8 Barn Elms

8.1 Introduction

8.1.1 This section of the non-technical summary presents the preliminary environmental assessment for the Thames Tunnel project at Barn Elms.

8.1.2 At this site it is proposed that the existing West Putney Storm Relief Sewer would be linked to the proposed Thames Tunnel through a shaft and an underground connection tunnel. Currently, the existing combined sewer overflow discharges approximately 26 times a year. The total volume of this discharge is 34,300m$^3$ each year.

8.1.3 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.

8.1.4 The environmental topics which have been assessed for this site are listed in the ‘Assessment’ section (9). Preliminary assessment findings are then presented topic by topic.

8.2 Site context

8.2.1 The site is shown as site number 3 on Figure 28.1.

8.2.2 The site is located within the London Borough of Richmond upon Thames (Figure 8.1). It is also close to the London Borough of Wandsworth

Figure 8.1 Barn Elms site location
8.2.3 The site is located within the grounds of the Barn Elms Schools Sports Centre and Barn Elms playing fields. Approximately 2½ hectares is required for the temporary construction works. This is indicated by the red line shown on Figure 8.2. The area of land required for the permanent works would be substantially smaller than that required for construction. The site is located entirely inland and requires no works within the foreshore.

8.2.4 Currently there is no direct vehicular access to the site. The Thames Path is a public right of way and runs along both banks of the river at this location. To the south of the site is the Beverley Brook which flows into the River Thames.

Figure 8.2 Aerial photograph of Barn Elms*

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

8.3 Proposed development

8.3.1 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. This would reduce flows for a typical year to an average of approximately 1,500m³/year.

8.3.2 In order for this interception to be achieved, construction works at this site would take approximately two and a half years. A construction road would be built roughly parallel to the Beverley Brook. A permanent access road for maintenance purposes would also be required.
8.3.3 A shaft with an internal diameter of approximately 6m and approximately 38m deep would be constructed. From the base of this shaft there would be an underground connection tunnel which would join up with the main tunnel. Through an interception chamber, flows from the existing West Putney Storm Relief Sewer would be diverted into the connection tunnel and into the main tunnel, located deep underneath the River Thames.

8.3.4 Most of the construction would take place from 8am to 6pm, Monday to Friday. Limited works may be required beyond these hours.

8.3.5 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 construction works.

8.3.6 Figure 8.3 shows an indicative plan of the construction works.

Figure 8.3 Indicative plan of construction works for Barn Elms

8.3.7 Once the works at this site have been built, a number of permanent features would remain (Figure 8.4). There would be an area of hardstanding to enable access into the shaft and the tunnel for inspection and maintenance purposes. Access for maintenance purposes would be required every three to six months. Once every ten years more substantial maintenance work would be required. The extent of the new permanent access road is shown in Figure 8.4. It would run parallel to the River Thames and extend from the existing boathouse to the proposed permanent structures.
8.3.8 There would be a kiosk to control the below ground equipment. There would also be a ventilation column. Most of the time, air would be drawn into the tunnel via this column to ensure that the air within the main tunnel is continuously circulated. From time to time when the main tunnel is filling up, air may be expelled via odour filters and out through the ventilation column at Barn Elms (and other sites along the route of the tunnel).

8.3.9 In the case of Barn Elms, the control kiosk and the ventilation column would be combined into a single structure, approximately 4 metres in height. They are positioned on an elevated platform to ensure they are above the area which is liable to flooding. In addition, there is an enclosure around the combined ventilation column and control kiosk. This is being designed to have a densely textured surface to encourage invertebrates and to promote biodiversity. There would also be a habitat wall around the shaft to further promote biodiversity. There would be no fencing around any part of the development once it is built. There would be no lighting at night.

Figure 8.4 Barn Elms indicative plan of built development
8.4 **Assessment**

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

a. Air quality and odour  
b. Ecology – aquatic and terrestrial  
c. Historic environment  
d. Land quality  
e. Noise and vibration  
f. Socio-economics  
g. Townscape and visual  
h. Transport  
i. Water resources (ground and surface)  
j. Flood risk

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

8.4.3 As part of the assessment process, consideration has been given to known major developments that may change future environmental conditions. There are no known developments in the vicinity of this site. Future environmental conditions are therefore not anticipated to change significantly from those which exist today as a result of other developments.

