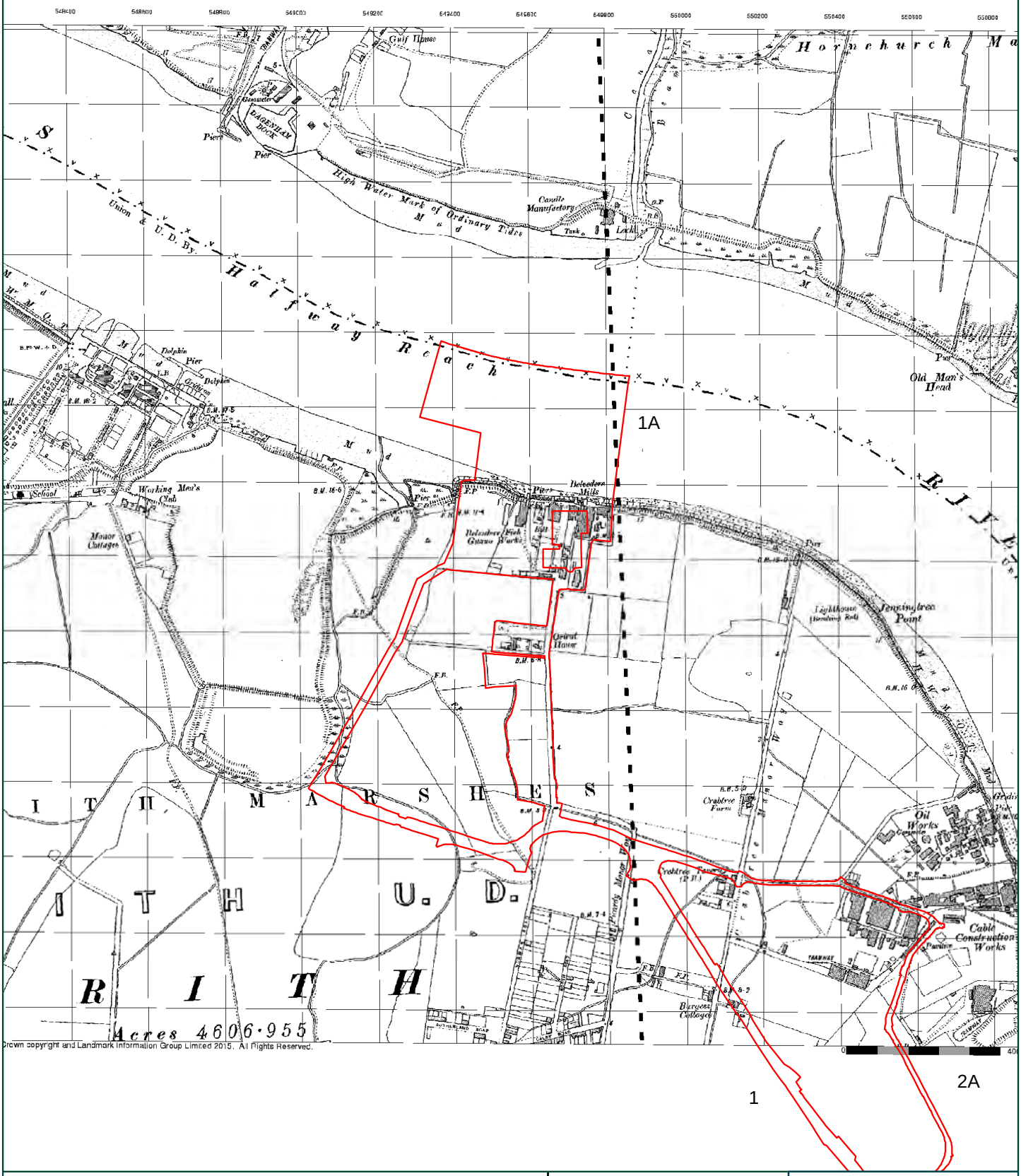
Title:

