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
S82NM

Thames Water Beckton
Sewage Treatment Works
THAMES TUNNEL

SITE SUITABILITY REPORT S82NM

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<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>
INTRODUCTION

Purpose and structure of the report

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.

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.

The Background Technical Paper provides information on the requirements for different site types, their sizes and typical activities/facilities within the sites.

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.

Background

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.

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.

Consultation

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.

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

2.1.2 Site S82NM occupies land within the boundary of Beckton Sewage Treatment Works (STW), on the north bank of the River Thames within the London Borough of Newham. A site location plan is attached as Appendix 2.

2.1.3 The River Roding bounds the site to the east. A green chain route, which is a designated public right of way and recreational footpath, is located along the river, on the site’s eastern boundary. Beyond this is a large timber yard and other warehouse uses. To the south of the site is the River Thames, stretching over half a kilometre across to the opposite shore in Greenwich. To the west of the site is a tract of derelict land and a mixture of business parks and retail parks.

2.1.4 The closest residential dwellings to the proposed works are 86 Westminster Gardens (~900m) and 36 Curzon Crescent (~900m).

2.1.5 The site is covered by various planning and environment designations in the Newham Unitary Development Plan. 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 The site can be accessed by road via Royal Docks Road (A1020), Eric Clarke Lane and Jenkins Lane. It is 1.2km from Transport for London Road Network (A13). There is a restricted direct access from the A13. There is no rail network local to the site. The site is 11km to Angerstein Wharf via Blackwall Tunnel, which has height restrictions. The nearest Docklands Light Railway stations (Gallions Reach and Beckton) are approximately 3km from the site. The site has direct access to river frontage. There are existing wharfage/jetty facilities at the site. 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:

- The site is within Beckton Sewage Treatment Works and there are both disused and operational infrastructure serving the site
- Northern Outfall Sewer (emergency overflow section) through the middle of the southern half of the site
- Overhead pylon.

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 the Chalk.

2.1.11 It is understood that Transport for London is planning to extend the Dagenham Dock DLR line and that the Thames Gateway Bridge could be built in that area and affect the works. The exact route of the DLR extension and the bridge location are at present unknown. If this site is selected, there would be dialogue with TfL and the other relevant authorities to consider matters if applicable, such as timing, engineering constraints, cumulative effects of the projects, potential for site sharing, etc.

2.2 Type of site

2.2.1 The site S82NM is being considered as a main shaft site.

2.2.2 This location represents the termination of the main tunnel and is within Thames Water owned land. The principal usage would be as a main drive site. However, it could be used
as a main reception site (ie equivalent to an intermediate shaft site set-up). For the purposes of this evaluation, only the main shaft site set-up is considered.

3 PROPOSED USE OF SITE – CONSTRUCTION PHASE

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

3.1.2 The construction phase layout drawings are illustrative and show:
- the layout as a main site
- potential access points.

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

3.1.4 Drawings of typical activities associated with the shaft 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
- gantry crane, approximately 8m high.

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

<table>
<thead>
<tr>
<th>Activity</th>
<th>Main shaft site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of construction period</td>
<td>6 to 7 years</td>
</tr>
<tr>
<td>Likely working hours, ie (night/day/weekend)</td>
<td>24 hours</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>Barge</td>
</tr>
<tr>
<td>Primary means of transporting materials to site</td>
<td>Road/barge</td>
</tr>
</tbody>
</table>

4 PROPOSED USE OF SITE – OPERATIONAL PHASE

4.1 Operational requirements

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

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

4.1.3 An overflow culvert would not be required as overflow would be provided from the Lee Tunnel shaft.

4.1.4 The above ground infrastructure at this site is likely to comprise a ventilation column 10m\(^a\) high and 3m diameter, a ventilation building 5m x 15m x 5m high and a 20m x 10m top

\(^a\) 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
structure with openings. The top structure is to provide access and egress into the main shaft and flap valve chamber.

4.1.5 The top structures are envisaged to be finished at a level of 107m\(^b\) 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.

4.1.6 Hardstanding would be provided to the top structure and this would probably be incorporated within the Lee Tunnel hardstanding.

4.1.7 The operational phase layout drawing shows the permanent works boundary (inclusive of the ventilation building, top structure, hardstanding and ventilation tower) fenced off with a gate. In practice, this may not be required as the site is within Beckton STW.

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

<table>
<thead>
<tr>
<th>Table 4.1 Operational phase data</th>
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</thead>
<tbody>
<tr>
<td><strong>Level of inspections and maintenance and likely working hours, ie, (night/day/weekend) - frequency of visits</strong></td>
</tr>
<tr>
<td><strong>No of traffic movements</strong></td>
</tr>
</tbody>
</table>

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 There are existing roads that can be used to access the site. Eric Clarke Lane, which is off Royal Docks Road (A1020), leads to the Beckton STW entrance gate on Jenkins Lane. There are existing roads within Beckton STW that can serve the site. The site is 1.2km from Transport for London Road Network (A13). There is a restricted direct access from the A13.

5.1.3 For the construction phase, use of existing roads throughout the working site is possible, widened/strengthened as necessary. Traffic management may be required to facilitate the construction vehicle movements throughout the existing worksite.

5.1.4 For the operational phase, access would be off Eric Clarke Lane, via the current treatment works road infrastructure.

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revised as it was considered that the difference would not change any discipline’s conclusion on the suitability of the site.

\(^b\) 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.
5.1.5 There is no usable rail network local to this site. The site is 11km to Angerstein Wharf via Blackwall Tunnel, which has height restrictions. The nearest Docklands Light Railway stations (Gallions Reach and Beckton) are approximately 3km from the site.

5.1.6 There are existing wharfage/jetty facilities serving the site. At this stage, and pending further investigations into the possibility of developing those facilities for use on this construction, it is assumed that new jetty/wharfage facilities would be provided and these are as indicated on the construction layout plan, though integration of the existing facilities is likely to be beneficial. The river is wide, with limited tidal movements at this location, and there are no apparent constraints to the construction of these facilities and the associated barge movements.

5.1.7 However, there would be an impact on river usage/navigation. It would be necessary for this to be examined in detail in the form of a specific risk assessment (including modelling of barge movements), which would require discussions with and approval of the PLA.

5.2 Construction works considerations

5.2.1 The site is within Beckton Sewage Treatment Works and is constrained by existing infrastructures serving the treatment works. There are foul mains and sludge mains close to the shaft and these may need to be diverted.

5.2.2 Disused buildings and treatment plant in the vicinity would need to be demolished to create a working area for the shaft. A Grade I listed building would also need to be removed and reinstated after completion of construction.

5.2.3 The site set-up and access used for the Lee Tunnel shaft could be utilised for the Thames Tunnel shaft.

5.2.4 The shaft is in close proximity to the Lee Tunnel shaft. The Lee Tunnel shaft should be accessible for maintenance during construction of the Thames Tunnel shaft.

5.2.5 Adequate measures should be taken to ensure that the construction of the shaft and the tunnel would not have a significant impact on the operation of Beckton STW.

5.2.6 There is a proposal to provide a tunnel connection between the Thames Tunnel shaft and the Lee Tunnel shaft. The one shaft diameter gap between the Thames Tunnel shaft and the Lee Tunnel shaft is considered to be adequate to construct the connecting tunnel and allow maintenance of both shafts.

5.2.7 It is assumed that there would be no overflow culvert on the Thames Tunnel shaft as one would exist on the Lee Tunnel shaft.

5.2.8 Enabling works would include the removal of disused treatment structure that currently occupies the proposed shaft location.

5.2.9 Available data on third-party assets show that the main assets of concern are the Lee Tunnel shaft, existing infrastructure serving Beckton STW (primarily the operations building and associated buildings), overhead cables and the proposed Docklands Light Railway extension. Construction methods would be adopted, as appropriate, to mitigate potential settlement of these assets.

