ENGLISH HERITAGE

The Battersea Channel Project, Nine Elms:
exploration of the buried prehistoric landscape

RESEARCH DESIGN AND METHOD STATEMENT
THE ARCHAEOLOGICAL AND GEOARCHAEOLOGICAL INVESTIGATION FOR THE BATTERSEA CHANNEL PROJECT, NINE ELMS

LONDON BOROUGHS OF LAMBETH AND WANDSWORTH

Figure 1: Some of the developments within the planning process in the Nine Elms/East Battersea area. Source: Wandsworth Borough Council web site

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1.0 PROJECT BACKGROUND

1.1 The following Research and Design Method Statement is the result of a collaborative process involving the various archaeological units, practitioners, and curators currently or previously involved in archaeological investigations within the Battersea Channel Project area.

1.2 The project covers a *ca*. 200ha area (part of a wider 'Opportunity Area' now known as 'Nine Elms Vauxhall' undertaken by the Nine Elms Vauxhall Partnership) and is supported by TfL, Lambeth and Wandsworth Borough Councils and English Heritage.

1.3 The area forms a large triangle around the Nine Elms area, lying on the south side of the River Thames between Chelsea Bridge and Vauxhall Bridge; broader at its western end where it extends from the waterfront southeastward over a distance of about 1.25 km, and narrowing eastward. It is bordered by the River Thames to the north, Chelsea Bridge Rd (A3216) / Silvertown Rd (B224) to the west and Wandsworth Rd (A3036) to the south and east. The centre of the site lies at National Grid reference 529375, 177095.

1.4 Of particular interest in the Battersea area is the potential of the Thames riverside and of the former marshlands, channels and gravel islands associated with the Battersea Channel, a former river channel situated on the wider Thames floodplain, located within the Nine Elms area.

1.5 The aim of this document is to set out the aims and methodology for undertaking post excavation analysis and publication of numerous disparate archaeological investigations within the project area, and to ensure that an agreed approach to fieldwork, post-excavation assessment/analysis and eventual publication is established. It follows on from an overarching brief, produced by English Heritage and endorsed by both Lambeth and Wandsworth borough council planning departments in early June 2014: http://www.english-heritage.org.uk/professional/advice/our-planning-role/greater-london-archaeology-advisory-service/glaas-publications/. This brief states that the following tasks need to be fulfilled within the Research Design and Method Statement:

Research Design (section 2)
This will include:

1 Identify: (1) research questions for individual sites; (2) sources of historic borehole and archaeological data, (3) types of palaeoecological study to be used, and (4) research questions for the project as a whole
2 Identify how over the period of field data collection, the scope of the project will be continuously reviewed
3 Identify the mechanism by which a stock take will be conducted to identify the sites that are to be included
4 Identify the mechanism by which a stock take will be conducted to identify the geoarchaeological/geotechnical material from the wider

area within the study zone to provide a context for the specific site works.

5 The form and scope of the anticipated publication will be determined at the conclusion of the field data collection stage.

Method Statement (section 3)

1 This will identify the fieldwork techniques of sampling and logging to be used across the different sites.

2 Identify software and approach to modelling geoarchaeological and geotechnical data derived from fieldwork and obtained from other sources such as the British Geological Survey

3 Identify the types of scientific dating to be used (e.g. radiocarbon dating), and how the samples will be obtained, processed and the laboratories to be used

4 Identify the techniques/approach that will be used for all archaeological and geoarchaeological / palaeoenvironmental investigations throughout the course of the project

5 Set out arrangements for presentation of results, reporting, dissemination and archiving

6 Identify elements of the project work that may not be within the scope of developer funding.

1.6 Each site within the project area has, is, or will be investigated on an individual basis by the various archaeological and geoarchaeological units. Prior to the start of each intervention a Written Scheme of Investigation (WSI) will have been submitted to the local planning authorities and approved. The WSI for each site will conform to the methods and objectives set out for the Battersea Channel Project, Nine Elms, Over-arching Archaeological / Geoarchaeological Brief & Research Design and Method Statement.

1.7 However, it is also highlighted that a number of archaeological / geoarchaeological investigations that form part of the Battersea Channel Project have already commenced, and in some cases been completed. It is therefore important to recognise that in reality the stages identified within these documents will run in parallel and not sequentially.

