Please note:

Further details are provided in the Final Report on Site Selection Process (doc ref: 7.05) that can be found on the Thames Tideway Tunnel section of the Planning Inspectorate’s web site.
Site suitability report
S93WH

Kirtling Street
# Thames Tunnel

## Site suitability report S93WH

### List of contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Purpose and structure of the report</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Background</td>
<td>1</td>
</tr>
<tr>
<td>1.3 Consultation</td>
<td>2</td>
</tr>
<tr>
<td>2  Site information</td>
<td>2</td>
</tr>
<tr>
<td>2.1 Site and surroundings</td>
<td>2</td>
</tr>
<tr>
<td>2.2 Type of site</td>
<td>4</td>
</tr>
<tr>
<td>3  Proposed use of site – construction phase</td>
<td>4</td>
</tr>
<tr>
<td>4  Proposed use of site – operational phase</td>
<td>5</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>5</td>
</tr>
<tr>
<td>4.2 Restoration and after-use</td>
<td>6</td>
</tr>
<tr>
<td>5  Engineering assessment</td>
<td>6</td>
</tr>
<tr>
<td>5.1 Access</td>
<td>6</td>
</tr>
<tr>
<td>5.2 Construction works considerations</td>
<td>7</td>
</tr>
<tr>
<td>5.3 Permanent works considerations</td>
<td>7</td>
</tr>
<tr>
<td>5.4 Health and safety</td>
<td>7</td>
</tr>
<tr>
<td>6  Planning assessment</td>
<td>7</td>
</tr>
<tr>
<td>6.1 Introduction</td>
<td>7</td>
</tr>
<tr>
<td>6.2 Planning applications and permissions</td>
<td>8</td>
</tr>
<tr>
<td>6.3 Planning context</td>
<td>8</td>
</tr>
<tr>
<td>6.4 Planning comments</td>
<td>13</td>
</tr>
<tr>
<td>7  Environmental appraisal</td>
<td>17</td>
</tr>
<tr>
<td>7.1 Introduction</td>
<td>17</td>
</tr>
<tr>
<td>7.2 Transport</td>
<td>17</td>
</tr>
<tr>
<td>7.3 Archaeology</td>
<td>17</td>
</tr>
<tr>
<td>7.4 Built heritage and townscape</td>
<td>17</td>
</tr>
<tr>
<td>7.5 Water resources – hydrogeology and surface water</td>
<td>18</td>
</tr>
<tr>
<td>7.6 Ecology</td>
<td>18</td>
</tr>
<tr>
<td>7.7 Flood risk</td>
<td>18</td>
</tr>
<tr>
<td>7.8 Air quality</td>
<td>19</td>
</tr>
</tbody>
</table>
7.9 Noise .......................................................................................................................... 19
7.10 Land quality .............................................................................................................. 19

8 Socio-economic and community assessment ............................................................... 20
  8.1 Introduction ................................................................................................................. 20
  8.2 Socio-economic profile ............................................................................................ 20
  8.3 Issues and impacts ...................................................................................................... 20

9 Property assessment ...................................................................................................... 21
  9.1 Introduction ................................................................................................................ 21
  9.2 Crown land and special land comments .................................................................... 21
  9.3 Land to be acquired ..................................................................................................... 22
  9.4 Property valuation comments .................................................................................. 23
  9.5 Disturbance compensation comments ...................................................................... 23
  9.6 Discretionary purchase costs comments ................................................................... 24
  9.7 Offsite statutory compensation comments ............................................................... 24
  9.8 Site acquisition cost assessment .............................................................................. 24

10 Site conclusions by discipline ..................................................................................... 25
  10.1 Introduction ................................................................................................................ 25
  10.2 Engineering ............................................................................................................... 25
  10.3 Planning ..................................................................................................................... 25
  10.4 Environment .............................................................................................................. 26
  10.5 Socio-economic and community .............................................................................. 27
  10.6 Property ..................................................................................................................... 27
  10.7 Next steps in the site selection process .................................................................... 28

Appendices ....................................................................................................................... 29
Appendix 1 – Sources of information
Appendix 2 – Site location plan
Appendix 3 – Planning and environment plans
Appendix 4 – Photographs of the site and surroundings
Appendix 5 – Transport plan
Appendix 6 – Services and geology plan
Appendix 7 – Construction phase layout
Appendix 8 – Operational phase layout
Appendix 9 – Environmental appraisal tables
List of tables

Page number

Table 3.1  Construction phase data ................................................................. 5
Table 4.1  Operational phase data ................................................................. 6

List of abbreviations

AOD  above Ordnance Datum
BAP  biodiversity action plan
BT   British Telecom
CPO  compulsory purchase order
CSO  combined sewer overflow
DLR  Docklands Light Railway
EA   Environment Agency
GLA  Greater London Authority
HGV  heavy goods vehicle
LNR  local nature reserve
LPA  local planning authority
LU   London Underground
m    metre/metres
MOL  Metropolitan Open Land
ONS  Office of National Statistics
ORN  Olympic Route Network
PLA  Port of London Authority
POS  public open space
PTAL public transport accessibility level
SAM  scheduled ancient monument
SINC site of importance for nature conservation
SNCI site(s) of nature conservation importance
SSR  site suitability report
SSSI site(s) of special scientific interest
SUDS sustainable urban drainage systems
TfL  Transport for London
TD   tunnel datum
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLRN</td>
<td>Transport for London Road Network</td>
</tr>
<tr>
<td>TPA</td>
<td>Thames Policy Area</td>
</tr>
<tr>
<td>UDP</td>
<td>unitary development plan</td>
</tr>
<tr>
<td>UXO</td>
<td>unexploded ordnance</td>
</tr>
</tbody>
</table>
1 Introduction

1.1 Purpose and structure of the report

1.1.1 The Site selection methodology paper (May 2009 and revised August 2011) outlines the process to be used to create the preferred list of main tunnel sites, and this process also applies to CSO sites. Paragraph 2.3.31 lists the type of general considerations that will be addressed in each site suitability report. Whether a consideration is relevant to the assessment of a site will depend on available information and professional judgement.

1.1.2 This report was prepared through the assessment of information from the perspective of a number of technical disciplines: engineering, planning, environment, property and community. The reports have been prepared on the basis of the information listed in Appendix 1 and this level of information is considered to be appropriate to this stage of assessment.

1.1.3 The Site selection background technical paper provides information on the requirements for different types of sites, their sizes and typical activities/facilities within the sites.

1.1.4 Each site suitability report considers a particular site on its own merits. In addition, an Engineering options report was produced, which relates to main tunnel and connection tunnel options. Information from both of these reports will feed into the technical assessment of how well the site may fit in with tunnel design options, ensuring combinations of sites spread across the length of the tunnel route provide a reasonable spatial distribution of sites (that will best assist with the construction of the tunnel, operation and maintenance). The outcomes are reported in the Phase two scheme development report.

1.2 Background

1.2.1 The process for selecting sites is set out in the Site selection methodology paper. All sites have previously passed through the following parts of Stage 1:

- Part 1A – Creation of the long list of potential main tunnel (and CSO) sites
- Part 1B – Creation of a short list of potential main tunnel (and CSO) sites
  - Table 2.2: Long list of main tunnel (and CSO) sites – an assessment against set considerations and values
  - Table 2.3: Draft short list of main tunnel (and CSO) sites – assessment against a list of more detailed considerations
  - Workshops to consider each site to arrive at a short list of sites.

---

a The amendments made in August 2011 do not change the site selection methodology process. The amendments only related to the introduction of a second phase of consultation (paragraphs 2.3.13-2.4.15) and minor factual updates.
1.2.2 The final part of Stage 1 includes this report. The following is an overall summary of all elements that apply to all the sites on the final short list:

- Part 1C – Creation of the preferred list of main tunnel (and CSO) sites – site data, site visits, site suitability reports, engineering options report and optioneering workshops that are reported in the *Phase two scheme development report*.

1.2.3 The *Site selection methodology paper* also contains a provision for a back-check process in paragraph 2.5.6 that states:

“If any sites for any of the main tunnel sites or intermediate sites (or CSO site) are eliminated for any reason, if there are significant changes of circumstances in relation to existing sites or combinations of sites, if new or replacement sites are required or found or if the engineering design develops in unexpected ways then a targeted repeat of stages 1-3 will need to be undertaken in order to fill in any site gaps.”

1.3 **Consultation**

1.3.1 Thames Water’s approach to engagement and consultation for the Thames Tunnel project is outlined in the *Statement of Community Consultation* and the accompanying *Community Consultation Strategy*. Thames Water has engaged regularly with all potentially affected London local authorities, other stakeholders and interested parties on sites and the project.

1.3.2 Phase one consultation has been completed for all the preferred and shortlisted sites along with the three main tunnel route options. The analysis of the consultation responses is set out in the *Report on phase one consultation* and *Interim engagement report*. Any relevant site comments were considered at the post phase one consultation optioneering workshops. The outcomes of these workshops are reported in the *Phase two scheme development report*. After the workshops, engagement on sites has continued with key stakeholders, and the engineering design for sites has also continued in parallel. In autumn 2011, phase two consultation will provide another opportunity for people to comment on sites.

2 **Site information**

2.1 **Site and surroundings**

2.1.1 This section provides an overview of all the site information that will be used by one or more disciplines to assess the site in sections 3 to 9 of this report.

2.1.2 Site S93WH is situated across three parcels of land currently occupied by industrial warehousing, a depot, former petrol filling station and office buildings within the Nine Elms/Battersea area in the London Borough of Wandsworth. Kirtling Street and Cringle Street run through and around the construction site. The site is bounded by the River Thames to north. A site location plan is attached as Appendix 2.
2.1.3 The Cringle Street ready-mix concrete depot, an office building and Thames Water Pumping Station are situated to the west of the site. The Tideway Industrial Estate, Nine Elms Lane and Royal Mail sorting office are situated to the east/southeast. New Covent Garden Market and properties located along Battersea Park Road are located to the south of the site.

2.1.4 The site is covered by various planning and environment designations in the adopted *London Borough of Wandsworth Core Strategy* and the saved policies from the *Unitary Development Plan*. All the mapped designations, where data was available, are shown on the planning and environment plans in Appendix 3.

2.1.5 Photographs of the site and surroundings, together with an aerial photograph of the site, are attached as Appendix 4.

2.1.6 The site can be accessed by road from Nine Elms Lane via Kirtling Street, and is 1.5km from existing rail sidings at Dickens Street, Battersea. It is split in two by Cringle Street, which is the main access to the waste transfer station and Battersea Power Station. The site fronts the river and the Nine Elms Pier jetty is immediately to the east. The CEMEX barges currently utilise the western half of the river frontage and residential barges from Nine Elms Pier occupy the eastern half. A number of preliminary transport plans for the site are attached as Appendix 5.

2.1.7 Third-party assets and significant utilities are listed below and are shown on the services and geology plan in Appendix 6:

- Major utilities in Cringle Street, Kirtling Street and Nine Elms Lane (EHV and HV cables, M/P gas mains, telecoms and trunk water mains), along the western and southern sides of the site, and through the site as it is split by Cringle Street.

- An electrical substation is adjacent to the site, on the south side of Cringle Street.

2.1.8 The locations of other third-party assets, such as BT and fibre optic communication cables, are to be confirmed by further studies and utility searches and may not be shown on the services and geology plan.

2.1.9 Information on the geology specific to this site can be found within the services and geology plan, which is in Appendix 6. This plan shows that the shaft would be founded in Lambeth Beds.

2.1.10 It is understood that Transport for London is planning to extend the Northern Line, which could affect the works. The proposed Battersea Station box is immediately to the southwest of the site, on the north side of Battersea Park Road, to the south of the old power station.

2.1.11 Depending on site area requirements, the Brooks Court office complex could be incorporated with the construction worksite, which would make available 19,100m² (17,000m² without), and could possibly be utilised as office accommodation without demolition. Currently, Brooks Court uses an access route across the ‘Cable & Wireless’ site car park off Cringle Street, and this would have to be discontinued for the duration of the
Thames Tunnel project works. Brooks Court has an alternative access off Kirtling Street which is currently blocked but could be reinstated.

2.2 Type of site

2.2.1 The site S93WH is being considered as:

- a main tunnel single drive site
- a main tunnel double drive site
- a main tunnel reception/intermediate site.

3 Proposed use of site – construction phase

3.1.1 The proposed construction phase layouts for the main tunnel sites are located in Appendix 7 – Construction phase layout, and are based on a preliminary assessment.

3.1.2 The construction phase layout drawings are illustrative and show:

- the layout as a main tunnel single drive site
- the layout as a main tunnel double drive site
- the layout as a main tunnel reception/intermediate site
- potential access points.

3.1.3 These drawings provide initial preliminary schematic layouts that have not been optimised. If the site proceeds to the next stage as a preferred site, construction phase layouts would be optimised to minimise impacts.

3.1.4 Drawings identifying typical construction activities associated with the shaft construction phase are provided in Appendix 7. Potential above-ground construction features (dependent on shaft type) include:

- approximately 3m high hoarding around the site boundary
- welfare facilities
- grout plant, approximately 3m to 5m high, including silos
- mobile crane, approximately 30m high
- gantry crane, approximately 8m high.

3.1.5 Construction of the shaft would require occupation of three blocks of land between Nine Elms Lane and the river, separated by Kirtling Street and Cringle Street. Cringle Street would need to remain open for access to Cringle Dock and Battersea Power Station. Parts of Kirtling Street would need to remain open for access to the concrete batching works at Cringle Wharf and for access to Tideway Wharf. The part of Kirtling Street between Cringle Dock and Tideway Wharf could be temporarily closed and included in the worksite, as it is most likely that no third party would require access to this section of road during the works.

3.1.6 The site is just short of the recommended 20,000m² area for an EPB double drive site but due to the shape of the site, it is still considered feasible to assess the site for this option. It is possible that the site would
need to be enlarged or the office accommodation may need to be located off site. Therefore, it is possible to assess it for all site options.

3.1.7 River jetties would be positioned in front of Nine Elms Pier, allowing access for barges using the CEMEX concrete batching works jetty (Cringle Wharf) immediately to the west.

3.1.8 Preliminary data associated with the construction phase are provided in Table 3.1.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Main tunnel single drive site</th>
<th>Main tunnel double drive site</th>
<th>Main tunnel reception/intermediate site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of construction period</td>
<td>Approx 6 years</td>
<td>Approx 6 years</td>
<td>4 to 5 years</td>
</tr>
<tr>
<td>Likely working hours, ie, (night/day/weekend)</td>
<td>24 hours</td>
<td>24 hours</td>
<td>12 hrs from 7am to 7pm</td>
</tr>
<tr>
<td>Working days</td>
<td>Mon to Sun</td>
<td>Mon – Sun</td>
<td>Mon – Sat</td>
</tr>
<tr>
<td>Primary means of transporting excavated material away from site</td>
<td>River</td>
<td>River</td>
<td>Road*</td>
</tr>
<tr>
<td>Primary means of transporting materials to site</td>
<td>Road/River</td>
<td>Road/River</td>
<td>Road*</td>
</tr>
</tbody>
</table>

* There may be feasible opportunities to use barge transport if used as a reception/intermediate site.