5.2.10 The shaft is located away from the Northern Outfall Sewer, but weight restrictions may have to be imposed to ensure that construction vehicles would not damage the bridge structures.

5.2.11 The shaft is located adjacent to one of the proposed Docklands Light Railway extension alignments. It is possible that one may impact the other and further assessments would be required.

5.2.12 The shaft would be located in an area occupied by sewage treatment plant and sludge holding tanks. It is possible that the ground in the area could be contaminated.
5.2.13 The excavated material taken away from the site and construction material coming into the site via the river may pass through an area that is of interest to the Environment Agency. Discussions with the Environment Agency would be required when developing the wharfage/jetty facilities, to allow the construction of the shaft.

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

5.3 Permanent works considerations

5.3.1 The top structure would be raised to approximately 1m above ground level.

5.3.2 No overflow would be required, as one would exist on the adjacent Lee Tunnel shaft.

5.3.3 The fence/hardstanding area could potentially be modified to incorporate the Lee Tunnel permanent works.

5.3.4 There is potential for integrating the ventilation building and surrounding infrastructure for both the Thames Tunnel and Lee Tunnel shafts.

5.3.5 The top structure as shown on the operational phase layout could be modified and reduced in size for this site since there is no requirement for housing an overflow infrastructure.

5.4 Health and safety

5.4.1 It is possible that the ground at the shaft location may be contaminated.

5.4.2 There are existing overhead cables in the area.

5.4.3 Work would take place within wastewater treatment works, where workers could be exposed to potentially fatal diseases, such as leptospirosis (Weil’s disease).

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

6 PLANNING ASSESSMENT

6.1 Introduction

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

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

6.2 Planning applications and permissions

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

6.2.2 Planning Application Reference 08/01159/LTGDC – this application is for the Lee Tunnel and Beckton STW extension scheme, incorporating the following elements pursuant to Beckton STW:

1. Shafts and a pumping station associated with the construction and operation of the Lee Tunnel; additional preliminary, primary, secondary sewage treatment and sludge treatment facilities, including buildings, structures, plant, underground connection pipe lines and associated works; odour control units; security gatehouse; wind turbine; tree felling; landscaping and habitat creation; excavation and land remediation.

2. Associated temporary construction compounds; material storage and handling areas and tanks; hardstandings; parking areas; the manufacture of concrete tunnel and shaft segments; temporary portable site offices and welfare accommodation at Beckton STW and a jetty bridge for construction purposes.

The application was submitted on 2 June 2008 and was approved on 1 December 2009.
6.2.3 Planning Application Reference 08/01162/FUL – this application is for the Lee Tunnel and Beckton STW extension scheme, incorporating the following elements within the London Borough of Newham: An underground wastewater storage and transfer tunnel (Lee Tunnel) between London Thames Gateway Development Corporation boundary east of Jubilee Line railway and Royal Docks Road. The application was submitted on 2 June 2008 and was approved on the 1 December 2009.

6.2.4 Planning Application Reference 05/0291/FUL – this application is for construction of a water distribution pipeline and the use of land for associated temporary construction activities (the application is accompanied by an Environmental Statement). The application was submitted on 23 February 2005 and is pending a decision.

6.2.5 Planning Application Reference 04/1002/FUL – this application was for construction of a water treatment plant, incorporating desalination technology, an intake from the River Thames and electricity substation, the laying of a water distribution pipeline within the STW, ancillary landscaping and access works, retention of the pilot plant for operational purposes and the use of land in connection with construction activities. Planning permission was refused on 28 June 2005 but an appeal was upheld and permission was granted on 15 July 2007.

6.2.6 Planning Application Reference 04/0593 – this application was for the approval of details pursuant to conditions attached to Planning Consent 03/0181.

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 London Borough of Newham Unitary Development Plan, which was adopted June 2001 and saved beyond 2008.

6.3.2 Policy EQ4, Quality of Waterside Development – a large proportion of the proposed site is designated as part of the Thames Policy Area, namely those areas close to or including a river frontage. Policy EQ4 aims to secure enhancements to the environmental quality and local character of the Thames Policy Area. Enhancements include such elements as design, recreation space, ecology, conservation and contributions to the vitality of the river.

6.3.3 Policy OS2, Green Belt and Metropolitan Open Land (MOL): Protection and Enhancement – the site is entirely designated as MOL. Policy OS2 restricts development or land use that would not improve or maintain MOL.

6.3.4 Policy EQ9, Protection of Sites of Nature Conservation Importance – the site contains a small area to the east protected as a Site of Nature Conservation Importance. Policy EQ9 explains that development that would have an adverse effect on such sites will not be permitted. Proposals on adjoining land will be considered on their impact and, where necessary, mitigation measures proposed.

6.3.5 Policy EQ12, Creation of Sites of Nature Conservation and Importance – the site is entirely within an Area of Nature Conservation Deficiency. Policy EQ12 explains that the council will seek to create further sites of nature conservation importance, having particular regard to those areas with a nature conservation deficiency.

6.3.6 Policy EQ15, Tree Planting in New Development – a large proportion of the site is designated as an Area of Deficiency in Tree Coverage. Policy EQ15 states that, where appropriate, tree planting will be required in new developments and made a condition of any planning permission. In areas of deficiency in tree coverage, a higher density of coverage may be required.

6.3.7 Policy EQ 16, Green Corridors – the site contains a Green Corridor, which runs through the southwest of the site. The policy requires development proposals to positively contribute to the council’s environmental improvement objectives, with particular attention to landscaping, boundary treatment and other structures adjoining waterways.

6.3.8 Policy OS7, Green Space – the site contains an area designated as a Green Space, which runs through the southwest of the site. This policy safeguards such areas by permitting only suitable development for recreation, leisure or nature conservation purposes. These are considered where an equivalent replacement facility is provided, there would be no loss
of environmental amenity, or where green spaces are outside the areas of Local Park Deficiency.

6.3.9 Policy EQ43, *Archaeology: Investigation, Excavation and Protection* – the site is entirely within an Archaeological Priority Area. The council will promote the conservation, protection and enhancement of the archaeological heritage of the borough. Developers of sites of potential archaeological importance will be required to produce a written report, as part of the application for planning permission, on the results of an archaeological assessment or field evaluation. When remains of importance are identified, the council will seek preservation of the remains in situ.

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 Newham**

6.4.2 The council stated that infrastructure is in place at the site. Existing designations include Metropolitan Open Land and Sites of Nature Conservation Importance. Further consideration will need to be given to how the shaft site will be accommodated within the site, given the existing structures and the proposed extension of sewage treatment works. This will include ensuring that the impact on the adjacent Sites of Nature Conservation Importance is minimal and that water transport is utilised during the construction process. The council advised that there should be minimal disruption to designated footpaths during the construction phase (the path along the river is closed for the Lee Tunnel Project) and transportation by road should be minimised or avoided. The council would seek continued involvement at the design stage of the project.

**English Heritage**

6.4.3 English Heritage stated that the Grade II listed Beckton Chimney is situated on the site.

**Environment Agency**

6.4.4 The Environment Agency stated that there are issues with the outflows into the River Roding. The Environment Agency advised that a range of mitigation measures have been agreed for the Lee Tunnel.

**Port of London Authority**

6.4.5 The Port of London Authority stated that the site is fine and the jetty is sound.

**Transport for London**

6.4.6 The network assurance team would seek confirmation of construction traffic, construction traffic routes and possible traffic management requirements. The site is located near to highly sensitive (TLRN/SRN) traffic routes, for example the A13 DBFO Road and A406, which is also an Olympic Route Network (ORN) Venue route. It is an extremely busy part of the network. Works would need to be co-ordinated as early as possible with other planned works/events on the network in the area. Residential properties are in close proximity to the site and noise considerations may lead to working hour restrictions by the local authority.

