

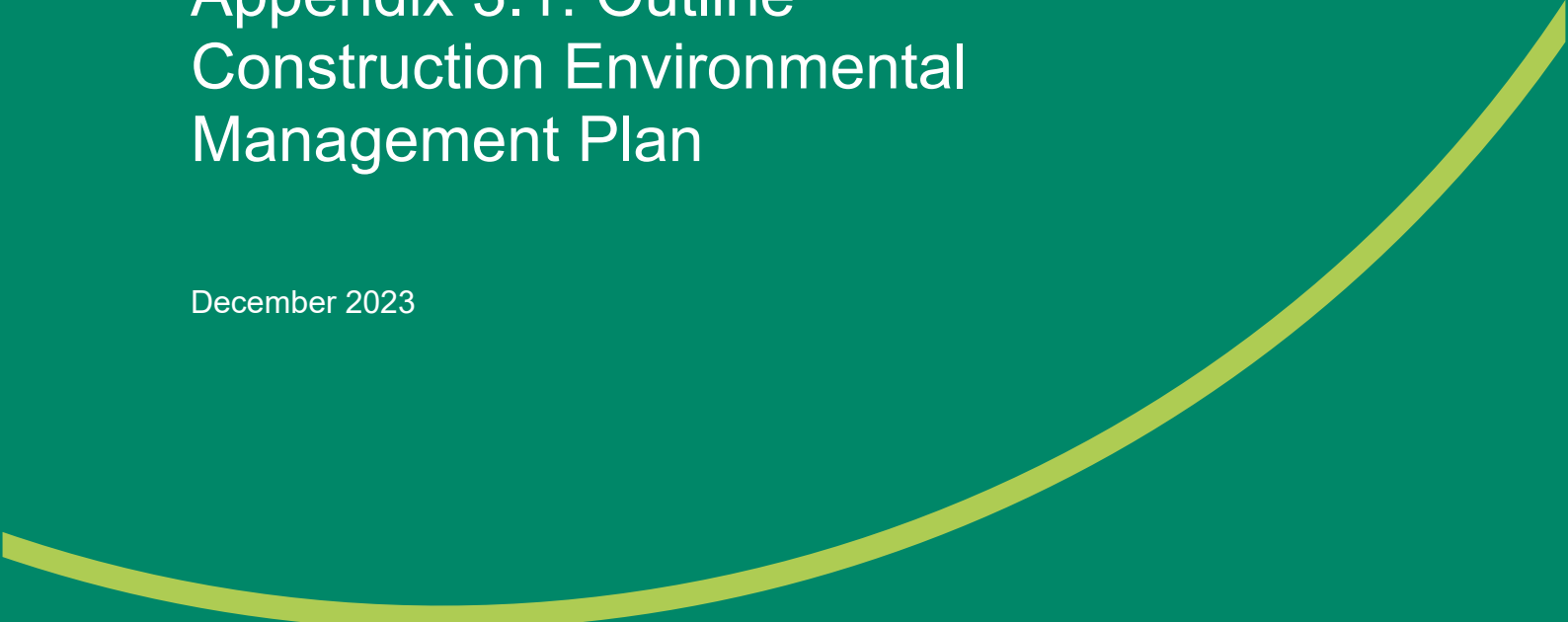
National Grid Cable Tunnel Replacement Project

Environmental Statement

Volume VI

Appendix 3.1: Outline Construction Environmental Management Plan

December 2023



Quality information

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1 Introduction

1.1 Project Summary

- 1.1.1 National Grid Electricity Transmission (hereafter National Grid) has developed proposals for the replacement of a cabled section of the Tilbury to Grain and Tilbury to Kingsnorth (TKRE) 400 kV circuits under the River Thames. The TRKE 400 kV circuits are currently predominantly overhead line, with a cable section installed within a deep tunnel crossing the River Thames. The TKRE Cable Tunnel Replacement Project (hereafter the Proposed Development) relates only to the tunnelled section of these circuits.
- 1.1.2 It is proposed that a **new bored tunnel** under the River Thames is constructed to house new cross linked polyethylene (XLPE) cables. The Proposed Development comprises the following above ground components:
- **Two new cable sealing end compounds:** one either side of the tunnel, onshore, which contain:
 - **Two new tunnel headhouses:** one either side of the new tunnel, onshore, which will cover the shaft into the tunnel;
 - **Two new overhead line gantry structures:** these will connect the overhead line downlead conductor and transfer them to six sealing end structures; and
 - **Modifications to the existing overhead line (OHL):** The new OHL conductors will be connected to the existing TKRE 400kV OHL conductors via new terminal pylons at Tilbury and Gravesend.

1.2 Purpose of the CEMP

- 1.2.1 The Construction Environmental Management Plan (CEMP) aims to ensure that any adverse effects of construction on the environment and local communities are minimised. To achieve this, the CEMP establishes a framework within which the appointed Contractor (including any sub-contractors or suppliers involved in the works) will plan, implement and deliver environmental management, mitigation and monitoring requirements during the construction phase of the Proposed Development. The controls and procedures contained within it are the practical means by which the mitigation commitments made in the Environmental Statement (ES) will be implemented. The objectives of these controls and procedures are:
- Provide a mechanism for ensuring that measures to mitigate potentially adverse environmental effects are implemented;
 - Ensure that environmental good practices are adopted throughout the construction of the Proposed Development;
 - Ensure a prompt response if any unacceptable adverse impacts are identified, with the provision of appropriate additional mitigation measures as required;
 - Provide a means for mitigating effects that may not be anticipated or become apparent until construction is underway;
 - Provide assurance to consultees and other stakeholders that requirements with respect to environmental mitigation are being addressed;
 - Provide a mechanism for compliance auditing to ensure mitigation measures are being effectively implemented and maintained through construction;
 - Implement a policy of potential reuse of all waste with disposal off site being a last resort (aligned to the waste hierarchy; and
 - Enable full compliance to be maintained with all relevant legislation.

- 1.2.2 It is intended that this outline version of the CEMP will be finalised by the appointed Contractor prior to the start of construction based on a detailed design and construction programme. The Detailed (or construction issue) CEMP will cover all construction activities, clearly set out roles and responsibilities and provide contact details for key personnel. It is also intended that the Detailed CEMP will be a 'live' document and will be updated as and when there are changes to the project team or when additional information becomes available (for example through detailed civil design or additional data supply or surveys such as pre-construction ecological surveys).
- 1.2.3 Compliance with the contents of the Detailed CEMP is therefore intended to provide a systematic approach to environmental management so that environmental risks are identified, incorporated in all decision-making and managed appropriately. Detailed construction techniques and supporting Risk Assessment Method Statements (RAMS), which will outline further mitigation requirements based on the measures discussed in the CEMP and any supporting appendices, will be produced by the Contractor.
- 1.2.4 The Detailed CEMP will be agreed with Gravesham Borough Council and Thurrock Council in advance of the start of construction. As a minimum, the Detailed CEMP should be formally reviewed every six months by the project Health, Safety and Environment (HSE) team and within a week following a high potential environmental incident; and passed to National Grid for approval prior to reissue.

1.3 Compliance with Project Environmental Management Systems and Sustainability

- 1.3.1 National Grid is committed to delivering sustainability and good environmental stewardship. In accordance with this proactive approach to sustainable design and construction, National Grid and the appointed Contractor will seek to maximise resource efficiency through reducing the amount of waste generated, minimising water consumption and making the most efficient use of energy.
- 1.3.2 The carbon footprint of the Proposed Development will be reduced during construction by avoiding CO₂ emissions where possible through, for example, keeping construction vehicle movements to the minimum necessary.
- 1.3.3 National Grid manages and reduces their effects on the environment via an Environmental Management System (EMS). The EMS is accredited to ISO14001:2015 and provides a framework for National Grid to deliver continual environmental assessment and improvement and comply with current legislation and environmental commitments. The appointed Contractor will prepare their own Project EMS in accordance with National Grids EMS prior to construction commencing. The Project EMS is expected to be integrated into the Contractor's own EMS arrangements and will address:
- Compliance with the CEMP and any other control and management documents;
 - Compliance with environmental consents and permits;
 - Overall compliance with environmental legislation, approved codes of practice, British Standards and industry best practice;
 - Detailed environmental management procedures to deliver the CEMP and other control and management plans including roles and responsibilities;
 - Monitoring and review arrangements;
 - Emergency procedures that are defined and adopted; and
 - Appropriate training and information for personnel.

1.4 Considerate Constructors Scheme

- 1.4.1 The Proposed Development will be registered with the Considerate Constructors Scheme (CCS). CCS is a national initiative through which construction sites and companies (contractors, subcontractors and suppliers) are monitored against a Code of Considerate Practice. The Code is

designed to encourage environmental and social best-practice during the construction period beyond statutory requirements.

- 1.4.2 The main areas of focus are respecting the local community, valuing the workforce and caring for the environment.

1.5 Structure

- 1.5.1 This Outline CEMP is split into nine sections as detailed below:

- Section 1: Introduction – provides background information about the Proposed Development and an overview of the contents of this Outline CEMP;
- Section 2: Project Description – provides an overview of the Proposed Development;
- Section 3: Construction Programme – provides an overview of the construction programme;
- Section 4: Roles and Responsibilities – sets out the roles and responsibilities of the expected parties involved in construction;
- Section 5: Communications, Reporting and Training – Sets out the requirements for regular communications and reporting as well as staff training;
- Section 6: Construction Environmental Management – Sets out the general requirements with respect to environmental management during construction;
- Section 7: Consents and Licences – Sets out the consents and licences currently identified as required during the construction of the Proposed Development;
- Section 8: Commitments Register – Sets out the specific environmental requirements identified by each topic discipline within the ES; and
- Section 9: Summary – Provides a summary of the Outline CEMP.

1.6 Other Construction Mitigation Plans

- 1.6.1 Table 1-1 lists the plans and procedures that could be developed prior to construction to set out in detail the management systems and approach that will be implemented during construction to comply with the Detailed CEMP. These will be produced as part of the development of the Detailed CEMP.

Table 1-1: Pre-Construction Management Plans

Management Plan	Description
Site Waste Management Plan (SWMP)	To be developed by the Contractor at detailed design. This will set out and identify site-specific measures for the collection, segregation, treatment and disposal of waste.
Materials Management Plan (MMP)	To be developed by the Contractor at detailed design. This will set out how excavated materials are to be managed to ensure that the quality of site-won materials is maintained so that they remain suitable for re-use, do not become contaminated and ultimately do not become waste, targeting 90% total waste diverted from landfill.
Construction Traffic Management Plan (CTMP)	To be developed by the Contractor at detailed design. This will set out the requirements for the safe movement of project related traffic both within the site and <i>en route</i> to and from the construction sites and will be largely based on the outline version provided (ES Volume VI Appendix 10.1 Outline CTMP).

Management Plan	Description
Flood Warning and Evacuation Plan	The Outline version provided with the Planning Application is to be reviewed and updated by the Contractor once appointed during the detailed design stage. This will set out the principles of a response to a significant flood during construction to ensure a coordinated response in the event of an emergency situation.
Drainage Management Plan (Document Reference 30003364-BHK-XX-XX-RP-C-02060)	The Outline version submitted with the Planning Application is to be reviewed and updated by the Contractor during detailed design. The Drainage Management Plan identifies all known risks to the water environment and identifies appropriate measures to prevent pollution during construction; and to manage runoff rates. The Drainage Management Plan will define the installation of pre-construction drainage measures to intercept run-off and ensure that discharge and runoff rates are controlled in quality and volume, in turn causing no degradation to water quality. This may include specific measures to be used in high-risk areas (for example construction along or across steep gradients and water course crossings). A phased approach may be taken to the development of the Drainage Management Plan to reflect the phasing of the construction programme. The Drainage Management Plan will include a Site Drainage Plan.
Landscape and Ecological Management Plan (LEMP)	The Outline version submitted with the Planning Application is to be reviewed and updated by the Contractor during detailed design. The Landscape and Ecological Management Plan details how habitats and other ecological enhancements will be managed and maintained in the long-term.
Construction Groundwater Control Strategy	To be developed by the Contractor at detailed design. This strategy will detail how groundwater levels and flows will be controlled to allow excavations to be made below groundwater level in dry and stable conditions.
Incident Response Plan	To be developed by the Contractor at detailed design. This will confirm to conform to Schedule 3 Annex 2 of National Grid's Contractor Health & Safety Performance Requirements (CHSPR).
Invasive non-native species management plan	To be developed by National Grid at detailed design to include safe means of removal and disposal of any areas of Russian olive impacted by the Proposed Development.
Dust Management Plan	To be developed by National Grid at detailed design. This plan will detail measures to control dust emissions and be approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real-time PM ₁₀ continuous monitoring and/or visual inspections.
Arboricultural Method Statement	To be developed by National Grid at detailed design. The issues to be address by this method statement include: • Conditions of planning consent; • Pre commencement meeting and site briefing; • Order and phasing of operations; • Tree works; • Tree protection fencing; • Site storage and facilities; • Movement of people, plant and materials ;

Management Plan	Description
	• Demolition; • Enabling works; • Installation of new surfacing; • Installation of new structures; • Installation of new services and/or diversion of existing services; • Hard landscaping; • Soft Landscaping; and • Removal of tree protection measures.
Carbon Management Plan	To be developed by the Contractor at detailed design using existing baseline analysis, and to define a reduction target for the works.

2 Project Description

- 2.1.1 National Grid Electricity Transmission (hereafter National Grid) has developed proposals for the replacement of a cabled section of the TKRE 400 kilovolt (kV) circuits under the River Thames.
- 2.1.2 It is proposed that a **new bored tunnel** under the River Thames is constructed to house new XLPE cables. In addition, associated new infrastructure is proposed either side of the River Thames in Tilbury and Gravesend comprising:
- **Two new cable sealing end compounds:** one either side of the tunnel, onshore, which contain:
 - **Two new tunnel headhouses:** one either side of the new tunnel, onshore, which will cover the shaft into the tunnel;
 - **Two new overhead line gantry structures:** these will connect the overhead line downlead conductor and transfer them to six sealing end structures; and
 - **Modifications to the existing overhead line (OHL):** The new OHL conductors will be connected to the existing TKRE 400kV OHL conductors via new terminal pylons at Tilbury and Gravesend.
- 2.1.3 Each required SEC would fall within Thurrock Council and Gravesham Borough Council's jurisdiction.

2.2 Cable Tunnel

- 2.2.1 The new cable tunnel will be approximately 2.2km long (from headhouse to headhouse), 4m in internal diameter (4.5m external diameter). The alignment is illustrated on Figure 1.1 Site Location Plan in ES Volume II Chapter 1: Introduction.
- 2.2.2 Twelve new XLPE cables will be installed in the new tunnel, once bored, to match the required 3325 megavolt amperes (MVA) maximum rating.
- 2.2.3 Due to advances in cable technology, XLPE is now being used in preference to the use of fluid filled cable (like those installed in the existing tunnel). In these modern cables, the central conductor is insulated by means of a cross linked polyethylene material, which is extruded around the conductor. The absence of fluid in the cable insulation enables a more mechanically robust overall cable construction. XLPE cables require less maintenance, with no ancillary fluid equipment to monitor and maintain¹.
- 2.2.4 For example, sulphur hexafluoride (SF₆)², typically used in electricity transmission and distribution to insulate live electrical parts and to switch the flow of electrical current on and off, is **not required** to be used in this project.
- 2.2.5 Each cable needs to be well-spaced from others for adequate heat dissipation which will be achieved by forced air ventilation.

2.3 Tilbury

Sealing End Compound

- 2.3.1 The new Tilbury SEC is proposed to be developed on an area of existing hardstanding in Tilbury, Thurrock, approximate grid reference TQ 66317 75873, on land owned on all sides by the Port of Tilbury, London, and which was formerly Tilbury Power Station. To the north of the proposed SEC is the existing Tilbury Substation. The land east is part of Ingrebourne Valley's Goshems Farm restoration project, raising the land on an historical landfill back to high quality, arable farmland. The

¹ National Grid (2015). Undergrounding high voltage electricity transmission lines. Available at: https://www.nationalgrid.com/sites/default/files/documents/39111-Undergrounding_high_voltage_electricity_transmission_lines_The_technical_issues_INT.pdf.

² National Grid (2022). What is SF₆? Sulphur hexafluoride explained. Available at: <https://www.nationalgrid.com/stories/energy-explained/what-is-sf6-sulphur-hexafluoride-explained#:~:text=What%20is%20SF6%20used%20for,in%20electricity%20transmission%20and%20distribution.&text=Medium%2D%20and%20high%2Dvoltage%20electrical,electrical%20current%20on%20and%20off.>

existing Tilbury SEC, serving the existing tunnel is approximately 290m south of the proposed Tilbury SEC. The River Thames is approximately 400m south of the permanent footprint of the proposed Tilbury SEC.

