Red & Yellow Specialist Extra Care

Melliss Avenue – Kew

Historic Environment Assessment

October 2018

MOLA
MUSEUM OF LONDON ARCHAEOLOGY

Red & Yellow

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Melliss Avenue – Kew
TW9 4BD

Historic environment assessment

NGR 519777 176917

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Mortimer Wheeler House, 46 Eagle Wharf Road, London N1 7ED
tel 0207 410 2200 email: business@mola.org.uk
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Cover: Existing structures, facing north (MOLA site visit 19/02/2018, photo no3)

1.1 Figures

Note: site outlines may appear differently on some figures owing to distortions in historic maps. North is approximate on early maps.

1.2 Appendix 1 Historic Environment Assessment Supplement

Executive summary

Red & Yellow on behalf of Melliss Ave Devco Limited have commissioned MOLA to carry out a historic environment assessment in advance of proposed development at Former Kew Biothane Plant, Melliss Avenue, Kew, London TW9 4BD in the London Borough of Richmond upon Thames. The scheme demolition of existing buildings and structures and redevelopment of the site to provide a Specialist Extra Care facility. The proposed building will have a ground floor slab supported on piled foundations and no basement.

The site was part of the Kew Sewage Treatment Works previously investigated in 1999–2000. Ten trenches were excavated at the second stage of the evaluation in the northern area of the Kew Sewage Treatment Works in 1999 following decommissioning of the sewage works. However no evaluation trenches were excavated within the current site. No archaeological deposits were observed or artefacts recovered from the spoil. During the watching brief in 2000 of the Kew Sewage Treatment Works the area of the current site was not investigated.

This assessment is supplemented by a 'deposit model' of the buried topography. The results show that the whole of the site lies within the former floodplain of the River Thames. In this area the sediment sequence consists of Late Pleistocene river gravels overlain by Holocene alluvium (fine, waterlain sediments).

This desk-based study assesses the impact of the scheme on buried heritage assets (archaeological remains). Above ground heritage assets (historic structures) are not discussed in detail, but they have been noted where they assist in the archaeological interpretation of the site. Buried heritage assets that may be affected by the proposals comprise:

- ***Palaeoenvironmental remains.*** *There is high potential across the site for palaeoenvironmental remains, of low significance, deposited within the natural alluvium deposits.*
- ***Prehistoric remains.*** *There is low to moderate potential for residual finds within the alluvium deposits. Such remains would be of low significance.*

There is low potential for Roman, medieval and post-medieval remains. The site was located some distance from settlements in marshland, during these periods. The initial strip of the area to create a levelled surface and the excavation of the filter beds would have removed any post-medieval archaeological remains.

There is high survival potential across the site for Palaeoenvironmental remains and moderate for prehistoric chance finds of low significance.

The main past impact affecting archaeological survival was the construction of the four filter beds as part of the Mains Drainage Works and Pumping Station sometime between 1913 and 1933.

There would be potential impacts on archaeological remains from the demolition of the existing industrial structures, levelling of the site, piled foundations for the proposed building, landscaping and the construction of new services.

The results of the previous investigation within the Kew Sewage Treatment Works have shown that the archaeological potential of the site is likely to be limited to remains of no more than low significance. The site has been impacted by the construction of the various structures associated with the treatment works. It is possible, however, that an archaeological watching brief would be required during preliminary ground preparation and subsequent foundation construction, which would ensure that any previously unrecorded archaeological assets were not removed without record.

Any archaeological work would need to be undertaken in accordance with an approved Written Scheme of Investigation (WSI) and could be carried out under the terms of a standard archaeological planning condition set out under the granting of planning consent

2 Introduction

2.1 Origin and scope of the report

2.1.1 Red & Yellow on behalf of Melliss Ave Devco Limited have commissioned MOLA (Museum of London Archaeology) to carry out a historic environment assessment in advance of proposed development at Former Kew Biothane Plant, Melliss Avenue, Kew, London TW9 4BD; National Grid Reference (NGR) 519777 176917: Fig 1. The scheme comprises demolition of existing buildings and structures and redevelopment of the site to provide a Specialist Extra Care facility. The proposed building will have piled foundations and no basement (David Stanley, Property Director, Red and Yellow, *pers. comm.*, 19/02/2018).

2.1.2 This desk-based study assesses the impact of the scheme on buried heritage assets (archaeological remains). It forms an initial stage of investigation of the area of proposed development (hereafter referred to as 'the site') and may be required in relation to the planning process in order that the local planning authority (LPA) can formulate an appropriate response in the light of the impact on any known or possible heritage assets. These are parts of the historic environment which are considered to be significant because of their historic, evidential, aesthetic and/or communal interest.

2.1.3 This report deals solely with the archaeological implications of the development and does not cover possible built heritage issues, except where buried parts of historic fabric are likely to be affected. Above ground assets (i.e., designated and undesignated historic structures and conservation areas) on the site or in the vicinity that are relevant to the archaeological interpretation of the site are discussed. Whilst the significance of above ground assets is not assessed in this archaeological report, direct physical impacts upon such assets arising from the development proposals are noted. The report does not assess issues in relation to the setting of above ground assets (e.g., visible changes to historic character and views).

2.1.4 The assessment has been carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) (DCLG 2012, 2014; see section 10 of this report) and to standards specified by the Chartered Institute for Archaeologists (CIfA Dec 2014a, 2014b), Historic England (EH 2008, HE 2015), and the Greater London Archaeological Advisory Service (GLAAS 2015). Under the 'Copyright, Designs and Patents Act' 1988 MOLA retains the copyright to this document.

2.1.5 Note: within the limitations imposed by dealing with historical material and maps, the information in this document is, to the best knowledge of the author and MOLA, correct at the time of writing. Further archaeological investigation, more information about the nature of the present buildings, and/or more detailed proposals for redevelopment may require changes to all or parts of the document.

2.2 Designated heritage assets

2.2.1 Historic England's National Heritage List for England (NHL) is a register of all nationally designated (protected) historic buildings and sites in England, such as scheduled monuments, listed buildings and registered parks and gardens. The List does not include any nationally designated heritage assets within the site.

2.2.2 The site is not within a conservation area as designated by the London Borough of Richmond upon Thames (https://www.richmond.gov.uk/media/11444/conservation_area_map-2.pdf).

2.2.3 The site is located within the London Borough of Richmond's Thames foreshore and bank Archaeological Priority Area (APA). The Thames has been a focus for human activity from earliest times, and archaeology may be found anywhere along it. Finds of all periods have been made along its banks, or been dredged from the river bed. The foreshore may in places preserve finds and wooded structures that have been buried by the rising water table over the last 10,000 years (Historic England 2018, GLHER data).

2.2.4 GLAAS is currently re-assessing APAs throughout the London boroughs in line with new guidelines to link archaeological sensitivity tiers to specific thresholds for triggering

archaeological advice and assessment (Historic England website). The APAs in the London Borough of Richmond upon Thames are currently being reviewed (https://www.historicengland.org.uk/services-skills/our-planning-services/greater-london-archaeology-advisory-service/greater-london-archaeological-priority-areas/). Once the review is complete the updated APAs will be included as part of the Local Plan when it is adopted in spring 2018 (https://www.richmond.gov.uk/media/14707/lbr-lp-008-statement-of-common-ground-historic-england-07-09-2017.pdf). However, until such time the current APA remains in force.

2.3 Aims and objectives

2.3.1 The aim of the assessment is to:

- identify the presence of any known or potential buried heritage assets that may be affected by the proposals;
- describe the significance of such assets, as required by national planning policy (see section 10 for planning framework and section 11 for methodology used to determine significance);
- assess the likely impacts upon the significance of the assets arising from the proposals; and
- provide recommendations for further assessment where necessary of the historic assets affected, and/or mitigation aimed at reducing or removing completely any adverse impacts upon buried heritage assets and/or their setting.

3 Methodology and sources consulted

3.1 Sources

3.1.1 For the purposes of this report, documentary and cartographic sources including results from any archaeological investigations in the site and the area around it were examined in order to determine the likely nature, extent, preservation and significance of any buried heritage assets that may be present within the site or its immediate vicinity. This information has been used to determine the potential for previously unrecorded heritage assets of any specific chronological period to be present within the site.

3.1.2 In order to set the site into its full archaeological and historical context, information was collected on the known historic environment features within a 1km-radius study area around it, as held by the primary repositories of such information within Greater London. These comprise the Greater London Historic Environment Record (GLHER) and the Museum of London Archaeological Archive (MoL Archaeological Archive). The GLHER is managed by Historic England and includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources. The MoL Archaeological Archive includes a public archive of past investigations and is managed by the Museum of London. The study area was considered through professional judgement to be appropriate to characterise the historic environment of the site. Occasionally there may be reference to assets beyond this, where appropriate, e.g., where such assets are particularly significant and/or where they contribute to current understanding of the historic environment.

3.1.3 In addition, the following sources were consulted:

- MOLA – in-house Geographical Information System (GIS) with statutory designations GIS data, the locations of all 'key indicators' of known prehistoric and Roman activity across Greater London, past investigation locations, projected Roman roads; burial grounds from the Holmes burial ground survey of 1896; georeferenced published historic maps; Defence of Britain survey data, in-house archaeological deposit survival archive and archaeological publications;
- Historic England – information on statutory designations including scheduled monuments and listed buildings, along with identified Heritage at Risk;
- Richmond Local Studies Library and Archive – historic maps and published histories;
- Groundsure – historic Ordnance Survey maps from the first edition (1860–70s) to the present day;
- British Geological Survey (BGS) – solid and drift geology digital map; online BGS geological borehole record data;
- Red & Yellow – Pre-Application no.2 presentation to Council, November 2017; Pre-Application Document for presentation at meeting on Friday 15th September 2017; ESI, Geo-environmental Investigation and Factual Report, November 2015; ESI, asbestos in soil statement, 17/02/2016, Atkins, Land Condition Survey, February 2016; M. J. Rees and Company Ltd., Topographical/ Buried Services Survey, Kew Biothane Plant, rev. A, December 2015; Marchese Partners, Proposed Plans and Elevations August 2018
- Internet – web-published material including the LPA local plan, and information on conservation areas and locally listed buildings.

3.1.4 The assessment included a site visit carried out on the 19th of February 2018 in order to determine the topography of the site and existing land use on the site, and to provide further information on areas of possible past ground disturbance and general historic environment potential. Observations made on the site visit have been incorporated into this report.

3.2 Methodology

Archaeological desk-based assessment

3.2.1 Fig 2 shows the location of known historic environment features within the study area. These have been allocated a unique historic environment assessment reference number (**HEA 1, 2**, etc), which is listed in a gazetteer at the back of this report and is referred to in the text. Where there are a considerable number of listed buildings in the study area, only those within the vicinity of the site (i.e. within 100m) are included, unless their inclusion is considered relevant to the study. Conservation areas and archaeological priority areas are not shown. All distances quoted in the text are approximate (within 5m).

3.2.2 Section 11 sets out the criteria used to determine the significance of heritage assets. This is based on four values set out in Historic England's *Conservation principles, policies and guidance* (EH 2008), and comprise evidential, historical, aesthetic and communal value. The report assesses the likely presence of such assets within (and beyond) the site, factors which may have compromised buried asset survival (i.e. present and previous land use), as well as possible significance.

3.2.3 Section 11 includes non-archaeological constraints. Section 13 contains a glossary of technical terms. A full bibliography and list of sources consulted may be found in section 14 with a list of existing site survey data obtained as part of the assessment.

Geoarchaeological deposit model

3.2.4 A geoarchaeological deposit model (see Appendix 1) has been prepared for the application site by MOLA. By modelling the buried stratigraphy and preliminarily reconstructing the evolving landscape of the site, deposits of likely archaeological and palaeoenvironmental potential can be identified. In order to understand the context of subsurface deposits existing across the site, information has been examined from:

- Past archaeological and geoarchaeological work undertaken in the area;
- BGS maps, describing the characteristics of the bedrock, soils and substrate in the area;
- Ordnance Survey and other mapping illustrating the modern landscape characteristics and topography of the area; and
- Historic maps and other sources suggesting the past landscape characteristics of the area.

3.2.5 In order to create the deposit model the geotechnical data was entered into a digital (Rockworks 15) database; boreholes with the prefix 'BH', test pits with 'TP' and window samples with 'WS', supplemented where appropriate by boreholes recorded in the BGS digital archive[1]. Seven geotechnical boreholes (BH), seven geotechnical test pits (TP) and fifteen BGS historic boreholes (BGS) were incorporated into the deposit model. The distribution of the boreholes is shown in Fig 1, Appendix 1.

3.2.6 A series of working cross-sections (transects: vertical slices through the sub-surface stratigraphy) were produced and correlations were made between key deposits. Individual lithostratigraphic units ('contexts') with related characteristics were grouped together and then linked with similar deposits in adjacent boreholes. Grouping produced a series of site-wide units (facies), which are representative of certain environments. Thus a sequence of environments both laterally and through time has been reconstructed for the site. Two transects were selected to illustrate the stratigraphic sequence and distribution of deposits across the site (Fig 4 and Fig 5, Appendix 1).

[1] The National Geoscience Data Centre collection of onshore scanned boreholes, shafts and well records via the BGS Borehole record viewer: http://www.bgs.ac.uk/data/boreholescans/home.html

3.2.7 Fig 1, Appendix 1 shows the site's location in relation to the alluvium of the River Thames (superficial geology). Fig 2, Appendix 1 is a Lidar digital terrain model. Lidar is a surveying method that measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensor. Fig 3, Appendix 1, is a topographic plot of the early Holocene surface (i.e. showing the Ordnance Datum (OD) level of the top of the underlying solid geology), which formed the ancient land surface at around 10,000 BC. Figure 4 Appendix 1, is a west-east transect across the site. Fig 5, Appendix 1, is a north-south transect across the site, showing the levels and thickness of deposits in section.

4 The site's topography and geology

4.1 Site location

4.1.1 The site is located at the former Kew Biothane Plant, Melliss Avenue, Kew, London TW9 4BD in the London Borough of Richmond upon Thames (NGR 519777 176917: Fig 1). The site area is 0.7ha and is bounded by a Thames Water site to the north, residential housing to the north, west and south, and the Thames River and bank to the east. The site falls within the historic parish of Mortlake, and was within the county of Surrey prior to being absorbed into the administration of the Greater London Borough of Richmond upon Thames.

