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
C05XE

Leaders Gardens, Putney Embankment
# THAMES TUNNEL

## SITE SUITABILITY REPORT C05XE

### LIST OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1</td>
<td>Purpose and structure of the report</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>Background</td>
<td>1</td>
</tr>
<tr>
<td>1.3</td>
<td>Consultation</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>SITE INFORMATION</td>
<td>2</td>
</tr>
<tr>
<td>2.1</td>
<td>Site and surroundings</td>
<td>2</td>
</tr>
<tr>
<td>2.2</td>
<td>Type of site</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>PROPOSED USE OF SITE – CONSTRUCTION PHASE</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>PROPOSED USE OF SITE – OPERATIONAL PHASE</td>
<td>3</td>
</tr>
<tr>
<td>4.1</td>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>4.2</td>
<td>Restoration and after-use</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>ENGINEERING ASSESSMENT</td>
<td>4</td>
</tr>
<tr>
<td>5.1</td>
<td>Access</td>
<td>4</td>
</tr>
<tr>
<td>5.2</td>
<td>Construction works considerations</td>
<td>5</td>
</tr>
<tr>
<td>5.3</td>
<td>Permanent works considerations</td>
<td>5</td>
</tr>
<tr>
<td>5.4</td>
<td>Health and safety</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>PLANNING ASSESSMENT</td>
<td>5</td>
</tr>
<tr>
<td>6.1</td>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>6.2</td>
<td>Planning applications and permissions</td>
<td>5</td>
</tr>
<tr>
<td>6.3</td>
<td>Planning context</td>
<td>5</td>
</tr>
<tr>
<td>6.4</td>
<td>Consultation comments</td>
<td>6</td>
</tr>
<tr>
<td>6.5</td>
<td>Planning comments</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>ENVIRONMENTAL APPRAISAL</td>
<td>8</td>
</tr>
<tr>
<td>7.1</td>
<td>Introduction</td>
<td>8</td>
</tr>
<tr>
<td>7.2</td>
<td>Transport</td>
<td>8</td>
</tr>
<tr>
<td>7.3</td>
<td>Archaeology</td>
<td>8</td>
</tr>
<tr>
<td>7.4</td>
<td>Built heritage and townscape</td>
<td>9</td>
</tr>
<tr>
<td>7.5</td>
<td>Water resources – hydrogeology and surface water</td>
<td>9</td>
</tr>
<tr>
<td>7.6</td>
<td>Ecology</td>
<td>9</td>
</tr>
<tr>
<td>7.7</td>
<td>Flood risk</td>
<td>9</td>
</tr>
<tr>
<td>7.8</td>
<td>Air quality</td>
<td>9</td>
</tr>
<tr>
<td>7.9</td>
<td>Noise</td>
<td>10</td>
</tr>
<tr>
<td>7.10</td>
<td>Land quality</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>SOCIO-ECONOMIC AND COMMUNITY ASSESSMENT</td>
<td>10</td>
</tr>
<tr>
<td>8.1</td>
<td>Socio-economic profile</td>
<td>10</td>
</tr>
<tr>
<td>8.2</td>
<td>Issues and impacts</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>PROPERTY ASSESSMENT</td>
<td>11</td>
</tr>
<tr>
<td>9.1</td>
<td>Introduction</td>
<td>11</td>
</tr>
<tr>
<td>9.2</td>
<td>Crown Land and Special Land comments</td>
<td>11</td>
</tr>
</tbody>
</table>
9.3 Land to be acquired 11
9.4 Property valuation comments 11
9.5 Disturbance compensation comments 12
9.6 Offsite statutory compensation comments 12
9.7 Site acquisition cost assessment 12

10 SITE CONCLUSIONS BY DISCIPLINE 12
10.1 Introduction 12
10.2 Engineering 12
10.3 Planning 12
10.4 Environment 12
10.5 Socio-economic and community 13
10.6 Property 13

APPENDICES 14
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 TABLE
### LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOD</td>
<td>above Ordnance Datum</td>
</tr>
<tr>
<td>BAP</td>
<td>Biodiversity Action Plan</td>
</tr>
<tr>
<td>BT</td>
<td>British Telecom</td>
</tr>
<tr>
<td>CPO</td>
<td>compulsory purchase order</td>
</tr>
<tr>
<td>CSO</td>
<td>combined sewer overflow</td>
</tr>
<tr>
<td>DLR</td>
<td>Docklands Light Railway</td>
</tr>
<tr>
<td>EA</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>GLA</td>
<td>Greater London Authority</td>
</tr>
<tr>
<td>HGV</td>
<td>heavy goods vehicle</td>
</tr>
<tr>
<td>LNR</td>
<td>local nature reserve</td>
</tr>
<tr>
<td>LPA</td>
<td>local planning authority</td>
</tr>
<tr>
<td>LU</td>
<td>London Underground</td>
</tr>
<tr>
<td>m</td>
<td>metre/metres</td>
</tr>
<tr>
<td>MOL</td>
<td>Metropolitan Open Land</td>
</tr>
<tr>
<td>ONS</td>
<td>Office of National Statistics</td>
</tr>
<tr>
<td>ORN</td>
<td>Olympic Route Network</td>
</tr>
<tr>
<td>PLA</td>
<td>Port of London Authority</td>
</tr>
<tr>
<td>POS</td>
<td>public open space</td>
</tr>
<tr>
<td>PTAL</td>
<td>public transport accessibility level</td>
</tr>
<tr>
<td>SAM</td>
<td>scheduled ancient monument</td>
</tr>
<tr>
<td>SINC</td>
<td>site of importance for nature conservation</td>
</tr>
<tr>
<td>SNCI</td>
<td>site(s) of nature conservation importance</td>
</tr>
<tr>
<td>SSR</td>
<td>site suitability report</td>
</tr>
<tr>
<td>SSSI</td>
<td>site(s) of special scientific interest</td>
</tr>
<tr>
<td>SuDS</td>
<td>sustainable urban drainage systems</td>
</tr>
<tr>
<td>TfL</td>
<td>Transport for London</td>
</tr>
<tr>
<td>TD</td>
<td>tunnel datum</td>
</tr>
<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) (paragraphs 2.3.29 - 2.3.34) outlines the process to be used to create the preferred list of shaft 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, but they depend on the relevance to the site and professional judgement made in the assessments.

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 - Sources of Information, and this level of information is considered to be appropriate to the current stage.

1.1.3 The Background Technical Paper provides information on the requirements for different site types, 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. 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). This is considered in the Preferred Scheme Report.

1.2 Background

1.2.1 The process for selecting sites is set out in the Site Selection Methodology (May 2009) paper. All sites have previously passed through the following parts of Stage 1:

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

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 shaft (and CSO) sites - site data, site visits, site suitability reports, engineering options report and optioneering workshops that will result in the Preferred Scheme Report.

1.3 Consultation

1.3.1 The Thames Water project team held meetings with London local authorities, statutory and other stakeholders to review the provisional short list of shaft and CSO sites. All general and site specific comments can be found in a separate report titled Consultation on the Short List of Sites: Consultation Feedback Report. These comments were considered to help determine the final short list of sites, but they were also considered at the optioneering workshops.

1.3.2 Further meetings were held with London local authorities, statutory and other stakeholders between January and March 2010. Comments are included in this report.
2 SITE INFORMATION

2.1 Site and surroundings

2.1.1 This site is one of the shortlisted sites for West Putney Storm Relief CSO. 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 The site C05XE is located with an area of public open space known as Leaders Gardens, situated in the London Borough of Wandsworth, close to its boundary with the London Borough of Richmond upon Thames. The park is well maintained with a sculpture, café, tennis courts and two play areas. The London Borough of Richmond upon Thames is adjacent to the north of the site and contains the CSO to be intercepted. A site location plan is attached as Appendix 2.

2.1.3 The surrounding area is predominantly characterised by large expanses of protected public open space, river-based sports and leisure facilities, and residential properties. The site is bound to the east by Embankment, the Thames Path and the River Thames. Further east of the site, across the River Thames, is Bishops Park Conservation Area and recreation ground, located in the London Borough of Hammersmith and Fulham. The site is within close proximity to the existing sea cadet facility to the north and bounded by Beverley Brook to the northwest. Beyond Beverley Brook, further northwest of the site, are the Barn Elms School Sports Centre playing fields. The site is bounded to the south by Festing Road and by residential properties on Stockhurst Close and Ashlone Road.

2.1.4 The CSO interception working area is positioned in the most northerly portion of the site, away from the children’s play facility and adjacent to Beverley Brook and the sea cadet facility. This area is covered by dense vegetation and mature trees, which are protected within the conservation area. The construction working area is set at a distance of approximately 18.5 metres from the nearest rear facade of residential properties within Stockhurst Close. These properties are a mix of three-storey flats and two-storey terraced dwellings. Those properties with rear facades orientated towards the CSO site have a communal garden area along the eastern boundary, which is currently screened from the proposed site by existing trees.

2.1.5 The site is covered by a number of designated areas under the Wandsworth Unitary Development Plan, and the London Borough of Richmond upon Thames Unitary Development Plan, including an area of protected Public Open Space, the Thames Policy Area, an Archaeological Priority Area and Conservation Area, and within a Protected Strategic View. All the mapped designations are shown on the planning and environment plans in Appendix 3.

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

2.1.7 There is no road access to the site. Access can be provided to the site from an unnamed road which is off the Embankment. There is no rail network local to the site. There are no existing wharfage/jetty facilities at the site – the site is approximately 50m from the river, although there is a road between the two. A transport plan for the site is attached as Appendix 5.

