

**APPENDIX 4.2A OUTLINE CONSTRUCTION ENVIRONMENTAL
MANAGEMENT PLAN**

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1 INTRODUCTION

1.1 Background

- 1.1.1 This document is the Outline Construction Environmental Management Plan (“Outline CEMP”) for the improvement of the M4 motorway (“M4”) to a smart motorway between junction 3 (Hayes) in west London and junction 12 (Theale), near Reading, (the “Scheme”).
- 1.1.2 Powers to construct the Scheme have been sought by the Highways Agency (“the Agency”) through an application for a Development Consent Order (“DCO”) to the Secretary of State for Transport (“Secretary of State”) via the Planning Inspectorate in Spring 2015.
- 1.1.3 The Outline CEMP contains control measures and the standards to be implemented throughout construction of the Scheme, which have been developed through the Environmental Impact Assessment (“EIA”), as reported in the Environmental Statement (“ES”) submitted with the DCO application.
- 1.1.4 The Scheme extends across the administrative areas of West Berkshire Council, Reading Borough Council, Wokingham Borough Council, Windsor and Maidenhead Royal Borough Council, Bracknell Forest Council, Slough Borough Council, South Bucks District Council, London Borough of Hillingdon, and London Borough of Hounslow. The Outline CEMP provides a consistent approach to the management of construction activities along the entire route of the proposed works and with a wide range of key stakeholders.
- 1.1.5 The Outline CEMP will evolve into a final Construction Environmental Management Plan (“final CEMP”), and as such is subject to refinement, amendment and expansion as necessary as the Scheme design, assessment and consenting processes develop. Engagement with stakeholders and communities forums will inform its future development. The development of the final CEMP, in accordance with this Outline CEMP, is provided for via a requirement in the DCO.

1.2 Structure of this document

1.2.1 This document comprises the following sections:

- a) Introduction (section 1);
- b) Scheme description (section 2) – describing the sections of the Scheme;
- c) Environmental management and implementation (section 3) – outlining measures and standards to protect communities and the environment during construction works;
- d) Community relations (section 4) – outlining the approach to community engagement;
- e) General site operations (section 5) – including mitigation of the impact of general site operations and construction activities, and the environment and pollution incident control measures;
- f) General requirements by environmental topic (sections 6 to 14) – setting out the measures that will be implemented to limit disturbance from construction activities, as far as reasonably practicable, in relation to the following topics which respond directly to the Scheme Environmental Statement (“ES”):
 - i. air quality;
 - ii. cultural heritage;
 - iii. landscape;
 - iv. nature conservation;
 - v. geology and soils;
 - vi. materials;
 - vii. noise and vibration;
 - viii. effects on all travellers; and
 - ix. road drainage and the water environment;
- g) **Annex A** – Outline Site Waste Management Plan (“SWMP”) – used to plan, implement, monitor and review waste minimisation and management on construction sites. The Outline SWMP has been based upon the Waste and Resources Action Programme’s (“WRAP”) SWMP template;

- h) **Annex B**– Outline Materials Management Plan - the Scheme’s Materials Management Plan (“MMP”), detailing how all construction phase materials (material resources and waste) would be managed, will be developed and implemented by the appointed Contractor. This Outline MMP provides a framework which will be used as a basis from which to develop the Scheme’s MMP;
- i) **Annex C** – Outline Logistics Plan - the Logistics Plan is a tool to manage all materials (including material resources and waste) from Scheme conception through to completion. The Logistics Plan will be designed to assist the Scheme in proceeding smoothly whilst achieving programme certainty and cost predictability;
- j) **Annex D** – Outline Scheme Asbestos Management Plan – outlines the process and programme in relation to locating, assessing and managing asbestos materials which may be encountered during the works; and
- k) **Annex E** - Outline Construction Traffic Management Plan (“Outline CTMP”) – sets out the proposed traffic management and maintenance responsibilities during construction of the Scheme.

1.3 Environmental management

- 1.3.1 The general process for the management of environmental effects on the Agency's projects is set out in the Design Manual for Roads and Bridges (“DMRB”) Volume 11, Section 2, Part 5, HD205/08 and Part 6, HD48/08 (Highways Agency, 2008). More specific advice is provided in the Interim Advice Note (“IAN”) 183/14 Environmental Management Plans (IAN 183/14) (Highways Agency, 2014). The guidance in IAN 183/14 takes into consideration Environmental Management Plans: Practitioner Best Practice Series, Volume 12 (IEMA, 2008) and BS EN ISO 14001: Environmental Management (BSI, 1996, as amended).
- 1.3.2 An Outline Environmental Management Plan (“Outline EMP”) has been prepared which is an overarching tool for managing the environmental effects of the Scheme, forming a structured plan for ensuring environmental commitments and actions are accurately recorded and implemented effectively on the ground.

1.3.3 The Outline EMP:

- a) provides a framework for recording environmental risks, commitments and other environmental constraints and clearly identify the structures and processes that will be used to manage and control these aspects;
- b) seeks to ensure compliance with relevant environmental legislation, government policy objectives and Scheme specific environmental objectives; and
- c) provides the mechanism for monitoring, reviewing and auditing environmental performance and compliance during detailed design, construction and operation.

1.3.4 The Outline EMP is a 'living document' which will evolve over the life of the project. The document provides an over-arching framework for environmental management during design, construction and operation. It identifies the environmental risks associated with the implementation of the Scheme. The Outline EMP sets out the processes for the production and implementation of the following environmental management documents for Scheme:

- a) Outline CEMP - this document, which sets out a series of proposed measures and standards of work that will be applied by The Agency and its Contractor throughout the construction period;
- b) Final CEMP - the Agency will require it's appointed Contractor to have a final CEMP which is certified to ISO 14001. The final CEMP will build upon the information contained in the Outline CEMP following the detailed design process; and
- c) Handover Environmental Management Plans ("HEMP") - towards the end of the construction period the final CEMP will be refined into a HEMP which will represent a further development of the Outline and final CEMP and will set out the proposed strategy for the future maintenance and management of all environmental areas and mitigation.

1.4 Purpose of the Construction Environmental Management Plan

- 1.4.1 This Outline CEMP sets out a series of proposed measures and standards of work that will be applied by the Agency and its Contractor throughout the construction period to:
- a) provide effective planning, management and control during construction of the Scheme with the aim of controlling potential impacts upon people, businesses and the natural and historic environment; and
 - b) provide the mechanisms to engage with the local community and their representatives throughout the construction period.
- 1.4.2 As a minimum, the Contractor will be required to comply with applicable environmental legislation at the time of construction of the Scheme together with any additional environmental controls imposed by the DCO. For this reason, the applicable statutory requirements are not repeated within this Outline CEMP. The references to guidance documents within this document are not intended to be exhaustive.

1.5 Compliance with the Environmental Statement

- 1.5.1 An EIA has been undertaken for the Scheme and an ES has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 ("EIA Regulations"). In line with the requirements of these regulations, the ES contains the assessment of the potential impacts on the environment that may be caused during construction of the Scheme and describes proposed mitigation measures.
- 1.5.2 The approach to be adopted by the Contractor to mitigate environmental impacts are set out within this Outline CEMP.
- 1.5.3 Information on the environmental management process throughout the detailed design of the Scheme, through to construction and hand-over is included within the Outline EMP (set out in Appendix 4.2 of Document Reference 6.3 (ES Appendices)).

1.6 Development of the environmental commitments

- 1.6.1 The environmental commitments with which the construction works must comply have been developed through the planning process from those identified in the ES to further measures agreed with the statutory authorities, consultees and (where appropriate) the affected landowners.
- 1.6.2 The key objective of the Outline CEMP is to ensure that all environmental commitments made throughout the development of the Scheme and identified during the EIA are met. These include:
- a) committed mitigation measures as set out in the ES;
 - b) environmental best practice measures including those set out within this Outline CEMP, those developed by the Agency, and any other guidance documents produced by statutory bodies such as the Environment Agency ("EA"), Natural England ("NE") and English Heritage ("EH"); and
 - c) any specific conditions relating to archaeological sites and/or finds.
- 1.6.3 The final CEMP will also contain information related to:
- a) any requirements attached to the DCO for the Scheme;
 - b) any further mitigation measures, as agreed post publication, with the consultees and landowners;
 - c) mitigation measures developed following the completion of ecological surveys prior to the works commencing; and
 - d) environmental commitments in the Contractor's Environmental Management System ("EMS").

1.7 Liaison with local planning authorities and statutory bodies

- 1.7.1 Liaison will be required with the relevant local planning authorities along the Scheme and relevant statutory bodies to ensure that the Scheme proposals and recommended mitigation measures are acceptable to the authorities and such statutory bodies.

2 M4 JUNCTIONS 3 TO 12 SCHEME DESCRIPTION

2.1 Overview

- 2.1.1 This section describes the principal characteristics of the areas surrounding the links of the M4 that are affected by and comprised within the Scheme.
- 2.1.2 Along the Scheme, the main conurbations are Reading, Maidenhead, Slough, Hillingdon and Hounslow. Smaller, but notable urban areas include Wokingham, Bracknell, Windsor, West Drayton and Hayes. Figure 2.1 provides an overview of the location of the Scheme.

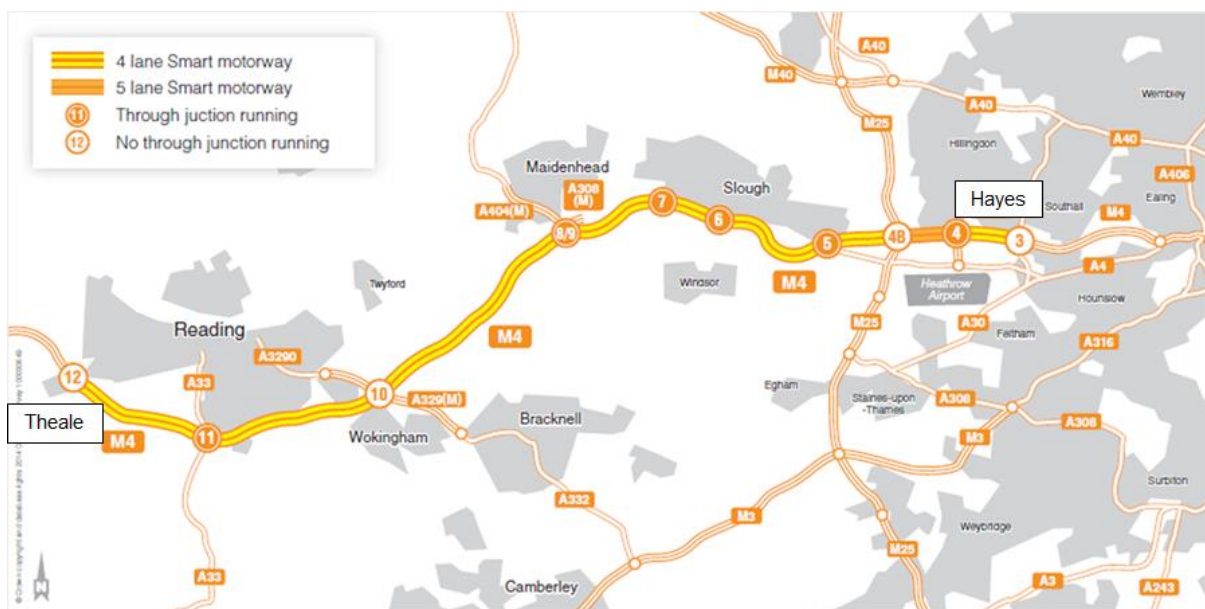


Figure 2.1: Scheme overview

- 2.1.3 The Scheme can be broken down geographically into the following sections:

2.2 Junction 12 to junction 11

- 2.2.1 The M4 between junction 12 (Theale) and junction 11 (Three Mile Cross) is approximately 7.3km long with three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway and lighting columns are located in the central reserve.
- 2.2.2 This section of the M4 skirts the south-west to southern edge of Reading, which forms the principal settlement in this location.

2.2.3 To the western extremity of the Scheme, west of junction 12, lies the North Wessex Downs Area of Outstanding Natural Beauty (“AONB”), the Sulham and Tidmarsh Woods and Meadows Site of Special Scientific Interest (“SSSI”), and Pincent’s Kiln SSSI. To the east of junction 12 the M4 crosses the Kennet and Avon Canal and then skirts south of the Reading urban area, through an area of agricultural land within which extensive gravel extraction activity has occurred, resulting in water filled gravel pits.

2.3 Junction 11 to junction 10

2.3.1 The M4 between junction 11 (Three Mile Cross) and junction 10 (Winnersh) is approximately 8.7km long with three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway and lighting columns are located in the central reserve.

2.3.2 From junction 11, the M4 continues around the southern Reading suburbs of Whitley and Lower Earley to Winnersh at junction 10. To the south of the M4, the area is characterised by smaller villages and settlements, including Shinfield and Sindlesham, until reaching the outskirts of Wokingham to the south of junction 10.

2.3.3 Between junction 11 and junction 10, the M4 passes through an area of agricultural land predominantly within the low lying floodplain of the River Loddon, and to the east passes between the urban edges of Sindlesham, Winnersh and Wokingham. Agricultural land is interspersed with a number of woodlands and copses, with trees along the River Loddon corridor. The urban areas nearest to the M4 predominantly comprise modern residential suburbs of Reading north of the M4.

2.4 Junction 10 to junction 8/9

2.4.1 The M4 between junction 10 (Winnersh) and junction 8/9 (Holyport) is approximately 11km long, and has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, and there is no lighting between these junctions.

2.4.2 This link of the M4 passes through a relatively sparsely populated rural area, characterised by scattered farms, homesteads and rural businesses. This rural area lies between Reading and Wokingham to the west and Maidenhead to the east.