4.1.2 The River Thames is 20m east from the site's eastern boundary.

4.2 Topography

4.2.1 Topography can provide an indication of suitability for settlement, and ground levels can indicate whether the ground has been built up or truncated, which can have implications for archaeological survival (see section 6.2).

4.2.2 The study area slopes down from the west to the east towards the River Thames.

4.2.3 A topographic survey of the site (Atkins 2016) shows that the site is relatively flat and at 4.0m Ordnance Datum (OD) but is surrounded by a bund wall (a containment wall around hazardous liquids are handled, processed or stored and must be of sufficient size to contain any likely leak) to the north, east and south which varies in height from 6.0m OD along the north, 6.2m OD along the east and 5.0m OD along the south.

4.3 Geology

4.3.1 Geology can provide an indication of suitability for early settlement, and potential depth of remains.

4.3.2 According to British Geological Survey (BGS) digital data the geology of the area comprises alluvium, which overlies the Kempton Park Gravel formation. The alluvial sequence within the channel is complex and may include phases with organic preservation and prehistoric landscape remains, including environmental evidence. The Thames channels changed, migrated and silted up over time as mean sea and river levels changed after the end of the last glaciation, roughly 10,000 years ago. It may be anticipated that there were periods when river level fell (regressions), leading to silting and the formation of shallow-water organic sediments including peat, possibly subsequently inundated by later rising flood (transgression) phases depositing deeper water clays.

4.3.3 A geotechnical survey was undertaken within the site in November 2015 by ESI Ltd (ESI 2015). The survey comprised twelve boreholes (BH1– BH12). BH1 and BH2 were located immediately to the north of the site but all other BHs are within the site (Fig 3). In both BH1 and BH5 gravel deposits were not recorded and alluvium deposits were recorded as deep as 6.4m below ground level (mbgl). That may suggest the presence of channels/streams once present in these areas and in the Ordnance Survey 1st edition 25'': mile map of 1869 (Fig 6) an inlet is shown in the north-east corner of the site, immediately to the west of the River Thames.

4.3.4 BHs 1, 2, 5, 11 and 12 were all sunk through the various bunds and thus contained greater depths of made ground, up to 5m. Across the rest of the site, the BHs recorded alluvium directly beneath a layer of made ground varying from 1.4m to 1.7m thick. The natural underlying Kempton Park Gravels were recorded between 2.7mbgl and 3.9mbgl directly beneath the alluvium in all but BHs 1 and 5 as discussed above. Modern made ground (i.e. containing identifiably modern inclusions such as concrete and plastic) and undated made ground were identified in all except BHs 5 and 11 and undated made ground was also identified in BHs 2, 5, 6, 7, 8, 11). The results of the boreholes are summarised in the table below.

4.3.5 Table 1 differentiates between modern made ground and undated made ground, which may

potentially contain deposits of archaeological interest. This distinction was not apparent in the original report as it was commissioned for engineering purposes.

Table 1: summary of geotechnical data (ESI 2015)
Levels are in metres below ground level (mbgl)

BH ref.	Modern made ground	Top of undated made ground	Top of natural alluvium	Top of natural Gravel
BH1	<4.6	-	4.6	-
BH2	<2.2	2.2	3.1	4.0
BH3	<2.0	-	2.0	2.3
BH4	<1.7	-	1.7	3.6
BH5	-	<5.2	5.2	-
BH6	<0.9	0.9	1.4	2.8
BH7	<0.2	0.2	1.4	2.8
BH8	<0.2	0.2	1.6	2.7
BH9	<1.6	-	1.6	2.8
BH10	<1.7	-	1.7	3.6
BH11	-	<2.8	2.8	3.9
BH12	<5.1	-	5.1	6.3

4.3.6 No remains of ground structures/obstructions associated with the earlier sewage treatment plant were identified during the investigation but cannot be entirely ruled out (ESI 2015). Boulders of concrete were locally encountered within the raised bund area located in the eastern sector of the site (*ibid.*).

4.4 Deposit Model

4.4.1 The deposit model (Appendix 1) provides a preliminary indication of the buried stratigraphy on the site and the archaeological and palaeoenvironmental potential, but should not be taken as the full or correct interpretation of the past environments that formerly existed here. It is based on a relatively small number of borehole logs, mostly for engineering purposes (and thus according to methods not designed for geoarchaeological use). Although data outside of the site (e.g. BGS borehole records) are very sparse, coverage of boreholes within the site is relatively good.

4.4.2 Nevertheless, there remain some ambiguities in the existing descriptions of some deposits at the site. Some deposits described in the previous ground investigation as the base of the made ground have been tentatively re-classified as Holocene alluvium based on their description and topographical position. Such ambiguous deposits were noted in BH03 (1.5 - 2.7m below ground level (bgl)), BH04 (2.5 - 4m bgl), BH06 (2.3 - 3.9m bgl) and BH07 (3 - 4.4m bgl).

4.4.3 Described below are the main depositional units identified, from ground level down to the base of the sequence representing the maximum depth of possible archaeology.

Facies 4

4.4.4 Modern made ground. Comprises surface layers of reinforced concrete, and a range of poorly-sorted clay, sand and gravel deposits with inclusions of brick, concrete, clinker, ash, glass, plastic and pottery. Locally described as having a hydrocarbon odour, indicating some contamination. Present at 3.8–5.2m OD (at surface).

Facies 3

4.4.5 Holocene alluvium. Fine-grained and well-sorted sediments, generally silty or sandy clay, colour ranges from grey to brown, occasionally mottled. Locally has an ‘organic odour’, possibly indicating the presence of some organic inclusions or bands of organic sediment not noted in the logs. The land may have been reclaimed in the medieval or post-medieval periods, but continued to be seasonally flooded. Medieval and post-medieval remains may exist within the upper part of the alluvium or within the lower part of the made ground deposits, although these may have been truncated by modern disturbance. Present at 2.1–2.7m OD (2.3–2.5mbgl).

Early Holocene Surface

4.4.6 Within the site this equates to the un-truncated surface of the Pleistocene gravels. This surface is illustrated in Appendix 1, Fig 3, and shows an undulating surface dipping towards the south east (i.e. towards the river channel and downstream). Present at 0.6–1.3m OD (3.9–4.0mbgl).

Facies 2

4.4.7 Palaeolithic Pleistocene Gravels. Dense sandy gravels and gravelly sands. River gravels formed during the Late Pleistocene (120,000 – 10,000 years ago) in a high-energy river braid plain. Present at 0.6–1.4mbgl (3.8–4.0mgl).

Facies 1

4.4.8 London Clay Formation. The London Clay formed in a shallow marine setting under tropical-subtropical climatic conditions during the Ypresian Age (56-48 million years ago) of the Eocene epoch. Its formation therefore predates the evolution of humans by several tens of millions of years, and so this deposit is of not archaeological interest. Present at -1.5 – -0.8m OD (4.7–5.3mbgl).

5 Archaeological and historical background

5.1 Overview of past investigations

5.1.1 The archaeological potential of the site and surrounding area is well understood. The site was part of the Kew Sewage Treatment Works previously investigated in 1999–2000 (**HEA 1**). At a first stage of the evaluation twenty trenches were excavated in the southern area of what comprised the Kew Sewage Treatment Works in 1999 (outside the current site boundaries), and no archaeological deposits predating the 18th/19th centuries were found (Hull 2000, 3). Ten trenches were excavated at the second stage of the evaluation in the northern areain 1999 following decommissioning of the sewage works (*ibid.*). However none of the evaluation trenches were located within the current site (see Fig 4). No archaeological deposits were observed or artefacts recovered from the spoil (*ibid.,*4–6). A watching brief was carried out in the Kew Sewage Treatment Works in 200. According to the report of the investigation the area of the current site was considered highly truncated and therefore not investigated further (Hammond 2000, Fig 2). However, the report is not very detailed and it is possible that no work was carried out in the area of the site due to no development being planned in this area.

5.1.2 Within the study area there have been 18 archaeological investigations comprising eight watching briefs, eight evaluations, no full excavations, one unknown investigation and one foreshore survey. The two closest to the site include evaluations at Defoe Avenue and the Public Records Office (currently The National Archives) *c* 300-360m north-west of the site (**HEA 2, 3**). The results of these investigations revealed archaeological remains of 18th–19th century and limited residual prehistoric flintwork. Similarly, the remaining investigations revealed 18th–19th century remains with the exception of limited medieval remains (**HEA 7, 8**) and some additional prehistoric finds (**HEA 4, 10**). All but three of the investigations were undertaken on the southern side of the River Thames, the same side as the site.

5.1.3 The results of these investigations, along with other known sites and finds within the study area, are discussed by period, below. The date ranges given are approximate.

5.2 Chronological summary

Prehistoric period (800,000 BC–AD 43)

5.2.1 The Lower (800,000–250,000 BC) and Middle (250,000–40,000 BC) Palaeolithic saw alternating warm and cold phases and intermittent perhaps seasonal occupation. During the Upper Palaeolithic (40,000–10,000 BC), after the last glacial maximum, and in particular after around 13,000 BC, further climate warming took place and the environment changed from steppe-tundra to birch and pine woodland. It is probably at this time that Britain first saw continuous occupation. Erosion has removed much of the Palaeolithic land surfaces and finds are typically residual. Only one two artefacts from this period have been recorded in the study area, a lithic implement and sub cordate hand-axe were found near Style Hall, 910m north-west from the site (**HEA 24**).

5.2.2 The Mesolithic hunter-gatherer communities of the postglacial period (10,000–4000 BC) inhabited a still largely wooded environment. The river valleys would have been favoured in providing a dependable source of food (from hunting and fishing) and water, as well as a means of transport and communication. Evidence of activity is characterised by flint tools rather than structural remains. At Kew Riverside, on Defoe Avenue, 330m north-west from the site (**HEA 3**), residual prehistoric flintwork, including a broken blade and a retouched scraper was recovered from a ditch which as a result has been tentatively dated to the late Mesolithic–late Bronze Age.

5.2.3 A number of chance finds have been found within the study area from this period. Two Mesolithic tranchet axes, an antler hammer, a mace head and a pick were found in the River Thames foreshore in Chiswick, 240m east of the site (**HEA 31**); A medium tranchet axe chance was found on Hartington Road 230m north-east of the site (**HEA 33**) and three Mesolithic tranchet axes were also found 960m south-east of the site (**HEA 35**).

5.2.4 The Neolithic (4000–2000 BC), Bronze Age (2000–600 BC) and Iron Age (600 BC–AD 43) are

traditionally seen as the time of technological change, settled communities and the construction of communal monuments. Farming was established and forest cleared for cultivation. An expanding population put pressure on available resources and necessitated the utilisation of previously marginal land. A Neolithic stone axe was found near Kew Pond, 980m west of the site (**HEA 22**), while a Neolithic chipped flint axe was found on Hartington Road, 430m south-east of the site (**HEA 34**). A potsherd from a Neolithic bowl was found in Mortlake, 930m south of the site (**HEA 27**) and a tertiary flake (lithic implement) in Grove Park, Chiswick, 510m north-east of the site (**HEA 29**). At Kew Riverside, on Townmead Road (**HEA 4**), 470m south of the site, two undated possible flint waste flakes were recovered from the surface of the natural sand deposits. On Kew Road, 870m north-west of the site, investigations revealed struck flints on the natural waterlaid sands (**HEA 10**). On West Hall Road, 430m south-west of the site, Bronze Age beaker (pottery) was found during the construction of a tennis court in 1912 (**HEA 25**). Multiple chance finds in Kew (**HEA 23**), 780m west of the site, include a Neolithic flint axe, two adzes, a Bronze Age socketed axe, Bronze Age horn picks and hammer heads and two Iron Age coins.

5.2.5 All the finds recorded within the study area are either chance finds or residual. During these periods the site was located beyond the area of settlement, which was possibly *c* 1.7km north-west of the site in the northern foreshore of Isleworth and southern Brentford, and within the valley of the Thames floodplain on the south side. It is likely that the site was regularly submerged and possibly towards the end of the periods was within marshland. Regardless it would have been unconducive to settlement but may have been used for the resources of the river when the tide was low.

Roman period (AD 43–410)

5.2.6 Within approximately a decade of the arrival of the Romans in AD 43, the town of *Londinium* had been established on the north bank of the Thames where the City of London now stands, 12km to the north-east of the site. It quickly rose to prominence, becoming a major commercial centre and the hub of the Roman road system in Britain. Small settlements, typically located along the major roads, supplied produce to the urban population, and were markets for *Londinium's* traded and manufactured goods (MoLAS, 2000, 150).

5.2.7 The site is located 1.4km south-east of the Silchester Road, the main Roman artery to all the west of Britain (Margary 1967, 57). The course is represented by modern-day Oxford Street to Notting Hill, Chiswick Road and so on through Brentford all the way to Exeter. The route was designed to follow the most direct east-west course passing along the most northern bend of Thames at Brentford (*ibid.*).

5.2.8 There is archaeological evidence for Roman rural settlements and agricultural activity scattered along the banks of the Thames in west London, which provide evidence for field systems (Roycroft 2008; Cowie 2009). The nearest Roman find to the site was a cheek-piece of helmet from the river just above Oliver's Island (Lawrence 1929, 81), 830m north-west of the site. Other than the above, there are no known finds dated to this period within the study area

5.2.9 Outside the study area, at 107 Mortlake High Street, 1.4km south-east of the site, a series of boundary or drainage ditches which date from the Late Iron Age through to the late Roman period were revealed during an evaluation.

5.2.10 During this period the site was located beyond the area of settlement, which was possibly *c* 2.0km north-west of the site at Brentford, and within the valley of the Thames floodplain on the south side. It is likely that the site was within marshland, occasionally submerged. Regardless it would have been unconducive to settlement but may have been used for the resources of the river when the tide was low.

Early medieval (Saxon) period (AD 410–1066)

5.2.11 Following the withdrawal of the Roman army from England in the early 5th century AD, *Londinium* was apparently abandoned. Germanic ('Saxon') settlers arrived from mainland Europe, with occupation in the form of small villages and an economy initially based on agriculture. By the end of the 6th century a number of Anglo-Saxon kingdoms had emerged, and as the ruling families adopted Christianity, endowments of land were made to the church. Landed estates (manors) can be identified from the 7th century onwards; some, as Christianity was widely adopted, with a main 'minster' church and other subsidiary churches or chapels. In

the 9th and 10th centuries, the Saxon Minster system began to be replaced by local parochial organisation, with formal areas of land centred on settlements served by a parish church.

