6 **Acton Storm Tanks**

6.1 **Introduction**

6.1.1 This section of the non-technical summary presents the preliminary environmental assessment for the Thames Tunnel project at Acton Storm Tanks.

6.1.2 At this site it is proposed that the existing Acton Storm Relief sewer would be linked to the proposed Thames Tunnel through a shaft to the main tunnel. The combined sewer overflow for this sewer currently discharges approximately 29 times a year. The current total volume of this discharge is approximately 312,000 m$^3$ each year.

6.1.3 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.

6.1.4 The environmental topics which have been assessed for this site are listed in the ‘Assessment’ section (6.4). Preliminary assessment findings are then presented topic by topic.

6.2 **Site context**

6.2.1 The site is shown as site number 1 on Figure 28.1.

6.2.2 The site is located within the London Borough of Ealing (Figure 6.1). It is also close to the London Borough of Hammersmith and Fulham and also the London Borough of Hounslow.

**Figure 6.1 Acton Storm Tanks site location**
6.2.3 The site is located within the existing Thames Water Acton Storm Tanks operational facility. The site is predominantly hardstanding and consists of the existing pumping station in the east of the site and six uncovered storm tanks. There is an area of grassed landscaping towards the south eastern part of the site. The site is remote from the River Thames and all works would be located entirely inland. Existing access into the site is via Warple Way at the junction of Canham Road. The construction site extends over approximately two hectares as indicated by the red line shown on Figure 6.2. The area of land required for the permanent works would be substantially smaller than that required for construction.

Figure 6.2 Aerial photograph of Acton Storm Tanks*

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

6.3.1 The proposal is to intercept the existing Acton Storm Relief sewer. With the Thames Tunnel in place, instead of untreated sewage discharging at current volumes directly into the River Thames, flows would be transferred into the proposed Thames Tunnel. Overall, for a typical year, this would remove all discharges from the combined sewer overflow.

6.3.2 A shaft with an internal diameter of approximately 15 metres and approximately 31 metres deep would be constructed. The stretch of the proposed Thames Tunnel from Carnwath Road within the London Borough of Hammersmith and Fulham would be tunnelled via a boring machine westwards to Acton Storm Tanks which forms the start of the Thames Tunnel. At Acton Storm Tanks, the size of the proposed shaft is being designed in response to three main factors: firstly, to enable the tunnel boring machine to be removed once tunnelling from the Carnwath Road Riverside site has been completed; secondly, for hydraulic reasons to ensure that air entrained within the liquid entering into the shaft is adequately de-aerated to avoid a build up of air pressure in the tunnel; and thirdly, to facilitate ease of access for maintenance purposes once the tunnel is built and in use.

6.3.3 The shaft would be located within two of the existing six storm tanks towards the northern section of the site. Once built, the area within these two tanks would be filled in up to ground level. Storm overflow which is currently directed into the storm tanks would be diverted into the shaft and transferred directly into the main tunnel. The remaining four storage tanks would not be required and would no longer be used for the storage of storm overflows.

6.3.4 During construction, a new access way would be provided on Canham Road.

6.3.5 Construction works at this site would take place over approximately three and a half years. Most of the construction work would take place between 8am and 6pm, Monday to Friday. Limited works may be required beyond these hours.

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

6.3.7 Figure 6.3 shows an indicative plan of the construction works.
6.3.8 Once the works at the site have been built, a number of permanent features would remain (Figure 6.4). There would be a surrounding area of hardstanding to allow access into the shaft and tunnel for inspection and maintenance purposes. Access for maintenance purposes would be required every three to six months and would use the existing access via Warple Way / Canham Road. Once every ten years more substantial maintenance works would be required and would be accessed via new access points off Canham Road.

6.3.9 A 9 metre high ventilation building is proposed to provide ventilation and odour control for the main tunnel. Air from the tunnel would be expelled via carbon filters which would be housed within this building. This would reduce the likelihood of the build up of odours within the tunnel. As the tunnel fills, air within the tunnel is displaced and passes through the carbon filters. This would ensure that air released via the ventilation column does not contain odour.