- 2.3.2 The Tilbury SEC will occupy an area of approximately 7,339m² / 0.73ha. During construction, a larger area of approximately 81,430m² / 8.14ha will be required during installation to accommodate construction equipment and storage areas.
- 2.3.3 The two new overhead line gantry structures within the Tilbury SEC will have a maximum height of approximately 13m.
- 2.3.4 The SEC will contain:
- 12 new XLPE cables;
 - 12 new cable terminations (polymeric);
 - 12 new cable support steel structures with buried concrete foundations;
 - Concrete surface troughs for new cables;
 - 1 water tank for fire fighting purposes
 - 6 Surge Arresters for protection of underground cables;
 - 6 earth switches; and
 - Tilbury headhouse.
- 2.3.5 The Tilbury SEC will be surrounded by a 2.4m mesh or palisade security fence topped with an electric pulse fence to a height of 3.4m.
- 2.3.6 Six new carparking spaces will be provided, to the east of the new headhouse, with three EV charging posts (comprising two charge outlets per post). One of the spaces will be a disabled parking bay.
- 2.3.7 The roads within the SEC will be tarmacked, however all other surfacing will comprise of gravel or other free draining stone material with a Type 3 sub-base.

Tilbury Tunnel Headhouse

- 2.3.8 The Tilbury headhouse will be situated within the Tilbury SEC. The purpose of the Tilbury headhouse is to:
- allow controlled safe and secure access into the tunnel shafts;
 - provide enclosure for ventilation fans and equipment to regulate the temperature in the tunnel;
 - to locate mechanical and electrical equipment; and
 - to house control equipment for the cable circuits.
- 2.3.9 The Tilbury headhouse will occupy an area of up to 481.75 m² / 0.048ha (based on an indicative footprint of 23.5 m x 20.5 m and have an approximate maximum building height of approximately 10m above ground level). This will be confirmed during the detailed design stage.
- 2.3.10 The new headhouse at Tilbury will accommodate:
- Ventilation plant for the tunnel and shafts;
 - A control room, with tally room, communications control, panels, mechanical plant and control panels;
 - Low Voltage (LV) Switch Room;
 - 110V Battery / Uninterruptible Power Supply Room;
 - Main fans room;
 - Shaft access via a staircase (but with space allocation for a lift, and lift motor room (if required));
 - Changing and shower room; and

- Water Closet (WC).

2.3.11 Externally, the new headhouse will have:

- a biodiverse roof;
- a temporary generator (hardwired to the LV Switch Room);
- an access hatch for cable feed; and
- a pedestrian access path.

2.3.12 The details of the ventilation equipment have not yet been finalised, however the headhouse will be acoustically insulated (where required) in line with BS8233:2014 to ensure operational noise levels are acceptable.

Tilbury Headhouse Utility Provision

Incoming Water Supply

2.3.13 A mains water supply will be required for each headhouse to facilitate amenity features such as sinks, basins, showers and toilets. Installation of below ground mains water shall be in accordance with Southern Water guidance.

2.3.14 At Tilbury, a connection from the existing water main is proposed that will deliver potable water to the new headhouse.

Foul Water Drainage Design

2.3.15 The Tilbury SEC will not be permanently manned and as such the preference will be to discharge foul water to the existing sewer. The Ground Penetrating Radar (GPR) survey results suggest there are no public foul sewers available, therefore a 9000 litre underground cess pit will be installed at the proposed Tilbury SEC. More information can be found in the Drainage Management Plan (Document Reference 30003364-BHK-XX-XX-RP-C-02060).

Operational Access to the Tilbury SEC

2.3.16 The proposed Tilbury SEC will be accessible from an existing private road belonging to Port of Tilbury. This private road connects to Fort Road and then the A1089 Ferry Road and the wider Strategic Road Network (SRN).

2.3.17 No new permanent access roads will be required for operational access into the proposed Tilbury SEC. One new bellmouth will be required from the existing private road.

2.4 Gravesend

Sealing End Compound

2.4.1 The proposed Gravesend SEC will be located within a vegetated area which is part of the Canal and Grazing Marsh, Higham Local Wildlife Site (LWS), designated for its grassland habitats and on land owned by National Grid at approximately TQ 67455 74158. To the north of the Proposed SEC is the existing SEC serving the existing tunnel. The land immediately east is owned by the Royal Society for the Protection of Birds (RSPB) and is partially leased and used as a Police Training Centre for rifle shooting. The land immediately west comprises of the Thameside Campus (National Maritime Training Centre), Metropolitan Police Specialist Training Centre (MPSTC) and Thames and the Medway Canal Association.

2.4.2 The Gravesend SEC will occupy an area of approximately 6,328m² / 0.6328ha, however a larger area of approximately 37,000 m² / 3.7 ha will be required during installation to accommodate construction equipment and storage areas.

2.4.3 Subject to final detailed design, the two new overhead line gantry structures within the Gravesend SEC will have a maximum height of approximately 13m.

- 2.4.4 The Gravesend SEC will be surrounded by a 2.4m mesh or palisade security fence topped with an electric pulse fence to a height of 3.4 m.
- 2.4.5 Nine new carparking spaces will be provided, six to the west of the new headhouse, and three to the north, just outside of the SEC.
- 2.4.6 The roads within the SEC will be tarmacked, however all other surfacing will comprise of gravel or other free draining stone material with a Type 3 sub-base.

Headhouse - Gravesend

- 2.4.7 The Gravesend headhouse will be situated within the Gravesend SEC. The purpose of the Gravesend headhouse is to:
- allow controlled safe and secure access into the tunnel shafts;
 - to locate mechanical and electrical equipment; and
 - to house control equipment for the cable circuits.
- 2.4.8 The Gravesend headhouse will occupy an area of approximately 230m² / 0.023ha (based on an indicative footprint of 15 m x 16 m) and have an approximate maximum building height of 8 m above ground level. This will be confirmed during the detailed design stage.
- 2.4.9 The new headhouse at Gravesend will accommodate:
- Tunnel dampers room with access hatch for shaft hoist;
 - Electric room; containing Low Voltage (LV) switch gear, communication panels, Motor Control Centre (MCC) panels;
 - Tally Room;
 - 110V Battery / Uninterruptible Power Supply Room;
 - Shaft access via a staircase;
 - Changing and shower room; and
 - WC.
- 2.4.10 Externally, the new headhouse will have:
- a biodiverse roof;
 - a temporary generator (hardwired to the electrical room); and
 - a pedestrian access path.

Gravesend Utility Provision

Incoming Water Supply

- 2.4.11 A mains water supply will be required for each headhouse to facilitate amenity features such as sinks, basins, showers and toilets. Installation of below ground mains water shall be in accordance with Southern Water guidance.
- 2.4.12 At Gravesend, an existing clean water pipeline running parallel to the road that is assumed to connect to Eastcourt Marshes Sealing End Compound Site was identified - a connection from the existing water main is proposed that will deliver potable water to the new headhouse.

Foul Water Drainage Design

- 2.4.13 The Gravesend SEC will not be permanently manned and as such the preference will be to discharge foul water to the existing sewer. However, the Ground Penetrating Radar (GPR) survey results suggest there are no public foul sewers available for either site, therefore a 9,000 litre underground cess pit will be installed at the proposed Gravesend SEC. More information can be found in the Drainage Management Plan (Document Reference 30003364-BHK-XX-XX-RP-C-02060).

Operational Access to the Gravesend SEC

- 2.4.14 The proposed Gravesend SEC will be accessible from an existing private road belonging to National Grid. This connects to another private road, the Thames and Medway Canal Road owned by Network Rail, which runs alongside the Thames and Medway Canal. The Thames and Medway Canal Road connects to Mark Lane, then Norfolk Road, which then connects to Prospect Grove, then the A226 Milton Road and the wider SRN.
- 2.4.15 No new permanent access roads will be required for operational access into the proposed Gravesend SEC.

2.5 Overhead line modifications

- 2.5.1 The new SECs require connection in to the wider TKRE 400 kV circuits overhead line.

Tilbury

- 2.5.2 At Tilbury, terminal pylon 4VG045A will be replaced with a new terminal pylon, which will be erected adjacent to its existing location, to the north of the proposed Tilbury SEC. This will form the new commencement of the 400kV OHL. The existing terminal pylon 4VG045B inside the Tilbury Substation will be refurbished.
- 2.5.3 Approximately 600m (3 spans of OHL conductor and OHL pylons 4VG45A, 4VG44 and 4VG43) of the existing 400kV OHL will be removed.
- 2.5.4 Approximately 200m of new double span overhead line will be installed from the existing terminal pylon (4VG45B) within the Tilbury Substation, to the new pylon 4VG045A.

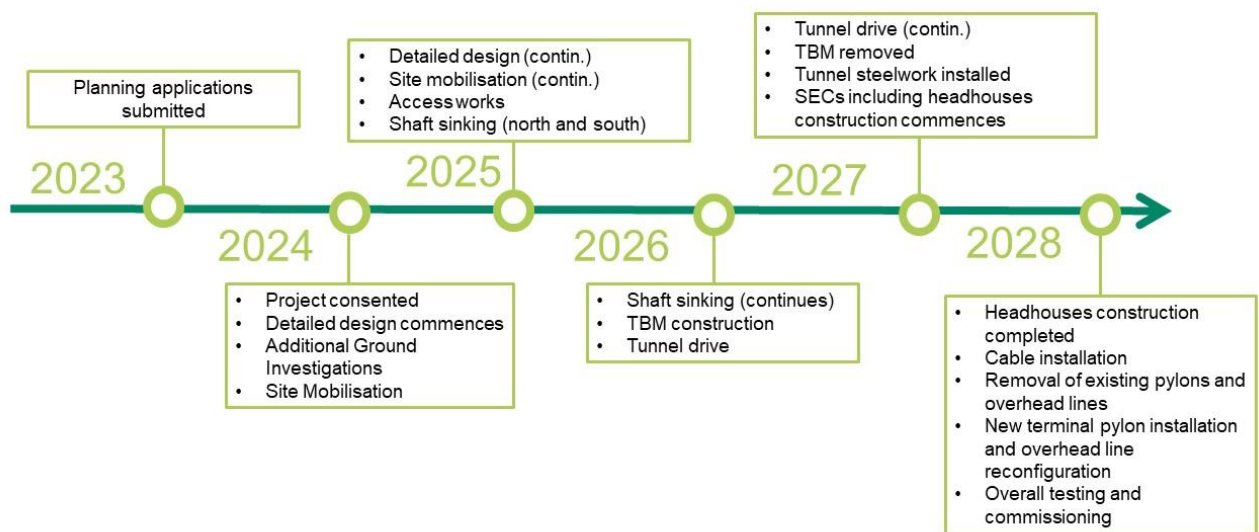
Gravesend

- 2.5.5 At Gravesend, approximately 400m of single span overhead line will be permanently removed and approximately 330m new double span overhead line will be installed between pylons 4VG041 and new pylon 4VG042. The existing pylon 4VG042 will be removed. Pylon 4VG042 will be replaced by a new terminal pylon which will be erected near the new SEC. The existing Pylon 4VG041 will be refurbished.

3 Construction Programme

3.1.1 Construction at the site will take place from 2024, when early mobilisation and further ground investigations take place. The main construction work will commence in 2025 and run until approximately 2028, when the Proposed Development is to be energised. The indicative construction programme is shown in Plate 3-1.

Plate 3-1: Construction Programme



4 Roles and Responsibilities

- 4.1.1 This section of the Outline CEMP sets out the key roles and responsibilities of parties involved in the construction of the Proposed Development. The Detailed CEMP will include contact details for key members of staff.

4.2 Key roles

- 4.2.1 The exact roles and responsibilities will be confirmed prior to construction; however, the following section provides an indication of the roles which are envisaged. Clearly establishing roles and responsibilities is vital to ensure the successful construction of the Proposed Development, including the implementation of the Detailed CEMP.

Overall Contractor Project Manager

- 4.2.2 The Contractor Project Manager is responsible for:
- Coordinating the delivery of all elements of the Proposed Development including ensuring conformance with the CEMP and other management plans, as well as any incident investigation required;
 - Facilitating the dissemination of generic environmental requirements to the project team;
 - Oversee the implementation and review of environmental procedures throughout the project;
 - Monitoring the environmental performance of the project through maintaining an overview of incidents, inspections and audits;
 - Ensuring that environmental considerations form an integral part of design and implementation of the works and to include environmental reviews as part of regular project meetings;
 - Review environmental matters with HSE Manager/ Advisor on a regular basis and as per project requirements;
 - Liaise with Project HSE Manager on all environmental issues as appropriate;
 - Ensure that all environmental incidents are reported to HSE Manager/ Advisor according to agreed procedures; and
 - Nominate individual project team members to support National Grid in public relations and community liaison activities, including local community meetings.

Site Manager/ Engineer

- 4.2.3 The Site Manager/ Engineer, working with the Contractor Project Manager is responsible for:
- Understanding and implementing all environmental procedures as identified in the CEMP, and ensuring that site operations function in compliance;
 - Reviewing risk assessments and method statements (RAMS) and/ or environment method statements (EMS) submitted by the Contractor prior to beginning new works activities;
 - Reviewing the Safety, Health and Environment (SHE) Plan, prepared and amended by the SHE Manager/ Advisor;
 - Reviewing and monitoring the implementation, and accuracy of, the CEMP;
 - Conducting incident investigation in the event of an incident or near miss being reported by any worker or member of site management staff during site walkovers or inspections;
 - Monitoring of Contractor compliance with plans and procedures;
 - Liaising with the emergency services;
 - Conducting regular site inspections;

- Reviewing applications for environmental consents and permits in line with the Contractor Project Manager; and
- Notify HSE team (and/ or local authority) when a variation in working time may cause impact upon local residents or upon a local authority consent.

Safety, Health and Environment Manager/ Advisor

4.2.4 The SHE Manager/ Advisor is responsible for:

- Providing site inductions and toolbox talks on safety, health and environmental matters and sensitivities to the appropriate staff prior to works being undertaken;
- Preparing, reviewing and updating the SHE Plan;
- Assisting the Contractor Project Manager and Site Manager/ Engineer in reviewing and approving RAMS and/ or Environmental Method Statements (EMS);
- Ensuring the RAMS/ EMPs are implemented, ensuring compliance with procedures and legislation. Check all documents for Duty of Care requirements;
- Ensuring Duty of Care with respect to all waste generated on Site;
- Preparing site specific mitigation plans in consultation with statutory consultees to ensure works can proceed in accordance with all environmental commitments and legislation;
- Providing technical advice on the implementation of the CEMP including changes to legislative requirements and best practice;
- Undertaking regular site inspections/ walkovers to ensure construction practice is compliant with best working practices and approved RAMS/EMS. Between the SHE Manager/ Advisor and Environmental or Ecological Clerk of Works (ECoW) environmental inspections will be undertaken frequently (as agreed with National Grid). The SHE Manager/ Advisor will have the authority to stop work where non-compliant working is observed;
- Reporting any health and/ or safety and environmental incidents to Site Management as per a defined reporting procedure (to be defined in the detailed CEMP and Project SHE Plan);
- Providing health and safety, and environmental advice to construction managers;
- Attending all construction progress meetings and providing updates on safety, health and environment performance of construction works. Also ensuring regular discourse with project site staff and subcontracted companies on environmental issues; Investigating environmental complaints (in line with the Stakeholder Communications Plan, see section 18.4.2);
- In conjunction with National Grid, liaise with government departments, local authorities and other statutory authorities on environmental matters. Obtaining consents and permits, as per project needs; and
- Ensuring that spill kits are checked at least weekly and kept fully stocked and in good repair.

Environmental Clerk of Works

4.2.5 An Environmental or Ecological Clerk of Works (ECoW) will be appointed for the duration of the construction. The purpose of this appointment is to ensure that the environmental interests of areas that may be affected by the works are safeguarded. The ECoW will have the appropriate authority to review RAMS, oversee works and recommend action as appropriate, including temporarily stopping works where non-compliant working is observed, for example to safeguard protected species and their habitats, or where any other breaches of environmental legislation are likely to occur.

4.2.6 The ECoW will ensure the implementation of, and compliance with, the provisions of the CEMP and the mitigation contained within the ES as well as licensing or other conditions imposed on the construction.

4.2.7 The ECoW may be a company who provide a general Clerk of Works who can liaise with a team of internal specialists (Technical Specialist Advisors) on specific environmental subjects, for example,

ecology, soils, noise, air quality, or pollution where required throughout construction, or a suitably qualified individual.