Fig.7: 1898-1899 OS 1:10,560 scale map, REP site

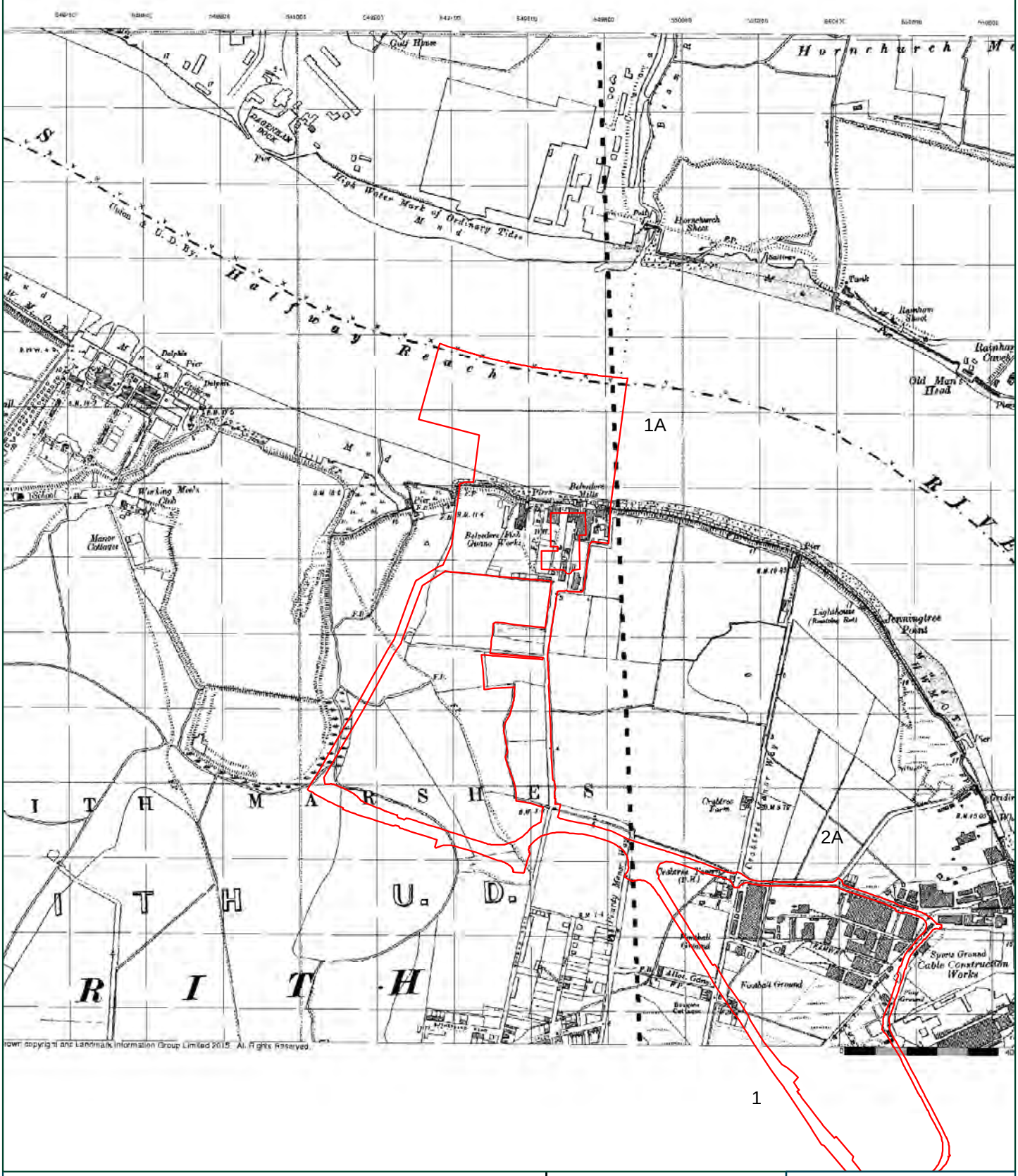
Address:

Riverside Energy Park, London Borough of Bexley

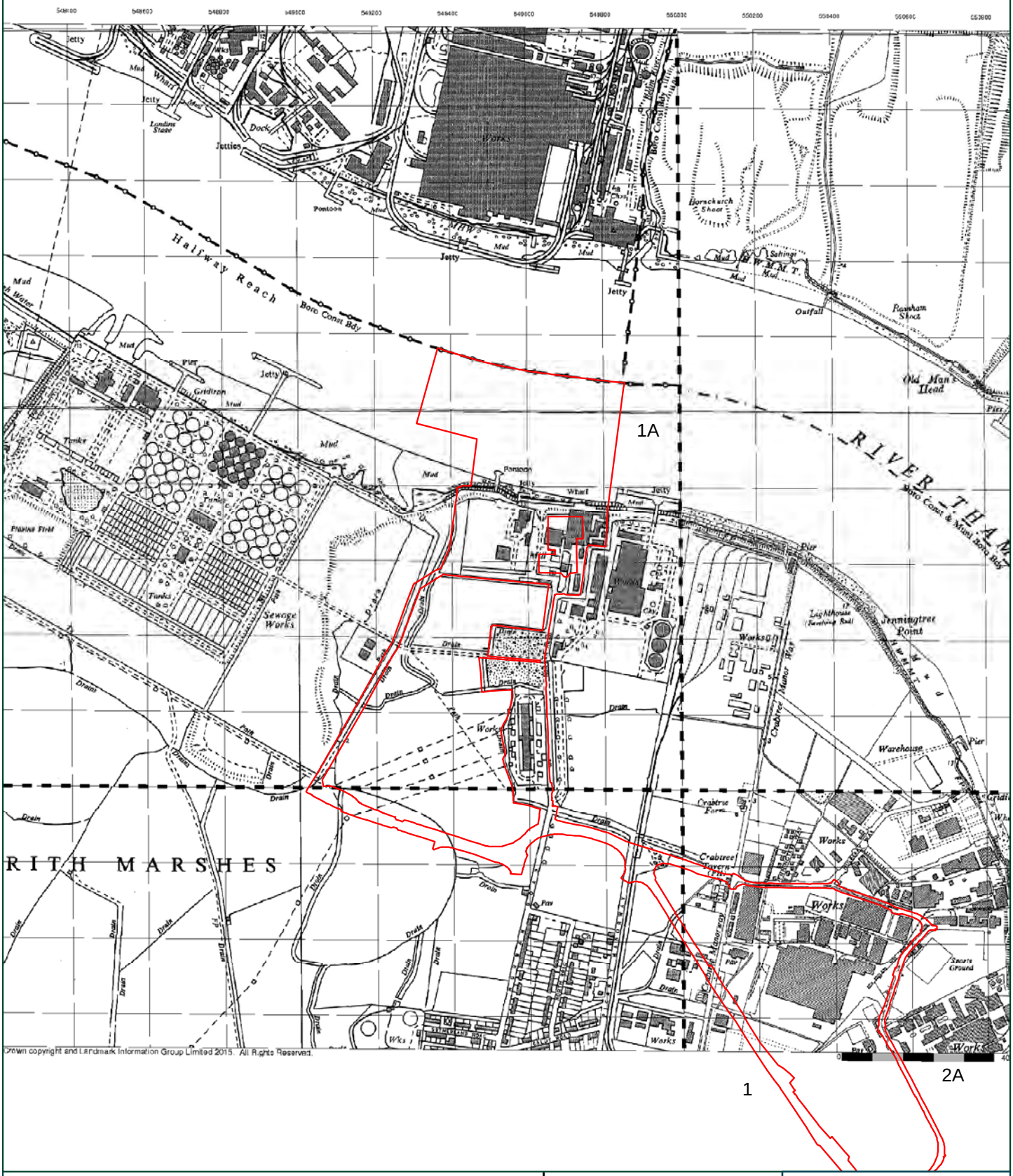
N



Title:
Fig.8: 1910 OS 1:10,560 scale map, REP site
Address:
Riverside Energy Park, London Borough of Bexley