5.2.12 There is no evidence for a Saxon settlement within the study area, the nearest being 1.2km to the south-east. There is little evidence of any activity in the study area apart from the single chance find dating to the early medieval period, a Viking 'V' type axe, which was found in the River Thames foreshore at Strand on the Green, 880m north-west of the site.

5.2.13 There has been evidence of the resource of the Thames in the form of fishtraps, sunken-featured buildings and metalwork along the Thames, at Brentford, 1.7km north-west of the site and Mortlake, 1.2km south-east of the site (Canham 1978, 24–31; Cowie and Blackmore 2008, 115; Lawrence 1929, 80–88; Roycroft 2008; Sharpe 1906, 21–27). It is possible that such remains could also be present within the site given its intertidal position.

5.2.14 During this period the site was located beyond the area of settlement and within the valley of the Thames floodplain on the south side. It is likely that the site was within marshland, occasionally submerged. Regardless it would have been unconducive to settlement but may have been used for exploiting the resources of the river.

Later medieval period (AD 1066–1485)

5.2.15 During the later medieval period the site would have been located some distance upstream from Mortlake, which in 1086 was assessed in *Domesday Book* as being very extensive, consisting of land for 35 ploughs. It included the manor of Barnes, Wimbledon and seventeen houses in London and four in Southwark were attached to it. The site lay within the bounds of the manor of Mortlake or the manor of Sheen, which was formed by subinfeudation from the manor of Mortlake (VCH Surrey 4, 69-74). The manor of Mortlake was held by the Archbishop of Canterbury, before the Conquest, who converted the riverside manor house into an archiepiscopal palace, 1.1km south-east of the site (where the brewery now stands), but no record exists of the date at which they first obtained it (*ibid.*). It is thought that a fishery granted by Henry II to Merton Priory was situated somewhere in the foreshore zone between Mortlake and Brentford (*ibid.*).

5.2.16 Cranmer was the last archbishop who held Mortlake (*ibid.*). In 1535–6 he exchanged Mortlake Manor and Wimbledon with the king for other lands. In 1536 Henry VIII granted the manors of Wimbledon and Mortlake to Thomas Cromwell, Secretary of State, who carried on extensive building there (*ibid.*; **HEA 26**).

5.2.17 During an evaluation at Williams Lane (**HEA 7, 26**), 910m south-east of the site, unspecified medieval activity was recorded. At The Ship Tavern (**HEA 8**), 1km south-east of the site, one of the post-medieval features that were excavated during an evaluation contained a single fragment of medieval pottery.

5.2.18 During this time the site was located beyond the area of settlement, in marshland, just west of the River Thames. However it is possible that by this time some form of land reclamation was being undertaken.

Post-medieval period (AD 1485–present)

5.2.19 For much of the post-medieval period the site was located within a predominantly rural landscape. Although previously the area was marshland, by now some form of reclamation, through the process of drainage and enclosure would have taken place and the area would have been embanked (Rippon 2000, 186). In most areas reclamation of the marshland was commonly associated with a mixed agricultural system (*ibid*., 230). During this time the area became increasingly important for growing fruit and vegetables, large quantities of which were transported by barge to London (Weinreb *et al.* 2008, 561, 562, 690, 691). Following the arrival of the railway in the 1840s, the character of this part of west London became increasingly suburban, although pockets of farmland persisted well into 20th century (*ibid.*).

5.2.20 Rocque's map of 1766 (Fig 5) shows that the site was within an open field on the west bank of the River Thames and to the east of 'Sand Lane' and directly east of what appears to have been an improved. Settlement is still thinly spread on the west side of the Thames with only two major 'settlements' shown, one to the south-west noted as 'Brick Stable' and one to the south-east. The map also shows that there was greater development on the east bank. From this period until the 1890s there is little change within the site.

5.2.21 The Ordnance Survey 1st edition 25'': mile map of 1869 (Fig 6) shows the site within agricultural land, possibly related to willow cultivation industry, north-east of 'West Park' (Atkins 2016; Hull 1999). It forms part of separate land holdings, possibly used for willow coppicing as well. A drainage ditch is shown in the north-east corner of the site, draining into the River Thames. The immediate surrounding area comprises also of agricultural land.

5.2.22 The construction of embankments and flood defences along the Thames has had long history extending back at least to the medieval period (see Spurrell 1885), but the construction of substantial masonry embankments in the region began in earnest in the Victorian era, as part of programme of great engineering works (including the construction of sewers) to cleanse and improve the quality of Thames water following the 'Great Stink' of 1858 (Weinreb *et al.* 2008, 247–249, 273, 347). The embankments in central London were mainly constructed between 1865 and 1885, while those upstream (including the embankment at Kew) were generally a little later (*ibid.*).

5.2.23 The Ordnance Survey 2nd edition 25'': mile map of 1896 (Fig 7) shows that the site had been cleared and the drainage ditch had been straightened and referred to as a "sluice". A new brick outlet has been constructed, called Kingston Creek, at the end of the drainage ditch. The Thames River wall, the eastern boundary of the site is noted as having a Tow Path but earthworks are shown within the southern quarter of the site forming the northern limits of the newly constructed drainage works. The drainage works and attendant Pumping Station immediately to the south of the site were constructed sometime between 1869 and 1896 with low and high level filter beds, precipitation tanks. A possible tramway has been laid running north/north-east of the site and basically forms the western boundary of the site. A footbridge is noted crossing the 'Kingston Creek' in the north-west corner of the site and it is possible that the map represents the path that the tramway is anticipated to take. This drain works was the site of the Kew Sewage Treatment Works, treating the trade effluent from the Stag Brewery, located *c* 1.1km further south in the bank of the River Thames (Atkins 2016). The brewery dates from 1487 when it was attached to a monastery and brewed for the local abbot and his monks, before becoming a substantial commercial brewery in 1765. Charles James Phillips took over the brewery in the 1840s, and together with James Wigan redeveloped it in 1869. The brewery was renamed the Stag Brewery in 1959 (http://industrial-archaeology.org/wp-content/uploads/2016/04/ian149.pdf). It is not known if the site in Kew Sewage Treatment Works was associated exclusively with the Stag brewery since the 19th century. The map also shows 'saltings' on the river side of the Thames wall, indicating that at the time that part of the river of was also still being used for non-industrial purposes.

5.2.24 The Ordnance Survey 1:2500 scale map of 1933 (Fig 8) shows major development within the site. Four large cylindrical filter beds were constructed on the site between 1913 and 1933, as part of an extension of Mains Drainage Works to the south. The tramways and footbridge have been removed and a new bank to the north of the site (potentially the existing northern bund) has been created when the area for the filter beds was created. Two small structures as shown within the site, possibly housing monitoring equipment for the beds, although one is attached to ditch running along the southern boundary of the site, which has two sluice gates on it (shown by SL on the maps). Additional precipitation tanks have been added to the existing tanks, with the new ones forcing the 'kink' in the south-east corner of the site boundary. The whole complex appears to be on the same level. Industrial development is shown for the first time to the west of the site.

5.2.25 There is no significant change within the site until the 1997 when it was redeveloped to its current layout, as shown in Fig 1, as the Kew Biothane Plant. The Stag Brewery ceased production in 2015 and therefore all activity has ceased within the site. The Ordnance Survey 1:2500 scale map of 1959–61 (Fig 9) shows minor changes, the construction of a building located in the south-west corner of the site, the removal of the ditch, sluice gates and small building at end of ditch and the erection of two small structures. The map indicates that the four filter beds were either dug down or were above ground and protected by a bank. A more substantial bank had been created to the north of the site to restrict/protect against spills as the sewage works has developed to the west and south of the site.

6 Statement of significance

6.1 Introduction

6.1.1 The following section discusses historic impacts on the site which may have compromised archaeological survival from earlier periods, identified primarily from historic maps, and information on the likely depth of deposits.

6.1.2 In accordance with the NPPF, this is followed by a statement on the likely potential and significance of buried heritage assets within the site, derived from current understanding of the baseline conditions, past impacts, and professional judgement.

6.2 Factors affecting archaeological survival

Natural geology

6.2.1 Current ground level is at 4.0m OD within the central area of the site and between 5m and 6.5m OD on the bund which runs along the eastern, northern and southern boundaries of the site. Based on geotechnical data, the level of natural geology within the site is as follows:

- The top of potentially truncated alluvium is between 2.6m OD and 2.3m OD (1.4–1.7m below ground level/mbgl)
- The top of untruncated Gravel is between 1.3m OD and 0.1m OD (2.7–3.9mbgl)

6.2.2 Between the top of the natural and the current ground level is modern made ground and undated made ground. The latter possibly comprises soil that was laid during the initial clearing and levelling of the site in the early 1900s and may contain residual material from all periods.

Past impacts

6.2.3 There is high survival potential across the site for Palaeoenvironmental remains and moderate for prehistoric chance finds of low significance.

6.2.4 The main past impact affecting archaeological survival was the construction of the four filter beds as part of the Mains Drainage Works and Pumping Station. The depth of the filter beds is not known but given the date and function it is likely that they will have extended up to *c* 1.5mbgl. The initial strip of the area to create a levelled surface would have removed archaeological remains on and directly below the ground surface. The excavation for the beds will have extended down into but not through the alluvium removing archaeological remains that survived the initial strip at the top of the alluvial sequence, most likely of post-medieval date. Deeper buried remains are unlikely to have been affected.

6.2.5 The filter beds remained on the site in the same lay out until 1997 when they were removed and replaced with the current tanks. It is not known if the removal of the previous beds required deep excavation. The foundations of the current structures extend up to *c* 1.5mbgl (David Stanley, Property Director, Red and Yellow, *pers. comm.*, 19/02/2018) and depending on the depth of made ground beneath them may not have penetrated through the alluvium. If they did they will have only extended a further 0.3m below the made ground, removing archaeological remains towards the top of sequence, potentially affecting later medieval agricultural remains, for example drainage ditches, of low significance. The presence of a relatively consistent depth of modern made ground suggests that the site was levelled prior to the construction of the existing tanks.

6.2.6 Buried services are present across the site. Excavation for the trenches of these services will have removed or truncated any archaeological remains within their footprint.

Likely depth/thickness of archaeological remains

6.2.7 Archaeological remains might be found directly beneath the made ground. Prehistoric remains might be found within the alluvial deposits and cut into the gravels. Palaeoenvironmental remains might be found throughout the alluvial deposits.

6.3 Archaeological potential and significance

6.3.1 The nature of possible archaeological survival in the area of the proposed development is summarised here, taking into account the levels of natural geology and the level and nature of later disturbance and truncation discussed above.

6.3.2 *The site has a high potential to contain palaeoenvironmental remains*. Alluvial deposits can provide evidence of past environments from the prehistoric period onwards. Peats and organic clays are likely to contain microfossils (e.g. pollen) and floral and faunal macrofossils such as molluscs and occasionally ostracods, seeds, plant fragments and pollen which can be utilised to reconstruct past local environments. Minerogenic deposits such as alluvial silts and clays have the potential for preservation of diatoms that can provide information on the salinity status of the depositional environments that would enhance interpretation of the sedimentary sequence. Wood and organic sediment can be dated by radiocarbon, important for establishing the chronology of the sequence. There is high potential for palaeoenvironmental remains preserved within the river alluvium. Such remains would be of **low** significance derived from their evidential value.

6.3.3 *The site has a low to moderate potential to contain prehistoric remains*. There is moderate potential within any alluvium for ritually deposited artefacts or residual finds but low potential for structural remains. Extensive prehistoric residual and chance finds have been recorded in the study area however the site's location within the intertidal zone and thus prone to inundation, would have made it unattractive for occupation, but may have been used for the exploitation of the resources of the river. Any residual finds would be of **low** significance.

6.3.4 *The site has a low potential to contain Roman remains*. No finds have been identified within the study area. The site is not located near a Roman settlement or road, away from an area of settlement within the valley of the Thames floodplain on the south side. It is likely that the site was within marshland, occasionally submerged therefore unconducive to settlement.

6.3.5 *The site has a low potential to contain early medieval/Saxon remains*. Only a single chance find dating to this period has been recorded in the study area. During this period the site was located beyond the area of settlement and within the valley of the Thames floodplain on the south side. It is likely that the site was within marshland, occasionally submerged. Regardless it would have been unconducive to settlement but may have been used for the resources of the river when the tide was low.

6.3.6 *The site has a low potential to contain later medieval remains*. Limited medieval activity was been recorded in the study area. Even though it is possible that by this time some form of land reclamation had being undertaken, during this time the site was possibly located beyond the area of settlement, in marshland, just west of the River Thames.

6.3.7 *The site has a low potential to contain post medieval remains*. The site appears to be located in agricultural land until the late 19th century when in the Ordnance Survey 2nd edition 25'': mile map of 1896 it is shown cleared. Four large cylindrical filter beds were constructed on the site between 1913 and 1933, as part of an extension of Mains Drainage Works to the south. The initial strip of the area to create a levelled surface and the excavation of the beds would have removed any post-medieval archaeological remains.

7 Impact of proposals

7.1 Proposals

7.1.1 The scheme comprises demolition of existing buildings and structures and redevelopment of the site to provide a Specialist Extra Care facility. The proposed H shaped building will have a ground floor slab overlying piled foundations. There will be no basement (David Stanley, Property Director, Red and yellow, *pers. comm.*, 19/02/2018) (Fig 13 and Fig 14).

7.2 Implications

7.2.1 The identification of physical impacts on buried heritage assets within a site takes into account any activity which would entail ground disturbance, for example site set up works, remediation, landscaping and the construction of new basements and foundations. As it is assumed that the operational (completed development) phase would not entail any ground disturbance there would be no additional archaeological impact and this is not considered further.

7.2.2 It is outside the scope of this archaeological report to consider the impact of the proposed development on upstanding structures of historic interest, in the form of physical impacts which would remove, alter, or otherwise change the building fabric, or predicted changes to the historic character and setting of historic buildings and structures within the site or outside it.

7.2.3 There is high survival potential across the site for palaeoenvironmental remains and a low to moderate potential for isolated prehistoric finds of low significance.

