



## **Thurrock Flexible Generation Plant**

### **Preliminary Environmental Information Report Appendix 2.2: Code of Construction Practice**

**Date:** September 2018

**Environmental Impact Assessment**  
**Preliminary Environmental Information Report**

**Volume 5**

**Appendix 2.2**

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## Summary

This document is the Code of Construction Practice for the Preliminary Environmental Information Report (PEIR) and chapters. It provides general and topic-specific strategies, control measures and monitoring procedures to limit the potential adverse impacts on the environment and the local community from constructing the proposed generation plant, as far as reasonably practicable.

## Qualifications

This document has been prepared by Clare Russell, a Principal Consultant and EIA Practitioner with 18 years' experience in environmental consultancy focusing on environmental impact assessment and management of construction impacts.

This document has been Checked by Tom Dearing, a Chartered Environmentalist and full Member of the Institute of Environmental Management and Assessment, who has eight years' experience of environmental impact assessment.

## 1. Introduction

### 1.1 General

1.1.1 This document is an Code of Construction Practice (CoCP) for the Thurrock Flexible Generation Plant. The CoCP accompanies the Preliminary Environmental Information Report (PEIR) and applies to the proposed development described in full in Volume 2, Chapter 2: Project Description.

### 1.2 Purpose of the CoCP

1.2.1 This CoCP provides a framework of management measures that Thurrock Power and its construction contractors will be required to adopt and implement for all construction activities associated with Thurrock Flexible Generation Plant. They include strategies, control measures for managing the potential environmental impacts of constructing the proposed generation plant (as outlined in Section 5 of this document) and limiting disturbance from construction activities as far as reasonably practicable. It focuses on the environmental aspects of the construction phase that may affect the interests of residents, businesses, the public and other sensitive receptors near to the application site.

1.2.2 The term 'construction' in this CoCP includes all site preparation, demolition, heavy goods vehicles (HGV) deliveries, waste removal, and all related engineering, construction and restoration activities as described in Volume 2, Chapter 2: Project Description.

1.2.3 This CoCP has been prepared in conjunction with the PEIR with the aim of ensuring that general best practice measures are followed during construction and any likely significant effects that are reported in the PEIR will be avoided where possible or mitigated.

1.2.4 This CoCP incorporates legislative requirements, current standards and best practice measures to define the standards of construction practice that contractors will be required to adopt and implement. However, compliance with this CoCP will not absolve Thurrock Power and its principal contractors or subcontractors from compliance with all legislation and byelaws relating to their construction activities.

## 1.3 Implementation of the CoCP

### Construction method statements

1.3.1 This CoCP is a 'living' document that will be updated as required during the EIA process. An updated CoCP will accompany the Environmental Statement (ES).

1.3.2 Prior to commencement of specific construction activities of the proposed elements, the principal contractor will develop Construction Method Statements which will set out the construction operations to be undertaken (including construction methods and types of plant required) and the associated environmental and health and safety issues. The activities requiring a method statement will be identified using a risk based approach during detailed design.

1.3.3 All construction staff employed on Thurrock Flexible Generation Plant will receive training on their responsibilities for minimising the risk to the environment and implementing the measures set out in this initial and any subsequent CoCP.

1.3.4 The principal contractors will ensure that contractors employ an appropriately qualified and experienced workforce. The principal contractors will also be responsible for identifying the training needs of their personnel to enable appropriate training to be provided. The training will include site briefings and toolbox talks to equip the workforce with the necessary knowledge on health, safety and environmental topics, and the relevant environmental control measures pertinent to works to be carried out that day.

1.3.5 Further details on adopted construction principles are included at Section 2.2 of this document.

## 1.4 Structure of the CoCP

1.4.1 This CoCP follows the structure below:

- Section 2 – General Principles;
- Section 3 – General Site operations;
- Section 4 – Roles and Responsibilities;
- Section 5 – Management of Environmental Issues; and
- Section 6 – References.

## 2. General Principles

### 2.1 Health and safety principles

- 2.1.1 Specific health and safety principles will be set and complied with as part of the construction of the generation plant. These would ensure that health and safety and welfare of employees and those who might be affected by the conduct of their undertaking, are considered. Appropriate industry standards for health and safety will be applied and continuous actions will be taken to secure a high level of safety performance, where required.
- 2.1.2 Arrangements will be put in place for the discharge of all duties under the Construction (Design and Management) Regulations 2015.

### 2.2 Construction principles

- 2.2.1 The appointed construction manager and the associated management team would be responsible for the implementation of the CoCP provisions, for monitoring and for ensuring that the various construction contractors are in compliance with these requirements.
- 2.2.2 Thurrock Flexible Generation Plant will be constructed in an environmentally sensitive manner and will meet the requirements of all relevant legislation, codes of practice and standards as identified in the PEIR and any updates to legislation or standards adopted at the time of construction to limit the adverse impacts on the local community and environment as far as reasonably practicable.
- 2.2.3 All principal contractors will be required to sign up to, and implement, the Considerate Contractors' Scheme (CCS). The scheme is a voluntary Code of Considerate Practice which seeks to minimise disturbance caused by construction sites to the immediate neighbourhood.

### 2.3 Local community liaison

- 2.3.1 Communication with local residents and businesses that may be affected by noise or other amenity aspects caused by the construction process would be undertaken. Co-ordination of communication would include a member of the construction management team to maintain good public relations and inform residents of the type and timing of construction works, paying particular attention to potential evening and night time works involved, if required, which may affect nearby receptors.

- 2.3.2 Local residents and parish councils in the surrounding area would be contacted in advance of the proposed works and activities. This information would include a general timetable of works, a schedule of working hour, the extent of works, and a contact name, address and telephone number in case of complaint or query. All complaints would be logged, investigated and, where appropriate, rectified by necessary action.

## 3. General Site Operations

### 3.1 Working hours

#### Core working hours

3.1.1 Core working hours for the construction of the generation plant are as follows:

- Monday To Friday: 08:00 – 18:00 hours;
- Saturday: 08:00 – 13:00 hours; and
- No Sunday, bank holiday or night working is proposed, with certain exceptions.

3.1.2 During the movement of construction plant and site vehicles period, the contractor may undertake the following activities:

- Arrival and departure of the workforce at the site and movement around the development site;
- Site inspections and safety checks, site meetings; and
- site housekeeping that does not require the use of plant.

3.1.3 Deliveries to the development site will only occur during the core working hours unless otherwise agreed.

#### Activities outside core working hours

3.1.4 In certain circumstances, when work is required to be undertaken at specific times to maintain the construction programme or address particular logistical, construction or environmental constraints.