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

8.5 **Air quality and odour**

8.5.1 The Barn Elms site is located within the London Borough of Richmond upon Thames Air Quality Management Area. Local monitoring data indicates that there are currently exceedences of the air quality objectives at roadside locations in the vicinity of the site. The nearest people who may be sensitive are users of the playing fields, Barn Elms Schools Sports Centre and local clubs (for example, the Boat House and Sea Cadets Corps) and occupiers of nearby residential dwellings on Home Way. The London Wetland Centre (which is a Site of Special Scientific Interest) is also considered in this assessment.

8.5.2 Based on this preliminary assessment, it is considered that the overall effect on local air quality from construction road traffic and construction plant is likely to be minor adverse at the Wetland Centre and residential properties. There is considered to be a negligible effect on users of the Sports Centre, Boat House and playing fields. Construction dust is likely to have a minor adverse effect on nearby residential properties and users of the Boat House, and a negligible effect elsewhere, taking account of the dust control measures in the Code of Construction Practice.
8.5.3 Preliminary assessment findings indicate that the effect of odour from air released from the ventilation column during operation is likely to be negligible.

8.5.4 Based on this preliminary assessment, it is considered that further measures are not required. As part of the ongoing assessment, data gathering and modelling will be carried out and reported in the Environmental Statement.

8.6 Ecology – aquatic

8.6.1 The West Putney Storm Relief Sewer outfall that would be intercepted, currently discharges into the freshwater reaches of the River Thames and Tidal Tributaries Site of Metropolitan Importance, and is within 10 metres of two Sites of Borough Importance. The intertidal area is dominated by pebbles and shingle. Above the exposed foreshore area, there is a river wall which supports vegetation. Surveys and data searches indicate a high diversity of fish and invertebrates.

8.6.2 During construction, no significant effects are likely to occur. The site is inland and controls would be in place via the Code of Construction Practice to prevent water pollution occurring. Noise and vibration levels would not give rise to effects on aquatic ecology. Once the tunnel is built and operating, there would be improvements to the river which in turn would improve conditions for river ecology, notably fish and invertebrates. Given the nature of effects at the site no mitigation is required.

8.7 Ecology – terrestrial

8.7.1 The site has potential for badgers, reptiles, bats, invertebrates, otters, breeding birds and water vole (Figure 8.5). The banks of the River Thames, close to the site, support a notable assemblage of wintering birds. Surveys for these species are ongoing. The site is also considered to be of value to hedgehogs and common amphibians such as frogs.

8.7.2 The proposed construction road would be located within the southern end of Barn Elms Playing Fields and adjacent to the Beverley Brook. Both are Sites of Importance for Nature Conservation. The London Wetland Centre Site of Special Scientific Interest is located to the north.

8.7.3 The loss of habitat within the Barn Elms Playing Fields Site of Importance of Nature Conservation would have a moderate adverse effect. Aquatic ecology effects on designated sites are considered in section 8.6. Elsewhere, the loss of mature vegetation would have a minor adverse effect. There would be a minor adverse effect on hedgehogs and frogs from habitat loss and disturbance. The assessment of effects and any mitigation required on all other species will be undertaken once surveys have been completed.

8.7.4 Measures to address adverse effects are likely to include reinstatement and replacement of habitat and management of construction. Once built and operational, no effects on terrestrial ecology are anticipated. The proposed habitat wall would promote local biodiversity.
Figure 8.5 A number of bat species have been recorded near the site, like the juvenile common pipistrelle bat

8.8 Historic environment

8.8.1 There are no nationally designated heritage assets within the site, nor are there any within the immediate vicinity. Barn Elms Playing Fields originally formed part of the Barn Elms medieval manorial estate, and are of medium heritage asset significance (Figure 8.6). The site of the manor house lies to the north, outside the site.

8.8.2 The eastern part of the site lies within the locally designated Barnes Common Archaeological Priority Area, and the main potential in terms of buried heritage is for palaeoenvironmental remains (e.g. organic remains, such as pollens or plant fossils) and for isolated prehistoric artefacts. There is also potential for post-medieval remains of pavilions, pump houses and tanks dating from the mid-19th century, and for remains of post-medieval ponds and water management features. The site has a moderate potential to contain later medieval agricultural remains, flood defences and fish ponds. There is a limited potential for the remains of prehistoric boats, trackways or structures.
8.8.3 During construction, site stripping would potentially truncate archaeological remains which may be beneath the topsoil. Deep excavations would remove any assets should these be present. This would give rise to a minor adverse effect on palaeoenvironmental, isolated prehistoric artefacts, later medieval and post-medieval remains. There would be a major adverse effect on any prehistoric boats, trackways or structural remains should these be present. No heritage assets of very high significance are anticipated.