4 Proposed use of site – operational phase

4.1 Introduction

4.1.1 The indicative operational phase layouts for the main tunnel sites are located in Appendix 8 – Operational phase layout, and are based on a preliminary assessment.

4.1.2 The generic elevations of structures shown on the operational phase layout are located in Appendix 8 and provide an illustration of typical examples of the permanent structures which are applicable to main tunnel sites.

4.1.3 The underground infrastructure at this site would likely comprise a shaft.

4.1.4 The above-ground infrastructure at this site would likely comprise a ventilation column and electrical control kiosk.

4.1.5 Hydraulically, the top structure to the shaft would be finished to a minimum level of 104.5m tunnel datum (TD) (4.5mAOD). Since the mean ground level in the area of the shaft is 104.5 to 105mTD (4.5 to 5mAOD), the top structure would be flush with the ground level. The top structure is to provide access and egress into the shaft. For further information on the generic layout of this top structure, refer to Appendix 8.
4.1.6 Hardstanding would be provided to the top structures. The site would be fenced.

4.1.7 Preliminary data associated with the operational phase are provided in Table 4.1.

**Table 4.1 Operational phase data**

| Level of inspections and maintenance and likely working hours, ie, (night/day/weekend) – frequency of visits | One daytime visit every six months for electrical/instrument inspection. An additional one-week maintenance period for tunnel/shaft inspection required per ten years that could be night/day/weekend working. |
| No. of traffic movements | One van visit every six months. An additional one-week period of two to ten movements per day (estimated several vans and two cranes) every ten years. |

4.2 Restoration and after-use

4.2.1 The portion of the site not occupied by the permanent works would be restored to its original condition on completion of the construction works. If any buildings were demolished, these would not be reinstated unless required.

5 Engineering assessment

5.1 Access

5.1.1 This section should be read in conjunction with Section 7.2.

**Road**

5.1.2 Access would be from Cringle Street and Kirtling Street, both off Nine Elms Lane. Two accesses would be required as the site would be split in two by Cringle Street.

5.1.3 For the operational phase, the permanent access would be from Kirtling Street.

**Rail**

5.1.4 The nearest freight rail-head would be at Dickens Street, Battersea (1.5km).

5.1.5 The nearest main line rail station would be Battersea Park (1km) and the nearest London Underground station would be Vauxhall (1.4km).
River

5.1.6 Excavated materials-out jetties could be positioned off Nine Elms Pier to the front and east of the site. This location for the jetty would have an impact on the houseboats and may require the relocation of some of them.

5.2 Construction works considerations

5.2.1 Existing electrical substation on Cringle Street would be adjacent to the site.

5.2.2 The site would be split in two by the need to maintain Cringle Street for third-party access, principally to Battersea Power Station, the waste transfer station and Cringle Dock. Access would also need to be maintained off Kirtling Street to CEMEX and the Tideway Industrial Estate, either side of the site.

5.2.3 Part of Kirtling Street (the north side) could be incorporated into the site area as it would not provide access for any third party during the course of the works.

5.2.4 The site is 19,100m² (excluding Cringle Street, which needs to remain open) and therefore nearly fulfils the minimum requirement of 20,000m² for a double drive site, but it is only marginally less and therefore is potentially a viable site. However, the use of a site with minimal area would increase the project risk associated with limited storage for excavated material and segments. Any interruptions to the transport chain would impact more quickly on the critical tunnelling activity.

5.2.5 It is likely that the proposed works can be constructed within the overall construction programme.

5.3 Permanent works considerations

5.3.1 The top structure would be flush with ground level.

5.4 Health and safety

5.4.1 Part of the site used to be occupied by paint and dye works, hence ground contamination may be present.

5.4.2 There are no other unusual health and safety issues with this site.

6 Planning assessment

6.1 Introduction

6.1.1 The planning assessment builds on the advantages and disadvantages reported in Table 2.3 and covers the following areas:

- Planning applications and permissions
- Planning context
- Planning comments.
6.2 Planning applications and permissions

6.2.1 An initial desktop search of the London Borough of Wandsworth online planning applications database identified the following planning applications submitted within the last five years applicable to the site.

6.2.2 Three areas of the site are identified within the application boundary for the redevelopment of Battersea Power Station. The outline planning application for the redevelopment of the site was approved on 23 August 2011 (ref 2009/3575), which proposes restoration and conversion of the power station building and a wide range of mixed uses, including retail, residential flats, business, cultural, hotel and conference facilities, restaurants, bars and cafes, and community and cultural space.

6.2.3 Listed building consents were also granted on 30 August 2011 for repairs, alterations and extensions to the Grade II* listed power station (ref 2009/3576), works associated to the jetty (ref 2009/3577) and demolition of the former Grade II Battersea Water Pumping Station (ref 2009/3578).

6.2.4 Conditions attached to the planning permission include the requirement for the approval of reserved matters for each phase of development which detail the scale of the building, the external appearance of the building (including facing materials) and landscaping of the site. No works shall be implemented without prior approval of these details. Further conditions state that no development beyond Phase 1 can be undertaken until the Northern Line Extension (NLE) is either operational, which is expected in approximately 2017, or a TWA order has been made in agreement with London Underground to bring forward the NLE Phase 1. In total, there are 62 conditions, including a large number of precommencement conditions.

6.2.5 Other minor applications consistent with the existing use of the other buildings and businesses which make up the site have been submitted and approved within the last five years.

6.2.6 Proposals to demolish Nine Elms Pier, located approximately 20m to the east of S93WH, and construct a new marina are currently being determined by the London Borough of Wandsworth (ref 2011/1926). The proposals will provide permanent moorings for up to 33 houseboats and two visitor boats. Amended plans are likely to be submitted before the application is determined.

6.3 Planning context

6.3.1 The following is a summary of the relevant local planning policies and designations affecting the site and are taken from the current statutory development plan for the borough. The local plan comprises the Core Strategy, adopted October 2010, emerging submission versions of the Development Management Policies Document (DMPD) and Site Specific Allocations Document (SSAD), as well as saved policies from the Wandsworth Unitary Development Plan, adopted August 2003, and the London Plan 2011, as well as the draft Vauxhall Nine Elms Battersea Opportunity Area Planning Framework (VNEB OAPF), published in November 2009. OAPFs are produced in partnership with the boroughs and support the principles of the London Plan, providing clarification to
policies in a spatial context. While OAPFs are not part of the development plan, they have do have material weight, which increases through the stages of public consultation to eventual formal adoption. The draft VNEB OAPF was subject to a 12-week public consultation in November 2009, and it is expected that adoption is likely to come forward in the near future. The draft VNEB OAPF can therefore be considered to have some material weighting.

6.3.2 The adopted Core Strategy and saved UDP policies are afforded full weight in planning considerations and decisions on planning applications. The emerging DMPD and SSAD policies were deemed as material considerations by the council from 29 October 2010, when the proposed submission versions of these documents were published for public consultation. Full adoption of the DMPD and SSAD is anticipated for April 2012, from which date they will carry full weight and supersede all saved polices from the UDP.

Vauxhall Nine Elms Battersea Opportunity Area

6.3.3 The site is located within the Vauxhall Nine Elms Battersea Opportunity Area. The consultation draft VNEB OAPF sets out the strategic policy framework for development within the area, providing the spatial context to deliver the London Plan Policy 2.13 (see below). The draft VNEB OAPF allocates the site within an area for high-density mixed-use housing-led intensification. The draft VNEB OAPF also supports the provision for extending the Northern Line from Kennington to Battersea via an intermediate station in the Nine Elms area.

London Plan

6.3.4 Policy 2.13, Opportunity Areas and Intensification Areas, states that development proposals should “support the strategic policy directions for the areas identified and seek to optimise residential and non-residential densities, provide necessary social and other infrastructure to sustain growth, and, where appropriate, contain a mix of uses”. Development should also promote inclusive access and support wider regeneration.

Core Strategy

6.3.5 Policy PL6, Meeting the needs of the local economy, states the Nine Elms area will continue to be a significant employment area within the borough.

6.3.6 Policy PL11, Nine Elms and the adjoining area in north-east Battersea, promotes high-density mixed-use development to help create a sense of place with new dynamic mixed-use urban centres, with local shops and services, permeable streets, amenity spaces and improved public transport links.

Heritage

6.3.7 The site is within an archaeological priority area and in close proximity to Grade II* listed Battersea Power Station.
6.3.8 Saved UDP

The following saved UDP policies are also applicable to these heritage designations;

6.3.9 Under Policy TBE14, Archaeological Priority Area, where development involves ground disturbance, the council will require developers to undertake an archaeological investigation. As appropriate, the council may, under Policy TBE15, require the preservation of findings either in situ or by excavation.

6.3.10 Policies TBE12 and TBE13, Listed Building, seek to preserve and enhance listed buildings and resist development which would harm their setting.

Emerging DMPD

6.3.11 DMPD Policy DMS 2, Managing the Historic Environment, requires development to sustain, conserve and, where appropriate, enhance the significance, appearance, character and setting of the heritage asset itself, and the surrounding historic environment. It also states developments which would disturb archaeological priority areas will need to be assessed and may require an archaeological evaluation report.

Thames Policy Area

6.3.12 The Thames Policy Area designation covers the site, and use of the site may require mitigation to safeguard views and character of the riverside.

Core Strategy

6.3.13 Core Strategy Policy PL 9, River Thames and the riverside, is applicable to the site and states that “measures to protect and enhance the river as a valuable resource for wildlife and biodiversity” will be supported. The policy also promotes greater use of the river and the protection of existing river infrastructure facilities. Mixed-use development is also promoted within the Thames Policy Area in order to create safe attractive environments, new homes, jobs, and leisure and social infrastructure facilities, as well as increased public access to the river.

Flood zone

Core Strategy

6.3.14 The site is located within Flood Zone 3a.

6.3.15 Core Strategy Policy PL 2, Flood Risk, states that development of appropriate sites within Flood Zone 2, 3a and 3b will require a flood risk assessment and take account of the strategic flood risk assessment for the borough.

Emerging DMPD

6.3.16 DMPD Policy DMS 5, Flood Risk Management, sets out the criteria that development within flood zones should meet in order to secure planning permission.
**River Thames**

6.3.17 The proposal includes development within the River Thames.

**London Plan**

6.3.18 *Policy 7.24, Blue Ribbon Network*, seeks to prioritise the use of the waterspace and adjacent land for water related purposes, in particular for passenger and freight transport.

**Core Strategy**

6.3.19 *Policy PL 4, Open space and the natural environment*, and *Policy PL 9, River Thames and the riverside*, both emphasise the biodiversity value of the River Thames, which should be protected and enhanced.

**Safeguarded wharves**

6.3.20 The proposed development is adjacent to RMC Battersea (Metro Greenham) aggregates yard, which is a safeguarded wharf in the *London Plan*.

**London Plan**

6.3.21 *Policy 7.26, Increasing the use of the Blue Ribbon Network for freight transport*, states that safeguarded wharves should only be used for waterborne freight-handling use. Any temporary use should not preclude the wharf being reused for waterborne freight-handling uses.

**Core Strategy**

6.3.22 *Policy PL 9, River Thames and the riverside*, continues to support the efficient operation of the borough’s wharves for freight-related activities.

6.3.23 The site is also in close proximity to the Cringle Dock Waste Transfer Station, which is also a safeguarded wharf.

6.3.24 *Policy PL 7, Land for Industry and waste*, lists the strategic industrial locations and locally significant industrial areas which are appropriate for industrial, logistics, and potentially waste management uses. The policy states “appropriately located sites for waste management will be identified in the SSAD” and “until the SSAD is adopted the Council will safeguard all existing waste management and other waste sites including wharves, unless appropriate compensatory provision is made in appropriate locations”.

**Open space deficiency**

6.3.25 The site is within an open space deficiency area.

**London Plan**

6.3.26 *Policy 7.18, Protecting local natural space and addressing local deficiency*, states that the loss of local protected open spaces must be resisted unless equivalent or better quality provision is made within the local catchment area.
Core Strategy

6.3.27 Policy PL 4, Open space and the natural environment, seeks to protect and improve public and private open space in the borough, and expects new development to incorporate appropriate elements of public open space and to make a positive contribution to the wider network of open spaces.

Green chains

6.3.28 The UDP identifies a green chain along the riverfront of the River Thames and the River Wandle.

Core Strategy

6.3.29 Core Strategy Policy PL 4, Open Space and the Natural Environment, and emerging DMPD Policy DMO 1, Protection and Enhancement of Open Spaces, both seek to protect and enhance the borough’s green chains.

Saved UDP

6.3.30 Policy ON7, Green Chain Links, prohibits development that would harm the open nature of any open land that contributes towards the green chain or link between open spaces, especially to Metropolitan Open Land and where they form strategic links between boroughs.

Amenity

6.3.31 The nearest residential properties are houseboats located in close proximity, at 120m to the east of the proposed shaft location and approximately 30m from the river jetty (out). Further properties are located on the south side of Battersea Park Road, approximately 90m from the southern boundary of the construction site.

Emerging DMPD

6.3.32 Core Strategy emerging DMPD Policy DMS 1, General development principles – Sustainable urban design and the quality of the environment, prohibits development which would harm the amenity of occupiers through unacceptable noise, vibration, traffic congestion, air pollution, overshadowing, overbearing, loss of outlook, privacy or sunlight/daylight.

Site specific allocations

6.3.33 The site is covered by a number of allocations in the emerging SSAD document which are noted below.

Emerging SSAD

6.3.34 Depot, Kirtling Street, Proposal Map Ref 2, allocates the site for mixed-use development with business and residential use as part of the main Battersea Power Station site.

6.3.35 Former petrol filling station, 2 Battersea Park Road, Proposal Map Ref 3, allocates the site for mixed-use development with business and residential use as part of the main Battersea Power Station site.
6.3.36 Number 88 Warehouse Kirtling Street, Proposal Map Ref 8, allocates the site for mixed-use development including residential, and continuation of the Thames Path national trail as part of the main Battersea Power Station site.

6.3.37 Cable & Wireless site, Unit 2a, Battersea Park Road, Proposal Map Ref 11, allocates the site for mixed-use development including residential.

6.3.38 Securicor Site, 8a Kirtling Street, Proposal Map Ref 17, allocates the site for mixed-use development including residential.

6.3.39 Brooks Court, Kirtling Street, Proposal Map Ref 23, allocates the site for mixed-use development including residential.

6.3.40 Policy justification for all of the above allocations states “the Opportunity Area has been identified for mixed use development within the London Plan and the Core Strategy. Development for a mix of uses will contribute to the targets set out in the Core Strategy for employment and housing. The scale of growth and change achievable in the Nine Elms area is also dependent on the proportionate provision of physical and social infrastructure”.

6.3.41 Proposal Map Ref 6 allocates the Cringle Dock site as a safeguarded wharf, however the existing use as a waste transfer station is not safeguarded in this document or the Core Strategy.

6.3.42 Proposal Map Ref 7 allocates the adjacent RMC Battersea (Metro Greenham) site as a safeguarded wharf, in accordance with the London Plan.

6.4 Planning comments

6.4.1 A number of planning designations are applicable to the site and to the adjacent land and buildings. The relevant planning policies identified are described in Section 6.3.