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

- Mature woodland
- Existing buildings adjacent to the site used by a small business for boat repairs
- Tide barrier on Beverley Brook adjacent to the site.

2.1.9 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.
2.1.10 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 London Clay.

2.2 Type of site

2.2.1 The site C05XE is being considered as a CSO site to intercept the West Putney Storm Relief Sewer CSO (CS05X).

3 PROPOSED USE OF SITE – CONSTRUCTION PHASE

3.1.1 The proposed construction phase layouts for the CSO site 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 CSO site
- potential access point.

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 Photographs of typical activities associated with the CSO site construction phase are provided in Appendix 7. Potential above ground construction features include:
- approximately 3m high hoarding around the site boundary
- welfare facilities, temporary structures, approximately 3m high
- grout plant, approximately 3 to 5m high, including silos
- mobile crane, approximately 30m high (maximum and not for full construction duration).

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

<table>
<thead>
<tr>
<th>Activity</th>
<th>CSO site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of construction period</td>
<td>0.5 to 2 years</td>
</tr>
<tr>
<td>Likely working hours, ie, (night/day/weekend)</td>
<td>12 hrs from 7am to 7pm</td>
</tr>
<tr>
<td>Working days</td>
<td>Mon to Sat</td>
</tr>
<tr>
<td>Primary means of transporting excavated material away from site</td>
<td>Road</td>
</tr>
<tr>
<td>Primary means of transporting materials to site</td>
<td>Road</td>
</tr>
</tbody>
</table>

*There may be feasible opportunities to use barge transport for this site.

4 PROPOSED USE OF SITE – OPERATIONAL PHASE

4.1 Introduction

4.1.1 The indicative operational phase layout for the CSO site is located in Appendix 8 – Operational Phase Layout, and is 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 CSO sites.
4.1.3 The above ground infrastructure at this site is likely to comprise a ventilation column 10m\textsuperscript{a} high and 3m diameter, a ventilation building 5m x 15m x 5m high and a 20m x 10m top structure with openings. The top structure is to provide access and egress into the main shaft and flap valve chamber.

4.1.4 The top structures are envisaged to be finished at a level of 107m\textsuperscript{b} tunnel datum (TD) (7mAOD), and since the ground level mean value at this site is 104mTD (4mAOD), the top structures would be raised to approximately 3m above the current ground level. For further information on the generic layout of this top structure, refer to Appendix 8.

4.1.5 A hardstanding would be provided to the top structures. The site would not be fenced.

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

| Level of inspections and maintenance and likely working hours, ie, (night/day/weekend) - frequency of visits | 1 daytime visit every six months for electrical/instrument inspection. An additional 1 week maintenance period for tunnel/shaft inspection required per 10 years that could be night/day/weekend working. |
| No of traffic movements                                                                                           | 1 van visit every six months. An additional 1 week period of 2 to 10 movements per day (estimated several vans and 2 cranes) every 10 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 to the site for both operational and construction phases could be provided from Ashlone Road, which is directly off the Embankment. The Embankment is a residential road with on-street parking. The site would be 1.9km from the South Circular Road (A205). The shortest route to the A205 would pass over a bridge which is subject to a weight restriction of 16T. An alternative longer route (B349/A306) to the site avoids this bridge.

Rail

5.1.3 There is no rail network local to this site. Putney railway and Putney Bridge tube station would be approximately 1.5km away from the site. However, rail access is not considered to be a significant factor for CSO sites.

\textsuperscript{a} It was anticipated that the ventilation column at shafts sites would be 10m high when the assessment in this report was undertaken. Although this was subsequently changed to 15m high, the assessment was not revised as it was considered that the difference would not change any discipline’s conclusion on the suitability of the site.

\textsuperscript{b} It was anticipated that the elevation of top structures at both CSO and shaft sites would be finished at 107mTD when the assessment in this report was undertaken. Although this was subsequently changed to 104.5mTD, the assessment was not revised as it was considered that the difference would not change any discipline’s conclusion on the suitability of the site.
River

5.1.4 River access and jetty/wharfage facilities are not a requirement for CSO sites. However, the site is within a reasonable distance of the foreshore with a direct road access so there may be feasible opportunities to use barge transport.

5.2 Construction works considerations

5.2.1 No demolition would be required.

5.2.2 The site is within a park (Leaders Gardens) which is covered with mature trees. These would need to be cleared to make way for the drop shaft, culvert from the interception chamber and the construction working area.

5.2.3 Data available on third-party assets and significant utilities show that the main items of concern in this area would be the tide barrier in Beverley Brook and the buildings to the north of the site, comprising a small business for boat repair and a sea cadet centre. Construction methods would be adopted, as appropriate, to mitigate potential settlement of these assets.

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

5.2.5 The interception chamber and connection culvert to the drop shaft would be outside the site boundary. The connection culvert would be approximately 65m long and would cross Beverley Brook. The connection culvert would have to be constructed in ‘open cut’, in stages, across Beverley Brook. The tide barrier would be approximately 35m away from the culvert. The interception chamber would be located to the outside edge of the nearest playing field, north of Beverley Brook.

5.3 Permanent works considerations

5.3.1 The top structures to the drop shaft and flap valve chamber would be 2m above ground level.

5.4 Health and safety

5.4.1 There are no 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 did not identify any planning applications submitted within the last five years applicable to the site.

6.3 Planning context

6.3.1 The following provides a summary of the relevant local planning policies and designations affecting the site. They are taken from the saved policies from the Wandsworth Unitary Development Plan, adopted August 2003 and saved beyond 2008. Policies are also
referred to from the adjoining London Borough of Richmond upon Thames Unitary Development Plan (First Review), which was adopted on 1 March 2005 and saved beyond 2008.

6.3.2 R1 and R2, Thames Policy Area – much of the site is located within a Thames Policy Area. Policy R1 states that within the Wandsworth Thames Policy Area (WTPA), outside the Industrial Employment Areas, Metropolitan Open Land, Putney Embankment Area and the safeguarded wharves, development of sites of 0.5ha and over will only be permitted if it includes a mix of uses. Policy R2 states that development of sites on the Thames riverside within the WTPA defined on the proposals map will not be permitted unless certain provisions and alternative arrangements are made for routes and accesses.

6.3.3 R14, Putney Embankment Policy Area – much of the site is located within the Putney Embankment Policy Area. Policy R14 protects from development that would result in loss of river-based uses and facilities or have a detrimental impact upon the historical character of the area for river sports.

6.3.4 TBE14 and TBE15, Archaeology Priority Area – the site is located wholly within a designated Archaeology Priority Area. Policies TBE14 and TBE15 require provision for archaeological investigation, evaluation and, where applicable, preservation in situ or excavation of remains.

6.3.5 TBE10 and TBE11, Conservation Area – the site is located partly within a Conservation Area. Policies TBE10 and TBE11 do not permit development if it would harm the character, appearance or setting of a conservation area or fail to respect the grain of the area, and also restrict development involving demolition.

6.3.6 Leaders Gardens is an area of Protected and Public Open Space and Play Equipment. Public Open Space is covered by policies ON1, ON2 and ON3, which restrict development leading to loss of open space (or part of open space), allotments, and related environmental and recreational functions. Policy LR1, Play Equipment, does not permit development involving the loss of children’s play facilities unless the council has identified no need for the facilities, or the use gives rise to harm to residential or other amenity and there is an identified need, with the site appropriately relocated.

6.3.7 Policy ON7, Green Chains and Links – Green Chains and links run along the north-western and eastern boundary of the site in-between the Richmond upon Thames and Wandsworth borough boundaries along Beverly Brook. Policy ON7 resists development proposals that would harm the open nature of any open land which could contribute to a Green Chain, or links between open spaces, especially between areas of Metropolitan Open Land and where they would form strategic links with adjoining boroughs.

6.3.8 The nearest residential properties lie to the south, on Stockhurst Close.

6.3.9 Policy GEN12, Housing, states that in determining proposals for development, the council will seek to protect and enhance the character and amenity of residential areas.

6.3.10 The London Borough of Richmond upon Thames is adjacent to the north of the site and contains the CSO to be intercepted. The following policies are therefore of interest:

6.3.11 ENV 26, Thames Policy Area – the area of Richmond to the north and west of the site is situated within Thames Policy Area and is subject to Policy ENV 26, which provides that the council will seek to protect and enhance the special character of the Thames by protecting views and vistas including the individual reaches, ensuring development is of an appropriate scale and design quality that respects and makes best use of the river frontage.

6.3.12 ENV 1, Metropolitan Open Land – the area to the northwest of the site within Richmond is an area of Metropolitan Open Land. Under Policy ENV1, there is a presumption against development that is incompatible with the openness of the Metropolitan Open Land. In considering development within MOL, the council will take into consideration the visual impact on the character of the open land.

6.4 Consultation comments

6.4.1 A series of consultations on the shortlisted sites were held with London local authorities, statutory and other pan-London stakeholders during July to September 2009 and January
to March 2010. This section summarises factual comments that have been made by consultees, and which have informed the SSR assessments.

**London Borough of Wandsworth**

6.4.2 The council stated that there is currently a park and a children's play area on the site and that Beverley Brook is adjacent to the site. It was highlighted that there is a possibility that ecological issues may arise.