Ground remediation

7.2.4 Ground remediation would entail the excavation and removal of contaminated ground along with any archaeological remains contained within it, to the maximum depth of excavation. This is normally likely to remove entirely any archaeological remains.

7.2.5 Following the removal of contaminated material, the ground would be built up to the required ground level with modern and archaeologically sterile made ground. If any archaeological remains survived the initial excavation, subsequent ground works for foundations and services etc. would only have an impact on such remains where these works extended below the depth of the modern made ground.

Demolition and levelling

7.2.6 Demolition of the existing industrial structures and levelling of the site would potentially have an impact, truncating any archaeological remains directly beneath the slabs of the various tanks within the site and the hardstanding, including that beneath the small light structures. Beneath the hardstanding this likely to only affect remains within the made ground but beneath the tanks, this may extend into the upper levels of the alluvial directly below the made ground and affect remains of post-medieval date.

Attenuation tank

7.2.7 An attenuation tank is proposed to the south of the site footprint (Fig 13). This is expected to reach no more than 1.5mbgl, which would remove any archaeological remains within the footprint of these works, potentially cutting into the top of the alluvium.

Piled foundations

7.2.8 The ground floor would overlie piled foundations would consist of either 0.45m or 0.6m diameter bored or CFA piles and would extend down as far as and into the London Clay (David Stanley, Property Director, Red and yellow, *pers. comm.*, 19/02/2018). Any archaeological remains within the footprint of each pile would be removed as the pile is driven downwards. The severity of the impact would also depend on the piling density.

7.2.9 The insertion of pile caps and connecting ground beams, along with the excavation of a pile

guide trench, typically extend no more than 1.0–1.5mbgl and would remove any archaeological remains within the footprint of these works to this depth.

Hard and soft landscaping, service/utilities trenches/drains

7.2.10 Hard landscaping normally refers to the construction of paths, paving, concrete, gravelled areas, drives and hard standing all of which entail fairly shallow/superficial ground disturbance and may have no impact once the areas have been levelled in preparation for the proposed development.

7.2.11 Soft landscaping refers to trees/vegetation planting, hedgerows and open space provision, which can entail deeper ground disturbance to 1.0-1.5mbgl. Specifically for planting the ground intrusion would entirely remove or severely disturb any archaeological remains at the tree location. The effects of tree planting would be localised.

7.2.12 The proposed excavation of new service trenches and drains would extend to a depth of 1.0-1.5mbgl as assumed for the purposes of this assessment. This would entirely remove any archaeological remains within the trench footprint.

8 Conclusion and recommendations

8.1.1 The site is located within the London Borough of Richmond's Thames foreshore and bank Archaeological Priority Area (APA).

8.1.2 There is high survival potential across the site for palaeoenvironmental remains and a low to moderate potential for isolated prehistoric finds of low significance.

8.1.3 There would be potential impacts on archaeological remains from the demolition of the existing industrial structures, levelling of the site, the creation of a new attenuation tank, piled foundations for the proposed building, landscaping and the construction of new services.

8.1.4 Table 2 summarises the known or likely buried assets within the site, their significance, and the impact of the proposed scheme on asset significance.

Table 2: Impact upon heritage assets (prior to mitigation)

Asset	Asset Significance	Impact of proposed scheme
Palaeoenvironmental remains (High potential)	Low	Demolition and levelling Attenuation tank Piled foundations Significance of asset reduced
Prehistoric remains (Low to moderate potential)	Low	

8.1.5 The results of the previous investigation within the Kew Sewage Treatment Works have shown that the archaeological potential of the site is likely to be limited to remains of no more than low significance. The site has been impacted by the construction of the various structures associated with the treatment works. It is possible, however, that an archaeological watching brief would be required during preliminary ground preparation and subsequent foundation construction, which would ensure that any previously unrecorded archaeological assets were not removed without record.

8.1.6 Any archaeological work would need to be undertaken in accordance with an approved Written Scheme of Investigation (WSI) and could be carried out under the terms of a standard archaeological planning condition set out under the granting of planning consent

9 Gazetteer of known historic environment assets

9.1.1 The gazetteer lists known historic environment sites and finds within the 1000m-radius study area around the site. The gazetteer should be read in conjunction with Fig 2.

9.1.2 The GLHER data contained within this gazetteer was obtained on 23/08/2018 and is the copyright of Historic England 2018.

9.1.3 Historic England statutory designations data © Historic England 2018. Contains Ordnance Survey data © Crown copyright and database right 2018. The Historic England GIS Data contained in this material was obtained in September 2018. The most publicly available up to date Historic England GIS Data can be obtained from http://www.historicengland.org.uk.

Abbreviations
AOC – AOC Archaeology
ASE – ASE Archaeology
DGLA – Department of Greater London Archaeology (Museum of London)
ELO – Greater London Historic Environment Record unique Event reference
GLHER – Greater London Historic Environment Record
MLO – Greater London Historic Environment Record unique Monument reference
MoLAS – Museum of London Archaeology Service (now MOLA)
NHL – National Heritage List for England (Historic England)

HEA No.	Description	Site code/ HER/NHL No.
1	**Kew sewage treatment works, Mortlake Road (off), Kew, Richmond, TW9** *Evaluation and watching brief by TVAS in 1999-2000* Twenty trenches were excavated across the site, providing a representative sample of the site. All trenches were sealed by c 0.2m of concrete and below this, a silty topsoil and subsoil was observed to overlie alluvial sand. The evaluation confirmed the survival of a late 18th–19th century feature (channel) crossing the site from north to south and associated gullies, illustrated on Rocque's map of 1768 (Fig 5), relating to the willow cultivation industry. The channel cut the alluvium in trenches 6, 7, 8, 10 and 17 and appeared to have naturally silted up. Pottery and clay pipe pieces were observed in all features dating to the 18th/19th century. No archaeological deposits or artefacts predating the late 18th century were found.	KSW98 ELO3819 ELO10565 MLO73538
2	**Public Records Office, Ruskin Avenue, Kew, Richmond, TW9** *Evaluation by DGLA in 1990* A 19th century structure, probably a greenhouse, was recorded. Archaeological works revealed clay and sand soils, including evidence of plough furrows.	RTAK90 ELO4458 MLO4487
3	**Kew Riverside, Defoe Avenue, Kew, TW9** *Evaluation by MoLAS in1993* Natural alluvium above sand and gravels was cut by drainage ditches, probably 18th–19th century. Some residual prehistoric flintwork, including a broken blade and a retouched scraper provisionally dated to the late Mesolithic - late Bronze Age, was recovered from one of these ditches and a natural feature. Subsoil and topsoil, containing 18th–20th century material, sealed the ditches.	KRR93 ELO3811 MLO60021-24
4	**Kew Riverside, Townmead Road, Kew, Richmond, TW9** *Evaluation by MoLAS in 2002* A number of 19th–20th century features cut the natural sand, including four bedding trenches near the south-west corner of the site and at least two large quarry pits in the northern half of the site. Two possible flint waste flakes were recovered from the surface of the sand.	KTR02 ELO956 MLO76430 MLO77291
5	**Thames foreshore survey, Kew Towpath Embankment, Richmond** *Foreshore survey and watching brief by MOLA in 2009* The survey identified the remains of a timber drain, a jetty and a concrete wall at the base of the river wall. The watching brief found a row of posts dating to the 19th or early 20th century over a distance of about 63.5m which may have been associated with the construction of the present embankment. Natural deposits of sandy clay were observed 0.7m below the current ground surface.	FRM16 ELO11257

HEA No.	Description	Site code/ HER/NHL No.
6	**Thames Bank, Cromwell House, Mortlake, Richmond** *Evaluation by DGLA in 1990* The site immediately adjacent to the Thames foreshore revealed only extensive recent disturbance and no trace of prehistoric or medieval occupation.	CWH90 ELO3123 021273
7	**Williams Lane (land off), Mortlake, SW14 7QT** *Evaluation by ASE in 2010* The evaluation found a number of features such as the foundations of 19th or 20th century buildings, the remains of two horses, medieval pottery sherds and pits and plough furrows dating to the Post Medieval period. The demolition of the 19th century buildings and the adaptation of the site for sporting activities has probably eradicated other archaeological finds or deposits and created a deep layer of made ground. Natural deposits of sand were observed between 5.7m OD and 5.4m OD.	WIX10 ELO11610
8	**The Ship Tavern, 10 Thames Bank, Mortlake, SW14** *Evaluation by AOC in 1998* A small number of post-medieval features were cut into the natural gravel; one of these produced a single fragment of medieval pottery.	TBK98 ELO4681 025272-5
9	**Traditional Japanese House, Royal Botanic Gardens, Kew, Richmond** *Watching Brief by Compass Archaeology in 2001* Probable planting beds for bamboo, dating to the late 19th century, were revealed in the eastern and southern areas of the site.	ROG01
10	**Kew Road, Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond** *Evaluation by DGLA in 1990* Investigations produced struck flints on the natural waterlaid sands. Also located was a 19th century structure, probably a greenhouse forming part of the earlier Jodrell Laboratory.	RGB90 ELO4402 MLO3972 MLO4458
11	**Kew Road, Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond** *Watching brief by MoLAS in 2005* A number of features associated with landscaping and drainage of the land at Kew Gardens in the 19th century were recorded, including the remains of a drainage ditch or soak-away and a fragment of brick wall and two brick soakaways.	JLB05 ELO6118 MLO97972
12	**The Royal Botanic Gardens, New Guild student plots, School of horticulture, land to the south of the Jodrell Laboratory, Kew** *Watching brief by Compass Archaeology in 2007* A programme of rescue archaeological recording and preservation in situ was undertaken in response to the discovery of brick structures during development work for additional planting beds for Kew Guild students. As the development programme already in place time was limited it was decided to open an area measuring 11m by 23.5m within the footprint of the new build. Archaeological work revealed the foundations of a complex rectangular red brick structure with internal divisions, which appears to be a large late 18th century greenhouse or 'forcing house'. A series of brick footings and internal walls and bases related to a building some 21.5m by 4.6m in plan, with a further wall marking an extension to the north. There was also evidence suggesting a further large building existed to the north. The walls indicated at least two phases of construction, with the northern wall apparently being rebuilt or strengthened at a later stage. Areas of burnt residue possibly indicate the presence of a central heating source (stove or furnace) with a similar structure at the western end. Further analysis revealed that the greenhouse probably belonged to land originally in the ownership of the Earl of Essex (the Capel family), and is first shown on maps dating to 1771, but not on Rocque's map of 1746. It is likely that the greenhouse is contemporary with the nearby Georgian School of Horticulture building. Both of these buildings are likely to have been part of the kitchen garden serving Kew Farm (the Capel family home), and predating the inclusion of this land in the Royal Botanic Gardens. Cartographic evidence suggests that the newly discovered building may have been a 'peach house' or 'vinery'. There was no evidence for earlier buildings and natural deposits were not exposed. The structure is now preserved under the Kew Guild student vegetable plots.	RBG07 ELO7777 MLO99308

HEA No.	Description	Site code/ HER/NHL No.
13	**3 Voltage Optimisation Units in the Royal Botanic Gardens, Kew Road, Kew, TW9 3AB** *Watching brief by Compass Archaeology in 2011* The groundworks were small scale at three locations and no archaeological finds or features were encountered. The works were primarily surface clearance and did not penetrate to a depth where archaeological remains might be expected to survive, or be encountered.	KEW11 ELO11956
14	**St Anne's Church, Kew Green, Kew, TW9** *Watching brief by Compass Archaeology in 2003* Examination of paving at the northwest corner of the church produced several reused grave slabs (two dated to 1767 and 1807-9) and other pieces of architectural masonry. Subsequent excavation revealed recent made ground, whilst a new soakaway just outside the churchyard exposed a truncated subsoil overlying natural gravels. *Watching brief by Compass Archaeology in 2007* Drainage installation works in the tarmac forecourt of St Anne′s Church (consecrated in 1714) exposed shallow made-ground layers and natural clay and gravels. Below the portico paving to the N, a section of brick wall foundation was exposed which is considered to be the remains of the boundary wall contemporary with the 1805-1837 phase of the church. A further section of wall foundation was observed to the south, representing a continuation of the existing boundary wall (constructed in 1837), suggesting it originally extended beyond its current limits. The lifting of a large slab, situated immediately outside the southernmost entrance exposed a brick vaulted burial vault with solid brick steps leading to a bricked up archway entrance. It is identified as that of a Hobbs family, with the earliest definite burial belonging to a Mrs Mary Hobbs in 1813. Excavations at the South Porch produced disarticulated human remains and the partial remains of an in situ adult. All human remains were re-interred in the same trenches. Examples of re-used monumental stone were recovered from the existing retaining wall, including some that had evidence of carving.	ACK03 ANK07 ELO906 ELO7616 MLO91128 MLO76378 MLO78050
15	**Loretta Wharf, 18-19 Strand-on the-green, Chiswick, W4** *Evaluation by MoLAS in 2009* Natural sands were cut by a robbed wall foundation and a series of pits containing 18th century or later material. Three contemporaneous, probable bedding trenches were recorded; all were sealed by garden soil of 18th century and later date, with modern asphalt and concrete above.	SOE99 ELO5205 MLO74168
16	**Chiswick Bridge, Great Chertsey Road, W4 3UJ** No information available	CIS13
17	**Quintin Hogg memorial ground, Great Chertsey Road, Chiswick, W4** *Watching brief by AOC in 2001* The archaeological works consisted of monitoring the groundworks and inspecting the deposits exposed to identify potential archaeological features. Topsoil sealing modern made ground over subsoil was found.	HTN01 ELO581 MLO76079