2.4.3 The M4 is located within Green Belt land from The Straight Mile overbridge (east of junction 10) to junction 8/9. Gently undulating agricultural land is interspersed with considerable woodland cover, and mature hedgerows define field boundaries. Settlement is limited, with Shurlock Row, White Waltham, Paley Street and Stud Green forming the principal villages prior to reaching Maidenhead. The M4 verges provide established tree planting which integrates well with the local wooded landscape.

2.5 Junction 8/9 to junction 7

2.5.1 The M4 between junction 8/9 (Holyport) and junction 7 (Huntercombe) is approximately 5km long, and has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, but each hard shoulder has intermittent breaks, or discontinuities. The main carriageway lighting columns are located in the central reserve.

2.5.2 This link of the M4 is located within Green Belt land and passes north of Holyport and the urban fringe area to the south of Maidenhead, before returning to the Green Belt. From here the M4 passes the village of Bray to the north before crossing the River Thames and then continuing east past the villages of Dorney Reach and Dorney to the south.

2.5.3 The River Thames and the nearby man-made Jubilee River (which functions as a flood alleviation channel) and recreational lakes, together with adjacent wet pasture, occupy most of the land between settlements. These watercourses and areas of open water are lined by riparian tree species, giving considerable vegetation cover in the local landscape.

2.6 Junction 7 to junction 6

2.6.1 The M4 between junction 7 (Huntercombe) and junction 6 (Chalvey) is approximately 3km long, and has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, but each hard shoulder has discontinuities. The main carriageway lighting columns are located in the central reserve.

2.6.2 This link of the M4 is located within the northern fringe of the Green Belt and between the outskirts of Slough to the north (including the area of Cippenham) and Eton Wick and the River Thames floodplain to the south.

2.6.3 As it approaches junction 6, the M4 lies immediately north and runs parallel to the Jubilee River. The River Thames is located further south beyond the villages of Dorney and Eton Wick.

2.7 Junction 6 to junction 5

- 2.7.1 The M4 between junction 6 (Chalvey) and junction 5 (Langley) is approximately 6km long, and has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, but each hard shoulder has discontinuities. The main carriageway lighting columns are located in the central reserve.
- 2.7.2 Land around this link of the M4 includes Green Belt land, and the Slough suburbs (including the areas of Upton Court Park, Ditton Park and Langley). This link of the M4 also passes to the north of the confluence of the Jubilee River with the River Thames, the town of Datchet and the Queen Mother reservoir.

2.8 Junction 5 to junction 4b

- 2.8.1 The M4 between junction 5 (Langley) and junction 4b (M25) is approximately 3km long, and has four running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, but each hard shoulder has discontinuities. The main carriageway lighting columns are located in the central reserve.
- 2.8.2 After passing under Sutton Lane overbridge, the M4 in this link is located within Green Belt land. From junction 5 the M4 passes from the eastern edge of Slough, through semi-rural surroundings to the M25 intersection at junction 4b. Where the urban area of Slough lies immediately adjacent to the M4, it predominantly comprises modern residential.

2.9 Junction 4b to junction 4

- 2.9.1 The M4 between junction 4b (M25) and junction 4 (Heathrow) is approximately 3km long, and has four running lanes in each direction. There is also a hard shoulder on the near-side of each carriageway and lighting columns are located in both the central reserve and the verge.
- 2.9.2 In this link, the M4 crosses the Wraysbury River and the River Colne before passing Saxon Lake to the south. The M4 is located within Green Belt land west of Saxon Lake and forms the northern boundary of the Green Belt between Saxon Lake and junction 4.

2.10 Junction 4 to junction 3

- 2.10.1 The M4 between junction 4 (Heathrow) and junction 3 (Hayes) is approximately 3km long with three running lanes in each direction. There is also a hard shoulder on the near-side of each carriageway and lighting columns are located in the central reserve.
- 2.10.2 This link is located within Green Belt land and crosses over Frog's Ditch and the River Crane. The M4 in this section is bounded to the north by the modern residential areas of Hayes and to the south by the village of Harlington and more open areas including Little Harlington Playing Fields and Cranford Park. Further south from the M4 corridor lies the eastern section of Heathrow Airport.
- 2.10.3 Areas to the south of the M4 include open areas and wooded parkland, including Cranford Park Conservation Area and associated listed buildings.

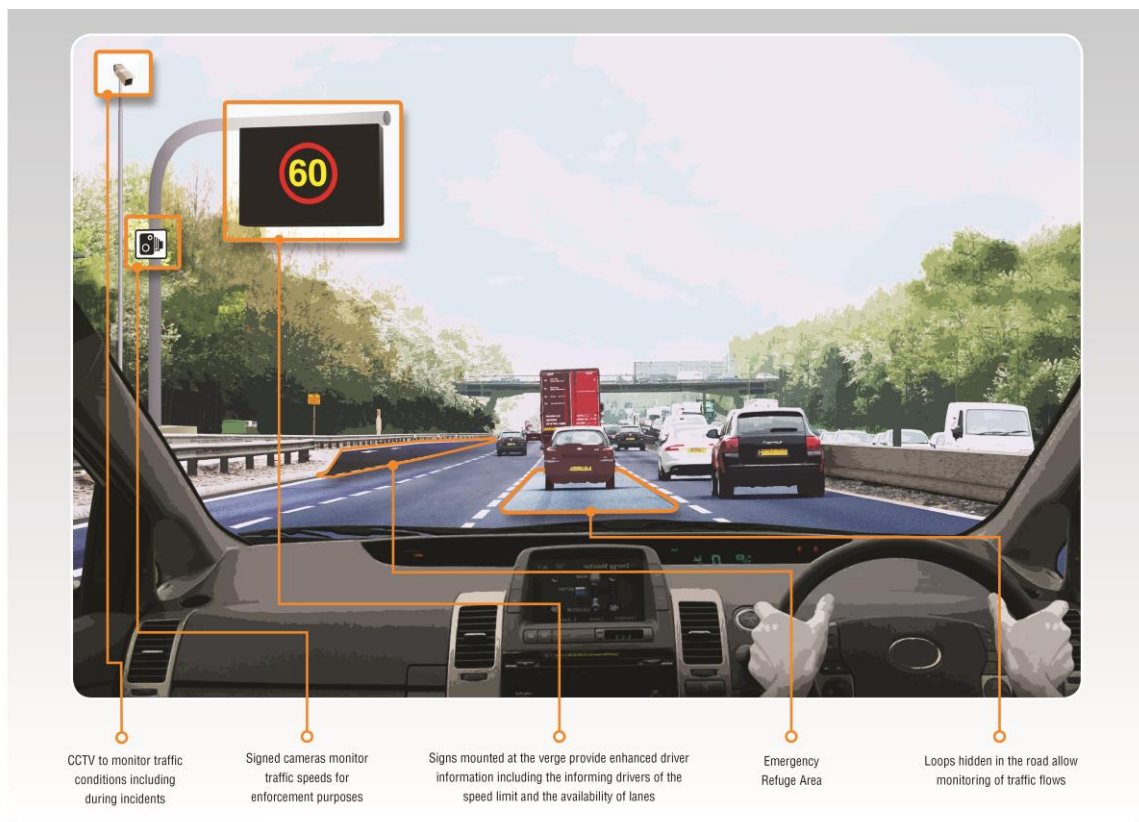
2.11 Overview of the Scheme proposals

- 2.11.1 This section of the Outline CEMP provides an overview of the proposed Scheme between junctions 3 and 12 on the M4.
- 2.11.2 Preliminary design is complete and the Scheme comprises the following principal elements:
- a) conversion of the hard shoulder to a permanent running lane and, where no hard shoulder is in place at present, the construction of a new lane. This will mainly take place between junction 4b and junction 8/9;
 - b) replacement of overbridge structures where portals are too narrow to accommodate the improved motorway;
 - c) extension of underbridges and other structures such as culverts and subways to accommodate the improved motorway;
 - d) changes to junctions and slip roads needed to accommodate traffic joining and leaving the improved motorway, and to allow use of the hard shoulder as a running lane, as well as allowing through junction running ("TJR");
 - e) provision of new gantries and signs to allow the motorway to function as a smart motorway with a variable speed limit, and to provide messages to road users; and

- f) other infrastructure needed for the improved motorway, such as emergency refuge areas (“ERAs”), enhanced communication systems, closed circuit television (“CCTV”) and electrical supplies, as well as works to accommodate statutory undertakers' apparatus and other parties who may be affected by the Scheme.

2.11.3 The majority of the works along the motorway corridor will be within land currently owned by the Secretary of State. This is because the Secretary of State is the highway authority for, and landowner of, Special Roads such as the M4. The Agency manages and operates the strategic road network on behalf of the Secretary of State. Additional land will be required permanently to accommodate the Scheme, such as for side road realignment at overbridges and underbridge widening. This will be kept to the minimum area required. Land will also be required temporarily for access, storage and construction activities, and in most cases will be reinstated to its former use on completion of construction.

2.11.4 Figure 2.2 sets out the key features of the Scheme:



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Figure 2.2: Key features of the M4 J3-12 smart motorway Scheme

- 2.11.5 Detailed design will commence during the examination period for the DCO. The detailed design will build on the preliminary design and also take into account the Government's Road Investment Strategy which was published in December 2014, which sets out the performance specification for Highways England – the public sector company, owned by the Government, which will replace the Agency in April 2015.
- 2.11.6 Providing the Application is successful and the Scheme is granted a DCO, construction will commence in late 2016 and the Scheme will be operational by 2022.

3 ENVIRONMENTAL MANAGEMENT AND IMPLEMENTATION

3.1 Context of the Outline CEMP and its delivery

- 3.1.1 To fulfil the aims of the Outline CEMP and to ensure that all the environmental commitments for the construction of the Scheme are met, it is important to ensure that the roles of all staff are clearly set out, and that prior to, and throughout the works, they are made aware of the environmental sensitivities and commitments that are required to be adhered to.
- 3.1.2 The Outline CEMP therefore sets out the site specific environmental management procedures per environmental discipline thereby providing all personnel involved in the works with a clear indication of the roles they are to undertake, the mitigation to be incorporated and commitments to be adhered to.
- 3.1.3 The EIA undertaken for the Scheme has considered the potential for significant adverse effects on the environment and has identified potential environmental impacts associated with the construction and operation of the Scheme, together with the identification of appropriate mitigation.
- 3.1.4 Following the appointment of the Contractor for the works it will be their responsibility to maintain and update the Outline CEMP and to produce the final CEMP for the construction works. The final CEMP will require to be certified to *BS EN ISO14001 Environmental Management Systems – specification with guidance for use* (BSI, 2004). The final CEMP will set out the Contractor's roles and responsibilities, together with appropriate control measures, training and briefing procedures, risk assessments, stakeholder engagement and monitoring systems to be employed during planning and constructing the works for all relevant topic areas.
- 3.1.5 As part of the final CEMP, the Contractor will be required to plan the works in advance to ensure that measures to reduce environmental effects are integrated into the construction methods and commitments set out in the ES and DCO, and that those commitments are complied with.
- 3.1.6 The final CEMP will cover the activities of the Contractor. The Contractor will also be required to coordinate with relevant parties whose actions may affect the works to construct the Scheme. This will be documented in the final CEMP, as appropriate.

- 3.1.7 The final CEMP will include procedures or plans to monitor compliance with the Scheme’s environmental requirements including statutory and consent requirements together with provisions for any corrective actions required.

3.2 Environmental objectives, targets and programme

- 3.2.1 The Agency’s environmental objective is to ensure “the best practicable environmental outcomes across all our activities, while working in the context of sustainable development and delivering value for money” (Highways Agency Environment Strategy, 2012)
- 3.2.2 Scheme specific environmental objectives and targets for construction preparation and construction phases will be agreed between the Agency and the Contractor. These are likely to include environmental, social and sustainability targets and key performance indicators (“KPIs”), such as targets for re-using and recycling waste on site.
- 3.2.3 Scheme objectives may include:
- a) zero pollution incidents;
 - b) minimise waste sent to landfill;
 - c) minimise disruption to residents (and associated complaints);
 - d) protect and enhance the landscape of the Wessex Downs AONB; and
 - e) protect and where possible enhance biodiversity.
- 3.2.4 The final CEMP will set out the final agreed objectives and will include a programme of actions to achieve the Scheme objectives and targets. Progress towards achieving the environmental objectives and targets will be monitored, measured and reported by the Contractor on a monthly basis to the Agency’s Project Manager.

3.3 Legal and other environmental obligations

- 3.3.1 The final CEMP will include, or reference, the legal and other environmental obligations relevant to the Contractor’s activities. These may include:
- a) environmental legislation;

- b) the commitments made in the ES and other documents submitted to the Inspectorate as part of the DCO Application;
- c) commitments made by the Agency to local planning authorities; regulatory bodies such as the EA, NE, and EH; and local communities;
- d) the requirements in the DCO; and
- e) other licences and consents required to construct the Scheme.

3.4 The Highways Agency environmental management system

3.4.1 The Agency will establish a process to require the relevant mitigation measures identified to be addressed through the construction phase by the Contractor. The process will set out:

- a) all relevant environmental aspects of the work and how they will be managed;
- b) staff competence and awareness requirements and how these are achieved and maintained;
- c) the approach to be implemented to plan and monitor compliance with environmental legislation and the environmental provisions in the DCO;
- d) monitoring compliance and the effectiveness of the measures included within this Outline CEMP;
- e) the measures to be taken to address non-compliance or unexpected impacts; and
- f) engagement and consultation with local authorities, other statutory bodies and the local community.