2.0 RESEARCH DESIGN

2.1 Geological and Geoarchaeological Background

2.1.1 Mapping by the British Geological Survey (BGS) (1:50,000 Sheet 270 South London 1998) shows Alluvium adjacent to the waterfront along the whole length of the site, with a broad (0.75 km) area of Alluvium extending southward across the Nine Elms area and then narrowing in a southwesterly direction, parallel with and slightly to the north of the Wandsworth Road. This area of Alluvium has been recognised as marking the position of a palaeochannel, termed by Morley (2010) the Battersea Channel. Between this palaeochannel and the alluvium adjacent to the waterfront, BGS maps an area of Kempton Park Gravel which forms a low terrace at levels between about 1.5m and 4.5m OD. This upstanding gravel remnant extends westward beneath Battersea Park and is termed by Morley (2010) the Battersea Eyot. Morley (2010) suggests that a second, less substantial palaeochannel with a W-E alignment lies to the north of the Battersea Channel, dividing the Battersea Eyot into northern and southern elements. Kempton Park Gravel is also mapped by BGS to the south and east of alluvium marking the position of the Battersea Channel. The bedrock beneath the site is the London Clay.

2.1.2 Recent investigations within or close to the present area of interest (Morley, 2009/10; Branch *et al* 2010; Green & Young 2011; Young *et al* 2012, 2013; Figure 1) have shown that the alluvium is everywhere underlain by sand and gravel which can be regarded as the Late Devensian Shepperton Gravel of Gibbard (1985, 1994). The surface of this gravel is uneven reflecting its origin as the deposit of an actively braiding river with gravel bars separated by low-water channels. The gravel surface is recorded by Young *et al* (2012) at levels up to -0.3m OD to the west of Battersea Power Station and down to below -4.5m OD within the Battersea Channel to the east of the Power Station. In general, low points recorded within the Battersea Channel lie between -2.0m and -4.0m OD.

2.1.3 Overlying the gravel surface are Holocene sediments in which it is possible to recognise the sequence of deposits that typically underlies the floodplain of the Lower Thames. However the sequence is often compressed or incomplete, due either to the lack of accommodation space or to truncation resulting from historic land-use activities. At the base of the sequence a sandy and silty alluvium (the Lower Alluvium) may be present, in which organic remains are often preserved (detrital plant remains, wood, Mollusca). Overlying the Lower Alluvium, peat is sometimes present, generally with a substantial mineral content indicating that the accumulating peat surface was subject to frequent inundation.

2.1.4 Dating of peat deposits within or close to the area of interest has shown that peats of widely different age are present within a relatively narrow height range, e.g. 7670-7510 cal BP at -1.25m to -1.75m OD (Morley 2010); 3980-3730 cal BP at -1.8m OD (Young *et al* 2012); 3460-3360 cal BP at -1.0m OD (Young *et al* 2013). This indicates that suitable conditions for peat formation were present at various times during the Holocene, probably in

abandoned channel remnants on an actively developing floodplain. In such conditions individual peat horizons will have been relatively limited in extent. This is consistent with the finding, e.g. to the west of Battersea Power Station (Young *et al* 2012) that where the Holocene alluvial sediments are thin, overlying the higher parts of the Shepperton Gravel surface, the peat is thin or completely absent. Overlying the peat, a silty mineral-rich alluvium (the Upper Alluvium) is widely present in which visible organic remains are generally uncommon.

2.1.5 As well as providing insights into the nature of the Holocene sequence within and close to the Battersea Channel, recent investigations have also made it possible to refine our understanding of the exact position of the channel and of subsidiary channels associated with it. Thus at the Pascal Street site (Young *et al* 2013) a palaeochannel was identified which could be interpreted either as a tributary channel feeding into the main Battersea Channel or as a discrete channel forming part of a network draining the floor of the Battersea Channel. Similarly, investigations to the west of Battersea Power Station (Young *et al* 2012) indicated the presence of a shallow palaeochannel at some distance from the main Battersea Channel, which might be tributary to it, or quite separate from it. The resolution of such uncertainties forms one of the principal aims of the investigation.