Opportunity Area

6.4.2 The site is within the Vauxhall Nine Elms Battersea Opportunity Area and included in Wandsworth’s SSAD Proposal map references 2, 3, 8, 11, 17 and 23, which allocate these sites for mixed-use development including residential. Sites 2, 3 and 8 are allocated for mixed-use development as part of the main Battersea Power Station site and form part of this redevelopment proposal.

6.4.3 The outline planning application (ref 2009/3575) for the redevelopment of the Battersea Power Station was approved on 23 August 2011, with the site forming part the later phases of the redevelopment (phases 5 and 7). Conditions attached to the planning approval require the Northern Line Extension (NLE) to Battersea to be operational before phases 2-7 can commence (which is expected in approximately 2017) or a TWA order has been made in agreement with London Underground to bring forward the NLE Phase 1. The likely timescales in which the redevelopment phases will be brought forward are considered to be compatible with the timescales for use of the site as a main tunnel shaft. In addition, due to
the extensive size of the Battersea Power Station site, the area proposed for the Thames Tunnel project could be used without delaying or preventing the redevelopment of a significant portion of the wider site.

6.4.4 While the majority of the Kirtling Street site could be redeveloped on completion of the temporary works, the area of the site where the main shaft is to be located would be permanently lost in terms of future redevelopment potential, and a suitable building configuration may have to be negotiated for this area other than that submitted in the outline application. Meetings with the landowner would be required to co-ordinate both temporary and permanent construction works.

6.4.5 It is likely that the development of the Battersea Power Station site and the Thames Tunnel project would happen at the same time, and therefore a co-ordinated approach to manage construction across the sites may be required. This would avoid potential conflicts over site access and HGV movements, and also reduce negative cumulative impacts on the surrounding area.

6.4.6 Route options for the proposed extension of the Northern Line have been considered in the site layout plan, and the shaft location in the northern area of the site avoids potential conflict between proposals. This approach accords with the opportunity area designation.

Heritage

6.4.7 The site falls within a designated archaeological priority area. Investigative and remedial requirements would need to be agreed with the LPA in accordance with policies DMS 2, TBE14 and TBE15 respectively. Further appraisal of the archaeological potential is provided in Section 7.

6.4.8 The site is also located in close proximity to the Grade II* listed Battersea Power Station and while the existing setting of the listed buildings does not enhance its character or appearance, the construction works associated with the Thames Tunnel project may give rise to some conflicts with policies DMS 2 and TBE13, and mitigation such as appropriately design hoarding may be required to reduce potential impacts on setting. The permanent legacy structures on the site should also be designed sensitively, having regard to the future setting of the listed building and their siting within the Thames Policy Area. Further appraisal of the impact on the setting of the listed buildings is provided in Section 7.

Thames Policy Area

6.4.9 The site is within the Thames Policy Area, and use of the site for the Thames Tunnel project would contribute to the aims of Policy PL 9 in terms of enhancement of the river as a valuable resource and by reducing the number of polluting CSO discharges, therefore increasing the river’s biodiversity. A cleaner river would, in turn, help to achieve the policy’s other aims, which include creation of a pleasant riverside environment and greater use of the river for recreational purposes.
River Thames

6.4.10 The site is within flood zones 2 and 3a. Emerging DPD Policy DM SD 6, Flood Risk, states development and land uses will be restricted in affected areas in line with PPS25 and, in addition to the Environment Agency's normal floodplain compensation requirement, attenuation areas to alleviate fluvial and/or surface water flooding must be considered where there is an opportunity. A further assessment of flood risk is made in Section 7.

6.4.11 The entire River Thames is designated as a site of metropolitan importance for nature conservation designation, and use of the site would involve erecting jetty structures within the river and foreshore. Given the purpose of the Thames Tunnel project to improve the environmental condition of the river, there is some compliance in principle with the associated SNCI policies. However, the extent of potential impact of these structures on the designated area is considered further in Section 7 of this report.

6.4.12 The site is adjacent to an operational safeguarded wharf and in close proximity to Cringle Dock, also a safeguarded wharf and waste transfer station. The location, layout and operation of the proposed jetty facilities should not impede access to the river or conflict with the continued use of the safeguarded wharf, in accordance with policies 7.26 and PL 9. Consultation with the existing operator of the aggregates yard may be required to determine patterns of usage of the safeguarded wharf, in order to avoid a conflict in operations and barge movements. It should be noted that the GLA is currently reviewing the status of safeguarded sites across the River Thames, with the initial report published for consultation on 7 October 2011. The report states that the safeguarded designsations in the Nine Elms area should be retained. Consultation ends on 7 January 2012 and the final report is due in early 2012.

6.4.13 Core Strategy Policy PL 7 states that “appropriately located sites for waste management will be identified in the SSAD” and “until the SSAD is adopted the Council will safeguard all existing waste management and other waste sites including wharves, unless appropriate compensatory provision is made in appropriate locations”. Cringle Dock is not identified within the list of sites in Policy PL 7 which make up the strategic supply of land for industry and waste uses. Furthermore, the SSAD allocates Cringle Dock as a safeguarded wharf but does not allocate or safeguard its existing use as a waste transfer station.

Open space

6.4.14 The site is within an area identified in the London Plan as deficient in open space. While the site itself consists of operational and derelict industrial land and its use will not impact on existing open space provision, the development of the Thames Tunnel project and associated permanent legacy structures should not, wherever possible, preclude future open space provision within this area, in accordance with the objectives of the opportunity area designation and Policy PL 4.
6.4.15 A green chain and links designation may be located along the northern boundary of the site. Development of the site may interrupt this designation since a significant conveyor and jetty structure would be located within the foreshore. Mitigation may be required to reduce any potential negative impact and this may include the temporary diversion and reinstatement of the green chain on the completion of works.

**Amenity**

6.4.16 The nearest residential properties are houseboats located in close proximity to the east of the proposed shaft location. Further properties are located on the south side of Battersea Park Road, approximately 90m from the southern boundary of the construction site. The separation distance from residences on Battersea Park Road is likely to be sufficient to safeguard against potential negative construction amenity impacts. However, with regard to the existing houseboats, the achievement of a much higher standard of mitigation may be required to avoid unacceptable levels of impact arising from 24-hour working, noise, dust, lighting and traffic movements. Should the site be a double drive, it is expected that such impacts to the house boat community are likely to grow in significance due to increased barge movements, and further mitigation would be sought. A planning application currently being determined proposes to demolish the existing Nine Elms Pier and build a new marina for 33 houseboats and two visitor moorings, thereby increasing the number of residential receptors close to the jetty. A number of the houseboats may require relocation during the temporary construction period for both a single or double drive. Provision of suitable alternative moorings and relocation of the houseboats may be problematic, and will require further investigation with affected property owners and the PLA. However, it may be possible to agree with the applicant a phased implementation of the Nine Elms Pier marina proposals that is compatible with our construction timeframe and avoids further relocation of houseboats.

6.4.17 The character of the surrounding area is industrial and located adjacent to major roads, therefore well managed HGV movements associated with the construction works should not cause an unacceptable level of impact to the surrounding area. For a double drive, HGV transport movements are expected to double, however the increased traffic movements are still expected to be acceptable, given the road infrastructure and surrounding industrial land uses.

6.4.18 The wider Nine Elms area will undergo significant change through major redevelopment in the near future and therefore disruption to amenity will be anticipated. Appropriate mitigation and construction management plans would reduce cumulative impacts.
7 Environmental appraisal

7.1 Introduction

7.1.1 The following sections summarise specialist assessments which are provided in Appendix 9 – *Environmental appraisal tables*.

7.2 Transport

7.2.1 The site is considered to be suitable for use as a single and double main tunnel drive site and a reception/intermediate site subject to acceptable diversion routes being agreed for the partial closure of Kirtling Street and Cringle Street (also see preliminary transport plans in Appendix 5). The site will feature a one-way working system, with access and egress on Kirtling Street. The permanent access is also located on Kirtling Street. Parking on Kirtling Street and Cringle Street will require removal to enable access for construction vehicles. Alternative parking is available along surrounding roads for the displaced vehicles.

7.2.2 Access to the TLRN (A3205) from the site is acceptable. There are no visible constraints along the access route to a potential rail access point at Battersea Power Station, although this would require the construction of rail sidings. The site is located adjacent to the river for access via the material conveyors. However, the Thames Path will require diversion around the site.

7.2.3 Reasonable potential exists for the workforce to utilise public transport to access the site, and some parking could be provided on site for the workforce. Some additional informal on-street parking is available on the surrounding roads.

7.3 Archaeology

7.3.1 Based on current information, this site is considered to be suitable for use as a single and double main tunnel drive site and a reception/intermediate site. Although no records exist for the main site, it is possible that archaeological receptors of high or medium value may be present. While no direct evidence has been revealed, waterlogged remains and peat deposits of high or medium value may also be present. Nineteenth century construction of the lead works is likely to have disturbed, to some extent, any archaeological remains that may be present.

7.4 Built heritage and townscape

7.4.1 From a built heritage perspective, this site is considered to be suitable for use as a single and double main tunnel drive site and a reception/intermediate site due to its position within an existing industrial landscape. There is potential for the setting of two listed buildings to be impacted during construction. However, impacts from the operational phase will be limited to two conservation areas.

7.4.2 The site is considered to be suitable as a single and double main tunnel drive site and a reception/intermediate site from a townscape perspective. The site is located within an area that is industrial in character and, with
careful design, this site has the potential to enhance the existing industrial character and waterfront.

7.5 Water resources – hydrogeology and surface water

7.5.1 In terms of hydrogeology, this site is less suitable for use as a single and double main tunnel drive site and a reception/intermediate site because the site lies within a source protection zone (SPZ 1) for an abstraction from the Chalk, and also the shaft is to be constructed within Lambeth Group, which is in hydraulic continuity with the principal Chalk aquifer. The Chalk piezometric head is likely to be approximately 5m above the base of construction and should be taken into account in the engineering design. Dewatering may be necessary. The superficial deposits are alluvium and infilled scour feature nearby, which are classified as a secondary aquifer at the shaft site. There is the potential for a limited impact on flow in the shallow aquifer due to a diaphragm wall or sheetpiling.

7.5.2 In terms of surface water resources, this site is considered to be suitable for use as a single and double main tunnel drive site and a reception/intermediate site. However, tight site boundary controls would be needed during construction, particularly for the single and double main tunnel drive sites, where the requirement for decking out into the river elevates a direct pollution risk to the River Thames.

7.6 Ecology

7.6.1 The site is considered less suitable as a single and double main tunnel drive site and a reception/intermediate site due to the combination of ecological issues raised at this site. The work is in the immediate vicinity of a site of borough Grade I importance. Sensitive working practices and some compensatory provision are likely to be required. Specially protected bird species are present and breeding adjacent to the site, which could affect working practices.

7.6.2 In the case of the single and double drive sites, the site also has some sensitivity due to the potential for temporary and permanent land-take from a site of metropolitan importance. There is the potential for a cumulative effect with other jetty structures in the river. Careful negotiation with the EA is likely to be required regarding works in the foreshore and river.

7.7 Flood risk

7.7.1 This site is considered suitable as a single and double main tunnel drive site and a reception/intermediate site as it is defended from flooding from the River Thames. Space for SUDS is limited and controls on quality of runoff would be required, owing to the presence of a total catchment source protection zone in the area of the site.

7.7.2 In the case of the single and double main tunnel drive site, new flood defences would require specific mitigation to maintain protection, and the piled decking structure would need to be assessed for impact on scour of sediments and the integrity of the flood defences.
7.8  **Air quality**

7.8.1 This site is considered to be less suitable for use as a single and double main tunnel drive site and a reception/intermediate site. There are residential properties in close proximity to the site, therefore there is potential for fugitive emissions of dust during construction to have a perceptible impact at these properties. These impacts could be minimised with standard dust control measures. There is potential for HGV movements on the local road network to cause localised air quality impacts in areas of already poor air quality. This can be somewhat mitigated by minimising the movement of HGVs during peak hours.

7.9  **Noise**

7.9.1 This site is considered less suitable for use as a single and double main tunnel drive site and a reception/intermediate site due to the proximity of residential houseboats located to the immediate north of the site. These houseboats are understood to have permanent residential status. Perimeter hoarding will potentially help reduce potential noise impact, but will be relatively ineffective where line of sight is not broken between source and receptor. Working 24 hours a day has the potential to adversely impact on the closest receptors and should use of this site be pursued, it may be necessary to restrict some of the noisier activities to daytime only. The number of vehicles associated with the construction phase is likely to be high, however the noise climate along Battersea Park Road is already relatively high and therefore the level of adverse noise impact is likely to be less severe.

7.9.2 For the single and double main tunnel drive sites, there are also further residential properties in close proximity to the jetty in the eastern part of the site at Elm Quay Court. The construction and use of a jetty in order to allow deliveries by barge will potentially result in an adverse noise impact, particularly if deliveries are to be made 24 hours a day.

7.10  **Land quality**

7.10.1 The site is considered less suitable as a single and double main tunnel drive site and a reception/intermediate site with respect to land quality based on the high potential for contamination of the site to have occurred, specifically from the paint works, numerous fuel tanks (AGTs and USTs), fuel stores, active petrol filling station, electricity substations, warehouse and depot on site, and the wharf operations, engineering works and gasworks in the vicinity of the site.

7.10.2 These potential contamination sources may impact on construction workers and other offsite human receptors through direct contact and inhalation exposure pathways. Additionally, the potential exists for contaminants to be drawn to the deeper aquifer if deep drilling/construction is undertaken on the site, and for migration to surface water receptors to occur through groundwater transport.
8 Socio-economic and community assessment

8.1 Introduction
8.1.1 The socio-economic and community assessment builds on the advantages and disadvantages reported in Table 2.3 and covers the following areas:
- Socio-economic profile
- Socio-economic and community issues and impacts.

8.2 Socio-economic profile
8.2.1 The site is in the Queenstown ward of the London Borough of Wandsworth. Statistics from the Office of National Statistics 2001 Census data show the following indicators for the ward, in comparison to the rest of Wandsworth, London and England as a whole:
- a higher percentage of unemployed people than the average for London or England
- a higher percentage of people with high level qualifications
- a mixed population, with a range of ages and ethnicity.

8.2.2 While the site itself was inaccessible to fieldworkers, site visits found that the area is used mainly by employees of the industrial works in the vicinity.

8.3 Issues and impacts
8.3.1 Based on the proposed location of workings for all three site options, it appears that a number of industrial units, depots and an office building located on site are likely to require demolition. While use of the site as a reception/intermediate site would minimise the number of properties required to be demolished, the majority of the site is within the proposed Battersea Power Station redevelopment so is likely to be subject to significant change.

8.3.2 The site is currently surrounded by a range of predominantly industrial uses. However, work has begun on the redevelopment of the Tideway Industrial Estate, located on the eastern edge of the site, into a mixed-use development. It appears likely that the construction timescale of the Thames Tunnel project site may overlap with the redevelopment of the wider area, with the potential that this may cause some disruption to early residents and other users of the development. The severity of the impact would be linked to the length of the overlapping period.

8.3.3 If the site is used as either as a double or single drive site, the greatest potential community impact appears likely to be on the houseboat community which is moored adjacent to the proposed materials-out jetty, and properties located to the south of the site, across Nine Elms Lane. It appears likely that some of the houseboats may need to be relocated during the construction works, particularly under the double drive site option, due to the proposed scale of works and likely level of disturbance caused by the requirement for 24-hour working. Given the location of the proposed shaft for the double and single drive options, it should be
possible to effectively mitigate potential impacts on the properties to the south of the site, as the less disruptive activities have been sited closest to these properties.