8.8.4 Adverse effects could be successfully mitigated by a programme of archaeological investigation before and/or during construction. This would include subsequent dissemination of the results and so achieve preservation by record.

8.8.5 The effects during the operational phase on the setting of heritage assets from the presence of above ground structures will be included in the Environmental Statement. Any mitigation requirements will also be presented.

8.9 **Land quality**

8.9.1 A search of historical and environmental data shows that the site has been parkland or in other recreational use since mapped records began, with areas of residential development and pockets of industrial activity surrounding the site. No contaminative uses are known to have taken place at the site. There is a record of a tank (use not specified) being present in the 1950s. However, even if a historic spillage of a contaminating substance had occurred, given the time elapsed this is unlikely to represent an ongoing contamination risk.

8.9.2 Previous ground investigations have recorded no significant soil or groundwater contamination. Desk based surveys have identified a low to medium risk from unexploded ordnance.
8.9.3 In the unlikely event that contamination is found during further site investigations or during construction, there could be a slight adverse effect on construction workers due to the potential for exposure to contaminated soils or other materials. There would be a negligible effect on the built fabric of the existing combined sewer overflow as it is unlikely that contaminants contained in subsurface materials would affect buried structures.

8.9.4 During operation there would be a negligible effect on future site users and the built environment (both the proposed Thames Tunnel development and the existing combined sewer overflow). Given that no significant effects are predicted during construction or operation, no mitigation is required.

8.10 Noise and vibration

8.10.1 The nearest location to the site which is sensitive to noise is the residential street, Home Way. Significant noise effects arising from construction activities are predicted at residential properties at Huntingford House, Lancaster House, Jay House and Stockhurst Close. No significant effects from vibration during construction are predicted. No significant noise or vibration effects are predicted during operation.

8.10.2 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.

8.10.3 In order to address significant noise effects, additional mitigation may be required. For example, localised screens and enclosures may be considered to reduce noise from particularly noisy, static operations.

8.10.4 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.

8.11 Socio-economics

8.11.1 The sports centre and pitches are well used for a range of purposes by local schools and private sports clubs. The Barn Elms Boat House, a Scouts Hut, the towpath forming the Thames Path and national cycle route, and the Beverley Brook footpath are all located in the vicinity of the site (Figure 8.7). Residential properties are located to the south of the site beyond the Beverley Brook.
8.11.2 During construction, there would be minor adverse effects on users of the sports pitches arising from land take. Amenity impacts on users of the Sports Centre, nearby residents and users of the Beverley Brook footpath would result in minor adverse effects. Amenity impacts on users of the Thames Path and national cycle route would result in negligible effects. Once operational, there would be negligible effects on recreational opportunities arising from the small area of land take for the above ground built structures.

8.11.3 Construction effects would be managed in accordance with the Code of Construction Practice. The operational layout of the development is being designed to minimise land take and effects on the sports pitches.

8.11.4 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.

**Figure 8.7 People watching the Boat Race from the Thames Path near Barn Elms**

8.12 **Townscape and visual**

8.12.1 During construction, due to site clearance, hoardings and the intensity of construction activity there would be a major adverse effect on the townscape character of the site and surrounding area. There would be a moderate adverse effect on the nearby Leaders Gardens and Barnes Common and minor adverse effects beyond due to the presence of cranes. Once operational there would be a minor to moderate adverse effect on the character of the site due to the introduction of built elements within a recreational green space. For the same reason, the effect on the wider Barn Elms recreational area would be negligible to minor adverse.
8.12.2 In terms of visual amenity during construction, due to the visibility of site hoardings, construction activity and cranes there would be a major adverse effect on the viewpoint looking south east from the track at Barn Elms Schools Sports Centre. There would be moderate adverse effects on the panoramic view from residences on Horne Way, the viewpoint looking north west from Leaders Gardens and the viewpoint looking south west from the Beverley Brook (Figure 8.8). Once operational, due to the filtered view beyond the tree line along the Beverley Brook there would be a negligible to minor adverse visual effect on the same four viewpoints.