4.2.8 In summary, the ECoW is responsible for:

- Inspections of the Contractor's work site to ensure compliance with environmental standards and requirements;
- Weekly routine audits of the Contractor's compliance with the CEMP – site activities and record keeping;
- Monitoring or inspection of site activities in response to incidents, breaches of the CEMP or complaints received from a third party;
- Inspections of works to ensure that environmental mitigation measures incorporated into the design have been implemented;
- Implementation of corrective mitigation measures where proposed mitigation results in effects over and above those within any ES, licenses or planning conditions; and
- Delivering toolbox talks on environmental matters and sensitivities to the appropriate staff prior to works being undertaken.

The Land Officer

4.2.9 The Land Officer is responsible for:

- Discussing/ agreeing all conditions relating to access, including fencing, gates, access to severed land, stock relocation, reinstatement, drainage, security and the complaints handling procedure with local land owners;
- Liaison between the Contractor, landowners / tenant farmers, other stakeholders and National Grid Land Officer/Surveyor and/or appointed land officer supplier;
- Being the first point of contact for any individuals, or agents of people, with interest in land and for all land related matters;
- Dealing with all matters relating to compensation claims or losses from those with land interests arising as a result of the Proposed Development; and
- Attending all construction progress meetings.
- This role may be supported by an Agricultural Liaison Officer (ALO) (or similar), employed by the Contractor to provide local landowners and those with land-related interests information regarding daily construction activities. The ALO will assist on activities listed above, as well as providing the Land Officer with information regarding the Contractors' use of appropriate access points and relaying information on any inadvertent damage to fences, gates, drains, trees or buildings from construction activities. The Land Officer/ ALO will work closely with the National Grid Land Officer/Surveyor, with a clear scope agreed to prevent the overlapping of National Grid and Contractor Land Officer responsibilities.

Traffic Safety and Control Officer

4.2.10 If not undertaken by a named member of the Contractor's SHE team, a Traffic Safety and Control Officer (TSCO) may be appointed for the duration of the construction of the Proposed Development to act as the main point of contact and undertake the following duties in relation to traffic management:

- Ensure that works are being carried out in accordance with the Construction Traffic Management Plan (CTMP);
- Check all Traffic Management drawings for compliance prior to issue;
- Manage applications for any required temporary Traffic Regulation Orders in relation to any required road closures, one-way restrictions or partial blocking of the highway, or implementation of temporary speed limits; applications for the introduction of temporary traffic lights; or other notification to the Local Highways Authority;

- Ensure sufficient resource is available to maintain Traffic Management on site; and
- Investigating and managing traffic related complaints; and
- Monitor the Traffic Management schemes and layouts to ensure their effectiveness and safety to workers and public.

Site Security

4.2.11 Site Security is responsible for:

- Mobilising site emergency contacts in the event of an out of hours incident occurring; and
- Containing the spill if it is safe to do so and have received spill control training.

All Other Project Staff

4.2.12 All other project staff will be expected to:

- Understand and implement procedures relevant to their role as laid out in the CEMP;
- Conduct their work with a view to reducing the environmental impact of the Proposed Development and to raise any environmental concerns with Site Engineer/ Manager or SHE Team; and
- Report all environmental incidents to Site Manager or SHE Team as soon as possible.

4.2.13 An environmental incident response team is to be identified. They will be trained and competent to attend environmental incidents and provided with appropriate equipment to deal with any reported incident.

5 Communications, Reporting and Training

5.1 Communication

- 5.1.1 To ensure that all parties involved in the construction are aware of the environmental mitigation requirements, controls and reporting requirements as agreed within the Detailed CEMP, the final document will be circulated to:
- National Grid;
 - the Contractor (including all subcontractors);
 - Local Planning Authorities; and
 - statutory and non-statutory consultees, as required.
- 5.1.2 This document will be maintained within the SHE management system and a hard copy kept within the site office.
- 5.1.3 Weekly SHE meetings will be held, which the HSE Manager/ Advisor and ECoW will attend. These meetings will communicate, discuss and consult any change in conditions, working practices, health, safety and environmental arrangements, procedures and overall environmental performance. The meetings will include any near misses or hazards that have been identified and any residual risks that have been identified in conjunction with the implemented environmental protection measures. The meetings will be minuted, will include attendance records, and will distributed to all relevant parties for reference.
- 5.1.4 The weekly SHE meetings will be augmented by additional meetings at intervals dictated by the requirements of the contract or at key stages of the works. Minutes of all such meetings will be produced and held on file for record purposes, with copies supplied to all relevant parties. The Contractor Project Manager will ensure that lessons learnt are communicated to ensure best practice across the project.
- 5.1.5 Environmental issues will be further communicated to all relevant parties by means such as the following:
- Environmental Policy Statement (to be displayed on a dedicated Environmental Notices Boards as a minimum);
 - Project Environmental Plan, including site specific EMP's, and associated documents (for example Site Waste and Material Management Plan);
 - RAMS (risk assessments and method statements);
 - Site Coordination Meetings;
 - Management Review Meetings;
 - Environmental briefings and Tool Box Talks (including the presentation of a weekly environmental log that includes a look ahead to the activities required in the following week and the specific mitigation required);
 - Site induction and training sessions;
 - Audits;
 - Consultation with Local Authorities and other regulatory bodies;
 - Advance notification to residents advising of project works;
 - Project Enquiry/Complaints line; and
 - KPI reporting to National Grid, Contractor and other third parties as required.
- 5.1.6 It is also anticipated that staff will be provided with Contact Cards for the Proposed Development, to pass out if questioned or approached by public. The cards would include relevant project contact information, such as the contact details of key site personnel dealing with the complaints and/ or the

complaints helpline (details of which will be confirmed within the Detailed CEMP), and links to sources of information such as the project website.

5.2 Public Communications and Liaison

- 5.2.1 Prior to commencing works on site, the Contractor will develop and implement a Stakeholder Communications Plan that includes community engagement. All public communications will be co-ordinated through and agreed in advance with National Grid.
- 5.2.2 The Contractor will provide details (postal and email address) of the named contacts to which all written complaints should be addressed and will also be responsible for the implementation of an appropriate system for logging and recording any complaints received. This log must be made available to the local authorities (Thurrock Council and Gravesham Borough Council) if requested. A 24-hour free telephone complaints helpline and a project website may also be established. The key contact details and the head or regional office contact information of the Contractor/construction company will be visible on boards placed around the perimeter of the construction site(s) in appropriate locations where they would be visible to the public. These details will also be provided to relevant departments of Gravesham Borough Council and Thurrock Council.
- 5.2.3 If members of the public directly approach a member of site staff and raise a concern regarding the site works, the staff member will direct them, via a Contact Card or similar, to the key site personnel dealing with the complaints and/or the complaints helpline as well as recording details. In all cases, staff will inform the Site Manager and Contractor Project Manager as soon as possible and always respect landowners' and residents' concerns. If the situation escalates members of staff will leave site until the situation has been resolved, making sure that the working area is left in a safe condition.
- 5.2.4 Any complaints received will be acknowledged within 24 hours during all hours when works, including deliveries, are taking place. The Contractor will ensure that all complaints receive a written response, including details of any action undertaken (if such action is deemed appropriate) and that National Grid is informed within 24 hours.
- 5.2.5 The Contractor will provide National Grid with a monthly report that details all complaints, who they were filed by and the actions taken.
- 5.2.6 Where required, in addition to ensuring that the public is fully informed of the proposed programme of works (including working hours), the Contractor will ensure that procedures are established for notifying the public in advance of planned works. It should also be noted that the agreed period of advanced notification will similarly apply to any alterations in the construction programme or working hours that have been agreed with the Contractor and the relevant departments at Gravesham Borough Council and Thurrock Council.
- 5.2.7 Any environmental complaints received will be investigated, with appropriate action taken and recorded, so that a full audit trail is available should the complainant raise the issue(s) with the appropriate local authority. The complainant would be provided with a response outlining the results of the investigation and any action taken.

5.3 Communication with other sites

- 5.3.1 The Contractor must ensure that regular liaison and coordination meetings are held with developers/contractors of other projects in the vicinity of the Proposed Development. The meetings should ensure that activities are coordinated, and environmental impacts (for example dust and particulate matter emissions) are reduced as far as possible. It is also important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.

5.4 Inductions and Training

- 5.4.1 The Contractor will develop an environmental communication and training plan prior to physical works. It will include training requirements for all employees, sub-contractors, suppliers and other visitors to promote environmental awareness throughout the Proposed Development. Details of the proposed training will be provided to National Grid prior to commencement of construction works. Additional training/ toolbox talks may be required outside of this based on circumstances such as

unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc. A record of all training and attendees will be maintained within the SHE management system.

- 5.4.2 All construction personnel will be required to hold a current valid Construction Skills Certification Scheme (CSCS) Card or equivalent and to have received a site-specific induction, prior to gaining regular access. Site specific logistics, safety and environmental information will be provided at the induction, so that all personnel including visitors are aware of the potential environmental issues. The induction will also include measures required to be undertaken to respect the local community and to outline any risks and preventative measures associated with their operations.
- 5.4.3 Information from the site induction will be displayed prominently on noticeboards at suitable locations around the site, such as the site canteen and reception, so that all personnel and visitors are reminded and informed of any changes to the existing systems and informed of any new procedures.
- 5.4.4 The induction should include the following topics, as a minimum:
 - Waste management;
 - Concrete management;
 - Ecology (including species and/or habitat protection);
 - De-watering of excavations;
 - Working in or near watercourses;
 - Surface water and groundwater pollution and control;
 - Spill response;
 - Sediment and dust management;
 - Noise management (prevention of nuisance);
 - Archaeology;
 - Soil management including ground stability as well as stripping and storage;
 - Environmental incident and emergency response procedures (see below); and
 - Reinstatement techniques.
- 5.4.5 Delivery drivers will also be required to undergo a site induction; however this may be reduced in scope/ detail due to the nature of their works on site.
- 5.4.6 In addition to the site induction, the Contractor will ensure all personnel are suitably trained on general site good practice and emergency procedures. Training will be provided by a suitably qualified person on a regular basis. Training and awareness raising will include, but will not be limited to:
 - Briefing staff on the Plans through presentations;
 - Toolbox Talks on site specific issues (further details provided below);
 - Method Statements are to include environmental elements including, but not limited to, (as appropriate) surface water management (including appropriate sediment control methods), task specific risk assessments, biosecurity, and reinstatement methods;
 - Pollution prevention training to include practical element for site-based staff (including the practical use of spill kits and training on the consideration and selection of appropriate sediment mitigation installation); and
 - Emergency training to include fire prevention techniques particularly for land cable operators.
- 5.4.7 In order to provide on-going reinforcement and awareness training, the topics outlined in the site induction, along with any other environmental issues which arise on site, will be discussed at regular Toolbox Talks, which will be site specific where required. The SHE Manager/ Advisor will maintain a schedule of Toolbox Talks. The proposed schedule - to be considered as a live document - will be

coordinated with the programme of works such that relevant training is presented in a manner timely to the risks presented by upcoming (or on-going) operations. Additional Toolbox Talks will be added to the schedule as required based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc. Toolbox talks will be provided by the SHE Advisor/ Manager and ECoW (or other relevant specialist such as archaeological clerk of works) throughout construction of the Proposed Development to provide on-going reinforcement and awareness training of environmental sensitivities and issues likely to be encountered.

- 5.4.8 Appropriate personnel (such as site foremen and machine operators) will also receive additional environmental training in order to ensure project work is carried out with due regard to environmental protection and to minimise on environmental impact of the Proposed Development. For example, specific refuelling training for named refuellers, waste management/ Duty of Care training for any staff with responsibility for waste management.
- 5.4.9 An environmental risk map, showing all sensitive areas, exclusion zones, wash out areas, watercourses, refuelling locations and waste management facilities will be displayed on the site notice board(s). The map will remain 'live' and will be updated throughout the lifetime of the Proposed Development and re-issued as required. As well as being prominently displayed, it will be provided to site staff, for example foremen, as required. It is expected that an electronic version will be accessible to all site staff via a shared project site.

5.5 Environmental Monitoring and Reporting

- 5.5.1 In addition to audits carried out by National Grid, the Contractor will implement its own programme of audit and inspections to check that site operations are in compliance with the CEMP, current procedures and legislation; are using Best Practice; and that the mitigation measures are being effectively implemented. Inspections will be undertaken for the duration of construction of the Proposed Development and will provide a measure of performance towards achieving the project objectives and targets. The Incident Response Plan (IRP) will set out how the project will respond to incidents and pollution events, for example silty run off to surface waters, and how these are to be reported (both internally to the project and externally).

Pre Construction Audit

- 5.5.2 Prior to construction a pre-construction audit will be undertaken by the ECoW to ensure that any specific requirements of this CEMP and relevant legislation, licenses and consents have been met. This audit will determine the adequacy of the system set up for management, mitigation and monitoring measures related to waste, pollution and the environment.

Daily Site Checks

- 5.5.3 Daily site checks will be carried out of the construction compounds and other working areas as required, including access roads and cable route working width. Checks will be undertaken by the SHE Manager/ Advisor and/or ECoW, or other suitably qualified staff. Any actions resulting from these checks will be reported at weekly progress meetings.

Weekly Site Inspections

- 5.5.4 A weekly site inspection will be carried out by the SHE Manager/Advisor and/or ECoW to identify any breaches and/or environmental incidents and identify suitable corrective measures. A report will be written for each inspection documenting the findings and any corrective measures suggested to be implemented.

Monthly Site Audits

- 5.5.5 Monthly environmental audits will be undertaken by the SHE Manager or designated auditor. The audit will evaluate compliance with environmental legislation, requirements of the CEMP, best

practice and any other National Grid or scheme-specific requirements. A report will be written for each audit documenting the findings and any corrective measures suggested to be implemented.

Records

5.5.6 The following records will be maintained to demonstrate conformance to the CEMP:

- Induction and training records;
- Site inspection reports;
- Incident Reports;
- Supplier and contractor records;
- Audit reports on 3rd parties;
- Drainage consents;
- Licences/ Permits; and
- Superseded copies of Environmental Plans.

Document Control

5.5.7 A document management system will be used by the Contractor to process and manage documents associated with the Proposed Development. The system should process documents throughout their life cycle from inception through creation, review, storage and distribution, archiving or destruction.

6 Construction Environmental Management

6.1.1 This chapter of the Outline CEMP describes the general environmental management measures and best practice that will be implemented during the construction of the Proposed Development to maximise ecological and environmental protection. The measures set out in this section are applicable to numerous environmental topics and have been considered within the impact assessment process where pertinent. Receptor specific mitigation that has been identified within ES Volume III (Tilbury), Chapters 7 to 14 and ES (Gravesend) Volume IV Chapters 15 to 22 of the ES is detailed in Section 8.

6.2 Health and Safety

6.2.1 National Grid are committed to ensuring the health and safety of site personnel and the protection of the environment in accordance with the Construction (Design and Management) Regulations 2015 (CDM) (Ref 1) and the principles and philosophy behind these. Therefore, a separate project specific Safety Health and Environment (SHE) Plan is expected to be produced in accordance with relevant legislation.

6.2.2 All staff, site visitors and delivery drivers will receive a relevant HSE induction to ensure they are aware of site hazards and health, safety, and environmental management requirements. Site staff will be briefed daily by the contractors prior to commencing work. Site-specific risk assessments will be carried out to ensure the risk strategy of the frequently changing workplace remains relevant. The contractors will be required to carry out audits and inspections throughout the construction phase.

6.3 Working Hours

6.3.1 The majority of works activities would be completed under normal working hours/ restrictions as follows:

- Monday to Sunday: 08:00 to 19:00.

6.3.2 Once the shaft construction is complete, the tunnelling phase will commence and is expected to take eight months. For this phase, the tunnelling will continue 24 hours a day until complete.

6.3.3 No works are to be undertaken out of hours (subject to Tunnel Boring Machine (TBM) delivery), on Bank Holidays without prior consultation and agreement with the relevant Local Authorities.

6.3.4 The agreed working hours will be set out in the Detailed CEMP.

6.4 Lighting

6.4.1 The Contractor will provide and maintain all lighting for the construction works and the site welfare and site security cabins. Task specific lighting will be required for winter working (due to the short-day lengths when lighting will be required at the beginning and end of the day).

6.4.2 Lighting will be directional with care to minimise potential for light spillage beyond the site particularly towards houses, live traffic, and neighbouring habitats especially where there are known populations of sensitive species. Lighting will be designed with reference to the Institute of Lighting Professionals Guidance Notes (in particular GN-8: Bats and Artificial Lighting (Ref 2) which was produced in collaboration with the Bat Conservation Trust, and GN-1: Reduction of Obtrusive Light (Ref 3)) in so far as it is reasonably practicable.