HEA No.	Description	Site code/ HER/NHL No.
18	**Royal Botanic Gardens, Kew, TW9** *World Heritage Site* This historic landscape garden features elements that illustrate significant periods of the art of gardens from the18th to the 20th centuries. The gardens house botanic collections (conserved plants, living plants and documents) that have been considerably enriched through the centuries. Since their creation in 1759, the gardens have made a significant and uninterrupted contribution to the study of plant diversity and economic botany.	NHL/WHS1000102 DLO33112 MLO102891 MLO101340 MLO99308 021136 MLO101302-3 MLO103103 MLO107212 MLO107400 MLO20198 MLO4458 MLO6745 MLO75655 MLO78299 MLO91021-7 MLO91050 MLO91125 MLO91203-21 MLO91319 MLO91405-16 MLO91417-23 MLO91473 MLO91505-7 MLO97972
19	**Dredging in the River Thames** *Casual observation* Finds were recorded having been moved by dredging in the River Thames in 1911.	ELO9 MLO75286
20	**Hammersmith New Cemetery, Clifford Avenue/Mortlake Road, Mortlake, SW14 7BU** *20th century cemetery* This site was founded in 1926 and is variously known as Hammersmith New Cemetery and Mortlake cemetery. It contains a single Gothic brick chapel and a lodge. Mortlake Crematorium is located in the north end of the site.	MLO103982 MLO69033
21	**Kew Green, Kew TW9** *Post-medieval settlement* The village is situated around the green	MLO73267
22	**Near Kew Pond, Kew TW9** *Findspot* Neolithic stone axe found in 1915	MLO18941
23	**Kew TW9** *Findspots* Neolithic polished flint axe now in private collection; Neolithic adze, chipped flint, accessioned by Museum of London, 1914; Neolithic adze, chipped flint; Bronze Age socketed axe with polygoral body with ribs on face; Iron Age coin: uninscribed gold stater found in a market garden near Kew in 1870; Bronze Age horn picks and hammer heads; Iron age coin: uninscribed gold stater, from brickfield near Kew.	MLO18917 MLO18918 MLO18955 MLO18960 MLO18973 MLO19007 MLO19102
24	**Style Hall** *Findspot* Palaeolithic lithic implement and sub cordate handaxe found near Style Hall.	MLO12775
25	**West Hall Road** *Findspot* Early Bronze Age beaker found during construction of tennis court in1912.	MLO18965
26	**Williams Lane, Mortlake** *Manor House* Cromwell House was probably the Manor occupied by Thomas Cromwell (died in1540). It was demolished in 1860.	MLO1753

HEA No.	Description	Site code/ HER/NHL No.
27	**Mortlake** *Findspot* Neolithic potsherd from bowl with impressed decoration. Conjectural restoration by Victoria and Albert Museum suggest that the bowl was originally 18cm high.	MLO19094
28	**Strand on the Green, Chiswick** *14th century settlement origins, documentary evidence* A settlement along the north bank of the River Thames known as Strand on the Green existed from the 14th century. Early activity consisted mainly of fishing and boat-building, but the settlement had some substantial houses by 1700. An embankment wall had been built by 1700 along the river-front. Several malt houses were recorded at the site during the 18th and 19th century.	MLO68853
29	**Grove Park Chiswick** *Findspot* Prehistoric lithic implement-tertiary flake	MLO24582
30	**Fauconberg Road, Chiswick** *Manor House* The manor was called Sutton Manor by 1181 and Sutton Court by 1537. In 1589 the Mansion House had a gatehouse, malt house, dovecote and farm buildings, some of which were repaired in 1590. Possible Roman brick and 17th century pottery were found at the site in 1905. The site is now occupied by flats.	MLO68838
31	**River Thames, Chiswick** *Findspot* Mesolithic: two tranchet axes, one antler hammer, one mace head, one pick.	MLO26929
32	**River Thames, Strand on the Green** *Findspot* Early medieval Viking 'V' type axe found in the River Thames between Kew road and rail bridges, listed in 1927 in the Museum of London catalogue.	MLO57222
33	**Hartington Road, Chiswick** *Findspot* Mesolithic medium tranchet axe	MLO22933
34	**Hartington Road, Chiswick** *Findspot* Neolithic chipped flint axe	MLO2202
35	**Mortlake** *Findspot* Three Mesolithic tranchet axes	MLO18147
36	**Thames Foreshore** Foreshore survey undertaken by LARF under the direction of Mike Webber, in 1996; Features recorded include unclassified deposits of clay and silt, jetty, drain, dock, structures, cast iron hing plates, railings, mooring bollards, aggradation, consolidation, concrete features, timber features, foundations, riverfront defence, vessel.	Survey zones: FHL12 FHL13 FHL15 FRM16 FRM17 FRM18 MLO69783-90 MLO69792 MLO69794-810 MLO69823 MLO69834 A101-131

10 Planning framework

10.1 National Planning Policy Framework

10.1.1 The Government issued the *National Planning Policy Framework* (NPPF) in March 2012 (DCLG 2012) and supporting *Planning Practice Guidance* in 2014 (DCLG 2014). The 2012 NPPF has been revised and a new NPPF was published in July 2018 (MHCLG 2018.

Conserving and enhancing the historic environment

10.1.2 The NPPF section concerning "Conserving and enhancing the historic environment" (section 12 of the NPPF 2012) has been replaced by NPPF 2018 Section 16, reproduced in full below:

Para 184. Heritage assets range from sites and buildings of local historic value to those of the highest significance, such as World Heritage Sites which are internationally recognised to be of Outstanding Universal Value. These assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations.

Para 185. Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. This strategy should take into account:

- a) the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation;
- b) the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;
- c) the desirability of new development making a positive contribution to local character and distinctiveness; and
- d) opportunities to draw on the contribution made by the historic environment to the character of a place.

Para 186. When considering the designation of conservation areas, local planning authorities should ensure that an area justifies such status because of its special architectural or historic interest, and that the concept of conservation is not devalued through the designation of areas that lack special interest.

Para 187. Local planning authorities should maintain or have access to a historic environment record. This should contain up-to-date evidence about the historic environment in their area and be used to:

- a) assess the significance of heritage assets and the contribution they make to their environment; and
- b) predict the likelihood that currently unidentified heritage assets, particularly sites of historic and archaeological interest, will be discovered in the future.

Para 188. Local planning authorities should make information about the historic environment, gathered as part of policy-making or development management, publicly accessible.

Proposals affecting heritage assets

Para 189. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

Para 190. Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a

heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.

Para 191. Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision.

Para 192. In determining applications, local planning authorities should take account of:

- a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;
- b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and
- c) the desirability of new development making a positive contribution to local character and distinctiveness.

Considering potential impacts

Para 193. When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

Para 194. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:

- a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;
- b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.

Para 195. Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

- a) the nature of the heritage asset prevents all reasonable uses of the site; and
- b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and
- c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and
- d) the harm or loss is outweighed by the benefit of bringing the site back into use.

Para 196. Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.

Para 197. The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

Para 198. Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.

Para 199. Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible64. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.

Para 200. Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

Para 201. Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive

contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 195 or less than substantial harm under paragraph 196, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.

Para 202. Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.

10.2 Greater London regional policy

The London Plan

10.2.1 The overarching strategies and policies for the whole of the Greater London area are contained within the *London Plan of the Greater London Authority* (GLA March 2016).

10.2.2 Policy 7.8 of the adopted (2016) London Plan relates to Heritage Assets and Archaeology:

> 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.
>
> 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.
>
> 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 [now named Historic England], 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.

10.2.3 Para. 7.31 supporting Policy 7.8 notes that 'Substantial harm to or loss of a designated heritage asset should be exceptional, with substantial harm to or loss of those assets designated of the highest significance being wholly exceptional. Where a development proposal will lead to less than substantial harm to the significance of a designated asset, this harm should be weighed against the public benefits of the proposal, including securing its optimal viable use. Enabling development that would otherwise not comply with planning policies, but which would secure the future conservation of a heritage asset should be assessed to see of the benefits of departing from those policies outweigh the disbenefits.'

10.2.4 It further adds (para. 7.31b) 'Where there is evidence of deliberate neglect of and/or damage to a heritage asset the deteriorated state of that asset should not be taken into account when making a decision on a development proposal'.

10.2.5 Para. 7.32 recognises the value of London's heritage: '…where new development uncovers an archaeological site or memorial, these should be preserved and managed on-site. Where this is not possible provision should be made for the investigation, understanding, dissemination and archiving of that asset'.

10.2.6 The current 2016 consolidation Plan is still the adopted Development Plan. However, consultation on revisions to the Plan was open until 2nd March 2018, and the *Draft New London Plan* is a material consideration in planning decisions (GLA website, 2017).

10.2.7 Policy HC1 “Heritage conservation and growth” of the *Draft New London Plan* relates to London’s historic environment:

> 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 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 sustain 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 seek to 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.

10.2.8 Para. 7.1.8 adds ‘Where there is evidence of **deliberate neglect** of and/or damage to a heritage asset to help justify a development proposal, the deteriorated state of that asset should not be taken into account when making a decision on a development proposal’.

10.2.9 Para 7.1.11 adds ‘Developments will be expected to avoid or minimise harm to significant archaeological assets. In some cases, remains can be incorporated into and/or interpreted in new development. The physical assets should, where possible, be made available to the public on-site and opportunities taken to actively present the site’s archaeology. Where the archaeological asset cannot be preserved or managed on-site, appropriate provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset, and must be undertaken by suitably-qualified individuals or organisations.

10.3 Local planning policy

10.3.1 Following the Planning and Compulsory Purchase Act 2004, Planning Authorities have replaced their Unitary Development Plans, Local Plans and Supplementary Planning Guidance with a new system of Local Development Frameworks (LDFs). UDP policies have been either ‘saved’ or ‘deleted’. In most cases archaeology policies are likely to be ‘saved’ because there have been no significant changes in legislation or advice at a national level.

10.3.2 The Loondon Borough of Richmond upon Thames Local Plan was adopted in July 2018. The adopted Local Plan incorporatrs all pf the Main Modifications reconnended by the Planning Inspector alongside the Additional Modifications made by the Council. At present an interim version is publicly available which will be subject to additional minor modifications.

10.3.3 Policy LP 7 specifically relates to archaeology:

Archaeology

The Council will seek to protect, enhance and promote its archaeological heritage (both above and below ground), and will encourage its interpretation and presentation to the public. It will take the necessary measures required to safeguard the archaeological remains found, and refuse planning permission where proposals would adversely affect archaeological remains or their setting.

Desk based assessments and, where necessary, archaeological field evaluation will be required before development proposals are determined, where development is proposed on sites of archaeological significance or potential significance.

4.7.1 Archaeological investigations in the borough to date have revealed evidence of prehistoric, Roman,Saxon, Medieval and post Medieval archaeology. An archaeological site is a place (or group of physical sites) in which evidence of past activity is preserved and can include industrial sites, marine and foreshore deposits/structures, buildings, machinery, roads, artefacts, wartime structures and modest domestic buildings. The preservation of archaeological remains is a material consideration when determining planning applications. As set out in national policy guidance, archaeological remains of national importance should be preserved in situ. While it is desirable to treat all remains in this manner, it is recognised that it is not always practical to do so.

4.7.2 However, regardless of their status, established procedures of consultation and evaluation as set out in national policy guidance and other advice must be followed in preparing development proposals. Prospective applicants should make an initial assessment of the archaeological potential and significance of a site by consulting with the appropriate specialist bodies, Historic England and the Greater London Archaeological Advisory Service (GLAAS). GLAAS is the borough’s archaeological advisers and should be consulted with regard to archaeological matters.

4.7.3 Archaeological Priority Areas (APAs) can be identified by local planning authorities under the Town and Country Planning Act 1990 and the borough's APAs are shown on the Archaeological Constraints Map. The borough's APAs are due to be reviewed in 2017 by GLAAS as part of a rolling programme of reviews across London. The Council will therefore provide a link to the latest available APAs constraints map.

10.3.4 Policy LP 4 refers to non-designated heritage assets:

Non-Designated Heritage Assets

The Council will seek to preserve, and where possible enhance, the significance, character and setting of non-designated heritage assets, including Buildings of Townscape Merit, memorials, particularly war memorials, and other local historic features. There will be a presumption against the demolition of Buildings of Townscape Merit.

11 Determining significance

11.1.1 'Significance' lies in the value of a heritage asset to this and future generations because of its heritage interest, which may be archaeological, architectural, artistic or historic. Archaeological interest includes an interest in carrying out an expert investigation at some point in the future into the evidence a heritage asset may hold of past human activity, and may apply to standing buildings or structures as well as buried remains. Known and potential heritage assets within the site and its vicinity have been identified from national and local designations, HER data and expert opinion. The determination of the significance of these assets is based on statutory designation and/or professional judgement against four values (EH 2008):

- *Evidential value*: the potential of the physical remains to yield evidence of past human activity. This might take into account date; rarity; state of preservation; diversity/complexity; contribution to published priorities; supporting documentation; collective value and comparative potential.
- *Aesthetic value*: this derives from the ways in which people draw sensory and intellectual stimulation from the heritage asset, taking into account what other people have said or written;
- *Historical value*: the ways in which past people, events and aspects of life can be connected through heritage asset to the present, such a connection often being illustrative or associative;
- *Communal value*: this derives from the meanings of a heritage asset for the people who know about it, or for whom it figures in their collective experience or memory; communal values are closely bound up with historical, particularly associative, and aesthetic values, along with and educational, social or economic values.

11.1.2 Table 3 gives examples of the significance of designated and non-designated heritage assets.

Table 3: Significance of heritage assets

Heritage asset description	Significance
World heritage sites Scheduled monuments Grade I and II* listed buildings Historic England Grade I and II* registered parks and gardens Protected Wrecks Heritage assets of national importance	Very high (International/ national)
Historic England Grade II registered parks and gardens Conservation areas Designated historic battlefields Grade II listed buildings Burial grounds Protected heritage landscapes (e.g. ancient woodland or historic hedgerows) Heritage assets of regional or county importance	High (national/ regional/ county)
Heritage assets with a district value or interest for education or cultural appreciation Locally listed buildings	Medium (District)
Heritage assets with a local (i.e. parish) value or interest for education or cultural appreciation	Low (Local)
Historic environment resource with no significant value or interest	Negligible
Heritage assets that have a clear potential, but for which current knowledge is insufficient to allow significance to be determined	Uncertain

11.1.3 Unless the nature and exact extent of buried archaeological remains within any given area has been determined through prior investigation, significance is often uncertain.

12 Non-archaeological constraints

12.1.1 It is anticipated that asbestos containing materials are included in the soil of the site (ESI, asbestos in soil statement, 2016) the locations of which have not been identified by this archaeological report. In general, the site's former use as a sewage treatment works could indicate the presence of contaminated land across the site.

12.1.2 A high voltage cable will be present on the east boundary of the site (David Stanley, property director, Red and Yellow, *pers. comm.*, 19/2/2018; Kew Biothene Contract Plan, 25/08/16, RevB), the exact location of which has not been identified by this archaeological report. The presence of other services is noted on the site (see Fig 3). Other than these, no other non-archaeological constraints to any archaeological fieldwork have been identified within the site.

