Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Sustainability Statement

Doc Ref: **7.07**

Appendix B.11

Kirtling Street

APFP Regulations 2009: Regulation **5(2)(q)**

Hard copy available in

Box **48** Folder **B**
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Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Appendix B: Site-specific appraisal

B.11 Kirtling Street

Type of site:	Main tunnel double drive site.
Description of proposals:	The site is situated on either side of Cringle Street and would drive the main tunnel to the Carnwath Road Riverside and Chambers Wharf sites.

Water quality
Maintain and enhance river water quality

Appraisal
The proposals would support the objective. Particular issues of relevance to the site appraisal include:

- Kirtling Street is located within a Source Protection Zone. There is known groundwater contamination within the lower aquifer which may affect other groundwater resources or surface water due to dewatering from the shaft which would ultimately be discharged to the River Thames. Discharges from dewatering would occur in compliance with the appropriate EA licence. Discharging to surface water would be implemented in accordance with the *Code of construction practice* (*CoCP*) to ensure quality is maintained.
- In-river construction would lead to a sediment release of 125m^3 (250t) from dredging and 33t (16.5m^3) from pilling operations. The river is a high sediment environment with approximately 40,000 t (20,000m^3) of sediment passing the site four times per day with tidal movements, peaking during spring tides. Therefore, the proposals would support the objective by maintaining water quality.
- During operation, there would be no direct improvement in water quality from the site, as it does not intercept a combined sewer overflow (CSO). However, the site is central to the construction of the project and therefore it has an important indirect role in facilitating the construction and supporting the objective more broadly.

In summary, during construction, measures in the *CoCP* and compliance with EA licences would ensure that potential discharges or effects on river water quality are managed and that river water quality is maintained.

During operation, there would be no direct improvement of river water quality. However, the proposals at the site are necessary to implement the project which would have a benefit on water quality. Therefore, it is considered to support the objective, although no direct benefits would occur.

Further details can be found in the *Environmental Statement* and the *CoCP*.

Biodiversity
Maintain and enhance biodiversity

Appraisal
The proposals would support the objective in part by maintaining biodiversity. Particular

issues of relevance to the site appraisal include:

- The site is within and adjacent to the River Thames and Tidal Tributaries Site of Importance for Nature Conservation (Grade III of Metropolitan importance) and comprises inter-tidal habitat and river channel. There would be a temporary loss of foreshore habitat measuring approximately 45m^2. It has been assessed that this would have a negligible effect on aquatic habitats. Therefore, it is considered that there would not be a loss of biodiversity and, as such, the objective would be supported.
- The potential increases in noise and vibration during construction have been assessed to have a minor adverse effect on fish. However, the low sensitivity of the habitat and the limited number of fish anticipated in the area at any time suggest that aquatic ecology receptors would not deteriorate.
- The limited terrestrial habitat on site is considered to be of negligible value. Consequently, it is anticipated that the proposals would have a negligible effect on the habitat. Therefore, the proposals would support the objective by maintaining the habitat.
- The effects on notable species such as bats and wintering birds have been assessed as being negligible. Consequently, the proposals are anticipated to support the objective by maintaining biodiversity.
- During operation, the activities at the site are minimal. No effects on terrestrial ecology have been identified. Therefore, it is considered to support the objective by maintaining biodiversity.
- During operation, there would be no direct improvement on water quality as the site does not intercept a CSO. The reinstatement of the foreshore, following the removal of the jetty after construction, is considered to support the objective of maintaining biodiversity.

In summary, the biodiversity of the site and river is likely to be maintained during construction. Therefore, it is considered that the proposals would support the objective.

During operation, the foreshore would be reinstated naturally. Biodiversity is anticipated to be maintained. Therefore the objective is considered to be achieved, although there are fairly limited opportunities for enhancement.

Further details can be found in the *Environmental Statement* and the *CoCP*.

Climate change mitigation

Maximise energy efficiency and minimise the carbon footprint of the project

Appraisal

This objective is most appropriately appraised at the project level, as opposed to the site level. This is because whilst there are variations in energy and CO_2 emissions between sites, in general, these are representative of the different types of site proposed (eg, drive site, CSO interception). The individual sites do not provide an appropriate measure of how far this sustainability objective has been achieved for each site. This is detailed within the *Energy and Carbon Footprint report*.