6.3.10 Located close to the ventilation building is a 15 metre high ventilation column. Each site along the route of the tunnel has a ventilation column through which air is drawn into the tunnel. At Acton when the tunnel is filing up, air would be expelled via filters within the building and to the ventilation column.
6.3.11 A brown roof is proposed on the ventilation building. A brown roof is specifically designed to promote local biodiversity through a covering of materials such as aggregate and gravels. These are low in nutrients and promote natural colonisation of brown field plant species, which are of particular value to insects and birds.

Figure 6.4 Acton Storm Tanks indicative plan of built development

6.4 Assessment

6.4.1 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

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

6.4.3 As part of the assessment process, consideration has been given to known major developments that may change future environmental conditions. In this case, there are no other 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.

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

6.5 Air quality and odour

6.5.1 The Acton Storm Tanks site is located within the London Borough of Ealing Air Quality Management Area. Local monitoring data indicates that there are currently exceedences of the air quality standards for nitrogen dioxide in the vicinity of the site. The nearest people who may be sensitive to the development are occupiers of nearby residential dwellings (Figure 6.5), commercial and industrial premises to the north of Canham Road and on Warple Way, and Southfield Primary School.

Figure 6.5 Acton flats at Factory Quarter on Warple Way

6.5.2 Based on preliminary assessment results, 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 residential properties and Southfield Primary School, and negligible at the commercial and industrial premises. In terms of construction dust, this is likely to have a minor adverse effect at the closest residential properties and commercial and industrial premises, and a negligible effect at Southfield Primary School, taking account of the dust control measures in the Code of Construction Practice.

6.5.3 Preliminary assessment findings indicate that the effect of odours released from the ventilation column is likely to be negligible.
6.5.4 Based on this preliminary assessment, it is considered that further measures are not required.

6.6 Ecology – aquatic

6.6.1 The Acton Storm Relief sewer overflow currently discharges into the reaches of the River Thames and Tidal Tributaries Site of Metropolitan Importance and also into the Chiswick Eyot Site of Metropolitan Importance. Seals are known to use the Eyot for temporarily resting out of the water. Data indicate a high diversity of freshwater and estuarine fish species (Figure 6.6). Invertebrates may include the depressed river mussel, a notable species of mussel.

6.6.2 There would be no in-river works associated with this site. No further consideration of the impacts associated with construction has therefore been undertaken.

6.6.3 During operation, the reduction in fish mortality that would result from improved oxygenation of the water is considered a moderate beneficial effect. In the longer term after the tunnel is operational, there would also be moderate beneficial effects in terms of an increase in the distribution of pollution sensitive fish species, and increased invertebrate diversity and abundance and distribution of rare and/or pollution sensitive invertebrate species. There would be a negligible effect on mammals.

6.6.4 No mitigation is required at this site given the beneficial effects predicted.

*Figure 6.6 Sea bass were found at a limited number of sites during the aquatic ecology surveys in autumn 2010.*

6.7 Ecology – terrestrial

6.7.1 The site includes existing buildings and hardstanding, amenity grassland, scattered trees and dense scrub. Spoil and wood piles are also present. The site and surrounding area have some local value for breeding birds and the site is likely to support a range of invertebrates. There is also potential for bats and reptiles within the site, and surveys for these species are ongoing.
6.7.2 No significant effects on designated sites are anticipated (aquatic ecology effects are considered in section 6.6). Site clearance would result in the loss of trees, grassland and scrub. This would have a local adverse effect. Habitat loss is also considered likely to result in local adverse effects on breeding birds and invertebrates on site. Measures to address these effects may include reinstatement and replacement of habitat, including wildflower seeding, relocation of habitat piles and the installation of a brown roof on the ventilation building.

6.7.3 Habitat loss and disturbance from construction activities on any bats or reptiles will be carried out once surveys have been completed and included in the Environmental Statement.

6.7.4 Once the tunnel is built and operational, no adverse effects on terrestrial ecology are predicted as a result of the operation of the tunnel.

6.8 Historic environment

6.8.1 The site does not contain any nationally or locally designated heritage assets, nor are there any in the immediate vicinity. The site is occupied by six large modern storm tanks and associated buildings dating to the 20th century, along with fragmentary remains associated with the earlier 19th-century sewage works (Figure 6.7). These are of low heritage significance. The Bedford Park Conservation Area, a high heritage asset, lies 125m to the south of the site. The main potential in terms of buried archaeological heritage is for footings of structures associated with the 19th-century sewage works, including the pump house. This would be of low heritage asset significance if present. The site is considered to have low potential for earlier archaeological remains as it lay outside of the main settlement areas in these periods and archaeological finds to date have been sparse.