3.1.5 Non-noisy activities such as fit-out within buildings may be undertaken outside those hours where these would not cause disturbance off-site.

3.1.6 It is possible that certain construction activities that cannot be interrupted, such as a continuous concrete pour, may be required.

3.1.7 Abnormal loads/construction plant delivery, or works affecting the railway may also be undertaken outside core working hours.

3.1.8 Activities outside of the core working hours will be agreed with the relevant local authority Environmental Health Officer (EHO) in consultation with relevant stakeholders (e.g. third-party asset owner) as required.

### 3.2 General site layout and good housekeeping

3.2.1 A good housekeeping policy will be applied to the construction areas at all times. As far as reasonably practicable the following principles will be applied:

- All working areas will be kept in a clean and tidy condition;
- Adequate welfare facilities will be provided for construction staff;
- Smoking areas at site offices/compounds or work sites will be equipped with containers for smoking wastes – these will not be located at the boundary of working areas or adjacent to neighbouring land;
- Wheel washing facilities will be cleaned frequently;
- Open fires will be prohibited at all times;
- All necessary measures will be taken to minimise the risk of fire and the contractor will comply with the requirements of the local fire authority;
- Waste from the construction areas will be stored securely to prevent wind blow; and
- Waste (particularly food waste) will be removed from the welfare facilities at frequent intervals.

### 3.3 Site induction

3.3.1 The construction of the generation plant will require all personnel working on site to have a site induction that includes an environmental protection and good practice component. Prior to commencing work on site, personnel must attend the site induction.

3.3.2 Site inductions will include reference to compliance with relevant planning / licence conditions, environmental requirements, environmental management structure and contacts, site specific environmental sensitivities, waste management arrangements, water and wastewater management, hazardous material management, fuel, oil and chemical management; spill contingency and environmental emergency response, reporting of incidents and complaints. More specific information will be provided to staff according to their role.

### 3.4 Site security, screening and fencing

3.4.1 The construction compound(s) will be secured to minimise the opportunity for unauthorised entry. All working areas shall be sufficiently and adequately fenced off from members of the public and to prevent animals from straying onto the construction areas.

3.4.2 All boundary fences/screens will be maintained in a tidy condition throughout the construction period to ensure they are fit for purpose.

3.4.3 Where possible, access to construction areas will be limited to specified entry points and all personnel entries/exits will be recorded for security and health and safety purposes. Adequate security shall be provided by contractors to protect the public and staff, prevent theft from or damage to the works, and prevent unauthorised entry to or exit from the site. Site gates shall be closed and locked when there is no site activity and appropriate security measures shall be implemented.

3.4.4 All temporary screening and fencing will be removed as soon as reasonably practicable after completion of the construction works.

### 3.5 Construction lighting

3.5.1 External lighting of the construction site will be designed and positioned to manage emissions from artificial light in accordance with good practice, whilst maintaining safety and security obligations.

3.5.2 Site lighting shall be positioned and directed to minimise nuisance to footpath users, residents, to minimise distractions to passing drivers on adjoining public highways and to minimise skyglow, so far as reasonably practicable. Lighting spillage will also avoid or minimise impacts on ecological resources, including nocturnal species.

3.5.3 Lighting during construction will take into account the requirements set out in BS EN 12464-2:2014 (British Standards Institution (BSI), 2014a). Lighting units will be designed to minimise illumination outside the construction works area (e.g. will be directional, task orientated and where possible, fully shielded). Further details regarding lighting during the construction phase will be developed post consent.

### 3.6 Pest control

3.6.1 The risk of pest/vermin infestation will be reduced by ensuring any putrescible waste is stored appropriately and regularly collected from the construction areas, and effective preventative pest control measures are implemented. Any pest infestation will be dealt with promptly and notified to the relevant local authority as soon as practical.

### 3.7 Clearance of site and reinstatement on completion

3.7.1 The construction compound(s) will be cleared on completion of construction works and all plant, temporary buildings or vehicles will be removed.

3.7.2 If works are delivered in phases, temporary construction compounds will be removed on completion of construction work associated with that phase unless otherwise approved by the local planning authority.

### 3.8 Construction compounds

1.1.1.1 Up to 2 hectares in total would be used for construction compound(s) and materials laydown within the application boundary in areas outside zone A. The size and location of these working areas are subject to further design, with the further 2 hectare temporary land-take assumed as the maximum design envelope parameter for the PEIR.

1.1.2 Areas of material/equipment storage also include:

- A laydown area of up to 1 acre within zone I (parallel to the railway) may be used for storage of large equipment before it is craned across the railway; and
- Working corridors of up to 20 m width for construction of temporary and permanent access roads and the gas pipeline route are assumed at this stage, to allow for construction plant access, spoil and materials laydown.

### 3.9 Emergency planning and procedures

3.9.1 Emergency procedures will be developed by each principal contractor for the proposed elements of the generation plant taking into account the anticipated hazards and the conditions at each work site. The procedures will be documented in an Emergency Response Plan and will include emergency pollution control measures (based on Environment Agency guidelines where appropriate), fire and site evacuation, and spill prevention control procedures and instructions to workforce. The Emergency Response Plans will also contain emergency phone numbers and the method of notifying local authorities and statutory authorities. The procedures will be displayed at the work sites and all site staff will be required to follow them at all times.

### 3.10 Pollution incident control

3.10.1 The principal contractor will develop and implement appropriate measures to control the risk of pollution due to construction works, material and extreme weather events/ This will include a Pollution Control Plan, which recognises the risk of pollution from construction activities and represents pro-active management practices to ensure that any pollution that may occur is minimised, controlled, reported to relevant parties/personnel and remediated.

## 4. Roles and Responsibilities

### 4.1 Project team

4.1.1 Whilst the key roles for the construction project team will not be assigned until post consent, the environmental roles required to implement the CoCP are set out in the sections below.

#### Site Manager

4.1.2 The Site Manager will be responsible for maintaining the CoCP document and systems as a working document; ensuring environmental standards are adhered to and monitoring compliance during construction; carrying out regular monitoring and inspections of construction work activities; and undertaking staff induction courses on environmental issues.

#### Environmental Co-ordinator

4.1.3 The Environmental Co-ordinator will be responsible for the interface between the environmental specialists and engineers. They will have the primary responsibility for managing environmental issues through the construction and post-construction monitoring and for obtaining the relevant licenses and consents.

#### Clerk of Works

4.1.4 The Clerk of Works will be the site representative and would be responsible for overseeing construction activities to ensure all environmental commitments are met and compliance with the conditions of all licences and permits.