6.4.3 Lighting will be used only when required and will comprise lighting of work areas and access and egress with low level directional lighting. Motion sensor lighting will be used in areas of high security risk and access and egress.

6.4.4 The following measures will be applied by the Contractor at all times for any lighting provided at or above ground level:

- Lights installed will be of the minimum brightness and/ or power rating capable of performing the desired function;
- Light fittings will be used that reduce the amount of light emitted above the horizontal (reduce upward lighting);
- Light fittings will be positioned correctly and directed downwards;
- Direction of lights will seek to avoid spillage onto neighbouring properties or habitats;
- Passive Infra-Red (PIR) controlled lights (motion sensors) will be considered for use where appropriate as these may be more acceptable to neighbours than those which are controlled by a time switch or are on all the time. These will be given particular consideration in areas of high security risk and access and egress; and
- Unnecessary lights will be switched off.

6.5 Security, Vandalism, Theft and Fly Tipping

- 6.5.1 The Contractor will be permitted (subject to appropriate planning approvals) to use:
- Perimeter fencing or hoarding for site security and public safety, placed so that Public Rights of Way (PRoW) are maintained or appropriately diverted; and
 - Motion sensor lighting in areas of high security risk.
- 6.5.2 The Contractor will consult with local police on security proposals and review arrangements throughout the period of the contract.
- 6.5.3 The Contractor will ensure that construction compounds including offices are adequately secured to protect the public and prevent unauthorised entry to or exit from the site; and will ensure that action is taken to securely store project plant and equipment so as not to attract opportunist thieves. Valuable materials, or those that are hazardous or attractive to thieves, will be stored in a secure area, out of sight of the public.
- 6.5.4 The Contractor will undertake site-specific assessments of the security and trespass risk for each working area (substation, cable routes etc.) and will ensure that suitable security arrangements are implemented to prevent unauthorised access to the sites. Access to the construction compounds will be limited to specified entry points only and personnel entries/exits will be recorded and monitored for both security and health and safety purposes, the gates will be kept secure unless they are being used.
- 6.5.5 There will be 24-hour security of the construction compounds.
- 6.5.6 Vandalism, theft and tipping are common causes of pollution and the project area will be adequately protected by fencing and locked access to discourage unauthorised access. Any occurrence of tipping on the site will be reported to the site management who will then inform the local environmental authority and the police if necessary.

6.6 Pollution Prevention

- 6.6.1 The Contractor will create a programme that includes dates where elements requiring works around watercourses will be constructed.
- 6.6.2 It is an offence to permit or cause pollution to the hydrological environment (including all surface water, groundwater and wetlands) either accidentally or deliberately (Ref 4). Surface water refers to all inland waters (other than groundwater) such as lakes, rivers, drains, estuaries and coastal water. Wetlands refer to particular areas of ground where the ecological, chemical and hydrological characteristics are attributed to frequent inundation or saturation by water.
- 6.6.3 Any pollutants getting into surface or foul drainage systems may end up polluting the nearest river or groundwater and can be traced back to source and could lead to prosecution of the company or individual by the regulator (Gravesham Borough Council, Thurrock Council, relevant Internal Drainage Board (IDB), Environment Agency (EA)) or the Marine Management Organisation (MMO).

- 6.6.4 Where a discharge to drains/sewers is required this must be under permit from the EA/ Gravesham Borough Council or Thurrock Council. Copies of consent documents must be kept and maintained by the Contractor's Site Manager.
- 6.6.5 If works within a watercourse is required, then approval from the Lead Local Flood Authority (LLFA), IDB or EA may be required. The Contractor must give the SHE Manager adequate notice (3 to 6 months) of upcoming works around watercourses so that consents can be applied for and specific mitigation measures can be developed. When developing methodologies and mitigation, the Contractor should refer to Pollution Prevention Guidelines for Works and Maintenance in or near Water (PPG5) (Ref 5). It is noted that the EA no longer provides 'good practice' guidance (withdrawing PPG5 from their library in 2014) and that consequently these guidelines are not endorsed by the EA as regulatory guidance in England. However, PPG5 is maintained and issued by the Scottish Environment Protection Agency and National Resources Wales and remains a useful source of good practice guidance for the design and mitigation of works within and near watercourses.
- 6.6.6 Where practicable, the Contractor will make sure the storage of any potentially polluting materials, plant and equipment will be more than ten metres from any water body, including surface water drains. Where works at river crossings are required, the Contractor (in liaison with the SHE Manager) will complete a risk assessment and adopt best practice measures to minimise risk to watercourses.
- 6.6.7 The Contractor will make available a suitable quantity of pollution control equipment, including consumable items such as absorbent pads and absorbent granules or similar material. These materials will be readily available at the Site always and a regular check during the weekly inspections made to see that they are available. Adequate provision will be made to ensure that absorbent pads, booms and granules are kept dry prior to use. The Contractor will make provisions for access to more sophisticated containment/ clean-up equipment such as absorbent booms, river booms etc, which will be 'boxed' and readily transportable at the construction base/site establishment and available for immediate dispatch to a spillage.

6.7 Spill Response and Spill Kits

Spill Response

- 6.7.1 In the event of a pollution incident the Contractor will follow the below processes. These will form that basis of a Spill Response Plan (typically a flow chart diagram to be advertised at site notice boards and high-risk areas such as refuelling areas):
- Spill kits would be available on the site in watertight containers (e.g., works near watercourses) and carried on all mobile plant. They would be regularly checked and topped up, especially after use. Appropriate training would be given to all construction workers in their use;
 - Storage of fuel and chemicals would be in accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001 and GPP 8: Safe storage and disposal of used oils;
 - Any liquid waste spillages or leaks (including fuel, oils, chemicals and silty run-off) must be reported to the ECoW or Environmental Manager. Should a serious environmental incident occur this will be reported to the Contractor Project Manager for further action;
 - In the event of a spill or a leak, the flow of pollution must be stopped and contained immediately if it is safe to do using spill kits, earth, sand or polythene to prevent pollution reaching drains and watercourses, or from soaking into the ground. All Method Statements will identify emergency procedures for each operation;
 - Spill kits must be replenished following use and spill kit materials used disposed of appropriately;
 - Spillages must not be washed into drainage systems or watercourses and detergents must not be used. Biodegradable oils or detergents must not be put into watercourses under any circumstances;

- Surface water drains on local roads or within the Proposed Development compound and stockpiling areas would be identified and where there is a risk that fine particulates or spillages could enter them, they would be protected (e.g., covers or sandbags);
- Any containers of contaminating substances (e.g., fuel) onsite would be leak-proof and kept in a safe and secure building or compound from which they cannot leak, spill or be open to vandalism. The containers would be protected by temporary impermeable bunds (or drip trays for small containers) with a capacity of 110% of the maximum stored volume. Areas for transfer of contaminating substances (including refuelling areas) would be similarly protected;
- Used absorbent materials and contaminated spoil must be swept up, or dug out, and contained in an appropriate container and arrangements made with an appropriately licensed waste contractor for disposal according to management procedures;
- The cause of any spill and leak must be investigated to prevent a reoccurrence. The HSE Manager or ECoW will provide advice regarding further appropriate remediation requirements, and will contact the appropriate regulatory body if appropriate: Working practices to be changed (if required) in accordance with the findings of the investigation;
- Details of the investigation and any changes to working practices will be changes communicated to all relevant personnel as appropriate and project documentation updated as required;
- Reporting requirements will be as per the Incident Response Plan (IRP) to be prepared by the Contractor (in agreement with National Grid) prior to construction, which is to conform to Schedule 3 Annex 2 of National Grid's Contractor Health & Safety Performance Requirements (CHSPR).;
- Any permanent oil storage tanks and temporary storage of 201 litres or more of oil in drums and mobile bowers, and ancillary pipe work, valve, filters, sight gauges and equipment requiring secondary containment, e.g., bunding or drip trays, as defined in the Control of Pollution (Oil Storage) (England) Regulations 2001. Environment Agency guidance on oil storage regulations for business and preventing groundwater pollution from underground fuel storage tanks would be complied with;
- No oil would be stored within 20 m of a watercourse (and potentially further if ground is angled towards a waterbody except for fixed/large plant associated with the construction of new bridges/culverts or hand tools;
- Where possible re-fuelling will be undertaken in designated areas within main compounds or satellite compounds. It is possible that refuelling of mobile plant may be required by mobile fuel bowser. This will not be undertaken within 20 m of a water feature, and only on flat land (or otherwise a greater distance and other measures may be required subject to an on-site risk assessment) and with a drip tray/plant nappy. If there is a need to use semi-mobile very large plant (e.g., crane) that must be located within 20 m of a water feature. Due to the difficulties in moving plant such as this they may need to be refuelled in situ. Again, a site-specific risk assessment will need to be undertaken by the Contractor;
- Biodegradable hydraulic oils would be used where possible in all plant and only in equipment working in or over watercourses;
- Any plant, machinery or vehicles would be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off site if possible or only at designated areas in the site compound;
- All fixed plant used on site to be self-bunded;
- Mobile plant to be in good working order, kept clean and fitted with plant 'nappies' at all times;
- Spill kits and oil absorbent material to be carried by mobile plant and located at high-risk locations across the site and regularly topped up;
- All construction workers would receive spill response training;
- The Site is to be secure to prevent any vandalism that could lead to a pollution incident;

- Construction waste/ debris are to be prevented from entering any surface water drainage or water feature;
- Concrete will not be batched on site and would instead be delivered on an 'as and when' basis in ready mixed lorries; and
- Particular care would be taken with the delivery and use of concrete and cement as it is highly corrosive and alkaline. No washing out of delivery vehicles to take place on site without suitable provision for the washing out water and provision of a suitable location that is lined with a geotextile to prevent infiltration to ground. Such washing would not be allowed to flow into any drain, watercourse or other waterbody, and the CEMP contains a methodology for dealing with any washing out water, or wheel wash. Wash water would be adequately contained, prevented from entering any drain/watercourse, and removed from site for appropriate disposal at a suitably licenced waste facility or otherwise treated and discharge under any required consent from the Environment Agency.

Spill Kits

- 6.7.2 Spill kit location points should be identified on a drawing (posted on notice/ RAMS boards) and clearly advertised with signage. Spill kit locations and requirements should also be detailed in RAMS. Spill kit points must include and have access to the following equipment and information:
- Absorbent granules, wipes, and socks;
 - Drain covers;
 - Plastic bags and ties for used spill kit materials;
 - Plastic bunds or trays;
 - Relevant and up-to-date material safety data sheets and COSHH information for substances used on site; and
 - Shovels and brooms.
- 6.7.3 Spill kits will be made available in the following locations:
- Adjacent to all fuel storage and refuelling areas;
 - Watercourse crossings; and
 - All mobile plant.
- 6.7.4 Additionally, as a minimum that all vehicles that access the construction site will carry an "Emergency Grab Pack"/ spill kit for immediate use in the event of a pollution incident.
- 6.7.5 When work is being undertaken in hydrologically and ecologically sensitive areas identified by the EcoW, spill kits will be available adjacent to the works. The size/ number of spill kits available should reflect the scale of the works and the potential scale of any spillage.
- 6.7.6 Spill kits must be contained in a suitable, labelled, weather-proof receptacle which can also be used to contain and transport contaminated spoil and absorbent materials (for example plastic bin or sturdy bag). Additional equipment for sensitive locations may include:
- Plugging clay and slab;
 - Absorbent cushions; and
 - Booms.
- 6.7.7 The SHE Manager (or named representative) will be responsible for ensuring that spill kits are checked at least weekly and kept fully stocked and in good repair.

Storage of Oil, Fuel and Chemicals

- 6.7.8 Details on the storage of waste will be provided in a Site Waste Management Plan (SWMP) to be produced by the Contractor prior to construction. Facilities will be provided for the collection, segregation, treatment and disposal of solid and liquid waste.
- 6.7.9 The following measures will be implemented on site for the storage of materials by the Contractor.
- 6.7.10 Oil, fuel and chemical storage location points will be identified drawing (posted on notice/ RAMS boards) and clearly advertised with signage. Where required these should also be detailed in the RAMS to be provided by the Contractor. In accordance with the Control of Substances Hazardous to Health (COSHH) Regulations, all containers must be clearly marked as to their contents.
- 6.7.11 On-site storage of oil, fuels and chemicals will be avoided if possible. Where on-site storage is required, the volumes to be stored will be minimised as far as practical through efficient management of resource. The Contractor will appoint nominated refuellers and these personnel will undergo appropriate training. The transfer of fuel between machines or plant is forbidden. Storage of oil, fuels, and chemicals will be at least 10 m from any watercourse including surface water drains; and at least 50 m from any borehole or well. Storage of oil, fuels, and chemicals will also be away from ecologically sensitive sites such as badger setts.
- 6.7.12 Oil storage containers include:
- Oil drums and fixed tanks;
 - Intermediate bulk containers (IBCs);
 - Mobile bowsters – containers designed to store and dispense oil that can be moved between locations but not under their own power; and
 - Some types of generator and transformer.
- 6.7.13 Clearly defined areas for the storage of oil, fuel and chemicals will be identified as part of the site establishment process. Issues to be considered when siting oil storage on site include:
- Suitability of ground conditions e.g., can the area be protected against flood damage/ inundation/ subsidence;
 - Proximity to sensitive environmental receptors such as surface waters, surface water drainage systems;
 - Ease of access to proposed storage area for oil deliveries/ refuelling;
 - Ability to secure proposed oil storage areas (to prevent theft/ vandalism);
 - Ensure no fuel stores are sited where they could be hit by moving vehicles and plant; and
 - Ensure all site staff are aware of designated fuelling areas and also those areas where fuelling is not permitted.
- 6.7.14 Storage areas will:
- Have an impermeable base;
 - Have control measures in place and have adequate spill kits easily accessible;
 - Be adequately signed/ labelled;
 - Be secured against damage/ theft/ vandalism; and
 - Be located away from areas of vehicle movement to avoid impact and damage; and install protective barriers or fencing where required.
- 6.7.15 Spill kits and drip trays will be provided for all equipment and at locations where any liquids are stored and dispensed. Spill kits will be located and maintained at all oil storage and refuelling locations. Storage tanks must comply with the requirements of Government guidance and the Control of Pollution (Oil Storage) (England) Regulations, 2001 (Ref 6) and be:
- In good repair;

- Fit for purpose;
 - Appropriate type and capacity for contents; and
 - Be appropriately labelled identifying the contents.
- 6.7.16 Mobile fuel tanks will be double skinned and locked when not in use, be of appropriate type and capacity for the contents and in good condition. They will be appropriately labelled identifying the contents.
- 6.7.17 All oils, fuels and chemicals must be stored in bunded, or secondary containment, facilities in the compound area or on site. Drip trays and plant nappies do not constitute bunding. Bunding or secondary containment, must:
- Provide, for a single tank, at least 110% of the maximum storage capacity of the tank;
 - Provide, for two or more tanks in one secondary containment system, at least 110% of the biggest tank's maximum storage capacity, or 125% of the total maximum storage capacity of all the tanks, whichever is the greatest;
 - Be impermeable to water and oil;
 - Be intact and without openings or valves for drainage;
 - Any draw-off pipes and fill pipes that pass through the containment system must be adequately sealed;
 - All valves, filters, sight gauges, vent pipes, and taps must be within the secondary containment, and so that any oil lost will be retained within it;
 - Any sight gauge must be supported and fitted with a valve that closes automatically when the gauge is not in use;
 - Fill and draw-off pipes must be located or protected so that they cannot be damaged by an impact or collision;
 - All taps and valves fixed to the storage tank, through which oil can be discharged to the open, must be fitted with locks and locked shut when not in use;
 - Hoses to be fitted with trigger-type handles suspended back within the bund after use;
 - Valves and trigger filler handles to be kept padlocked when not in use; and
 - Fuel bowsers will be kept in a safe and secure building or compound from which they cannot leak, spill or be open to vandalism.
- 6.7.18 All static Plant, such as pumps and generators, will be double skinned (integral drip trays) where possible or as a secondary requirement for external drip trays, that are to be checked and emptied daily in accordance with the Site Waste Management Plan (to be produced by the appointed contractor prior to construction). Spill mitigation (drip trays and plant nappies) must be used for all other static plant for example pumps, generators and compressors. Oil, oil powered pumps and generators must be positioned on spill mitigation and located at least 10m from any watercourse (increasing to 50m where practical). Plant nappies should be used in preference to drip trays. Drip trays must be monitored and emptied regularly with inspections being carried out daily or more frequently during periods of wet weather. Drip trays must not be allowed to overflow. The effluent collected from drip trays and waste plant nappies must be disposed of as hazardous waste and in accordance with the site specific SWMP.
- 6.7.19 To prevent the risk of spills, runoff, and wind-blown emissions the following measures will be put in place:
- Storage facilities will be provided for solid materials, including waste soils, to prevent deterioration of the materials and their escape (via surface run off or wind blow);
 - Storage facilities will be kept secure to prevent acts of vandalism that could result in leaks or spills; and

- All containers of any size will be correctly labelled indicating their contents and any hazard warning signs.