3.5 Collaboration and co-ordination across concurrent projects

3.5.1 Whilst the detailed procurement strategy for the Scheme is not yet confirmed, it is anticipated that construction would be split into a number of phases along the length of the Scheme, and that some of these would proceed concurrently, i.e. that there would be on-going construction activity in more than one location under the control of different contractors (referred to as "the Contractor" in this Outline CEMP).

- 3.5.2 As a consequence, there would be a need for co-ordination of activity outside site boundaries to reduce risk of conflict and to maximise opportunities for reducing overall impact on surrounding communities and the environment. This role would be fulfilled by the employer's representative, with technical support as appropriate.
- 3.5.3 The Agency would have particular regard to co-ordination of activity by the Contractor in respect of:
- a) community liaison: communicating upcoming activity to affected communities and responding to questions/concerns raised;
 - b) emergency response: maintaining communication with emergency services and ensuring that emergency response plans do not conflict;
 - c) traffic management: working collaboratively with the aim of avoiding potential conflict in arrangements and minimising disruption to road users;
 - d) access to site: communication and collaboration in respect of arrangements for site access and abnormal loads with highway authorities and emergency services;
 - e) construction workforce: monitoring the impact of the workforce on the community in its travel to and from work and its use of temporary accommodation; and
 - f) other construction projects: maintaining communication between the works on the Scheme and those of other relevant projects in the area.

3.6 Enforcement

- 3.6.1 The provisions of the Outline CEMP will be imposed by the Agency on the Contractor by means of the works contracts. The contracts will incorporate both:
- a) general requirements; and
 - b) site specific requirements.
- 3.6.2 A requirement in the DCO will also require the Scheme to be constructed in accordance with the final CEMP. Breach of this requirement is an offence under s.161 of the Planning Act 2008.

3.6.3 The Contractor (and any sub-contractors) will be required to comply with the terms of the final CEMP and appropriate action will be taken by the Agency with the aim of ensuring compliance.

3.7 Structure and responsibilities

3.7.1 A management structure that includes an organisational chart encompassing all staff responsible for environmental work is to be included within the final CEMP. This will set out the respective roles and responsibilities with regard to the environment and identify the nominated Construction Environmental Manager. Illustrative key roles and responsibilities are set out in Table 3.1 below:

Table 3.1: Roles and Responsibilities

Role	Responsibilities
Construction Manager	<p>Responsible for the management of the construction of the Scheme. Has overall responsibility for the environmental performance of the Scheme and all staff. The Contractor's Project Manager will be required to:</p> <ul style="list-style-type: none"> • provide information on contract requirements to the Environmental Advisor following contract award and prior to start of works on site; • approve the final CEMP and ensure that all controls specified within this CEMP are implemented by employees and sub-contractors; • ensure environmental and waste requirements are included on requisitions and in subcontracts and orders; • ensure that all required consents/licences are in place prior to work commencing on site; • log and monitor incidents and non-compliances. Report incidents and non-compliances to the Agency's Project Manager at the earliest possible opportunity; • ensure that The Agency is informed of all environmental complaints; • provide an initial point of contact for members of the public/local community who have queries regarding the works; • ensure employees and sub-contractors receive Induction Training (including environmental) and tool box talks, as appropriate; • verify actions resulting from non-compliances and observations raised during audits are completed by the deadlines set; • undertake inspections alongside the Construction Environmental Advisor to ensure that the environmental controls as set out within the final CEMP are in place and working effectively; and • ensure all records are retained and readily available on Site.
Site Materials and Waste Manager	<p>Responsible for implementing the Site Waste Management Plan ("SWMP") throughout the construction of the Scheme and to ensure that waste is disposed of legally, economically and safely in line with the SWMP and all relevant legislation.</p>
Construction Environmental Advisor ("EAD")	<p>To ensure that the Scheme complies with all environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the ES throughout its construction. The EAD will be required to:</p> <ul style="list-style-type: none"> • provide toolbox talks and environmental inductions to all staff involved in the construction of the Scheme; • undertake daily Site inspections to monitor compliance with the environmental licences/consents for the works and with the final CEMP; • deal with queries and correspondence on environmental issues;

Role	Responsibilities
	<ul style="list-style-type: none"> • implement follow-up corrective actions to ensure compliance with UK regulations and legislation; • approval of method statements and any changes to the final CEMP in consultation with The Agency's Project Manager and the appropriate statutory bodies; • maintaining and updating the final CEMP during the works; • keep record of all activities on Site, environmental problems identified, transgressions noted and a schedule of all tasks undertaken; and • provide appropriate professional and practical advice to contractors, consultants and project team members associated with environmental and ecological issues and where appropriate resolve issues in a practical and efficient way.
<p>Traffic Control Officer</p>	<p>The traffic safety and control officer will ensure compliance with the Contractor's traffic management plan. Additional responsibilities will include:</p> <ul style="list-style-type: none"> • management and implementation of traffic management measures associated with the Scheme; • ensuring compliance with all relevant health and safety directives in liaison with the Contractor's Health and Safety Manager ("HSM"), relating to operations and live traffic; • management of the layout of site access and egress points for all construction sites and compounds; • arranging for site inspections at regular intervals and equipment attended to and maintained and in the case of accidents or incidents having replacement signs, cones, bollards and lights and the like erected without delay; and • maintaining a log of all complaints received in relation to traffic during Scheme construction.
<p>All Site Staff (including sub-contractors)</p>	<p>To receive general environmental awareness training, and undertake work in accordance with all works Method Statements and toolbox talks. Only trained personnel are to manage particular tasks such as refuelling plant and equipment, managing the stores, water quality monitoring and supervising the segregation and collection of waste. The responsibilities of all staff on site throughout the construction of the works will include the following:</p> <ul style="list-style-type: none"> • all staff are to be appropriately trained to carry out their respective tasks; • all environmental policies, procedures and rules as set out in the final CEMP are to be adhered to; • adhere to legislation, codes of practice, guidance notes relevant to their work; • determine and implement good environmental methods of working as set out in the final CEMP; • organise work to be carried out to the required standard with minimum risk to the environment. All Site personnel will receive instructions on their responsibilities to ensure correct environmental practice in line with the final CEMP; and • all Site personnel will report environmental incidents immediately to the Construction Manager and the EAD who will be responsible for advising the Client's Project Manager and ensuring that corrective actions are completed.

Role	Responsibilities
Client Project Manager	To ensure compliance with all the relevant legal requirements, commitments and targets agreed for the Scheme.
Design Team	To provide information relevant to construction that may assist the Contractor to manage environmental aspects of the Scheme.
Public Liaison Officer	<p>Communications with the public and interested parties, outreach and education, where appropriate. The role will include the following responsibilities:</p> <ul style="list-style-type: none"> • responding to any concerns or complaints raised by the public in relation to the works; • to liaise with the Construction Manager and EAD on landowner and community concerns relating to the works; • ensure that the Client's Project Manager and the EAD are informed of any complaints relating to the environment; and • keep the public informed of project progress and any construction activities that may cause inconvenience to local communities.

3.8 Site management

Monitoring

- 3.8.1 The Contractor will undertake the necessary monitoring as outlined for each environmental topic (see sections 6 to 14) to comply with the requirements of this Outline CEMP, any additional consent requirements and their EMS. Monitoring will assess the effectiveness of mitigation measures and the impact of construction works. Additional actions that may be necessary to enable compliance will also be considered.
- 3.8.2 Monitoring, together with provisions for any corrective action required, will be implemented using the systems set out under the final CEMP.

3.9 Considerate constructors

- 3.9.1 The Contractor will be required to sign up and adhere to the Considerate Constructors Scheme¹.

3.10 Contractors' method statements

- 3.10.1 The Contractor will set out the procedures to be followed for construction operations in method statements that will address health, safety, site security and the environmental issues associated with construction operations. The operations requiring a method statement will be identified using a risk based approach. As a minimum, method statements will be prepared for site preparation, construction activities and reinstatement of land and/or infrastructure following completion of the main construction works.
- 3.10.2 Method statements will define any specific environmental control measures, including environmental and cultural heritage protection works, to be implemented to meet the requirements of this Outline CEMP, and will consider the cumulative effects of concurrent construction activities.
- 3.10.3 The Contractor's approach to method statements will be reviewed and accepted by the Client's Project Manager. An assurance programme will be established by the Agency's representative and its Contractor to monitor compliance with these planned arrangements.

¹ A UK national Scheme which promotes good practice on construction sites through its codes of considerate practice, which commit registered sites to be considerate and good neighbours, as well as being respectful, environmentally conscious, responsible and accountable

Supervision

- 3.10.4 Sufficient suitably qualified and experienced personnel will be appointed by the Contractor to supervise the main construction works. This will include professionally qualified environmental management staff, with relevant experience in the environmental disciplines included within the ES and this Outline CEMP. They will be present on site during the main construction works, as appropriate, to advise the Contractor and the contract management team, and supervise and report on the implementation of appropriate environmental mitigation measures and safeguards.
- 3.10.5 The EAD will manage all environmental issues during construction. The EAD will ensure that the guidance documented in the Outline CEMP and subsequent final CEMP is effectively implemented.

3.11 Emergency preparedness and response

- 3.11.1 The Contractor will develop an emergency preparedness and response plan to cover accidents on site, environmental hazards (flooding, heavy rain, high winds), and other risks that may occur on site.
- 3.11.2 A spill response plan, which all staff are made aware of, will be implemented in the event of an environmental incident. This plan will take into account any Client specific requirements.
- 3.11.3 The plan will include the following as a minimum:
- a) 24 hour contact details for all emergency response personnel and the emergency services;
 - b) the location of the nearest hospitals and GP practices including directions from site;
 - c) the procedures for the reporting of, and documenting of emergency incidents;
 - d) the responsibilities of all staff during an emergency event; and
 - e) the location of all hazardous materials located on site and within the site compounds.
- 3.11.4 The appropriate incident response equipment will be available next to particularly sensitive activities (e.g. overpumping) or areas of a site (such as fuel storage areas).

- 3.11.5 Practice spillage drills will be conducted on site to ensure that staff know how to use spill response equipment correctly and effectively. This process will also be used to help identify potential areas of weakness in incident response provisions. Learning points from any incidents will be identified and disseminated to help prevent recurrence.

3.12 Training and awareness

- 3.12.1 The Agency will require the Contractor to employ an appropriately qualified and suitably experienced workforce. Where appropriate, this will include holding a registration with relevant recognised competence schemes.
- 3.12.2 The Contractor will be responsible for identifying the training needs of their personnel to enable appropriate training to be provided and will engage suitably qualified and experienced professionals for this purpose. The training will include site briefings and toolbox talks to equip relevant staff with the necessary level of knowledge on health, safety, community relations and environmental topics, and an ability to follow environmental control measures and to advise employees of changing circumstances as work progresses.

3.13 Communication

- 3.13.1 Regular communication must be maintained between representatives at all levels of the contract to ensure that everyone is fully aware of Scheme environmental issues. Communication methods must include inductions, toolbox talks, briefings, letters/memos/emails etc. and review meetings.
- 3.13.2 Prior to commencing work on site, all staff must be made aware of their environmental obligations, roles and responsibilities and any site restrictions/requirements through a site induction.
- 3.13.3 The Scheme Team will agree responsibilities for communication with statutory bodies, local residents/businesses and other members of the public that may be affected by construction activities.
- 3.13.4 Proactive communication with regulatory environmental bodies will be established to facilitate the efficient progression of the works. The EAD will liaise regularly with local authorities and their Environmental Health Departments. This is particularly important in the event that construction work outside of the standard site working hours is necessary.

- 3.13.5 The Contractor will appoint a Public Liaison Officer (“PLO”) who will be responsible with the Agency for leading consultation with affected communities, possibly through the production of newsletters.
- 3.13.6 The EAD will be the single point of contact for the regulatory authorities. The Contractor will provide the regulatory authorities with relevant contact details prior to the commencement of construction.
- 3.13.7 Section 4 provides further details about the approach that will be adhered to in respect of communication at a community engagement level.

3.14 Non-conformance and corrective action

- 3.14.1 The implementation of the final CEMP will be audited by the Contractor during the construction period. The audit programme and review process will be documented within the final CEMP.
- 3.14.2 Objectives will be used to check the effectiveness of key mitigation measures, identify and deal with any unforeseen impacts that arise, and maintain dialogue with relevant parties.

Evaluation of compliance

- 3.14.3 The objectives will be regularly monitored to ensure compliance with the Agency's policies and requirements. Scheme activities may also be audited for legislative and regulatory compliance, as required by the BS ISO EN 14001 standard.

Non-conformance procedures and environmental incidents

- 3.14.4 The Scheme Team will have established systems and procedures for responding to environmental incidents.
- 3.14.5 Two registers will be set up in the final CEMP as follows:
- a) a Non-Conformance & Corrective Action Register (which forms part of the Contractor’s Quality Procedures and is not exclusively for environmental issues); and
 - b) an Environmental Incidents Register.
- 3.14.6 The Non-Conformance & Corrective Action Register will detail:
- a) the date the non-conformance was identified;
 - b) a description of the non-conformance;
 - c) the implications of the non-conformance in terms of environmental impacts;

- d) a description of the elements of the environment affected by the impact (receptors);
- e) the corrective actions aimed at addressing the non-conformance;
- f) the persons responsible for implementing corrective actions; and
- g) the timeframe for implementation of corrective actions.

3.14.7 The Environmental Incidents Register will detail:

- a) the date that the environmental incident occurred;
- b) a description of the environmental incident situation;
- c) the impact of the environmental incidents;
- d) a description of the elements of the environment which have been subjected to impacts caused by environmental incidents (receptors);
- e) the actions to be implemented in response to the environmental incident;
- f) the person responsible for undertaking actions; and
- g) the timeframe for implementing actions.