2.2 Archaeological Background

2.2.1 The Battersea Channel Project area incorporates the eastern portion of the Battersea Channel, its margin and the very eastern portion of the eyot between it and the current course of the Thames that in the main is occupied by Battersea Park. Limited recorded archaeological evidence has been recorded from the former channel area while the Thames southern foreshore along this stretch of London has produced considerable archaeological evidence from the Mesolithic to Iron Age in particular. It is desire to redress this 'balance' by taking advantage of the redevelopment opportunity that has given rise to this Project.

2.3 Project Aims & Objectives

2.3.1 In order to increase our knowledge and understanding of the evolution of the landscape within the confines of the Battersea Channel Project area, and the nature of human occupation, the following research aims are proposed for the geoarchaeological and archaeological investigations:

1 What was the location, orientation, size and depth of the Battersea Channel and associated smaller channels?
2 How did these channels shape the prehistoric landscape and to what extent was the landscape impacted by processes such as changes in sea level/salinity?
3 How did the floodplain and dryland vegetation evolve over time?
4 What was the nature of human occupation during the prehistoric and historic periods?
5 How did environmental change affect human occupation during the prehistoric and historic periods and what was the impact of human occupation on the landscape?

2.4 Project Review Meetings

2.4.1 In order to fulfil requirements 2 to 5 of the Research Design as outlined in section 1.5, project review meetings will be convened and chaired on a biannual basis by the Greater London Archaeological Advisory Service (GLAAS, English Heritage) involving all archaeological/geoarchaeological units working within the project area, and other interested parties. These meetings will provide the opportunity for:

1 sharing and discussing the findings from each site,
2 the sharing of data (e.g. stratigraphic data for deposit modelling purposes) assuming no confidentiality clauses are in place,
3 consideration/updating of the project aims, and
4 discussion of the eventual publication format.

3.0 METHOD STATEMENT

3.1 Desk-based geoarchaeological deposit model

3.1.1 Geoarchaeological interest for the Battersea Channel Project derives from the ability within the project area to predict the underlying geology and topography of the site through the analysis of stratigraphic data.

3.1.2 Geoarchaeological deposit modelling can be achieved by collation of borehole data associated with geotechnical boreholes (including 'open source' data such as British Geological Survey borehole logs), site specific geoarchaeological boreholes and stratigraphic data from archaeological investigations.

3.1.3 The deposit model can be used as a predictive tool to identify landscape features with potential for the recovery of significant archaeological / geoarchaeological remains (e.g. gravel eyots and former channels), as well as to address more specific questions such as:

1 What is the nature and level of early Holocene (Mesolithic) gravel topography?
2 What is the nature, thickness and depth of the alluvium?
3 What are the levels and radiocarbon dates for the lowest and highest organic sequence/ levels of peat?
4 What is the depth and extent of modern disturbance?
5 What deposits occur at the interface of Pleistocene gravel and Holocene alluvium?
6 If sand occurs, can it be dated (Carbon-14 or inclusions?)
7 Is there evidence for soil formation prior to initial inundation?
8 When was the site first inundated
9 Was initial inundation by tidal water?
10 Were subsequent inundations by fresh or tidal water?
11 What are the characteristics of the alluvium in terms of the number of peat and silty-clay units?
12 What are the characteristics of the alluvium in terms of its preservation of macro and microfossil indicators of past environments and ecology?
13 Are dryer periods of weathering and possible soil formation, or the emergence of dry landsurfaces preserved within the peat and clay-silts?
14 Is there evidence for human activity in the area during the deposition of the alluvial (and earlier) deposits? This might be shown indirectly by pollen, plant macro and insect remains or directly by artefacts.
15 Is there evidence for activity on the site in the Roman or Medieval periods?
16 Is there evidence for catastrophic flooding in the Medieval period?
17 What is the evidence for land reclamation in the Post Medieval period?

3.1.4 It was initially proposed within the Over-Arching Brief that Stage 1 of the project would consist of producing a desk-based geoarchaeological deposit model for the entire project area. The rationale for this proposal was that it would:

1 Be a predictive tool that can be used by the English Heritage Archaeology Advisor and archaeological/geoarchaeological consultants/practices in advance of individual site developments
2 Develop a set of procedures for deposit modelling to be used by individual geoarchaeological teams throughout the course of the project
3 Provide preliminary identifications of landscape features with potential for the recovery of significant archaeological/geoarchaeological remains (e.g. gravel eyots and former channels)
4 Identify areas in which more stratigraphic data is required to inform the deposit model.