6.8 Operation and Refuelling of Plant and Equipment

6.8.1 To eliminate the risk of any potential ground, watercourse or drainage contamination from the various liquids and site effluents, the following best practice control measures will be implemented by the Contractor:

- Plant and equipment must be located and used on hard-standing and where practicable, away from any other body of water, including ditches and ponds, or surface water drains unless specifically carrying out works on watercourses;
- Self-bunded plant must be specified and used where possible;
- Plant or equipment must not be stored/ placed/ parked directly over the site drainage system. 'No Parking' exclusions will be established;
- All fuel will be safely stored within double skinned fuel bowzers located at predetermined points on site for safe and easy access by plant but away from any drainage access points;
- Wherever possible, refuelling must be undertaken in the compound areas and not at the work sites;
- All refuelling must take place on hard-standing (for large plant) or over plant nappies/ drip trays (small plant and equipment);
- Refuelling areas will have appropriate and replenished spill kits available in case of spillage, which will be cleaned up immediately;
- Refuelling lines will be fitted with automatic shut off devices and must not be locked on. The use of 'Dead Mans' catches on fuel pumps (i.e., that allow fuel pumping without attendance) will be strictly prohibited;
- Any vehicles normally used on public roads will not be refuelled on site;
- Refuelling will only be carried out in designated areas and by those personnel suitably trained; and
- Other items such as hydraulic oils etc. will also be stored in appropriate storage containers, clearly labelled and stored in a secure container or bunded area by the COSHH Co-ordinator. As far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in, on or over watercourses.

6.8.2 For fuel bowser refilling, the fill pipe must be situated within the secondary containment system of the bowser, or if not, a drip tray must be used during delivery to the tank. All coupling and discharge points must be checked prior to discharge of a delivery. Deliveries must be supervised at all times.

6.8.3 All drip trays for static Plant refuelling and servicing will be of sufficient size to retain 10% of the total volume of liquids being 'handled'. Interceptor drip trays will only be used for oil-based products; they are ineffective for water soluble products.

6.8.4 For larger items of Plant or mobile Plant such as excavators etc, where the continuous use of drip trays is not practical, the Plant will undergo daily inspections by a competent person to check for defects, such as leaking hoses, interference by others etc. Records of inspections will be maintained and held on file by the Contractor. Where defects are evident the item of Plant will be removed from the Site immediately and serviced or replaced as soon as possible.

6.9 Surface, Groundwater and Foul Drainage

6.9.1 The following section outlines the principles for the prevention of pollution to the water environment, including foul drainage systems. It will be the responsibility of the Contractor's Site Manager/ Engineer (or named representative) to ensure that the measures set out below (where relevant to

the works being undertaken), are considered and incorporated into the RAMS and implemented on site.

- 6.9.2 As mentioned above, it is an offence to permit or cause pollution to the hydrological environment either accidentally or deliberately (Ref 4).

Drainage Management Plan

- 6.9.3 An Outline Drainage Management Plan (Document Reference Document Reference 30003364-BHK-XX-XX-RP-C-02060) incorporating a Site Drainage Plan (SDP) has been prepared and is to be reviewed and updated as appropriate during detailed design. The Drainage Management Plan specifies measures to minimise the impact of the construction on existing drainage systems (manmade and natural). This is to be further developed following detailed drainage investigations (e.g., to identify underground sewers and surface water drains etc.) and hydrological assessments, which will determine potential location specific risks in relation to the water and natural environment and identify appropriate control measures to reduce the risks.
- 6.9.4 The SDP will be updated (as required) following detailed design and will be held on site and displayed in a prominent location. Drainage systems will be identified by a colour coding system; blue for surface water and red for foul water, the SDP will be a 'live' document and will be updated with any changes to the network.
- 6.9.5 All details included in the Drainage Strategy/ SDP will be reviewed and approved by the Contractor's Site Manager and SHE Team prior to works being implemented.

Pre-construction drainage

- 6.9.6 To minimise the potential for erosion and sediment laden run-off leaving the construction area and polluting the water environment, the following measures will be undertaken prior to construction:
- Control surface run-off entering and leaving the site effectively and prevent clean catchment flows from entering works areas (this may include the installation of specially designed pre-construction drainage systems to collect and divert water away from the working area). This will reduce the volume of water requiring treatment ensuring that the site mitigation measures do not become overwhelmed following intense or heavy precipitation events;
 - Identify areas known to be particularly or potentially prone to erosion prior to the on-ground siting of access roads and earthworks and avoid these areas where practicable;
 - Prepare RAMS detailing mitigation measures on how to prevent and control sedimentation and erosion during construction including as a minimum;
 - The location of any stockpiles will be located well away from watercourses, ditches and drains. Silt mitigation, including silt fences will be installed around the base of the stockpile. In the event that this is not possible the measures to divert surface water around stockpiles and earthworks and back into drainage paths will be included;
 - Minimise storage of excavated material in areas of sensitive habitat and/or shallow groundwater;
 - Consider specific activities that require protection and control;
 - Use of existing roadside drains and field drains where practical to install measures to treat and contain runoff;
 - The installation of supporting sediment collection devices and erosion control works e.g., silt fences, vegetation, sandbags, grips, interceptor ditches and diversion drains;
 - All sedimentation and erosion control measures to be implemented during construction;
 - Specify conditions under which any sediment and erosion control measure can be decommissioned; and

- The detailed drainage design for any temporary outfalls will be agreed with the relevant authority (and following grant of appropriate permissions/ permits) prior to the commencement of construction.

Foul Drainage

- 6.9.7 Where available, the preference will be to manage foul drainage during construction, by connecting to, and discharging into, the local foul or combined sewer system. Such discharges must be disposed of in accordance with the Water Industries Act 1991 (Ref 7), and the Contractor will be required to obtain the necessary approvals prior to discharging into the public sewer.
- 6.9.8 If discharge via the local foul or combined sewer system is not available or not permitted, foul water and sewage effluents produced by the construction workforce will be contained by temporary foul drainage facilities (such as a septic tank) and disposal off-site by a licensed contractor.
- 6.9.9 The Environment Agency's approach to groundwater protection guidance document and other relevant guidance will be followed, as appropriate.

Site Wastewater

- 6.9.10 The Contractor will implement the following best practice control measures to manage (non-foul) site effluent or wastewater:
- Any (non-foul) site effluent or wastewater is to be retained on site within an intermediate bulk container (IBC) or holding tank and taken away for disposal by a registered waste carrier. No discharge of wastewater to ground or water will occur;
 - All wash down of vehicles and equipment will take place in designated areas;
 - Where wheel washes and boot washes are installed adjacent to site accesses or egresses, these will be self-contained, will recycle wash water as much as possible and will not directly discharge to the environment;
 - All active drainage points within and adjacent to the site will be clearly identified and where necessary appropriate interceptors to trap silt and accidental pollutants must be installed;
 - All site water discharges and wastewater from the site welfare facilities will be contained in an appropriate tank and removed from site by vehicle. No effluent or site water will be allowed to discharge directly onto the ground or water course; and
 - A specialist wastewater contractor will be employed to dispose of any hazardous liquid wastes found on site and disposed of in accordance with those regulations.

Concrete Management

- 6.9.11 Wet concrete and concrete block structures are highly alkaline and corrosive and can have a devastating effect on the water environment.
- 6.9.12 Where practicable concrete mixing and washing down of mixing plant is to be carried out by the suppliers and away from Proposed Development Site.
- 6.9.13 Where onsite concrete washout is required this will be prohibited within a minimum of 10m of any body of water, including ditches and ponds, or surface water drains, and within 5m of a foul drain. Where practical, this will increase to 50m. Where concreting is required within 10m of a watercourse this will be agreed with National Grid in advance of the works. Areas which have been identified with important habitats or species will also be avoided, where possible.
- 6.9.14 The Contractor will clearly demarcate and signpost designated areas for concrete washout. The use of specialist concrete washout systems should be considered. If skips are to be used for concrete washout, they will be contained within a specially bunded area to prevent any accidental spillage reaching ground. The bund will be lined so as to be impermeable, and sand placed within the bund to make the clean-up of any concrete spillages into the bund easier.

- 6.9.15 The skips to be used for washout will be inspected on delivery to site, and frequently during the works to ensure they are undamaged. Holed or damaged skips (i.e., where there is a potential for leaks) will not be used for concrete washout and will be removed from site. All concrete washout skips will be fully lined so that all concrete and washout water is retained within the lining.
- 6.9.16 Prior to any concrete being used on site the Contractor will produce a Concrete Washout Procedure, which will also include details of the emptying of concrete washout skips (if used) and the treatment of high pH washout water.
- 6.9.17 Control measures include:
- Use only designated areas for concrete washout;
 - No concrete contaminated water is permitted to be discharged to the water environment (including groundwater);
 - Concrete, bulk and bagged, and concrete additives will be stored a minimum of 10 metres (increasing to 50m where practical) away from watercourses, gullies and drains in properly secured, covered and bunded areas;
 - Any surplus concrete must only be discharged to a fully lined skip (or concrete washout system);
 - Discharge of wet/ unset concrete onto ground, other than for defined works, is strictly prohibited;
 - Concrete washout skips will not be allowed to overflow and should be covered during heavy rainfall to prevent rainwater accumulation / creation of excess high pH water;
 - Any excess water within concrete washout skips should be pumped to an IBC and the water treated (on or off site) to reduce pH;
 - Concrete washout skips should only be tipped out when completely dry (all water evaporated or pumped off) and when the concrete is fully set;
 - The integrity of the lining and available capacity of the concrete washout skip will be checked prior to the discharge. If there is damage or insufficient capacity to take the whole discharge the skip cannot be used; and
 - All staff will be trained on the risks of working with concrete (both health and safety and environmental risks).
- 6.9.18 All staff will be instructed to report to the HSE Team immediately if they see any concrete spillages or concrete washout likely to cause pollution, and start the following control measures:
- stop the action which is causing pollution immediately;
 - take immediate remedial action – block the spill, place booms and absorbent materials to help soak up the spill;
 - monitor effects of spill; and
 - learn from the experience and plan site works to avoid pollution happening again.

Dewatering of Excavations

- 6.9.19 If dewatering is required, the Contractor will develop a detailed dewatering scheme prior to construction to manage the water arising from dewatering operations and treat the water prior to controlled discharge. This may include the construction of raised lagoons for the storage of water and to allow the settlement of any sediment prior to discharge. Consideration will be given to the potential effects of dewatering on adjacent water features and groundwater abstraction points, both from drawdown during dewatering and subsequent discharge, and mitigation applied.
- 6.9.20 As the need for dewatering of excavations is likely to be required for longer than three months, any activity involving pumping of water from excavations will require consideration under the Environmental Permitting (England and Wales) Regulations 2010. A Permit to Pump system will be implemented by the Contractor. The Contractor's SHE Team will be consulted on the best working methods and an approved Permit to Pump will be required for all pumping operations (before

dewatering or discharges commence). Water will never be pumped directly to a watercourse or be allowed to directly enter a watercourse or be discharged to ground.

6.9.21 It is anticipated that the detailed dewatering scheme will form part of the detailed CEMP/ the minimum requirements likely to be adopted include:

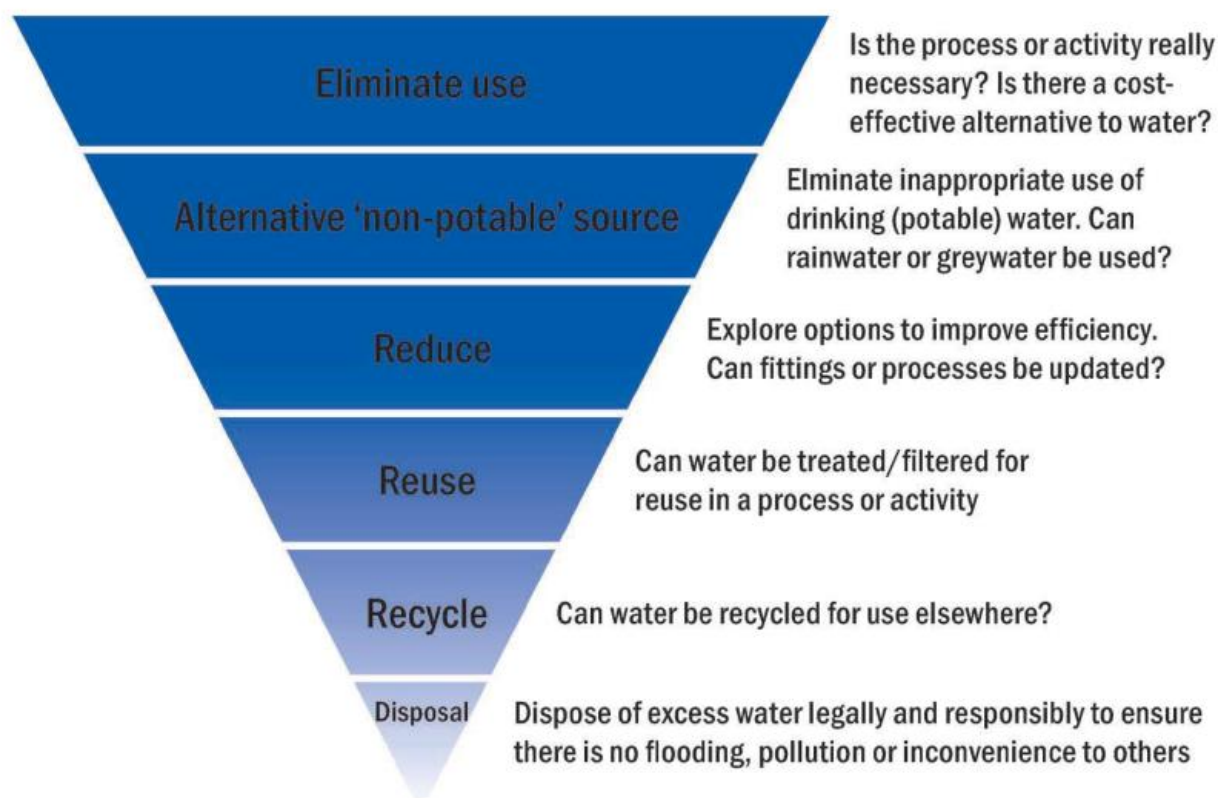
- All discharge waters to be passed through suitably sized settlement systems in order to remove suspended solids.
- The subsequent discharge outputs to be regularly monitored by the person in charge of the activity for evidence of suspended solids, unusual smells and oils. If necessary, pumping will cease and the SHE Team consulted.
- Inspection of the pump by a competent person if it is to be operating for a long period.
- The SHE Team to monitor any pumping activities and record any findings.
- Where silty or oily water is noted to be entering/discharging from the pump the following measures will be taken:
 - Stop pumping.
 - Investigate source of pollution
 - Take action to reduce pollution.
 - Where none of the above is applicable then the water can be disposed of by tanker to an appropriate treatment works with relevant waste documentation.

Water Efficiency

6.9.22 The Contractor will implement working methods that reduce water consumption and measures that improve water-use efficiency on site.

6.9.23 The Contractor will develop and adopt water conservation measures based on the water hierarchy shown in Plate 6-1.

Plate 6-1: Water Hierarchy



6.9.24 In addition, the Contractor will:

- Undertake water audits that identify all water-using processes, activities and equipment on Site (these will be updated periodically to reflect any significant changes in site activities through the project life cycle);
- Develop an action plan, including staff engagement and training for relevant staff, to reduce water consumption by all water-using processes, activities and equipment on site;
- Undertake monitoring regime to assess the effectiveness of water conservation measures in the plan; and
- Establish a reporting regime to advise on the effectiveness of the plan (which will be completed at a minimum of annually).

6.10 Vehicles and Plant

6.10.1 Vehicles and plant provided for use on the Site will be in good working order to ensure optimum fuel efficiency and are free from leaks. This will also reduce emissions to air (fume/smoke) and noise and vibration. Plant which cannot comply with these requirements will be removed from site. Plant with integral bunding will be specified and plant nappies will be placed below static mechanical plant. Additionally, the operation and use of vehicles and plant can be a major source of dust and particulate emissions and therefore measures to minimise impacts to air quality will also be implemented as described in the commitments register in Section 8.