6.4.7 The borough co-ordination team stated that the site is currently included, in part, within the Docklands Light Railway (DLR) Dagenham Dock extension alignment and must be protected to safeguard this alignment. It has been recommended by the DLR that an agreement is reached with Thames Water which regulates the interface between DLR’s alignment and the works included within the Thames Tunnel programme. Thames Water and the DLR are currently discussing the interface.
Other statutory consultees

London Thames Gateway Development Corporation

6.4.8 The London Thames Gateway Development Corporation (LTGDC) advised that there are a number of relevant designations and considerations, including: the site is safeguarded as a Waste Management Site (Policy EQ55); proposed cycle network; proposed recreational footpath network; TGB safeguarding; transport corridor safeguarding (ie, for an alternative to ELT2) and safeguarding of current alignment of the DLR Dagenham Dock extension. The area surrounding Beckton Sewage Treatment Works (London Riverside and Royal Docks) is identified in the Consolidated London Plan for the development of up to 34,000 new homes and 19,500 jobs. Accordingly, the impacts on this proposed population, as well as the existing population, will need to be considered, particularly with respect to odour impacts. The LTGDC advised that the proposal should fit in with other proposals for Beckton, for example, the Beckton extension and Lee Tunnel. It is also advised that the DLR extension should be considered. The LTGDC stated that it is their understanding that there will be no intermediate shaft sites in the LTGDC area.

6.5 Planning comments

6.5.1 A number of planning designations are applicable, both on and adjacent to the site. These designations have been identified and described in Section 6.3. From these designations, those relating to industrial uses, contaminated land, archaeology and nature conservation are of most relevance to the proposed development.

6.5.2 The decision on the Lee Tunnel and Beckton STW extension is of significant importance for the potential use of the site for the Thames Tunnel Project. Approval of the Lee Tunnel and Beckton STW extension scheme establishes the acceptability, in principle, for this type of development.

6.5.3 The site is entirely designated as MOL. The proposed development is unlikely to conflict with the designation, since all construction works are sited among the existing infrastructure of the sewage works. It is therefore unlikely to unacceptably impact on the openness of the site.

6.5.4 Green corridors and green space are located at the southwest areas of the site. The initial construction layout plans should not encroach on these designated areas, and consideration would need to be given to minimising disruption to designated footpaths.

6.5.5 Given the nature and visual impact of the existing onsite operations, the Thames Tunnel construction works are unlikely to have a detrimental impact on the visual amenity of the area. The remaining above ground structures are also unlikely to result in overly prominent development in this location and therefore should not conflict with the Thames Policy Area.

6.5.6 The shaft working areas are proposed more than 1,400m away from the nearest residential properties in Windsor Terrace. This is a significant separation distance and it is therefore unlikely that residential amenity would be adversely impacted upon by the construction works.

6.5.7 The site falls within a designated Archaeology Important Area. Any investigative and remedial requirements would need to be agreed with the LPA in accordance with policies D31 and D30 respectively. Further appraisal of the archaeological potential on the site is provided in Section 7.

6.5.8 The proposal site is adjacent to the River Thames, a designated Site of Importance for Nature Conservation. This is a general designation, covering the entire River Thames. The purpose of Thames Tunnel Project is to improve the overall environmental condition of the river which, among other gains, will promote biodiversity. Construction activity adjacent to and within the river, with the appropriate level of mitigation, is considered unlikely to adversely impact upon or conflict with the aims of this designation. However, a fuller assessment of the likely impact on the immediate location is included in Section 7.
7 ENVIRONMENTAL APPRAISAL

7.1 Introduction

The following sections summarise specialist assessments which are provided in Appendix 9 – Environmental Appraisal Tables.

7.2 Transport

The site is suitable as it would utilise an existing access for Beckton Sewage Treatment Works. Access to the TLRN (A13) is suitable for HGVs, with no visible restrictions along the route. The route to the potential rail access point at Angerstein Wharf is less suitable, due to the long distance and the height restrictions through the Blackwall Tunnel. An alternative route via Woolwich Ferry is also restricted.

The site is located adjacent to the river and would require the construction of two new jetties in place to transfer materials, although it is likely that infrastructure including jetties established for the preceding Lee Tunnel Project would be reused.

There is limited potential for the workforce to utilise public transport to access the site. Onsite parking could be provided for the workforce and informal on-street parking along Jenkins Lane is possible as there are no visible restrictions (although unlikely to be supported by the local authority). No traffic management requirements are identified at this stage.

7.3 Archaeology

The site is suitable. Research undertaken for the preceding Lee Tunnel Project suggests that receptors onsite are likely to be of medium value, although this does not preclude the presence of archaeological receptors of potential high value on the site.

Peat deposits containing archaeological material have been commonly recorded throughout London in a similar proximity to the River Thames. Investigations in adjacent sites and on the Beckton Rectangle suggest that alluvial deposits containing archaeological material are likely to be present and these would require mitigation before construction proceeds.

7.4 Built heritage and townscape

This site is suitable because of relatively few impacts upon the historic built environment and townscape. However, a direct impact upon one Grade II listed chimney adjacent to the site is possible. The chimney is due to be temporarily dismantled to protect it during the construction of the Lee Tunnel and it may be stored away from the site during the construction period. The post construction impact could be mitigated through a high quality scheme design (with particular attention paid to the location of operational features and their relationship with the listed chimney) and/or screening. The project team should note that this chimney has already proved to be an important constraint upon the Lee Tunnel Project at the same location.

Further impacts upon the character of the site, the River Thames and its frontage could also be mitigated through the scheme design and appropriate landscaping. Consideration would need to be given to any agreed mitigation for the Lee Tunnel Project with regards to the listed chimney, as these measures may also successfully mitigate any adverse impacts upon the listed chimney arising from the development of S82NM – Main.

7.5 Water resources – hydrogeology and surface water

In terms of hydrogeology, the site is suitable because although the construction of this main shaft would take place within Chalk (major aquifer), the site does not lie within 400-day capture zones of licensed abstractions. No long-term impact on the Chalk aquifer is expected, although dewatering of the Chalk, Thanet Sands and superficial deposits would be required during the construction phase. The Chalk piezometric head is likely to be approximately 65m above the base of construction and should be taken into account in the engineering design.
7.5.2 In terms of surface water resources, this site is suitable because there is no direct pathway to the River Thames and the River Roding for pollution, although standard mitigation would be required.

7.6 Ecology (terrestrial and aquatic)
7.6.1 The site is potentially suitable as the foreshore structures (jetties, etc) from the preceding Lee Tunnel Project would presumably be reused for the Thames Tunnel and no additional land-take impacts on the foreshore would be likely. Negotiation with the EA is likely to be required if any additional impacts are anticipated.

7.7 Flood risk
7.7.1 This site is less suitable as there may be constraints on SuDS, due to space and suitability for infiltration. However, the site is protected from the one in 1,000-year flood level.

7.8 Air quality
7.8.1 This site is suitable for use as a shaft site as there is sufficient distance from the site to potential dust sensitive receptors that there is a low risk of a perceptible impact at the nearest residential receptors, provided standard dust control measures are in place. There is potential for HGV movements on the local road network to cause localised air quality impacts, however this can be mitigated by minimising the movement of HGVs during peak hours.

7.9 Noise
7.9.1 This site is suitable as the distance between the site and the nearest residential properties is large and disturbance from noise or vibration is highly unlikely. The number of HGV movements is high but the haul road does not pass by any residential receptors and therefore is unlikely to result in disturbance.

7.10 Land quality
7.10.1 The site is considered less suitable with respect to land quality, based on the high potential for contamination of the site to have occurred with gas works, depots and numerous storage tanks in the vicinity of the site.