8.3.4 While materials jetties are not required for the reception/intermediate site option, it still appears likely that a number of the houseboat community may be affected due to their proximity to the works.

8.3.5 Operational impacts on the local community appear likely to be minimal, although the location of the shaft site may influence the configuration of future redevelopment of the area.

9 Property assessment

9.1 Introduction

9.1.1 This report builds on the advantages and disadvantages in Table 2.3 and the assessment provides more up-to-date information.

9.1.2 The site is made up of various privately owned industrial and commercial buildings, some of which are vacant.

9.1.3 The site is recognised as a potential high-density residential-led development opportunity.

9.2 Crown land and special land comments

Main tunnel double drive site

9.2.1 The freehold property is in various private ownerships. The majority of the site is owned by developers Treasury Holdings and Ballymore, who own various other development sites within the Nine Elms area. The areas which fall within these ownerships are therefore neither Crown land nor special land. There should therefore be no procedural difficulty in acquiring the land, using compulsory purchase powers, in its current state. However, if development commences, in practical terms, the sites may no longer be available for acquisition, which represents a risk to the project. Nevertheless, there is no indication at this stage that development is likely to start soon.

9.2.2 The Brooks Court property is in various private ownerships, so there should be no procedural difficulty in acquiring the land via compulsory purchase.

9.2.3 The parts of Cringle Street and Kirtling Street which are within the site are owned by LB Wandsworth.

9.2.4 Number 88 Kirtling Street, which is at the northern end of the site, is occupied by the V&A Museum as a store. The lease is in the name of the Secretary of State, therefore this is a Crown interest that cannot be acquired by compulsory purchase. The V&A should be contacted to ensure that an acquisition can be agreed, although it is understood that it may be intending to vacate in the near future.

9.2.5 The foreshore and riverbed, which will be needed for temporary conveyors and jetties for the double and single options, are partly within registered
Crown land and partly within unregistered land. The unregistered area is likely to be owned by the Crown or the PLA. Crown land cannot be compulsorily purchased. Therefore, there is a risk that this land cannot be acquired unless an acquisition can be agreed. PLA land can be compulsorily purchased but a compulsory acquisition that is opposed by the PLA will create risk.

9.2.6 The part of the foreshore that may be compulsorily purchased is not easily accessible by the public and does not appear to be used by the public. Therefore, it is unlikely to be considered open space for the purpose of S.131 of the Planning Act 2008.

9.2.7 If the area that may be compulsorily purchased is considered to be special land, a special parliamentary procedure would be required unless exchange land is provided, or if the site is smaller than 200 square metres. Alternatively, it may be possible to avoid including land acquisition powers and instead rely on the PLA licensing regime. If temporary works powers only are required, this would not amount to land acquisition and the issue would not arise.

9.2.8 Contact should be made with the owner as soon as possible to establish if an acquisition can be agreed.

9.2.9 The conveyors and jetties are not required for the intermediate options, therefore the above Crown and PLA comments do not apply to the intermediate option.

Main tunnel single drive site

9.2.10 The comments are the same as for the double main site, except that Brooks Court is not needed.

Reception/intermediate site

9.2.11 The property needed for this option is 88 Kirtling Street, which is owned by developers Treasury Holdings. The freehold is neither Crown land nor special land. There should therefore be no procedural difficulty in acquiring the freehold, using compulsory purchase powers, in its current state. However, if development commences, in practical terms, the site may no longer be available for acquisition, which represents a risk to the project. However, there is no indication at this stage that development is likely to start soon.

9.2.12 Number 88 Kirtling Street is occupied by the V&A Museum as a store. The lease is in the name of the Secretary of State, therefore this is a Crown interest that cannot be acquired by compulsory purchase. The V&A should be contacted to ensure that an acquisition can be agreed, although it is understood that it may be intending to vacate in the near future.

9.3 Land to be acquired

9.3.1 The compensation assessment assumes that the majority of the worksite would be acquired temporarily, via the acquisition of new rights for the period of the works stated in the engineering section above. Alternatively,
the site could be acquired via a freehold acquisition, followed by a resale at the end of the works.

9.3.2 A smaller area within the worksite would need to be acquired permanently for operational purposes. This area is located in the northern part of the worksite.

9.3.3 In order to carry out the works, an area of foreshore and riverbed would be required for the double and single main options. The intermediate site option does not require the acquisition of foreshore or riverbed for jetties.

9.3.4 A right of way to enable access to the operational land will also need to be acquired for all site options.

9.4 Property valuation comments

Main tunnel double drive site

9.4.1 Compensation is assessed on a diminution in value basis for the new rights (temporary occupation during works, access rights during works, access rights for operational purposes) and on a market value basis for the permanent acquisition.

9.4.2 Part of the site (88 Kirtling Street) is within the planning application for the redevelopment of the Battersea Power Station. However, the entire site is within the Vauxhall Nine Elms Battersea Opportunity Area and is recognised as suitable for high-density mixed-use development, therefore acquisition costs will be high.

9.4.3 Compensation for foreshore and riverbed land has been assessed in line with industrial land values, assuming flood compensation land will be required. In addition, an allowance for a one-off payment to the Crown or PLA has been made, although this is difficult to assess at this stage.

9.4.4 The advertising hoardings on the Nine Elms Lane frontage appear to lie outside of the worksite and have been excluded from the compensation estimate.

Main tunnel single drive site

9.4.5 Comments made for the double main tunnel site options apply to the single main tunnel site options respectively.

Reception/intermediate site

9.4.6 Comments made for the double main site apply to the intermediate site options, except foreshore and riverbed land is not required for the intermediate site options.

9.5 Disturbance compensation comments

Main tunnel double drive site

9.5.1 The acquisition cost estimate assumes that the V&A Museum (occupier of 88 Kirtling Street) and current occupiers of the Brooks Court office building have a right to disturbance compensation, which has been assessed on a
relocation basis. However, it is possible that the V&A may vacate and disturbance compensation may not become payable.

9.5.2 A cost allowance has also been made for the relocation of the boat moorings.

9.5.3 The disturbance costs are likely to be significant but acceptable.

**Main tunnel single drive site**

9.5.4 Compensation has been assessed on the same basis as the double main, except Brooks Court has been excluded from the disturbance assessment for this option.

9.5.5 The disturbance costs are likely to be significant but acceptable.

**Reception/intermediate site**

9.5.6 The intermediate site only requires the relocation of the V&A facility.

9.5.7 Disturbance costs for are likely to be moderate.

**9.6 Discretionary purchase costs comments**

9.6.1 Works on the site will be 24 hours a day, seven days a week for each of the three options, although the intermediate option is likely to result in significantly less noise and disruption than the other two options. There could be significant potential for discretionary purchase costs in relation to the houseboats and residential properties on Nine Elms Lane to the east of the jetties.

9.6.2 It should be noted that this area is changing and, by the time the Thames Tunnel project works are under way, it is possible that there may be more residential property in this area than currently exists. However, the discretionary scheme may exclude residential property that was bought in the knowledge of the Thames Tunnel project proposal.

**9.7 Offsite statutory compensation comments**

9.7.1 There should be limited potential for offsite statutory compensation under S.10 of the *Compulsory Purchase Act 1965*, as there is unlikely to be any physical interference with public or private property rights.

9.7.2 There should also be limited potential for claims under the *Land Compensation Act 1973 Part 1*, as the completed works are unlikely to result in diminution in value to property.

**9.8 Site acquisition cost assessment**

9.8.1 The site has potential for high-density residential-led development. Therefore, the underlying land value will be high, which will result in high acquisition costs.

9.8.2 Acquisition costs will be very high for the double and single main options.

9.8.3 Acquisition costs will be lower for the intermediate option, but still high.
10 Site conclusions by discipline

10.1 Introduction
10.1.1 The conclusions presented in this section are drawn from each discipline’s assessment, and are designed to inform the workshop where a final conclusion is reached on whether the site can be taken forward as a potential preferred site, subject to its fit with possible drive strategies in the case of main tunnel sites.

10.2 Engineering
10.2.1 This site is considered suitable as a single and double main tunnel drive site and a reception/intermediate site because the site would be large enough, with a riverside location. The provision of jetty facilities would be difficult, as this would rely on using the area in front of the existing Nine Elms Pier and Cringle Wharf and/or using the Nine Elms Pier itself, which would mean the relocation of some of the residential boats around Nine Elms Pier.

10.3 Planning
10.3.1 On balance, the site is considered suitable as a main tunnel single drive site and a reception/intermediate site, provided sufficient mitigation measures are employed to avoid unacceptable impacts on the designations identified in Section 6.3.
10.3.2 While the location of the shaft is within the planning application boundary to redevelop the Battersea Power Station, this area forms the latter phases of the proposals and may be compatible with our construction timetable. The area above the main shaft may be permanently lost in terms of future redevelopment potential, and a suitable building configuration may have to be negotiated for this area other than that submitted in the outline application. Meetings with the landowner would be required to co-ordinate both temporary and permanent construction works.
10.3.3 The use of jetties for a drive site would require the achievement of a much higher standard of mitigation to avoid unacceptable levels of impact on the amenity of the existing houseboats arising from 24-hour working, noise, dust, lighting and traffic movements.
10.3.4 The design, location, permanent access and, particularly, visual impact of the permanent legacy structures, will require further consideration in relation to the Grade II* listed Power Station and future regeneration plans for the wider area. Further consideration and mitigation measures will also be required to take account of the flood zone, SNCI, safeguarded wharf and green chain designations.
10.3.5 The site is also considered to be suitable as a main tunnel double drive site, provided high-level mitigation measures are employed to avoid unacceptable impacts on the designations identified in Section 6.3. The increase in tunnelling activity and transport movements associated with a double drive would result in a higher level of noise, dust, lighting and traffic...
movements, with potentially twice as many transport movements as a single drive site. Due to the location of the site within a wider industrial area designated for substantial future regeneration, the surrounding receptors are likely to experience disruption from the associated construction activity in any case. However, the cumulative impacts of increased vehicle movements will need to be considered with the redevelopment proposals which come forward in the surrounding area, to ensure wider cumulative impacts are not experienced.

10.3.6 The most sensitive receptors are the houseboat community, which will be significantly impacted on by the increase in barge movements, and a number of houseboats may require temporary relocation. However, proposals to demolish the Nine Elms Pier and build a new marina are currently being determined by Wandsworth. It may be possible to agree with the applicant a phased implementation that is compatible with our construction timeframe, thus minimising the affect on the houseboats.

10.3.7 Potential conflict of barge movements necessary for a double drive site and the proximity of two operational safeguarded wharves would require detailed consideration.

10.3.8 Construction facilities associated with a main tunnel double drive site would also have a greater visual impact with the increased height of temporary buildings required. However, due to the surrounding industrial land uses and potential construction activity coming forward within the regeneration area, this impact is not considered a significant issue. The provision of permanent structures on a double drive site is expected to be equivalent to that proposed for a single drive.

10.4 Environment

10.4.1 Overall, the site is considered to be suitable as a main tunnel single and double drive site and a reception/intermediate site.

10.4.2 Based on current information, the site is suitable from the perspective of transport, archaeology, built heritage, townscape, water resources (surface water), and flood risk.

10.4.3 This site is considered less suitable from the perspectives of water resources (hydrogeology), ecology, air quality, noise and land quality.

10.4.4 Overall, the site is considered suitable, but further investigation would be required as to whether water resources (hydrogeology), ecology, air quality, noise and land quality impacts could all be adequately mitigated. Likely mitigation considerations would include the following:

- Hydrogeology – mitigation may be required as construction of the drop shaft will take place within the source protection zone (SPZ 1) of abstractions from Chalk defined by the EA. Mitigation is likely to include consideration of appropriate disposal of discharges from dewatering, if needed, and possible provision of an alternative groundwater supply.

- Ecology – measures to minimise potential impacts on a site of metropolitan importance (in the case of the single and double main
tunnel drive sites), a site of borough Grade I importance, and specially protected birds. Sensitive working practices and some compensatory provision are likely to be required.

- Air quality – measures to ensure dust at the closest receptors is adequately mitigated.

- Noise – standard noise barriers are unlikely to be entirely effective, and other techniques may be required to reduce construction noise to acceptable levels.

- Land quality – any required remediation of contamination (at this high risk site) and/or measures to ensure no mobilisation of contaminants retained in situ.

10.5 Socio-economic and community

10.5.1 This site is considered less suitable for use as a main tunnel single and double drive site and reception/intermediate site. The single and double drive options with jetties are likely to result in the potential relocation of the residential boat community, moored in the vicinity of the site. The impacts will be greatest if the site is used as either a double or single drive site, due to the requirement for 24-hour working and the proposed location of the jetties. While the reception/intermediate site option may cause less disruption and the impacts are more likely to be mitigated, a number of houseboats will still be in close proximity to the main shaft work area.

10.5.2 In addition, use of the site will require the demolition of a number of buildings on site, but this has to be assessed in the context of the proposed redevelopment of the area as part of the Battersea Power Station redevelopment.

10.5.3 Mitigation may involve relocation and/or compensation discussions with the houseboat community and the businesses located on site. Discussions around construction timescales may also be required with the developers of the Battersea Power Station and Tideway Industrial Estate.

10.6 Property

10.6.1 Advantages and disadvantages of this site are as follows.

Advantages of the site:

- The site is in private ownership and therefore the freehold ownership should present no significant procedural difficulty in acquiring the land, using compulsory purchase powers.

Disadvantages of the site:

- The site will command residential development value and the acquisition cost will be high

- If development commences, the site may no longer be available for acquisition, which represents a risk to the project
• The site is part occupied by the V&A Museum, which is a Crown interest that cannot be acquired by compulsory purchase, and therefore acquisition will need to be by agreement.

10.6.2 Due to primarily to high acquisition cost, this site is considered **less suitable** for use as a main tunnel double and single drive site and a reception/intermediate site.