12.1.3 Note: the purpose of this section is to highlight to decision makers any relevant non-archaeological constraints identified during the study, that might affect future archaeological field investigation on the site (should this be recommended). The information has been assembled using only those sources as identified in section 2 and section 13.4, in order to assist forward planning for the project designs, working schemes of investigation and risk assessments that would be needed prior to any such field work. MOLA has used its best endeavours to ensure that the sources used are appropriate for this task but has not independently verified any details. Under the Health & Safety at Work Act 1974 and subsequent regulations, all organisations are required to protect their employees as far as is reasonably practicable by addressing health and safety risks. The contents of this section are intended only to support organisations operating on this site in fulfilling this obligation and do not comprise a comprehensive risk assessment.

13 Glossary

Alluvium	Sediment laid down by a river. Can range from sands and gravels deposited by fast flowing water and clays that settle out of suspension during overbank flooding. Other deposits found on a valley floor are usually included in the term alluvium (e.g. peat).
Archaeological Priority Area/Zone	Areas of archaeological priority, significance, potential or other title, often designated by the local authority.
Brickearth	A fine-grained silt believed to have accumulated by a mixture of processes (e.g. wind, slope and freeze-thaw) mostly since the Last Glacial Maximum around 17,000BP.
B.P.	Before Present, conventionally taken to be 1950
Bronze Age	2,000–600 BC
Building recording	Recording of historic buildings (by a competent archaeological organisation) is undertaken *'to document buildings, or parts of buildings, which may be lost as a result of demolition, alteration or neglect',* amongst other reasons. Four levels of recording are defined by Royal Commission on the Historical Monuments of England (RCHME) and Historic England. Level 1 (basic visual record); Level 2 (descriptive record), Level 3 (analytical record), and Level 4 (comprehensive analytical record)
Built heritage	Upstanding structure of historic interest.
Colluvium	A natural deposit accumulated through the action of rainwash or gravity at the base of a slope.
Conservation area	An area of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance. Designation by the local authority often includes controls over the demolition of buildings; strengthened controls over minor development; and special provision for the protection of trees.
Cropmarks	Marks visible from the air in growing crops, caused by moisture variation due to subsurface features of possible archaeological origin (i.e. ditches or buried walls).
Cut-and-cover [trench]	Method of construction in which a trench is excavated down from existing ground level and which is subsequently covered over and/or backfilled.
Cut feature	Archaeological feature such as a pit, ditch or well, which has been cut into the then-existing ground surface.
Devensian	The most recent cold stage (glacial) of the Pleistocene. Spanning the period from *c* 70,000 years ago until the start of the Holocene (10,000 years ago). Climate fluctuated within the Devensian, as it did in other glacials and interglacials. It is associated with the demise of the Neanderthals and the expansion of modern humans.
Early medieval	AD 410–1066. Also referred to as the Saxon period.
Evaluation (archaeological)	A limited programme of non–intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area.
Excavation (archaeological)	A programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological remains, retrieves artefacts, ecofacts and other remains within a specified area. The records made and objects gathered are studied and the results published in detail appropriate to the project design.
Findspot	Chance find/antiquarian discovery of artefact. The artefact has no known context, is either residual or indicates an area of archaeological activity.
Geotechnical	Ground investigation, typically in the form of boreholes and/or trial/test pits, carried out for engineering purposes to determine the nature of the subsurface deposits.
Head	Weathered/soliflucted periglacial deposit (i.e. moved downslope through natural processes).
Heritage asset	A building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. Heritage assets are the valued components of the historic environment. They include designated heritage assets and assets identified by the local planning authority (including local listing).
Historic environment assessment	A written document whose purpose is to determine, as far as is reasonably possible from existing records, the nature of the historic environment resource/heritage assets within a specified area.
Historic Environment Record (HER)	Archaeological and built heritage database held and maintained by the County authority. Previously known as the Sites and Monuments Record
Holocene	The most recent epoch (part) of the Quaternary, covering the past 10,000 years during which time a warm interglacial climate has existed. Also referred to as the 'Postglacial' and (in Britain) as the 'Flandrian'.
Iron Age	600 BC–AD 43

Later medieval	AD 1066 – 1500
Last Glacial Maximum	Characterised by the expansion of the last ice sheet to affect the British Isles (around 18,000 years ago), which at its maximum extent covered over two-thirds of the present land area of the country.
Locally listed building	A structure of local architectural and/or historical interest. These are structures that are not included in the Secretary of State's Listing but are considered by the local authority to have architectural and/or historical merit
Listed building	A structure of architectural and/or historical interest. These are included on the Secretary of State's list, which affords statutory protection. These are subdivided into Grades I, II* and II (in descending importance).
Made Ground	Artificial deposit. An archaeologist would differentiate between modern made ground, containing identifiably modern inclusion such as concrete (but not brick or tile), and undated made ground, which may potentially contain deposits of archaeological interest.
Mesolithic	12,000 – 4,000 BC
National Record for the Historic Environment (NRHE)	National database of archaeological sites, finds and events as maintained by Historic England in Swindon. Generally not as comprehensive as the country HER.
Neolithic	4,000 – 2,000 BC
Ordnance Datum (OD)	A vertical datum used by Ordnance Survey as the basis for deriving altitudes on maps.
Palaeo-environmental	Related to past environments, i.e. during the prehistoric and later periods. Such remains can be of archaeological interest, and often consist of organic remains such as pollen and plant macro fossils which can be used to reconstruct the past environment.
Palaeolithic	700,000–12,000 BC
Palaeochannel	A former/ancient watercourse
Peat	A build-up of organic material in waterlogged areas, producing marshes, fens, mires, blanket and raised bogs. Accumulation is due to inhibited decay in anaerobic conditions.
Pleistocene	Geological period pre-dating the Holocene.
Post-medieval	AD 1500–present
Preservation by record	Archaeological mitigation strategy where archaeological remains are fully excavated and recorded archaeologically and the results published. For remains of lesser significance, preservation by record might comprise an archaeological watching brief.
Preservation in situ	Archaeological mitigation strategy where nationally important (whether Scheduled or not) archaeological remains are preserved *in situ* for future generations, typically through modifications to design proposals to avoid damage or destruction of such remains.
Registered Historic Parks and Gardens	A site may lie within or contain a registered historic park or garden. The register of these in England is compiled and maintained by Historic England.
Residual	When used to describe archaeological artefacts, this means not *in situ,* i.e. Found outside the context in which it was originally deposited.
Roman	AD 43–410
Scheduled Monument	An ancient monument or archaeological deposits designated by the Secretary of State as a 'Scheduled Ancient Monument' and protected under the Ancient Monuments Act.
Site	The area of proposed development
Site codes	Unique identifying codes allocated to archaeological fieldwork sites, e.g. evaluation, excavation, or watching brief sites.
Study area	Defined area surrounding the proposed development in which archaeological data is collected and analysed in order to set the site into its archaeological and historical context.
Solifluction, Soliflucted	Creeping of soil down a slope during periods of freeze and thaw in periglacial environments. Such material can seal and protect earlier landsurfaces and archaeological deposits which might otherwise not survive later erosion.
Stratigraphy	A term used to define a sequence of visually distinct horizontal layers (strata), one above another, which form the material remains of past cultures.
Truncate	Partially or wholly remove. In archaeological terms remains may have been truncated by previous construction activity.
Watching brief (archaeological)	A formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons.

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14.4 Available site survey information checklist

Information from client	**Available**	**Format**	**Obtained**
Plan of existing site services (overhead/buried)	N	–	N
Levelled site survey as existing (ground and buildings)	Y	pdf	Y
Contamination survey data ground and buildings (inc. asbestos)	Y	pdf	Y
Geotechnical report	Y	pdf	Y
Envirocheck report	Y	pdf	Y
Information obtained from non-client source	**Carried out**	**Internal inspection of buildings**	
Site inspection	Y	n/a	