#### Ecological Clerk of Works

4.1.5 The Ecological Clerk of Works (ECoW) would report on ecological matters and would be responsible for undertaking preconstruction surveys and monitoring. The ECoW will review results of protected species surveys prior to the commencement of works in different areas and will contribute to the preparation of crossing method statements, where required, where construction works could impact on sensitive environmental features such as a watercourse.

4.1.6 Vehicle speeds will be restricted within the working corridor to minimise the disturbance of various species.

4.1.7 To minimise the impacts in soil structure and ecology, topsoil and subsoil heaps will be located at adequate distances to ensure the protection of retained soils.

4.1.8 Night working will be avoided where possible. Where night working is unavoidable, light fixtures will be directed away from habitat of value to protected or otherwise notable species including badgers, birds and bats, to minimise likely disturbance effects of light spillage.

## 5. Management of Environmental Issues

### 5.1 Landscape and Visual Resources

#### Objectives

- 5.1.1 Construction works would be carried out in such a way to ensure that disturbance to landscapes and visual receptors (identified in Volume 3, Chapter 6: Landscape and Visual Resources) is minimised.

#### Management measures

- 5.1.2 A Landscape Management Plan will be produced, detailing the management of hedgerows and trees impacted by the construction works, prior to any removal of trees or hedgerows. Removal of trees and hedgerows, where required, will be kept to a minimum, as far as reasonably practicable, and any land used temporarily for construction, and not ultimately incorporated in permanent development or approved landscaping, is to be reinstated to its former condition, to limit visual impacts to surrounding sensitive receptors.
- 5.1.3 Vegetation to be retained will be protected throughout the course of the construction phase, in accordance with British Standard (BS) 5837:2012 (BSI, 2012).
- 5.1.4 Any fencing installed for the means of providing protection to vegetation proposed to be retained, will be maintained throughout the construction phase in order to ensure that means of protection is fit for purpose.
- 5.1.5 Good housekeeping will be maintained on all construction areas and secure storage will be provided for materials at risk from wind blow. Stockpiles will be in defined temporary storage areas.
- 5.1.6 Appropriate lighting will be used to reduce the incidence of visual intrusion to sensitive receptors.

### 5.2 Historic Environment

#### Objectives

- 5.2.1 To minimise the impact of construction works on buried archaeology, heritage assets and their setting.

#### Management measures

- 5.2.2 A geophysical survey has been undertaken to identify potential archaeological interest within the site boundary. The site is considered to be of some archaeological interest due to the number and form of anomalies largely present in the southern area of the site.
- 5.2.3 A programme of advanced archaeological investigation following consent will focus on identified sites that will be adversely affected by the generation plant. Targeted investigation works will be undertaken in accordance with an (Archaeological) Written Scheme of Investigation to be agreed with the relevant authorities prior to the commencement of construction works.
- 5.2.4 Identification of unexpected archaeological assets/sites encountered during the construction phase would be undertaken in line with procedures agreed with the relevant authorities.

## 5.3 Land use, Agriculture and Socio-economics

### Objective

- 5.3.1 To protect the quality and integrity of the soil resources, and to maintain farm access and agricultural businesses and employment where possible.

### Mitigation measures

- 5.3.2 Consideration will be given to the appropriate use of different soil resources on the sites during construction. This will draw upon the soils information collected during soil surveys undertaken prior to the construction phase, and will take into account the principles of good practice in soil handling and restoration as set out in the following guidance documents:

- Department for Environment, Food and Rural Affairs (Defra) (2000) Good Practice Guide for Handling Soils; and
- Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including the Toolbox Talks).

- 5.3.3 A Soil Management Strategy will be produced as to ensure the above measures are implemented.

## 5.4 Terrestrial Ecology

### Objectives

- 5.4.1 To minimise the impact of construction works on protected species and designated sites and to minimise the loss of nature conservation features such as hedgerows and mature trees.

### Management measures

#### General

- 5.4.2 The Ecological Clerk of Works (ECoW) will be appointed by the principal contractor to oversee enabling works and construction where necessary. The ECoW will be a suitably experienced and qualified professional ecologist. The ECoW will review results of protected species surveys prior to the commencement of works in different areas and will contribute to the preparation of crossing method statements where they could impact on sensitive environmental features such as a watercourse.

- 5.4.3 Vehicle speeds will be restricted within the working corridor to minimise disturbance to various species.

- 5.4.4 To minimise impacts on soil structure and ecology, topsoil and subsoil heaps would be located at adequate distances to ensure the protection of the retained soils and to avoid potential run-off into watercourses.

- 5.4.5 Night working will be avoided where practicable. Where night working is unavoidable, light fixtures will be directed away from habitat of value to protected or otherwise notable species, to minimise likely disturbance effects of light spillage.

### *Biosecurity and invasive species*

- 5.4.6 A biosecurity protocol will be implemented to minimise risk of spreading invasive species as a result of the construction of the proposed generation plant. When working in the vicinity of invasive terrestrial plants and injurious weeds, works will be supervised by the ECoW. Known locations of invasive plant species will be marked on site and vehicle movements restricted in the vicinity of these locations. Any spoil containing or likely to contain invasive plant material to be stored separately from non-contaminated spoil and treated as appropriate, with control measures adopted.

- 5.4.7 The main risk is associated with the spread of invasive species in aquatic (ditch) habitats, including vectors for disease. Measures to control the spread of invasive plants will include the following;

- Ensuring vehicle tyres and wheel arches are cleared of mud, plants and other organic material before moving from one site of the proposed development to another; and
- Leaving removed material on site.

- 5.4.8 Appropriate measures will also be taken against invasive, non-native animal species and the relevant bodies will be notified of their location if any are recorded during pre-commencement surveys.

### *Protective buffer zones*

- 5.4.9 Where practical, works-free protective buffer zones will be established around retained habitats of ecology and nature conservation concern, namely hedgerows. These buffer zones would be maintained throughout the construction period.

- 5.4.10 Root protection zones around retained hedgerows and trees will be assessed by the ECoW.

5.4.11 All buffer zones will prohibit the tracking of heavy vehicles, and the storage and refuelling of vehicles, machinery, equipment and soils. All protective buffer zones will be maintained throughout the construction period. The ECoW will regularly (at least once every two weeks) monitor adherence to the requirements of the buffer zones and will maintain a record of all site checks undertaken and findings.

#### **Trees and hedgerows**

5.4.12 If required, where individual trees are to be felled, sections of dead or decaying wood will be soft felled (felled in sections) and, where practicable, will be relocated to suitable locations as near to the source tree as practicable, as instructed by the ECoW (i.e. within areas of similar environmental conditions, particularly regarding shade and ground water-levels).