3.1.5 Since (as highlighted in 1.7) a number of investigations have already commenced within the Battersea Channel Project Area, it is proposed here that the production of a desk-based deposit model will instead happen as a final stage of the project as part of the publication. In this way, the model will provide a steer for archaeological/geoarchaeological investigations that occur within the area after completion of the current project, in much the same way as current investigations in for example the Lower Lea Valley refer to the deposit modelling of Corcoran et al. (2011).

3.1.6 Instead, prior to any fieldwork starting on a new site, all available existing data (e.g. existing geotechnical records) will be used to gain an understanding of the likely landscapes to be found on the site, so that the most appropriate geoarchaeological and/or archaeological strategy can be adopted. In addition, following the completion of any site-based deposit modelling exercise, a digital table of the stratigraphic data will be submitted to GLAAS/Greater London HER in a format that can be utilised by other units (see section 3.2)*. Thus, at the start of any new project, Greater London HER should be contacted to acquire any relevant data. Information will also be shared at the Project Forum Review Meetings (see 2.4).

**It is fully recognised that there may be client-based confidentiality agreements on certain sites that prevent the circulation of this stratigraphic data – such instances will need to be reported to the Project Forum.*

3.2 Geoarchaeological field investigations & deposit modelling

3.2.1 Site-specific WSI's will outline the method of geoarchaeological field investigation to be used on any given site. However, such investigations are likely to take the form of one or more of the following:

1 monitoring geotechnical site investigations (boreholes and/or test-pits),
2 putting down and describing geoarchaeological specific boreholes, or,
3 working on sections within archaeological trenches. Samples will be retained for laboratory-based assessment/analysis if appropriate and when feasible.

3.2.2 The description and recording of all soils and sediments in the field/laboratory will follow standard geoarchaeological terminology and will aim to characterise the visible properties of each deposit, in particular relating to its texture, colour, structure, depositional boundaries, inclusions and evidence for depositional and post-depositional processes.

3.2.3 The results will be used to produce a preliminary interpretation of the site formation processes and depositional environment. Description of the sedimentary sequences recovered will provide important, primary information on the nature of the depositional environment through time. Sand and gravel indicates deposition with a high energy fluvial environment, such as braided river system, during cold climatic conditions. Fine-grained mineral sediment, such as silt or clay indicates deposition within or on the margins of a lake, pond or river. Soil and peat formation indicates the formation of semi-terrestrial or fully terrestrial conditions resulting in the colonisation of vegetation adapted to the specific local conditions.

3.2.4 The sedimentary logs retrieved from the on-site geoarchaeological work, geotechnical monitoring and/or open source data will be input into a Rockworks digital database for deposit modelling purposes (see explanation in 3.1). From this database the following can be created:

1 transects (schematic cross sections)
2 surface elevation and thickness models for each of major stratigraphic units (e.g. River Terrace Gravels).

3.2.5 The data will then be able to be viewed on a site by site basis or in the wider landscape context of the Battersea Channel Project Area.

3.2.6 The sedimentary logs must have location and height data (i.e. x,y & z data) and will be divided up into basic sedimentary (lithological) units as follows: the underlying basal geology, if available (e.g. the London Clay); the underlying gravel unit at a minimum (whether river terrace or floodplain deposit) or the underlying basal geology if the gravel has been eroded out; alluvial deposits (where possible divided into sands/sandy clays near the base, silty clays/clays and peats up profile); any soil deposits on top of the alluvium directly below the made ground; and finally the modern made ground deposits.