**English Heritage**

6.4.3 No comment.

**Environment Agency**

6.4.4 No comment.

**Port of London Authority**

6.4.5 No comment.

**Transport for London**

6.4.6 No comment.

**Other statutory consultees**

6.4.7 No comment.

**6.5 Planning comments**

6.5.1 There are several designations that are applicable on or adjacent to the site. These designations have been identified and described in Section 6.3.

6.5.2 The majority of the site is also designated as a protected public open space. Policies ON1, ON2 and ON3 aim to resist the loss of open space. Use of the site would conflict with these policies and it is likely that replacement or an upgrade of existing open space facilities within the surrounding area may be required by the LPA. Furthermore, Policy LR1 states that the council will prevent the loss of play equipment. However, the site is of sufficient size to locate the works away from the playground, thus avoiding some conflict with Policy LR1. However, the amenity value and enjoyment of this equipment could be temporarily affected by impacts from the construction works such as noise, dust and traffic movements and, given the close proximity to the works, it is unlikely that mitigation would provide a sufficient safeguard.

6.5.3 The entire site is within a designated conservation area. With appropriate mitigation to reduce potential impacts on setting, appearance and local views, the proposal should not cause an unacceptable level of impact; however, some impact is likely. Use of the site may involve the removal of a number of mature trees which currently surround the site. These trees should be retained and protected during the construction works wherever possible, to help screen the construction works and avoid the loss of trees within a conservation area. A detailed heritage assessment is provided in Section 7.

6.5.4 The Thames Tunnel construction works and associated after-use infrastructure should not result in overly prominent development in this location and provided that sufficient screening can be provided and the loss of mature trees minimised, the construction works should not have an unacceptable impact on the visual amenity of the area. It should therefore meet the requirements of Policies R1 and R2. The legacy structures should be carefully designed to ensure they are sympathetic to this location, and well integrated into the existing site and surrounding area.
6.5.5 The proposed scheme would not result in the loss of river-based uses and facilities, and thus should not conflict with Policy R14.

6.5.6 The site is within an archaeology priority area and suitable investigation and remediation works would need to be agreed with the LPA in accordance with policies TBE14 and TBE15. Further appraisal of the archaeological potential on the site is provided in Section 7.

6.5.7 To the north-western and eastern boundaries are Green Chains, protected against development that would harm the open nature of any open land by Policy ON7. The site and surroundings, although designated open space, are well vegetated, screened and unlikely to be considered open in nature, and it may be possible to avoid direct impacts on these designated areas. Thus it is unlikely there would be a conflict with Policy ON7.

6.5.8 The site is also in close proximity to the residential dwellings in Stockhurst Close. The nearest dwellings are 6m from the site edge but are 18.5m from the works area within the site. Residents may experience some loss of amenity due to dust, noise and increased traffic movements from the construction works. Appropriate mitigation would reduce these potential impacts and a control of the construction working hours would also reduce potential disruption.

6.5.9 In addition, the site abuts the Sea Cadets centre to the north. It is possible that these users may also experience some loss of amenity. However, appropriate mitigation, including restricting working hours onsite, would again limit this potential loss.

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 less suitable as a CSO site from a transport perspective.

7.2.2 The site is less suitable as a CSO site as, to achieve highway access, significant amounts of residential on-street parking along Embankment and Festing Road would require removal to provide passing places for construction vehicles. If this cannot be achieved, then the site is likely to be unsuitable for HGVs. The route to access rail encounters similar constraints to the TLRN access route; however, rail transport is unlikely to be feasible for the small volumes of excavated material produced by the site.

7.2.3 The site is less suitable for public transport access, although some workforce parking could potentially be provided onsite.

7.2.4 Traffic management is likely to be required to construct site access, and to divert pedestrian access to the park and some pedestrian routes within Leaders Gardens.

7.3 Archaeology

7.3.1 On the basis of the current information available, and given the extent and high value of archaeological remains in the proximity, this site is considered to be less suitable as a CSO site.

7.3.2 Owing to a lack of previous investigations in the area, the nature and extent of archaeological receptors cannot be confidently identified at this stage. However, on the basis of the information available, which includes recordings of an Iron Age settlement circa 50m north of the site and Neolithic find spots in the locality, it is possible that archaeological receptors of potentially high or medium value may be present within this site.

7.3.3 Peat deposits containing archaeological material have been commonly recorded throughout London in a similar proximity to the Thames. While no direct evidence has been revealed,
given the location of the site and wider evidence for historical occupation along the river, it is a reasonable assumption to suggest that waterlogged remains and peat deposits of high or medium value may be present.

7.4 Built heritage and townscape
7.4.1 On the basis of the information currently available, this site is considered to be less suitable in relation to built heritage as there is the potential for direct impacts upon one conservation area and one protected view. The site is almost wholly located within the Putney Embankment Conservation Area and has the potential to indirectly impact upon Bishop’s Park, a Conservation Area and Registered Historic Park and Garden located on the opposite bank of the river.

7.4.2 Should the site be pursued, the majority of direct or indirect impacts upon these built heritage receptors is likely to be mitigated through a high-quality scheme design and/or screening. However, in respect of the protected view from King Henry VIII’s Mound, Richmond Park, to St Paul’s, and of the potential loss of trees within a conservation area, particular attention would need to be paid to the location of any permanent structures and temporary visual impacts, and the need to fell trees within the site.

7.4.3 From a landscape perspective, the site is also considered less suitable as it is presently covered by trees and vegetation, and removal of mature vegetation is likely to be visually significant, with the potential to adversely affect the character of the site and the character of the frontage to Beverley Brook.

7.5 Water resources – hydrogeology and surface water
7.5.1 In terms of hydrogeology, and on the basis of the current information available, this site is considered to be suitable as a CSO shaft site because the drop shaft is to be constructed in London Clay (non-aquifer), and no impact on the Chalk aquifer is expected. The Chalk piezometric head is likely to be approximately 2.4m above the base of construction and should be taken into account in the engineering design. The superficial deposits at the site comprise alluvium, classified as a minor aquifer, which is likely to be the subject of limited impacts on flow due to sheet piling.

7.5.2 In respect of surface water resources, this site is less suitable because it is located immediately adjacent to Beverley Brook and there is a direct pathway for pollution to the brook, which in turn flows into the River Thames. As such, specific mitigation would be required to prevent pollution.

7.6 Ecology
7.6.1 Overall, the CSO site is considered to be less suitable, due to potential adverse impacts on London BAP habitat ‘Parks, Squares and Amenity Grassland’, and the potential for the site to support reptiles, breeding birds and roosting bats. Subsequently, this site is likely to require extensive ecological surveys and provision of compensatory habitat (potentially involving offsite solutions) if it is selected. Invasive Japanese knotweed is known to occur near the mouth of Beverley Brook and would require treatment prior to construction.

7.7 Flood risk
7.7.1 In terms of flood risk, the CSO site is less suitable, owing to the potential risk of flooding from the River Thames and Beverley Brook, which would require specific mitigation. The site is also constrained by a flood defence feature passing through the site, which would require flood defence consent for any works close to or on the defence.

7.8 Air quality
7.8.1 This site is considered less suitable for use as a CSO site, as there is potential for fugitive emissions of dust during construction to have a perceptible impact at residential properties in close proximity to the site. These impacts could be reduced 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 Based on the information currently available, the site is considered to be less suitable due to the relatively short separation distances between the site and the closest sensitive receptors. The number of vehicles associated with the construction phase and their access route (through residential streets) has the potential to cause disturbance to properties lining those streets. Vibration levels from shaft sinking may give rise to human annoyance at nearby sensitive properties.

7.10 Land quality
7.10.1 The site is less suitable as a CSO shaft site, based on the moderate potential for contamination of the site to have occurred, specifically from the use of the site as a works depot.
7.10.2 This has the potential to impact on site workers and adjacent human receptors through direct contact exposure pathways and, to a lesser extent, volatilisation.

8 SOCIO-ECONOMIC AND COMMUNITY ASSESSMENT

8.1 Socio-economic profile
8.1.1 A summary of population statistics from the 2001 Census for the Thamesfield ward in the London Borough of Wandsworth are presented below and compared with population averages for London and England as a whole:

- Higher rate of full-time employees and self-employed people, which coincides with a lower proportion of unemployed people
- Higher rate of employment in management, professional occupations and associated technical occupations
- Substantially higher proportion of people educated to Level 4/5 (degree level) than the national or London average
- Higher proportion of people aged between 25 and 44
- Higher proportion of white British people than in the rest of the borough or London – around 77% of people were born in the UK.

8.1.2 Overall, this community profile suggests that the population is mainly young professionals.

8.2 Issues and impacts
8.2.1 The greatest impact from a community perspective is likely to be the direct loss of open space within the gardens and the impact on users of the gardens and associated facilities, although the site visit found the proposed site area to have low usage. The remainder of the gardens is also likely to be affected by noise disturbance from the site.

8.2.2 The site is adjacent to a sea cadet centre and boat repair yard to the north and a high-density residential development is opposite the site to the south. Opposite the site to the north is the Barn Elms School Sports Centre. The site visit found the area to be relatively quiet, aside from the constant background noise from planes on the Heathrow flight path overhead. The noise from the use of the site may cause disturbance to local residents and users of the cadet unit and sports centre.

8.2.3 The Putney Embankment is opposite the site to the east. The Embankment is mentioned in several London walking guides and is likely to be a popular route, especially due to the boat races (including the annual Oxford-Cambridge boat race) along the River Thames which pass the site. The site visit confirms pedestrian movement on the Embankment was higher
than in the park. The use of the site may impact on the noise levels on the Embankment and may discourage people from using the route for leisure and recreation.