10.7 **Next steps in the site selection process**

10.7.1 It should be noted at this point that the above conclusions do not represent an overall recommendation on the suitability of a site. The disciplines discuss their site suitability report conclusions at optioneering workshops, along with main tunnel drive strategy options. Main tunnel sites need to link together to form possible drive options for construction of the main tunnel. Therefore, a preferred site can only be identified through a series of main tunnel drive option comparisons. The outcome of this two-step process (sites and then drive option comparisons) is set out in the *Phase two scheme development report*. 
Appendices
Appendix 1 – Sources of information

Engineering
- Traffic Management and Access Roads/Rail – URS Scott Wilson
- Access River – BMT Isis
- Services (Utilities) and Third Party Assets – Thames Tunnel and utility companies
- Geology – British Geological Society and Thames Tunnel
- Construction and Operational Layout Template – Thames Tunnel
- Site selection background technical paper – Thames Tunnel

Planning
- London Borough of Wandsworth online planning applications database
- Wandsworth Core Strategy, adopted October 2010
- Saved policies in the Wandsworth Unitary Development Plan, adopted in August 2003
- Emerging submission version of the Development Management Policies Document (DMPD), May 2011
- Emerging submission version of the Site Specific Allocations Document (SSAD), May 2011
- London Plan, adopted July 2011
- Consultation draft Vauxhall Nine Elms Opportunity Area Planning Framework, November 2009

Environment

Transport
- Map of Transport for London Road Network (TLRN) – www.tfl.gov.uk
- Bus Route Maps: North-east, north-west, south-west, south-east – www.tfl.gov.uk
- Crossrail Plans – www.crossrail.co.uk/crossrail-bill-documents
- PTAL scores – Obtained from Table 2.3 information
- Thames Path map – www.walklondon.org.uk
- Capital Ring – www.walklondon.org.uk
- Cycle Routes – www.sustrans.org.uk and Local Cycling Guides 1-14
- Design Manual for Roads and Bridge TD 42/95, Highways Agency
Archeology
- Historic Environment data from Greater London Archaeology Advisory Service (GLAAS)
- National Monuments Record – for some additional information regarding registered historic parks and gardens
- London Archaeological Archive and Research Centre (LAARC)
- Local authority websites
- Bing maps

Built heritage and townscape
- Local authority lists of Locally Listed Buildings
- National Monuments Record – for some additional information regarding registered historic parks and gardens
- Unitary development plan and DPDs
- Local authority websites
- Bing maps

Water resources – hydrogeology and surface water
- Local authority details of unlicensed abstractors
- Environment Agency abstraction licence details
- Environment Agency groundwater levels and contour maps (2009-11)
- Environment Agency water quality (surface water and groundwater)
- Environment Agency Groundwater Source Protection Zones
- Envirocheck
- British Geological Survey (BGS) logs
- BGS 1:50,000 Geological Sheets – Solid and Drift Editions (England and Wales)
- BGS Geology of London – Special Memoir for 1:50,000 Geological sheets 256 (North London), 257 (Romford), 270 (South London) and 271 (Dartford) (England and Wales)
- Crossrail (2005) – Assessment of Water Impacts Technical Report: Appendix C – Baseline Data. Figure C.4: Extent of Saline Intrusion based on 177 mg/l *5mmol/l) Isochlor

Ecology
• Multi-Agency Geographic Information for the Countryside (MAGIC) – www.magic.gov.uk - statutory designated sites
• London Wildweb – wildweb.london.gov.uk - non-statutory site of importance for nature conservation
• National Biodiversity Network – http://searchnbnn.net - distribution of protected species
• Google Maps – aerial views of habitat features
• BAP habitats – www.natureonthemap.org.uk
• Priority habitats and species on national and local scales – www.ukbap.org.uk

Flood risk
• Environment Agency Flood Map – www.environment-agency.gov.uk
• Environment Agency National Flood and Coastal Defence Database
• Envirocheck

Air quality
• Local authority websites
• London Air Quality Network – www.londonair.org.uk
• Defra UK-AIR, air quality information resource – www.airquality.co.uk
• Defra Air Quality Management Areas – http://aqma.defra.gov.uk
• Defra Local Air Quality Management – http://laqm.defra.gov.uk

Noise
• Envirocheck – Identification of receptors
• Promap – Calculation of distances between site and receptors
• Multimap – Aerial photography – www.multimap.co.uk
• Defra noise maps – Identification of existing noise levels

Land quality
• Google Maps/Earth
• Site walkover information
• Envirocheck Data Sheets provided as a GIS Database
• British Geological Survey (BGS) logs

Socio-economic and community
• Statistics from the Office of National Statistics 2001 Census data
Property

- Valuation office agency website
- Multimap
- Land Registry
Appendix 2 – Site location plan
This is an indicative working draft plan which has been produced for the purpose of confidential discussions only. Accordingly, the draft plan must not be copied, distributed or shown to any third party without the express written permission of Thames Water Utilities Limited. It provides an indication of sites that, following discussions with local authorities and other stakeholders, may be confirmed as being on the shortlist of construction sites for the proposed Thames Tunnel. Inclusion of a site on this draft plan should not be taken to mean that such site will be selected as a construction site to form part of the Thames Tunnel scheme.
Appendix 3 – Planning and environment plans
This is an indicative working draft plan which has been produced for the purpose of confidential discussions only. Accordingly, the draft plan must not be copied, distributed or shown to any third party without the express written permission of Thames Water Utilities Limited. It provides an indication of sites that, following discussions with local authorities and other stakeholders, may be confirmed as being on the shortlist of construction sites for the proposed Thames Tunnel. Inclusion of a site on this draft plan should not be taken to mean that such site will be selected as a construction site to form part of the Thames Tunnel scheme.

Legend

- Thames Policy Area
- River Walks
- Safeguarded Wharves
- Site Allocations Document Sites
- Regeneration Areas
- Areas of Opportunity
- Strategic Industrial Locations

Thames Water Utilities

Title: APPENDIX 3A PLANNING & ENVIRONMENT PLAN S93WH SITE
This is an indicative working draft plan which has been produced for the purpose of confidential discussions only. Accordingly, the draft plan must not be copied, distributed or shown to any third party without the express written permission of Thames Water Utilities Limited. It provides an indication of sites that, following discussions with local authorities and other stakeholders, may be confirmed as being on the shortlist of construction sites for the proposed Thames Tunnel. Inclusion of a site on this draft plan should not be taken to mean that such site will be selected as a construction site to form part of the Thames Tunnel scheme.
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Appendix 4 – Photographs of the site and surroundings
This is an indicative working draft plan which has been produced for the purpose of confidential discussions only. Accordingly, the draft plan must not be copied, distributed or shown to any third party without the express written permission of Thames Water Utilities Limited. It provides an indication of sites that, following discussions with local authorities and other stakeholders, may be confirmed as being on the shortlist of construction sites for the proposed Thames Tunnel. Inclusion of a site on this draft plan should not be taken to mean that such site will be selected as a construction site to form part of the Thames Tunnel scheme.
View from the River Thames, looking south towards Cringle Dock (right) and Kirtling Wharf (left).

View along Kirtling Street towards Kirtling Wharf.
View looking north along Kirtling Street.

View looking west along Kirtling Street towards 88 Kirtling Street, with Battersea Power Station in the background.
Appendix 5 – Transport plan
APPENDIX 5
TRANSPORT PLAN
S93WH SITE

This is an indicative working draft plan which has been produced for the purpose of confidential discussions only. Accordingly, the draft plan must not be copied, distributed or shown to any third party without the express written permission of Thames Water Utilities Limited. It provides an indication of sites that, following discussions with local authorities and other stakeholders, may be confirmed as being on the shortlist of construction sites for the proposed Thames Tunnel. Inclusion of a site on this draft plan should not be taken to mean that such site will be selected as a construction site to form part of the Thames Tunnel scheme.
Appendix 6 – Services and geology plan
Appendix 7 – Construction phase layout
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THAMES TUNNEL SCHEME. BASED ON PRELIMINARY ASSESSMENT. INDICATIVE CONSTRUCTION PHASE ARRANGEMENT. DISCLAIMER:

DRAWN BY: c
DRAWING NO.: N/A
SCALE: 1:1000
SHEET SIZE: A1
REV: A

DRAWING TITLE: SITE SUITABILITY REPORT
CONTRACT NAME: THAMES TUNNEL
PROJECT NAME: NUMBER 100019345
SITE NAME: WANDSWORTH
LOCATION / TOWN: LONDON
LOCATION CODE: TQ2877
SUB PROCESS: PDY
SECURITY REFERENCE: A1

THAMES WATER UTILITIES LTD 2008
02/11/2011
BY LOCATION  : E:\async working dir\pw-ttp_pdf_svc_4\dms04380\100-DL-PNC-S93WH-100102.dgn

DATE
APPD
CHKED
DESCRIPTION
ISS
DSGNR

REV

AREA = 1000m²
AREA = 1575m²
AREA = 3500m²
AREA = 500m²
AREA = 7500m²
AREA = 900m²
AREA = 1250m²
AREA = 16439m²
AREA = 19694m²
AREA = 2000m²

RIVER THAMES
HEATHWALL JUMPING STATION
WASTE
SEGMENT SHAFT AND SEGMENT STORAGE STOCKYARD
SEGMENT LOADING AREA AND CRANE, PRIMARY GANTRY CRANE, SEGMENT STORAGE AND HANDLING AREA, PROCESSING AND SEPARATION PLANT, TRASH CHUTE AND PLANT AREA
GLASS RECYCLING AREA
RECESSIVE PUMP STATION
TBM YARD
OFFICES/WELFARE
TBM WORKSHOP AND TUNNEL STORAGE AREA
TBM MATERIALS AND SPARES
MAINTENANCE AREA
TBM WORKSHOP AND TUNNEL STORAGE AREA
MAINTENSANCE AREA

Thames Water Utilities
Paddington, London W2 1AF
37 North Wharf Road,
The Point, 7th Floor,
THAMES TUNNEL SCHEME.

SELECTED AS A CONSTRUCTION SITE TO FORM PART OF THE
THAMES TUNNEL.  INCLUSION OF A SITE ON THIS DRAFT PLAN
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SHORTLIST OF CONSTRUCTION SITES FOR THE PROPOSED
STAKEHOLDERS, MAY BE CONFIRMED AS BEING ON THE
FOLLOWING DISCUSSIONS WITH LOCAL AUTHORITIES AND OTHER
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BASED ON PRELIMINARY ASSESSMENT.
INDICATIVE CONSTRUCTION PHASE ARRANGEMENT.

DISCLAIMER:

THAMES TUNNEL - DOUBLE DRIVE

S93WH - KIRTLING STREET

100-DL-PNC-S93WH-100202

AREA = 19694m²
SITE BOUNDARY

AREA = 18532m²
TEMPORARY WORKING

AREA = 1500m²
OFFICES AND WELFARE

AREA = 1200m²
POWER

AREA = 500m²
CANTEEN AND MEDICAL

AREA = 625m²
OFFICES

AREA = 4360m²
SEGMENT

SHAFT AND

STORAGE AND HANDLING AREA

AREA = 4547m²
PROCESSING AND SEPARATION PLANT,
EXCAVATED MATERIAL, SLURRY

AREA = 750m²
GROUT

AREA = 1200m²
PARKING / VEHICLE MARSHALLING

AREA = 2140m²
TBM YARD

AREA = 450m²
TBM MATERIALS AND SPARES

AREA = 1690m²
MAINTENANCE AREA

AREA = 1500m²
STORAGE AREA

AREA = 1000m²
TBM WORKSHOP AND TUNNEL

ACCESS

CEMEX

CEMEX BARGE

OFFICE AND VIN PANEL

MASTERPLAN FOR INFORMATION
THAMES TUNNEL SCHEME.
SELECTED AS A CONSTRUCTION SITE TO FORM PART OF THE THAMES TUNNEL. SHOULD NOT BE TAKEN TO MEAN THAT SUCH SITE WILL BE INCLUDED IN THE THAMES TUNNEL. INCLUSION OF A SITE ON THIS DRAFT PLAN SHORTLIST OF CONSTRUCTION SITES FOR THE PROPOSED STAKEHOLDERS, MAY BE CONFIRMED AS BEING ON THE FOLLOWING DISCUSSIONS WITH LOCAL AUTHORITIES AND OTHER LIMITED. IT PROVIDES AN INDICATION OF SITES THAT, EXPRESS WRITTEN PERMISSION OF THAMES WATER UTILITIES DISTRIBUTED OR SHOWN TO ANY THIRD PARTY WITHOUT THE RIGHTS 2011. ALL RIGHTS RESERVED ORDNANCE SURVEY LICENCE ON BEHALF OF HMSO. © CROWN COPYRIGHT AND DATABASE MAPPING REPRODUCED BY PERMISSION OF ORDNANCE SURVEY.

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THAMES WATER UTILITIES

S93WH - INTERMEDIATE SHAFT
JBRO
AREA = 1000m²

TQ2877
1:1000
SHAFT
PUMPING STATION
HEATHWALL
STATION

100-DL-PNC-S93WH-100302
THAMES TUNNEL
S93WH - KIRTLING STREET

WANDSWORTH
OFFICES/WELFARE
AREA = 1050m²

EXCAVATED MATERIAL
TBM MATERIALS AND SPARES
MAINTENANCE AREA AND
TBM WORKSHOP AND TUNNEL
STORAGE AREA
TBM PROCESSING AND SEPARATION PLANT,
EXCAVATED MATERIAL, SLURRY
STORAGE AREA
OFFICES/WELFARE, CANTEEN
AND MEDICAL

AREA = 1225m²

1050m²
20m ID
SHAFT
STATION
PUMPING
HEATHWALL
AREA = 1225m²
SEGMENT STORAGE STOCKYARD
SEGMENT LOADING AREA AND
CRANE, PRIMARY GANTRY CRANE,
SHAFT, PRIMARY AND SECONDARY
CRANE, SECONDARY
CRANE, PRIMARY
CRANE

AREA = 4957m²
TEMPORARY WORKING
AREA = 19694m²
SITE BOUNDARY

AREA = 500m²
OFFICES/WELFARE
AREA = 1050m²
EXCAVATED MATERIAL

AREA = 1000m²
Appendix 8 – Operational phase layout
THAMES TUNNEL SCHEME.

SELECTED AS A CONSTRUCTION SITE TO FORM PART OF THE
SHOULD NOT BE TAKEN TO MEAN THAT SUCH SITE WILL BE
THAMES TUNNEL. INCLUSION OF A SITE ON THIS DRAFT PLAN
SHORTLIST OF CONSTRUCTION SITES FOR THE PROPOSED
STAKEHOLDERS, MAY BE CONFIRMED AS BEING ON THE
FOLLOWING DISCUSSIONS WITH LOCAL AUTHORITIES AND OTHER
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NUMBER 100019345

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OPERATIONAL LAYOUT
S93WH - SINGLE DRIVE AND INTERMEDIATE
FOR INFORMATION

THAMES WATER UTILITIES
THAMES TUNNEL SCHEME.
SELECTED AS A CONSTRUCTION SITE TO FORM PART OF THE THAMES TUNNEL. SHOULD NOT BE TAKEN TO MEAN THAT SUCH SITE WILL BE INCLUDED IN THE THAMES TUNNEL. INCLUSION OF A SITE ON THIS DRAFT PLAN SHORTLIST OF CONSTRUCTION SITES FOR THE PROPOSED STAKEHOLDERS, MAY BE CONFIRMED AS BEING ON THE FOLLOWING DISCUSSIONS WITH LOCAL AUTHORITIES AND OTHER LIMITED. IT PROVIDES AN INDICATION OF SITES THAT, EXPRESSED WRITTEN PERMISSION OF THAMES WATER UTILITIES DISTRIBUTED OR SHOWN TO ANY THIRD PARTY WITHOUT THE PERMISSION OF THAMES WATER UTILITIES 2008. ACCORDINGLY, THE DRAFT PLAN MUST NOT BE COPIED, PRODUCED FOR THE PURPOSE OF CONFIDENTIAL DISCUSSIONS ONLY. THIS IS AN INDICATIVE WORKING DRAFT PLAN WHICH HAS BEEN PRODUCED FOR THE PURPOSE OF CONFIDENTIAL DISCUSSIONS ONLY. SCALE 1:1000.