3.2.7 If access to Rockworks software is not available, data will be transferred to an Excel spreadsheet in the following format (which will be provided) so that it can be transferred to Rockworks for production of the project-wide deposit model at the publication stage (lithology will have a drop-down box to aid nomenclature). An example can be seen below:

Bore	Easting	Northing	Elevation	Total Depth	Depth1	Depth2	Lithology	Comment
BH1	999999	999999	1	10	0	2	made ground	Modern, not archaeological and not redeposited alluvium
					2	4	silt clay/clay silt	Mudlfats becoming overbank flood deposits and weathered to surface
					4	6	peat, woody	Woodland wetland, alder carr
					6	8	sand, silty	Pale yellow grey, tuffa rich, fine grained spring deposits
					8	9	gravel, sandy	Floodplain gravels
					9	10	clay, stiff/ fissured	London Clay

Table 1: format for data transfer

3.2.8 Following completion of the geoarchaeological field investigations, a report will be generated on the sedimentary history of the site, and detailed recommendations will be made for any geoarchaeological assessment/analysis (see 3.3).

3.3 Geoarchaeological assessment & analysis

3.3.1 If further work is recommended, selected sequences from the site will be chosen for assessment of palaeobotanical remains (e.g. pollen, plant macrofossils, diatoms, Mollusca) and dating (e.g. radiocarbon, OSL) based on the buried topography and the distribution of sub-surface deposits.

3.3.2 Such investigation, subsequent reporting and archiving will follow standard procedures and specific details will be provided within the WSI for each individual site. However, the following principles will be followed:

1 Wherever possible the same sequences and levels will be selected for all palaeobotanical proxies, as this will enable the results to be compared.

2 If suitable organic sediment is recovered, consideration will be given to carrying out radiocarbon (^{14}C) dating, in order to provide a dating framework for the stratigraphic sequence. Samples for dating will be cut from the sequences retained from each site. Radiocarbon samples will be of selected plant or animal macrofossils rather than bulk peat. This is because bulk peat samples provide only a very broad indication of age and not all the constituents of the peat may be appropriate for radiocarbon dating. The radiocarbon laboratory used will depend upon the preference of each individual unit, and the required turn-around time of the eventual client.

3 If suitable organic deposits or inclusions are not found, but silts and fine sands exist with potential for Optically Stimulated Luminescence dating, then intact cores (if sealed and opaque as recovered in U4's/U100) could be considered for OSL dating, in place of radiocarbon samples. The radiocarbon laboratory used will depend upon the preference of each individual unit, and the required turn-around time of the eventual client.

4 Palaeobotanical assessment/analysis of microfossil remains should involve pollen assessment at a minimum and, if appropriate, diatoms (and/or ostracods/ foraminifera). Pollen will aim to provide a reconstruction of the vegetation history, as well as identifying indirect evidence for human activity nearby and provide relative dating, where sediments suitable for radiocarbon are not found. Diatoms, ostracods and/or foraminifera will aim to assess the potential for providing information such as changes in past water salinity.

5 Palaeobotanical assessment/analysis of macrofossil remains should involve waterlogged plant macrofossils (seeds/fruits/wood), insects and Mollusca on suitably organic-rich samples. Borehole samples are less likely to yield high concentrations of remains due to the small size of the sample, but may provide sufficient material for radiocarbon dating. Larger samples from for example, archaeological trenches have the potential to yield greater concentrations of remains and therefore more valuable information.

3.4 Archaeological evaluation

3.4.1 The initial evaluations will be undertaken at site specific level conforming to the site specific specification. The evaluation report will need to identify if the archaeological result contains information pertinent to the scope of the Project. Summary information can then be considered by the Project specific archaeological practice. The mechanism by which this evaluation stage information is then communicated between the practices will be decided at the first Project Forum meeting.

3.5 Archaeological excavation, post-excavation assessment & analysis

3.5.1 The excavations that are undertaken will conform to the site specific level specification. The excavation report will need to identify if the archaeological result contains information pertinent to the scope of the Project. Information can then be considered by the Project specific archaeological practice. The mechanism by which the data from the excavation stage is then communicated between the practices will be decided at the first Project Forum meeting.

3.6 Publication

3.6.1 It is anticipated that the publication will be focussed upon addressing the project aims as outlined within section 2.3. However, it is fully anticipated that these aims and thus the content and format of the publication will evolve as investigations continue to progress within the project area. Further discussions on the final publication and division of tasks will take place during the course of the biannual meetings convened and chaired by GLAAS.

3.6.2 At the conclusion of the post-project and publication, the shared collective data will be submitted to the Greater London HER in Excel form with the potential option of it also being presented as a gis layer.