9 PROPERTY ASSESSMENT

9.1 Introduction

9.1.1 The site under consideration for a CSO site comprises the northern part of Leaders Gardens, a public park in the London Borough of Wandsworth.

9.1.2 The land referencing data indicates that part of the site is registered to the London Borough of Wandsworth, and that part may not be registered. However, it seems likely to be owned in entirety by the London Borough of Wandsworth. The CSO works also involve construction of an interception chamber within the Barn Elms School Sports Centre to the north, which is also owned by the London Borough of Wandsworth.

9.2 Crown Land and Special Land comments

9.2.1 While incomplete land referencing data has been available, the site is part of a park that is managed by and likely to be owned by the London Borough of Wandsworth. It is therefore highly likely that the land will be classified as Special Land under sections 16 to 19 of the Acquisition of Land Act 1981. If this is the case, and if an acquisition cannot be agreed with the freeholder, a Ministerial procedure may be needed after the Order is confirmed. As the whole Order would be subject to the Ministerial procedure, not just this site, the project could be delayed by a minimum period of several months in the best case. In the worst case, the Order might be rejected by the Minister, in which case an Act of Parliament would be needed before the Order could come into effect. This could delay the project for a much longer period and even result in the Order failing.

9.2.2 Until discussions have taken place with the freeholder, it is not known if the acquisition would be agreed. Therefore, there is a risk that if the freeholder will not co-operate, the whole project could be significantly delayed – or even stopped – by the special parliamentary procedure. It would therefore be advisable to discuss the acquisition with the freeholder at an early stage and seek agreement to the acquisition.

9.3 Land to be acquired

9.3.1 The compensation assessment assumes that the worksite and access to it would be acquired temporarily, via the acquisition of new rights for the period of the works stated in the engineering section above. At the end of the works, a smaller area would need to be acquired permanently.

9.3.2 The permanent area required for the operational phase would measure approximately 20m by 20m, and would be sited in the northern corner of Leaders Gardens, with access from Ashlone Road. Rights would be required to construct and operate the interception chamber in Barn Elms School Sports Centre to the north, and also the connecting culvert beneath Beverley Brook.

9.3.3 The land itself is in a corner of Leaders Gardens and the loss of the site, while likely to be unpopular, would not compromise the use of the park to any great extent.

9.3.4 No rights of way or easements have been included in the assessment of this site acquisition cost.

9.4 Property valuation comments

9.4.1 Compensation for the acquisition of new rights is normally based on the diminution in value to the land caused by the acquisition. Compensation for the permanent acquisition of land is normally based on market value. However, compensation for the permanent acquisition of unusual types of property, where there is no general market, can be assessed on the basis of the cost of equivalent reinstatement at a new site, but there must be a genuine intention to reinstate.
9.4.2 If 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, the costs are likely to be relatively low and therefore acceptable.

9.4.3 If compensation is assessed on an equivalent reinstatement basis, then the acquisition costs would be significantly higher, but still acceptable.

9.5 Disturbance compensation comments
9.5.1 This site is unlikely to give cause to any disturbance compensation claims.

9.6 Offsite statutory compensation comments
9.6.1 There are unlikely to be any offsite statutory compensation claims under either Part 1 of the Land Compensation Act 1973 or Section 10 of the Compulsory Purchase Act 1965.

9.7 Site acquisition cost assessment
9.7.1 The acquisition cost is assessed as acceptable.

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 on whether the site moves forward as one of the preferred sites or not.

10.2 Engineering
10.2.1 This site is suitable as a CSO site because it would be of adequate size and would have reasonable (though potentially very long) vehicular access. No demolition would be required. It would be in close proximity to the river and hence to the main tunnel. However, the interception chamber and connection culvert would be outside the site boundary and the culvert would need to cross Beverley Brook.

10.3 Planning
10.3.1 On balance, the site is considered less suitable as a CSO site.
10.3.2 The site is covered by a number of planning and environmental designations. Of these, open space and the potential impacts on the conservation area are of most significance. Use of the site, with mitigation, may be considered acceptable. However, the impact of the loss of open space and the requirement for replacement facilities by the LPA would require further investigation.
10.3.3 The proximity to residential properties and the Sea Cadets facility would also require mitigation.

10.4 Environment
10.4.1 Overall, the site is considered less suitable as a CSO site.
10.4.2 The site is considered suitable from the perspective of hydrogeology.
10.4.3 The site is considered less suitable from the perspective of transport, archaeology, built heritage, townscape, surface water resources, ecology, air quality, noise, land quality and flood risk.
10.4.4 Overall, the site is considered less suitable and further investigation would be required as to whether transport, archaeology, built heritage, townscape, surface water resources,
ecology, air quality, noise, land quality and flood risk impacts could all be adequately mitigated. Likely mitigation considerations would be likely to include:

- **Archaeology** – there is potential for high or medium value archaeology within the site and as such further investigation would be required.
- **Built heritage and townscape** – further investigation to determine whether the scheme would protect and enhance the conservation area in which it is located. Sensitive design and screening to minimise adverse impacts on the character of the park.
- **Transport** – further investigation into the likely feasibility and acceptability of removing significant amounts of residential on-street parking along Embankment and Festing Road to provide passing places for construction vehicles.
- **Ecology** – ecological surveys to confirm the presence of any protected or notable species, and provision of compensatory habitat (potentially involving offsite solutions).
- **Flood risk and surface water** – mitigation to reduce flood risk to the worksite and specific mitigation to prevent pollution of Beverley Brook and the River Thames. Flood Defence Consent for any works close to or on the flood defence feature that passes through the site.
- **Noise** – standard noise barriers are unlikely to be entirely effective and other techniques may be required to reduce construction noise to acceptable levels.
- **Air quality** – measures to ensure dust is adequately mitigated for the closest receptors.
- **Land quality** – any required remediation of contamination (at this moderate risk site) and/or measures to ensure no mobilisation of contaminants retained in situ.

### 10.5 Socio-economic and community

10.5.1 The site is **less suitable** from a community impacts perspective. Due to the proposed CSO site location, the greatest impact from a community impacts perspective is likely to be on the gardens on the site. The loss of a section of the gardens is likely to affect local residents and other open space users. As the site is part of a larger area of open space, the effects of this loss may be limited, although there is also likely to be disturbance to the rest of the gardens through use of the site. Mitigation may involve discussion around noise reduction measures and limiting site working hours.

10.5.2 The sea cadet premises adjacent to the site may be affected by the use of the site, as may the local residents and the Barn Elms sports centre grounds opposite the site. The footpath and embankment adjacent to the site are also likely to be affected by the noise levels from the site. Mitigation adjacent to the site may involve discussion around noise reduction measures and limiting site working hours.

### 10.6 Property

10.6.1 Overall, the site has been assessed as **suitable** as a possible site for a CSO. The acquisition costs should be acceptable.

10.6.2 Should the site be preferred overall, dialogue should take place with the owner at an early stage to establish if the owner would be prepared to agree to the acquisition and on what terms.
APPENDIX 1 – SOURCES OF INFORMATION

Engineering
- Traffic Management and Access Roads/Rail – Scott Wilson
- Access River – BMT
- Third Parties (Shafts/CSOs) – Mott MacDonald and AECOM
- Geology – Thames Water
- Utilities – Thames Water and AECOM
- Construction and Operational Layout Template – London Tideway Tunnels.
- Background Technical Paper – London Tideway Tunnels

Planning
- London Borough of Wandsworth online planning applications database
- Saved policies in the *Wandsworth Unitary Development Plan*, adopted in August 2003
- Saved policies in the *London Borough of Richmond upon Thames Unitary Development Plan (First Review)*, adopted in March 2005

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

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

Water resources – hydrogeology and surface water
- Environment Agency abstraction licence details
- Environment Agency groundwater levels
- Local Authority details of unlicensed abstractors
- Envirocheck

**Ecology**
- Richmond upon Thames Habitat Action Plan for the Tidal Thames
- Multi-Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk - statutory designated sites
- London Wildweb - http://wildweb.london.gov.uk - non-statutory site of importance for nature conservation
- National Biodiversity Network - http://searchnbn.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**
- Envirocheck

**Air quality**
- Local Authority websites
- www.londonair.org.uk/london/asp/default.asp?la_id=&showbulletins=&width=1680
- http://www.airquality.co.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 level

**Land quality**
- Google Maps/Earth
- Site walkover information

**Socio-economic and community**
- Statistics from the Office of National Statistics 2001 Census data
- Leaders Gardens - http://www.wandsworth.gov.uk/Home/EnvironmentandTransport/Parks/Parkscommons/LeadersGardens.htm
- Wandsworth Council - http://www.wandsworth.gov.uk/Home/Environment; and Transport/Parks/Parkscommons/LeadersGardens.htm
- Wandsworth, Chelsea & Fulham Sea Cadets - http://units.ms-sc.org/Wandsworth%20Chelsea%20Fulham/Default
- Putney Walking Guides - http://www.london-footprints.co.uk/wkputneyroute.htm
- http://www.thames-path.org.uk/thames_putney_richmond.html

Property
- Site visit
- Promap, Ordnance Survey and A-Z mapping
- Multimap/Google Earth aerial/satellite photographs
- Mouchel referencing
APPENDIX 2 – SITE LOCATION PLAN
APPENDIX 2
C05XE SITE
SITE LOCATION PLAN

Legend
- Local Authority Boundary
- Short Listed CSO Sites
- CSO (Directly Controlled)

Mapping reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2009. All rights reserved.
Ordnance Survey Licence number 100019345
CH2M HILL accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.