Figure 8.8 Winter view towards the site from the mouth of the Beverley Brook

8.12.3 Measures to reduce effects during the construction phase are being incorporated into the proposals, for example, through protection of trees. In terms of operation, a process of iterative design and assessment is being employed to reduce adverse effects including through landscape design and to promote beneficial effects. It is likely that there would be no significant adverse effects during operation and therefore no further mitigation is proposed.

8.13 Transport

8.13.1 The Barn Elms site has poor public transport accessibility with no railway or underground stations within close proximity. However, there are bus stops in the local area which serve Putney and Hammersmith. Construction vehicle access to the site is proposed from the A205 south of the site, along Rocks Lane and then towards the site via a new access route located just north of the Beverley Brook (Figure 8.9).
8.13.2 During construction, the number of heavy goods vehicle movements would be comparatively low. However, construction activity is considered likely to result in a moderate adverse effect on road network operation and delay. Effects on pedestrian amenity and safety are expected to be moderate adverse (due to the footway diversion and increased vehicle flows) and negligible on cyclists. A minor adverse effect is expected on local bus routes due to the relocation of one bus stop, with a negligible effect expected on other public transport. During the operational phase there would be very occasional vehicle trips to and from the site for maintenance activities and these would have a negligible effect on the surrounding transport networks.

8.13.3 The project is being designed to limit the effects on transport networks as far as possible. At this location, mitigation measures during construction would take the form of traffic management measures to manage vehicles accessing and exiting the site. The site access and bus stop relocation would be designed to ensure neither affects the safety of road users or pedestrians. Mitigation is not required for the operational phase.

**Figure 8.9 Local access information**

![Local access information](image)

8.14 Water resources - ground water

8.14.1 The shaft would pass through the upper aquifer and into the underlying London Clay. The interception chamber would be located in the upper aquifer, which is the most sensitive in terms of ground water.

8.14.2 Construction and operational effects on the upper aquifer would be limited to physical obstruction to groundwater flow and this is anticipated to be negligible.

8.14.3 Monitoring of water levels and water quality would be undertaken during construction and operation.
8.15 Water resources – surface water

8.15.1 The site is located within 100 metres of the River Thames and approximately 20 metres north of the Beverley Brook (Figure 8.10). The London Wetland Centre, which is a designated Site of Special Scientific Interest, is located immediately to the north and there are a number of other nationally and locally designated water-dependent conservation sites within 2 kilometres of the site.

Figure 8.10 The mouth of the Beverley Brook

8.15.2 Water quality in the River Thames near the site is currently classified as 'moderate' with an objective to reach 'good' status by 2027.

8.15.3 Construction effects on surface water resources would be managed in accordance with measures contained in the Code of Construction Practice. With the Code in place it is anticipated that effects from site runoff and the risk of contaminants entering drains would not be significant. Therefore no further mitigation would be required.

8.15.4 Once operational, the scheme would reduce the number of discharges from the West Putney Storm Relief combined sewer overflow, from the current average level of 26 spills a year (113 hours duration and 34,300 m³) to a predicted level of one spill a year (4 hours and 1,500 m³) once the tunnel is in place. This reduction would give rise to a beneficial effect on water quality. The number of risk days for river users being exposed to pathogens would be reduced by up to 132 days. In addition, the tonnage of sewage derived litter would be expected to be reduced from approximately 9 tonnes to less than half a tonne a year.
8.16 **Flood risk**

8.16.1 The main source of flood risk to the site is from the tidal River Thames. The site is located within the 'high probability' flood zone, although it is protected by flood defences which run along the banks of the Thames. The site is also located adjacent to the Beverley Brook, however a tide barrier situated at the confluence with the River Thames prevents tidal flows affecting the water levels in the Brook. The Beverley Brook's channel capacity is sufficient to contain extreme fluvial flood events at this location. Therefore the risk to the site from fluvial flooding is considered to be low.

8.16.2 The site may be at risk of localised surface water flooding due to runoff generated by the land surrounding the site. The works required to construct the tunnel could also affect the local flood defences. Further studies are being completed to assess these potential effects.

8.16.3 The current level of protection afforded by the defences would be maintained on the site. Any increases in hard standing and the resultant increase in surface water runoff would be mitigated for in accordance with current planning policy.

8.17 **Further information**

8.17.1 Further information regarding preliminary assessment findings for Barn Elms can be found in Volume 9 of the Preliminary Environmental Information Report.