Figure 6.7 OS 2nd edition 25” scale map of 1896–99
6.8.2 During construction there may be localised impacts to late 19th century machinery and removal of an inscribed granite slab, resulting in a minor adverse effect. Deep excavations would entirely remove any buried heritage assets. This would constitute a minor adverse effect for any surviving 19th–20th century structural remains.

6.8.3 The desk-based study of the site suggests that no heritage assets of very high significance are anticipated that might merit a mitigation strategy of permanent preservation in situ. Any minor adverse effects could be mitigated by a programme of archaeological investigation before and/or during construction.

6.8.4 An assessment of effects on the historic environment arising from the operation of the tunnel, such as on the setting of heritage assets outside the site, will be included in the Environmental Statement.

6.9 Land quality

6.9.1 A search of historical and environmental data identified two contaminative uses on site. The site was developed as a sewage treatment works in the mid 1890s; this included filter beds in a similar position to the present storage tanks. The filter beds and other infrastructure such as a pump house were extended to cover the majority of the existing site throughout the 20th century. The filter beds were replaced by the existing storm tanks during the 1980s. A railway which was dismantled in the 1960s/70s, formerly occupied an area adjacent to the western extent of the site. The area adjacent to the north and east of the site has a manufacturing history dating back to the early part of the twentieth Century, although it has now been largely redeveloped for housing.

6.9.2 The main contamination risk is likely to be associated with the on-site use as a sewage pumping station which includes an above ground fuel tank and the former railway. Desk based surveys have identified a low/medium risk from unexploded ordnance.

6.9.3 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. Based on the preliminary assessment findings, mitigation measures during the construction phase are not considered necessary.

6.9.4 During operation there would be negligible effect on future users and the built environment and therefore does not require mitigation.

6.10 Noise and vibration

6.10.1 A noise survey has been carried out for the Acton Storm Tanks site (Figure 6.8). The site is dominated by road traffic noise. The nearest locations to the site which are sensitive to noise and vibration are the residential properties on Canham Road to the north.

6.10.2 Significant noise effects arising from construction activities are predicted at Stanley Studios and residential properties at Greenend Road, Edison
Court, Telsa Court and Canham Road. Significant vibration effects arising from construction activities are predicted at Stanley Studios and residential properties at Greenend Road, and Canham Road. No significant effects as a result of the operation of the site are predicted.

6.10.3 During construction, the contractor would be required to follow best practice (as described in the Code of Construction Practice) at all times to reduce the noise and vibration effects upon the local community. For example, this may include suitable siting of equipment.

6.10.4 Beyond best practice measures, it is anticipated that additional 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.

6.10.5 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.

**Figure 6.8 Noise monitoring within the Thames Water Acton Storm Tanks site**
6.11 **Socio-economics**

6.11.1 Residential properties surround the site to the north, east and south. There are also commercial and factory buildings located within Acton Park Industrial Estate to the north. There are two main semi-private amenity spaces situated beyond Warple Way, to the east of the site. The site is wholly used for the storage and transfer of overflow storm water. Site operatives attend the site on a regular basis.

6.11.2 During construction, there are considered to be moderate adverse effects on the amenity of some nearby residents although further mitigation measures are being examined to reduce these effects. Amenity effects on users of the two semi-private open spaces are considered to be negligible. There are no anticipated socio-economic effects as a result of the operation of the Thames Tunnel.

6.11.3 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.

6.12 **Townscape and visual**

6.12.1 The site comprises concrete storm tanks (Figure 6.9) set into the ground, semi-mature trees and boundary fencing. Although the condition of townscape within the site is good, it is of low value due to its industrial usage.