Title:
Fig.9: 1938 OS 1:10,560 scale map, REP site
Address:
Riverside Energy Park, London Borough of Bexley



Application Boundary

1:14,000 at A4

0 450m

Title:

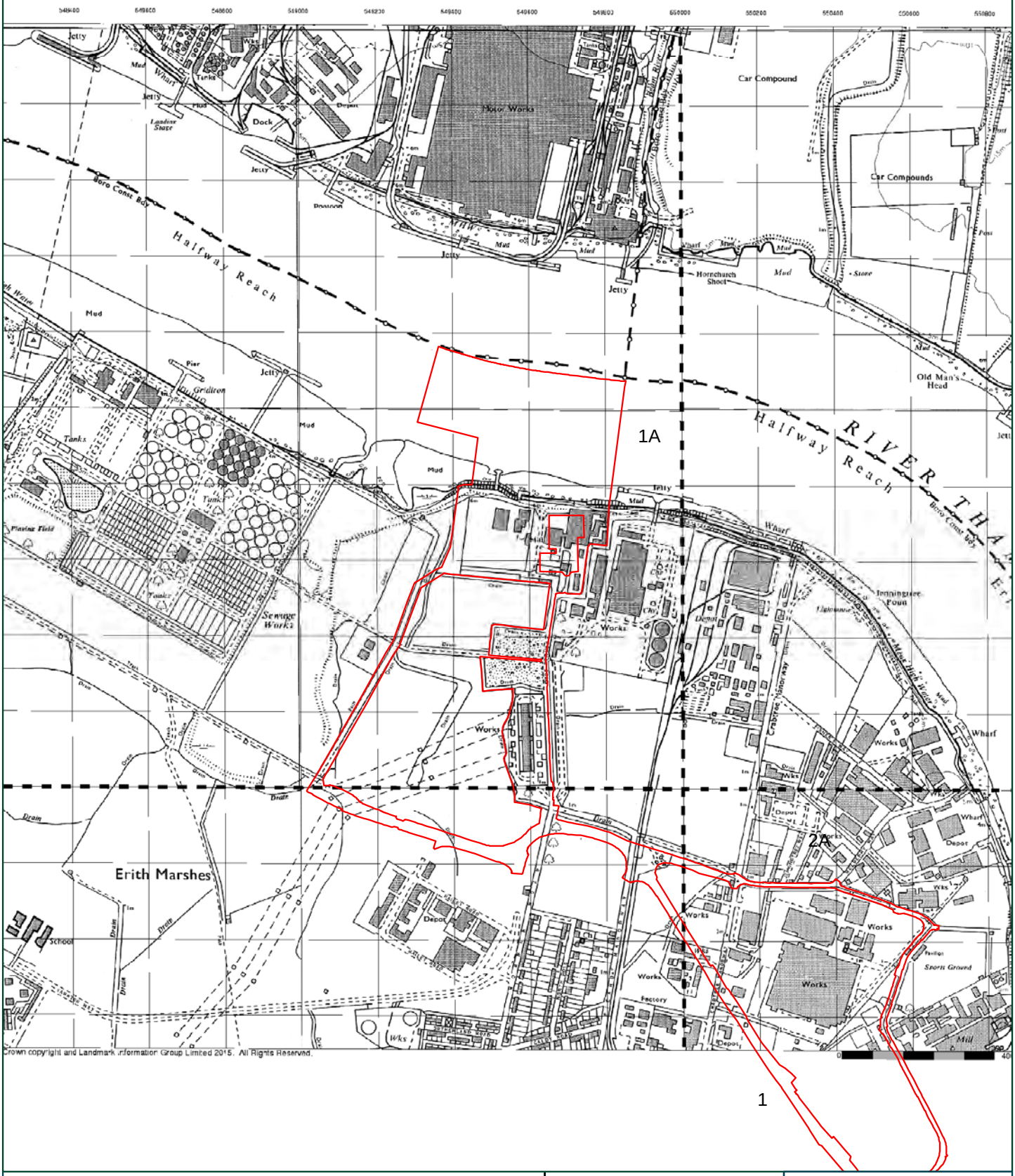
Fig.10: 1961-69 OS 1:10,000 scale map, REP site

Address:

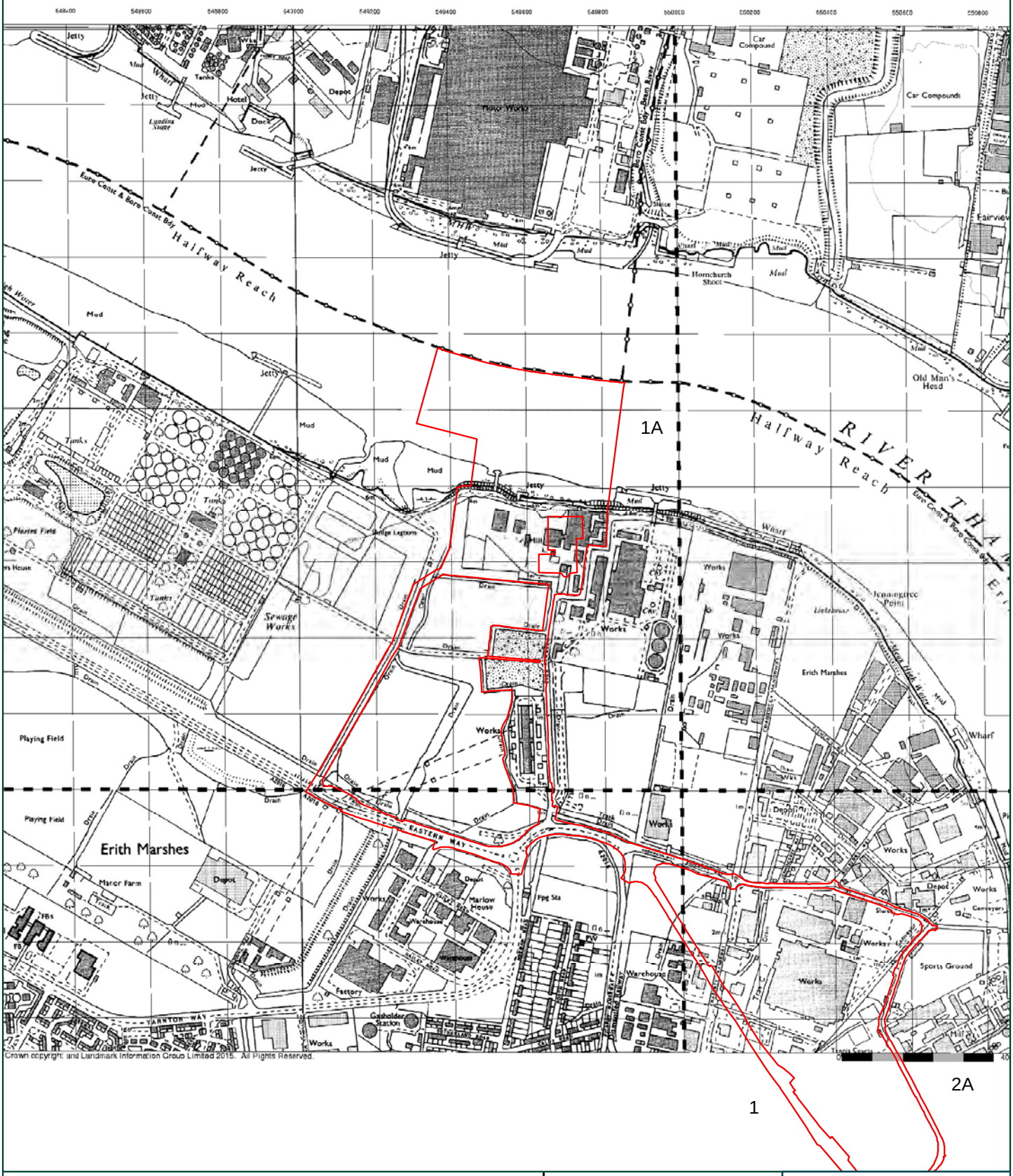
Riverside Energy Park, London Borough of Bexley

N

orion.



Title:
Fig.11: 1975-76 OS 1:10,000 scale map, REP site
Address:
Riverside Energy Park, London Borough of Bexley



Title:
Fig.12: 1993-96 OS 1:10,000 scale map, REP site
Address:
Riverside Energy Park, London Borough of Bexley

Application Boundary

1:14,000 at A4

0 450m

N

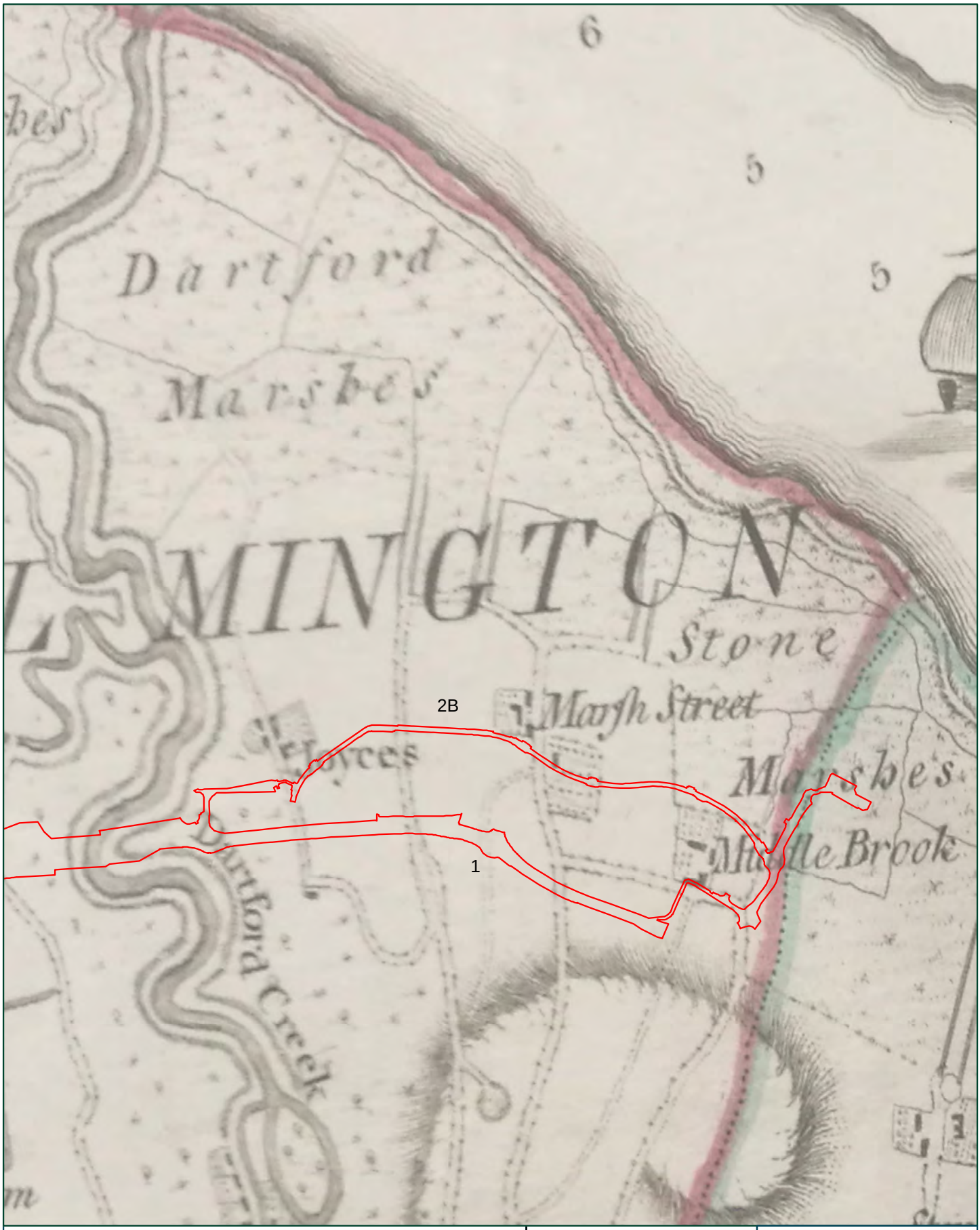
Title:

Fig.13: 2017 OS 1:10,000 scale map, REP site

Address:

Riverside Energy Park, London Borough of Bexley

orion.



Application Boundary

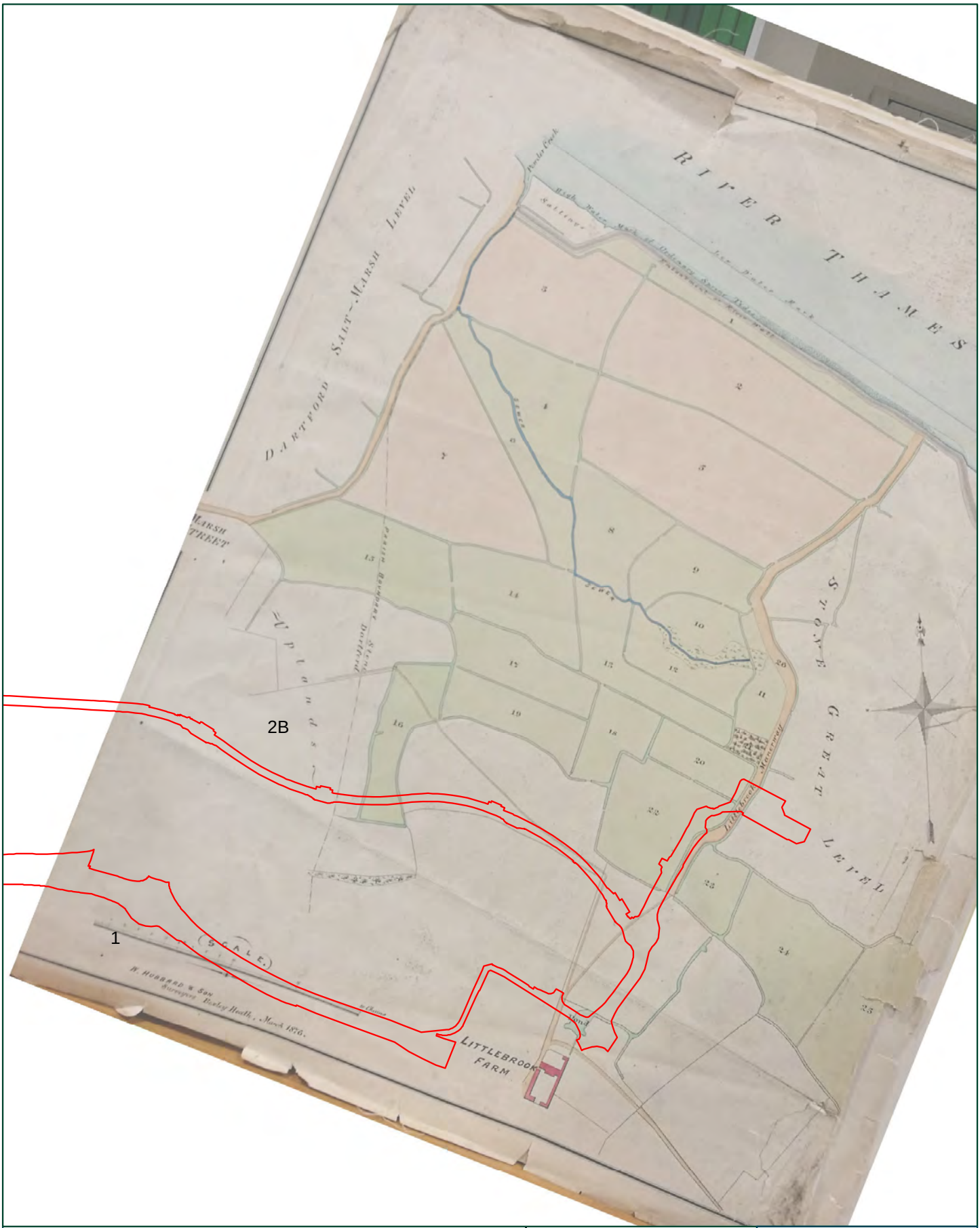
1:14,000 at A4

0 0.35km

N

Title:
Fig.14: 1769 Andrews and Drury map of Kent

Address:
Riverside Energy Park, London Borough of Bexley