Title:
APPENDIX 2
C05XE SITE
SITE LOCATION PLAN
APPENDIX 3 – PLANNING AND ENVIRONMENT PLANS
APPENDIX 4 – PHOTOGRAPHS OF THE SITE AND SURROUNDINGS
Internal view of the site looking west across the indicative area of works.

View along Stockhurst Close towards the site. The photograph shows the approximate area of the proposed site access onto Ashlone Road from the southwest area of Leaders Gardens near the junction with Stockhurst Close.
View from within the site towards residential properties on Stockhurst Close, in a westerly direction. Indicative works area is located to the northeast.

Internal view of the site taken from the southern part of the site looking north towards the river.
APPENDIX 5 – TRANSPORT PLAN
APPENDIX 6 – SERVICES AND GEOLOGY PLAN
APPENDIX 7 – CONSTRUCTION PHASE LAYOUT
APPENDIX 8 – OPERATIONAL PHASE LAYOUT
VENTILATION COLUMN (CSO)

DIAGRAMATIC REPRESENTATION OF THE STRUCTURE ABOVE CSO SHAFTS

ELECTRICAL CONTROL KIOSK (CSO)

NOTE:
1. STRUCTURE TO BE PROTECTED BY REMOVABLE HANDRAILS IN THE TEMPORARY CASE.
2. POSITION OF COVERS ARE VARIABLE WITHIN 10m FROM THE EDGE OF THE STRUCTURE, AND THE LOCATION IS BASED ON SITE SPECIFIC REQUIREMENT.
3. CLADDING OF VENTILATION BUILDING TO SUIT LOCATION AND AESTHETICS.
4. ALL TOP STRUCTURES TO HAVE:
   - ACCESS STAIRS/LADDER
   - TEMPORARY OR PERMANENT HAND RAILING
5. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
APPENDIX 9 – ENVIRONMENTAL APPRAISAL TABLES

<table>
<thead>
<tr>
<th>Transport</th>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to road network</td>
<td>Site accesses onto Ashlone Road in the north of Leaders Gardens near the junction with Embankment. This is an existing pedestrian entrance which will diversion to maintain access to the park for pedestrians. Ashlone Road is subject to a Ashlone Road and Embankment are subject to 30mph speed limits and are street lit. Ashlone Road has a carriageway width of 8m. Embankment has a carriageway width of 7.8m and contains on street parking (reducing effective carriageway width to 4m). Achievable visibility out of the site access along Ashlone Road is 10m to the south (end of road) and 30m to the north (junction with Embankment). Access to the A205 (TLRN strategic highway network) from Ashlone Road onto Embankment, then along Festing Road, to Lower Richmond Road (becoming Mill Hill Road) and Rocks Lane (A306). This route avoids traffic calming along Queens Ride. Access to the A205 (TLRN strategic highway network) runs through a residential area and is restricted by parked vehicles on both road sides of Embankment (reducing effective carriageway width to 4m) and Festing Road (reducing effective carriageway width to 3.6m). There are no visible restrictions over railway bridge on Rocks Lane. Distance to TLRN 2.2km from site. See Transport Access Plan in Appendix 5.</td>
<td>Pedestrian entrance to the park will need to be relocated to remove conflict between construction vehicles and users of the park. Conclusion: Road access suitable but a new site access will require construction onto Ashlone Road. Access route to the TLRN (A205) will use Embankment and Festing Road which have narrow effective carriageway widths of 4m and 3.6m respectively due to on street parking on both sides. Selective on street parking should be removed to provide passing places for construction vehicles.</td>
<td></td>
</tr>
<tr>
<td>Access to river</td>
<td>River access not required for CSO site. Excavated material would be transferred to a main shaft site by road.</td>
<td>River access not required as excavated material will be transported away by road.</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>Site considerations</td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------</td>
<td>----------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Access to rail</td>
<td>Use of rail is unlikely to be feasible due to the small quantities of excavated material produced by a CSO site.</td>
<td>Route to possible rail link at Clapham Junction runs through a high street area along York Road and under/over several bridges (with no visible restrictions) in addition to the constraints encountered upon accessing the TLRN (A205). Clapham Junction railway sidings at the Traincare Depot accessible using Plough Road.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to railway sidings at Clapham Junction uses the same route to the TLRN (A205); proceeding eastwards along the A205 then onto Putney High Street and Putney Bridge Road. Putney Bridge Road avoids the two 15’0” height restricted rail bridges on the A205. The route continues along the A3, A217, onto York Road and along Plough Road. On return, the A3 is used towards the roundabout with the A219 to avoid the 15’0” bridge on Upper Richmond Road. The route runs through a high street area, and over and under several bridges (with no visible restrictions) in addition to the constraints already identified upon accessing the TLRN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking</td>
<td>Parking could be provided for workforce within the site boundary in Leaders Gardens. On street permit holder and pay &amp; display parking is available within vicinity of site, but is restricted during Mon-Sat 09:30-16:30 for a maximum stay of 4hrs. Some informal parking will be displaced by site access, although it is likely that this can be relocated to surrounding areas on Ashlone Road or Stockhurst Close.</td>
<td>Parking for vehicles within site boundary could be provided. Additional parking on street is unlikely to be adequate for workforce as the maximum stay is for 4hrs Mon-Sat 09:30-16:30. Several informal on street parking spaces will be displaced. Alternative parking may be provided on Ashlone Road and Stockhurst Close.</td>
<td></td>
</tr>
<tr>
<td>Public transport accessibility</td>
<td>PTAL 1-2, as identified within Table 2.3.</td>
<td>PTAL least suitable. Public transport access issues for workforce.</td>
<td></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>Traffic Management</td>
<td>The existing pedestrian entrance to the park will need to be relocated to remove the conflict between construction vehicles and pedestrians. Provision of new parking spaces along Embankment - a change to the restrictions of existing on street parking spaces along Embankment or Festing Road required. Site access will require construction.</td>
<td>Site access will require construction. Pedestrian access to park will require diversion and some pedestrian routes within park. Temporary traffic management in the form of marking out new parking bays along Embankment (if restrictions cannot be changed) and removal of a significant number of spaces along Embankment and Festing Road to create passing places.</td>
</tr>
</tbody>
</table>

**Summary:** The site is considered to be less suitable as a CSO site from a transport perspective.

The site is less suitable as a CSO site as, to achieve highway access, significant amounts of residential on-street parking along Embankment and Festing Road would require removal to provide passing places for construction vehicles. If this cannot be achieved, then the site is likely to be unsuitable for HGVs. The route to access rail encounters similar constraints to the TLRN access route however rail transport is unlikely to be feasible for the small volumes of excavated material produced by the site.

The site is less suitable for Public transport access although some workforce parking could potentially be provided on site.

Traffic management is likely to be required to construct site access, divert pedestrian access to park and some pedestrian routes within Leaders Gardens.
## Archaeology

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designations, including Archaeological Priority Areas</td>
<td>Within the Wandsworth Archaeological Priority Area.</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>Summary of historical uses</td>
<td>The north western end of the site was developed from the late 19th century (a wharf is indicated in some historic maps) and has since been cleared. The remainder of the site appears to have been largely undisturbed, and was transformed from open green field to park land in the early 20th century, and remains parkland today.</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>Potential receptors of very high or high value with the potential to be directly affected</td>
<td>No archaeological receptors are recorded within the area of the site. This does not preclude the possibility of unrecorded archaeological receptors of high value being present within the site. In this case an Iron Age settlement is recorded c.50m north west of the site and Neolithic findspots are recorded elsewhere in the locality. Peat deposits are also likely in this location.</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>Potential receptors of medium value with the potential to be directly affected</td>
<td>No archaeological receptors are recorded within the area of the site. This does not preclude the possibility of unrecorded archaeological receptors of medium value being present 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>Other receptors with the potential to be directly affected</td>
<td>The dewatering of adjacent waterlogged deposits may be an issue considering the close proximity of the site to the 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>Extent of existing disturbance</td>
<td>There is no evidence of any disturbance within the site. Geotechnical data indicates a 5m thickness of made and superficial ground which may include archaeological material.</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>Site considerations</td>
<td>Comments</td>
<td>Mitigation required and conclusions</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
<td>-----------------------------------</td>
</tr>
</tbody>
</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:** On the basis of the current information available, and given the extent and high value of archaeological remains in the proximity, this site is considered to be less suitable as a CSO site.

Owing to a lack of previous investigations in the area, the nature and extent of archaeological receptors cannot be confidently identified at this stage. However, on the basis of the information available, which includes recordings of an Iron Age settlement c.50m north of the site and Neolithic findspots in the locality, it is possible that archaeological receptors of potentially high or medium value may be present within this site.

