23 Earl Pumping Station

23.1 Introduction

23.1.1 This section of the non-technical summary presents the preliminary environmental assessment for the Thames Tunnel project at Earl Pumping Station (Figure 23.1).

23.1.2 At this site it is proposed that the existing Earl Storm Relief Sewer would be linked to the proposed Thames Tunnel through a shaft and the Greenwich to Chambers Wharf long connection tunnel. Currently, the existing combined sewer overflow discharges approximately 26 times each year at a total volume 539,000m³ per year.

23.1.3 In the following section a description of the existing site is given. This is followed by a description of the development proposed at this site.

23.1.4 The environmental topics which have been assessed for this site are listed in the ‘Assessment’ section (23.4). Preliminary assessment findings are then presented topic by topic.

23.2 Site context

23.2.1 The site is shown as site number 19 on Figure 28.1.

23.2.2 The site is located within the London Borough of Lewisham (Figure 23.1). It is also close to the London Borough of Southwark

Figure 23.1 Earl Pumping Station site location
23.2.3  The site encompasses the existing Thames Water Earl Pumping Station and industrial land to the south. Approximately half a hectare would be required for the temporary works. This is indicated by the red line shown on Figure 23.2. The permanent works area would be considerably smaller. The site is located entirely inland and requires no works within the foreshore.

23.2.4  The site can currently be accessed from Croft Street to the west, Chiltern Street to the north and Yeoman Street to the east via Plough Way and Lower Road (A200). There are no public rights of way through or close to the site.

Figure 23.2 Aerial photograph of Earl Pumping Station*

*Note: The red line boundary is approximate in this image

23.3  Proposed development

23.3.1  The proposal is to intercept the existing combined sewer overflow. With the Thames Tunnel in place, instead of untreated sewage discharging at current volumes directly into the River Thames, flows would be diverted into the proposed Thames Tunnel. For a typical year, this would reduce flows from the combined sewer overflow to an average of four spills a year at a total volume of approximately 50,500m$^3$ a year.

23.3.2  In order for this interception to be achieved, construction works at this site would take approximately four years. Access to the site would be through two separate access points with one from Yeoman St and the other onto Croft Street.
23.3.3 A shaft with an internal diameter of approximately 17m and approximately 50m deep would be constructed. The base of the shaft would link directly to the Greenwich long connection tunnel which would join up with the main tunnel at Chambers Wharf. Flows from the existing Earl Storm Relief Sewer would be diverted into the long connection tunnel through an interception chamber and into the main tunnel, located deep underneath the River Thames.

23.3.4 In order to manage and mitigate effects on the environment during construction, a Code of Construction Practice has been drafted. This sets out measures to be adhered to during the process of construction works.

23.3.5 Most of the construction would take place from 8am to 6pm, Monday to Friday, although limited works would be required beyond these hours, for example for extended concrete pours.

23.3.6 Figure 23.4 shows an indicative plan of the construction works.

**Figure 23.3 Indicative plan of construction works for Earl Pumping Station**
23.3.7 Once the works have been built, most of the structures would be below ground. However, the top of the shaft, valve chamber and ventilation column would be visible (Figure 23.4). The valve chamber would be approximately three meters high and would be within existing Thames Water land to the south west of the pumping station. The shaft would be constructed on the land to the south of the existing Thames Water site and would be finished four meters above ground level. The outside of the shaft structure and valve chamber would be covered in brick and have a brown roof. The surrounding area would be finished with hardstanding to allow maintenance access which would be required every three to six months. Once every ten years more substantial maintenance work would be required.

23.3.8 The ventilation column would be required to allow air to be released when flows in the tunnel rise into the shaft and would be located in the existing Thames Water compound. Air would be treated through filters and released through the ventilation column. On rare occasions when the tunnel is filling rapidly, the air would be released through an opening in the ventilation structure on top of the shaft.

23.3.9 The existing Thames Water Pumping station would remain fenced following construction; the new area of hard-standing surrounding the shaft would be open to the public.

Figure 23.4 Earl Pumping Station indicative plan of built development
23.4  **Assessment**

23.4.1  Based on the existing site and the works proposed, the following environmental topics have been included in the scope of this preliminary environmental assessment:

- Air quality and odour
- Ecology – aquatic and terrestrial
- Historic environment
- Land quality
- Noise and vibration
- Socio-economics
- Townscape and visual
- Transport
- Water resources (ground and surface)
- Flood risk

23.4.2  In the following sections, information about the preliminary assessment of each of these topics is presented.

23.4.3  As part of the assessment process, consideration has been given to known major developments that may change future environmental conditions. The assessment has assumed that Marine Wharf West and Cannon Wharf will be complete by 2022 and the rest of the Plough Lane Strategic Area will be built out by 2026.