3.15 Control of records

3.15.1 Copies of all environmental documentation relevant to the works will be filed on site, and made available for internal inspection, including:

- a) any written communication with the Environmental Regulator/competent body/consultee;
- b) waste transfer notes;
- c) hazardous waste consignment notes;
- d) monitoring/performance data (including audits);
- e) consents and licences required and obtained;
- f) survey records/reports;
- g) environmental risk assessments/impact assessments;
- h) incident and complaint records; and
- i) environmental training records (inductions etc.).

4 COMMUNICATION

4.1 Engaging with communities

- 4.1.1 The Agency will prepare a community engagement strategy for the construction stage of the Scheme that will provide the approach to community engagement and a step-by-step guide to the enquiries and complaints procedure.
- 4.1.2 The strategy will include procedures to:
- a) maintain effective community engagement throughout the construction period;
 - b) inform affected communities in advance of the relevant construction works;
 - c) inform affected communities in advance about the programme of the construction works; and
 - d) provide information on the enquiry and complaints procedures and how this is operated.
- 4.1.3 Ongoing and continuing community engagement will be undertaken through establishing structured stakeholder engagement boards and community focus groups for the project.
- 4.1.4 This strategy will be detailed within the final CEMP and will identify the local authorities, community groups, statutory and non-statutory bodies that may be affected by the works and how they will be consulted.
- 4.1.5 The strategy will include the following:
- a) details of regular meetings and public consultation events;
 - b) methods for consulting with the project team regarding any issues related to the construction works;
 - c) regular forums with the local authorities and local communities;
 - d) written records of all meetings/discussions held as well as the identification of how actions have been addressed; and
 - e) identification of how any issues identified have been incorporated in to the evolution of the final CEMP.

4.1.6 Meetings will be attended by the Agency and a Community Liaison Officer together with members of the Contractor's site team and local authorities as may be necessary to cover the matters to be discussed.

4.2 Community engagement requirements

4.2.1 During construction, a programme of high quality, effective and sustained communications will include:

- a) online – the Agency's website and other digital media including relevant links to its partners' and stakeholders' websites. These will be updated to reflect construction and community liaison requirements of the Scheme, and will include the following:
 - i. the latest information on the progress of the construction works;
 - ii. areas affected by construction;
 - iii. mitigation in place to reduce adverse effects of construction;
 - iv. information regarding planned construction works; and
 - v. road closures and works recently completed;
- b) newsletter – a Scheme newsletter will be issued on a regular basis and will provide information regarding construction progress and planned works;
- c) provision of information on progress of construction works –the relevant local authority, district councils, parish councils, councillors, constituency and regional members of Parliament and other relevant persons will be kept informed of the progress and effects of construction works;
- d) notification to local residents, businesses and parish councils and other key stakeholders– the Contractor will notify occupiers of nearby or affected properties, businesses and adjacent or affected parish councils a minimum of two weeks in advance of planned construction works that may affect them. The notification will provide details of the enquiries and complaints procedure developed in accordance with the requirements set-out below (at section 4.3). Information included in the notifications will include, as appropriate:
 - i. the location of the planned works;

- ii. the activities to be carried out;
- iii. the duration of the planned works and the periods within which works will be undertaken (i.e. whether during normal working hours, during the evening or overnight);
- iv. the anticipated effects of the planned works;
- v. the measures to be implemented in line with the final CEMP to mitigate the impact of the planned works; and
- vi. enquiries and complaints procedure – as described in section 4.3.

4.3 Enquiries and complaints procedure

4.3.1 The Agency's information line will be used to deal with enquiries and complaints from the public. This consists of a phone line, email and website contact facility. The information line is staffed by the Agency staff 24 hours a day, 7 days a week. The relevant contact number, email and website addresses for the information line will be displayed on signs around the construction site.

4.3.2 The system and procedure will:

- a) log enquiries and complaints in a register;
- b) deal with enquiries and complaints appropriately, recognising that they may be due to the effect of construction works on the interests of, and impacts on persons and their properties;
- c) pass on the enquiry or complaint to the correct person for review and appropriate action if the person recording it cannot do so;
- d) take appropriate action and response to enquiries or complaints; and
- e) outline the process for the employer's representative to review enquiries and complaints regularly to assess the adequacy, efficiency and effectiveness of the enquiries and complaints system and procedure and the measures being taken to respond to any enquiries or complaints.

4.3.3 The extent of the action taken will depend on the nature of the complaint. All complaints will be investigated to establish the cause of the complaint and whether the works comply with the Scheme's environmental requirements and other relevant requirements such as legislation, standards and codes of practice.

4.4 Internal communication

4.4.1 It will be the responsibility of the Contractor to ensure that the environmental issues and protocols related to the works are communicated to all staff, and that the staff on Site adhere to the contents of the final CEMP. It will be the responsibility of the Contractor to ensure that an appropriate communication matrix is implemented throughout the works for the Scheme. Prior to, and during, the works the Contractor will communicate to all personnel on site:

- a) site specific environmental information which all personnel should be aware of;
- b) details of the final CEMP and associated emergency response procedures;
- c) details of any pending/actual enforcement action; and
- d) any other specific environmental requirements relating to the site.

4.4.2 As the construction of the Scheme progresses, should updates be required to the final CEMP or any of its associated appendices, it will be the responsibility of the Contractor to provide the Client's Project Manager with any proposed amendments. In addition, the Contractor will also communicate any environmental incidents or issues associated with the environmental monitoring throughout the works.

4.4.3 Monthly contract review meetings will be undertaken, during these meetings the following will be reviewed:

- a) environmental requirements;
- b) objectives and targets for the works (including environmental) to ensure that targets are being met; and
- c) a review of all environmental incidents and any non-compliances, the purpose of which will be to ensure that appropriate actions have been undertaken to rectify these matters.

5 GENERAL SITE OPERATIONS

5.1 Introduction

5.1.1 The procedure dealt with in this section of the Outline CEMP addresses site management practices that should be employed throughout the works to ensure the safe and compliant operation of the Site and gives consideration of surrounding receptors in the general operation of the Site. The Contractor will be required to develop individual CEMPs to identify specific local requirements in relation to each local authority's area, for the construction compound sites and the main Scheme.

5.2 Licences and consents

5.2.1 The Contractor will seek to obtain consents from the relevant local authority where necessary under s61 of the Control of Pollution Act 1974 for the proposed construction works, excluding non-intrusive surveys. Applications will include details on proposed working hours.

5.2.2 Any conditions included in consents/licences/permits will be documented in the final CEMP and considered as part of the planning, design and construction process.

5.2.3 A copy of all relevant environmental applications and consents/authorisations is to be kept in a project environmental file and copies provided to The Agency of all applications and consents/authorisations as soon as practical after submission and receipt.

5.3 Site specific procedures

Committed mitigation measures

5.3.1 Procedures for material handling and storage on Site are specifically dealt with in section 11 of this Outline CEMP. Further information can be found on the waste management procedure (including the Site Waste Management Plan) in section 11.

5.3.2 Throughout the duration of the works the Contractor must identify best practices on a regular basis and submit to the Agency for consideration and wider circulation. Where best practice is identified the final CEMP and method statements will be updated to reflect any changes to site procedures.

5.4 Working hours

Core working hours

- 5.4.1 Core working hours will be from 08:00 to 19:00 on weekdays (excluding bank holidays) and from 07:00 to 16:00 on Saturdays. The Contractor will adhere to the core working hours for each site as far as is reasonably practicable.
- 5.4.2 Guidance on the site specific variations to core hours and/or additional hours likely to be required will be included within the final CEMP following consultation with the relevant local authorities.
- 5.4.3 Except in the case of an emergency, any work required to be undertaken outside core hours (not including repairs or maintenance) will be notified to the relevant local authorities prior to undertaking the works.
- 5.4.4 The majority of the works will be carried out during the daytime, although night-time works will be required.
- 5.4.5 Certain operations such as earthworks are season and weather dependent. In these instances the Contractor may extend the core working hours and/or days for such operations to take advantage of daylight hours.
- 5.4.6 Certain other specific construction activities will require extended working hours for reasons of engineering or environmental practicability. These activities include, but are not limited to surveys, e.g. for wildlife or engineering purposes which may need to be carried out outside of core working hours although given the nature of these works it is considered unlikely that they would affect surrounding receptors materially.
- 5.4.7 Repair or maintenance of construction equipment that is required to be carried out outside of core working hours will be confirmed by the Contractor and set-out within the final CEMP.
- 5.4.8 In the event that work is required either in response to an emergency or to prevent unsafe conditions or harm to staff, the general public or the environment, the relevant local authority will be informed as soon as reasonably practicable of the reasons for, and likely duration of, those works. The Contractor will maintain a log of all such instances within the final CEMP.

Start up and close down periods

- 5.4.9 To maximise productivity within the core hours, the Contractor will require a period of up to one hour before and up to one hour after normal core working hours for start-up and close down of activities. This will include but not be limited to deliveries, movement to place of work, unloading, maintenance and general preparation works.
- 5.4.10 These start up and close down periods will not include operation of plant or machinery likely to cause a disturbance to local residents or businesses. Further, these periods will not be used to otherwise extend core working hours.

Abnormal deliveries

- 5.4.11 Abnormal loads or those that require a police escort (e.g. delivery of prefabricated bridge beams or heavy plant) may be delivered outside core working hours.

5.5 Construction compound selection

- 5.5.1 Construction of the Scheme will require the establishment of a main office compound (c.5 ha) and several smaller section compounds (c.1ha each) to accept material deliveries, provide distribution of plant and equipment and provide office and welfare facilities for workers and a base for vehicle recovery.
- 5.5.2 These locations will need to be adjacent or proximate to the motorway or motorway junctions to allow easy access and egress from site. These locations are shown on the Works Plans.
- 5.5.3 Nine compounds sites have been identified as potentially suitable, provision for which has been included in the DCO. The actual sites to be used and the period they are required for will be selected by the Contractor on the basis of:
- a) location - A suitable compound location will be necessary to service the works in the local area. This minimises travelling time and associated carbon output (e.g. compound 5 is proposed as the proposed main compound due to the central location);

- b) construction schedule – Subject to development of the detailed construction programme, other than compound 5 (which is required for the full duration of the Scheme), other compounds may only be required for part of the overall construction period (while the works in the adjacent area are undertaken);
- c) access – some of the compounds have previously been used as construction compounds or are contiguous with the M4. Once appointed, the Contractor will discuss access details with the relevant local authorities with the aim of securing suitable safe access routes and minimising traffic flows on local roads where practicable;
- d) specific issues – Part of the area identified for Compound 3 has planning permission for development as a park and ride facility. Therefore its use will be subject to consultation with Wokingham and Reading Councils (subject to not creating an unacceptable effect on the park and ride scheme); and
- e) environmental issues – Consideration of environmental impact of proposed sites (e.g. presence and maintenance of any sensitive ecology).

5.6 Construction site layout and appearance

5.6.1 Prior to development being undertaken the Contractor will provide method statements to the relevant local authorities. The method statements will provide for:

- a) the parking of vehicles of site operatives and visitors;
- b) loading and unloading of plant and materials;
- c) storage of plant and materials used in constructing the development;
- d) the erection and maintenance of security hoarding including decorative displays and facilities for public viewing, where appropriate;
- e) wheel washing facilities;
- f) measures to control the emission of dust and dirt during construction (see Section 6 of this Outline CEMP); and

- g) a scheme for recycling/disposing of waste resulting from demolition and construction works.

5.6.2 To reduce the likelihood of either an environmental incident or nuisance occurring the following measures will be used, where relevant:

- a) prohibition of open fires, and a requirement to take preventative measures to reduce the likelihood of fires;
- b) removal or stopping and sealing of drains and sewers taken out of use;
- c) no discharge of site runoff to ditches, watercourses, drains, sewers or soakaways without consultation with the appropriate authority;
- d) maintenance of wheel washing facilities or other containment measures;
- e) provision of dust suppression facilities where required;
- f) location of storage, machinery, equipment and temporary buildings to reduce environmental effects and where practicable, outside flood risk areas;
- g) use of modern well maintained plant;
- h) the use of modern specification noise alarms that meet the particular safety requirements of the site, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- i) controls on lighting/illumination to reduce visual intrusion or any adverse effect on sensitive ecology;
- j) the location of site accommodation to avoid overlooking residential property;
- k) containing and limiting visual intrusion of construction sites, as far as reasonably practicable;
- l) provision of maps showing sensitive areas and buffer zones where no pollutants are to be stored or used;
- m) where reasonably practicable, maintenance of public rights of way (including diversions) for pedestrians, cyclists and equestrians affected by the Scheme, including reasonable adjustments to maintain or achieve inclusive access;

- n) adequate welfare facilities for staff; and
- o) smoking areas at site offices/compounds or work sites equipped with containers for smoking wastes - these would not be located at the boundary of working areas or adjacent to neighbouring land.

5.6.3 In addition to the general measures for construction sites set-out above the following additional restrictions are placed on specific compound sites:

- a) use of one way systems within compound areas to minimise reversing noise;
- b) Scheme inductions/briefing for all personnel to include specific consideration of both night work and working in compounds during all to minimise disturbance to adjacent residents; and
- c) agreement of fencing provision at each compound with local authorities giving consideration to the proximity of local residents.

5.6.4 Prior to the commencement of construction full details of all plant to be used, including manufacturers' specifications, will be discussed with the relevant local authorities.

Unexploded ordnance

5.6.5 The Contractor will raise awareness of hazards from unexploded ordnance ("UXO") through the site induction process and toolbox talks. This would assist in establishing appropriate actions to take in the event that a suspect item is uncovered.