Procedures to maximise energy efficiency and minimise the carbon footprint of the scheme would be implemented through project-wide initiatives, and not specifically at the site level. Energy Management Plans would be implemented through the *CoCP*, which, alongside Thames Water's proposals to account for carbon emissions throughout the construction

process, would assist in the management of emissions arising from the sites.

Energy and emissions are discussed in the thematic appraisal within the climate change mitigation section (see Appendix A). Additional details are also provided within the *Energy and Carbon Footprint report*.

Whilst predominantly addressed at the project-wide level, at the site level it is anticipated that the proposals would broadly support the objective. The following broad issues are anticipated to arise at the site:

- Greenhouse gas emissions resulting from construction materials at the site would be approximately 193,000t CO_2e. During the construction phase approximately 9,600t CO_2e and 25,800t CO_2e would result from logistics and construction (TBM, plant and machinery operation, lighting and welfare facilities) respectively.
- Barges would be used to transport materials to and from the site. This would help reduce the carbon footprint by 2,400t CO_2e by reducing the individual number of HGV movements that would otherwise be required. Consequently, it would support the objective.
- During operation, the site would make use of passive ventilation. Consequently, it would support the objective by minimising the energy requirements for venting and maximising the efficiency of ventilation points.

In summary, during construction the use of barges to transport material to and from the site would support the objective by minimising the construction carbon footprint.

During operation, the ventilation strategy would be passive at this site. The low energy requirements would help support the objective by maximising energy efficiency.

Further details can be found in the *Environmental Statement*, the *Energy and Carbon Footprint report* and the *CoCP*.

Change adaptation and flood risk

Maximise resilience and adaptability to change; Take account of flood risk in the design of sites

Appraisal

The objective on resilience and adaptability to climate is predominantly considered at a project-wide level due to relevant changes in population and climate occurring at regional level rather than specifically at a site level (see Appendix A).

However, at the site level the proposals would support the objectives to maximise resilience and adaptability to climate change, and take account of flood risk in design. Particular issues of relevance to the site appraisal include:

- The majority of the site is located within Flood Zone 3a, although part of the construction site would be located in Flood Zone 3b. The *CoCP* states that contractors would be responsible for providing and maintaining continuous flood protection. It also states that where possible, vulnerable materials and operations should be located within elevated parts of the site away from potential flood paths. This would support the objectives by ensuring that sites are designed to take account of flood risk and be adaptable to changes in climate which may affect the frequency and height of flood events'.
- The risk of surface water flooding is considered to be low. Oversized pipes would be incorporated to ensure that, should tidal conditions prevent discharge; surface water

run-off can be stored appropriately. Therefore, the proposals support the objective.

- The proposals would not result in an increase in permanent hard standing. The site is also located adjacent to the River Thames, which helps alleviate the effects of urban heat. Therefore, the proposals would be resilient to future changes in temperature and would support the objective.
- Measures would be taken to ensure that flood defences are maintained during construction and operation. This would support the objective on resilience and adaptability and ensures that flood risk has been taken into account during the design of sites.

In summary, during construction flood defences would be maintained to ensure that there is no increased risk of flooding. This would support the objective.

During operation, resilience and adaptability are predominantly addressed at the project-wide level. At the site-specific level, the proposals are not likely to affect urban heat. Resilience to flooding would be provided by maintained flood defences. This would support the objective.

Further details can be found in the *Environmental Statement*, *Site Selection Report* and *CoCP*.