23.4.4  Further information on the topic specific methodology for conducting the assessment is given in section 4 of this non-technical summary.

23.5  **Air quality and odour**

23.5.1  The site is located within one of the London Borough of Lewisham’s Air Quality Management Areas and adjacent to the London Borough of Greenwich’s Air Quality Management Area. The nearest people who may be sensitive to the development are occupiers of nearby residential dwellings on Chilton Grove and Croft Street as well as the future occupiers of the planned new Cannon Wharf development. There are also commercial and industrial premises adjacent to the site (Figure 23.5).

23.5.2  Based on this preliminary assessment, it is considered that the overall effect on local air quality from construction road traffic and construction plant, as well as from construction dust, is likely to be minor adverse at the residential and commercial properties and negligible at the industrial premises, taking account of the dust control measures in the Code of Construction Practice.

23.5.3  Preliminary assessment findings indicate that the effects of odours released from the ventilation structure is likely to be negligible.

23.5.4  Based on this assessment, it is considered that mitigation measures are not required.
23.6 Ecology – aquatic

23.6.1 The sewage outfall that would be intercepted currently discharges into the brackish zone of the designated River Thames and Tidal Tributaries Site of Metropolitan Importance. Greenland Dock Site of Borough Importance lies within 200m of the Pumping Station site. Data indicates a reasonably high diversity of fish species, but invertebrate diversity is limited.

23.6.2 There would be no ‘in river’ works associated with this site. No further consideration of the impacts associated with construction has therefore been undertaken for aquatic ecology.

23.6.3 During operation, the reduction in fish mortality that would result from improved oxygenation of the water is considered to be a moderate beneficial effect in year one and year six. Effects on invertebrate diversity and abundance and the increase in the distribution of pollution sensitive invertebrate species are considered to be minor beneficial in the longer term of operation. A similar increase in pollution sensitive fish species is considered to be a moderate beneficial effect in the longer term of operation. Effects on habitats and mammals would be negligible.

23.6.4 No mitigation is required at this site because only beneficial effects are anticipated.
23.7 Ecology – terrestrial

23.7.1 The majority of the site is hardstanding and buildings with scattered trees and scrub. The site is of value for common nesting bird species and has some limited potential for black redstart. Japanese knotweed, an invasive plant, is also present. The removal of Japanese knotweed would be undertaken prior to construction. There are three Sites of Importance for Nature Conservation within 500m of the site.

23.7.2 Based on preliminary assessment findings, no significant effects are anticipated on designated sites due to the distance and isolation of these sites from Earl Pumping Station (aquatic ecology effects are considered in section 23.6). Site clearance would result in the loss of a small area of scrub vegetation, which would also result in the loss of bird nesting and foraging resource. This loss would have a minor adverse effect at the site level on vegetation and breeding birds.

23.7.3 It is anticipated that operational activity would be limited to occasional maintenance work, which is considered unlikely to have significant effects on terrestrial ecology. Brown roofs are proposed on the shaft and valve chamber which would promote local biodiversity.

23.7.4 In addition to measures included within the Code of Construction Practice, further mitigation, such as habitat creation will be developed as necessary and reported in the Environmental Statement.

23.8 Historic environment

23.8.1 Neither the site nor immediate vicinity contain any nationally designated heritage assets. The site comprises industrial land, partially occupied by the 1940s Thames Water Earl Pumping Station. No assets with heritage significance have been identified. The site lies within a locally designated Archaeological Priority Area and the main archaeological potential for the site is for buried 19th-century footings of former houses, factory buildings and/or associated yards (which if present would be of low heritage asset significance). The underlying alluvium has moderate potential for palaeoenvironmental remains, e.g. organic remains, such as pollen or plant fossils, which if present would be of low to medium heritage asset significance, and an uncertain, probably low potential, for evidence of prehistoric activity (which if present would be of high heritage asset significance).

23.8.2 Construction works would entail deep excavations which would entirely remove any archaeological assets within the footprint of each area of excavation. If such assets were present, this would comprise a high magnitude of impact which would give rise to a minor adverse effect for surviving 19th century remains and palaeoenvironmental remains, and a moderate or major adverse effect for any finds related to prehistoric activity or settlement, if present, without a suitable mitigation strategy in place. No effects are predicted on the Pumping Station building.