Peat deposits containing archaeological material have been commonly recorded throughout London in a similar proximity to the Thames. While no direct evidence has been revealed, given the location of the site and wider evidence for historical occupation along the river, it is a reasonable assumption to suggest that waterlogged remains and peat deposits of high or medium value may be present.
### Built Heritage and Townscape

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designations including Conservation Areas, including trees</td>
<td>Listed Buildings&lt;br&gt;Three bollards at junction with Putney Embankment (Spring Passage), Grade II: 230m&lt;br&gt;Locally Listed Buildings&lt;br&gt;Although a Local List is maintained by the borough of Hammersmith and Fulham, this information is not currently available. However, there are no locally listed buildings within 250m of C05XE located within the boroughs of Richmond-upon-Thames or Wandsworth&lt;br&gt;Conservation Areas&lt;br&gt;Fulham Reach Conservation Area: 250m&lt;br&gt;Bishops Park Conservation Area: 100m&lt;br&gt;Putney Embankment Conservation Area: 0m (A large proportion of the site is located within the designated area)&lt;br&gt;Registered Historic Parks &amp; Gardens&lt;br&gt;Bishops Park, Grade II: 200m&lt;br&gt;Locally Listed Parks and Gardens&lt;br&gt;There are no Locally Listed Parks and Gardens within 250m of C05XE.&lt;br&gt;Protected Views&lt;br&gt;King Henry VIII’s Mound, Richmond Park, to St Pauls: 0m (the line of the protected view passes through the centre of C05XE)&lt;br&gt;Local data on protected views is not currently available for the boroughs of Hammersmith and Fulham and Wandsworth.</td>
<td>In the case of listed buildings, conservation areas, registered historic parks and gardens, and protected views, a high quality scheme design and adequate screening for the development may be required, as discussed below.&lt;br&gt;A detailed desk-based assessment in conjunction with archaeology work will be required to further determine the likely impact of the development and to inform more detailed mitigation proposals.&lt;br&gt;On the basis of currently available information (June 2009) and on the basis of certain receptors not being present within 250m of C05XE, mitigation will not be applicable in the case of locally listed buildings and locally listed parks and gardens.</td>
</tr>
<tr>
<td>Potential receptors of medium to very high importance with the potential to be directly affected</td>
<td>There is the potential for one conservation area (Putney Embankment Conservation Area) and one protected view (King Henry Vlll’s Mound, Richmond Park, to St Pauls) to</td>
<td>Mitigation to enhance or preserve the character or appearance of the Putney Embankment Conservation Area is likely to be required. It would require a</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>Built Heritage and Townscape</td>
<td>be directly affected.</td>
<td>high quality scheme design and possible screening in order to mitigate against potential adverse impacts upon the designated area. Furthermore, the development may require the removal of trees from within the site and this will be a material consideration in obtaining consent for the site because of its location within a conservation area. The protected view from King Henry VIII’s Mound, Richmond Park, to St Paul’s passes through the centre of the site, although the area in which permanent structures are proposed lies to the north of the vista and is therefore unlikely to result in any significant impact upon this view. Nonetheless, mitigation through a high quality scheme design (with particular attention paid to the location of construction and operational features of the site away from the line of the view) which ensures that there is no permanent alteration to this protected view is likely to be required.</td>
</tr>
<tr>
<td>Other receptors of lesser importance with the potential to be directly affected</td>
<td>Not Applicable.</td>
<td>Not Applicable.</td>
</tr>
<tr>
<td>Potential receptors of medium to very high importance with the potential to be indirectly affected</td>
<td>There is the potential for one listed building (Bollards at Junction with Putney Embankment) two Conservation Areas (Fulham Reach and Bishops Park Conservation Areas) and one registered historic park and garden to be indirectly affected.</td>
<td>The listed bollards do not share a visual relationship with C05XE and therefore are unlikely to be affected by the scheme or require any mitigation. The Bishops Park and Fulham Reach Conservation Areas are located on the opposite (eastern) bank of the River Thames from C05XE. Views to and from these designated areas are largely screened by mature trees.</td>
</tr>
</tbody>
</table>
### Built Heritage and Townscape

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation around the site (forming part of the Leaders Garden) and along the western bank of the River Thames. As a result the visual relationship between the site and these two conservation areas is limited and it is unlikely that the development of C05XE will result in an indirect visual impact to either conservation area and mitigation is therefore unlikely to be required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Bishops Park registered historic park and garden (Grade II) is located 200m from C05XE on the opposite (eastern) bank of the River Thames. From the boundary of the registered area there likely to be views across the River Thames towards C05XE and therefore mitigation in the form of a high-quality scheme design and/or screening is likely to be required to reduce the visual impact of the site upon this built heritage receptor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other receptors of lesser importance with the potential to be indirectly 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>Site is located within Thames policy Area and Conservation Area Policy TBE10. Sensitive site on Leaders Garden, playground and tennis courts; Beverly Brook and residential properties in Stockhurst Close to the west; residential properties on Ashlone Road and Festing Road to the south; Beverly Brook and Wandsworth Chelsea &amp; Fulham sea cadet Headquarters to the north; Embankment Road and River Thames to the east.</td>
<td>Retention of trees where possible and protection in accordance with BS 5837. Introduction of landscape scheme to include appropriate surface treatments and planting to reinstate vegetated character of site. Removal of mature vegetation and the presence and operation of machinery, materials stores and buildings on site would potentially severely</td>
</tr>
</tbody>
</table>
# Built Heritage and Townscape

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The site is almost entirely covered with mature trees and vegetation. The removal of mature vegetation on site would increase openness and reduce isolation. The presence and operation of machinery, materials stores and buildings is likely to result in temporary, adverse direct impacts on the character of the site and temporary, adverse indirect impacts on neighbouring areas.</td>
<td></td>
<td>impact character of site and frontage to Beverley Brook. This site is less suitable as the proposals would potentially have an adverse effect on its character.</td>
</tr>
<tr>
<td>Potential views likely to be affected</td>
<td>Open views from the rest of Leaders Garden, and from residential properties on Stockhurst Close (depending on extent of tree removal). Partially interrupted views of the site from surrounding properties along Stockhurst Close to the south, partially interrupted views from Beverley Brook and Beverley Brook Path. Potential views from residential properties along Festing Road, should the works area be moved from the current indicative location.</td>
<td>During construction, use of hoardings and appropriate lighting. Design of top structure, vent column, and electrical kiosk to be given careful consideration. Existing trees play large part in screening, therefore, trees to be retained as far as possible. Removal of mature vegetation would be visually significant. This site is, therefore, less suitable.</td>
</tr>
<tr>
<td>Particular considerations on sites where new permanent structures are required</td>
<td>The direct impact of the permanent structures upon the Putney Embankment Conservation Area and the Protected View from King Henry VIII’s Mound, Richmond Park, to St Pauls, will need to be carefully considered. The potential indirect impact of the development upon one registered historic park and garden will also need to be considered.</td>
<td>Any permanent structures will need to be of a high quality design in order that their visual intrusiveness is minimised; screening may also be required. This would be required so that the character or appearance of the Putney Embankment Conservation Area is preserved or enhanced in accordance with planning policy and English Heritage guidance. The construction of permanent structures may necessitate the removal of trees from the site and this will be a material consideration in obtaining consent for the site because of its location with</td>
</tr>
</tbody>
</table>
## Built Heritage and Townscape

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>a conservation area. Similarly, a high-quality scheme design and/or screening may be required to reduce the visual intrusiveness of any permanent structures on the protected view. Of particular importance will be ensuring that no permanent structures fall within the line of the view – the current design proposals show permanent structures to the north and away from the protected view and this should not be altered. Any temporary impacts upon this protected view during construction work will also need to be carefully considered in accordance with planning policy. The scheme design of the permanent structures and/or screening will be required to reduce the visual impact of C05XE upon the setting of the Bishop’s Park Registered Historic Park and Garden.</td>
</tr>
<tr>
<td>Potential issues</td>
<td>Numerous built heritage receptors are located with 250m of C05XE. Of these there is the potential for the Putney Embankment Conservation Area and the protected view from King Henry VIII’s Mound, Richmond Park, to St Pauls, to be directly affected. Indirect impacts may also be experienced by one registered historic park and garden. There is the potential to mitigate against all of these impacts through a high quality scheme design and/or screening.</td>
<td>The scheme design will have to be of a sufficiently high quality and may need to include some screening so that the potential direct and indirect impacts of C05XE upon one conservation area, one protected view and one registered historic park and garden are mitigated against. Of particular importance, any permanent structures will need to be placed away from the line of the protected view from King Henry VIII’s Mound, Richmond Park, to St Pauls. Any temporary visual impacts upon this protected view arising during construction will also need to be carefully considered in accordance with planning policy.</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></td>
<td></td>
<td>considered.</td>
</tr>
</tbody>
</table>

**Summary:** On the basis of the information currently available, this site is considered to be less suitable in relation to built heritage as there is the potential for direct impacts upon one conservation area, and one protected view. The site is almost wholly located within Putney Embankment Conservation Area and has the potential to indirectly impact upon Bishops Park, a Conservation Area and Registered Historic Park & Garden located on the opposite bank of the River.

Should the site be pursued, the majority of direct or indirect impacts upon these built heritage receptors is likely to be mitigated through a high-quality scheme design and/or screening. However, in respect of the protected view from King Henry VIII’s Mound, Richmond Park, to St Pauls, and of the potential loss of trees within a conservation area, particular attention would need to be paid to the location of any permanent structures and temporary visual impacts, and the need to fell trees within the site.