5.4.13 The length of individual hedgerow sections to be removed will be reduced as far as reasonably practicable.

5.4.14 Crossings of hedgerows may be with trenched or trenchless techniques (e.g. horizontal directional drilling, HDD), to be defined following further design for each crossing location.

5.4.15 All sections of hedgerow removed to enable construction of the generation plant, will be replanted as soon as practicable, regarding the appropriate planting months. Replacement planting will comprise native shallow-rooting hedgerow species typical of the area. To prevent potential damage to the proposed pipeline, no standard trees will be planted along the pipeline corridor. Enhancement planting will be considered on a case by case basis across the site, to improve connectivity and/or native species diversity. Enhancement planting could include the planting of native hedgerow trees, typical of the area.

5.4.16 Planting and management of any reinstated hedgerows will be undertaken in accordance with Volume 6, Appendix 9.2: Outline Ecological Management Plan. Detailed landscaping proposals will be developed in accordance with a Landscape Management Plan. Planting will be undertaken as soon as practicable and once it could be confirmed that works will not significantly and adversely affect new planting. Where required, newly planted hedgerows will be protected by adequate fencing until the hedgerow has become established.

#### **Grassland**

5.4.17 Areas of grassland within Zone I that are used for temporary laydown areas for construction will be restored as soon as practicable after construction.

5.4.18 Restoration and management of reinstated grassland will be undertaken in accordance with Volume 6, Appendix 9.2: Outline Ecological Management Plan. Detailed landscaping proposals will be developed in an accordance with a Landscape Management Plan.

5.4.19 The grassland seedmix to be used will comprise species appropriate to the local area and the nutrient levels of the substrate, full details of which will be determined when the full EMP is produced post-consent.

#### **Reptiles**

5.4.20 To minimise the potential impacts on reptiles, pre-commencement translocation of reptiles to a receptor site will be carried out, as outlined in Volume 6, Appendix 9.2: Outline Ecological Management Plan where this is the most appropriate way of protecting reptile species.

5.4.21 Where small areas of reptile habitat are to be cleared, and where sufficient habitat is available immediately adjacent to the works area (to be identified by the ECoW), relocation of reptiles would be undertaken via progressive and careful habitat clearance works such as the gradual strimming of above-ground vegetation such as brambles, rough grass and scrub prior to construction, to deter reptiles from the working area where alternative habitat is available to them.

5.4.22 Uprooting of vegetation and habitat management will involve the clearance of ground cover in order to create unfavourable conditions. If habitat is cleared during the reptile hibernation period (which is typically between November and February inclusive, dependent on local weather conditions and this period will be assessed by the ECoW), trees and scrub will be cut using brushcutters or chainsaws, to a height of approximately 30 cm above ground-level, so as to minimise the potential for disturbance to root balls where hibernating reptiles may be located.

5.4.23 Vegetation clearance for reptile relocation carried out during the active period for reptiles will be undertaken in appropriate weather conditions to enable reptiles to relocate from the advancing works. Appropriate conditions will be assessed by the ECoW.

### **Badgers**

- 5.4.24 No active badger setts are currently known to occur within 30 metres of the site. If any setts are identified during the pre-commencement surveys, in addition to the above-mentioned measures, including those to control vehicle speeds and minimise the likely impacts of light spillage in the vicinity of a sett, no construction works will be carried out within minimum distances of an active sett entrance. Works within 30 metres of a badger sett entrance may require a Natural England licence for badgers. Protection zones will be marked out on site, such as with high-visibility fencing or coloured tape. Excavations more than 0.5 metres deep will be fenced or covered overnight where practicable, or if this is not practicable, a method of escape (e.g. a plank to act as a ladder) will be provided for foraging mammals. In addition, large diameter pipes will be capped at the end of each working day to reduce the potential for badgers and other animals to enter them and become trapped.
- 5.4.25 If work is required within minimum distances of a sett and therefore, sett closure or disturbance cannot be avoided, this will need to be carried out outside the badger breeding season (between 30th November to 1st July) and in accordance with a Natural England approved method statement and licence for badgers, prior to the commencement of works.
- 5.4.26 Toolbox talks on badgers will be provided by the ECoW to all construction staff on site and an emergency procedure protocol will be given to contractors in the event of encountering a badger or discovering a sett.

### **Breeding birds**

- 5.4.27 The potential loss of active nests within in trees hedges and potentially also within arable areas, during construction would be mitigated by the following measures:
- Undertaking clearance of potential bird nesting habitat outside the breeding season (March to August inclusive);
  - Inspection of any vegetation that needs to be removed between March and August by a professional ecologist;
  - Any nest found during construction would be cordoned off and protected until the ceased to be active; and
  - Disturbance from construction noise will be minimised by the adoption of good working practice.

## **5.5 Aquatic Environment**

### **Objective**

- 5.5.1 To minimise the impact of construction works on protected species and designated sites of the aquatic environment and to minimise the loss of nature conservation features such as ditches.

### **Management measures**

- 5.5.2 Volume 6, Appendix 9.2: Outline Ecological Management Plan will be will be prepared in consultation with the local planning authority. The plan will be based on the principles of the Outline EMP as submitted alongside the DCO application.

### **General**

- 5.5.3 General mitigation measures are outlined in Sections 5.4.2 to 5.4.5 of terrestrial ecology above. Specific mitigation measures with consideration to impacts to the aquatic environment are included as in the following sections.

### **Biosecurity**

- 5.5.4 A biosecurity protocol will be implemented to minimise risk of spreading invasive species. The main risks are associated with transfer of aquatic plants or animals (including vectors for disease) between watercourses or waterbodies. Where the construction of the proposed generation plant requires the crossing of ditches, control measures would include the following:

- Ensuring vehicle tyres and wheel arches are cleared of mud, plants and other organic material before moving from one watercourse to another;
- Leaving removed material on site; and
- Cleaning boots and disinfecting (away from ditches to prevent potential pollutant incidents) all equipment that might come into contact with water.

### **Protective buffer zones**

- 5.5.5 Works-free protective buffer zones will be established around retained habitats of ecology and nature conservation concern, namely retained ditches, where practicable. These buffer zones will be maintained throughout the works period.
- 5.5.6 Buffer zones surrounding ditches will be at least five metres in width; approvals will be obtained as necessary for works closer to channels managed by Drainage Boards (DBs), LLFAs and the Environment Agency.

5.5.7 Where it is not practical establish a buffer zone from retained ditches of the stipulated width due to site working constraints, additional precautions to prevent e.g. run-off from soil stockpiles into ditches will be put in place, such as silt fencing.

5.5.8 Crossings of ditches may be trenched or trenchless techniques (e.g. horizontal directional drilling, HDD), to be defined following further design for each crossing location.