8 SOCIO-ECONOMIC AND COMMUNITY ASSESSMENT

8.1 Socio-economic profile
8.1.1 The site is located within the Beckton ward of the London Borough of Newham. Statistics from ONS 2001 Census data show the following indicators for the ward, in comparison to the rest of Newham, London and England as a whole:

- Higher percentage of economically active, aged people that are full-time employees than the borough as a whole, but a lower percentage than the London or national average
- Slightly lower percentage of unemployed people in the ward than the borough as a whole, but a higher percentage than in the city and country
- Percentage of people who have achieved Level 4 or 5 educational qualifications is slightly higher than in the borough as a whole; the figure is significantly below the percentage for London but higher than the national average
- Age profile for the ward is roughly similar to that of the borough as a whole and England
- Predominantly white British residents, however the area also has significant proportions of African and Caribbean people.

8.1.2 These statistics indicate that the population in this area, although less deprived than the majority of the borough, is still well below the national averages in terms of employment. The ward is also ranked well below the national average in terms of the income and health.
of the local population. Educational standards are, however, in line with the national average.

8.2 Issues and impacts

8.2.1 The use of part of the Beckton Sewage Treatment Works site for a main shaft appears likely to have only a limited number of potential issues and impacts on the local community.

8.2.2 The greatest potential issues appear likely to be associated with the potential impact on the green chain route, a designated public right of way and recreational footpath which runs adjacent to the site to the east along the edge of Barking Creek. The creek itself may also have a value to local water sports enthusiasts. Barking Creek Barrier is a visitor attraction, and works on the site may affect visitor numbers.

8.2.3 The commercial and retail uses at Jenkins Lane Retail Park to the north, Tesco to the west and Gallion’s Reach to the southwest may face disruption from the works. The level of disruption, however, is likely to be low due to the size of the works area in comparison to the site and the amount of buffer area between the works and these receptors.

9 PROPERTY ASSESSMENT

9.1 Introduction

9.1.1 This site comprises an area within Beckton Sewage Treatment Works.

9.1.2 This is an operational pumping station and sewage works, owned and managed by Thames Water.

9.2 Crown Land and Special Land comments

9.2.1 While the land at the sewage works is likely to be Special Land, no problems are foreseen as Thames Water has control of it.

9.3 Land to be acquired

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

9.3.2 It is assumed that Thames Water is the owner of the entire site. National Grid do own part of the sewage works, however it appears that this would not form part of the site.

9.3.3 The portion of the site that would be used may be operationally required by Thames Water, however this is an internal matter.

9.3.4 Thames Water has previously investigated the possibility of developing the site.

9.3.5 It was not possible to access the site when visited.

9.3.6 The engineering drawings show two new jetties extending from the site into the river: one for receiving construction materials and the other for handling excavated material. It would be necessary to obtain approval from the PLA for such structures, including payment of annual licence fees. There is an existing jetty at the site which may be capable of use for the project.

9.3.7 It is noted from the engineering drawings that the operational site would comprise an area of approximately 40m by 50m.

9.4 Property valuation comments

9.4.1 Thames Water owns the site and therefore there is no external valuation sum to be assessed.

9.4.2 There may be alternative use values associated with the site, however this should be an internal matter for Thames Water when considering the operational use of the site.
9.4.3 No rights of way or easements have been included in the assessment of this site acquisition cost.

9.5 **Disturbance compensation comments**
9.5.1 There are unlikely to be any disturbance compensation claims.

9.6 **Offsite statutory compensation comments**
9.6.1 The site is currently operational land under water authority use, and therefore it would be difficult to perceive a case where the value of an adjoining property is affected further by the proposed works.

9.7 **Site acquisition cost assessment**
9.7.1 The site acquisition costs are considered to be acceptable, especially considering the site is within Thames Water’s control.

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** for use as a main shaft site because it is of adequate size, has good vehicular access (including existing roads within the STW that could be used to serve the working site) and already has wharfage facilities, which could be further developed to serve the site. There would be less constraint in terms of demolition, relocation and diversion of assets in the area as the site is wholly owned by Thames Water. The site set-up for the Lee Tunnel shaft might also be available for use on this construction. There is potential space to relocate the shaft further away from the proposed route of the Docklands Light Railway which runs through and along the outside southern edge of the site, should this prove necessary.

10.3 **Planning**
10.3.1 This site is considered **suitable** for use as a main shaft site.
10.3.2 There are few planning designations applicable to the site, and it is considered that with appropriate mitigation measures, these designations are unlikely to be unacceptably impacted upon.
10.3.3 The outcome of the current Lee Tunnel and STW extension scheme planning application would require close monitoring, in terms of its potential impact for the use of this site for the Thames Tunnel.

10.4 **Environment**
10.4.1 Overall, the site is **suitable** for a main shaft site, although mitigation would be required to enable the site to be used.
10.4.2 Based on current information, the site is **suitable** from the perspectives of transport, archaeology, built heritage and townscape, water resources, ecology, air quality and noise.
10.4.3 This site is considered **less suitable** from the perspectives of flood risk and land quality.
10.4.4 Overall, the site is considered **suitable**, subject to further investigation of whether flood risk and land quality impacts can be adequately mitigated. Likely mitigation considerations would include:

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

10.5 Socio-economic and community

10.5.1 This site is **suitable** as a main shaft site from a community impact perspective.

10.5.2 The use of the site is unlikely to lead to significant impacts on the local community due to the current use of the site as a sewage treatment works, the size of the site and the fact that most surrounding properties are used for commercial and retail activities.

10.5.3 The engineering proposals for siting the works have, to an extent, mitigated against potential impacts on the surrounding properties, as well as the creek side footpath. Any residual impacts may be mitigated through engagement with key stakeholders over noise attenuation and any other form of disruption.

10.6 Property

10.6.1 This site is **suitable** as a main shaft site, provided it is possible to build the site without hampering existing operations at the sewage works.
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 Newham online planning applications database
- Saved policies in the Newham Unitary Development Plan, adopted in June 2001

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
- The Lea Valley Walk - 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
- Newham 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**
• Thames Estuary Partnership (2002) Tidal Thames Habitat Action Plan
• London Biodiversity Action Plan - www.lbp.org.uk
• 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
• Black redstart distribution in London - www.blackredstarts.org.uk/pages/londonmap.html
• 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**
• Environment Agency Flood Map – www.environment-agency.gov.uk
• 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 levels

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

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

**Property**
• Not applicable
APPENDIX 2 – SITE LOCATION PLAN
Legend

- Local Authority Boundary
- Short Listed Shaft Sites

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Map Ref: ........101PL-SS-00628
Date: ..............2009/11/17
Projection: .......British National Grid

Title: APPENDIX 2
S82NM SITE
SITE LOCATION PLAN
APPENDIX 3 – PLANNING AND ENVIRONMENT PLANS
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APPENDIX 4 – PHOTOGRAPHS OF THE SITE AND SURROUNDINGS
View of the site looking south. The Grade II listed chimney is visible on the left hand side of the photograph prior to being temporarily dismantled to protect it during the construction of the Lee Tunnel.

View of the site looking southeast. The listed chimney is visible on the right and the Barking Flood Barrier in the background on the left.
View of pumping station located in the western area of the treatment works looking east. The proposed site access runs adjacent to the rear of this building.
APPENDIX 5 – TRANSPORT PLAN
Route within sewage treatment works not assessed
APPENDIX 6 – SERVICES AND GEOLOGY PLAN
APPENDIX 7 – CONSTRUCTION PHASE LAYOUT
APPENDIX 8 – OPERATIONAL PHASE LAYOUT
VENTILATION BUILDING (SHAFTS)

VENTILATION TOWER (SHAFTS)

Diagrammatic representation of top structure above main and intermediate shafts.