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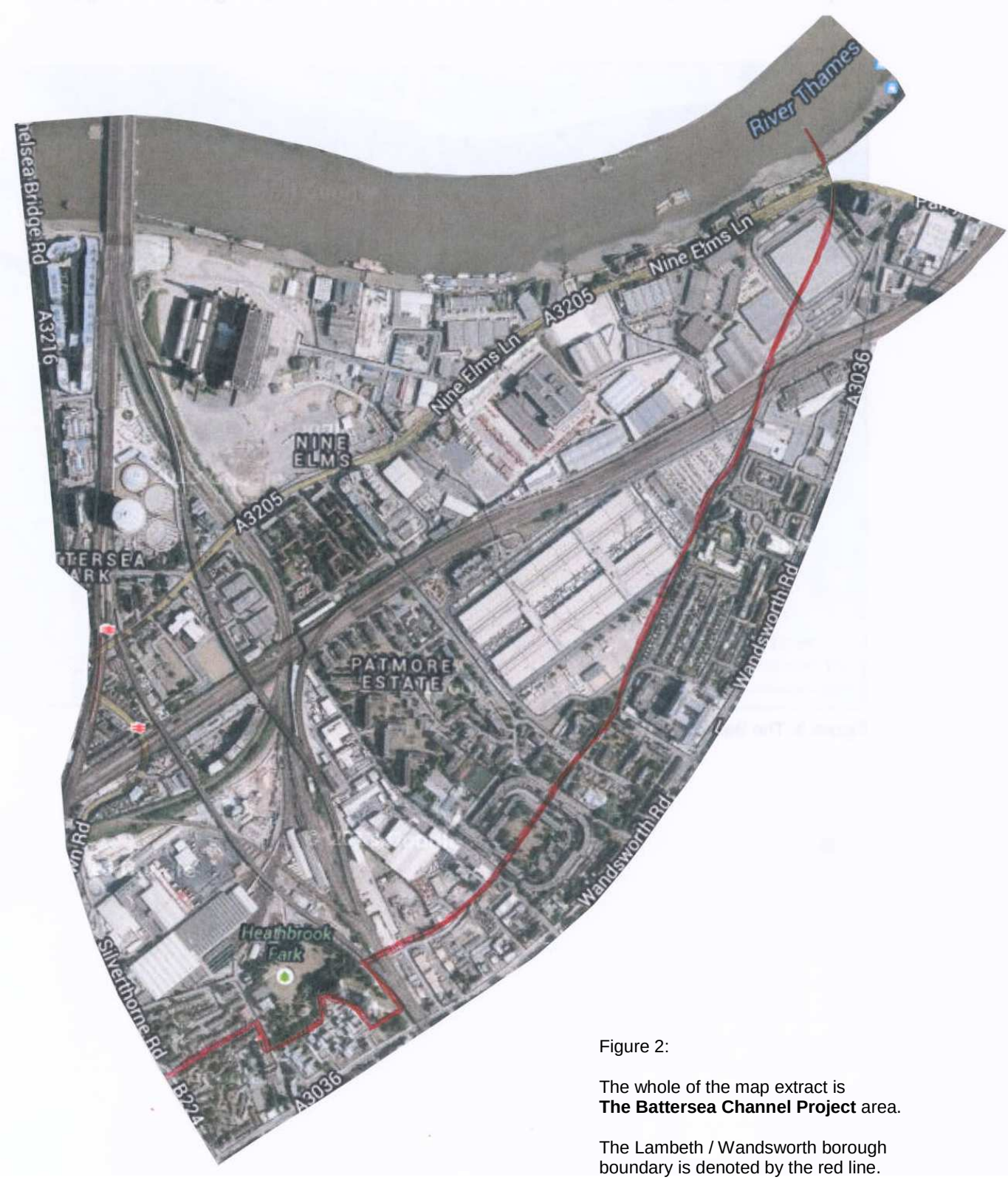

Figure 2:

The whole of the map extract is **The Battersea Channel Project** area.

The Lambeth / Wandsworth borough boundary is denoted by the red line.

BCP: Nine Elms

3nd draft 28 November 2014 *Planning and Conservation: London, English Heritage*

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