**Water voles**

5.5.9 Considering the mobile nature of water voles, pre-construction surveys will be undertaken to confirm the presence/absence of water voles along all ditches of potential value to water voles.

5.5.10 Water voles will be translocated from central ditches that will be removed within Zone A in advance of construction, under licence from Natural England and in accordance with the measures set out in the Volume 6, Appendix 9.2: Outline Ecological Management Plan.

5.5.11 The installation of the gas pipeline is to be undertaken beneath ditches supporting water voles. Works-free buffer zones will be established around sections of the ditches that support water voles if this is practicable. Buffer zones will prohibit the tracking of heavy vehicles and storage of vehicles, machinery, equipment and soils and should be a minimum width of 15 metres.

5.5.12 Methods of installing pipelines across ditches known to support water voles (such as open cut trenching) would be undertaken in consultation with Natural England. Where considered necessary by the ECoW, high visibility fencing will be erected between the drains and the works areas to prevent access by workers and heavy machinery, and to prevent storage of equipment or materials within this zone. To prevent water voles from becoming trapped in the pipeline installation pits, exclusion fencing will be installed around pipeline installation pits where considered necessary by the ECoW.

5.5.13 Where water vole activity has been/is recorded along ditches to be crossed by open cut installation, construction and installation works will be carried out in accordance with a crossing method statement and under licence from Natural England as necessary, which will include measures to protect water voles from significant disturbance.

5.5.14 Crossing method statements will include pre-construction measures to deter water voles from the working corridor and an adequate buffer zone (i.e. up to 15 metres where favourable habitat is present). Measures could potentially include:

- Removal of vegetation from channel and bank-side vegetative cover (up to a minimum of 1.5 metres inland from the top of the bank) between mid-February and early April;
- The potential capture and translocation of water voles from working areas by an appropriately qualified and experienced ecologist;
- A destructive search of water vole burrows within the working corridor under the watching brief of an appropriately qualified and experienced ecologist; and
- Measures to protect adjacent sections of the ditches, which will not be directly impacted by trenching, such as marking out on the ground the boundary of the proposed works, to control the movement of personnel and vehicles.

5.5.15 Works will be conducted in accordance with Natural England guidance, which states that “for summer works, vegetation removal should be carried out for a two-week period prior to development. Winter works should either carry out the mitigation in September and maintain unsuitable habitat until the works commence, or in the event of an emergency, trapping and vole proof fencing may have to be employed” (English Nature, 2001). Works will also consider best practice guidelines published in Strachan et al. (2011).

**5.6 Traffic and Transport**

**Objectives**

5.6.1 To carry out construction works in such a way that maintains highway safety and avoids or minimises adverse effects on local communities and highway users.

**Management Measures**

5.6.2 Prior to the commencement of construction traffic movements, a Construction Traffic Management Plan (CTMP) for the construction of the generation plant will be prepared in consultation with the relevant local planning authority, Local Highway Authority and Highways England. The purpose of the CTMP is to document measures to manage construction traffic in accordance with the wider principles established in this CoCP.

5.6.3 The CTMP will document the following where relevant:

- HGV routing from the principal ‘A’ road network to the construction access off the public highway;
- Route signage (if required), route timing and forecast vehicle movement estimates;

- Localised mitigation measures where necessary (e.g. temporary pedestrian crossings, traffic control measures);
- Details of any localised restrictions in vehicle movements (e.g. localised route restriction locations, localised restricted delivery timings or introduction of temporary speed limits);
- Scope of pre-commencement and post construction surveys of minor links;
- Location of supporting infrastructure (e.g. wheel wash facilities, welfare facilities etc.);
- Traffic management measures associated with temporary construction compounds and associated facilities;
- Pedestrian crossing opportunities where routes have the potential for severance;
- The preferred route, route timing and method of transport for abnormal indivisible loads; and
- Emergency planning.

**Accesses for HGV construction traffic**

- 5.6.4 Site access will be required mainly for the construction phase as the principal vehicle movements are anticipated to be associated during construction (including the commissioning phase). As such, two road access options have been considered as part of the access design.
- 5.6.5 Access could be taken from the A1089 and Marshfoot Road to a temporary haul road which could be constructed running broadly west to east between St Chads Road (at the Gateway Academy Roundabout) and Gun Hill to the south of Biggin Lane. From Gun Hill, access would continue via Coopers Shaw Road, Church Road and Station Road at the level crossing where a private access road would then be constructed in a corridor area to the main development site. This would involve the realignment of an existing farm track access that routes through that land.
- 5.6.6 Alternatively, the primary permanent access option is from the A13 turning south at the Orsett Cock interchange (A13/A128), avoiding Chadwell St Mary and West Tilbury, which provides access to an existing level crossing of the railway line at Station Road and the private access road. This would involve the realignment of an existing farm track access that routes through that land. On this route, ten points of additional land will be required for road widening to allow the transportation and anticipated abnormal indivisible loads (e.g. delivery of transformers).
- 5.6.7 Temporary laydown areas would also be required for items such as gas engines and transformers, which could be lifted across the railway using a tower crane to be constructed there temporarily.

- 5.6.8 A further temporary access for the duration of the construction phase may be developed from the public highway a Station Road running south east to the potential cooling pipe route for the construction of the pipe.
- 5.6.9 The HGV routing will seek to maximise use of the 'A' road network, making use of 'B' roads and minor roads where required.
- 5.6.10 The CTMP will ensure that all construction traffic follows pre-prescribed routing, to avoid impacts on the wider network and conflicts with local users, however some larger vehicles may need to follow specially advised routes to avoid any specific constraints on the highway network.
- 5.6.11 Localised traffic management measures would be implemented, including temporary speed restrictions, where appropriate and in consultation with the Local Highway Authority.
- 5.6.12 All delivery contractors and construction staff will be instructed to use the construction access route in compliance with the CTMP for all stages of the construction works by way of a condition of supply contracts.
- 5.6.13 If deemed necessary by the relevant Local Highway Authority, where routine HGV vehicle movements are generated, e.g. during groundworks, the supplier will be requested to maintain a log, the purpose of which is demonstrate compliance with following prescribed accesses off the A road network and delivery times in accordance with this CoCP (or any other agreed variances).
- 5.6.14 If deemed necessary by the relevant Local Highway Authority, the construction accesses will have temporary signs posted along the confirmed routes. Temporary signs are to be installed prior to the commencement of HGV traffic generating works.
- 5.6.15 The design of the HGV access, including visibility standards and, where necessary, temporary speed restrictions on the adjacent highway, will be agreed with the relevant highway authority.
- 5.6.16 In requesting the installation of temporary route signage, as owner of existing road signage, it is deemed that the relevant highway authority authorise the temporary installation of temporary route signage on their asset.