This drawing is for information

Drawing Title: SITE SUITABILITY REPORT
Drawing No.: 100-DL-PNC-S93WH-100203
Sheet Size: 1:1000
Thames Water Utilities Ltd 2008
Paddington, London W2 1AF
37 North Wharf Road, The Point, 7th Floor, W2 1AF
Ventilation Building (Shafts)

Ventilation Tower (Shafts)

Diagramatic representation of top structure above main and intermediate shafts.
# Appendix 9 – Environmental appraisal tables

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to road network</td>
<td>The construction site is split into three work areas on Kirtling Street. The site includes parts of Cringle and Kirtling Street that will need to be closed and a suitable diversionary route agreed with the highway authority and TfL. A one-way system is proposed at the construction site, with the access and egress located on Kirtling Street. Parking on Cringle Street and Kirtling Street will require removal for the sections of site located on the highway and to enable access for construction vehicles. Visibility from the proposed egress point appears acceptable. Permanent access will be provided via the northern end of Kirtling Street. Both Kirtling Street and Cringle Street are two-way single carriageway roads, subject to a 30mph speed limit. Nine Elms Lane is a wide multi-lane single carriageway road featuring a bus lane and shared cycle/footway. Access routes to the site from the TLRN (A3205) use Kirtling Street or Cringle Street. Parking on Kirtling Street and Cringle Street will require removal to enable access. A preliminary transport access plan is attached as Appendix 5.</td>
<td>The construction site accesses are acceptable, providing a suitable diversion route for traffic on Cringle Street and Kirtling Street can be agreed with the highway authority. Access to the TLRN (A3205) is acceptable but requires the removal of on-street parking on Kirtling and Cringle Street. The TLRN (A3205) forms part of the red route.</td>
</tr>
<tr>
<td>Site considerations</td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Access to river</td>
<td>The site is located adjacent to the river for access via material conveyors. The Thames Path will require diversion/mitigation as it currently runs through the site boundary.</td>
<td>The site is located adjacent to the river for access via material conveyors. The Thames Path will require diversion/mitigation.</td>
</tr>
<tr>
<td>Access to rail</td>
<td>The nearest potential rail access point is at Battersea Power Station on Cringle Street. Rail sidings would require construction. Access to Battersea Power Station is via Nine Elms Lane and Kirtling or Cringle Street. There are no visible constraints along the route. The distance is 0.5km to the rail access point.</td>
<td>Access to potential rail sidings at Battersea Power Station is via Nine Elms Lane and Kirtling or Cringle Street. Sidings will require construction. No constraints identified along the access route.</td>
</tr>
<tr>
<td>Parking</td>
<td>Some parking is to be provided on site for workforce. Informal on-street parking is also available along Kirtling Street and Cringle Street, although some of this will require removal to enable access for construction vehicles.</td>
<td>Some parking is available on site and on surrounding roads for the workforce. Some parking will require removal to ensure construction access is not obstructed.</td>
</tr>
<tr>
<td>Public transport accessibility</td>
<td>PTAL 3-4 as identified within Table 2.3.</td>
<td>Reasonable potential for the workforce to utilise public transport to access the site.</td>
</tr>
<tr>
<td>Traffic management</td>
<td>The site area will include parts of Kirtling Street and Cringle Street. A suitable diversion route will therefore need to be devised and agreed with TfL and the local highway authority. Parking will require removal on Kirtling Street and Cringle Street. To minimise the impact of construction vehicles, a one-way system should be introduced. The eastern end of Cringle Street could be converted to no entry (for</td>
<td>Site area includes parts of Kirtling and Cringle Street. A suitable diversion route will therefore need to be devised and agreed with TfL and the local highway authority. Parking will require removal on both Kirtling Street and Cringle Street. The Thames Path requires diversion.</td>
</tr>
</tbody>
</table>
### Transport

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>construction vehicles) to create a one-way loop.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Thames Path on Kirtling Street will require diversion around the site boundary.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A preliminary transport management plan is attached as Appendix 5.</td>
<td></td>
</tr>
</tbody>
</table>

**Summary:** The site is considered to be suitable for use as a single or double main tunnel drive site and a reception/intermediate site, subject to acceptable diversion routes being agreed for the partial closure of Kirtling Street and Cringle Street. The site will feature a one-way working system, with access and egress on Kirtling Street. The permanent access is also located on Kirtling Street. Parking on Kirtling Street and Cringle Street will require removal to enable access for construction vehicles. Alternative parking is available along surrounding roads for the displaced vehicles. Access to the TLRN (A3205) from the site is acceptable. There are no visible constraints along the access route to a potential rail access point at Battersea Power Station, which would require the construction of rail sidings. The site is located adjacent to the river for access via the material conveyors. However, the Thames Path will require diversion around the site. Reasonable potential exists for the workforce to utilise public transport to access the site, and some parking could be provided on site for the workforce. Some additional informal on-street parking is available on the surrounding roads.
<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Designations, including archaeological priority areas</strong></td>
<td>The site is within the Wandsworth Archaeological Priority Area (APA)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Summary of historical uses</strong></td>
<td>In the 19th century, the site contained buildings relating to the lead works surrounding a central courtyard. The southern part of the site (proposed location of temporary yard) contained public baths of 20th century date.</td>
<td>A detailed desk-based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td><strong>Potential receptors of very high or high value with the potential to be directly affected</strong></td>
<td>No archaeological receptors are recorded within the site. This does not preclude the possibility of unrecorded archaeological receptors of high value being located within the site.</td>
<td>A detailed desk-based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td><strong>Potential receptors of medium value with the potential to be directly affected</strong></td>
<td>The shaft site area does not appear to have been substantially developed until the 1950s, when a large building was constructed across the whole site. A late 19th century lead works occupied much of the additional site (MLO64086). Foundations associated may still exist below ground. Remains such as this are unlikely to prevent proposed development but may require mitigation through excavation.</td>
<td>A detailed desk-based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td><strong>Other receptors with the potential to be directly affected</strong></td>
<td>Construction impact of potential waterlogged deposits containing archaeological remains may cause dewatering. This potential impact should be considered, given the reasonably close proximity of the site to the River Thames.</td>
<td>A detailed desk-based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td><strong>Extent of existing disturbance (if known)</strong></td>
<td>Considerable previous development in the 19th century, including the construction of the lead works, may have disturbed archaeological remains. Waterlogged remains may still exist at depth. Borehole data suggests made ground of 1m.</td>
<td>A detailed desk-based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
</tbody>
</table>
## Archaeology

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
</table>
| Potential issues    | Detailed design proposals and an outline method statement will be required to enable initial assessment of development impacts, and to inform mitigation proposals. With the currently available information, it is not possible to highlight specific potential issues. | Mitigation methods could include:  
• desk-based assessment  
• production of deposits model  
• archaeological monitoring of geotechnical investigations  
• archaeological evaluation  
• archaeological watching brief  
• archaeological excavation. |

**Summary:** Based on current information, this site is considered to be suitable for use as a single and double main tunnel drive site and a reception/intermediate site. Based on the information currently available, although no records exist for the main site, it is possible that archaeological receptors of high or medium value may be present within this site. While no direct evidence has been revealed, waterlogged remains and peat deposits of high or medium value may also be present. Nineteenth century construction of the lead works is likely to have disturbed archaeological remains, if present, to some extent.
<table>
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</tr>
</thead>
</table>
| **Listed buildings** | Battersea Power Station, Grade II*: 250m  
Battersea Pumping Station, Grade II: 220m  
**Conservation areas** | Churchill Gardens  
Conservation Area: 100m  
Dolphin Square Conservation Area: 175m  
**Locally listed buildings** | There are no locally listed buildings within 250m of the site.  
**Registered historic parks and gardens** | There are no registered historic parks and gardens within 250m of the site.  
**Locally listed parks and gardens** | There are no locally listed parks and gardens within 250m of the site  
**Protected views** | There are no protected views within 250m of the site.  
In the case of listed buildings and conservation areas, a high-quality scheme design and adequate screening for the development may be required, as discussed below.  
A detailed desk-based assessment, in conjunction with archaeology, will be required to further inform the likely impact of the development, and to determine more detailed mitigation proposals. |
| Potential receptors of medium to very high importance with the potential to be directly affected | Not applicable | Not applicable |
| Other receptors of lesser importance with the potential to be directly affected | Not applicable | Not applicable |
### Built heritage and townscape

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Potential receptors of medium to very high importance with the potential to be <strong>indirectly</strong> affected</td>
<td>There is the potential for two listed buildings to be indirectly impacted by the scheme. There is the potential to indirectly impact the two conservation areas which lie on the north bank of the river.</td>
<td>Impacts on the listed buildings will be limited to the construction phase due to existing screening of the operational site. This can be mitigated through the erection of hoarding and appropriate lighting. Impacts on the conservation area are reduced by the industrial character of existing views. There is no mitigation proposed.</td>
</tr>
<tr>
<td>Other receptors of lesser importance with the potential to be <strong>indirectly</strong> affected</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Sensitive landscape character areas likely to be affected, including trees and TPOs</td>
<td>Existing industrial site that stretches from the River Thames inland to Battersea Park Road. The area adjacent to the river has the potential to positively contribute to the waterfront character of the Thames. Construction activities on the site would be in keeping with the industrial character of the site. The construction of the jetties (in the case of the single and double main tunnel sites) and infrastructure adjacent to the River Thames has the potential to result in temporary adverse impacts on the waterfront character in these two areas. Although permanent structures would be located adjacent to the River Thames and would have the potential to result in adverse impacts on the</td>
<td>Presence and operation of machinery, materials stores and buildings on site would be in keeping with the industrial character of the site but would potentially interrupt the waterfront character adjacent to the river. Design of the jetties and associated infrastructure (in the case of the single and double main tunnel sites) requires careful consideration to minimise disruption of the waterfront character and preserve the character of the residential areas to the northeast. Construction activities will be in keeping with the industrial character of the site. Although the development will require the removal of industrial buildings, assuming that the design of the permanent</td>
</tr>
</tbody>
</table>
## Built heritage and townscape

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>waterfront character, the loss of neighbouring industrial buildings during construction will enable appropriate mitigation to be implemented.</td>
<td>structures is carefully considered and implemented with an appropriate landscape scheme including planting, this will integrate facilities into the waterfront character and has the potential to enhance the streetscape of neighbouring streets. The site is therefore considered suitable.</td>
<td></td>
</tr>
<tr>
<td>Potential views likely to be affected</td>
<td>The site does not lie within any protected views. It does lie within views from two conservation areas. The site is visible in open views from the river, Cringle Street, Nine Elms Lane and Kirtling Street. The existing buildings on the site partially restrict views and, where views are possible, they are drawn to the landmark building of Battersea Power Station in the west and towards the river to the north. Residential properties to the south overlook the site, and its river frontage is visible for travellers along the Thames and from the north bank of the Thames. During construction, an additional area to the northeast would be used for construction of a jetty and additional infrastructure in the case of the single and double main tunnel sites. This area is overlooked by adjacent residential areas and is visible for travellers along the Thames and from the north bank of the Thames. Existing views are of industrial areas with a mixed style of</td>
<td>During construction, the use of hoardings and appropriate lighting would help minimise visual impact of the construction activities but would themselves potentially interrupt views along the Thames and towards Battersea Power Station. The loss of industrial buildings on the sites would, however, potentially open up views towards the Thames and the power station. Design of the ventilation chimney, ventilation buildings and implementation of appropriate landscape scheme requires careful consideration to reduce visual intrusion and integrate the permanent structures into the waterfront area. The loss of industrial buildings on the site will open up areas for redesign, and there is potential to enhance existing views. With careful design, the interruption of riverside views and of views towards Battersea Power Station can be minimised, resulting in this site being considered suitable.</td>
</tr>
</tbody>
</table>
## Built heritage and townscape

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<tbody>
<tr>
<td></td>
<td>industrial buildings and structures. The presence and operation of machinery, jetties on the Thames, materials stores and buildings would interrupt views along the Thames and towards the power station, potentially resulting in temporary adverse impacts. The construction activities, however, would be in keeping with the current industrial nature of the views. Permanent structures are to be located adjacent to the Thames and these would potentially have adverse impacts on views along the Thames. Mitigation of these structures, however, could minimise potential impact and seek to integrate the structures into the mixed-use waterfront view.</td>
<td>Any permanent structures would need to be of a high-quality design and/or screened in order to reduce any visual impacts on the designated areas.</td>
</tr>
<tr>
<td>Particular considerations on sites where new permanent structures are required</td>
<td>The permanent structures have the potential to indirectly impact on two conservation areas due to their position on the waterfront.</td>
<td>The scheme design would need to be of a sufficiently high quality and may need to incorporate some screening in order that the potential impact of the development on two listed buildings and two conservation areas is mitigated.</td>
</tr>
<tr>
<td>Potential issues</td>
<td>There is the potential for two listed buildings and two conservation areas to be indirectly impacted during construction. The permanent elements have the potential to indirectly impact on two conservation areas. There is the potential to mitigate any adverse impacts through a high-quality scheme design and/or screening.</td>
<td></td>
</tr>
</tbody>
</table>
### Built heritage and townscape

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary:</strong> From a built heritage perspective, this site is considered to be suitable for use as a single and double main tunnel drive site and a reception/intermediate site due to its position within an existing industrial landscape. There is potential for the setting of two listed buildings to be impacted during construction. However, impacts from the operational phase will be limited to two conservation areas. The site is considered to be suitable as a single and double drive and a reception/intermediate main tunnel site from a townscape perspective. The site is located within an area that is industrial in character and, with careful design, this site has the potential to enhance the existing industrial character and waterfront.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site considerations</td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hydrogeological conditions (groundwater and surface water)</td>
<td>Geology (thickness)</td>
<td>The shaft will be constructed to an invert level of approximately 44mbgl.</td>
</tr>
<tr>
<td>From BGS Geological Model, giving average ground condition profile. Local near</td>
<td>• Superficial geology and made ground (10m)</td>
<td>Therefore, the shaft will be founded in the Lambeth Group. The piezometric head in Chalk will be</td>
</tr>
<tr>
<td>surface conditions may vary, particularly within the river.</td>
<td>• London Clay (32m)</td>
<td>approximately 5m above the base of the construction.</td>
</tr>
<tr>
<td></td>
<td>• Lambeth Group (19m)</td>
<td>There is a scour feature in this area.</td>
</tr>
<tr>
<td></td>
<td>• Thanet Sand (9m)</td>
<td></td>
</tr>
<tr>
<td>Hydrogeology</td>
<td>Piezometric level: ~ -34mAOD (~39mbgl) from EA Jan 08 water level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contouring.</td>
<td></td>
</tr>
<tr>
<td>Groundwater monitoring location</td>
<td>EA hydrometry sites:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TQ27-284A – 241m west of the site (water levels to May 2005)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TQ37-24A – 1.73km southeast of the site (water levels to May 2003).</td>
<td></td>
</tr>
<tr>
<td>SPZs and groundwater users</td>
<td>SPZ</td>
<td>A simple volumetric approach has been used to calculate the total catchment zone of the abstraction</td>
</tr>
<tr>
<td></td>
<td>• Located in a source protection zone (SPZ 1) defined by EA</td>
<td>borehole. A conservative mean annual recharge of 100mm/year was used to calculate a radius for</td>
</tr>
<tr>
<td></td>
<td>(Environment agency website, 2010).</td>
<td>licensed abstraction boreholes as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Licensed abstraction boreholes</td>
</tr>
<tr>
<td></td>
<td>EA licensed groundwater abstractions and details</td>
<td>1. 384m</td>
</tr>
<tr>
<td></td>
<td>• 23 licensed abstraction boreholes within 2km radius.</td>
<td>2. 590m</td>
</tr>
<tr>
<td></td>
<td>Licence numbers:</td>
<td>3. 472m</td>
</tr>
<tr>
<td></td>
<td>1. 28/39/39/238 (2 boreholes)</td>
<td>4. 96m</td>
</tr>
<tr>
<td></td>
<td>2. 28/39/42/0074 (1 borehole)</td>
<td>5. 75m</td>
</tr>
<tr>
<td></td>
<td>3. 28/39/39/0232 (2 boreholes)</td>
<td>6. Defined by EA</td>
</tr>
<tr>
<td></td>
<td>4. 28/39/39/0226 (1 borehole)</td>
<td>7. 135m</td>
</tr>
<tr>
<td></td>
<td>5. 28/39/39/0225 (2 boreholes)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. 28/39/39/0141 (4 boreholes)</td>
<td></td>
</tr>
</tbody>
</table>
## Water resources – hydrogeology and surface water