6.11 Housekeeping

6.11.1 The Contractor will ensure high levels of housekeeping are maintained to control nuisance through windblown litter and potential health effects through the attraction of vermin. Housekeeping will be included at induction and as part of scheduled Toolbox Talks. Levels of housekeeping will be monitored daily by the SHE Team. Litter picking will be undertaken when necessary, both within and outside of the site should this become necessary. The Contractor will ensure that there are adequate waste bins/ skips on site and that, where practicable, these are located as close as possible to working areas to promote use. Where possible waste segregation at source should be promoted.

6.12 Air Quality

6.12.1 The Contractor will ensure that appropriate measures to mitigate any air quality impacts due to the construction of the Proposed development are implemented. The measures outlined in the mitigation register (Table 8-1) are considered to be 'standard' measures which must be employed where required. This does not preclude the use of additional air quality management measures where the need arises.

6.12.2 Commitments related to communications, site management, and the use of vehicles and plant are already included.

6.12.3 These mitigation measures are designed to protect human health, avoid dust nuisance, and mitigate impacts to surrounding ecological habitats and species for instance by preventing the smothering of vegetation and limiting the deposition of dust that may be re-animated beyond the site boundary or become mixed with run off (creation of silty water). Exhaust gases contain oxides of nitrogen which can also alter the nutrient status of surrounding habitats when deposited in sufficient quantities.

Powering the Tunnel Boring Machine

6.12.4 It is National Grid's preference that the TBM will be powered through a grid connection (directly connected to the electrical grid that powers the local community), however, at this stage of design, it is not possible to confirm if this is a viable option. Consequently, as a worst case scenario, the TBM will need to be powered by onsite generators. In this event, two to three diesel generators would be required, depending on the type of TBM chosen, sited in the Main Works Compound at Tilbury.

- 6.12.5 For the purposes of the environmental assessment, the construction program currently assumes that the tunnelling phase will last for a period of 34 weeks. Within that period, tunnelling will be undertaken for 25 weeks, with the remaining 9 weeks programmed for intervention. Over the 34-week program, the power demand required of the tunnelling work will vary. For example, the generators will only be required to operate at full load for around 12.5 weeks, 37% of the 34-week programme. At other times, the generators will operate at a reduced load, depending on the activities being undertaken at the time. This is also dependent on whether an Earth Pressure Balance (EPB) TBM or slurry TBM is selected.
- 6.12.6 As is identified in the Tilbury air quality assessment (ES Volume III Chapter 12), there is a requirement for emission stacks to be secured to the generators. The actual height of these would be stipulated by the final selection of the TBM as well as the manufacturer of the generator. Modelled scenarios suggest a worst-case height of 50m, and a best-case height of <5m. Selective Catalytic Reduction (SCR) technology would be required to reduce NO_x impacts.

Monitoring

- 6.12.7 The Contractor will appoint a nominated person(s) to undertake daily on-site and off-site inspections, where receptors (including access roads and public highways) are nearby, to monitor dust. The inspection should also include all haul routes within the site. All inspection results will be recorded in a log, which will be made available to the local authority when requested. Any exceptional incidents that cause dust and/or emissions, either on- or off-site and the action taken to resolve the situation will also be recorded in the log.

Vehicles, Plant, Travel and Logistics

- 6.12.8 The operation and use of vehicles and plant can be a major source of dust and particulate emissions and therefore measures to minimise impacts to air quality will be implemented as described in the commitments register in Section 8.

Preparing and maintaining site

- 6.12.9 The Contractor will plan the site layout so that machinery and dust causing activities are located away from receptors, as far as possible. Access gates are to be located at least 10m from receptors where possible.
- 6.12.10 Solid screens or barriers will be erected around dusty activities or, if required, at the planning application boundary. These will be at least as high as any stockpiles on-site. Where there is high potential for dust production for an extensive period the working area or the specific dust generating operations will be fully enclosed. All site fencing, barriers and scaffolding will be kept clean using wet methods to prevent resuspension of dust.
- 6.12.11 Stockpiles will be covered, seeded or fenced to prevent wind-whipping (generation of airborne dust through erosion). Materials that have a potential to produce dust will be removed from site as soon as possible, unless being re-used on-site. These measures will also help mitigate rainfall infiltration, leachate generation and surface runoff.
- 6.12.12 The creation of site runoff of water or mud (silty runoff) will be avoided as, when dried, this can become a source of wind-blown dusts.
- 6.12.13 All site haul routes are to be inspected for integrity and necessary repairs to the surface undertaken as soon as reasonably practicable; and hard surfaced haul routes should be installed wherever possible (this will also minimise vehicle generated noise and vibration). All haul roads are to be regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- 6.12.14 A wheel washing system will be implemented, (fitted with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). The Contractor will ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever

site size and layout permit, to minimise the risk of trackout of debris to the public highway. Equipment washing facilities will also be provided where required.

6.12.15 Road sweeping (including and water jet vacuums) will be undertaken as necessary to remove any material tracked out of the site from local public and site roads. This may require the sweeper being continuously in use. This will reduce the risk of silt being washed into surface water gullies and watercourses and reduce the risk of dust generation. The risk of dust generation will be further minimised by avoiding the dry sweeping of large areas.

Operational controls of construction activities

6.12.16 To minimise the generation of air emissions during construction works for the Proposed Development, the Contractor will ensure that:

- All cutting, grinding or sawing equipment is fitted, or used in conjunction, with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems;
- There is an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation. Non-potable water should be used where possible and appropriate;
- All chutes and conveyors are enclosed, and skips covered;
- Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment are minimised and fine water sprays are used on such equipment wherever appropriate;
- There is equipment readily available on site to clean any dry spillages. All spillages will be cleaned as soon as reasonably practicable after the event, using wet cleaning methods;
- Earthworks and exposed areas/ soil stockpiles are revegetated to stabilise surfaces as soon as practicable;
- Hessian, mulches or trackifiers are only to be used where it is not possible to re-vegetate, as soon as practicable; and
- Soils are to be stripped progressively so as to minimise the area of bare land and stockpiles soils as far as is practicable.

6.12.17 The use of bonfires and burning of waste materials will be strictly prohibited.

6.13 Energy Use and Efficiency

6.13.1 The production of energy is closely linked to greenhouse gas (GHG) emission and climate change, which requires construction projects to identify and implement wherever practicable measures to increase energy efficiency.

6.13.2 Energy consumption during the construction phases can be attributed to a variety of operations. These operations are identified below, with the measures that can be taken to reduce the energy consumption.

Construction Plant and Site Vehicles

6.13.3 Measures to ensure the energy efficiency of construction plant and site vehicles are described in Section 6.10.

Reuse of materials

6.13.4 Reduce the number of vehicle movements around and off the site by maximising the volume of site won material that can be incorporated into the design (i.e., resulting from an optimised cut fill balance during design).

Deliveries and Logistics

- 6.13.5 Prior to commencement of construction the Contractor will prepare a CTMP based upon the Outline CTMP presented as ES Volume VI Appendix 10.1.
- 6.13.6 Prior to the commencement of construction, the Contractor will also produce a Construction Logistics Plan to manage sustainable delivery of goods and materials.
- 6.13.7 The Contractor will take account of the following in its delivery and logistics planning:
- Identify local road restrictions, including height, width and weight;
 - Times of the day to avoid deliveries to and removal of waste from the site, for example, peak commute times, start and end of the school day ('the school run'), level crossing closures;
 - Most efficient routes to and from the site to avoid unnecessary fuel usage (and carbon emissions);
 - Engagement of national logistics that provide telemetry services to assist in planning deliveries more effectively and give real time data that can also be helpful in arranging back haul routes for surplus materials and waste removal;
 - Manage movements of on-site vehicles to reduce time idling waiting for a space to be cleared for the products to be off loaded; and
 - Reduce the potential for complaints from local residents due to nuisance caused by vehicles parked around the planning application boundary, by ensuring adequate on-site parking where feasible. Where practicable measures such as adopting a car sharing policy, promoting the use of public transport, and provision of works mini-buses should also be implemented.

Site Accommodation and Facilities

- 6.13.8 The Contractor will seek to procure site accommodation (including canteens and changing rooms) that is energy efficient, thereby reducing energy consumption through better insulation, glazing, lighting (e.g., motion sensors), heating and electricity (e.g., meters and master switch off).
- 6.13.9 As part of the site induction, encourage site-based staff to adopt more energy behaviour and adopt 'switch off' schemes.

Grid Connection

- 6.13.10 National Grid is seeking to establish a connection to the electricity distribution network to facilitate the construction works, including the powering of the TBM and slurry treatment plant (if that type of TBM is selected). The Contractor will also investigate opportunities to utilise small scale renewable energy sources, including photovoltaic panels, hydrogen fuel cells, or wind turbines to provide energy for the site; with diesel generators to be considered the least desirable option for power provision.

6.14 Carbon Reduction

- 6.14.1 The Proposed Development should identify and implement wherever practicable measures to reduce GHG emissions and contributing to minimise the impacts from projected climate change.
- 6.14.2 There are a variety of measures to take into account in terms of carbon reduction during construction as detailed below:
- Specify materials and construction products with a lower embodied carbon where practicable;
 - Consider materials and construction products with higher recycled and secondary content, e.g., Ground Granulated Blast furnace Slag (GGBS) or pulverised fuel ash (PFA) as cement substitute in concrete;

- Procure materials and construction products from local suppliers to minimise carbon emissions associated with transport;
- Where practicable transport materials and construction products to site via lower carbon modes for example rail opposed to road; and
- Reduce volume of materials used and incorporate site won materials, i.e., excavated materials generated through earthworks.

6.15 Waste Targets

6.15.1 The Proposed Development should identify and implement wherever practicable measures to achieve the waste targets as set out in the National Grid's Our 2021–2026 Environmental Action Plan (dated April 2021). These are reiterated below.

By 2026 National Grid aims to:

- *achieve zero-waste to landfill across construction projects;*
- *reduce the waste intensity of construction projects year on year;*
- *pilot and implement circular economy principles by aligning the business to internationally recognised standards, e.g. BS 8001– circular economy standards;*
- *increase construction recycling and composting rates and set a target from a 2021/22 baseline;*
- *align Procurement Strategy to internationally recognised standards, e.g. ISO20400 Sustainable Procurement;*
- *increase operational and office recycling rates from 45% and 46% (respectively) to 60%; and*
- *maintain high standards of oil containment and pollution management.*

7 Consents and Licences

7.1.1 A schedule of the potential consents and licences required for the Proposed Development has been prepared, refer to Table 7-1 below. The Contractor will be responsible for identifying any further statutory consents required for the construction, pre-commissioning and re-instatement of the Project. Where the Contractor applies for consents or licences, National Grid will be provided with copies of them as soon as possible after receipt. The relevant commitments and conditions on consents and licenses will be transferred to the Commitments Register to ensure they are delivered and their implementation is monitored.

Table 7-1: Required Consents and Licenses

Consent / License	Legislation	Consenting Body	Requirement	Relevant to Tilbury/Gravesend
Flood Risk Activity Permit	The Environmental Permitting (England and Wales) Regulations 2016	Environment Agency	As working near to main rivers at the Gravesend site.	Gravesend
Water Activity Permit	Environmental Permitting Regulations (England and Wales) Regulations 2016 (as amended)	Environment Agency	Environmental Permit may be required by the EA for discharge of surface water runoff to controlled waters (e.g. ditches, streams, rivers, lakes and to ground) or the discharge of groundwater back to ground or to a watercourse.	Tilbury Gravesend
Trade Effluent Discharge Consent	Water Industry Act 1991 (as amended)	Thames Water (Tilbury) Southern Water (Gravesend)	If there is a requirement to discharge to public foul sewers. At this stage it is considered unlikely as no nearby public sewers.	Tilbury Gravesend
Ordinary watercourse Land Drainage Consent	Land Drainage Act 1991	Lead Local Flood Authority	Required for any temporary or permanent works that may affect the flow of an Ordinary Watercourse (i.e. all watercourses/ ditches that can convey water at times that are not Main Rivers).	Gravesend

Consent / License	Legislation	Consenting Body	Requirement	Relevant to Tilbury/Gravesend
Permit to treat, remove and/or dispose of Invasive Non-Native Species (INNS).	Wildlife and Countryside Act 1981; Environmental Protection Act 1990	Environment Agency	INNS has been identified on both the Tilbury and Gravesend sites. A permit to treat or remove may be required and would be identified through the development of the INNS management plan.	Tilbury Gravesend
Waste Transfer Permit	Environmental Permitting Regulations (England and Wales) Regulations 2016 (as amended)	Environment Agency	Required for the transfer of tunnel shaft and spoil to a receiver site.	Tilbury Gravesend
Navigational Risk Assessment	Port Marine Safety Code	Port of London Authority	Required for the use of the River Thames to transport shaft and tunnel spoil via barge.	Tilbury
River Works Licence (Vessel Licensing)	Port of London Act 1968 (as amended)	Port of London Authority	Required for the use of vessels operating on the tidal Thames to transport shaft and tunnel spoil via barge.	Tilbury Gravesend
SSSI Assent	Section 28H(1) of the Wildlife and Countryside Act 1981 (as amended and inserted by section 75 and Schedule 9 of the Countryside and Rights of Way Act 2000)	Natural England	Only required if proposed SSSI designation is formally made	Tilbury
Public Path Order	Town and Country Planning Act 1990 Highways Act 1980	Kent County Council	For the temporary diversion of Public Right of Way NS317 / National Cycle Network Route 1	Gravesend

8 Commitments Register

- 8.1.1 This section sets out any discipline specific mitigation beyond the general construction good practice measures set out in section 6, as identified by each topic discipline within the ES. These measures may include both mitigation by design/embedded mitigation and specific bespoke measures. Discipline appropriate general measures are signposted where required.
- 8.1.2 As the Proposed Development develops, the register will be continually reviewed. The achievement criteria will also be developed by the Contractor(s) and agreed with National Grid prior to construction commencing.
- 8.1.3 The Register will be used to inform the environmental procedures and provide a tool for construction teams when preparing construction Method Statements or field briefings. The Register will be regularly updated throughout the construction phase, with actions outstanding and completed to be noted as evidence is collated.
- 8.1.4 The Register will identify whether or not a Method Statement or Risk Assessment is required for each environmental commitment. Where one is required, work will not proceed on that element, or on other work that will affect that element, until it has been signed off at the appropriate level.
- 8.1.5 The Register is included in Table 8-1, specifying which project stage each commitment is relevant to, the pre-construction, construction or post construction stages. The Register also identifies responsible personnel for each action. The Register also identifies which commitments/ mitigation are relevant to both the Gravesend and Tilbury sides or whether specific commitments/ mitigation are relevant to only one side of the Proposed Development.
- 8.1.6 The Contractor is responsible for advising the Project Manager on any changes to Method Statements or the planned construction work as these may result in changes to the Final CEMP and Register or require additional consultation with Statutory Environmental Bodies.
- 8.1.7 In addition to the Register below, the Contractor is also responsible for implementing good environmental practice on site, in line with their own Environmental Management Systems, including but not limited to typical issues such as:
- Any working hour restrictions;
 - Dust suppression measures;
 - Environmental Aspects and Impacts Register;
 - Traffic management (further details contained within the Final TMP);
 - Site waste management;
 - Materials management;
 - Site Water Management;
 - Vehicle maintenance and management;
 - Pollution prevention and control (including storage, refuelling and incident response);
 - Response procedures e.g. services strike, contaminated land;
 - Hazardous materials handling and storage;
 - Noise management;
 - Securing and delineation of working areas including signage;
 - Energy reduction; and
 - Soil management.