**Highway safety and reduced movements**

- 5.6.17 All new HGV accesses will be designed and constructed to meet appropriate visibility and other highway standards, and if appropriate will be implemented alongside temporary traffic management measures such as reduced highway speeds.

5.6.18 Localised management of vehicle movements will be considered where there is risk of vehicles meeting each other on narrow sections of roads.

5.6.19 Where possible, overall vehicle movement generation will be minimised through measures to encourage and promote sustainable travel and transport.

5.6.20 Load sizes and vehicle usage will be monitored, and where possible, load consolidation and delivery to construction sites using alternative vehicles. The re-use of HGVs will be encouraged, where possible, such as backloading. Where practical local suppliers will be used to minimise the distance travelled by HGVs.

#### **Highway condition surveys (minor links)**

5.6.21 If required by the Local Highway Authority, video condition surveys will be undertaken before HGVs make use of a section of road and after the substantial completion of works on minor links used by HGVs to access the proposed elements of the generation plant. Damage to the highway caused by the passage of construction vehicles will be repaired or an appropriate financial contribution made to the asset owner.

#### **Site access design**

5.6.22 Prior to making use of the construction access for material vehicle movement, the contractor must advise the Local Highway Authority of the following:

- Any temporary works;
- Assessment of visibility splays at the access and any mitigation required, including any localised traffic control measures such as deployment of banksmen, temporary reductions in speed limit or temporary traffic lights;
- Details of any additional land required for any permanent and/or temporary access roads and improvements; and
- Details of extent of pruning, coppicing or felling of vegetation, if required, to facilitate visibility splays.

5.6.23 the construction site access will comply with the following general principles:

- Have sufficient areas available at all times for all vehicles to enter and exit in a forward gear;
- To be accepted into the works area directly without waiting on the highway;
- Suitable surface finish;
- Suitable fluming arrangements for any ditches at the side of the road; and
- Provide for road-sweeping activity in the vicinity of the access.

#### **Road/railway crossings**

5.6.24 The main development site for the proposed elements of the generation plant would cross the London, Tilbury and Southend Railway line which dissects the north western portion of the main development site, north of the area of the proposed corridor for proposed access, gas and other service connections.

5.6.25 The method of crossing the railway line is being discussed with Network Rail and will be confirmed once a detailed design of the site components is prepared and the transport requirements are confirmed.

5.6.26 The proposed generation plant for the proposed corridor of the gas pipeline and installation for connection to the high-pressure gas mains would cross Church Road and Station Road on the most north easterly extent of the proposed development.

5.6.27 Where works are required in the highway, traffic management measures will be agreed with the Local Highway Authority prior to implementation. The works should minimise delays to existing highway users and maintain highway safety.

5.6.28 Where works break out on to the existing highway network, the original highway will be reinstated after construction work is completed.

#### **Abnormal Indivisible Loads**

5.6.29 It is anticipated that the construction phase will involve transportation of several abnormal indivisible loads comprising large components to the areas of the proposed elements of the generation plant, such as transformers, power conversion system units to be delivered to the substations and other associated equipment. The haulage contractor appointed to undertake this work will be required to comply with statutory regulations in terms of consulting with Highways England, the police and local highway authorities. The notification requirements differ depending on the weight, length and width of the abnormal indivisible load.

5.6.30 The timing of abnormal indivisible loads will be discussed with the relevant highways authorities to minimise delay for other road users and to minimise risk to highway users. This timing of abnormal indivisible load deliveries to the site will be discussed to ensure that there is no adverse impact on the access road in terms of delays to vehicles using the site.

5.6.31 The routing of abnormal indivisible load deliveries will be agreed with the relevant highway authorities. The delivery of abnormal indivisible loads would typically be undertaken in convoy and under escort. Where abnormal indivisible loads require the full width of the carriageway or for unusual manoeuvres at junctions, appropriate temporary road closures and traffic management will be put in place as appropriate to maintain the safety of other road users. Access for emergency vehicles will be maintained at all times during the delivery of abnormal indivisible loads.

5.6.32 If required, the following further mitigation measures may be deployed by the principal contractor:

- Removal and reinstatement of street furniture;
- The lopping and pruning of trees and overhanging vegetation; and
- Protection for services as required along the route.

#### **Vehicle breakdowns and emergency events**

5.6.33 The principal contractor will identify a local recovery service(s) which will be used in the event of a contractor vehicle breakdown.

5.6.34 In the event of a major incident in the local area that requires good accessibility along the road network, or in the event of road closures following an incident, the emergency services can direct construction vehicles to make use of alternative routes. In certain circumstances the emergency services may wish to restrict the volume of traffic in the road network. Under such circumstances, the construction contractor can be instructed to temporarily delay or cancel deliveries to reduce the burden on the wider highway network.

#### **Coordination with other developments**

5.6.35 Thurrock Power will liaise with the Local Highway Authority and other major projects, such as Tilbury 2.

## **5.7 Noise and Vibration**

### **Objective**

5.7.1 To control and limit the noise and vibration levels generated by the construction of the proposed development, so far as reasonably practicable to minimise disturbance to sensitive receptors.

### **Mitigation measures**

5.7.2 To manage noise and vibration generating activities, all works will be carried out in accordance with the following principles:

- Construction works will be undertaken in accordance with the Best Practicable Means (as defined in Section 72 of the Control of Pollution Act 1974), to minimise noise and vibration effects. Noise control measures will be consistent with the recommendations of the current version of BS 5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' - Part 1: Noise and Part 2: Vibration' (BS 5228-1:2009+A1:2014 and BS 5228-1:2009+A1:2014) (BSI, 2014b and BSI, 2009);
- Best Practicable Means (e.g. the use of quieter alternative methods, plant and/or equipment, where reasonably practicable, the use of site hoardings, enclosures, portable screens and/or screening nosier items of plant, where reasonably practicable; maintaining and operating all vehicles, plant and equipment in an appropriate manner, to ensure that extraneous noise from mechanical vibration is kept to a minimum); and
- Construction noise management measures for specific construction activities will be agreed with relevant local authorities prior to the start of construction and added to the CoCP.

## **5.8 Air Quality**

### **Objective**

5.8.1 To minimise the generation of dusts near sensitive receptors during construction and to facilitate community engagement and a proactive approach to complaints regarding nuisance dusts.

### **Mitigation measures**

#### **General measures**

5.8.2 The principal contractor will inform site personnel about the need to minimise dust as well as about the health hazards associated with the exposure to excessive dust. Their training will include advice relating to the commitments made in this CoCP.