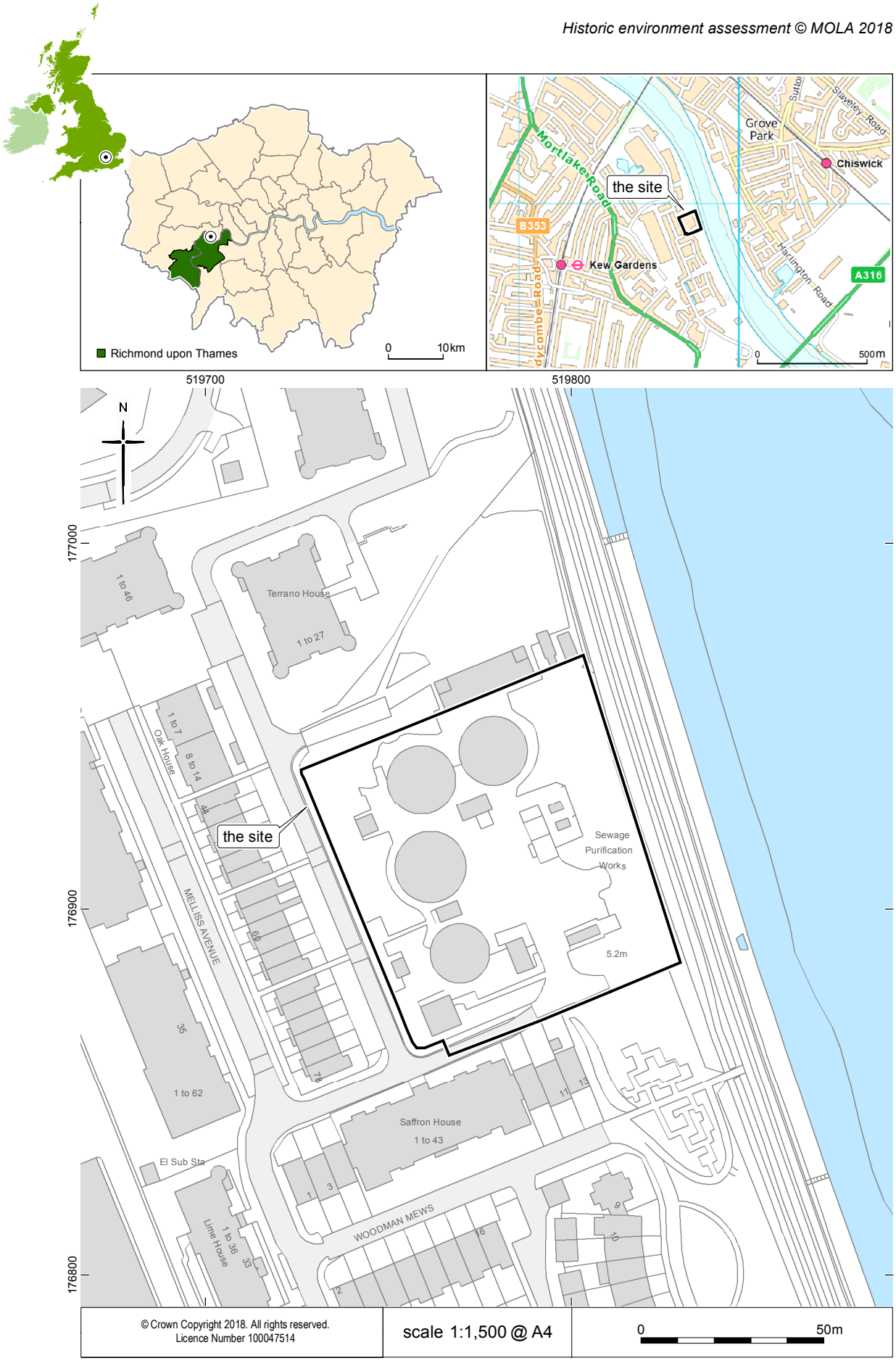


Fig 1 Site location

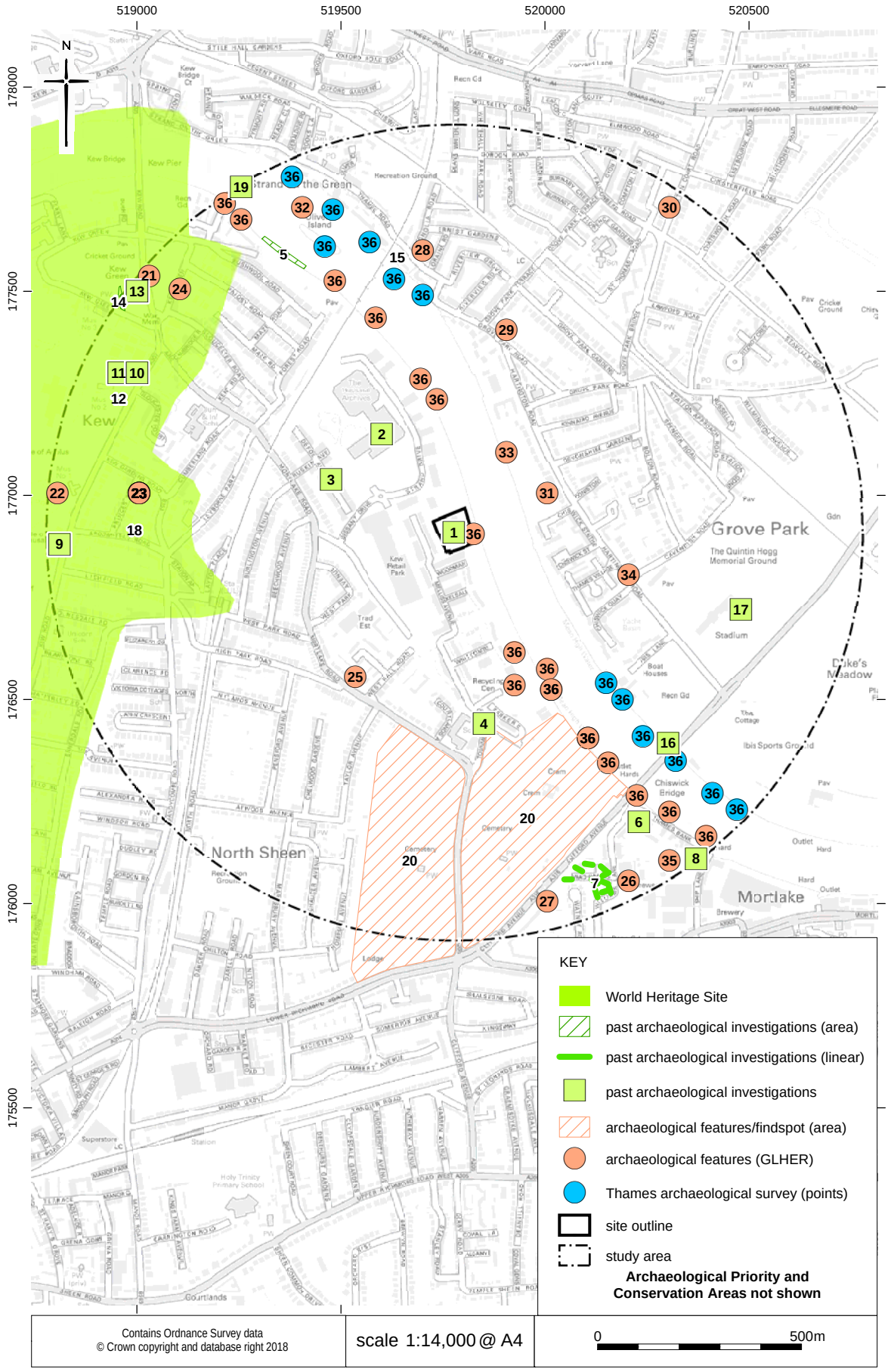
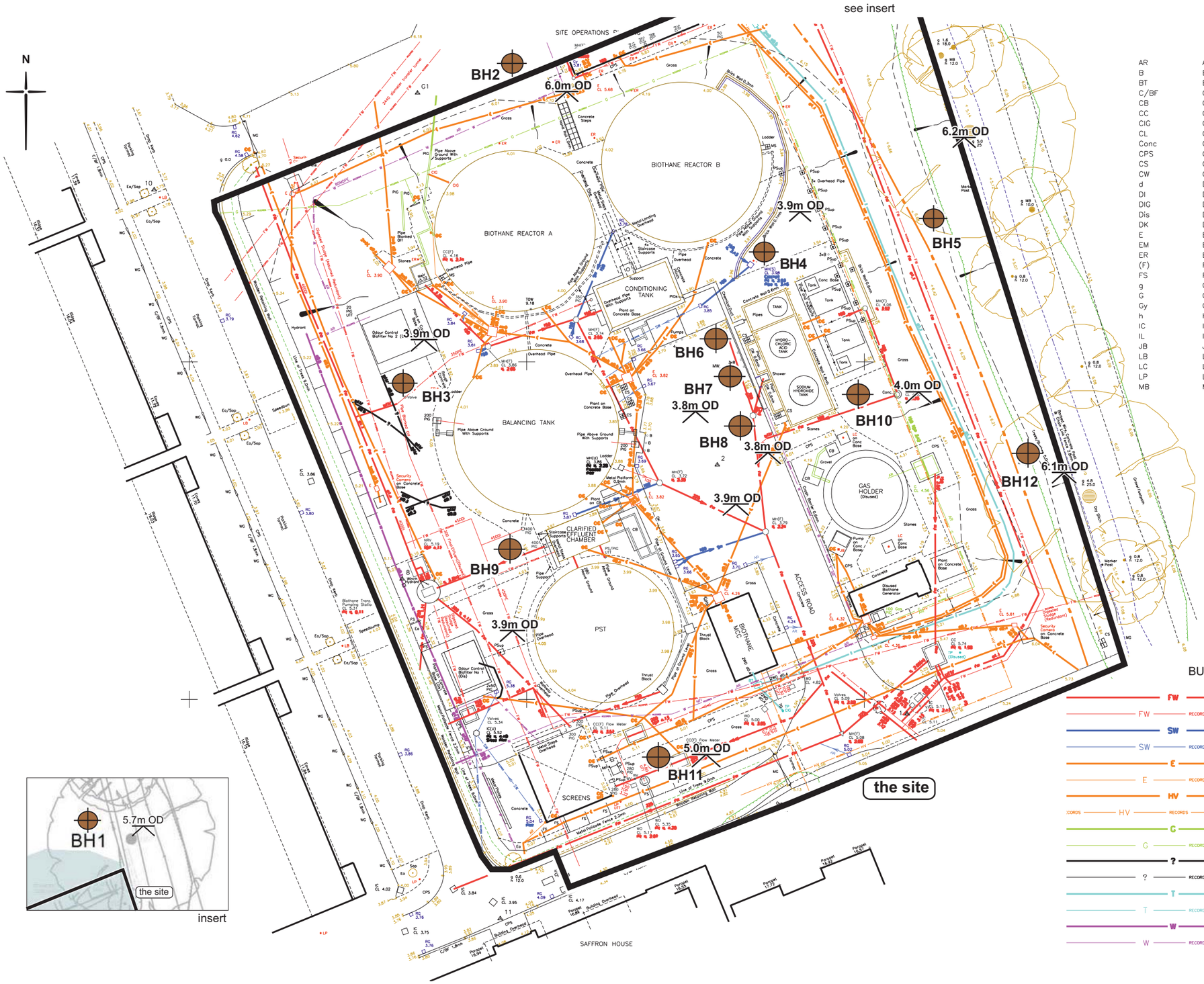


Fig 2 Historic environment features map



ABBREVIATIONS

AR	Assumed Route	MG	Metal Gate
B	Bollard	mh	Metres High
BT	British Telecom IC	MH	Manhole
C/BF	Close Boarded Fence	MP	Metal Post
CB	Concrete Base	MS	Metal Steps
CC	Concrete Chamber	MW	Monitoring Well
CIG	Cable Into Ground	NFI	No Further Information
CL	Cover Level	NRV	Non Return Valve
Conc	Concrete	PIG	Pipe Into Ground
CPS	Concrete Paving Slabs	PNV	Pipes Not Visible
CS	Concrete Steps	PS	Penstock
CW	Concrete Wall	PST	Primary Settlement Tank
d	Depth	PSU	Pipe Size Unknown
DI	Ductile Iron	PSup	Pipe Support
DIG	Duct Into Ground	RE	Rodding Eye
Dis	Disused	RG	Road Gully
DK	Drop Kerb	(S)	Storm
E	Electricity IC	Sap	Sapling
EM	Electricity Marker	TOP	Top Of Pipe Level
ER	Earthing Rod	TOW	Top Of Wall
(F)	Foul	TP	Telephone Pole
FS	Fence Support	(U)	Unknown
g	Girth	UTT	Unable To Trace
G	Gas IC	UTTF	Unable to Trace Further
Gy	Gully	V	Valve
h	Height	VP	Vent Pipe
IC	Inspection Cover	W	Water Inspection Cover
IL	Invert Level	WD	Way Duct
JB	Junction Box	WDE	Way Duct Empty
LB	Light Bollard	WG	Wooden Gate
LC	Lightning Conductor	WO	Washout
LP	Lamp Post	WV	Water Valve
MB	Multibole		

BURIED SERVICES

- Drainage Foul
- Drainage Foul (Records)
- Drainage Storm
- Drainage Storm (Records)
- Electricity
- Electricity LV (Records)
- **Electricity HV**
- Electricity HV (Records)
- Gas
- Gas (Records)
- Services Unidentified
- Services Unidentified (Records)
- Telephone
- Telephone (Records)
- Water
- Water (Records)
- Chamber

Fig 3 Plan of topography and buried services; location of boreholes (ESI 2015; M. J. Rees and Company Ltd., Topographical/ Buried Services Survey, Kew Biothane Plant, rev. A, December 2015)

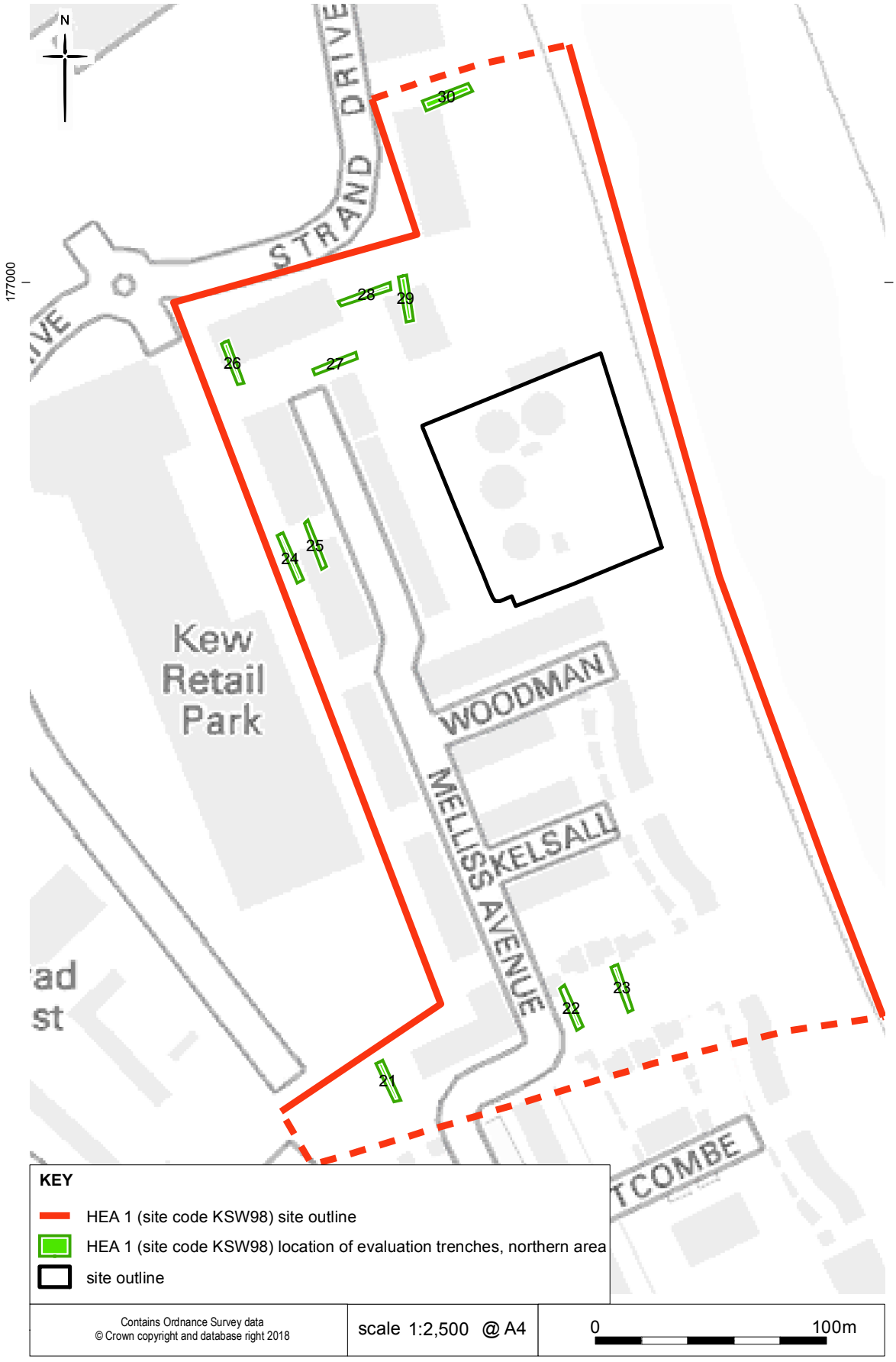


Fig 4 Kew Sewage Treatment Works, location of evaluation trenches in northern area (HEA 1; Hull 2000; Hammond 2000)

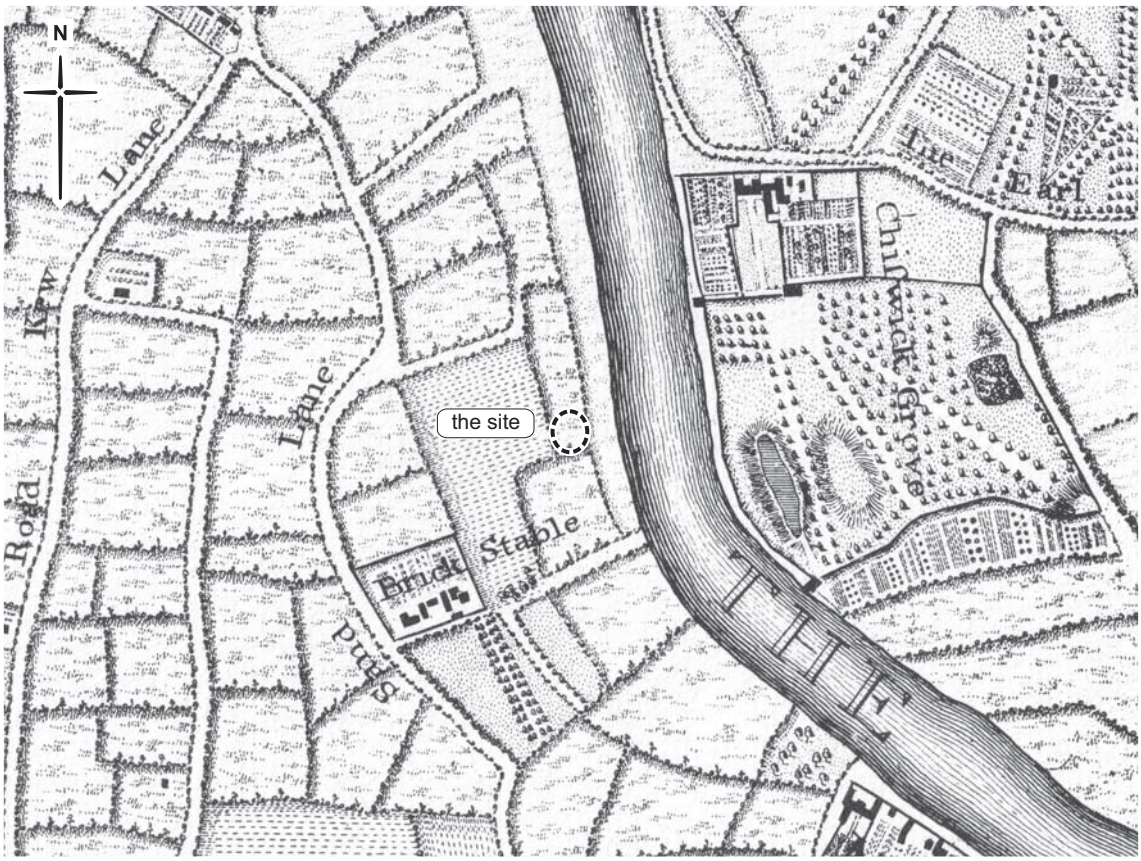


Fig 5 Rocque's map of 1766

Fig 6 Ordnance Survey 1st edition 25":mile map of 1869 (not to scale)