From a landscape perspective the site is also considered less suitable as it is presently covered by trees and vegetation, and removal of mature vegetation is likely to be visually significant with the potential to adversely affect the character of the site and the character of the frontage to Beverly Brook.
## Water resources - hydrogeology and surface water

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
</table>
| Hydrological conditions (Groundwater and Surface Water) | **Geology (thickness):**  
- Superficial Geology and Made Ground (5m)  
- London Clay (47m)  
- Lambeth Group (18m)  
- Thanet sand (8m)  
**Hydrogeology:**  
- Piezometric Level in Chalk Aquifer: ~-25m AOD (~30mbgl) from EA Jan 08 water level contouring | The drop shaft will be constructed to an invert level of approximately 32.43mbgl therefore the shaft will be founded in the London Clay. Piezometric head\(^1\) in the Chalk is approximately 2.43m above the base of the construction. Therefore, pressure would be expected during construction and is to be considered as part of geotechnical design. |
| | **Groundwater Monitoring Location**  
- EA Hydrometry Sites:  
  TQ27-336 - approximately 2.34 km south of the site (water levels to Dec 1994)  
  TQ27-159 - approximately 2.57 km southeast of the site (water levels to March 2009)  
**Watercourses:**  
- Adjacent to River Thames and Beverley Brook | |
| Source Protection Zones (SPZ) and groundwater users | **SPZ**  
- Not located in a Source Protection Zone defined by EA  
**EA Licensed Groundwater Abstractions and Details:**  
- No public water supply  
- 3 licensed abstraction borehole within 2km radius  
*Licence Numbers:*  
1. 28/39/39/0221 (1 borehole)  
2. 28/39/39/0177 (2 borehole)  
*Locations:*  
1. 360m northeast of the site (other side of the River Thames)  
2. 1.36 km southwest of the site (other side of the River Thames)  
**Operator:**  
1. Fulham Football Club Ltd.  
2. Trustees of the Hurlingham Club  
**Abstracted Aquifer Unit:** | A simple volumetric approach has been used to calculate the 400 days travel times of the abstraction borehole. A conservative mean annual recharge of 100mm/year was used to calculate a radius for licensed abstraction boreholes as follows:  
1. 72m  
2. 109m  
As a result, the drop shaft will not be located within either of these catchment areas.
## Water resources - hydrogeology and surface water

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
</table>
| 1. Chalk  
2. Gravel  
**Abstraction Purposes:**  
1. Industrial, commercial and public service (sports grounds/facilities- spray irrigation)  
2. Industrial, commercial and public service (sports grounds/facilities- spray irrigation)  
**Abstraction Quantity (annual):**  
1. 6,500 m³  
2. 15,000 m³  
**Local Authorities (LA)**  
**Unlicensed Groundwater Abstractions and Details**  
- No abstraction borehole within 1km radius inside Hammersmith and Fulham Council  
- No abstraction borehole within 1km radius inside Richmond Upon Thames Council Boundary  
- No abstraction borehole within 1km radius inside Wandsworth Council Boundary  
| Borehole locations and depths  
There are 8 historical records of water wells: 5 deep wells and 3 shallow wells within 1 km radius.  
Depth range: 96.3 – 152.4m  
Depth range: 14.6 – 14.8m  | Not applicable |
| Potential impacts on surface water features  
The site is located adjacent to the River Thames. There is an indirect pathway for pollution to the Thames.  
The site is located adjacent to the Beverley Brook and there is a direct pathway for pollution to this brook.  | Work needs to be undertaken in consideration of Pollution Prevention Guidelines – PPG1, PPG5 and PPS23. |
| Potential impacts on groundwater (resources and quality)  
No impact on groundwater at depth is likely since the drop shaft is to be constructed in London Clay (non aquifer). At shallow depth, the drop shaft is located in Alluvium which is classified as a minor aquifer. Impact on shallow aquifer is likely to be limited where water is | See below (likely types of mitigation measures that will be required) |
## Site Considerations

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely types of mitigation measures that will be required</td>
<td>No mitigation is likely to be required as groundwater is not impacted.</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Potential issues</td>
<td>Potential upward pressure is expected during construction. Limited impact on flow in shallow aquifer due to sheet piling.</td>
<td>Pressure to be considered as part of geotechnical design.</td>
</tr>
</tbody>
</table>

**Summary:** In terms of hydrogeology, and on the basis of the current information available, this site is considered to be suitable as a CSO shaft site because the drop shaft is to be constructed in London Clay (non aquifer), and no impact on the Chalk aquifer is expected. The Chalk piezometric head is likely to be approximately 2.4 m above the base of construction and should be taken into account in the engineering design. The superficial deposits at the site comprise Alluvium classified as a minor aquifer, which is likely to be the subject of limited impacts on flow due to sheet piling.

In respect of surface water resources, this site is less suitable because it is located immediately adjacent to the Beverley Brook and there is a direct pathway for pollution to the brook, which in turn flows into the River Thames. As such, specific mitigation would be required to prevent pollution.
<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ecology</strong> (terrestrial and aquatic)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statutory designations</td>
<td>Leg of Mutton Reservoir and Barnes Common LNRs are within 2km. Barn Elms Wetland Centre SSSI is within 2km.</td>
<td>None required</td>
</tr>
<tr>
<td>Non-statutory designated wildlife sites</td>
<td>Site is adjacent to Beverley Brook from Richmond Park to the River Thames Borough grade II site and Beverley Brook in Wandsworth Borough Grade I site.</td>
<td>Any constructions impinging on Beverley Brook are likely to require compensatory habitat provision. Avoidance of water pollution of the brook would be important.</td>
</tr>
<tr>
<td>BAP priority habitats</td>
<td>London BAP habitat 'Built Up Areas and Gardens' lies within this area. The brook forms part of the London BAP habitat 'Rivers and Streams'. Leaders Gardens is likely to comprise London BAP habitat ‘Parks, Squares and Amenity Grassland’. Reedbeds, a London BAP Priority habitat, are noted to have been planted along Beverley Brook nearby.</td>
<td>Loss of ‘built up/garden habitat’ and ‘Parks, Squares and Amenity Grassland’ may require compensatory provision. No landtake from the river or foreshore, or Beverley Brook, is anticipated. Care will need to be taken to avoid discharge or run-off into the river or Beverley Brook</td>
</tr>
<tr>
<td>Protected or otherwise notable species within the Study Area</td>
<td>Difficult to provide an accurate assessment as aerial photography is obscured by dense tree cover. Site may have potential to support reptiles, breeding birds and roosting bats. No direct impacts on aquatic receptors, although Beverley Brook is likely to provide spawning habitat for fish, and, could have potential for water vole.</td>
<td>Mitigation will be possible but may require off-site provision. If bat roosts were found to be present, mitigation would be required possibly including off-site provision. Careful placement of lighting to minimise illumination of surrounding habitat is likely to be required. Controls may need to be placed on piling operations close to the river bank. Negotiation with EA may be required.</td>
</tr>
<tr>
<td>Potential issues</td>
<td>Course of Beverley Brook known to support stands of Japanese knotweed</td>
<td>Presence of invasive species within 10m of construction site will be noted during any initial site survey. However, eradication could lead to delays in construction programme.</td>
</tr>
</tbody>
</table>
Ecology (terrestrial and aquatic)

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

**Summary:** Overall, the CSO site is considered to be less suitable, due to potential adverse impacts on London BAP habitat ‘Parks, Squares and Amenity Grassland’, and the potential for the site to support reptiles, breeding birds and roosting bats. Subsequently this site is likely to require extensive ecological surveys and provision of compensatory habitat (potentially involving off-site solutions) if it is selected. Invasive Japanese knotweed is known to occur near mouth of Beverley Brook and would require treatment prior to construction.
## Flood risk assessment

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood Risk Zone</td>
<td>Flood Zone 3 (1 in 200 year flood extent) and partly defended to the 1 in 1000 year flood level – there is a residual risk of a breach for which mitigation would need to be considered as part of the FRA. The flood risk to the site is from the Tidal Thames and from the Beverley Brook located to the North West of the site.</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 potentially space for SuDS onsite. The site would need to be investigated for suitability of infiltration SuDS due to the geology of the site.</td>
<td></td>
</tr>
<tr>
<td>Potential issues</td>
<td>There is a flood defence feature running through the site, this would require flood defence consent for any work on or close to the flood defence.</td>
<td>Consultation with the Environment Agency and a flood defence consent.</td>
</tr>
</tbody>
</table>

**Summary:** In terms of flood risk, the CSO site is less suitable owing to the potential risk of flooding from the Thames and the Beverley Brook, which would require specific mitigation. The site is also constrained by a flood defence feature passing through the site, which would require Flood Defence Consent for any works close to or on the defence.
## Air quality

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing Air Quality</strong></td>
<td>The air quality objective for NO2 is exceeded on major roads in vicinity of site. There is a diffusion tube located at the approximate point the site traffic accesses the A205.</td>
<td>There is a nearby diffusion tube for this site, however it cannot be guaranteed the LA will maintain the monitoring point.</td>
</tr>
<tr>
<td><strong>Sensitive Receptors</strong></td>
<td>There are residential properties along the South Circular (A205) and along the access route from the A205 to the site. There are residential properties within 40m of the proposed site on Stockhurst Road, Festing Road and Ashlone Road.</td>
<td>There are relevant air quality sensitive receptors present along the route the construction traffic is likely to take.</td>
</tr>
<tr>
<td><strong>Existing traffic issues</strong></td>
<td>The main traffic issue in this area is exhaust emissions along the A205 corridor.</td>
<td>Additional vehicle emissions have a high potential to interfere with local air quality action plan policies.</td>
</tr>
<tr>
<td><strong>Existing sources of significant air pollutants</strong></td>
<td>See above.</td>
<td>See above.</td>
</tr>
<tr>
<td><strong>Notable gaps in existing air quality monitoring</strong></td>
<td>There is no data available at the likely access to A205 and the nearest existing data indicates existing exceedance of AQLV.</td>
<td>Collect minimum 6 months diffusion tube data at site access to A205 or other point of access to major road network in case the LA removes their tube.</td>
</tr>
<tr>
<td><strong>Potential issues</strong></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 hour Standard dust control measures will minimise the effect of fugitive dust on nearby sensitive receptors.</td>
</tr>
</tbody>
</table>