5.6.6 Should the Contractor consider it likely that UXO could be encountered during the works an emergency response procedure will be prepared in accordance with Unexploded ordnance, A guide for the construction industry CIRIA C681 (CIRIA, 2009) as part of the final CEMP and implemented by the Contractor to respond to any discovery of UXO. This emergency response procedure will include notifications to the relevant local authorities and emergency services.

Lighting

- 5.6.7 Site lighting and signage will be provided by Contractor to enable the safety and security of the construction sites. Lighting will also be designed, positioned and directed so as not to intrude unnecessarily on adjacent buildings, ecological receptors, structures used by protected species and other land uses to prevent unnecessary disturbance, interference with local residents, railway operations, or passing motorists. This provision will apply particularly to sites where night working will be required. In addition, at construction sites where potentially significant impacts are identified, the Contractor will develop and implement lighting controls as part of their EMS.
- 5.6.8 Where appropriate, lighting to site boundaries will be provided and illumination will be sufficient to provide a safe route for the passing public. Motion sensor lighting will be used where appropriate to prevent unnecessary usage. The final lighting scheme to be implemented by the Contractor will be required to comply with the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01 (2011) and the provisions of BS 5489, Code of Practice for the Design of Road Lighting (BSI, 2013a), where applicable.

Temporary site accommodation and welfare facilities

- 5.6.9 Accommodation, offices, welfare (canteen and washing facilities), fleet parking and storage depots are planned to be located within compounds. The locations of these will be confirmed once the Contractor has been appointed and site location plans included within the final CEMP.

Occupational healthcare

- 5.6.10 The Contractor will ensure there is provision for either access to on-site or near site occupational healthcare in relevant locations.

Security

- 5.6.11 Construction worksites will be under the control of the Contractor, who has a statutory duty to prevent unauthorised access to the site. The Contractor will carry out site specific assessments of the security and trespass risk at each site and implement appropriate control measures.

- 5.6.12 The measures may be used by the Contractor to prevent unauthorised access to the site, include:
- a) use of high perimeter fencing or hoarding but only where necessary for site security and public safety;
 - b) lighting at site perimeters (designed as per the lighting specification set out above);
 - c) security guards and patrols;
 - d) CCTV and infrared surveillance and alarm systems where required;
 - e) communications initiatives for local schools to warn of dangers;
 - f) consultation with neighbours on site security matters;
 - g) consultation with local crime prevention officers on security proposals for each site with regular liaison to review security effectiveness and response to incidents; and
 - h) immobilisation of plant out of hours, removing or securing hazardous materials from site, securing fuel storage containers and preventing unauthorised use of scaffolding to gain access to restricted areas and neighbouring properties.

5.7 Pollution incident control and emergency preparedness

Pollution prevention measures

- 5.7.1 The Contractor will develop method statements and implement appropriate measures (see paragraph 5.8.5 below) to control the risk of pollution due to construction works, materials and extreme weather events.
- 5.7.2 In particular, the following measures will be adopted to manage the risk of pollution incidents:
- a) provision of maps showing the locations, together with address and contact details, of local emergency services facilities such as police stations, fire authorities, medical facilities and other relevant authorities;
 - b) ensure that site drainage plans and flood risk management plans are available on site and are kept up-to-date;
 - c) statement of appropriate information which will be held on site and to be provided immediately in the event of any incident such as a spillage or release of a potentially hazardous material;

- d) ensure staff competence and awareness in implementing plans and using pollution response kit through toolbox talks, site training and induction;
- e) provision of contact details for the relevant authorities, such as the EA, and the persons responsible on the construction site and within the Contractor organisation for pollution incident response;
- f) provision of contacts with a competent spill response company which can be contacted at short notice for an immediate response;
- g) notification of relevant statutory bodies, environmental regulatory bodies, local authorities and local water and sewer providers of pollution incidents, where required; and
- h) notification of appropriate emergency services, authorities and personnel on the construction site.

5.7.3 The Contractor must have established systems and procedures for responding to environmental incidents. Within the final CEMP two registers will be set up as follows:

- a) a Non-Conformance & Corrective Action Register (which forms part of the Contractor's Quality Procedures and is not exclusively for environmental issues); and
- b) an Environmental Incidents Register.

5.7.4 The registers will include a pollution incident control plan, as part of the final CEMP, which recognises the risk of pollution from construction activities and presents pro-active management practices to ensure that any pollution incident that may occur, such as a diesel spillage, is minimised, controlled, reported to relevant parties and remediated. The plan will define the criteria for implementing the relevant measures.

5.7.5 The plan must comply with industry best practice guidance, including the EA's Pollution Prevention Guidelines and CIRIA Environmental good practice – site guide.

5.7.6 In the preparation of local pollution incident response measures, the Contractor will consult with relevant organisations, including, but not limited to, statutory bodies and other relevant parties, such as the Health and Safety Executive (“HSE”) (Construction), the Fire Authority, the Ambulance Service, the EA, NE, utilities companies and the respective local authorities. The EA Pollution Prevention Guidelines 21 (Incident Response Planning), 2014 will also be utilised in the preparation of these response measures.

5.7.7 A spill response plan, which all staff are made aware of, will be implemented in the event of an environmental incident

Monitoring

5.7.8 The Contractor will prepare a schedule of monitoring requirements for inclusion within the final CEMP. This will include, but not be limited to, routine site inspections and environmental monitoring such as noise or archaeological watching brief.

5.7.9 The Contractor will put in place arrangements to investigate and provide reports on any potential or actual significant pollution incidents, including, as appropriate:

- a) a description of the pollution incident, including its location (and Ordnance Survey (“OS”) grid reference), the type and quantity of contaminant and the likely receptors;
- b) contributory causes;
- c) adverse effects;
- d) measures implemented to mitigate adverse effects; and
- e) any recommendations to reduce the risk of incidents occurring.

Emergency preparedness

5.7.10 The Contractor will develop an emergency preparedness and response plan for inclusion within the final CEMP to cover accidents on site, environmental hazards (flooding, heavy rain, high winds), and other risks to health and safety that may occur on site.

- 5.7.11 The emergency response procedures will be standardised as far as practicable across the various work sites and will be appropriate to the anticipated hazards and the specific layout. If specific local circumstances are identified these will be highlighted within the appropriate CEMPs in addition to the main emergency response procedures. The emergency procedures will be produced in consultation with the emergency services
- 5.7.12 The appropriate incident response equipment will be detailed within the final CEMP and will be available next to particularly sensitive activities or areas of a site (such as fuel storage areas).
- 5.7.13 Emergency procedures will contain emergency phone numbers and the method of notifying statutory authorities. Contact numbers for the key staff of the Contractor will also be included.

Emergency access

- 5.7.14 The Contractor will ensure that the requirements of the relevant fire authority will be followed for the provision of site access points. The accesses may vary over time and will be updated as required, and should also be suitable for emergency services.

Fire prevention and control

- 5.7.15 The Contractor will ensure that appropriate plans and management controls are in place for all construction sites, associated accommodation and health and safety welfare facilities, with the aim of preventing fires.

5.8 Site documentation

- 5.8.1 Copies of the following documents will be held on site:
- a) the DCO (at all times);
 - b) the final CEMP (at all times);
 - c) any licence required (throughout the ground investigation works);
 - d) travel plan;
 - e) stakeholder communication plan
 - f) the pollution spillage response plans and all site emergency procedures (at all times); and
 - g) staff training records (at all times).

6 AIR QUALITY

6.1 Introduction

- 6.1.1 This procedure set-out in this section of the Outline CEMP applies to the management of emissions to the atmosphere during the construction of the Scheme. All staff are responsible for complying with the requirements of the procedure. Typical emissions arising from plant operating during construction works and from vehicles going to and from the site would have the potential to contribute to local levels of air pollution, particularly nitrogen dioxide ("NO₂"), carbon dioxide ("CO₂") and particles measuring 10µm or less ("PM₁₀").
- 6.1.2 Dust nuisance has the potential to occur more readily during prolonged dry weather and times of strong winds. Dust becomes more difficult to suppress once it is airborne and consequently, good site management during the construction period will be required to include the ability to respond quickly to such conditions in order to minimise potential nuisance impacts.

6.2 Standard mitigation measures

- 6.2.1 Standard mitigation measures, as listed in this section, will be applied at works along the entire Scheme route, at all construction compounds and for all overbridge and underbridge works. The Contractor will:

General mitigation measures

- a) develop and implement a series of dust management measures and monitoring measures. Monitoring may include monitoring of dust deposition, dust flux, real-time PM₁₀ continuous monitoring and/or visual inspections;
- b) undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results and complaint resolution, and make the log available to the local authority etc. when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary;
- c) fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;

- d) keep site fencing, barriers and scaffolding clean using wet methods where there is the risk of dust accumulation;
- e) remove materials that have the 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;
- f) cover, seed or fence stockpiles to prevent wind whipping;
- g) avoid excessively steep slopes on stockpiles to avoid material slippage and wind whipping;
- h) materials handling areas will be maintained to the minimum required area to constrain dust emissions;
- i) impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph 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);
- j) all vehicles and plant should be well maintained and regularly serviced according to manufacturers' recommendations;
- k) ensure all vehicles switch off engines when stationary - no idling vehicles;
- l) all construction plant should use fuel equivalent to ultra low sulphur diesel ("ULSD") where possible;
- m) where possible, haul routes should be located away from off-site sensitive properties and watered regularly;
- n) all construction plant will be operated in accordance with the manufacturer's written recommendations;
- o) vehicle and construction plant exhausts should be directed away from the ground and be positioned at a height to facilitate appropriate dispersal of exhaust emissions where possible;
- p) the movement of construction traffic around the site will be kept to the minimum reasonable for the effective and efficient operation of the site and construction of the Scheme;
- q) site access points will be designed to avoid queuing traffic; and

- r) 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.

Demolition measures

See paragraph 6.3.4 of this Outline CEMP for demolition mitigation measures.

Earthworks measures

- a) re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- b) use hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable;
- c) only remove the cover in small areas during work and not all at once; and
- d) compacting deposited materials, with the exception of topsoil, as soon as possible after deposition.

Surfacing measures

- a) surfacing equipment (e.g. planer) only to be operated with any manufacturers dust abatement measures in place.

Construction measures

- a) avoid scabbling (roughening of concrete surfaces) if possible;
- b) 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; and
- c) where drilling is used for the purposes of excavating within rock, the exposed surfaces will be watered to limit dust emissions as necessary.

Trackout measures

- a) use water-assisted dust sweeper(s) on access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- b) avoid dry sweeping of large areas;
- c) ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;

- d) record all inspections of haul routes and any subsequent action in a site log book; and
- e) implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) where reasonably practicable.

6.3 Additional mitigation measures

6.3.1 Where standard mitigation measures may not be sufficient to minimise emissions of dust alone, additional mitigation measures, as set out below, will be required.

6.3.2 Sites considered to be higher risk, and therefore requiring the application of additional mitigation measures are those with sensitive receptors (residential properties and allotment gardens) close to the works (i.e. within 200m). In particular, additional mitigation measures are proposed for all overbridge and underbridge works and higher risk construction compounds.

6.3.3 Those construction compound locations that will require additional mitigation measures are as follows:

- a) construction compound 2;
- b) construction compound 3;
- c) construction compound 4;
- d) construction compound 5;
- e) construction compound 6;
- f) construction compound 8; and
- g) construction compound 9.

6.3.4 The additional mitigation measures to be undertaken in relation to these bridge works and compounds by the Contractor are as follows:

Communication measures

- a) develop and implement a stakeholder communications plan that includes community engagement before work commences on site;

- b) display the name and contact details of person(s) accountable for air quality and dust issues on the construction compound site boundaries. This may be the environment manager/engineer or the site manager. Duties will include provision of vehicle, plant and equipment maintenance records, which can be viewed on request; and
- c) display the head or regional office contact information.

General mitigation measures

- a) 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;
- b) make the complaints log available to the local authority etc. as soon as reasonably practicable;
- c) record any exceptional incidents that cause dust and/or air emissions, either on-site or offsite, and the action taken to resolve the situation in the log book;
- d) hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. In particular, it is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes;
- e) carry out regular site inspections to monitor the effectiveness of mitigation measures, record inspection results, and make an inspection log available to the local authority etc. promptly upon request;
- f) 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;
- g) undertake dust deposition, dust flux, or real-time PM₁₀ continuous monitoring. Wherever 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;

- h) plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- i) erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site;
- j) avoid site runoff of water or mud;
- k) ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, within Greater London;
- l) avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable;
- m) manage the sustainable delivery of goods and materials through careful programming of delivery and removal of materials;
- n) implement a travel plan that supports and encourages sustainable travel (e.g. public transport, cycling, walking, and car-sharing);
- o) on plant likely to generate excessive quantities of dust (e.g. screening or crushing equipment) enclosing, shielding or provision of filters will be employed. Items such as dust extractors, filters and collectors on drilling rigs and silos will be used;
- p) 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);
- q) ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- r) use enclosed chutes and conveyors and covered skips;
- s) minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- t) avoid bonfires and burning of waste materials.

Demolition measures

- a) 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;
- b) avoid explosive blasting where possible, using appropriate manual or mechanical alternatives; and
- c) comply with measures set out in the Outline Scheme Asbestos Management Plan (Annex D)

Construction measures

- a) ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- b) for smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

Trackout measures

- a) maintain and inspect on-site haul routes for integrity and operate a program of routine maintenance and where necessary carry out area specific repairs to the surface as soon as reasonably practicable;
- b) install hard surfaced haul routes if possible, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- c) ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site entrances and exits, wherever site size and layout permits;
- d) in locations without hard standing it may also be necessary to clean the vehicle bodies in addition to wheels; and
- e) access gates to be located at least 10m from receptors where possible.