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 requirements.
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

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<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to road network</td>
<td>Temporary construction and permanent accesses are onto Jenkins Lane using an existing access for Beckton Sewage Treatment Works. The route through the treatment works to Jenkins Lane has not been assessed. The site is split into two main areas linked by an access road which would be used to access the onsite parking, offices and canteen. Further assessment would be required to identify the likely impact of vehicular trips along this road during the construction period. Jenkins Lane is subject to a 30mph speed limit and is street lit. It has a carriageway width of 8m and has no visible parking restrictions. Visibility is achievable 90m to the west and is restricted to the east by an existing access into another site. Access to the A13 (TLRN strategic highway network) via Jenkins Lane and Spur Road. There are no visible restrictions along the route. Distance to TLRN 1.8km. TLRN in vicinity of site highly sensitive. A406 forms part of Olympic Route Network. See Transport Access Plan in Appendix 5.</td>
<td>Conclusion: Road access to site is possible for HGVs using an existing access. The route through the treatment works to Jenkins Lane has not been assessed. The site is split into two sections and further assessment would be required to identify the likely impact of vehicular trips along the access road between these areas. Access route to the TLRN (A13) has no visible restrictions.</td>
<td></td>
</tr>
<tr>
<td>Access to river</td>
<td>Main shaft site located adjacent to river requiring the construction of two new jetties in the place of an existing jetty for the transfer of materials to and from the site.</td>
<td>Site adjacent to river requiring two new jetties in place of an existing jetty for the transfer of materials.</td>
<td></td>
</tr>
<tr>
<td>Access to rail</td>
<td>Access to Angerstein Wharf existing rail facility uses the same route to the TLRN (A13) and follows along the TLRN to the Blackwall Tunnel. The Blackwall Tunnel is subject to a 15’6” height restriction southbound and 13’4” restriction northbound which may restrict</td>
<td>Route to potential rail link at Angerstein Wharf contains many constraints and is least suitable being a substantial distance. Route runs under and over several bridges with no visible restrictions, as well as through the Blackwall</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>access in addition to having a narrow width. The route then continues along Blackwall Tunnel Approach, John Harrison Way and West Parkside to Angerstein Wharf on Horn Link Way. Alternative route via Woolwich Ferry also restricted. Maximum vehicle height 15’5”. Angerstein Wharf is an existing multi modal aggregates depot. Distance 11.4km to rail access point from shaft site via Blackwall Tunnel.9.2km.</td>
<td>Tunnel which has height restrictions which differ depending on direction. Alternative route via Woolwich Ferry also restricted. Angerstein Wharf is an existing multi modal aggregates depot.</td>
<td></td>
</tr>
<tr>
<td>Parking</td>
<td>Some parking could potentially be provided on site for workforce. Informal on street parking is available along Jenkins Lane with no visible restrictions.</td>
<td>Some parking for workforce could be provided within site boundary. On street parking along Jenkins Lane also possible, with no visible restrictions.</td>
</tr>
<tr>
<td>Public transport accessibility</td>
<td>PTAL 1-2 (low), as identified within Table 2.3.</td>
<td>Limited potential for workforce to utilise public transport to access site.</td>
</tr>
<tr>
<td>Traffic Management</td>
<td>No traffic management identified at this stage.</td>
<td>No traffic management identified at this stage.</td>
</tr>
</tbody>
</table>

### Summary:

The site is suitable as a main shaft site as it would utilise an existing access for Beckton Sewage Treatment Works. Access to the TLRN (A13) is suitable for HGVs with no visible restrictions along the route. The route to the potential rail access point at Angerstein Wharf is less suitable due to the long distance and the height restrictions through the Blackwall Tunnel. An alternative route via Woolwich Ferry is also restricted.

The site is located adjacent to the river and would require the construction of two new jetties in place to transfer materials although it is likely that infrastructure including jetties established for the preceding Lee Tunnel project would be re-used.

There is limited potential for the workforce to utilise public transport to access the site. On site parking could be provided for the workforce and informal on street parking along Jenkins Lane is possible as there are no visible restrictions (although unlikely to be supported by the local authority). No traffic management requirements are identified at this stage.
## 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>The site is within the Newham Archaeological Priority Area</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Summary of historical uses</td>
<td>On the 1st ed O.S map (1868), the site is shown as agricultural land with the northern outfall sewer running west to east across the site and exiting into the Thames. A series of irrigation dams are shown by the river foreshore. By the 1900’s the site is much more developed with numerous sludge lagoons and other structures which make up the modern works.</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 of high value 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.</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>There are four receptors of probable medium value within the site. Becton sewage works itself is a record in the NMR. MLO14192 is a record of the site (at the East Ham sewerage works) of a medieval manor house. The manor no longer exists but below ground remains may still be present. MLO61523 was an evaluation by D. Divers for NMUS, Oct 1994; site code HE-BN 94. Deposits of alluvium, probably infilling a N-S river channel, peat and a horizon of naturally-fallen yew trees were found. The peat was dated by radiocarbon to the Neolithic and/or Bronze Age. A single piece of burnt flint may suggest human occupation, but its context is uncertain. A further evaluation took place at the Sludge incinerator site NMR 1038157. This does not preclude the possibility of unrecorded.</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>
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<td>-------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>archaeological receptors of medium value being present within the site.</td>
<td></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>Dewatering of potential 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 (if known)</td>
<td>Some parts of the site do not appear to have undergone extensive development. Outside of the already developed areas, any archaeological material which may be present is likely to have not been significantly disturbed. Borehole data for the area indicates a significant localised depth of made ground at up to 12 m.</td>
<td>A detailed desk based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
</tbody>
</table>
| Potential issues                                | The peat sequence known to exist in the area would be of importance where it remains. Recording and sampling would be required prior to construction. Detailed design proposals, and an outline method statement would 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 (review of recent work)  
  • Production of deposits model  
  • Archaeological monitoring of geo technical investigations  
  • Archaeological evaluation  
  • Archaeological watching brief  
  • Archaeological excavation. |

**Summary:**
The site is suitable as a main shaft site. Research undertaken for the preceding Lee Tunnel project suggests that receptors on site are likely to be of medium value although this does not preclude the presence of archaeological receptors of potential high value on the site. Peat deposits containing archaeological material have been commonly recorded throughout London in a similar proximity to the Thames. Investigations in adjacent sites and on the Beckton Rectangle suggest that alluvial deposits containing archaeological material are likely to be present and these would require mitigation before construction proceeds.
<table>
<thead>
<tr>
<th>Site considerations</th>
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</tr>
</thead>
</table>
| **Designations including Conservation Areas, including trees** | Listed Buildings  
Chimney, Beckton Sewage Treatment Works, Grade II: 0m (it is located within the site boundary)  
Locally Listed Buildings  
62 River Road (Squibb Davis Demolition Ltd), former Village School: 245m  
Algor Wharf, 42 River Road: 135m  
Conservation Areas  
There are no conservation areas within 250m of S82NM – Main.  
Registered Historic Parks & Gardens  
There are no Registered Historic Parks and Gardens located within 250m of S82NM – Main.  
Locally Listed Parks and Gardens  
There are no locally listed parks and gardens within 250m of S82NM - Main.  
Protected Views  
There are no protected views within 250m of S82NM - Main. | In the case of listed buildings and locally listed buildings, a high quality scheme design and adequate screening for the development may be required, as discussed below.  
A detailed desk-based assessment in conjunction with archaeology work would be required to further determine the likely impact of the development and to inform more detailed mitigation proposals.  
On the basis of currently available information (July 2009) and on the basis of certain receptors not being present within 250m of S82NM - Main, mitigation would not be applicable in the case of conservation areas, registered historic parks and gardens, locally listed parks and gardens and protected views. |
<p>| <strong>Potential receptors of medium to very high importance with the potential to be directly affected</strong> | There is potential for one Grade II listed building to be directly impacted upon as a result of the development as it is located within the site boundary of S82NM – Main. | The Grade II listed chimney at Beckton Sewage Treatment Works is located within the site boundary and immediately adjacent to the area proposed for the shaft and associated workings (based on Drawing No. 100-DL-PNC-S82NM-100002). There is the potential for the chimney to therefore be directly affected by the development and if not directly impacted upon there is a high potential for the setting of the chimney to be adversely affected by the works. Mitigation in the form of a high quality scheme design (including moving the shaft site and associated workings away |</p>
<table>
<thead>
<tr>
<th>Site considerations</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Built Heritage and Townscape</td>
<td></td>
<td>from the listed chimney) and/or screening would help reduce any adverse impacts. However, it is</td>
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<td></td>
<td>understood that mitigation in the form of the dismantling of the chimney, its storage and re-erection</td>
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<td></td>
<td></td>
<td>has already been considered as part of the proposed Lee Tunnel Works which would also impact</td>
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<td>upon the structure. This mitigation, if agreed and implemented, could also be used for the Thames</td>
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<td></td>
<td>Tunnel project. In that instance, the design of the scheme and/or screening may nonetheless be</td>
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<td></td>
<td></td>
<td>required to reduce any impacts upon the setting of the re-erected chimney.</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</td>
<td>Not Applicable.</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>indirectly affected</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other receptors of lesser importance with the potential to be indirectly affected</td>
<td>There is potential for two locally listed buildings to be impacted upon</td>
<td>Both of the locally listed buildings are located on the opposite side of the Barking Creek within</td>
</tr>
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<td>as a result of the development proposals.</td>
<td>an area characterised by industrial development. Although both locally listed buildings have the</td>
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<td>potential to share a visual relationship with the S82NM – Main, their distance from the site (and,</td>
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<td>in particular, those areas within the site within which constructional and operational features</td>
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<td>are proposed to be located) together with their current industrialised setting means that the</td>
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<tr>
<td></td>
<td></td>
<td>development is unlikely to result in any major impact upon their settings. As a consequence no mitigation</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Built Heritage and Townscape</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site considerations</strong></td>
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<tr>
<td><strong>Comments</strong></td>
</tr>
<tr>
<td><strong>Mitigation required and conclusions</strong></td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td>Sensitive landscape character areas likely to be affected, including trees and TPOs</td>
</tr>
<tr>
<td>Potential views likely to be affected</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>Permanent elements mainly visible from the River Thames.</td>
<td>amenity and reduce visual impact. This site is suitable, since adverse visual impact on the River is restricted to the construction phase. The demolition of warehouses could soften views with appropriate planting mitigation. This would aid permanent visual amenity.</td>
</tr>
</tbody>
</table>