**Summary:** This site is considered less suitable for use as a CSO site from an air quality perspective, as there is potential for fugitive emissions of dust during construction to have a perceptible impact at residential properties in close proximity to the site. These impacts could be reduced 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>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise band level (from Defra noise maps)</td>
<td>Information from Defra noise maps indicates daytime noise levels of less than 58 dB LAeq and night-time noise levels of less than 50 dB LAeq at residential properties on Horne Way, Stockhurst Close, Ashlone Road and Festing Road, located to the south and south west of the site. The residential properties facing the site are likely to experience low daytime and night-time noise levels due to their remoteness from major roads. 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>Not applicable</td>
</tr>
<tr>
<td>Sensitive Receptors</td>
<td>There are sensitive receptors at a distance of approximately 30m to the south of the indicative works area at Stockhurst Close, and at 80m on Horne Way. Further residential properties are located to the South on Festing Road and Ashlone Road. To the west and northwest of the site are playing fields and to the east of the site, on the other side of the River Thames, is Bishops Park with residential properties beyond on Stevenage Road. Sensitive receptors to the south consist of 3-storey residential dwellings at Stockhurst Close. To the south west there are 6 storey residential flats on Horne Way. There are a large number of sensitive receptors adjacent to the site access route which will considerably be affected by HGV traffic, which includes Ashlone Road. The Thames Path and other recreational facilities lie adjacent to the site.</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
## Noise

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing traffic issues</td>
<td>Local road traffic on Horne Way, Ashlone Road and Embankment coupled with more distant road traffic on the A306 and A219, will contribute to the local noise climate in the area of the sensitive receptors.</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Existing sources of significant noise emissions</td>
<td>Local road traffic, coupled with more distant road traffic on the A306 to the west and the A219 to the south east will contribute to the local noise climate in the area of the sensitive receptors. There are no railway lines or significant industrial noise sources evident in the area.</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Potential issues</td>
<td>Construction:</td>
<td>Adherence to the good site practices provided in BS5228.</td>
</tr>
<tr>
<td></td>
<td>The construction period is estimated at up to 2 years and working hours will be 12 hours per day (7am to 7pm) Monday to Saturday. This has the potential to result in adverse noise impacts upon the sensitive receptors on Ashlone Road and Stockhurst Close to the south of the site. A relatively high number of daily HGV movements are anticipated, and this has the potential to result in adverse noise impacts upon properties on Ashlone Road and at properties at Stockhurst Close and other nearby residential streets. Proposed 3m site boundary fencing will provide useful noise mitigation to some plant and construction activities. Situating plant in the north western or eastern areas of the site would maximise the distance between them and the nearest receptors and minimise the potential disturbance. Vibration resulting from general construction works is not anticipated to result in an adverse impact. The nearest receptors to the proposed shaft location are at a distance of approximately 30m and it is</td>
<td>Siting of noisy equipment and construction activities as far as is practicable from sensitive receptors. Provision of site boundary noise fences if practicable.</td>
</tr>
</tbody>
</table>
## Noise

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>unlikely that vibration levels will result in minor cosmetic damage during shaft sinking. Vibration levels may result in annoyance. Vibration from tunnelling should be considered on a case by case basis at particular sensitive locations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operation: 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:** Based on the information currently available, the site is considered to be less suitable due to the relatively short separation distances between the site and the closest sensitive receptors. The number of vehicles associated with the construction phase and their access route (through residential streets) has the potential to cause disturbance to properties lining those streets. Vibration levels from shaft sinking may give rise to human annoyance at nearby sensitive properties.
## Land Quality

<table>
<thead>
<tr>
<th>Site location</th>
<th>Grid Reference: 523563, 176118</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current site use</td>
<td>The site comprises Leaders Gardens with current plans indicating shaft site in part of the gardens referred to as a ‘separate railed-off tranquil garden which slopes down to Beverley Brook’ on the council website: (<a href="http://www.wandsworth.gov.uk/Home/Environment">http://www.wandsworth.gov.uk/Home/Environment</a> and Transport/Parks/Parkscommons/LeadersGardens.htm). The site comprises amenity grassland and roughly mown amenity grassland, banks/flood plain of the Beverley Brook, semi-mature and mature trees, hedge, bramble and footpath.</td>
</tr>
<tr>
<td>Topography</td>
<td>Site is mostly flat. Slight raised ground in north-western tip of site.</td>
</tr>
<tr>
<td>Field evidence of contamination (i.e., visual/olfactory)</td>
<td>None identified on site.</td>
</tr>
<tr>
<td>Current surrounding land use (immediately adjacent to site)</td>
<td>North/Northeast: See Cadet HQ and adjoining area which appears to function as a boat repair/storage area, possibly associated with CHAS NEWENS MARINE CO LTD, who have a registered office 500m south on Putney Embankment. Beverley Brook (Wharf area and Tide Barrier) at point of confluence with River Thames, Putney Embankment Road, Thames Path and the River Thames beyond. East: Putney Embankment Road, and the River Thames beyond. South: Festing Road and Residential along Ashlone Road and Festing Road. West: Beverley Brook, and 3 Storey Residential on Stockhurst Close.</td>
</tr>
</tbody>
</table>

### Geological and hydrogeological information

<table>
<thead>
<tr>
<th>Geological strata(^3) (Thickness)</th>
<th>Superficial Geology and Made Ground (5m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>London Clay (47m)</td>
</tr>
<tr>
<td></td>
<td>Lambeth Group (18m)</td>
</tr>
<tr>
<td></td>
<td>Thanet sand (8m)</td>
</tr>
<tr>
<td>Underlying aquifer classes (Major/Minor/Non-aquifer)</td>
<td>Non-Aquifer: London Clay Minor Aquifer: River Terrace Deposits, Lambeth Group, Thanet Sands Major Aquifer: Chalk</td>
</tr>
<tr>
<td>Groundwater vulnerability/Soil classification (High/Intermediate/Low/Not applicable)(^1)</td>
<td>River Terrace Deposits - Minor Aquifer High Leaching Potential of Soils (U)1.</td>
</tr>
<tr>
<td>Source Protection Zone details</td>
<td>Not located in a Source Protection Zone defined by EA</td>
</tr>
<tr>
<td>Surface water receptors</td>
<td>Beverly Brook (10m northwest) River Thames (40m northeast)</td>
</tr>
</tbody>
</table>
## Land Quality

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

#### Site history information and historical potentially contaminating activities (based on mapping data)

- **Onsite**
  - Open land, 1862-1895
  - Site is divided by a road, west side is occupied by works yard/depot and east side is occupied by a public garden/park, 1896-1991
  - Wharf, (transport support and cargo handling), (western site boundary), 1920-1972
  - Gardens occupies the whole site, 1991-present

- **Offsite**
  - Electrical sub-stations (closest located 5m west), 1951-1972
  - Tank – contents unspecified, (closest located 130m west), 1913-1952

#### Pollution incidents to controlled waters

- Three
  - Miscellaneous – Unknown, minor incident (115m east), within River Thames
  - Miscellaneous – Other, minor incident (150m southeast), within River Thames
  - Chemicals– Unknown, minor incident (210m south), within Putney Reservoir

#### Landfill sites

- None

#### Other waste sites

- None

#### Registered radioactive substances

- None

#### Fuel stations/Depots

- None

#### Contemporary trade entries

- No data
  - Stained glass designers and producers, active, (70m southwest)
  - Domestic cleaning service, inactive, (120m west)
  - French polishing, active, (175m southwest)
  - Lighting manufacturers, active, (175m southwest)
  - Laundry equipment manufacturers and suppliers, inactive, (180m southwest)

### Site classification based on above information

<table>
<thead>
<tr>
<th>Potential site contaminants derived from surface sources (eg, contaminants in made ground)</th>
<th>Activity</th>
<th>Distance and direction to site</th>
<th>Contaminants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Some potential for made ground from potential filling operations during development 2) Wharf operations (transport support and cargo handling) 3) Works yard/depot</td>
<td>1) Onsite and directly adjacent to site 2) Onsite 3) Onsite</td>
<td>1) Metals, PAHs, TPH 2) Metals, TPH, PAHs 3) Metals, TPH, PAHs</td>
<td></td>
</tr>
</tbody>
</table>
## Land Quality

### Potential site contaminants derived from offsite sources and transported to site

<table>
<thead>
<tr>
<th>Source Pathway-Receptor Risk Assessment at CSO Construction Stage (Conceptual Site Model)²</th>
<th>Source 1:</th>
<th>Source 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Electrical substations 1) 5m west 1) PCBs</td>
<td>A1, A2, A3, B4, C5</td>
<td>D6, E1, F7</td>
</tr>
</tbody>
</table>

### Identified source-pathway-receptor risk assessment at CSO construction stage (Conceptual Site Model)²

- **Contamination category**: Category 2 – assessed as Medium Risk
- **Conclusion**: The site is less suitable as a CSO shaft site based on the moderate potential for contamination of the site to have occurred, specifically from the use of the site as a works depot. This has the potential to impact on site workers and adjacent human receptors through direct contact exposure pathways, and to a lesser extent volatilisation.

### Notes:
1. 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.
2. Refer to schematic Conceptual Site Model for explanation of site-specific source-pathway-receptors.
3. From BGS Geological Model giving average ground condition profile. Local near surface conditions may vary, particularly within the river.
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