#### **Preparing and maintaining the site**

5.8.3 In minimising the generation of dust nuisance near sensitive receptors during the construction phase, the contractor will consider the following measures:

- The site layout, seeking to locate machinery and dust generating activities away from sensitive receptors, as far as possible;
- Installation of solid screens or barriers around dust generating activities, with any screens being at least as high as any stockpiles on site;

- Consideration of enclosures where dust generating activities may be undertaken over extended periods;
- Implementing site management measures to provide for dust-generating materials to be removed from site as soon as possible, unless being re-used on site. If they are being re-used on site, the stockpiles will be covered, seeded or fenced to prevent wind whipping;
- Where appropriate, consideration of dust suppression methods for certain activities;
- Bonfires and burning of waste on site will not be permitted;
- Site fencing, barriers and scaffolding will be kept clean; and
- Avoiding site runoff of water or mud.

#### **Construction operations**

5.8.4 The following measures would be carried out throughout the duration of the construction works:

- Cutting, grinding, sawing and excavation equipment will be fitted with or used in conjunction with suitable dust suppression techniques (such as water sprays or local extraction);
- Adequate water supply will be made available to enable effective dust/particulate matter suppression. Non-potable water will be used where possible and appropriate;
- Enclosed chutes, conveyors and covered skips will be used where practicable;
- Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised and fine water sprays on such equipment where appropriate; and
- Equipment to clean any dry spillages will be readily available. Spillages will be cleaned up as soon as reasonably practicable after the event using wet cleaning methods.

#### **Earthworks**

5.8.5 The following measures relate to the methods adopted to control the dust emissions as a result of earthworks:

- Earthworks and exposed areas/soil stockpiles will be re-vegetated as soon as practicable. Hessian or mulches will be used where it is not possible to re-vegetate or cover topsoil as soon as practicable. Cover will be removed only in small areas during work and not all at once;
- Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out unless this is required for a particular process, in which case appropriate additional control will be put in place;

- Bulk cement and other fine powder materials will be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery;
- Roughening up of concrete surfaces (scabbing) will be avoided;
- Where feasible, vehicles entering and leaving the site will be covered to prevent escape of materials during transport;
- Inspect on site haul routes for integrity and instigate necessary repairs to the surface as soon as practicable;
- Record all inspections of haul routes and any subsequent action in a site log book;
- Provide for regularly damped down haul road in the event of dust generation;
- Dry sweeping of large areas will be avoided; and
- Where possible, dust generating activities will be programmed to avoid prolonged dry or windy weather conditions.

#### **Machinery and site vehicles operations**

- Vehicle engines will be switched off when stationary;
- Where feasible, mains electricity or battery powered equipment will be used instead of diesel or petrol powered equipment/generators;
- Speed limits will be imposed for construction vehicles along haul roads and work areas. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided);
- Water-assisted dust sweeper(s) will be used on the accesses and adjacent local roads to remove, as soon as practicable, any material tracked out of the site;
- At main construction compounds, wheel washing system (with rumble grids to dislodge accumulated dust and mud) will be implemented. An adequate area of hard standing will be provided between the wheel wash facility and the site exit, wherever site size and layout permits;
- Where surfaced haul routes are installed, regularly damp down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly clean;
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and
- Access gates to be located at least 10 metres or more from receptors where possible.

#### **Site management and monitoring**

5.8.6 The following measures will be undertaken to ensure air quality throughout the construction phase:

- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the local planning 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. The DMP may include monitoring of dust deposition, dust flux, real-time PM<sub>10</sub> continuous monitoring and/or visual inspections;
- Agree dust deposition, dust flux, or real-time PM<sub>10</sub> continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a 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;
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials;
- Record all dust and air quality complaints, identify cause(s), take any appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the relevant local planning authority on request;
- Record all inspections of haul routes and any subsequent action in a site log book;
- Exceptional incidents that cause dust and/or air emissions either on or off site will be recorded in the log book together with the action taken to resolve the situation. Liaison with any other high-risk construction sites within 500 metres of the site boundary to ensure that plans are co-ordinated and that dust/particulate matter emissions are minimised;
- Where dust activities are being undertaken, to undertake daily on and off site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local planning authority on request; and
- Increase the frequency of inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

#### **Communication of air quality management**

- 5.8.7 The name and contact details of the person(s) accountable for air quality management on the site (typically Clerk of Works or Site Manager) will be posted on an information board at a local site access.

- 5.8.8 The principal contractor should also seek to post contact details of the Clerk of Works or Site Manager details at crossing points with PRow (when works are occurring in the locality) or other areas where the public may pass the 'front door' of the work front.
- 5.8.9 It is also anticipated that the proposed development will be part of the CCS, which includes dust control measures.

## **5.9 Climate Change**

### **Objectives**

- 5.9.1 To minimise as far as reasonably practicable effects to climate as a result of greenhouse gas (GHG) emissions generated during the construction phase.

### **Management measures**

- 5.9.2 The primary impact of GHG emissions generated during the construction period would be as a result of embodied carbon within construction materials used, i.e. the indirect GHG emissions generated from the supply chain in the production of those materials. Direct GHG emissions produced during the construction phase may include on site fuel consumption and emissions from construction plant.
- 5.9.3 Measures to reduce construction plant and site vehicle GHG emissions, as far as reasonably practicable, would include the following:
- Vehicle engines will be switched off when stationary;
  - Mains electricity or battery powered equipment would be used instead of diesel or petrol powered equipment/generators, where feasible;
  - Re-use materials on site, as far as reasonably practicable, to minimise the number of vehicle deliveries and thus limit vehicle emissions;
  - Seek a reduction on total materials required and hence embodied carbon through lean/efficient design;
  - Specify materials with low embodied carbon (e.g. based on data in the Building Research Establishment (BRE) Green Guide to Specification or product environmental product declarations (EPDs));
  - Source materials locally, where possible, to reduce transport GHG emissions; and
  - Consider use of an established methodology such as PAS2080 (Carbon Management in Infrastructure) (BSI, 2016) and/or life-cycle analysis to guide low-carbon design and construction, set a feasible reduction target and quantify its achievement.

## 5.10 Hydrology and Flood Risk

### Objective

- 5.10.1 To minimise the risk of surface water flooding during the construction phase, to prevent pollution of surface watercourses and to minimise the impact on local surface water features.