6.4 Monitoring

6.4.1 Throughout the works the Contractor must implement inspection and monitoring procedures to assess the effectiveness of measures to prevent dust and air pollutant emissions. The relevant local authorities will be consulted regarding the monitoring procedures to be implemented which will include the following measures, as appropriate:

- a) regular site inspections covering the establishment of operation of the construction site;
- b) inspection procedures for areas adjacent to the construction site to visually assess any dust and air pollution which may be generated;
- c) reference to inspection and maintenance schedules for construction vehicles, plant and machinery; and
- d) inspection procedures relating to the level of trafficking, use and condition of haul routes.

6.4.2 Monitoring may also be required around sites using dust deposition, dust flux, real-time PM₁₀ continuous monitoring.

6.4.3 Monitoring, together with provisions for any corrective action required will be documented by the Contractor and records of monitoring will be held on site.

6.5 Site documentation

In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:

- a) copies of the EAD Daily Log Reports;
- b) log of complaints in relation to dust with the identified source and details of corrective action taken; and
- c) plant inspection, maintenance and defect reports.

7 CULTURAL HERITAGE

7.1 Introduction

7.1.1 The objective of this section of the Outline CEMP is to ensure that all construction works are carried out in such a way as to avoid or minimise potential damage and disturbance to archaeological sites and deposits.

7.2 Cultural heritage general provisions

7.2.1 The Contractor will manage the impact of construction works on cultural heritage assets, including:

- a) designated assets - scheduled monuments; listed buildings; registered parks and gardens; conservation areas and registered historic battlefields; and
- b) undesignated assets - archaeological and palaeoenvironmental remains including geological deposits that may contain evidence of the human past, historic landscapes, historic buildings and the built environment (this includes locally designated assets).

7.2.2 General management measures for cultural heritage assets include:

- a) potential impacts to any sub-surface archaeological remains will be mitigated by maintaining archaeological watching briefs during topsoil stripping and excavations into previously undisturbed ground during the construction phase. The archaeological watching brief should be followed by an appropriate programme of assessment, analysis and reporting;
- b) provision to the Contractor of locations and descriptions of all known cultural heritage assets within and adjacent to construction works;
- c) a programme detailing the implementation of cultural heritage investigation works prior to and during construction;
- d) the Contractor will monitor compliance against the above programme of cultural heritage investigation works using appropriately qualified environmental management staff;

- e) during all stages, the Contractor will facilitate archaeological and built heritage specialists undertaking the cultural heritage investigation works (including purposive investigation);
- f) all cultural heritage intervention, recording, analysis, dissemination and archiving will be undertaken by suitably qualified and demonstrably experienced persons in accordance with an approved Written Scheme of Investigation (“WSI”), the production of which will be attached as a requirement of the DCO; and
- g) consultation through all stages of the implementation of the programme of cultural heritage investigation works, including final publication and archiving, by Contractor with the relevant local authority archaeologist and EH (where appropriate).

7.3 Heritage assets

7.3.1 Suitable Scheme-wide measures and procedures, to be developed by the Contractor in consultation with EH (where appropriate), and the relevant local authorities, will include the following, as appropriate:

- a) the Contractor will develop procedures for topsoil stripping and excavation before commencement of such works and the interface of those works with archaeological investigations, including procedures to be adopted in the event of a potentially nationally significant unanticipated discovery or disturbance of significant archaeological remains;
- b) procedures adopted to preserve archaeological remains in situ beneath earthworks; and
- c) if unknown archaeological assets, such as buried remains or artefacts, are exposed during the course of construction, these will immediately be reported to the Contractor’s project manager and a procedure for the discovery of unexpected assets will be implemented, including informing the relevant local authority archaeologist.

Metal detectors

7.3.2 During site preparation and construction the use of metal detectors will be prohibited within areas of identified/defined archaeological interest unless deployed by the Contractor's archaeological specialists or other appointed persons in the execution of their activities.

Human remains

- 7.3.3 Should human remains be located during construction either during archaeological works or as part of construction activity, the Contractor will comply with all relevant legislative requirements and record the discovery of any such remains.
- 7.3.4 The removal of human remains will be undertaken in accordance with the Burial Act 1857 and an exhumation licence obtained from the Ministry of Justice (“MoJ”) prior to the removal of any remains. Excavation of human remains will consider guidance contained in Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England (English Heritage and the Church of England, 2005).

Treasure Act

- 7.3.5 Should artefacts be located during the course of construction that are deemed by their material content or context to be treasure, as defined by the Treasure Act 1996, then all necessary measures to comply with the requirements of the Act, including reporting such finds, and any project specific requirements will be implemented by the Contractor.

Written Scheme of investigation

- 7.3.6 A Scheme-wide WSI will be prepared by the Contractor in advance of site preparation and construction, in consultation with the relevant local authority and EH (where appropriate). This document will detail the principles, standards, methods and techniques to be employed on the project for cultural heritage investigation works.
- 7.3.7 All cultural heritage works will be undertaken in accordance with the WSI.
- 7.3.8 A site specific WSI will be developed by the Contractor for each area or site-specific cultural heritage works. These documents will be developed in consultation with the relevant local authority and EH (where appropriate).
- 7.3.9 All cultural heritage investigation works will be undertaken in accordance with the generic and site specific WSIs.

Construction compound 5

- 7.3.10 A programme of archaeological work, including a WSI is to be prepared in relation to construction compound 5, pursuant to a requirement in the DCO. The WSI will include:
- a) a programme and methodology of site investigation and recording;

- b) a programme for post investigation assessment;
- c) provision for analysis of the site investigation recording;
- d) provision for publication and dissemination of the analysis and records of the site investigation;
- e) provision to be made for archive deposition of the analysis and records of the site investigation; and
- f) nomination of a competent person or persons/organisation to undertake the works set out within the WSI.

7.4 Measures in the event of unexpected discoveries of national significance

7.4.1 In case unexpected cultural heritage assets of potential national significance be identified during construction, a procedure for dealing with the assets will be agreed by the Contractor with EH and the relevant local authority and implemented. Mitigation may include the following, as appropriate:

- a) investigation and assessment of discoveries to determine their significance if this cannot be determined from the asset as found;
- b) assessment of potential project impacts to inform design of appropriate mitigation measures;
- c) preparation of a WSI for any stage of archaeological work required;
- d) excavation, recording and reporting on any discoveries; and
- e) recording and implementing measures to preserve any discoveries in situ, if required or if appropriate.

7.5 Mitigation of potential impacts on cultural heritage assets

7.5.1 Given the location of proposed construction compound 5 in the vicinity of the Mesolithic site at Bray, a scheduled monument, there is some potential for unknown archaeological remains to be present. Geophysical survey and archaeological evaluation trenching will be undertaken prior to establishment of this construction compound. Once the nature and extent of the actual archaeological remains are established it will be possible to finalise mitigation impacts to any archaeological remains present in the area by designing the compound over or around the remains, or recording them via archaeological excavation, or a combination of the two.

7.5.2 The following features are located in the vicinity of known archaeological remains:

- a) gantries G8-20, G8-17, G8-11, G8-09 and G8-05;
- b) gantries G6-20 to G6-08 and the widening of the junction 8/9 slip roads and Monkey Island overbridge;
- c) gantries G5-10 to G5-02 and the widening at junctions 7 and 6, Oldway Lane overbridge and Wood Lane overbridge;
- d) gantries G4-18 to G4-02, Windsor Branch Railway underbridge, Datchet Road overbridge, Recreation Ground overbridge and construction compounds 7 and 8;
- e) gantries G3-01 to G2-01 and the widening of the junction 4 slip roads;
- f) gantries G1-12 to G1-01 and the widening of the junction 4 slip roads;
- g) gantries G9-14 to G9-02 and the widening of the westbound junction 11 slip road and construction compounds 2 and 3; and
- h) gantries G7-29 to G7-23, G7-07 to G7-06 and the proposed widening of the junction 8/9 slip roads, and construction compound 4.

7.5.3 In these locations there is potential for the Scheme to cause direct physical impacts to currently unknown archaeological remains. If such works are likely to disturb previously un-excavated ground, archaeological watching briefs will be undertaken during topsoil stripping and excavations. Any archaeological watching briefs will be followed by an appropriate programme of assessment, analysis and reporting. This will be secured by a requirement attached to the proposed DCO.

7.5.4 The Contractor will provide appropriate fencing and hoarding as may be necessary to protect cultural heritage assets and their amenity within or adjacent to the construction site, including unknown sites discovered during construction.

- 7.5.5 If archaeological investigations or works to protect cultural heritage features are required on land which is to be occupied temporarily or land adjacent to the construction site/compounds, the owners and occupiers of that land, and the relevant local authority (where appropriate) will be consulted by the Contractor in advance of the works being undertaken.
- 7.5.6 The Contractor will implement appropriate watching briefs and archaeological monitoring during construction works adjacent to sites of archaeological or cultural heritage interest and during topsoil stripping.
- 7.5.7 The nature, extent and frequency of monitoring will be appropriate and determined in consultation with the local authority archaeologist and EH (where appropriate), taking into consideration the nature of the planned construction works and proximity of the relevant site.

7.6 Monitoring

- 7.6.1 The Contractor will implement appropriate monitoring of the consequences of construction work on all cultural heritage assets (designated and non-designated) to ensure the effectiveness of management.

7.7 Site documentation

- 7.7.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:
- a) records of all archaeological remains found and copies of any mitigation measures determined in consultation with the local authority archaeologists and/or EH throughout the works.

8 LANDSCAPE

8.1 Introduction

8.1.1 This section of the Outline CEMP provides information and advice regarding the landscape management and maintenance of landscape reinstatement works associated with the M4 junction 3 to 12 Scheme.

8.2 Site specific procedures

8.2.1 The procedures and mitigations outlined below intend to minimise the landscape impact of the works and to set out the procedures that will be followed during the construction of the Scheme and its subsequent restoration. The procedures addressed incorporate best practice measures for the protection of the landscape and visual receptors.

8.3 Landscape management – general provisions

8.3.1 The final CEMP will be required to include specific measures to reduce the impacts of the construction works at particular locations. In particular, measures will be included to minimise visual intrusion e.g. the retention and protection of perimeter vegetation, the creation of buffer zones, the use of temporary earth mounding from excavated soil within the compound area and the installation of solid timber hoarding around the perimeter of the compounds. A number of construction mitigation measures will be provided for the duration of the construction works, while others will be permanent.

8.3.2 Appropriate controls will be required to be put in place by the Contractor to protect landscape and visual amenity from construction activities. Controls will include, as appropriate:

- a) in order to mitigate against deterioration in landscape character and views resulting from operation, planting proposals will be prepared at detailed design, based on the proposals outlined on the Environmental Masterplan (“EM”) drawings (Document Reference 7.4, Annex A, sheets 1 to 31);

- b) areas of existing vegetation to be retained and protected for the duration of the construction phase have also been identified within the EM drawings and Appendix 8.4 of Document Reference 6.3 (ES Appendices);
- c) at detail design the designer will prepare, at a suitable scale, a plan showing areas of existing trees and vegetation to be retained within the Order limits. The plan will also show the respective root protection zone and protection measures for the retained vegetation as well as identifying the existing vegetation to be removed. All vegetation which is to be removed, up to the Order limits, is indicated on the site clearance drawing (Document Reference 7.4, Annex A,);
- d) involvement of an arboricultural and/or ecological specialist as required, in relation to vegetation clearance, tree works and the creation of new wildlife habitats;
- e) provision of appropriate temporary protective fencing to reduce the risks associated with vehicles trafficking and/or material stock piles and other temporary works over root systems or beneath tree canopies;
- f) at detailed design the designer will prepare, at a suitable scale, landscape planting plans showing the replacement tree and shrub planting plots and grass seeding areas for the Scheme. This will include for each planting plot a schedule of plant species, the percentage mixes, plant sizes, planting density and planting quantities. For grassland areas this should include the quantity and sowing rates for the seed mixes to be used. The planting plans will be accompanied with a planting specification which will include details of tree, shrub and grass seed provenance and the details of the plant suppliers to be used;
- g) a programme and specification for undertaking all forms of landscape works;
- h) protection of existing and new areas of planting and other vegetation;
- i) inspection, maintenance and management of existing and new landscape areas;

- j) prevention of damage to the landscape and landscape features adjacent to the construction site by movement of construction vehicles and machinery;
- k) adoption of other procedures set out in this Outline CEMP so far as they are relevant for the protection of the landscape;
- l) provision of suitably qualified and experienced specialists in landscape management with specific responsibility for monitoring and supervising landscape works and maintenance (i.e. works in relation to the clearance of vegetation, topsoil and subsoil stripping, handling, storage and replacement, works to trees, seeding, protective fencing, planting creation of new wildlife habitats, and subsequent maintenance); and
- m) the use of well-maintained temporary unpainted solid timber hoardings without Contractor's logo.

8.3.3 The detailed landscape design for the Scheme, and in particular the choice of suitable species for the new planting areas, will take into account the requirements of the BAA/CAA birdstrike avoidance team.

8.3.4 At construction compound 3 (located at the south west edge of Reading (Calcot), east of the A4 Bath Road), construction compound 5 (located on the west side of the A330 Ascot Road) and construction compound 9 (located at the south east edge of Brands Hill, north of the A4 Colnbrook Bypass), the perimeter vegetation between the adjacent residential properties and the A4 Bath Road/A330 Ascot Road/A4 Colnbrook Bypass and the perimeter of the site will need to be retained and protected in accordance with BS5387: Trees in relation to design, demolition and construction – Recommendations. These measures will apply during the lifetime of these Compounds. In developing the layout for and operating these compounds the Contractor will be required to ensure there is minimal disruption on the adjacent residential properties. It is proposed that the Contractor will establish a storage area for the topsoil stripped from the site to be located along the east and north edge of the site to provide a buffer to the adjacent properties. It will be necessary to ensure that such a storage area does not adversely affect the root protection zone of the adjacent retained vegetation.