Application Boundary

1:8,000 at A4

0 0.2km

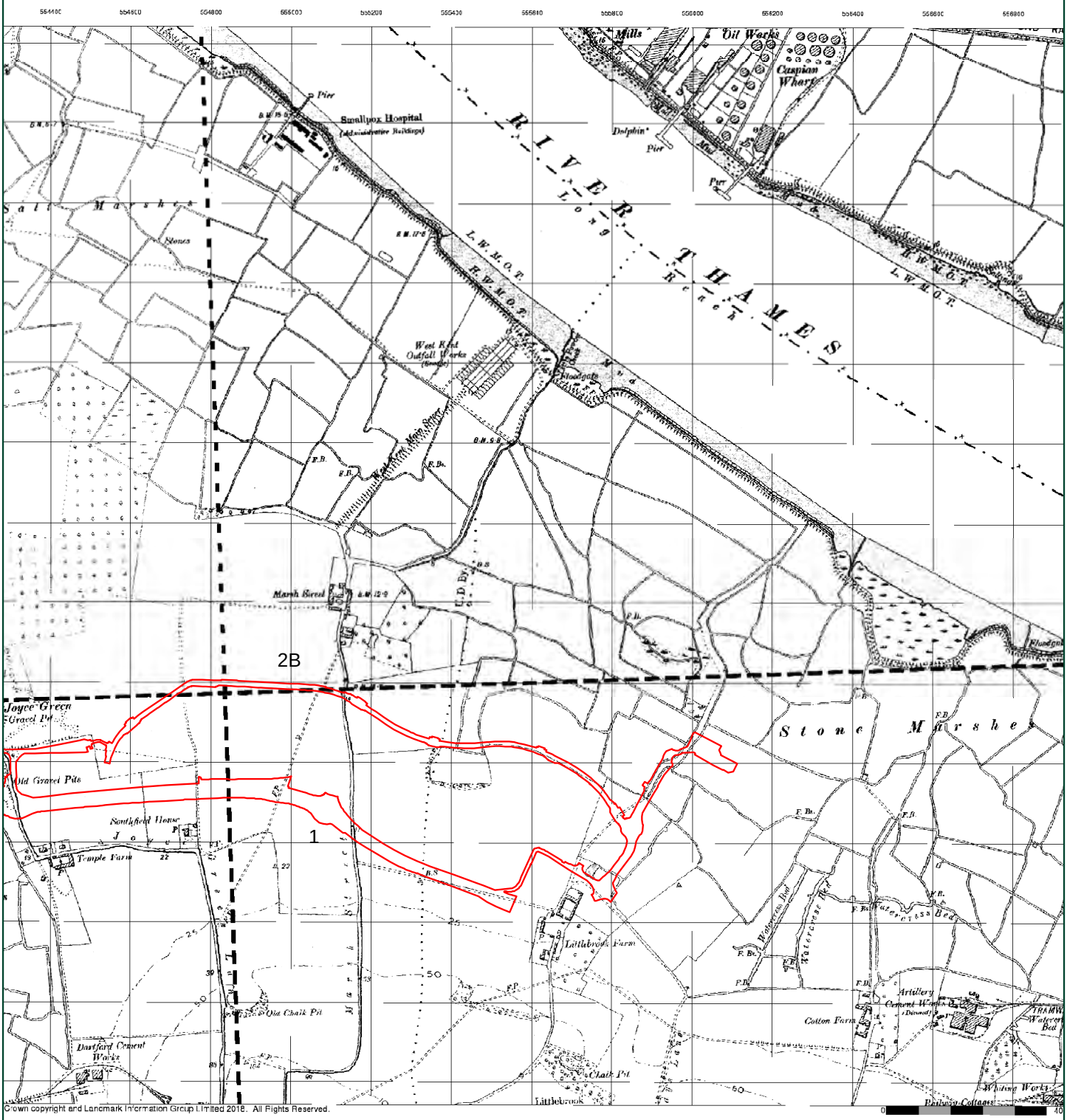
N

Title:

Fig.15: 1826 Volume of maps of the levels surveyed by W. Hubbard of Dartford

Address:

Riverside Energy Park, London Borough of Bexley



Application Boundary

1:14,000 at A4

0 450m

Title:

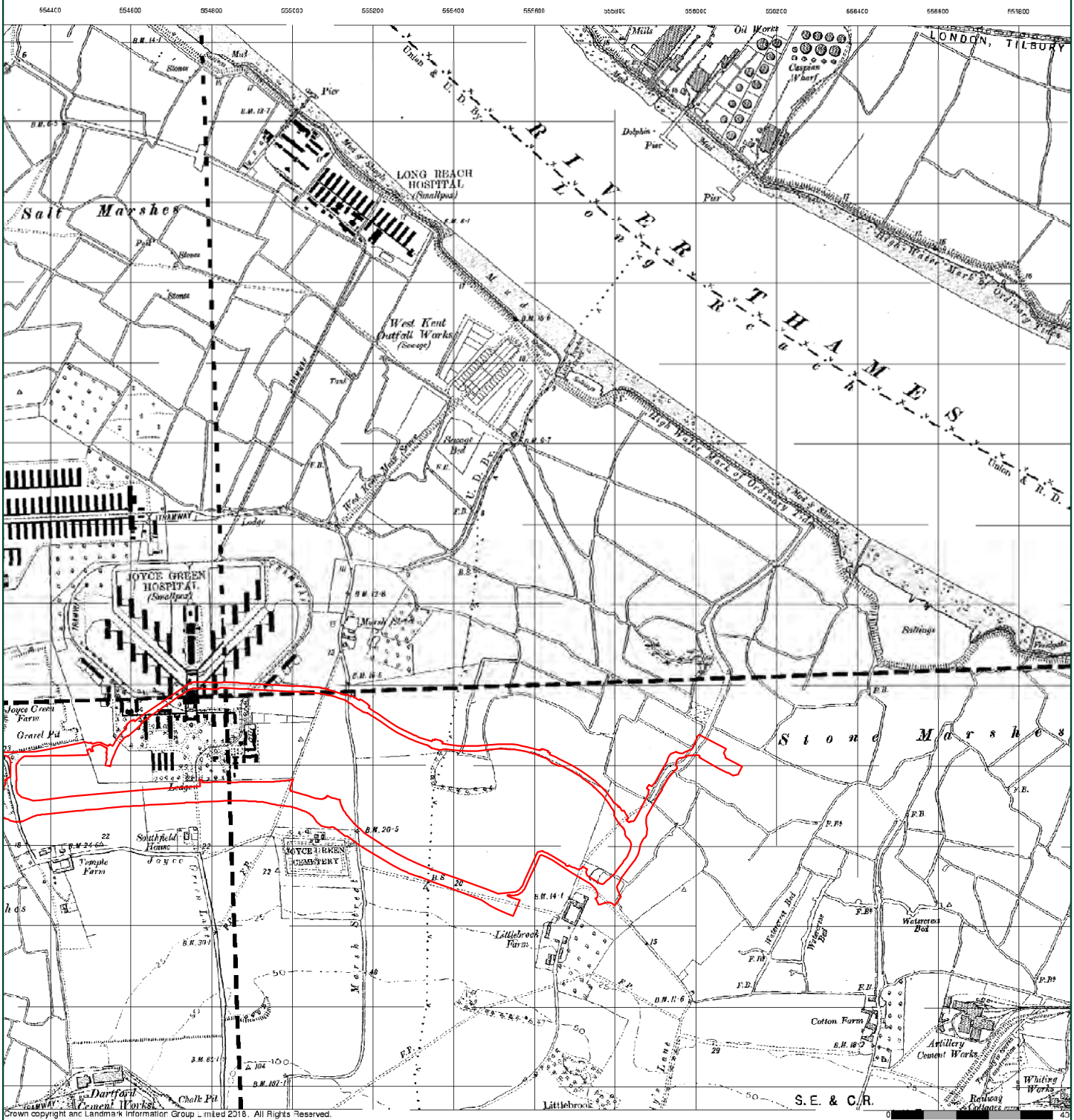
Fig.16: 1898-1899 OS 1:10,560 scale map, Littlebrook site

Address:

Riverside Energy Park, London Borough of Bexley

N

orion.



Application Boundary

1:14,000 at A4

0 450m

Title:

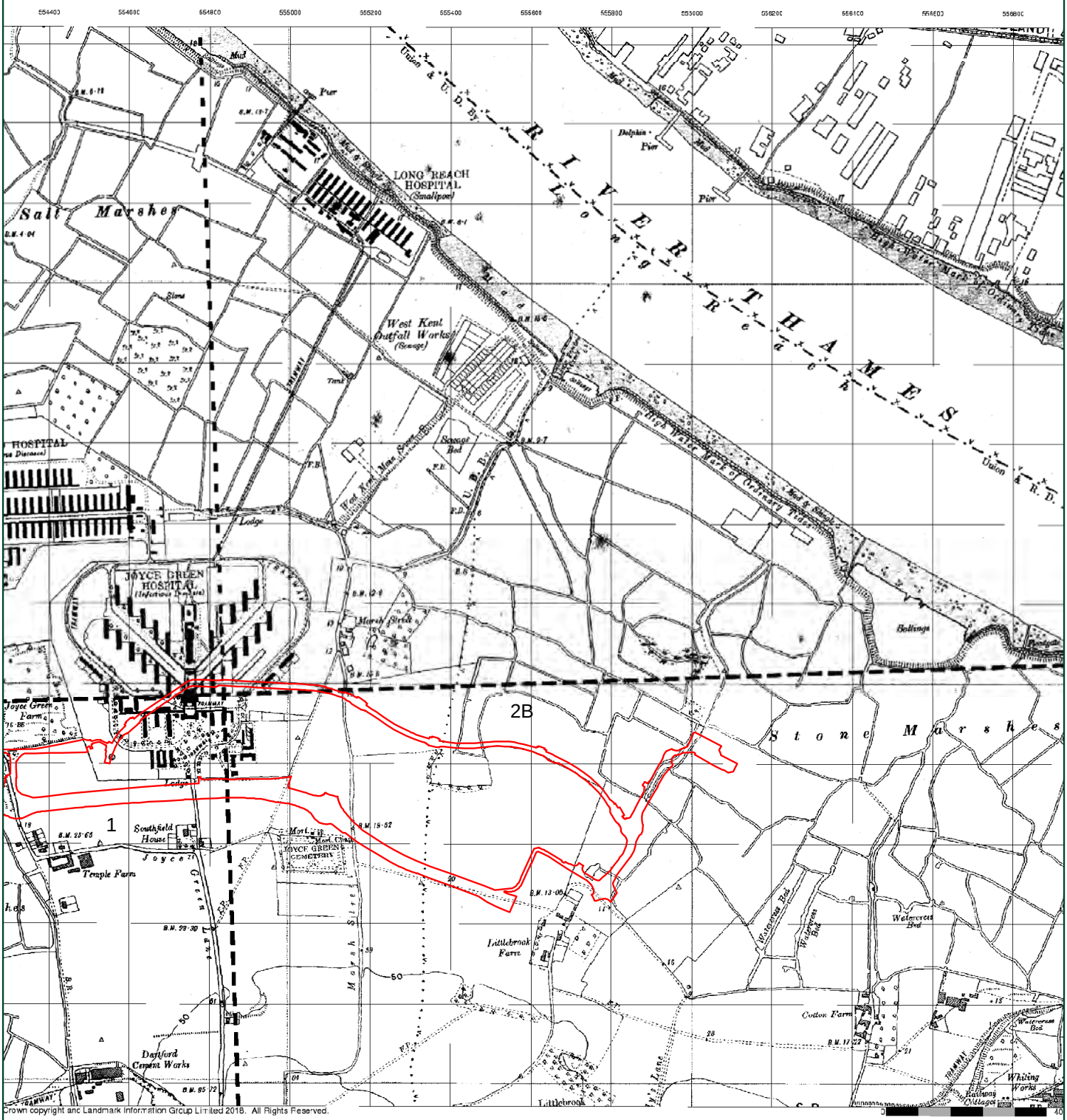
Fig.17: 1910 OS 1:10,560 scale map, Littlebrook site

Address:

Riverside Energy Park, London Borough of Bexley

N

orion.