Excavated materials and waste management

Minimise waste arisings and its impacts on the environment and communities and to promote re-use, recovery, recycling and beneficial use

Appraisal

The proposals would support the objective to minimise waste arisings and its impacts. Particular issues of relevance to the site appraisal include:

- Over 1.6Mt of excavated material would be generated from construction activities. The majority (1.5Mt) would be of Lambeth Group (813,000t) or London clay (698,000t) geology. The material would be managed in accordance with the excavated materials and waste strategy that seeks to maximise beneficial re-use of material. This would support the objective by driving re-use, recovery, recycling and beneficial use, as well as minimising the impacts on communities and the environment.
- The excavated material would be transported from site by barge. This reduces the number of HGVs required and therefore minimises the impact on communities associated with road traffic in support of the objective.
- An estimated 5,700t of construction waste would be generated. This would be managed through measures set out in the *CoCP*, including the application of a site waste management plan to maximise re-use, recovery and recycling. The volume of construction waste has been minimised in part through the design development process which has enabled a smaller site to be used than initially envisaged at phase one consultation. This would support the objective.
- There is a high risk of asbestos being present on the site. However, as defined in the *CoCP*, the removal of asbestos would be managed in compliance with HSE regulations, which would ensure that it would not pose a risk to the local community. The removal of asbestos from the site may be beneficial to the local community and environment. Therefore, the proposals would support the objective.
- The site would generate approximately 85t per annum of welfare waste. This would

be managed in line with measures in the *CoCP,* including through a site waste management plan in accordance with the waste hierarchy. Consequently, the objective would be supported.

- Operational waste at the site is considered to be minimal, resulting from routine maintenance. This would include wastes from the air management unit, such as spent granular carbon. This would not affect the objective.

In summary, during construction, the *CoCP* and comprehensive excavated material and waste management strategy seek to minimise waste arisings. The use of barges to transport material would minimise effects on the local community and the environment. Therefore the proposals would support the objective.

During operation waste arising is considered to be minimal and would not affect the objective.

Further details can be found in the *Environmental Statement*, excavated material and waste management strategy (see *Environmental Statement* Vol 3 Appendix A3), *Site Selection Report* and *CoCP*.

Resources and raw materials

Promote the sustainable use of resources

Appraisal

The objective to promote the sustainable use of resources is most appropriately appraised as a project-wide issue, rather than specifically at the site level. Whilst it will be important to work towards the objective through ongoing considerations towards the further design of sites, the major opportunities will arise by taking interventions across the project as a whole.

A significant volume of materials would be required to support construction. The concrete required is central to the durability of the tunnel and therefore the scope for promoting the sustainable use of resources is limited by engineering requirements. A range of measures are proposed at the project level which support the objective and which would assist to promote the sustainable use of resources. Further details are available in the project-wide appraisal within the resources and raw materials section (see Appendix A).

Whilst largely addressed at the project-wide level, at the site level, the proposals would support the objective. The following considerations are relevant to the sustainability at the site level.

- It is estimated that 135,000l of water would be used every 24 hours during the peak construction period between the years of 2018-2021. This is largely accounted for by the 93,000l per 24 hours required for the shaft and tunnel grout/concrete. The requirements for concrete are constrained by engineering specifications. The water would be managed through a water use management plan, implemented through the *CoCP*. The requirements for water usage during construction are shown to be within the available water for London as estimated in Thames Water's water resources management plan and therefore would support the objective by making sustainable use of resources.
- The operation of the site is not anticipated to present a large demand for materials. It is anticipated that the requirement for materials would be minimal and would not affect the objective.

In summary, during construction, the proposals make use of sustainable supplies of water which would support the objective.

During operation, the requirement for materials is minimal and would not affect the objective.

Further information can be found in the *Environmental Statement* and the *CoCP*.

Population, human health and equality

Ensure health and safety, and support the well-being of communities in which the project operates;
Encourage equality and sustainable communities

Appraisal

The proposals would not fully support the objective to ensure well-being of communities. The equality and sustainable communities objective is predominantly addressed within the project-wide thematic appraisal (Appendix A). Particular issues of relevance to the site appraisal include:

- Construction work would last approximately 6.5 years. Standard hours would be used with continuous working hours required for approximately 29 months during tunnelling works and would mainly be underground or within noise enclosures. The CoCP sets out measures that would be enforced to ensure the safety, health and well-being of communities, including a noise enclosure over the shaft prior to tunnelling works commencing. Therefore, the proposals would support the objective.
- Significant adverse effects with respect to noise are anticipated to occur at a number of receptor locations during construction. No further on-site mitigation measures are considered practicable, although compensatory measures would be provided, which may include temporary relocation if appropriate. Consequently it would not support the objective as residents' well-being could be adversely affected.
- Minor adverse effects with respect to air quality are anticipated to occur at a number of receptors during construction. Measures in the *CoCP* would continue to ensure the health and safety and well-being of communities. This would support the objective.
- The Thames Path would be temporarily diverted to allow works to take place. The *CoCP* states that adequate signage and lighting would be provided to ensure the safety and security of users. The Thames Path would be reinstated following construction. This would support the objective by ensuring that the amenity was maintained for the well-being of the community and that the safety and health of the community was considered in the design.
- During operation, the Thames Path would be fully reinstated along its existing alignment. This would support the objective by ensuring recreational amenity which would contribute to the well-being of the community.
- Encouraging equality and sustainable communities is predominantly addressed at the project-wide level. However, extensive public consultation has been undertaken to take into account the community's views on the proposals at the site. This has been considered in conjunction with engineering, environmental, planning and cost issues to achieve a balance between vying interests. Consequently, it is considered that the proposals support the objective of equality and sustainable communities.

In summary, during construction, a number of factors would support the objectives, however some would not because it has not been possible to mitigate certain impacts and a number would remain to affect people. Measures embedded in the design through the *CoCP* would help reduce some effects to maintain health, safety and well-being of communities. However, given the complexity of the site and intensity of works, the objective to ensure the well-being of communities would not be fully supported due to changes in noise at some receptors. During operation, the Thames Path would be reinstated along its original route.

Further details can be found in the *Environmental Statement* and the *CoCP*.

Economy

Promote a strong and stable economy

Appraisal

The proposals would support the objective. Particular issues of relevance to the site appraisal include:

- 11 commercial office units would be permanently displaced. They are considered to be small businesses (between 10 to 49 employees). Whilst they would no longer be located at the site, they would still be operational and contributing to the economy. However, it is uncertain whether they would be located in proximity of the site, within the borough, or within the wider region. The project would provide compensation to affected businesses in line with its compensation programme. Therefore, the objective would be supported.
- The Cemex works would be reconfigured on the site. It would remain operational during the Thames Tideway Tunnel construction works. Costs associated with reconfiguration of the site would be compensated in line with the project compensation programme. Designing the site layout to enable the Cemex works to continue operation is considered to support the objective.
- Approximately 235 workers would be employed at the peak of construction. This would help support employment and contribute towards the objective.
- There are no anticipated operational effects. Consequently there would be no effect in relation to the objective.

In summary, during construction, there may be some effects on existing businesses but these would likely be compensated in line with the project compensation programme. The existing Cemex works would stay operational and the construction works for the Thames Tideway Tunnel would generate a number of employment opportunities. Therefore, it would support the objective.

During operation, the objective would not be affected.

Further details can be found in the *Environmental Statement* and the *CoCP.*

Environmental protection and enhancement

Minimise significant adverse environmental effects relating to air quality, noise and vibration, and lighting from construction and operation of the Thames Tideway Tunnel;
Protect and enhance the character of landscapes and townscapes;
Protect and conserve the historic environment.

Appraisal

The proposals would in general support the objective in relation to minimising environmental

effects. In general, the development would affect the landscape and townscape objective, support the historic environment objective. Particular issues relevant to the site appraisal include:

Environmental effects

- The site is located within an air quality management area (AQMA). It is categorised as having a high risk on air quality from construction dust. Air quality has been assessed to have a minor adverse effect on receptors. Stringent measures in the *CoCP* seek to minimise effects on air quality. Therefore, it is considered to support the objective.
- It has been assessed that there would be significant adverse effects from on-site surface construction noise at a number of receptors. Vibration effects have been reduced through the use of lower vibration compacting methods. The *CoCP* includes measures to minimise the effects from noise and compensatory measures would be provided for remaining significant adverse effects. Consequently, all measures have been taken to minimise significant adverse effects and, as such, it would support the objective.
- During operation, the effects from air quality and noise and vibration have been assessed as negligible and would not affect the objective.
- Operational lighting has also been kept to a minimum which would reduce nuisance from lighting. This would support the objective.