### Particular considerations on sites where new permanent structures are required

- Permanent structures at S82NM - Main would potentially have a direct impact on one Grade II listed building and upon the character of the site and, to a lesser extent, upon the character of the River.

- Permanent structures at S82NM - Main would potentially have a direct impact on one Grade II listed building and upon the character of the site and, to a lesser extent, upon the character of the River.

### Potential issues

- The potential issues are the direct impact that the development could have on one Grade II listed building and upon the character of the site and upon the character of the River. There is the potential to mitigate these impacts through the screen design, screening and landscaping.

- Mitigation in the form of a high quality scheme design, screening and landscaping is likely to be required to mitigate adverse impacts upon the Grade II listed chimney at the Beckton Sewage Treatment Works and the character of the site and the River. The location of constructional and operation features within the site would need to be carefully considered and, if possible, be moved away from the site of the listed chimney. Mitigation already agreed for the
### 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>listed chimney in respect of the Lee Tunnel Project would also need to be taken into account and may be able to be used as part of the mitigation strategy for S82NM – Main.</td>
</tr>
</tbody>
</table>

### Summary:

This site is suitable as a main shaft site because of relatively few impacts upon the historic built environment and townscape; however a direct impact upon one Grade II listed chimney adjacent to the site is possible. The chimney is due to be temporarily dismantled to protect it during the construction of the Lee Tunnel and it may be stored away from the site during the construction period. The post construction impact could be mitigated through a high quality scheme design (with particular attention paid to the location of operational features and their relationship with the listed chimney) and/or screening. The project team should note that this chimney has already proved to be an important constraint upon the Lee Tunnel project at the same location.

Further impacts upon the character of the site, the River and its frontage could also be mitigated through the scheme design and appropriate landscaping. Consideration would need to be given to any agreed mitigation for the Lee Tunnel project with regards to the listed chimney as these measures may also successfully mitigate any adverse impacts upon the listed chimney arising from the development of S82NM – Main.
## 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>
| Hydro-geological conditions (Groundwater and Surface Water) | Geology (thickness)  
- Superficial Geology and Made Ground (12m)  
- Thanet sand (13m)  
- Chalk (to beyond the depth of shaft) | The shaft would be constructed to an invert level of approximately 72.61 mbgl therefore the shaft would be founded in the Chalk. Piezometric head\(^1\) in Chalk would be approximately 64.61m above the base of the construction. Therefore, dewatering would be required and should be considered as part of geotechnical design. |
| Hydro-geological conditions (Groundwater and Surface Water) | Hydrogeology  
- Piezometric Level in Chalk Aquifer: ~ -2m AOD (~8 mbgl) from EA Jan 08 water level contouring  
Groundwater Monitoring Location  
- EA Hydrometry Sites: No hydrometry site nearby  
- Adjacent to River Thames and River Roding |  |
| SPZs and groundwater users | SPZ  
- Not located in a Source Protection Zone defined by EA  
EA Licensed Groundwater Abstractions and Details  
- No licensed abstraction borehole within 2km radius  
Local Authorities (LA) 
Unlicensed Groundwater Abstractions and Details  
- No abstraction borehole within 1km radius inside Newham Council Boundary |  |
| Borehole locations and depths | No historical records of water wells within 1km radius. | Not applicable |
| Potential impacts on surface water features | The site is located adjacent to the River Thames and the River Roding. The site is behind flood defences so the pollution risk is through drainage to the river channels. | Work needs to be undertaken in consideration of Pollution Prevention Guidelines – PPG1, PPG 5 and PPS23. |
| Potential impacts on groundwater (resources and quality) | An impact on groundwater at depth is likely since the main shaft is to be constructed in Chalk (major aquifer) overlain by Thanet Sand and Superficial Deposits (minor aquifer) which would need to be dewatered. | See below (likely types of mitigation measures that would be required) |
## Water Resources – Hydrogeology and Surface Water

<table>
<thead>
<tr>
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<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely types of mitigation measures that would be required</td>
<td>No mitigation would be required for groundwater as construction of main shaft would not take place within the 400 day capture zone of licensed abstractions.</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Potential issues</td>
<td>The main shaft to be excavated in Chalk below piezometric head, therefore dewatering of the Chalk, Thanet Sand and Superficial Deposits would be required. Possible saline intrusion caused by dewatering.</td>
<td>Piezometric head in Chalk to be considered as part of geotechnical design. The issue of the appropriate disposal of discharges from dewatering to be considered. Dewatering to be kept to a minimum.</td>
</tr>
</tbody>
</table>

### Summary:
In terms of hydrogeology, the site is suitable as a main shaft site because although the construction of this main shaft would take place within Chalk (major aquifer), the site does not lie within 400 day capture zones of licensed abstractions. No long term impact on the Chalk aquifer is expected, although dewatering of the Chalk, Thanet Sands and Superficial Deposits would be required during the construction phase. The Chalk piezometric head is likely to be approximately 65 m above the base of construction and should be taken into account in the engineering design. In terms of surface water resources, this site is suitable as a main shaft site because there is no direct pathway to the River Thames and the River Roding for pollution although standard mitigation would be required.
### Ecology (terrestrial and aquatic)