*Figure 6.9 View of existing storm tanks at Acton*

6.12.2 The intensity of construction activity and site clearance would have a moderate adverse effect on the site and residences on Warple Way. Minor adverse effects are predicted due to the presence of cranes. Once the scheme is operational there would be minor beneficial effects on the site and residential area on Warple Way due to the removal of two storm tanks and improved structures and boundary treatment.
6.12.3 In terms of visual amenity, during the construction phase there would be a major adverse effect at one of the viewpoints on Canham Road to the north of the site. This is due to the foreground visibility of hoardings and construction activity. There would be moderate adverse effects on viewpoints from residences to the east and south of the site. Once operational there would be minor adverse effects due to visibility of the new building within an area which is currently open in nature. Moderate beneficial effects on the viewpoint on Canham Road to the north of the site are anticipated. Improvements are also anticipated to four viewpoints including from residences to the east and south of the site based on a high quality architectural and landscape design.

6.12.4 Mitigation measures during the construction phase are being incorporated into the proposals, for example through use of capped and directional lighting when required. For the operational phase, a process of ongoing design and assessment is being employed to reduce adverse effects for example through landscape design. Remaining operational effects and benefits will depend on the design and will be reported in the Environmental Statement.

6.13 Transport

6.13.1 The Acton Storm Tanks site has poor public transport accessibility being located 750 metres from Acton Central National Rail Station and 1 kilometre from Turnham Green Underground Station. A number of bus stops are located within half a kilometre of the site. The site is on the southern side of Canham Road and construction vehicle access is proposed from a new access directly off Canham Road.

6.13.2 During construction, the number of heavy goods vehicle movements would be moderate. The nature of the construction site layout at this location is considered likely to result in a minor adverse effect on road network operation and delay due to junction modifications and delays to journey time. Effects on pedestrian and cyclist amenity and safety are expected to be minor adverse. A negligible effect is expected on public transport services. During the operational phase there would be very occasional vehicle trips to and from the site for maintenance activities. These would have a negligible effect on the surrounding transport networks.

6.13.3 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 are likely to be required and would take the form of traffic management measures to improve pedestrian crossing times and the capacity of junctions. Mitigation is not required for the operational phase.

6.14 Water resources - ground water

6.14.1 The shaft would pass through the upper aquifer and into the underlying non aquifer (London Clay). The shaft would not penetrate the lower aquifer beneath (Chalk). The interception chamber would sit in the upper aquifer. The most sensitive aspect with regard to ground water is the upper aquifer which is defined as being of medium value.
6.14.2 Construction and operational effects on the upper aquifer would be limited to physical obstruction to groundwater flow. This is anticipated to be negligible.

6.14.3 No soil or groundwater contamination has been identified on site to date. Should any be encountered, this would be dealt with using a risk based approach and appropriate remediation ahead of construction. The effect on groundwater quality is considered to be negligible at this stage.

6.14.4 Groundwater monitoring of water levels and water quality will continue during construction.

6.15 Water resources – surface water

6.15.1 The site is located over a kilometre north of the River Thames. The section of the River Thames closest to the site lies within Thames Upper waterbody, as classified under the Thames River Basin Management Plan. There is also the possibility for effects on the downstream Thames Middle waterbody. The Thames Upper and Middle waterbodies are currently classified under the Water Framework Directive as being at moderate potential status, with a status objective of good potential by 2027. There are no water dependent designated conservation sites within two kilometres of the site.

6.15.2 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 further mitigation would therefore be required.

6.15.3 Once the tunnel is operational, it is predicted that there would be no spills to the river from the Acton Storm Relief sewer in a typical year with a beneficial effect on water quality. The number of risk days for river users being exposed to pathogens would be reduced by up to 116 days to zero per year. In addition, the tonnage of sewage derived litter can be expected to be reduced to zero for a typical year.

6.16 Flood risk

6.16.1 The site is located within several flood zone classifications, associated with the tidal River Thames. The existing tank structures lie within the high probability flood zone, and the remaining parts of the site lie within the medium and low probability flood zones. However the entire site is protected by tidal flood defences which run along the banks of the Thames. The site may be at risk of localised surface water flooding due to runoff generated by land surrounding the site.

6.16.2 No works are proposed to the existing flood defences. The current level of protection afforded by the defences would therefore be maintained on the site. The risk of the site flooding once the scheme is in operation from tidal events is therefore considered to be negligible. Any increases in hard standing and the resultant increase in surface water runoff would be mitigated in accordance with current planning policy.
6.17 **Further information**

6.17.1 Further information regarding preliminary findings of the assessment for Acton Storm Tanks can be found in Volume 7 of the Preliminary Environmental Information Report.