<table>
<thead>
<tr>
<th>Site considerations</th>
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</tr>
</thead>
<tbody>
<tr>
<td>7. 28/39/42/0070 (1 borehole)</td>
<td></td>
<td>8. 388m</td>
</tr>
<tr>
<td>8. 28/39/39/0223 (1 borehole)</td>
<td></td>
<td>9. 311m</td>
</tr>
<tr>
<td>9. 28/39/39/0139 (4 boreholes)</td>
<td></td>
<td>10. 101m</td>
</tr>
<tr>
<td>10. 28/39/39/0209 (1 borehole)</td>
<td></td>
<td>11. 296m</td>
</tr>
<tr>
<td>11. 28/39/42/0060 (2 borehole)</td>
<td></td>
<td>12. 188m</td>
</tr>
<tr>
<td>12. 28/39/42/0033 (1 borehole)</td>
<td></td>
<td>13. Defined by EA</td>
</tr>
<tr>
<td>13. 28/39/42/0072 (1 borehole)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Locations:
1. 1.77km northwest of the site
2. 349m west of the site
3. 1.3northwest of the site
4. 1.87km northwest of the site
5. 876m northwest of the site
6. 409m northeast of the site
7. 1.22km southwest of the site
8. 1.53km northwest of the site
9. 929m northeast of the site
10. 1.38km northeast of the site
11. 1.39km southwest of the site
12. 1.89km northeast of the site
13. 175m southwest of the site

Operator:
1. Grosvenor Limited
2. Halcyon Estate limited
3. Terrace Hill
4. Goldstein
5. Royal Horticultural Society
6. Mantilla Limited
7. Tarmac Limited
8. London Underground Ltd
9. Panoramic Management Co Ltd
10. Westminster Garden Limited
11. Wandsworth borough

The shaft is located within the source protection zone (SPZ 1) of abstractions from Chalk defined by the EA and the total catchment zone of one abstraction from Chalk (28/39/42/0074).
### Water resources – hydrogeology and surface water

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>council</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Allied Distillers Ltd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Thames Water Utilities Ltd</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abstracted aquifer unit:
1. Chalk
2. Chalk
3. Chalk
4. Chalk
5. Chalk
6. Chalk
7. Chalk
8. River and glacial deposits
9. Chalk
10. Chalk
11. Chalk
12. Chalk
13. Chalk

Abstraction purposes:
1. Industrial, commercial and public service (non-evaporative cooling and spray irrigation)
2. Private water supply (drinking, cooking, sanitary, washing)
3. Industrial, commercial and public service (non-evaporative cooling)
4. Private water supply (general use)
5. Agriculture (spray irrigation)
6. Private water supply (drinking, cooking, sanitary, washing)
7. Industrial, commercial and public service (mineral products – general use)
8. Industrial, commercial and public service (transport – non
### Water resources – hydrogeology and surface water

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<tr>
<td></td>
<td>evaporative cooling) 9. Industrial, commercial and public service (non-evaporative cooling) 10. Private water supply (drinking, cooking, sanitary, washing) 11. Industrial, commercial and public service (municipal grounds – spray irrigation and make-up or top-up water) 12. Industrial, commercial and public service (non-evaporative cooling) 13. Public water supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abstraction quantity (annual): 1. 184,896m³ 2. 438,000m³ 3. 280,000m³ 4. 11,612m³ 5. 7,000m³ 6. 258,967m³ 7. 23,000m³ 8. 189,216m³ 9. 121,510m³ 10. 12,810m³ 11. 110,000m³ 12. 44,323m³ 13. 2,555,000m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Local authorities (LA) unlicensed groundwater abstractions and details • No abstraction borehole within 1km radius.</td>
<td></td>
</tr>
<tr>
<td>Borehole locations and depths</td>
<td>There are 21 historical records of water wells: 20 deep wells and one shallow well within 1km radius.</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Site considerations</td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Depth range: 100.8 – 182.8m&lt;br&gt;Depth range: 7m</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Potential impacts on surface water features</strong></td>
<td>The site is located adjacent to the River Thames. In the case of the reception/intermediate site, the site is located behind the flood defences. For the main tunnel single and double drive sites, the majority of the site is behind flood defences. However, the requirement for decking out into the river elevates a direct pollution risk to the River Thames.</td>
<td>Work will need to be undertaken in consideration of Pollution Prevention Guidelines – PPG1, PPG5 and PPS23.</td>
</tr>
<tr>
<td><strong>Potential impacts on groundwater (resources and quality)</strong></td>
<td>Impact on groundwater at depth is likely since the shaft is to be constructed in the Lambeth Group, which may be in hydraulic continuity with the Chalk principal aquifer and may need to be dewatered. At shallow depth, the shaft is located in alluvium, which is classified as a secondary aquifer. Limited impact on shallow aquifer if water is excluded from the excavation by diaphragm wall or sheetpiling.</td>
<td>See below (likely types of mitigation measures that will be required)</td>
</tr>
<tr>
<td><strong>Likely types of mitigation measures that would be required</strong></td>
<td>Mitigation may be required as construction of the shaft will take place within SPZ 1 and dewatering and the presence of shaft may affect groundwater body and abstractors.</td>
<td>Possible provision of alternative groundwater supply</td>
</tr>
<tr>
<td><strong>Potential issues</strong></td>
<td>The shaft is to be excavated in Lambeth Group, which is in hydraulic continuity with the principal Chalk aquifer and dewatering may be needed. Limited impact on flow in shallow aquifer.</td>
<td>Scour feature nearby to be considered as part of geotechnical design. The issue of the appropriate disposal of discharges from dewatering to be considered if dewatering is needed. Dewatering to be kept to a minimum.</td>
</tr>
</tbody>
</table>
### Water resources – hydrogeology and surface water

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Impact on and mitigation for shallow aquifer will depend on construction design.</td>
</tr>
</tbody>
</table>

**Summary:** In terms of hydrogeology, this site is less suitable for use as a single and double main tunnel drive site and a reception/intermediate site because the site lies within a source protection zone (SPZ 1) for an abstraction from the Chalk, and also the shaft is to be constructed within Lambeth Group, which is in hydraulic continuity with the principal Chalk aquifer. The Chalk piezometric head is likely to be approximately 5m above the base of construction and should be taken into account in the engineering design. Dewatering may be necessary. The superficial deposits are alluvium and infilled scour feature nearby, which are classified as a secondary aquifer at the shaft site. There is the potential for a limited impact on flow in the shallow aquifer due to a diaphragm wall or sheetpiling.

In terms of surface water resources, this site is considered to be suitable for use as a single and double drive and a reception/intermediate main tunnel site. However, tight site boundary controls would be needed during construction, particularly for the single and double main tunnel sites, where the requirement for decking out into the river elevates a direct pollution risk to the River Thames.
### Ecology (terrestrial and aquatic)

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Main tunnel reception/intermediate site</th>
<th>Main tunnel single and double drive site options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>Statutory designations</td>
<td>Battersea Park Nature Area LNR lies 600m from this site.</td>
<td>None required.</td>
</tr>
<tr>
<td>Non-statutory designated wildlife sites</td>
<td>Site is adjacent to Battersea Power Station BGI site. Site is within 600m of Battersea Park SMI.</td>
<td>Working practices must be designed to avoid disturbance to breeding birds, which include peregrine falcon. None required.</td>
</tr>
<tr>
<td>BAP priority habitats</td>
<td>A small part of the site corresponds to London BAP habitat ‘wasteland.’</td>
<td>Loss of wasteland habitat may require limited compensatory provision.</td>
</tr>
<tr>
<td>Site considerations</td>
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<td>Main tunnel single and double drive site options</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>Protected or otherwise notable species within the study area</td>
<td>Black redstart and peregrine are known to breed/have recently bred adjacent to this site. There is potential for buildings on site to be used by roosting bats. Site has potential to support uncommon or notable invertebrates.</td>
<td>Working practices must be designed to avoid disturbance to breeding birds. If bat roosts were found to be present, mitigation would be required, possibly including offsite provision.</td>
</tr>
<tr>
<td>Potential issues</td>
<td>No further issues.</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>
### Ecology (terrestrial and aquatic)

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</thead>
<tbody>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
</tbody>
</table>

**Summary:** The site is considered less suitable as a single and double drive and a reception/intermediate main tunnel site due to the combination of ecological issues raised at this site. The work would be in the immediate vicinity of a site of borough Grade I importance. Sensitive working practices and some compensatory provision are likely to be required. Specially protected bird species are present and breeding adjacent to the site, which could affect working practices.

In the case of the single and double drive, the site also has some sensitivity due to the potential for temporary and permanent land-take from a site of metropolitan importance. There is the potential for a cumulative effect with other jetty structures in the river. Careful negotiation with the EA is likely to be required regarding works in the foreshore and river.
<table>
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<th>Main tunnel single and double drive site options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>Flood risk zone</td>
<td>Flood Zone 3 (one in 200-year flood extent) but defended to the one in 1,000-year flood level. There is a residual risk of a breach, for which mitigation would need to be considered as part of the FRA. Sewage transmission infrastructure is considered to be water compatible according to Table D.2 of PPS25.</td>
<td>An FRA would be required to assess the residual risk of flooding to the site.</td>
</tr>
<tr>
<td>Assessment of conditions for SUDS</td>
<td>There is limited space for SUDS and the site is existing brownfield. The superficial geology is likely to be permeable and hence infiltration SUDS are likely to be feasible, if space is available.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Potential issues</td>
<td>No further issues.</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>
### Flood risk assessment

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Main tunnel reception/intermediate site</th>
<th>Main tunnel single and double drive site options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td></td>
<td>protect and maintain flood defences, and an assessment of the impact of the piled structure on scour of sediments and resultant effect on flood defences.</td>
<td>standards and impact of piled structure on sediment scour and flood defence integrity.</td>
</tr>
</tbody>
</table>

**Summary:** This site is considered suitable as a single and double main tunnel drive site and a reception/intermediate site as it is defended from flooding from the River Thames. Space for SUDS is limited and controls on quality of runoff would be required, owing to the presence of a total catchment source protection zone in the area of the site.

In the case of the single and double main tunnel drive site, new flood defences would require specific mitigation to maintain protection, and the piled decking structure would need to be assessed for impact on scour of sediments and the integrity of the flood defences.
## Air quality

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQMA</td>
<td>The air quality objective for NO₂ is exceeded on major roads in vicinity of site.</td>
<td>There is a need for more site specific data.</td>
</tr>
<tr>
<td>Sensitive receptors</td>
<td>There are residential properties along Nine Elms Lane (A3205) and Battersea Park Road (A3205). The nearest residential properties are on Battersea Park Road, approximately 35m from the site. There are also houseboats and Elm Quay close to the proposed jetty works in the case of the single and double drive site options.</td>
<td>There are relevant air quality sensitive receptors present along the route the construction traffic is likely to take.</td>
</tr>
<tr>
<td>Existing traffic issues</td>
<td>The main traffic issue in this area is exhaust emissions from vehicles along the A3205 corridor.</td>
<td>Additional vehicle emissions have a high potential to interfere with local air quality action plan policies.</td>
</tr>
<tr>
<td>Existing sources of significant air pollutants</td>
<td>See existing traffic issues above.</td>
<td>See existing traffic issues above.</td>
</tr>
<tr>
<td>Notable gaps in existing air quality monitoring</td>
<td>There is no data at likely access to A3205 and the nearest existing data indicates existing exceedance of AQLV.</td>
<td>Collect minimum six months’ diffusion tube data at the nearest residential receptors to the site access to A3205 or other point of access to major road network.</td>
</tr>
<tr>
<td>Potential issues</td>
<td>The risk from additional exhaust emissions from construction HGVs is undefined at present. The risk from dust impacts is moderate.</td>
<td>Minimise HGV movements on the local road network during the peak hours. Standard dust control measures will minimise the effect of fugitive dust on nearby sensitive receptors.</td>
</tr>
</tbody>
</table>
## Air quality

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
</table>

**Summary:** This site is considered to be less suitable for use as a single and double drive and a reception/intermediate main tunnel site. There are residential properties in close proximity to the site, therefore there is potential for fugitive emissions of dust during construction to have a perceptible impact at these properties. These impacts could be minimised with standard dust control measures. There is potential for HGV movements on the local road network to cause localised air quality impacts in areas of already poor air quality. This can be somewhat mitigated by minimising the movement of HGVs during peak hours.
### Noise

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Main tunnel reception/intermediate site</th>
<th>Main tunnel single and double drive site options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>Noise band level (from Defra noise maps)</td>
<td>Information from Defra noise maps indicates daytime noise levels of between less than 58dB and 79dB $L_{Aeq}$ and night-time noise levels of between less than 50dB and 70dB $L_{Aeq}$ in the area surrounding the proposed site. Noise levels from the Defra noise maps provide an indication of prevailing noise levels only, and will not be employed in any detailed assessments for chosen sites.</td>
<td>n/a</td>
</tr>
<tr>
<td>Sensitive receptors</td>
<td>There are sensitive receptors close to the northern boundary of the site in the form of houseboats at Tideway Dock. Further residential properties are located on Battersea Park Road to the south.</td>
<td>n/a</td>
</tr>
<tr>
<td>Site considerations</td>
<td>Main tunnel reception/intermediate site</td>
<td>Main tunnel single and double drive site options</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>Comments</strong></td>
<td><strong>Mitigation required and conclusions</strong></td>
</tr>
<tr>
<td></td>
<td>To the north there are houseboats with permanent residential status. These are located approximately 15m from the temporary working area and 40m from the shaft location. Residential properties located to the south on Battersea Park Road are four storeys in height. These are located at a distance of approximately 175m from the temporary working area and 220m from the shaft location. There are further residential properties located to the east at Elm Quay Court. To the immediate west and east are various industrial buildings which are not considered to be noise sensitive.</td>
<td>from the shaft location. Also, the further residential properties located to the east at Elm Quay Court are in close proximity to the jetty in the eastern part of the site.</td>
</tr>
</tbody>
</table>
## Noise