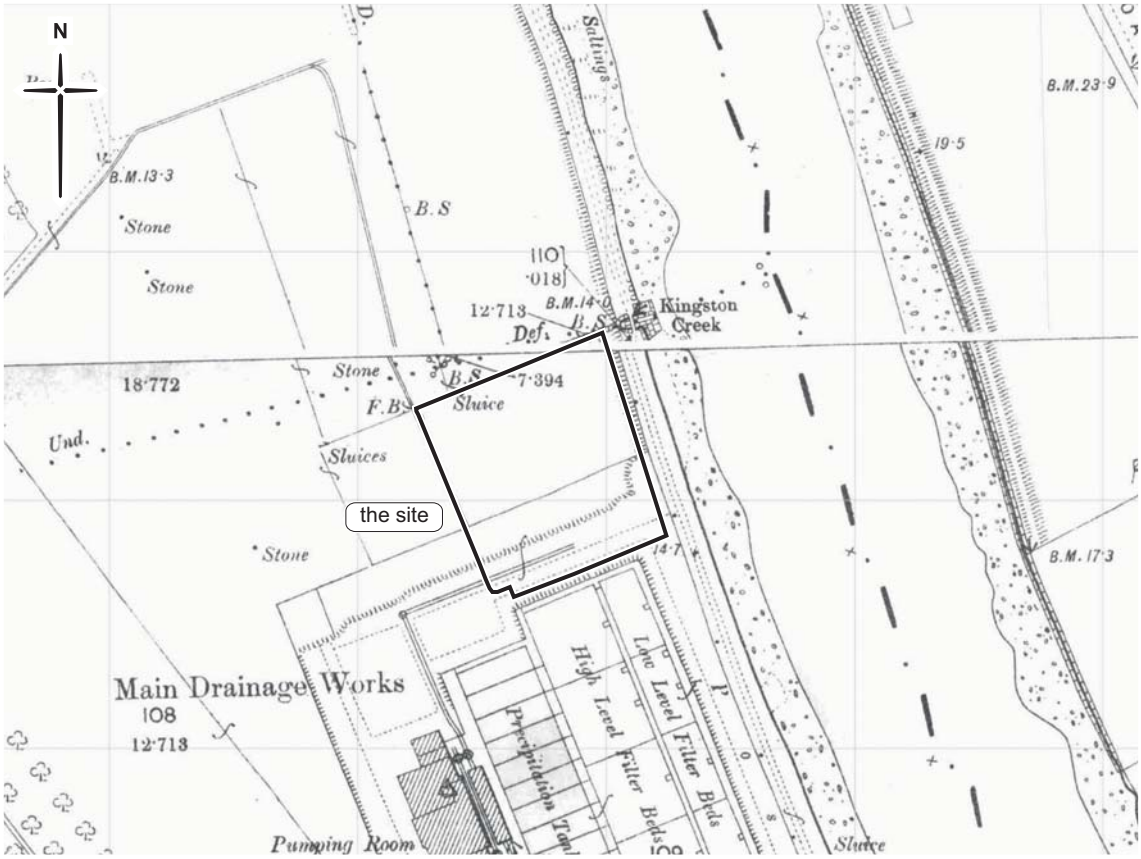


Fig 7 Ordnance Survey 2nd edition 25":mile map of 1896 (not to scale)

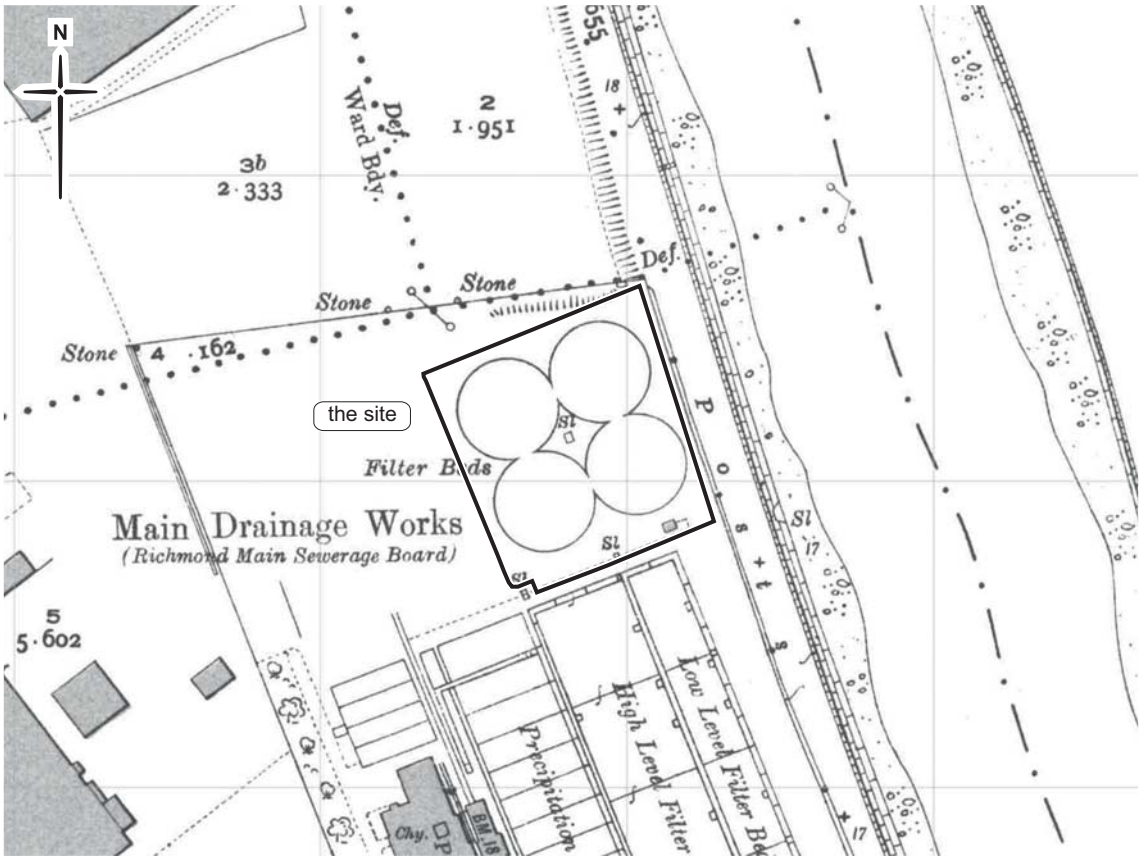


Fig 8 Ordnance Survey 1:2500 scale map of 1933 (not to scale)

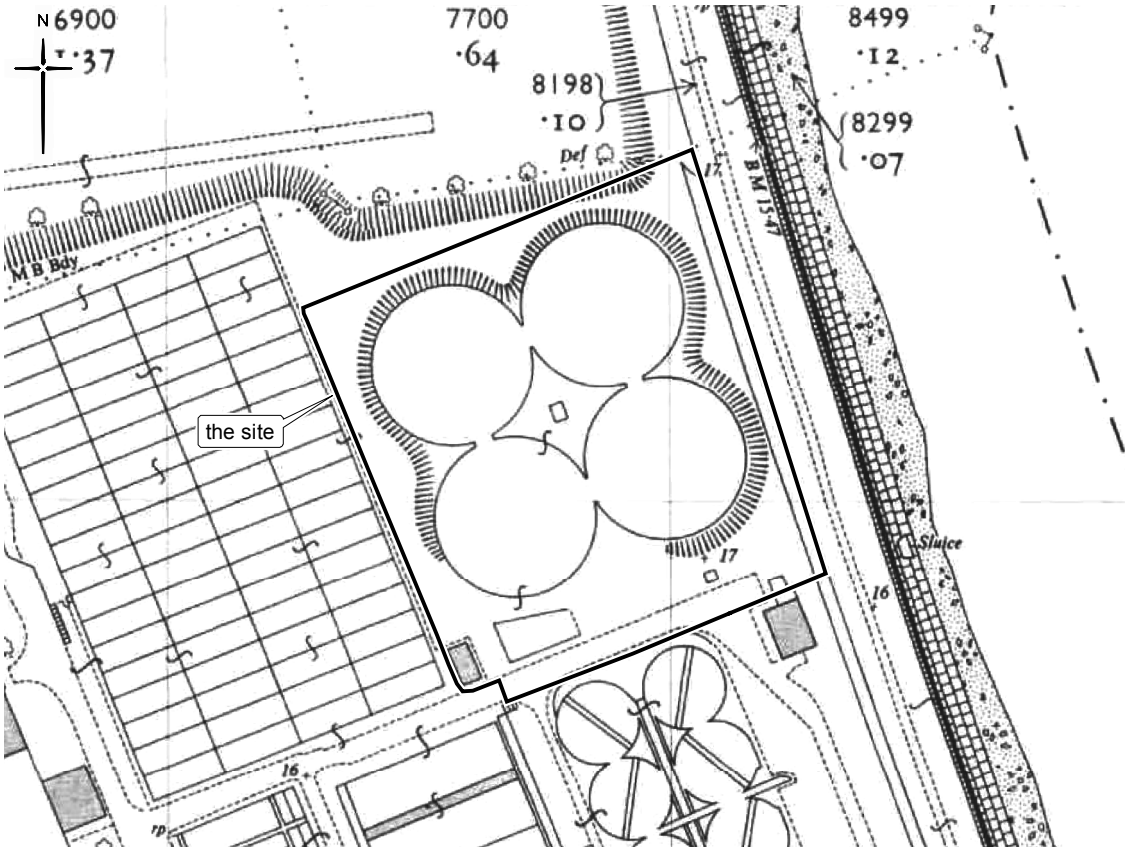


Fig 9 Ordnance Survey 1:2500 scale map of 1959-61 (not to scale)

Fig 10 View looking north towards the existing structures (MOLA site visit 19/02/2018, photo no3)

Fig 11 View looking south from the northern tanks towards the southern boundary of the site (MOLA site visit 19/02/2018, photo no14)

Fig 12 View looking east towards the eastern boundary of the site (MOLA site visit 19/02/2018, photo no17)

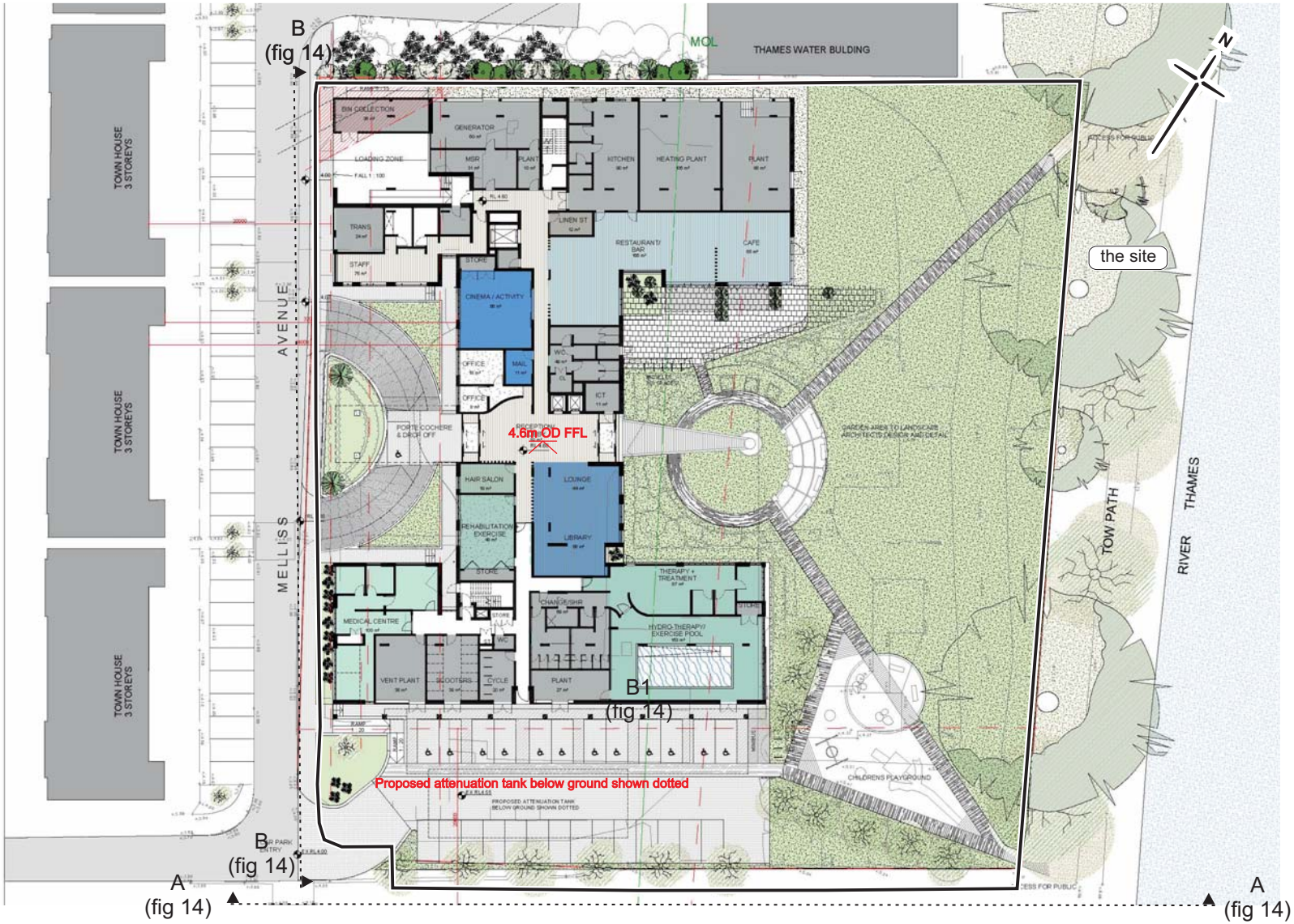


Fig 13 Proposed site plan (Marchese Partners, Drawing No. PA2.01 Revision G, 06/08/2018)

Fig 14 Proposed site sections (Marchese Partners, Drawing No. PA3.03 and PA3.04, Revision D, 06/08/2018)