Table 8-1: Outline Environmental Mitigation Register

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
General Environmental Management					
A1	National Grid to finalise Outline CEMP into Detailed CEMP, and agree with Thurrock Council / Gravesham Borough Council, prior to construction commencing.	National Grid	Pre-construction	☒	☒
A2	Contractor to appoint a suitably experienced Environmental Manager for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works (ECoW) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The EcoW will monitor that the works proceed in accordance with relevant environmental requirements and adhere to the required good practice and mitigation measures. The EcoW will be supported as necessary by appropriate specialists, including ecologists and arboriculturists.	Contractor	Pre-construction	☒	☒
A3	Develop and implement a stakeholder communications plan before work commences on site.	National Grid	Pre-construction	☒	☒
A4	All statutory consents, permits or licenses required for the construction should be obtained. Any conditions included should be documented in the Detailed CEMP and considered as part of the planning, design, and construction process.	Contractor	Pre-construction	☒	☒
A5	A separate project specific Safety Health and Environment (SHE) Plan would be produced in accordance with relevant legislation.	Contractor	Pre-construction	☒	☒
A6	Maintain an Environmental Incident Response Team for immediate response and attendance at environmental incidents or aspects. Out of hours contact names and telephone numbers for the Environment Incident Response Team should be made available.	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
A7	Provide all employees, site operatives and personnel with pollution awareness induction training and regular toolbox talks covering environmental issues.	Contractor	Construction	☒	☒
A8	Review Detailed CEMP every three months and update and reissue as required.	Contractor	Construction	☒	☒
A9	Identify good practices on a regular basis and submit to the National Grid for consideration and wider circulation.	Contractor	Construction	☒	☒
A10	For each method statement produced, prepare an Environmental Risk Assessment.	Contractor	Construction	☒	☒
A11	Adequately protect the construction sites from vandalism, theft, and fly-tipping by fencing and locking access gates to discourage unauthorised access. Any occurrence of tipping on the site will be reported to the site management who will then inform the local environmental authority and the police if necessary.	Contractor	Construction	☒	☒
A12	Consult with local police on security proposals and review arrangements throughout the period of the contract.	Contractor	Construction	☒	☒
A13	Ensure that construction compounds including offices are adequately secured to protect the public and prevent unauthorised entry to or exit from the site; and will ensure that plant, equipment, and materials are stored in such a manner so as to not attract opportunist thieves.	Contractor	Construction	☒	☒
A14	Undertake site-specific assessments of the security and trespass risk and ensure that suitable security arrangements are implemented to prevent unauthorised access to the sites. Access to the construction compounds will be limited to specified entry points only and personnel entries/ exits will be recorded and monitored for both security and health and safety purposes, the gates will be kept secure unless they are being used.	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
A15	Ensure high standards of housekeeping are maintained to control nuisance such as windblown litter and potential health effects through the attraction of vermin. Housekeeping will be included at induction and as part of scheduled Toolbox Talks. Levels of housekeeping will be monitored daily by the HSE Team. Litter picking will be undertaken, when necessary, both within and outside of the site should this become necessary. Burning of rubbish, other waste or organic material will be prohibited.	Contractor	Construction	☒	☒
A16	The Environment and Sustainability File (or equivalent) must be prepared and finalised for submission to National Grid's Project Manager	Contractor	Construction	☒	☒
A17	The Detailed CEMP Mitigation Register must be completed (achievement criteria and dates achieved to be added to this table) and issued to the Applicant's Project Manager.	Contractor	Construction	☒	☒
Biodiversity					
B1	The ecological CoW will complete a walkover pre-construction to reconfirm the ecological baseline conditions and to identify any new ecological risks. Prior to the commencement of site clearance, a precautionary method of works (PMoW) to cover pre-construction site clearance works will be developed and implemented. This will include consideration of the following: - Reptiles – all widespread reptile species known to occur at Tilbury, and slow worm, grass snake and common lizard occur at Gravesend. Phased vegetation clearance to displace reptiles into areas of suitable adjacent habitat, alongside hand searching by an ecologist/supervised destructive clearance will be required in areas of suitable reptile habitat. Clearance works should be undertaken during the period March to October inclusive under suitable weather conditions. Ideally clearance works will target March, September and October in those areas of the Site with potential to support nesting birds.	National Grid	Pre-construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	- Birds – Vegetation clearance should wherever possible (including consideration of other species constraints) be targeted to be undertaken during the period September to February inclusive. - Bats – A single mature tree at Gravesend contains potential roosting features for bats. Emergence surveys in 2023 found no evidence of use by bats but the tree should be subject to climbed inspection by a suitably licensed bat ecologist immediately prior to felling; - Badgers – are known to be active in the local area. While no setts within either the Site boundary are known, the Site and a surrounding 30m buffer should be checked for presence of new setts by an ecologist prior to and during site clearance works - Water vole – are known to utilise the ditch to the east of the proposed Tilbury SEC. A suitable section of ditch not supporting burrows will be identified by a water vole holder of a CL31 licence to displace water vole. Where necessary habitat manipulation will be undertaken in advance of the works to displace water vole from a 5m section of bank to allow a new headwall to be installed. - Protected plant species – the Ecological Clerk of Works will undertake a search of all areas to be disturbed during works for notable rare/plant species and where found their locations will be clearly demarked to enable them to be avoided during works.; - Invertebrates – specific requirements in relation to the translocation and management of invertebrate habitat will be subject to a separate method statement (see Item B2) The draft Precautionary Method of Working report (PMoW) will be shared with key consultees such as the planning authorities, Port of Tilbury, Buglife and Natural England for their comment prior to being implemented.				
B2	Prior to commencement of site clearance, a detailed mitigation strategy for the tall fescue planthopper will be devised and agreed with the local	National Grid	Pre-construction	☐	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	planning authority and Natural England. This is expected to include details of: - Works methodology to be utilised for translocation of existing tall fescue habitat; - Location of temporary receptor site (expected within laydown/compound areas to the west of the proposed SEC with connectivity to areas of retained tall fescue habitat; - Specification for the reinstatement of areas of temporary disturbance associate new pylon construction in field to the north of the proposed Tilbury SEC; and - Measures to be incorporated into final landscape design to benefit tall fescue planthopper and other invertebrates. The draft PMoW will be shared with key consultees such as the planning authorities, Port of Tilbury, Buglife and Natural England for their comment prior to being implemented.				
B3	The main construction areas should be encircled with noise fencing (closed board fencing) to minimise the risk of disturbance of adjoining habitats suitable to support a range of notable nesting birds. It is expected the layout and design of fencing will require local authority approval via a planning condition.	Contractor	Pre-construction	☒	☒
B4	A 5m width buffer of semi-natural habitat will be retained adjoining all ditches during construction. No works will be permitted within this buffer zone and the boundary will be marked by fencing to prevent incursions into this zone. The design of the scheme will ensure no degradation in the quality of existing habitats.	Contractor	Pre-construction	☒	☒
B5	An invasive non-native species management plan will be drafted and implemented to include safe means of removal and disposal of any areas of Russian olive Tilbury) and Japanese Knotweed (Gravesend) impacted by the Proposed Development.	National Grid	Pre-construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
B6	To ensure compliance with relevant wildlife legislation, pre-construction surveys to check for the presence of invasive non-native species will be undertaken prior to the commencement of vegetation clearance works.	Contractor	Pre-construction	☒	☒
B7	Works should seek to minimise the losses of tall fescue dominated habitat as a consequence of proposed service diversion works. Trenching works within the verge will be confined to the first 3m adjoining the existing road, with spoil removed to avoid impacts on the remainder of the suitable habitat in the verge and maintain habitat connectivity. Methods to be agreed with Natural England.	Contractor	Pre-construction	☐	☒
B8	A sustainable end-use of the spoil generated from the tunnel will be sought. It is intended a partnership will be made with a third party to receive the spoil via an existing licenced facility to enable its use in habitat creation that will deliver a net gain in biodiversity.	Contractor	Pre-construction	☒	☒
B9	Contractor to minimise vegetation clearance associated with the overhead line works. All vegetation clearance required to be conducted in accordance with agreed PMoW under ecological supervision.	Contractor	Construction	☒	☒
B10	In order to maximise invertebrate value, the Contractor will be directed to ensure reinstatement of ground leaving a varied topography incorporating vehicle ruts and gentle scrapes and mounds, and exposing sub-soil layers in some areas to encourage areas of less vigorous vegetation growth.	Contractor	Construction	☐	☒
B11	Lighting – construction lighting will be minimised, and where required efforts made to direct lights downwards and away from sensitive receptors and minimise light spill into adjacent areas; ensuring that lighting is turned off when not required • The use of lighting will be minimised to that required for safe site operations and security and turned off when not required; • Lighting will utilise directional fittings to minimise outward light spill and glare (e.g. via the use of light hoods/cowls which direct light below the	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	horizontal plane, preferably at an angle greater than 20° from horizontal); and Lighting will be directed towards the middle of the each site rather than towards the boundaries or sensitive receptors.				
B12	Lighting during operation will be managed to ensure it is avoided wherever possible, and where required sensitive design ensures that spillage into adjacent habitats is minimised. Lighting design will be undertaken in accordance with the Bat Conservation Trust and Institute of Lighting Engineer's Guidance Note 08/23	National Grid	Operation	☒	☒
B13	The Contractor will provide a Biodiverse Brown Roof for the headhouse buildings. The Contractor is to follow best practice guide provided by invertebrate charity, Buglife ³ , on the specific specification of the roof. This is to be agreed with National Grid. The preferred suppliers are listed below: https://dustygedge.co.uk/; https://www.grassroofcompany.co.uk/	Contractor	Pre-construction	☒	☒
Landscape and Visual					
C1	A Landscape and Ecological Management Plan (LEMP) is to be produced prior to construction based on the Outline LEMP.	Contractor	Pre-construction	☒	☒
C2	Land used temporarily will be reinstated to its pre-construction condition and use, unless agreed otherwise.	Contractor	Construction	☒	☒
C3	Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression where appropriate.	Contractor	Construction	☒	☒
C4	Working areas will be appropriately fenced. The type of fencing installed may also serve to provide acoustic of the work sites and reduce the potential for disturbance of users in the surrounding areas. Fencing will be regularly	Contractor	Construction	☒	☒