23.8.3 No effects on the historic environment arising from the operation of the Thames Tunnel infrastructure at Earl Pumping Station are predicted.
23.8.4 The desk-based study of the site suggests that no heritage assets of any significance are anticipated that might merit a mitigation strategy of permanent preservation in situ. The adverse effects could be successfully mitigated by a suitable programme of archaeological investigation before and/or during construction, drawing on a range of techniques. This would include subsequent dissemination of the results and so achieve preservation by record.

23.9 **Land quality**

23.9.1 A search of historical and environmental data indicates that the northern part of the site was first developed with housing and the southern area was shown to be occupied by part of a large tar works which extended to the south. Several potential contamination sources have been identified historically both within the site and in the vicinity of the site. This included industrial operations such as timber works and tar works. Previous ground investigations of a site approximately 80m to the east recorded contamination of groundwater. Desk based studies have identified a low/medium risk from unexploded ordnance.

23.9.2 Based on preliminary assessment findings, there may be a slight adverse effect on construction workers due to the potential for exposure to contaminated soils or other materials if they are present, although any exposure risk would be short-term. There would be a negligible effect on the built environment as it is considered unlikely that contaminants contained in subsurface materials would affect buried structures. The preliminary assessment therefore identified no need for mitigation during the construction phase. The Environmental Statement will consider any additional information from ground investigations.

23.9.3 During operation the preliminary assessment indicates that there would be a negligible effect on future users and the built environment. The assessment identified no need for mitigation during the operational phase.

23.10 **Noise and vibration**

23.10.1 A noise survey has been carried out for this site. The noise environment is dominated by road traffic noise and noise from the industrial units. The nearest locations to the site which are sensitive to noise and vibration are residences to the north, west and south and industrial units to the east.

23.10.2 Based on this preliminary assessment, significant noise effects arising from construction activities are predicted at residential properties on Yeoman Street, Chilton Grove, Croft Street and at offices on Yeoman Street. Significant vibration effects arising from construction activities are predicted at residential properties on Chilton Grove and Croft Street. No significant effects as a result of the operation of the site are predicted.

23.10.3 During construction, the contractor would be required to follow best practice (as described in the Code of Construction Practice) at all times to reduce noise and vibration effects on the local community for example through suitable siting of equipment on site.
23.10.4 It is anticipated that mitigation would be required to address noise and vibration effects during construction. This could include the use of localised screens and enclosures to reduce noise from particularly noisy, static operations.

23.10.5 The next stage of the assessment will profile the variation in construction noise levels across the programme of work with the aim of refining mitigation design and seeking to reduce the significant effects of construction noise and vibration. Further details of mitigation measures will be provided in the Environmental Statement including the significance of residual effects once mitigation has been taken into account.

23.11 Socio-economics

23.11.1 The site comprises Thames Waters operational land and land currently occupied by three industrial/warehousing businesses. Residential dwellings and other industrial/warehousing premises surround the site. It is estimated that the business space within the site accommodates work space for up to 24 employees.

23.11.2 During construction, there are considered to be moderate adverse effects on amenity of nearby residents and minor adverse effects in relation to the displacement of businesses on site. There are no anticipated operational effects as a result of the works at Earl Pumping Station.

23.11.3 In completing the assessment, there is scope for further construction phase mitigation measures to be incorporated in the design with the aim of seeking to reduce significant adverse amenity effects which have been identified in this preliminary assessment.

23.12 Townscape and visual

23.12.1 The site comprises pumping station buildings (Figure 23.6), warehouses, hardstanding and five mature London plane trees, and is generally in a fair condition. The surrounding townscape is a mix of industrial premises and 20th / 21st century residential properties.

23.12.2 Based on preliminary assessment findings, during construction due to site activity and hoardings there are likely to be moderate adverse effects on the site and Rotherhithe Mixed Residential and minor adverse effects on Cannon Wharf Business Area. Once operational, preliminary assessment findings indicate there would be moderate beneficial effects on Cannon Wharf Business Area and minor beneficial effects on the site and Rotherhithe Mixed Residential due to the removal of industrial buildings, well-designed above ground structures and improved boundary treatment.

23.12.3 In terms of visual amenity, during construction preliminary assessment findings indicate that there are likely to be moderate adverse effects on viewpoints to the north and south of the site and minor adverse effects on viewpoints from residences surrounding the site due to the visibility of cranes. Once operational, preliminary assessment findings indicate that there would be minor beneficial visual effects on three viewpoints from residences surrounding the site due to the visibility of new structures and boundary treatments, assuming a high level of design quality.
23.12.4 Measures during the construction phase are being incorporated into the proposals, for example through use of capped and directional lighting when required and the use of hoarding. For the operational phase, a process of iterative design and assessment has been employed to maximise beneficial effects. The level of benefits during operation will depend on the final architectural and landscape design and will be reported in the Environmental Statement.