8.3.5 The height of the offices, workshops, plant and storage elements within construction compounds 3 and 9 will need to be limited to no more than

3m in height to ensure minimal visual disruption on the adjacent residential properties. The uses within these compound will also need to be limited such as no concrete batching plant will be allowed.

8.4 Mitigation of potential impacts on the landscape or landscape resources

- 8.4.1 Locations for landscape measures will be detailed in the final CEMP, and will ensure the protection and mitigation of adverse effects on sensitive and valued landscape features and characteristics.
- 8.4.2 A record of how the implementation of the works meets control measures, relevant to protection of the landscape and key landscape features, will be maintained and regularly reviewed by the Contractor.
- 8.4.3 Relevant local authorities (Wokingham District Council, Royal Borough of Windsor and Maidenhead, Bracknell Forest Council, South Bucks District Council, Slough Borough Council and London Borough of Hillingdon), NE and other statutory bodies that have an interest and adjacent landowners will be consulted regarding the landscape and planting proposals.
- 8.4.4 Access to the construction site will be controlled in accordance with the requirements of the Outline CTMP (refer to Annex E). Potential impacts on trees or other mature vegetation will be retained in order to avoid any additional impacts, when positioning site access and egress points.
- 8.4.5 Reusable excavated material will be handled in an appropriate manner to ensure it is of sufficient quality to be used for either structural embankments, environmental mitigation earthworks or agreed third party use. Appropriate construction good practice in handling all material re-use will be followed, and controls set out in section 11 of this Outline CEMP will apply.
- 8.4.6 The procedures set out in section 11 of this Outline CEMP relating to the handling of soils will be applied equally in relation to soils used in areas to be seeded or planted. The sourcing, testing, stripping, handling, storage and spreading of site-won and imported topsoil will comply with BS 6031: 2009 Code of practice for earthworks (BSI, 2009). Further, imported topsoil will comply with the BS 3882: 2007 Specification for topsoil and requirements for use (BSI, 2007).
- 8.4.7 The following measures will be implemented by the Contractor:
- a) compliance with the requirements of section 9 in relation to

- preventing the spread of invasive and non-native species;
- b) avoidance of unnecessary tree and vegetation removal and protection of existing trees in accordance with BS5837:2012 Trees in relation to design, demolition and construction (BSI, 2012);
- c) compliance with the requirements of National Highways Sector Scheme for Landscape and Ecology (NHSS18);
- d) protection of habitat areas and ecological features;
- e) procurement, movement, handling, storage, planting and maintenance of plant material will be carried out in accordance with BS 3936 - 1: 1992 Nursery stock (BSI, 1992). Specification for trees and shrubs; and
- f) maximising use and recycling of plant material salvaged during enabling works, and of plant material propagated from flora on the site prior to commencement of the works.

8.4.8 In order to ensure the replacement tree and shrub areas establish as intended the Contractor is required to maintain this planting for a five year period from the date of completion of the works. As part of this requirement the Contractor will be responsible for rectifying all planting defects during this period. This will be carried out on an annual basis.

8.4.9 Planting, seeding, wildflower seeding and other landscape works by the Contractor will comply with the recommendations of the latest British Standards, BS4428: 1989 Code of practice for general landscape operations - excluding hard surfaces (BSI, 1989).

8.4.10 The protection of habitats and ecological features will be integrated by the Contractor with the landscape works and will adhere to the requirements of BS 42020:2013 Biodiversity. Code of practice for planning and development (BSI, 2013). For further details of habitats and ecological features to be protected reference should be made to section 9 of this Outline CEMP.

8.5 Protection of trees

- 8.5.1 The Contractor will employ an arboricultural consultant to oversee works relating to the protection of trees. The locations for the existing vegetation to be protected within the Order limits are identified in Appendix 8.4 of the ES. The Scheme also includes locations where there are trees within the Order limits or which lie immediately adjacent to it, which are covered by Tree Protection Order (“TPO”) or are within a Conservation Area. The protection of these trees also refers to the protection of the trees root system. A schedule of the TPOs is provided in Schedule 9 of the DCO.
- 8.5.2 The Contractor must identify, retain and protect the areas of vegetation identified in Appendix 8.4 and the trees covered by TPO or that lie within Conservation Areas throughout the construction phase. In doing so, the Contractor is required to employ the services of an arboriculturalist to carry out a tree survey and report in accordance with BS5387: 2012 Trees. This survey will identify all the trees covered by a TPO, as well as those within Conservation Areas, including those trees located outside the Order limits but which have root systems that are likely to extend into the area covered by the Order limits. The tree survey is required to identify the full root zone of these trees and to provide measures to protect the roots and the tree for the duration of the construction work.
- 8.5.3 Where it is not possible to retain the vegetation or full tree, consideration will be given to coppicing the vegetation/tree. This will involve cutting the tree back to the base, allowing the new shoots to establish. The coppiced stool and new growth will then be protected during the construction period.
- 8.5.4 The Contractor will protect trees in line with the recommendations in *BS5837:2012 Trees in relation to design, demolition and construction* (BSI, 2012). Trees will be considered to be those covered by BS5837 with stem diameter greater than 75mm measured at 1.5m above ground level. The trees to be protected will be identified by the Contractor’s arboricultural consultant.
- 8.5.5 Measures to protect trees will be determined by the Contractor prior to implementation, including the following, as appropriate:
- a) provision of appropriate protective fencing to reduce the risks associated with vehicles trafficking over root systems or beneath canopies;
 - b) measures to prevent compression of soils;

- c) maintenance of vegetation buffer strips, where practicable; and
 - d) procedures for the selective removal of lower branches to reduce the risk of damage by construction plant and vehicles.
- 8.5.6 Any tree surgery operations will comply with the recommendations in BS 3998: 2010 Tree work - Recommendations, as appropriate.
- 8.5.7 Tree felling will be carried out by Contractor taking appropriate consideration of the Forestry Commission's Forest and Water Guidelines (Forestry Commission, 2003) to mitigate risks from felling of trees on the freshwater environment. Where there are no windthrow or visual issues, tree felling will be reduced to that necessary to allow the safe construction and operation of the Scheme. Where appropriate, tree surgery, e.g. crown reduction, pollarding etc., will be employed in preference to felling so as to maintain the maximum biodiversity/landscape interest. Any tree surgery or felling operations must consider the legal protection given to roosting bats and breeding birds (refer to section 9 of this Outline CEMP).
- 8.5.8 The arboricultural and ecological consultant should liaise with the Contractor to identify the quantities of cut timber and brash that should be retained on site for habitat creation measures (e.g. the creation of log piles and hibernacula).

8.6 Tree planting and replacement

- 8.6.1 Any trees intended to be retained which are felled or die as a consequence of construction works will be replaced by the Contractor. Where reasonably practicable, the size and species of replacement trees will be selected to achieve to the greatest extent possible, a close resemblance of the original trees most effectively using locally occurring native species of local provenance and taking cognisance of any management plans for areas of woodland immediately adjacent.
- 8.6.2 Where a tree which is covered by a TPO or located within a Conservation Area is either affected by the works (i.e. such as root damage or felled), the Contractor will be required to liaise with and agree the replacement tree species and tree size with the relevant local planning authority. As a minimum replacement trees will be “of an appropriate size and species and planted at the same place as soon as the owner of the land can reasonably do this”, as is required under Department for Communities and Local Government (2012) National Planning Policy Framework (“NPPF”).

8.6.3 The supply, storage, handling, planting and maintenance of new planting will be undertaken by the Contractor in accordance with appropriate British standards, including *BS 4428: 1989 Code of practice for general landscape operations (excluding hard surfaces)* (BSI, 1989) and other guidance including the UK Forestry Standard and the United Kingdom Woodland Assurance Standard (UKWAS, 2008).

8.7 Monitoring

8.7.1 The Contractor will undertake appropriate inspection, monitoring and maintenance of landscaping and planting provided as part of the Scheme to facilitate the effective establishment of vegetation and record the effectiveness of landscaping proposals.

8.8 Site documentation

8.8.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:

- a) photos and other records taken of the site prior to the works commencing.

9 NATURE CONSERVATION

9.1 Introduction

- 9.1.1 Given the ecological sensitivities associated with the Order limits which have been identified, all staff on site will receive a tool box talk on the ecological sensitivities, as part of their site induction. Briefings will be given by the EAD when activities have specific risks of disturbance to ecological receptors or the potential for the presence of ecologically protected species.
- 9.1.2 Where pre-construction surveys are undertaken the Contractor will be required to update the final CEMP to include any additional mitigation measures and/or licences required for the works.

9.2 Site specific procedures

- 9.2.1 The procedures and mitigation measures outlined below seek to minimise the ecological impact of the construction works across the Scheme. The mitigation will, however, have to be refined/confirmed, and revised (if required) following the completion of the pre-construction ecological surveys, and will be set-out accordingly in the final CEMP

9.3 General provisions

- 9.3.1 Relevant information will be included in individual species or habitat management plans. Species or habitat management plans will be prepared by the Contractor for the following (these plans will also form part of the final CEMP):
- a) habitats and plants (ancient woodland and trees with TPOs);
 - b) invasive plant species;
 - c) European Protected Species (i.e. great crested newt, otter and bats);
 - d) badger;
 - e) breeding (nesting) birds;
 - f) water vole; and
 - g) reptiles.
- 9.3.2 Vegetation removal will be minimised as far as possible and fenced off to prevent accidental incursions by construction plant and equipment. Land

cleared of vegetation for temporary construction works will be replanted as soon as reasonably practicable following construction.

- 9.3.3 Best practice pollution prevention and control measures will be adopted and identified in the final CEMP.
- 9.3.4 Where temporary habitat loss is required to facilitate construction, the vegetation will be reinstated post construction, in accordance with the EM. Where appropriate, the Contractor will mitigate the loss of ecologically important habitats through habitat creation. Where replacement planting is provided, this mitigation will be integrated with landscape planting, as appropriate, using native species of local provenance.
- 9.3.5 The Contractor will have regard to the requirements of sections 6, 12 and 14 of this Outline CEMP relating to dust and air quality, noise and vibration, and protection of the water environment, respectively, to protect ecologically important habitats and species adjacent to the construction site.
- 9.3.6 The Contractor will consult with the relevant local authorities, NE, the EA and the relevant local wildlife trusts regarding preparation of the ecological aspects of the final CEMP.
- 9.3.7 A qualified ecologist will oversee the implementation of the ecological mitigation.
- 9.3.8 The Contractors will undertake pre-construction surveys to determine the current status and distribution of protected and notable species and their current status and distribution along the Scheme. The Contractor will ensure that exclusion zones which are appropriate considering the nature of the construction works to be undertaken are maintained.
- 9.3.9 General measures to be implemented by the Contractor on the Scheme include:
- a) the Contractor will be required to comply with the EA's Pollution Prevention Guidance ("PPG") during works close to ditches, watercourses and culverts;
 - b) ensure careful siting of compounds, materials storage areas, haul routes etc. to avoid semi-natural habitats and protected species wherever possible;

- c) avoid night-time working where practicable – particularly in the vicinity of sensitive habitats such as woodland, hedgerows and watercourses;
- d) avoid the use of lighting, generators (and other noisy equipment) at night where possible – particularly in the vicinity of sensitive habitats;
- e) cover all excavations overnight (where practicable) or providing appropriate escape ramps for mammals (where practicable) in the form of a sloped face to the excavation or a scaffold plank or similar;
- f) visually check uncovered excavations for the presence of wildlife each morning before works commence. The Contractor will seek advice from the EAD if a protected species is found or suspected;
- g) where practicable reducing the severance impact of vegetation removal by maintaining the feature intact as long as possible, in particular by keeping any gap to the minimum required for the purpose and considering filling gaps with brash or similar when work is not being undertaken (e.g. on a bat commuting route at night) so that it can continue to function as a wildlife corridor; and
- h) careful and regular management of soil storage areas to maximise their future value in landscape planting and to dissuade badgers and other burrowing animals from colonising them in the interim.

9.4 Protected species

- 9.4.1 The programming of construction works include seasonal constraints for a range of species and their habitats (e.g. great crested newt breeding ponds, reptile hibernation habitat and bat breeding roosts as applicable). To prevent illegal disturbance of breeding birds or their nests, no removal of vegetation will take place within the bird breeding season (typically March to August), unless a competent ecologist has first undertaken an appropriate inspection of the vegetation for active birds' nests prior to its clearance. Having completed the inspection, the EAD will provide confirmation that no birds or their nests will be harmed or disturbed whilst breeding and/or that there are appropriate measures in place to protect nesting birds on the site. Consideration will also be given to impacts on nesting birds adjacent to the Order limits. These seasonal constraints will

be a consideration when developing the final CEMP and the construction programme.

Great crested newts

9.4.2 Vegetation clearance, excavation and demolition of structures all have the potential to disturb, injure or kill great crested newts, as some habitats within the soft estate represent suitable terrestrial habitat for these species. Because of this a highly precautionary approach will be taken where there is considered to be even a low level of risk that great crested newts might be present, phased vegetation clearance will be completed under the supervision of a qualified ecologist prior to the start of the great crested newt hibernation period. Consideration will be given to the timing of these works to avoid disturbance during the hibernation period (between October to February, inclusive):

- a) vegetation will be cut down to 150mm above ground level (using, for example, brush-cutters or strimmers) to avoid harm to great crested newts which may be present at ground level. The arisings will be raked off and removed from the footprint of the works. The cleared area will be left undisturbed for at least 24 hours; and
- b) if a significant density of vegetation remains (i.e. if there is sufficient vegetation below 150mm in which great crested newts may be concealed), this vegetation will then be cleared to ground level. The arisings will be raked off and removed from the footprint of the works. The cleared area will be left undisturbed for at least 24 hours.