³ https://cdn.buglife.org.uk/2019/07/Creating-Green-Roofs-for-Invertebrates_Best-practice-guidance.pdf
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Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	inspected and maintained and removed as part of the demobilisation unless otherwise specified.				
C5	The contractor will retain vegetation and trees where practicable. Where vegetation is lost and cannot be replaced due to restrictions associated with underground services or wayleaves, reinstatement in accordance with the Outline Landscape and Ecological Management Plan shall be followed.	Contractor	Construction	☒	☒
C6	The contractor will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to design, demolition and construction. This will be applied to trees within the Red Line Boundary which will be preserved through the construction phase, and to trees outside where such measures do not hinder or prevent the use of the relevant working width for construction.	Contractor	Construction	☒	☒
C7	A five-year aftercare period will be established for all reinstatement and mitigation planting.	Contractor	Post-Construction	☒	☒
C8	Separation and storage of subsoil and topsoil to ensure no degradation in quality and reinstatement undertaken as soon as possible after completion of construction of each section/area of works.	Contractor	Construction	☒	☒
C9	Temporary and separate placement of topsoil and subsoil will be stored with the additional height of the subsoil storage used on whichever side of the Site requires greater screening benefit, where practicable.	Contractor	Construction	☒	☒
C10	To control the spread of invasive weeds in accordance with the Wildlife and Countryside Act 1981, any plant or machinery that has been used in areas infested with invasive species (both terrestrial and aquatic), such as Japanese knotweed and Russian olive, will be thoroughly cleaned. Water used to clean vehicles will be controlled to prevent the spread of the plant (through seeds, rhizomes, fragments, etc.). The area will be cordoned off to prevent any inadvertent spreading.	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
Historic Environment					
D1	Ongoing discussion and engagement with the County Archaeologist (or equivalent) relating to the archaeological mitigation strategy.	National Grid	Pre-Construction	☒	☒
D2	An appropriate programme of archaeological and palaeoenvironment investigation, sampling and recording to mitigate any adverse effects of shaft construction on deeply buried peat horizons and alluvial deposits is to be developed and implemented based on the results of the archaeological/ geoarchaeological investigation.	National Grid	Pre-Construction	☒	☒
D3	A WSI for an Earthwork Survey and a Trial Trench Evaluation is to be developed, the scope and specification of the mitigation would be agreed in consultation with the County Archaeologists for Essex and Kent County Council as advisers to Thurrock Council and Gravesham Borough Councils.	National Grid	Pre-Construction	☒	☒
D4	In the event of human remains being found during the course of archaeological monitoring of construction works, works should stop, the local coroner, Project Manager and County Archaeologist (or equivalent) should be notified immediately. The local area around the remains should be immediately isolated and protected by the Archaeological Contractor. Work in this area should not recommence without the prior acceptance of the Project Manager and a Ministry of Justice (exhumation) licence being in place prior to their removal.	Contractor	Construction	☒	☒
D5	If archaeological finds are discovered during archaeological monitoring of construction works, the Applicant's Project Manager will be informed, and appropriate steps undertaken, in consultation with the County Archaeologist (or equivalent), to excavate and record the finds prior to construction works continuing.	Contractor	Construction	☒	☒
D6	Ensure all written records of the archaeological investigations undertaken are completed and submitted in a timely manner. A copy of any analysis, reporting or publication required as part of the Mitigation Strategy should be deposited	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	with the relevant local authority repositories as part of the Proposed Development archives within 1 year of completion of the Proposed Development or such other period as may be agreed in writing by the relevant planning authority. Archive should be deposited with an appropriate museum.				
D7	In the event that artefacts which are recovered, fall within the scope of the Treasurer Act 1996 and Treasure (Designation) Amendment Order 2023, these will be reported to the Project Manager immediately. The Project Manager will contact His Majesty's Coroner, the relevant Portable Antiquities Scheme Finds Liaison Officer and the Historic Environment Officer. The Project Manager will ensure that the Treasure regulations are enforced and that all the relevant parties are kept informed. A list of finds that have been collected that fall under the Treasure Act and related legislation will be included in the fieldwork report. Artefacts that are classified as 'treasure' will be removed to a safe place, but where removal cannot be completed on the same working day as the discovery, suitable security measures must be taken to protect the finds from damage or unauthorised removal	Contractor	Construction	☒	☒
Traffic and Transport					
E1	The Outline CTMP (ES Volume VI Appendix 10.1) sets out the mitigation measures to be implemented during the construction phase of the Proposed Development to ensure that all traffic associated with the construction works operate in a safe and compliant manner at all times. This will be updated by the Contractor in liaison with Thurrock Council / National Highways / Kent County Council to a final version prior to construction.	Contractor	Pre-construction	☒	☒
Noise and Vibration					
F1	Following any changes to the design, the Contractor would ensure that an updated noise assessment has been carried out to ensure there would be no additional or increase in negative effects on nearby receptors.	Contractor	Pre-Construction	☒	☒
F2	The majority of works activities would be completed under normal working hours/ restrictions as follows: Monday to Sunday: 08:00 to 18:00 and no	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	working on Bank Holidays unless otherwise agreed with the relevant local authority. The agreed working hours will be set out in the Detailed CEMP.				
F3	The main construction areas should be encircled with noise fencing (closed board fencing) , the layout and design of fencing will require local authority approval via a planning condition.	Contractor	Construction	☒	☒
F4	A set of generic best practice working methods referred to as Best Practicable Means (BPM) would be employed during the construction phase. Typical BPM are outlined below, which would be refined as individual commitments in the Final CEMP: • Unnecessary revving of engines will be avoided, and equipment will be switched off when not in use; • Appropriate routing of construction traffic on public roads and along access tracks; • Drop heights of materials will be minimised; • Plant and vehicles will be sequentially started up rather than all together; • Plant will always be used in accordance with manufacturers' instructions. Care will be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading will also be carried out away from such areas; and • Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturer's specifications.	Contractor	Construction	☒	☒
Air Quality					
G1	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager	Contractor	Construction	☒	☒
G2	Display the head or regional office contact information	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
G3	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM ₁₀ continuous monitoring and/or visual inspections.	National Grid	Pre-Construction	☒	☒
G4	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Contractor	Construction	☒	☒
G5	Make the complaints log available to the local authority when asked.	Contractor	Construction	☒	☒
G6	Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.	Contractor	Construction	☒	☒
G7	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	Contractor	Construction	☒	☒
G8	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	Contractor	Construction	☒	☒
G9	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	Contractor	Construction	☒	☒
G10	Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	large site, before work on a phase commences. Further guidance is provided by the Institute of Air Quality Management (IAQM) on monitoring during demolition, earthworks and construction.				
G11	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	Contractor	Construction	☒	☒
G12	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	Contractor	Construction	☒	☒
G13	Avoid site runoff of water or mud.	Contractor	Construction	☒	☒
G14	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	Contractor	Construction	☒	☒
G15	Cover, seed or fence stockpiles to prevent wind whipping.	Contractor	Construction	☒	☒
G16	Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London Non-Road Mobile Machinery (NRMM) standards, where applicable.	Contractor	Construction	☒	☒
G17	Ensure all vehicles switch off engines when stationary - no idling vehicles.	Contractor	Construction	☒	☒
G18	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	Contractor	Construction	☒	☒
G19	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas.	Contractor	Construction	☒	☒
G20	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	Contractor	Construction	☒	☒
G21	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate	Contractor	Construction	☒	☒
G22	Use enclosed chutes and conveyors and covered skips	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
G23	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Contractor	Construction	☒	☒
G24	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods	Contractor	Construction	☒	☒
G25	Avoid bonfires and burning of waste materials	Contractor	Construction	☒	☒
G26	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	Contractor	Construction	☒	☒
G27	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	Contractor	Construction	☒	☒
G28	Avoid explosive blasting, using appropriate manual or mechanical alternatives	Contractor	Construction	☒	☒
G29	Bag and remove any biological debris or damp down such material before demolition	Contractor	Construction	☒	☒
G30	Avoid scabbling (roughening of concrete surfaces) if possible.	Contractor	Construction	☒	☒
G31	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place	Contractor	Construction	☒	☒
G32	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use	Contractor	Construction	☒	☒
G33	Avoid dry sweeping of large areas	Contractor	Construction	☒	☒
G34	If diesel generators are required to be used to power the Tunnel Boring Machine (if no electric or grid connection possible), the Contractor would be required to source generators that have the lowest emissions possible and carry out air quality modelling to determine stack heights required in line	Contractor	Construction	☐	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	with the methods used in Environmental Statement (ES) Volume III Chapter 12 Air Quality.				
Water Environment					
H1	Site clearance will be kept to a minimum and there will be a 5m buffer around all water features. (e.g., using temporary exclusion fencing, fabric silt fences, straw bales, maintaining vegetation etc.) other than at crossings or where there are specific tasks that need to be undertaken close to a water features.	Contractor	Construction	☒	☐
H2	Avoidance of wet weather working where practical, especially site clearance, earthworks and works to water features	Contractor	Construction	☒	☒
H3	Appropriate separate storage of topsoil/subsoil and materials, and at least 20 m from water features on flat ground.	Contractor	Construction	☒	☒
H4	Any earth bund/ stockpile to be present for longer than two weeks will be either seeded, covered using geotextiles, or other pressures provided to ensure it is not a source of excessive fine sediment in runoff to water features	Contractor	Construction	☒	☒
H5	The implementation of a temporary drainage system and other measures to manage pollution risk during construction (e.g., fabric silt fences, lagoons, bunds, straw bales, sandbags, lamella clarifiers or other proprietary measures as may be required) etc	Contractor	Construction	☒	☒
H6	Any dewatering of excavations will include measures where necessary to filter the water prior to discharge to a watercourse or ground (there shall be no discharge of any construction site runoff to existing water bodies);	Contractor	Construction	☒	☒
H7	The control of mud deposits at entry and exits to the Site using wheel washing facilities and/ or road sweepers operating during earthworks or other times as considered necessary.	Contractor	Construction	☒	☒
H8	Works adjacent to watercourses will be kept to a minimum, with any stockpiling of materials or stripped soils to be located away from watercourses as far as reasonably practicable.	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
H9	Where construction works do encroach on the channel of watercourses, works will be undertaken to ensure water flows are unobstructed and that flood risk does not increase elsewhere.	Contractor	Construction	☒	☒
H10	Suitable de-watering methods will be used to maintain a dry working area or to maintain flows where they are being pumped around the works. This will require spare pumps to be stored on site. After each day, equipment and debris will be removed from the channel and a portion of flow allowed to flow through any temporary dam that has been constructed.	Contractor	Construction	☒	☒
H11	Weather forecasts will be monitored on a daily basis and works planned accordingly.	Contractor	Construction	☒	☒
H12	Contractors will be required to sign up to Environment Agency flood warning alerts and update and implement an Emergency Response Plan (based on the outline version provided at the planning stage) in the event of a possible flood event (based on weather forecasts, flood alerts and observations on site), enforceable from the first day of construction works through to the end of all works on site, 24 hours per day, seven days per week.	Contractor	Pre-Construction / Construction	☐	☒
H13	There may be localised lowering/control of groundwater required to enable the construction of the shafts and tunnel. To minimise the impact of any groundwater control activities during construction on the water receptors, a Construction Groundwater Control Strategy will need to be prepared by the Contractor at the detailed design stage. Furthermore, best practice mitigation measures will be followed to avoid and or minimise impact on groundwater and will be included in the Final CEMP. The mitigation measures will be informed by the findings from the ground investigation which will provide information of site-specific ground conditions, including groundwater quality and quantity data.	Contractor	Pre-construction	☒	☒
H14	The Contractor would design and adhere to groundwater controls to ensure water levels in adjacent water features are maintained and any discharge is of a suitable quality.	Contractor	Pre-construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
			/ Construction		
H15	The Contractor would design and adhere to a programme of water monitoring of the dewatering discharges.	Contractor	Pre-construction / Construction	☒	☒
H16	If discharging water to a nearby watercourse, the rate of discharge will need to be agreed with the relevant authority to ensure that there is no unacceptable increase in flood risk or risk of scour. Any discharge will need to be undertaken with the agreement of the relevant statutory regulator and will need to comply with the pollution prevention requirements set out in the final CEMP.	Contractor	Pre-construction	☒	☒
H17	The contractor would need to manage the risk from groundwater flooding through appropriate working practices (during excavations) and with adequate plans and equipment in place for de-watering to ensure safe dry working environments.	Contractor	Construction	☒	☒
H18	The contractor should develop an inspection and maintenance programme to mitigate against the main flood risks found for the Tilbury Site - the inundation of the sealing compound drainage and the overtopping of siltation retention ponds.	Contractor	Operation	☐	☒
Materials and Waste					
I1	Register with the Considerate Constructors Scheme	Contractor	Pre-Construction	☒	☒
I2	Sort and segregate waste into different waste streams (where technically feasible).	Contractor	Construction	☒	☒
I3	Shelter to be provided to prevent materials such as cardboard and paper from deteriorating while being sorted or awaiting collection. Space to be provided to accommodate skips and the storage of reusable materials.	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
I4	Develop and implement a Materials Management Plan under the CL:AIRE Definition of Waste: Development Industry Code of Practice to support the re-use of excavated materials, minimize off-site disposal; and to demonstrate the necessary lines of evidence to support the proper reuse/offsite disposal of materials and ensure compliance with regulatory guidance.	Contractor	Construction	☒	☒
I5	The Contractor will develop and implement a Site Waste Management Plan (SWMP). This will be required to include measures to ensure waste produced or held on a site is disposed of safely, efficiently and lawfully, and meets all of National Grid's environmental targets. This will ensure incorporation of <i>"appropriate facilities for the storage and recycling of waste"</i> as required by Gravesham Council policy <i>"CS19: Development and Design Principles"</i> .	Contractor	Pre-Construction	☒	☒
I6	The Contractor will identify and implement, wherever practicable, measures to achieve the National Grid's waste targets (as detailed in 6.15).	Contractor	Pre-Construction	☒	☒
Land Contamination					
J1	All workers would be required to wear Personal Protective Equipment (PPE) such as dust masks as applicable.	Contractor	Construction	☒	☒
J2	Should any potentially contaminated ground, including isolated 'hotspots' of contamination and/or potential deposits of asbestos containing materials (ACM), be encountered, the contractor would be required to investigate the areas and assess the need for containment or disposal of the material. The contractor would also be required to assess whether any additional health and safety measures are required.	Contractor	Construction	☒	☒
J3	In the event that contamination is identified, appropriate remediation measures would be taken to protect construction workers, future site users, water resources, structures and services.	Contractor	Construction	☒	☒
J4	The contractor would ensure that all material is suitable for its proposed use and would not result in an increase in contamination-related risks on	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	identified receptors, including any landscaped areas and underlying groundwater.				
J5	Any waters removed from excavations by dewatering would be discharged appropriately, subject to the relevant permits being obtained from the Environment Agency.	Contractor	Construction	☒	☒
J6	The contractor will implement a dust suppression/management system in order to control the potential risk from airborne contamination migrating off-site to adjacent sites.	Contractor	Construction	☒	☒
J7	The contractor will compile a piling risk assessment.	Contractor	Construction	☒	☒
Arboriculture					
K1	In accordance with the National Planning Policy Framework (NPPF), veteran trees are an irreplaceable habitat that can only be removed in wholly exceptional circumstances in addition to having a suitable compensation strategy. Veteran Tree T139 (as identified in the Arboriculture Impact Assessment, Appendix D Tree Protection Plan, sheet 11) is located within the temporary working area on the Gravesham side. This veteran tree will be protected from adverse impacts during this time in accordance with the tree protection measures presented in the Arboriculture Impact Assessment Appendix E.	Contractor	Construction	☒	☐
K2	All construction site facilities including site huts, staff and contractor parking and areas for storage will be located outside of the Root Protection Area (RPA) or crown spread of retained trees, including those not specifically covered in this report. Space is likely to be constrained on the Site and will need to be carefully considered.	Contractor	Construction	☒	☒
K3	The Construction Exclusion Zones identified on the Tree Protection Plan must be fully respected and their location and significance is to be highlighted to all site staff and contractors during the formal site briefing.	Contractor	Construction	☒	☒
K4	The use, mixing and washing of materials can lead to run off or inadvertent spillage into tree root zones. Many substances often used on construction	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
	sites can be toxic to tree roots (such as concrete, fuels, salts, builders' sand and herbicides) and can result in the death of tree roots and beneficial soil organisms and can have a significant impact on the future health and appearance of the tree. The storage of materials and arising's can result in an effective raised soil level. This buries tree roots at depths where air and water are less available and can lead to the decline or death of the tree. For these reasons the storage of materials and any washing, mixing, or refuelling will take place in agreed allocated areas at least 5m from the edge of the RPA of retained trees.				
K5	Any slope effect must be considered and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs.	Contractor	Construction	☒	☒
K6	Particular care is required where high sided vehicles, long reach machinery and plant with jibs, booms and counterweights are to operate with in proximity to retained trees. A banksman will be used where the movement of plant or long reach machinery occurs within 5m of any part of a retained tree to ensure no damage is sustained.	Contractor	Construction	☒	☒
K7	Existing areas of unsurfaced ground must be protected during the demolition and construction phases if they are to be re-used for new plantings. Protection can be achieved using fit for purpose ground protection measures as set out in BS5837:2012 Section 6.2.3 or by creating a fenced exclusion zone. Where protection is not feasible, soil amelioration or replacement works will be required to ensure suitable growing conditions for new trees to fully establish.	Contractor	Post - Construction	☒	☒
K8	Where new trees are to be planted, the minimum planting distances detailed in Annexe A, Table A.1 of BS5837:2012 must be adhered to, to prevent direct damage to services and structures from future tree growth.	Contractor	Post - Construction	☒	☒
K9	New tree planting should be implemented in accordance with the guidance set out in BS8545: 2014 Trees: from nursery to establishment in the landscape – Recommendations.	Contractor	Post - Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
K10	Where existing services become redundant within the RPA of a retained tree, the default position must be that they be decommissioned and left in situ. Where this is not feasible the following principles are to be observed.	Contractor	Construction	☒	☒
K11	Existing services are to be removed by winching out from an access/inspection chamber located outside of an RPA. It may be acceptable to fill redundant pipe work with an inert material or undertake pipe bursting where necessary within the RPA of retained trees.	Contractor	Construction	☒	☒
K12	All services are to be routed outside of the RPA of retained trees. The following general principles will apply and where services must be routed within the RPA of a retained tree this process will be subject to a detailed method statement with approval from the Planning Authority. The principles of the National Joint Utilities Group (NJUG) Volume 4 guidance must be adhered to. All services must be bundled as far as possible and installed within RPAs using hand/compressed air excavation (e.g. for shallow service runs) or trenchless techniques such as impact moling (thrust boring) with all access pits and inspection chambers being located outside of the RPA. The route must run as far from the main stem of a retained tree as possible and must be at a minimum depth so that the upper 1m of the soil profile is undisturbed. The depth of the run may need to be adjusted to account for soil type and species variation and this must be determined subject to the advice of an arboriculturist. This operation must take place as specified in a Method Statement. Any water pipes must be constructed so as to be resistant to ingress by tree roots (both existing trees, and newly planted trees) which could include the use of root barriers where appropriate.	Contractor	Construction	☒	☒
Sustainability and Carbon Management					
L1	The carbon management approach shall be aligned to PAS2080 to ensure all stages of the works that have a carbon impact are considered and accounted.	Contractor	Construction	☒	☒

Ref Number	Commitment / Mitigation	Responsible Person	Project Stage	Commitment relevant to Gravesend	Commitment relevant to Tilbury
L2	Using existing baseline analysis, the Contractor shall develop a carbon management plan (CMP) and define a reduction target for the works. The CMP must be presented to The Client Sustainability Advisor every 3 months	Contractor	Construction	☒	☒
L3	The Contractor will appoint a Biodiversity Net Gain (BNG) consultant with experienced working knowledge of the Defra Metric v4 required to calculate BNG to implement commitments made to achieve up to 15% BNG on and off site.	Contractor	Post Construction	☒	☒
L4	The Sustainability Action Plan will be progressed during construction and actions implemented. This includes choosing materials with a lower carbon impact such as earth friendly concrete, 100% recycled steel, and sustainable timber.	Contractor	Construction	☒	☒
Marine Ecology					
M1	The barge to be used to transport tunnel and shaft spoil shall adhere to the International Maritime Organisation Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (Biofouling Guidelines) ⁴ ;	Contractor	Construction	☐	☒
M2	All marine based equipment, materials, machinery, and PPE used will be in a clean condition prior to their arrival on site, and upon removal from site, to minimise risk of introducing Invasive Non-Native Species (INNS) into the marine environment.	Contractor	Construction	☐	☒

⁴ IMO. (2011). 2011 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species. Annex 26. Resolution MEPC.207(62). Adopted 15 July 2011.

9 Summary

- 9.1.1 Provided the measures detailed within this Outline CEMP are developed into a Detailed CEMP by the appointed Contractor, ahead of and/or during construction, environmental impacts associated with the Proposed Development will be avoided or reduced.

10 References

Ref 1: The Construction (Design and Management) Regulations (2015). Available at <https://www.legislation.gov.uk/uksi/2015/51/contents/made>

Ref 2: Institute of Lighting Professionals (2018). Guidance Note 8: Bats and Artificial Lighting. Available at: <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/>

Ref 3: Institute of Lighting Professionals (2021) Guidance Note 1: The Reduction of Obtrusive Light (GN01:2011). Available at: <https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/>

Ref 4: Environmental Permitting (England and Wales) Regulations (2010). Available at: <https://www.legislation.gov.uk/ukdsi/2010/9780111491423/contents>

Ref 5: Pollution Prevention Guidelines for Works and maintenance in or near water (PPG5) (2018). Available at: <https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf>

Ref 6: Control of Pollution (Oil Storage) (England) Regulations, (2001). Available at: <https://www.legislation.gov.uk/uksi/2001/2954/contents/made>

Ref 7: Water Industries Act (1991). Available at: <https://www.legislation.gov.uk/ukpga/1991/56/contents>

10.1 Abbreviations

Abbreviation	Meaning
ACM	Asbestos containing materials
ALO	Agricultural Liaison Officer
BNG	Biodiversity Net Gain
BPM	Best Practicable Means
BS	British Standard
CCS	Considerate Constructors Scheme
CEMP	Construction Environmental Management Plan
CHSPR	Contractor Health & Safety Performance Requirements
CMP	Carbon Management Plan
COSHH	Control of Substances Hazardous to Health
CSCS	Construction Skills Certification Scheme
CTMP	Construction Traffic Management Plan
DMP	Dust Management Plan
EA	Environment Agency
ECOW	Environmental / Ecological Clerk of Works
EMS	Environmental Management System
EMS	Environment Method Statements
EPB	Earth Pressure Balance
ES	Environmental Statement
GGBS	Ground Granulated Blast furnace Slag
GHG	greenhouse gas
GPR	Ground Penetrating Radar
HSE	Health, Safety and Environment
IAQM	Institute of Air Quality Management
IBC	Intermediate Bulk Container
IDB	Internal Drainage Board
INNS	Invasive Non-Native Species
IRP	Incident Response Plan
kV	Kilovolt
LEMP	Landscape and Ecological Management Plan
LLFA	Lead Local Flood Authority
LV	Low Voltage
LWS	Local Wildlife Site
MCC	Motor Control Centre
MMO	Marine Management Organisation
MMP	Materials Management Plan
MPSTC	Metropolitan Police Specialist Training Centre
MVA	megavolt amperes
NJUG	National Joint Utilities Group
NPPF	National Planning Policy Framework

Abbreviation	Meaning
NRMM	Non-Road Mobile Machinery
OHL	Overhead Line
PFA	pulverised fuel ash
PMoW	precautionary method of works
PPE	Personal Protective Equipment
RAMS	Risk Assessment Method Statements
RSPB	Royal Society for the Protection of Birds
SCR	Selective Catalytic Reduction
SDP	Site Drainage Plan
SF ₆	sulphur hexafluoride
SHE	Safety Health and Environment
SRN	Strategic Road Network
SWMP	Site Waste Management Plan
TBM	Tunnel Boring Machine
TKRE	Tilbury to Grain and Tilbury to Kingsnorth
TSCO	Traffic Safety and Control Officer
WC	Water Closet
XLPE	Cross linked polyethylene