<table>
<thead>
<tr>
<th>Site considerations</th>
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<tbody>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>Existing traffic issues</td>
<td>Road traffic on Nine Elms Lane (A3205) is likely to dominate the local noise climate in the area of the closest sensitive receptors.</td>
<td>n/a</td>
</tr>
<tr>
<td>Existing sources of significant noise emissions</td>
<td>Road traffic on Nine Elms Lane (A3205) is likely to dominate the local noise climate in the area of the closest sensitive receptors. Railway lines and Battersea Power Station exist at greater distances from the site. However, a greater contribution is expected from local industrial activities.</td>
<td>n/a</td>
</tr>
<tr>
<td>Potential issues</td>
<td><strong>Construction:</strong> The construction period is estimated at four to five years and working hours will be 24 hours per day, Monday to Sunday. This adherence to the good site practices provided in BS5228. Siting of noisy equipment and construction activities as far as is practicable</td>
<td><strong>Construction:</strong> The construction period is estimated at six to seven years and working hours will be 24 hours per day, Monday to Sunday. This</td>
</tr>
<tr>
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<td>--------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td></td>
<td>has the potential to result in adverse noise impacts on the houseboats to the north and residential properties to the south of Battersea Park Road. It is anticipated that a high number of HGVs will enter and egress the site per day. This has the potential to have an adverse impact on residential receptors located on Battersea Park Road. Proposed 3m site boundary fencing will provide useful noise mitigation to some plant and construction activities. Careful positioning of the noisiest plant, ie, making use of surrounding buildings between the site and the receptor locations, will assist in reducing the noise from sensitive receptors. Provision of site boundary noise fences. Restriction of some construction activities to daytime working.</td>
<td>has the potential to result in adverse noise impacts on the houseboats to the north and residential properties to the south of Battersea Park Road. It is anticipated that a high number of HGVs will enter and egress the site per day. This has the potential to have an adverse impact on residential receptors located on Battersea Park Road. Deliveries of materials by barge may also lead to an adverse noise impact to residential properties located along the River Thames, especially at houseboats located at Tideway Dock. Proposed 3m site boundary fencing will provide useful noise mitigation to some plant and construction activities.</td>
</tr>
<tr>
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</tr>
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</tr>
<tr>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
<td>Comments</td>
</tr>
<tr>
<td>potential noise impact.</td>
<td></td>
<td>and construction activities. Careful positioning of the</td>
</tr>
<tr>
<td>Vibration resulting from general construction works is not anticipated to result in an adverse impact. The nearest land-based receptors to the proposed shaft location are at a distance of approximately 220m, and it is unlikely that vibration levels will result in annoyance or minor cosmetic damage during shaft sinking. Vibration from tunnelling should be considered on a case-by-case basis at particular sensitive locations. <strong>Operation:</strong></td>
<td>Mitigation required and conclusions</td>
<td>Careful positioning of the noisiest plant, ie, making use of surrounding buildings between the site and the receptor locations, will assist in reducing the potential noise impact. In the case of the double main tunnel site, the triple height site offices located in the south of the site may provide some additional partial shielding from construction activities. Vibration resulting from general construction works is not anticipated to result in an adverse impact. The nearest land-based receptors to the proposed shaft location are at a distance of approximately 220m, and it is unlikely that noise from the ventilation column and associated construction activities.</td>
</tr>
</tbody>
</table>
### Noise

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<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>permanent structures should result in adverse noise impacts to nearby sensitive receptors.</td>
<td>vibration levels will result in annoyance or minor cosmetic damage during shaft sinking. Vibration from tunnelling should be considered on a case-by-case basis at particular sensitive locations. <strong>Operation:</strong> With appropriate attenuation (if necessary), there is no reason why noise from the ventilation column and associated permanent structures should result in adverse noise impacts to nearby sensitive receptors.</td>
<td></td>
</tr>
</tbody>
</table>
### Summary:
This site is considered less suitable for use as a single and double main tunnel drive site and a reception/intermediate site due to the proximity of residential houseboats located to the immediate north of the site. These houseboats are understood to have permanent residential status. Perimeter hoarding will potentially help reduce potential noise impact, but will be relatively ineffective where line of sight is not broken between source and receptor. Working 24 hours a day has the potential to adversely impact on the closest receptors and should use of this site be pursued, it may be necessary to restrict some of the noisier activities to daytime only. The number of vehicles associated with the construction phase is likely to be high, however the noise climate along Battersea Park Road is already relatively high and therefore the level of adverse noise impact is likely to be less severe. For the single and double main tunnel drive sites, there are also further residential properties in close proximity to the jetty, in the eastern part of the site at Elm Quay Court. The construction and use of a jetty in order to allow deliveries by barge will potentially result in an adverse noise impact, particularly if deliveries are to be made 24 hours a day.

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<td>Comments</td>
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</table>

- **Summary:** This site is considered less suitable for use as a single and double main tunnel drive site and a reception/intermediate site due to the proximity of residential houseboats located to the immediate north of the site. These houseboats are understood to have permanent residential status. Perimeter hoarding will potentially help reduce potential noise impact, but will be relatively ineffective where line of sight is not broken between source and receptor. Working 24 hours a day has the potential to adversely impact on the closest receptors and should use of this site be pursued, it may be necessary to restrict some of the noisier activities to daytime only. The number of vehicles associated with the construction phase is likely to be high, however the noise climate along Battersea Park Road is already relatively high and therefore the level of adverse noise impact is likely to be less severe. For the single and double main tunnel drive sites, there are also further residential properties in close proximity to the jetty, in the eastern part of the site at Elm Quay Court. The construction and use of a jetty in order to allow deliveries by barge will potentially result in an adverse noise impact, particularly if deliveries are to be made 24 hours a day.
## Land quality

<table>
<thead>
<tr>
<th>Site considerations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site location</strong></td>
<td>Grid Reference: 529290, 177481</td>
</tr>
<tr>
<td><strong>Current site use</strong></td>
<td>A large warehouse occupies the northern region of the site. A depot is located at the central and south-western regions of the site. A works is present at the southeast region and residential houses are located at the southern extent of the site.</td>
</tr>
<tr>
<td><strong>Topography</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Field evidence of contamination</strong> (ie, visual/olfactory)</td>
<td>None identified at this stage.</td>
</tr>
</tbody>
</table>
| **Current surrounding land use (immediately adjacent to site)** | **North:** River Thames.  
**East:** Residential and commercial uses.  
**South:** Battersea Park Road and commercial uses.  
**West:** Concrete batch facility, waste sorting facility and derelict industrial land. |

## Geological and hydrogeological information

<table>
<thead>
<tr>
<th>Geological strata¹</th>
<th>Geology (thickness)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Superficial geology and made ground (10m)</td>
<td></td>
</tr>
<tr>
<td>• London Clay (32m)</td>
<td></td>
</tr>
<tr>
<td>• Lambeth Group (19m)</td>
<td></td>
</tr>
<tr>
<td>• Thanet Sand (9m)</td>
<td></td>
</tr>
</tbody>
</table>

| Underlying aquifer classes | Unproductive aquifer: London Clay  
Secondary aquifer: River terrace deposits, Lambeth Group, Thanet Sand  
Principal aquifer: Chalk |
|---------------------------|---------------------------|

| **Groundwater vulnerability/Soil classification (High/Intermediate/Low/Not applicable)²** | River terrace deposits – minor aquifer  
High leaching potential of soils (U)¹ |
|-----------------------------|-------------------------------------|

<table>
<thead>
<tr>
<th><strong>Source protection zone details</strong></th>
<th>Construction of shaft will take place within SPZ 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surface water receptor</strong></td>
<td>River Thames (adjacent north)</td>
</tr>
</tbody>
</table>

## Relevant information within a 250m radius of the site

<table>
<thead>
<tr>
<th>Historical potentially contaminating activities</th>
<th>On site</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Industrial buildings (central/northern region), 1896-1910</td>
<td></td>
</tr>
<tr>
<td>• Historical building plans list 2 no. paint based oil tanks (located at the northern region of the site), 1897-1961</td>
<td></td>
</tr>
</tbody>
</table>
## Land quality

### Site considerations

- Historical building plans list 5 no. above-ground oil tanks (located at the northern region of the site), 1897-1968
- Historical building plans list 2 no. potential fuel tanks (located at the northern and central regions of the site), 1897, 1966
- Historical building plans list 2 no. oil stores (located at the northern region of the site), 1961
- Historical building plans list 4 no. sunk petrol tanks (located at the northern region of the site), 1961-1968
- Historical building plans list numerous records of asbestos (located at the northern and central regions of the site), 1961-1968
- Paint works (central/northern region), 1947-1972
- Engineering works (southwest region), 1909-1972
- Public baths (southeast region), 1909-1972
- Above-ground tank (south), 1909-1972
- Tanks – contents unknown (4 no.), (southern region of site), 1951-1976
- Electrical substations (2 no.), (south-eastern region of site), 1951-1952
- Car park (south), 1972-1977
- Warehouse (north), 1972-present
- Depot/works (central region), 1972-1985
- Depot (central region), 1976-present.

### Off site

- Works (adjacent west), 1976-1996
- Depot (adjacent east), 1976-1996
- Works (adjacent west), present
- Wharf operations (adjacent northeast), 1868-1882
- Engineering works (adjacent west), 1947-1972
- Imperial Wharf (adjacent east), 1947-1972
- Tanks – contents unknown (4 no, closest 6m west), 1976
- Industrial estate (12m east), present
- Gas works (15m southeast), 1868-1882
- Warehouse (43m south), present
- Refuse transfer station (61m west), present
<table>
<thead>
<tr>
<th>Land quality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site considerations</strong></td>
</tr>
<tr>
<td>• Goods depot (74m southwest), 1909-1972</td>
</tr>
<tr>
<td>• Foundry (83m south), 1947-1972</td>
</tr>
<tr>
<td>• Water works (146m west), 1868-1882</td>
</tr>
<tr>
<td>• Engineering works (98m west), 1909-1920</td>
</tr>
<tr>
<td>• South Lambeth Goods Depot (62m southwest), 1972-1977</td>
</tr>
<tr>
<td>• Depot (138m south), 1972-1977</td>
</tr>
<tr>
<td>• Pumping station (155m west), 1947-present</td>
</tr>
<tr>
<td>• Milk depot (157m southeast), 1947-1972</td>
</tr>
<tr>
<td>• Lime works (176m northeast), 1868-1882</td>
</tr>
<tr>
<td>• Rail lines (200m south), 1868-1882</td>
</tr>
<tr>
<td>• Electricity works (223m west), 1947-1977</td>
</tr>
<tr>
<td>• Warehouse (227m east), 1976-1996</td>
</tr>
<tr>
<td>• Depot (240m southeast), 1976-1996</td>
</tr>
</tbody>
</table>

| Pollution incidents to controlled waters |
| Two |
| • Storm sewage, minor incident (200m northeast), within River Thames |
| • Storm sewage, minor incident (243m northeast), within River Thames |

| Landfill sites |
| One historic landfill site |
| • Cringle Wharf, ref EAHLD11892 (56m west), no data |

| Other waste sites |
| Two waste transfer sites |
| • Cleanaway Ltd, transfer – river, very large (greater than 250,000T per year) since 23-10/1991. Listed as operational. (99m west) |
| • LWRA hazardous waste unit, input undefined. Listed as lapsed/cancelled. (139m west) |
| One licensed waste management facility |
| • Household, commercial, industrial transfer station. Status shown as transferred. (91m west) |

| Registered radioactive substances |
| None |

| Fuel stations/depots |
| One |
| • ESSO Battersea Service Station, active (on site, south) |

| Contemporary trade directory entries |
| Six |
| • Petrol filling stations, inactive (on site, south) |
| • Commercial cleaning services, inactive (on site, south) |
| • Distribution services, inactive (73m east) |
## Land quality

### Site considerations

- Water coolers, active (73m east)
- Waste disposal services, active (88m west)
- Gate manufacturers, inactive (112m south)

### Site classification based on above information

<table>
<thead>
<tr>
<th>Activity</th>
<th>Distance and direction to site</th>
<th>Contaminants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential site contaminants derived from surface sources (eg, contaminants in made ground)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Some potential for made ground from potential filling operations during development</td>
<td>1) On site and directly adjacent to site</td>
<td>1) Metals, TPH, PAHs</td>
</tr>
<tr>
<td>2) Warehouse/depot/works</td>
<td>2) On site</td>
<td>2) Metals, TPH, PAHs</td>
</tr>
<tr>
<td>3) Fuel tanks</td>
<td>3) On site</td>
<td>3) Metals, TPH, PAHs</td>
</tr>
<tr>
<td>4) Paint works and paint based oil tanks</td>
<td>4) On site</td>
<td>4) Metals, TPH, PAH, solvents</td>
</tr>
<tr>
<td>5) Electrical substation</td>
<td>5) On site</td>
<td>5) PCBs</td>
</tr>
<tr>
<td>6) Petrol filling station</td>
<td>6) On site</td>
<td>6) Metals, TPH, PAHs</td>
</tr>
<tr>
<td><strong>Potential site contaminants derived from offsite sources and transported to site</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Wharf operations</td>
<td>1) Directly adjacent to site</td>
<td>1) Metals, TPH, PAHs</td>
</tr>
<tr>
<td>2) Works/depot</td>
<td>2) Directly adjacent to site</td>
<td>2) Metals, TPH, PAHs</td>
</tr>
<tr>
<td>3) Gas works</td>
<td>3) 15m southeast</td>
<td>3) Metals, TPH, PAHs, phenols, sulphates, cyanide</td>
</tr>
</tbody>
</table>
## Land quality

<table>
<thead>
<tr>
<th>Site considerations</th>
<th></th>
</tr>
</thead>
</table>
| **Potential contamination pathways to site (Conceptual Site Model)** | **Source 1:** A1, A3, B4  
**Source 2:** D6, E1, F7 |

<table>
<thead>
<tr>
<th>Contamination category</th>
<th>Category 3 – assessed as high risk</th>
</tr>
</thead>
</table>

**Summary:** The site is considered less suitable as a single and double main tunnel drive site and a reception/intermediate site with respect to land quality based on the high potential for contamination of the site to have occurred, specifically from the paint works, numerous fuel tanks (AGTs and USTs), fuel stores, active petrol filling station, electricity substations, warehouse and depot on site, and the wharf operations, engineering works and gasworks in the vicinity of the site. These potential contamination sources may impact on construction workers and other offsite human receptors through direct contact and inhalation exposure pathways. Additionally, the potential exists for contaminants to be drawn to the deeper aquifer if deep drilling/construction is undertaken on the site, and for migration to surface water receptors to occur through groundwater transport.

**Notes:**

1. From BGS Geological Model, giving average ground condition profile. Local near surface conditions may vary, particularly within the river.

2. Soil information for urban areas is based on fewer observations than elsewhere in the country. Therefore, a worst case vulnerability (H) is assumed until proven otherwise.

3. Refer to schematic Conceptual Site Model for explanation of site-specific source-pathway-receptors.
Contacts

For information about the Thames Tideway Tunnel

Call: 0800 0721 086 Lines are open 24 hours a day
Visit: www.thamestidewaytunnel.co.uk
Email: info@tidewaytunnels.co.uk

For our language interpretation service call 0800 0721 086

For information in Braille or large print call 0800 0721 086

For information about acceptance of our application and the examination process please contact the Planning Inspectorate.

Call: 0303 444 5000
Visit: http://infrastructure.planningportal.gov.uk