### Management measures

#### Best practice measures

- 5.10.2 Construction work would be undertaken in accordance with the Code of Construction Practice which will inform the Construction Environmental Management Plan (CEMP), and guidance including:

- EA guidance for discharges to surface water and groundwater: environmental permits;
- EA guidance for oil storage regulations for businesses;
- EA guidance for work on a river, flood defence or sea defence;
- EA Pollution Prevention Guidance, which have been withdrawn. However, still provide useful best practice guidance;
- EA, Pollution Prevention Guidance Note 6: Pollution Prevention Guidelines – Working at Construction and Demolition Sites;
- EA, Pollution Prevention Guidance Note 5: Working in, near or liable to affect watercourses;
- Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C532); CIRIA – SuDS Manual;
- CIRIA (C741) Environmental good practice on site guide;
- CIRIA (C648) Control of water pollution from linear construction projects;
- Prevent surface water being affected during earthwork operations. No discharge to surface watercourses will occur without permission from the EA (SuDS Manual);
- Wheel washers and dust suppression measures to be used as appropriate to prevent the migration of pollutants (SuDS Manual);
- Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual);
- A construction method statement to be submitted for approval by the responsibly (SuDS Manual); and
- Defra / Environment Agency, October 2005. Flood Risk Assessment Guidance for New Development, Phase 2 FD2320/TR2.

### Pollution prevention measures

- 5.10.3 Refuelling of machinery will be undertaken within designated areas where spillages can be easily contained. Machinery will be routinely checked to ensure it is in good working condition.
- 5.10.4 Any tanks and associated pipe work containing substances included in List 1 of the Groundwater Directive would be double skinned and be provided with intermediate leak detection equipment.
- 5.10.5 The following specific mitigation measures for the protection of surface water during construction activities will be implemented:
- Management of construction works to comply with the necessary standards and consent conditions as identified by the EA and LLFA (Essex CC);
  - A briefing for all staff highlighting the importance of water quality, the location of watercourses and pollution prevention included within the site induction;
  - Areas with prevalent run-off to be identified and drainage actively managed, e.g. through bunding and / or temporary drainage;
  - Areas with prevalent run-off to be identified and drainage actively managed, e.g. through bunding and / or temporary drainage;
  - Areas at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) to be bunded and carefully sited to minimise the risk of hazardous substances entering the drainage system or the local watercourses. Additionally, the bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage / spillage. Bunds used to store fuel, oil etc. to have a 110% capacity of the volume of fuel, oil etc. to be stored;
  - Disturbance to areas close to watercourses reduced to the minimum necessary for the work;
  - Excavated material to be placed in such a way as to avoid any disturbance of areas near to the banks of watercourses and any spillage into the watercourses;
  - Construction materials to be managed in such a way as to effectively minimise the risk posed to the aquatic environment;
  - Plant machinery and vehicles to be maintained in a good condition to reduce the risk of fuel leaks;
  - Drainage works to be constructed to relevant statutory guidance and approved via the LLA prior to the commencement of construction; and
  - Consultation with the EA to be ongoing throughout the construction period to promote best practice and to implement proposed mitigation measures.

## 5.11 Geology, Hydrogeology and Land Contamination

### Objectives

5.11.1 To protect the underlying secondary and principal aquifers in terms of groundwater quality and flow and to mitigate potential adverse effects to human receptors from potential sources of contamination.

### Management measures

5.11.2 A Phase 1 Preliminary Risk Assessment identifying the potential sources of contamination at the site has been undertaken to inform the conceptual site model to assess how contamination may impact the identified receptors via pollutant linkages, including impacts to construction workers at the site.

5.11.3 Good environmental practices will be implemented based on current legal responsibilities and guidance on good environmental management in:

- CIRIA C532 Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (2001); and
- CIRIA C648 Control of Water Pollution from Linear Construction Projects (2006).

5.11.4 Sources of silt and contaminated water will be mitigated as far as practicable by implementing the following measures:

- Minimise dewatering and pumping of excavations and subsequent disposal of water;
- Minimise runoff from exposed ground and stockpiles;
- Minimise runoff from plant and wheel washing;
- Avoidance of fuel spillages;
- Use appropriate waste storage and disposal measures.

5.11.5 Measures to prevent and control spillage of oil, chemicals and other potentially harmful liquids will be implemented. Appropriate storage and handling of materials and products will be provided and will include for example:

- Avoidance of oil storage within 50 metres of a spring, well or borehole;
- Avoidance of oil storage within 10 metres of a watercourse;
- Avoidance of oil storage where oil could run over hard ground into a watercourse;
- Secondary containment system that can hold at least 110% of the oil volume stored; and
- Avoidance of storage of oil in areas at risk of flooding.

5.11.6 In accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001, refuelling of machinery will be undertaken within designated areas where spillages can be easily contained. Machinery will be routinely checked to ensure it is in good working condition; and any tanks and associated pipe work containing oils and fuels will be double skinned and be provided with intermediate leak detection equipment.

5.11.7 Any leaks or spillages of potentially polluting substances to be contained, collected and then removed from site in an appropriate manner e.g. use of absorbent material, bunding or booms. An emergency action plan would be formulated which all site personnel would be required to adhere to.

5.11.8 Used oils will be disposed of properly in accordance with Environmental Permitting (England and Wales) Regulations 2016.

5.11.9 Ground workers will be provided with appropriate risk assessments, which will address the potential for contaminated soil to be encountered. Appropriate Personal Protective Equipment (PPE) (e.g. disposable coveralls, gloves and particulate/vapour masks) should be provided to protect ground workers in the event that contaminated soils and/or groundwater are encountered.

5.11.10 Site personnel to be vigilant for any unusual visual or odorous characteristics of soils and groundwater which could indicate the presence of previously unencountered contamination.

5.11.11 Should any previously unidentified contamination be encountered at the site during the construction phase, a remediation strategy would be followed in accordance with consultation with the relevant authorities.

## 6. References

British Standards institution (BSI) (2009) BS 5228-2:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites. Vibration

British Standards Institution (BSI) (2012) BS 5837:2012. Trees in relation to design, demolition and construction. Recommendations.

British Standards Institution (BSI) (2016) PAS 2080:2016. Carbon Management in Infrastructure.

British Standards Institution (BSI) (2014a) BS EN 12464-2:2014. Light and lighting. Lighting of work places. Outdoor work places.

British Standards institution (BSI) (2014b) BS 5228-1:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites. Noise

Construction Industry Research and Information Association (CIRIA) (2001) C532 Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors. London, CIRIA

Construction Industry Research and Information Association (CIRIA) (2006) C648 Control of Water Pollution from Linear Construction Projects

Department for Environment, Food and Ra Affairs (Defra) (2000) Land use planning: Good practice guide for handling soils.

Department for Environment, Food and Ra Affairs (Defra) (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including the Toolbox Talks).

English Nature (2001) Great Crested Newt Mitigation Guidelines. York, English Nature

Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction. Version 1.1.

Strachan, R., Moorhouse, T. and Gelling, M. (2011). Third Edition. Oxford, WildCRu.