Figure 23.6 Buildings at Earl Pumping Station

23.13 Transport

23.13.1 The site has moderate public transport accessibility. Public transport within the vicinity of the site includes the River Bus from Greenland Pier, bus services and London Overground and Underground station from Surrey Quays and from Canada Water. Vehicle access is proposed along Plough Way (B206) onto Yeoman Street Figure 23.7). The site would have two vehicular access points, with entry from Yeoman Street and exit onto Croft Street.

23.13.2 During construction, the number of heavy goods vehicle movements would be comparatively low. Due to the location of the construction site and the need to make modifications to the highway layout, vehicle activity is considered likely to result in a minor adverse effect on road network operation and delay. Effects on pedestrian and cyclist amenity and safety are expected to be minor adverse and negligible respectively. A negligible effect is expected on public transport and river services. During the operational phase there would be very occasional vehicle trips to and from the site for maintenance activities but these would have a negligible effect on the surrounding transport networks.

23.13.3 The project is being designed to limit the effects on the transport networks as far as possible. At this location, mitigation measures during the construction phase may be required and may take the form of traffic signal optimisation at local junctions to improve pedestrian crossing times and junction capacity. Mitigation is not required for the operational phase.
23.14 Water resources - ground water

23.14.1 The proposed shaft would pass through the upper and into the lower aquifer. Associated interception infrastructure would penetrate the upper aquifer. The main receptors are the upper aquifer, which is defined as being of medium value and the lower aquifer, which is defined as being of high value.

23.14.2 Construction effects on the upper aquifer would be limited to physical obstruction to groundwater flow and this is anticipated to be negligible. Construction effects on the lower aquifer would relate to dewatering which could impact groundwater resources and induce groundwater movement. The effects of dewatering require further investigation in order to characterise the extent of effects. Design measures will be developed in parallel with further investigation in order to minimise the effects.

23.14.3 Once operational the potential effects would be obstruction to groundwater flow and seepage to and from the shaft. Embedded design measures, such as secondary lining would ensure that these effects are negligible.

23.14.4 Monitoring of groundwater levels and quality would continue throughout construction and operation.

23.15 Water resources – surface water

23.15.1 The site is located within Thames Water’s Earl Pumping Station and lies 200 metres southwest from the River Thames and the Surrey Commercial Docks.
23.15.2 The section of the River Thames closest to the site lies within a zone of the river defined by the Environment Agency as the Thames Middle waterbody. This is currently classified under the Water Framework Directive as being at moderate potential status, with a status objective of good potential by 2027. The Lavender Pond Local Nature Reserve is located within 2 kilometres of the site and is water dependent.

23.15.3 There is the potential for effects on surface water resources from the proposed construction works through surface water runoff and exposure of the drainage system to contaminants. After taking into account the measures incorporated into the design and Code of Construction Practice, such effects are expected to be manageable and not significant. No mitigation would therefore be required.

23.15.4 Once operational, the scheme would reduce the number of discharges from the Earl Pumping Station combined sewer overflow to a predicted level of four spills per year once the tunnel is in place.

23.15.5 This reduction would have been a beneficial effect on water quality. The number of risk days for river users being exposed to pathogens would be reduced by up to 104 days of risk of exposure per year. In addition, the tonnage of sewage derived litter can be expected to be reduced from approximately 137 tonnes to 16 tonnes per year.

23.16 Flood risk

23.16.1 The main source of flood risk to the site is the tidal River Thames and the site is located within the ‘high probability’ flood zone, although it is protected by flood defences which run along the river bank.

23.16.2 The site may be at risk of localised surface water ponding during extreme rainfall events. However, no changes are proposed to the percentage of hard standing on the site and this area would continue to be served by the local drainage system.

23.16.3 Though not in the immediate vicinity of the site, the route of the Greenwich Pumping Station connection tunnel passes beneath the Thames tidal flood defences approximately 600m to the east of the site. The work required to construct the tunnel could affect the local flood defences, and further studies are being completed to assess potential impacts.

23.17 Further information

23.17.1 Further information regarding preliminary assessment findings for Earl Pumping Station can be found in Volume 24 of the Preliminary Environmental Information Report.