<table>
<thead>
<tr>
<th>Site considerations</th>
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<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statutory designations</strong></td>
<td>Ripple LNR is within 2km of site</td>
<td>No likely impact.</td>
</tr>
<tr>
<td><strong>Non-statutory designated wildlife sites</strong></td>
<td>River Thames and Tidal Tributaries SMI lies within the development site&lt;br&gt;The Greenway and Old Fort Nature Reserve BGI site for nature conservation runs through the site.&lt;br&gt;Beckton Meadows South BGI site lies adjacent to the proposed works boundary</td>
<td>Any constructions affecting the Thames, including temporary or buried works such as a culvert would require compensatory habitat provision. There may also be post-works restoration required.&lt;br&gt;No disturbance issues likely, but working practices should be designed to minimise dust and other atmospheric pollutants.&lt;br&gt;No disturbance issues likely, but working practices should be designed to minimise dust and other atmospheric pollutants, and avoid pollution of water bodies on this site. Much of the BGI would have been lost to the preceeding Beckton STW extension development.</td>
</tr>
<tr>
<td><strong>BAP priority habitats</strong></td>
<td>Barking Creek forms part of London BAP habitat ‘Rivers and Streams.’&lt;br&gt;The foreshore on the Thames consists of BAP priority habitat ‘Mudflats’&lt;br&gt;The Tidal Thames is a London BAP habitat.&lt;br&gt;London BAP habitat ‘Reedbeds’ is present on site.</td>
<td>Care would need to be taken to avoid impacts (including contaminated runoff) into the creek.&lt;br&gt;Any constructions affecting the Thames, including temporary or buried works such as a culvert would require compensatory habitat provision. There may also be post-works restoration required.&lt;br&gt;Any loss (particularly permanent loss) of creek-side habitat would require compensatory habitat provision. There may also be post-works restoration required.</td>
</tr>
<tr>
<td><strong>protected or otherwise notable species within the Study Area</strong></td>
<td>Pipistrelle bats have been known to utilise buildings on site for roosting (though demolition is proposed for these). Several bat species use the site for</td>
<td>If bat roosts were found to be present, mitigation would be required for any buildings to be affected by works, possibly including off-site provision. Careful</td>
</tr>
</tbody>
</table>
## Ecology (terrestrial and aquatic)

<table>
<thead>
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<tbody>
<tr>
<td></td>
<td>foraging.</td>
<td>placement of lighting to minimise illumination of surrounding habitat is likely to be required. Mitigating work practices may be required for any works on the foreshore or in the river. Mitigation would be possible but may require off-site provision. Detailed negotiation may be required with the EA for the placement of structures (e.g. jetties) in this location. Any constructions in the Thames may require detailed aquatic invertebrate and fish investigation. Work practices would need to avoid direct loss of areas of sea club rush and shading.</td>
</tr>
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</tr>
<tr>
<td>Potential issues</td>
<td>The cumulative impact of all jetties proposed within the scheme may increase flow velocity in the river with effects on juvenile migratory fish</td>
<td>Consideration needs to be given to the cumulative impacts on hydrodynamics with reference to known critical flow velocities for fish. Not considered significant at a site specific level.</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>Summary:</td>
<td>The site potentially is suitable as a main shaft site as the foreshore structures (jetties etc) from the preceding Lee Tunnel project would presumably be re-used for the Thames Tunnel and no additional land-take impacts on the foreshore would be likely. Negotiation with the EA is likely to be required if any additional impacts are anticipated.</td>
<td></td>
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</tbody>
</table>
## Flood Risk Assessment

<table>
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<tr>
<th>Site considerations</th>
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<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) but 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. Sewage transmission infrastructure is considered to be water compatible according to table D.2 of PPS25 and hence suitable in this location.</td>
<td>An FRA would be required to assess the residual risk of flooding to the site.</td>
</tr>
</tbody>
</table>

- **Assessment of conditions for SuDS**

  The site is currently developed and in addition, it is unclear if the site is suitable for infiltration SuDS, further investigation is required.

  **Not applicable.**

### Potential issues

| Summary: |

This site is less suitable as a main shaft site as there maybe constraints on SuDS due to space and suitability for infiltration. However, the site is protected from the 1 in 1000 year flood level.
<table>
<thead>
<tr>
<th>Site considerations</th>
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</tr>
</thead>
<tbody>
<tr>
<td>AQMA</td>
<td>The air quality objective for NO₂ is exceeded on major roads in vicinity of site.</td>
<td>There is a need for more site specific data.</td>
</tr>
<tr>
<td>Sensitive Receptors</td>
<td>There are residential properties along Alfreds Way (A13). The nearest residential properties are on Westminster Gardens, some distance from the site.</td>
<td>There are relevant air quality sensitive receptors present along the route the construction traffic is likely to take.</td>
</tr>
<tr>
<td>Existing traffic issues</td>
<td>The main traffic issue in this area is exhaust emissions from vehicles along the A13 and A406 corridors.</td>
<td>Additional vehicle emissions have a high potential to interfere with local air quality action plan policies.</td>
</tr>
<tr>
<td>Existing sources of significant air pollutants</td>
<td>See existing traffic issues above.</td>
<td>See existing traffic issues above.</td>
</tr>
<tr>
<td>Notable gaps in existing air quality monitoring</td>
<td>There is no data at likely access to A13 and the nearest existing data indicates existing exceedance of AQLV.</td>
<td>Collect minimum 6 months diffusion tube data at the nearest residential receptors to the site access to A13 or other point of access to major road network.</td>
</tr>
<tr>
<td>Potential issues</td>
<td>The risk from additional exhaust emissions from construction HGVs is undefined at present. The risk from dust impacts is low.</td>
<td>Minimise HGV movements on the local road network during the peak hours. Standard dust control measures would minimise the effect of fugitive dust on nearby sensitive receptors.</td>
</tr>
</tbody>
</table>

**Summary:**
This site is suitable for use as a main shaft site as there is sufficient distance from the site to potential dust sensitive receptors that there is a low risk of a perceptible impact at the nearest residential receptors, provided standard dust control measures are in place. There is potential for HGV movements on the local road network to cause localised air quality impacts, however this can be mitigated by minimising the movement of HGVs during peak hours.
<table>
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<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 L_Aeq and night-time noise levels of less than 50 dB L_Aeq at residential locations within the area of the shaft. Noise levels from the Defra noise maps provide an indication of prevailing noise levels only, and would not be employed in any detailed assessments for chosen sites.</td>
<td>n/a</td>
</tr>
<tr>
<td>Sensitive Receptors</td>
<td>The area of the proposed site is currently a large sewage treatment works. Surrounding the site are various other industrial land uses, including a refuse transfer station and a retail centre. The nearest residential receptors are located to the north at a distance of 1.1km from the site. Further residential properties are located to the west of the site at a distance of over 1.3km.</td>
<td>n/a</td>
</tr>
<tr>
<td>Existing traffic issues</td>
<td>Local road traffic and activities associated with the sewage treatment works and surround industrial and trading estates are likely to dominate the existing noise climate. Traffic noise from the A13 to the north and the A1020 to the west may also contribute.</td>
<td>n/a</td>
</tr>
<tr>
<td>Existing sources of significant noise emissions</td>
<td>Local road traffic and activities associated with the sewage treatment works and surround industrial and trading estates are likely to dominate the existing noise climate. Traffic noise from the A13 to the north and the A1020 to the west may also contribute.</td>
<td>n/a</td>
</tr>
<tr>
<td>Potential issues</td>
<td>Construction: The construction period is estimated at 6 to 7 years and working hours would be 24 hours per day Monday to Saturday. This has the potential</td>
<td>Adherence to the good site practices provided in BS5228. Siting of noisy equipment and construction activities as far as is practicable</td>
</tr>
</tbody>
</table>

Appendix 9 – Page 16
<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>to result in adverse noise impacts to sensitive receptors to the north of the site. HGV movements are likely to be relatively high and this has the potential to have an adverse impact on residential receptors located close to the haul route. Barge movements are proposed relating to the transport of concrete and excavated material. This has the potential to result in an adverse noise impact on sensitive receptors located close to the proposed jetties. Proposed 3m site boundary fencing would provide useful noise mitigation to some plant and construction activities however due to the distance between the site and the nearest noise sensitive properties their use is unlikely to be required. Vibration resulting from general construction works is not anticipated result in an adverse impact. The nearest receptors to the proposed shaft location are at a distance of approximately 1.1km and it is highly unlikely that vibration levels would result in minor cosmetic damage or annoyance during shaft sinking. Vibration from tunnelling should be considered on a case by case basis at particular sensitive locations. Operation: With appropriate attenuation (if necessary), there is no reason why noise from the ventilation column and top chamber should not result in adverse noise impacts to nearby sensitive receptors.</td>
<td>from sensitive receptors.</td>
<td></td>
</tr>
</tbody>
</table>