Application Boundary

1:14,000 at A4

0 450m

N

Title:

Fig.18: 1938 OS 1:10,560 scale map, Littlebrook site

Address:

Riverside Energy Park, London Borough of Bexley

orion.

Application Boundary

1:14,000 at A4

0 450m

N

Title:

Fig.19: 1961 OS 1:10,000 scale map, Littlebrook site

Address:

Riverside Energy Park, London Borough of Bexley

Application Boundary

1:14,000 at A4

0 450m

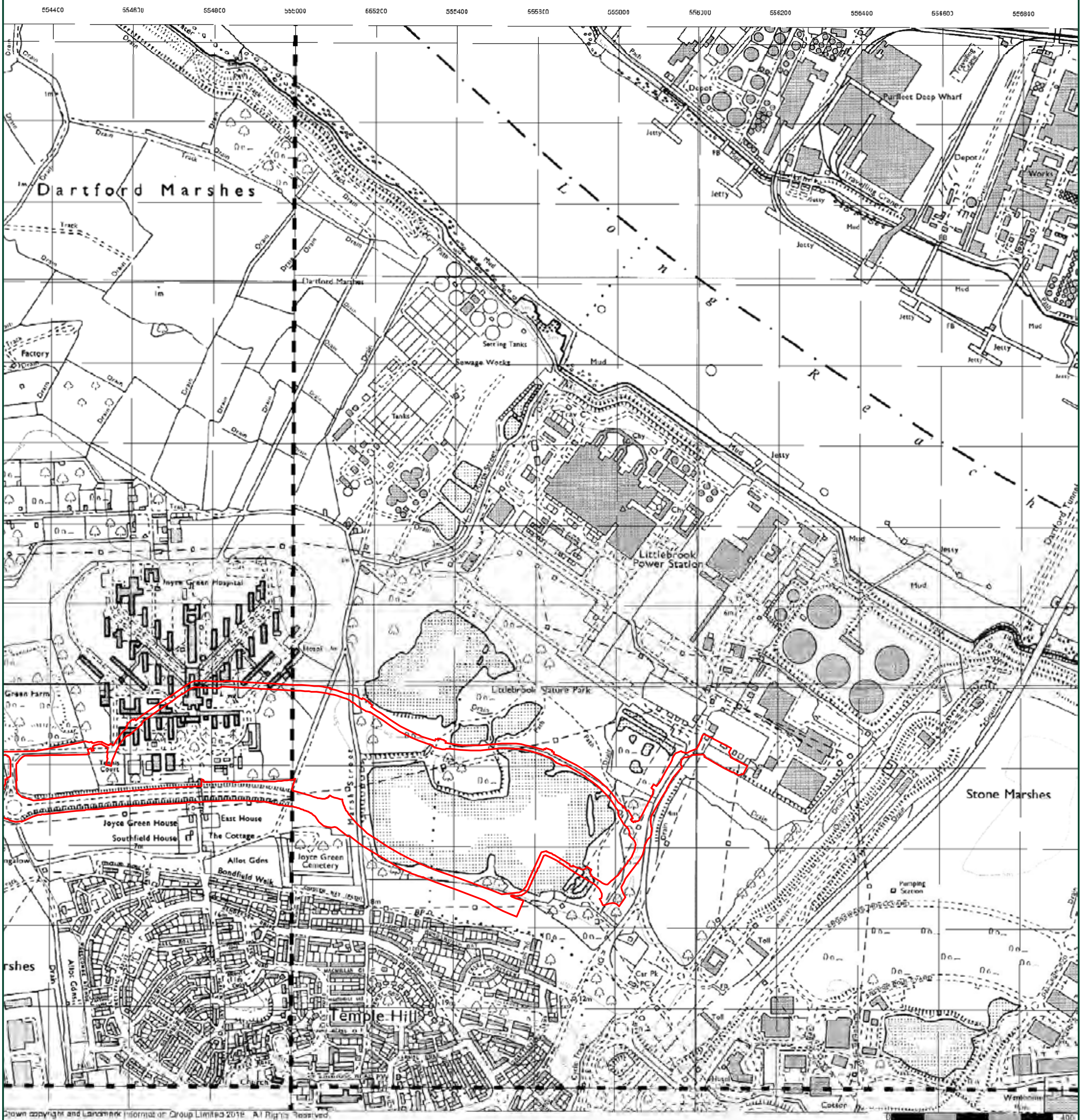
N

Title:

Fig.20: 1974-77 OS 1:10,000 scale map, Littlebrook site

Address:

Riverside Energy Park, London Borough of Bexley



Application Boundary

1:14,000 at A4

0 450m

N

Title:

Fig.21: 1983-87 OS 1:10,000 scale map, Littlebrook site

Address:

Riverside Energy Park, London Borough of Bexley

Application Boundary

1:14,000 at A4

0 450m

N

Title:

Fig.22: 2017 OS 1:10,000 scale map, Littlebrook site

Address:

Riverside Energy Park, London Borough of Bexley