Landscape and townscape

- It has been assessed that there would be a number of major and moderate adverse effects on views and character areas, due to construction activities. No mitigation is possible, due to the requirements for the surface works. Consequently, the proposals would not fully support the objective.
- During operation, it has been assessed that there would be minor beneficial effects on views and character areas due to the removal of dilapidated buildings and the creation of public river frontage at Heathwall Pumping Station. This would support the objective.

Historic environment

- The site lies within an archaeological priority area and is approximately 160 m from the Grade II* listed Battersea power station. There would be potential adverse effects on buried archaeology but these would be mitigated by measures in the *CoCP* and archaeological investigation and watching brief techniques. Therefore, the proposals would support the objective.
- Major adverse effects have been assessed for a group of late 19th / early 20th century industrial brick buildings. These would be recorded and a photographic survey taken, which would reduce the effect to negligible. Consequently, whilst not being protected, they would be preserved through record.

In summary, during construction, measures in the *CoCP* and development of the design have minimised effects on receptors. This would support the objective to minimise environmental effects relating to air quality, noise and vibration. Compensatory measures would be provided to address significant adverse effects. Changes to townscape views and character areas would not fully support the objective on landscape and townscape. The use of a watching brief and archaeological investigation to mitigate effects on buried archaeology would support the objective on historic environment.

During operation, the proposals would not affect the noise and vibration or air quality objective. They would support the landscape and townscape objective and they would not affect the historic environment objective.

Further details can be found in the *Environmental Statement* and the *CoCP*.

Land use

Efficient and sustainable use of land and buildings

Appraisal
The proposals would support the objective. Particular issues of relevance to the site appraisal include:

- The site is on brownfield land in an industrial area with direct river access and good road access therefore making it suitable as a double drive site. The site avoids the use of undeveloped land and would, therefore, support the objective.
- The site selection process has highlighted that there may be opportunities for using the existing Cringle Wharf jetty. This would support the objective by promoting the re-use of existing structures.
- The design development between phase one and phase two consultation established that a smaller site could be used for driving the tunnel boring machines (TBMs). Consequently, the site makes efficient use of available land.
- During operation, land would be returned to previous owners or made available for future use. This would support the objective by allowing land to be re-used following construction of the tunnel infrastructure.

In summary, the proposals make efficient use of land and would support the objective.

Further details can be found in the *Environmental Statement* and the *Site Selection Report*.

Sustainable transport

Minimise the detrimental impacts associated with the transport of construction materials and waste on communities and the environment, by prioritising the use of sustainable transport

Appraisal
The proposals would support the objective. Particular issues of relevance to the site appraisal include:

- It is anticipated that 90% of material would be transported to and from the site along the river by barge. The effects from the 10% of road traffic associated with moving material to and from the site have been addressed by measures in the *CoCP*. This would support the objective by minimising the detrimental impact on the environment and communities by minimising the use of HGVs and promoting the use of river transport.
- It is estimated that there would be 72 HGV movements on average during the construction period. There would be approximately 192 HGV movements per day during the peak construction period which would last 14 months. Measures set out in the *CoCP* such as provision of a traffic management plan would ensure that detrimental impacts arising from construction traffic would be minimised.
- The PTAL for the site has been classified as between level 3 and 4, indicating moderate accessibility by public transport. Measures in the *CoCP*, including the

requirement to prepare a green travel plan and only allowing vehicles necessary to undertaking works, on site, would help minimise detrimental impacts on local communities. This would support the objective by prioritising sustainable transport methods and minimising effects on local communities and the environment from private vehicle traffic.

- The objective is not applicable during operation. This is because the objective is focussed on construction effects. Additionally, there would be minimal transport movements to and from the site during routine operational maintenance. Such effects have been assessed as negligible in the *Environmental Statement*.

In summary, during construction the proposals support the objective by minimising detrimental impacts on the community and the environment through the promotion and use of river transport to move some 90% of material. The *CoCP* includes mitigation measures to further minimise the effects of road traffic associated with construction and access of the site by workers. Therefore, the proposals would support the objective.

During operation, the effects are anticipated to be limited and would not affect the objective.

Further details can be found in the *Environmental Statement* and the *CoCP*.

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