Summary:
This site is suitable as a main shaft site as the distance between the site and the nearest residential properties is large and disturbance from noise or vibration is highly unlikely. The number of HGV movements is high but the haul road does not pass by any residential receptors and therefore is unlikely to result in disturbance.
## Land Quality

<table>
<thead>
<tr>
<th>Site location</th>
<th>Grid reference:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current site use</td>
<td>The site is within the boundary of the Beckton Sewage Treatment Works.</td>
<td></td>
</tr>
<tr>
<td>Topography</td>
<td>The site is largely flat.</td>
<td></td>
</tr>
<tr>
<td>Field evidence of contamination (ie, visual/olfactory)</td>
<td>No site visit was made, however the site is known to be undergoing remediation as part of the preparatory works for construction of the Lee Tunnel.</td>
<td></td>
</tr>
<tr>
<td>Current surrounding land use (immediately adjacent to site)</td>
<td>The sewage treatment works entirely surrounds the site. Gemini Business Park is the closest alternative land use, North: sewage treatment works East: sewage treatment works South: sewage treatment works West: sewage treatment works (Gemini Business Park)</td>
<td></td>
</tr>
</tbody>
</table>

| Geological and hydrogeological information |  |
| Geological strata | Geology (thickness) |
| | |  |
| | • Superficial Geology and Made Ground (12 m) |
| | • Thanet sand (13 m) |
| | • Chalk (to beyond the depth of shaft) |
| Underlying aquifer classes | Non-Aquifer: London Clay |
| | Minor Aquifer: River Terrace Deposits, Lambeth Group, Thanet Sands |
| | Major Aquifer: Chalk |
| Groundwater vulnerability/Soil classification (High/Intermediate/Low/Not applicable) | River Terrace Deposits - Minor Aquifer |
| | High Leaching Potential of Soils (U) |
| Source protection zone details | Not located in a Source Protection Zone |
| Surface water receptor | River Thames (directly adjacent to site, south) |
| | River Roding (directly adjacent to site, east) |

| Relevant information within a 250m radius of the site |  |
| Historical potentially contaminating activities (based on mapping data) | Onsite |
| | • Open land 1868 |
| | • Northern outfall sewer running north west to southeast across site 1868 |
| | • Irrigation dams centre, south area of site 1868 |
| | • Main drainage works located in southern area of site 1896 – 1909 |
| | • Beckton sewage treatment works located on site and north and northwest of the site 1949 – present |
| | • Numerous tanks (above and underground tanks) – contents unknown 1973 – present |
| | Offsite |
| | • Industrial buildings – use not specified (directly adjacent to site) 1896 – 1954 |
### Land Quality

- Beckton gas works (directly adjacent to site, west) 1952 – 1979
- Railway for industrial use (directly adjacent to site, west) 1896 – 1954
- Gemini business park (directly adjacent to site) – present
- Numerous tanks – contents unknown, potentially fuel related (closest located 28m northwest) 1967 - 1986
- Wharf operations, transport support and cargo handling (closest located 56m east) 1909 – present
- Numerous electrical substations (closest located 84m northwest) 1967 – 1986
- Disturbed ground (86m northeast) 1920
- Depots located along eastern side of site (closest located 96m east) 1947 – present
- Timber yard (98m east) 1976 – present
- Dock (118m northeast) 1896 – 1909
- Inorganic processes within the chemical industry – Umicare Oxyde (UK) Ltd (135m east) no mapping dates
- Tramway (139m northwest) 1909
- Works – use not specified (closest located 154m southeast) 1948 – present
- Sewage works (163m west) 1972
- Historical building plans listing gas storage (164m northeast) 1908
- Chemical works (168m east) 1872 - 1946
- Manufacture of timber and wood-based products (179m east) 1992
- Quarry processes including roadstone (196m east) 2002
- Heap – unknown constituents (228m northwest) 1996
- Mobile screening and crushing processes (239m east) 1998

### Pollution incidents to controlled waters

Ten
- Oils – unknown, minor incident (on site)
- Unknown sewage, minor incident (on site)
- Unknown sewage, minor incident (19m east)
- Oils – unknown, significant incident (69m south)
- Oils – unknown, minor incident (69m south)
- Oils – unknown, significant incident (69m south)
- Unknown sewage, significant incident (127m south)
- Chemicals – unknown, minor incident (129m east)
- Other sewage, minor incident (174m east)
- Storm sewage, minor incident (212 south)

### Landfill sites

One Waste Management Facility

### Other waste sites

Five Waste Transfer Sites
- SITA Waste Handling Ltd – household, commercial and
Land Quality

<table>
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<tr>
<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&lt;br&gt;2) Beckton Sewage Treatment Works&lt;br&gt;3) Tanks – contents unknown</td>
<td>1) Onsite and directly adjacent to site&lt;br&gt;2) Onsite and directly adjacent to site, north and northwest&lt;br&gt;3) Onsite and directly adjacent to site</td>
<td>1) Metals, PAHs, TPH&lt;br&gt;2) Metals, TPH, PAHs, Pathogens, Sulphates, Nitrogen compounds, Chloride, Phenols&lt;br&gt;3) Metals, PAHs, TPH, Solvents</td>
</tr>
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<td>1) Works/industrial processes – use not specified&lt;br&gt;2) Railway for industrial processes&lt;br&gt;3) Beckton gas works&lt;br&gt;4) Tanks – contents unknown</td>
<td>1) closest located directly adjacent to site, west&lt;br&gt;2) directly adjacent to site, west&lt;br&gt;3) directly adjacent to site, west&lt;br&gt;4) closest located 28m northwest</td>
<td>1) Metals, PAHs, TPH, Solvents&lt;br&gt;2) Metals, PAHs, TPH, Solvents&lt;br&gt;3) Metals, TPH, PAHs, Phenols, Sulphates, Cyanides&lt;br&gt;4) Metals, PAHs, TPH, Solvents</td>
</tr>
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Registered radioactive substances None

Fuel stations/Depots None

Contemporary trade directory entries None

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>
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<td></td>
</tr>
<tr>
<td>Potential site contaminants derived from offsite sources and transported to site</td>
<td>1) Works/industrial processes – use not specified&lt;br&gt;2) Railway for industrial processes&lt;br&gt;3) Beckton gas works&lt;br&gt;4) Tanks – contents unknown</td>
<td>1) closest located directly adjacent to site, west&lt;br&gt;2) directly adjacent to site, west&lt;br&gt;3) directly adjacent to site, west&lt;br&gt;4) closest located 28m northwest</td>
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</tr>
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Potential contamination pathways to site (Conceptual Site Model)³

Source 1: A1, A3, B4<br>Source 2: D6, E1, F7

Contamination category Category 3 – Assessed as High Risk

Summary:
The site is considered less suitable as a main shaft site based on the high potential for contamination of the site to have occurred with gas works, depots and numerous storage tanks in the vicinity of the site.

This potentially poses a risk to construction workers and adjacent human receptors through direct contact and inhalation exposure pathways as well as ground gas risks. Additionally, the potential...
<table>
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<tr>
<td>exists for contaminants to be drawn to the deeper aquifer if deep drilling/construction is undertaken on the site and for migration to surface water receptors to occur through groundwater transport.</td>
</tr>
</tbody>
</table>

**Notes:**

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

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

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

For information about the Thames Tideway Tunnel

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

For our language interpretation service call 0800 0721 086

For information in Braille or large print call 0800 0721 086

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

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