9.4.3 Features which may be used as refuges will be removed by hand by a qualified ecologist and searched for the presence of great crested newts. A destructive search of any larger features suitable for use by newts will be undertaken by hand or using a small excavator, under ecological supervision.

Reptiles

9.4.4 The construction works may potentially cause injury or death to reptiles. Given this potential, it will be necessary to promote the removal of reptiles from the construction areas through phased vegetation clearance. Phased vegetation clearance in areas suitable for reptiles will be completed prior to the start of the reptile hibernation period. This work will be overseen by an ecologist, and include the following measures:

- a) strim vegetation down to 150mm (i.e. brush-cutting and strimming) to avoid harm to reptiles which may be present at ground level. Rake off the arisings and remove from works footprint. Leave cleared area undisturbed for at least 24 hours of dry weather;
- b) if a significant density of vegetation remains (i.e. that there is sufficient vegetation below 150mm in which reptiles may rest) use strimmers to clear vegetation to ground level. Rake off the arisings and remove from works footprint. Leave undisturbed for at least 24 hours of dry weather; and
- c) remove potential reptile refuges from the footprint of the works as identified by the ecologist, by hand or using a small excavator.

Breeding birds

- 9.4.5 As breeding birds are protected under legislation, efforts will be made to ensure the removal of all suitable nesting habitats (scrub, shrubs and trees) over the autumn and winter prior to construction and outside the main bird nesting season (March to August inclusive), taking into consideration any other mitigation measures for other species (e.g. in relation to great crested newts).
- 9.4.6 Should the clearance of bird nesting habitat not be possible within these seasonal constraints, precautionary mitigation measures to avoid impacts upon birds will be applied. This will require a suitably qualified ecologist to survey areas to be cleared for nesting birds no more than 24 hours prior to clearance. Wherever nests are found, a cordon of approximately 10m will be placed around the nest and no works permitted within that area until the chicks have fledged.

Bats

- 9.4.7 In order to minimise or avoid adverse impacts on bat roosts, the Scheme design will seek to avoid high level disturbance through controlling and reviewing construction works and by avoiding works during the active bat season (May to September inclusive).
- 9.4.8 The Contractor will be required to avoid construction lighting and use directional lighting to avoid causing disturbance to bats using sensitive roosts and foraging habitat, particularly during the period May to September.

- 9.4.9 All invasive works to bridges, underpasses and culverts will need to be undertaken in accordance with best practice guidelines, specifically in relation to 'Bats in Bridges' from The Bat Conservation Trust. Works within these vicinities will be avoided during the active season for bats wherever possible.
- 9.4.10 If invasive works are required on any structure identified as having a bat roost within it, a European Protected Species licence will be sought from NE and mitigation will be implemented as agreed in the related method statement.

Water voles

- 9.4.11 A pre-construction survey will be undertaken along water courses near construction works which were considered to have suitable habitat to support water voles to confirm continued absence of this species.
- 9.4.12 The potential impacts of pollution upon watercourses that are suitable for use by water voles will be mitigated through the provisions of this Outline CEMP and the final CEMP, including compliance with the EA's Pollution Prevention Guidance 5 ("PPG5").

Otters

- 9.4.13 A pre-construction survey will be undertaken along water courses in close proximity to construction works which were considered to be suitable habitats for otters to confirm continued absence of this species.
- 9.4.14 Where works are to be undertaken to structures on watercourses which may be used by otters (such as Thames Bray underbridge), measures to minimise disturbance will be implemented. Night working will be minimised to avoid disturbance to otters commuting along watercourses. In particular, efforts will be made to avoid significant construction noise or vibration during the hours of darkness. Construction/site lighting will use directional lamps, so that light-spill to the watercourses and their banks is avoided. Wherever possible, allowance for the passage of otters along one or both banks of the watercourse will be incorporated within the temporary works arrangements.
- 9.4.15 The potential effects of pollution upon watercourses that are suitable for use by otters will be mitigated through the provisions of the outline and final CEMPs, including compliance with the EA's PPG, as detailed above in relation to water voles.

Badgers

- 9.4.16 Construction activities have the potential to impact directly upon badgers through the loss of setts and indirectly through disturbance.
- 9.4.17 A pre-construction survey within the vicinity of construction works will be undertaken prior to the start of works to ensure that badgers have not dug another sett within the application area or to determine any changes in the use of already identified setts. It is usual to re-survey the construction site immediately following vegetation clearance to confirm the total number of setts affected by the works.
- 9.4.18 A licence from NE will be required where it is considered that any works will cause disturbance to an active badger sett. A licence application will be compiled on a case by case basis, and will require mitigation to be put in place as a condition of the licence. The licence will include a detailed method statement setting out the measures to be implemented, which will be specific to each sett.
- 9.4.19 Appropriate tree/scrub species will be planted to include native fruit, berry and nut producing species such as hawthorn, blackthorn, hazel and bramble to provide alternative food resources for badgers.

9.5 Species licencing

- 9.5.1 Draft protected species licences have been issued to NE to obtain letters of comfort in support of the application for the DCO. Once consent is granted, the Contractor will finalise, obtain and comply with all of the requirements of protected species licences and approved method statements, as necessary for construction of the Scheme.

9.6 Control of invasive and non-native species

- 9.6.1 Detailed pre-construction surveys will be undertaken to confirm and map the locations of all invasive species. The pre-construction survey results will be incorporated, along with species-specific control measures, into the final CEMP. Surveys will be undertaken for:
- a) Japanese knotweed (*Fallopia japonica*);
 - b) Giant hogweed (*Heracleum mantegazzianum*);
 - c) Indian balsam (*Impatiens glandulifera*);
 - d) rhododendron (*Rhododendron ponticum*);

- e) wall cotoneaster (*Cotoneaster horizontalis*); and
- f) Virginia creeper (*Parthenocissus inserta*).

9.6.2 The control measures will be implemented in accordance with EA best practice guidance and Environmental Protection Act 1990 (as amended). Detailed method statements will be included in the final CEMP and strictly implemented as needed throughout the construction phase.

9.6.3 The strategy adopted will comply with appropriate construction, handling, treatment and disposal procedures in relation to these and any other species listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981, as amended, or the Weeds Act 1959 to prevent the spread of such species.

9.6.4 All site staff will be briefed on the identification and treatment of invasive plant species as part of the Contractor's environmental training programme, including toolbox talks, to be included in the final CEMP.

9.7 Monitoring

9.7.1 The Contractor will undertake appropriate monitoring of construction works and implementation of mitigation measures to enable the effectiveness of these measures to be identified.

9.8 Site documentation

9.8.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:

- a) copies of all pre-construction survey reports; and
- b) copies of all protected species licences obtained for the works.

10 GEOLOGY AND SOILS

10.1 Introduction

10.1.1 Based upon the location of the Scheme and its existing land use, it is considered that the proposed works have the potential to impact upon areas of contamination. This section of the Outline CEMP sets out the appropriate mitigation to be implemented during the works in relation to the disturbance of contaminated land and the soils in general within the Order limits.

10.2 Ground investigation

10.2.1 Ground investigation will be undertaken within the Order limits during the detailed design phase. Boreholes are planned at sites identified as former landfills in order to determine accurately the extent (if any) of contaminated materials within the highway boundary. The results of the ground investigation will be used to ensure that new earthworks and structures do not encroach into existing areas of contaminated land. Where the potential for such encroachment cannot be eliminated, through the final Scheme design appropriate mitigation to minimise the potential short term health and safety and environmental risks to sensitive receptors will be identified and implemented.

10.2.2 All ground investigation works will be undertaken in accordance with UK best practice, including BS 5930:1999 Code of Practice for site investigations (BSI, 1999) and BS 10175:2011 Investigation of potentially contaminated sites Code of Practice (BSI, 2011).

10.2.3 Where significant contamination is encountered, a risk based approach will be applied by the Contractor in line with Contaminated Land Report 11, Model Procedures for the Management of Land Contamination (CLR11) (DEFRA and EA, 2004).

10.2.4 If identified during the ground investigations the risk to ground and surface water resources, processes and abstractions from contaminated land will be assessed. In addition to the excavation and treatment of contaminated soils, it may also be necessary to install gas and leachate control systems within affected sites, on a temporary or permanent basis, in order to ensure that gas and leachate migration pathways are controlled and do not adversely affect the operation of the Scheme or the wider environment as a consequence of the Scheme.

10.3 Mitigation of potential impacts

- 10.3.1 Measures will be implemented by the Contractor to assess and control risks to humans (e.g. construction workers, site visitors and nearby residents) resulting from the disturbance of contaminated land including the effects from encountering contaminated dust, soils and groundwater and the presence of ground gas and/or vapours, which may lead to confined space risks during excavations. If ground gas issues are identified, appropriate monitoring will be undertaken and/or appropriate ground gas protection measures provided by the Contractor.
- 10.3.2 An assessment of excavated soils will be undertaken by the Contractor to identify any potential risks posed to the geological and hydrogeological environment from the reuse of such soils as engineering fill. Mitigation of the effects on soils both within and outside the Order limits, which relate mainly to the spread of contamination, will be achieved through careful site control of excavation, separation, handling and storage activities to ensure that those soils identified as contaminated are not mixed with uncontaminated soil.
- 10.3.3 Areas of land falling within the footprint of new earthworks may be stripped of potentially valuable topsoils which may be reused within the Scheme or, where surplus to requirements, potentially offered for beneficial reuse off-site in the surrounding area. Topsoils existing at temporary construction compound locations would be stripped and stockpiled for later reinstatement following the decommissioning and removal of the construction compounds.

10.4 Construction on or adjacent to land affected by contamination

- 10.4.1 Control measures will be implemented by the Contractor for construction activities on or adjacent to the land identified as being affected by contamination. This will include the following, as appropriate:
- a) additional wheel wash facilities will be provided where necessary and site traffic movements will be minimised to ensure that the contamination is not spread;
 - b) redundant services near potentially contaminated areas will be either removed or cut off and sealed to avoid creating migration pathways for contamination;

- c) material known or suspected to be contaminated will be stockpiled and tested prior to reuse or disposal. Stockpiles will be segregated depending on the source of the material and the apparent nature of the contamination. Stockpiles will be placed on a low permeability liner, suitably protected from damage by earthmoving plant, to prevent leaching of contaminants into underlying groundwater and surface watercourses. Known or suspected contamination stockpile areas will be tested adequately prior to and after use to ensure that no cross-contamination has occurred;
- d) prior to reuse of site-won materials, pre-classification testing of soils will be undertaken. Pre-classification test data will be assessed against appropriately derived criteria for potential acceptability. The testing scope and frequency and assessment criteria are to be derived during the detailed design stage;
- e) the soil and soil leachate acceptance criteria will be derived in the detailed design stage, and all imported fill is required to meet that criteria;
- f) piled foundations and ground improvement works located within 50m of potential or known areas of land contamination or with potential to impact the Source Protections Zones identified along the route will require a site-specific environmental risk assessment, and will be required be identified within the relevant CEMPs. The Contractor will adhere to appropriate guidance, including the Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention, (National Groundwater and Contaminated Land Centre, 2001);
- g) within areas of known or suspected contamination, buried services will be protected from the ingress of mobile and aggressive contaminants. Furthermore, the ingress and migration of contamination along service ducts and drainage will be prevented. In the case of drainage runs, the infiltration of surface water into the underlying contaminated ground should be prevented and clean or lined service corridors will be installed to provide a suitable barrier to migrating ground gases adjacent to known/potential sources;

- h) materials used for the Scheme will be proven 'suitable for use' by adoption of acceptance criteria and will be deposited under either environmental permitting regulations or the Definition of Waste: Development Industry Code of Practice ("CL:AIRE", 2011);
- i) construction activities will follow best practice guidelines to avoid contamination from leaks, spillages and inappropriate storage of materials on site. Appropriate control measures will be identified and implemented through the final CEMP (see Section 5 of this Outline CEMP).

10.5 Monitoring

- 10.5.1 The Contractor will prepare and implement a gas monitoring procedure, as appropriate, based on the potential for presence of underground gases. Gas monitoring will be undertaken in accordance with BS8576:2013 (Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds ("VOCs") (BSI, 2013).

10.6 Site documentation

- 10.6.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:
 - a) copies of the EAD Daily Logs identifying any issues relating to contamination.

11 MATERIALS

11.1 Introduction

11.1.1 This procedures dealt with in this section of the Outline CEMP apply to the storage and handling of excavated materials during the works, and the methods for dealing with waste arisings throughout the construction programme. All staff are responsible for complying with the requirements of these procedures. In addition, the following three annexures to the Outline CEMP have been prepared for this purpose:

- a) Annex A Outline SWMP;
- b) Annex B Outline MMP; and
- c) Annex C: Outline Logistics Plan.

11.2 Site specific procedures

Committed mitigation measures

11.2.1 The Outline SWMP will be required to be updated, implemented and adhered to throughout the programme of construction works.

11.2.2 The Outline MMP provides a framework by which all of the Scheme's materials (material resources and waste) will be managed. The Outline MMP will be developed further and implemented by the Contractor to ensure the efficient and sustainable procurement, handling and management of all materials associated with the Scheme.

11.2.3 The Outline Logistics Plan will be further developed by the Contractor to effectively manage all movements of materials on and offsite. Having a Logistics Plan in place will improve the safety and reliability of deliveries to the Scheme, reduce congestion and minimise the environmental impacts.

11.3 General provisions

11.3.1 The principal objectives of sustainable resource management are to use material resources more efficiently, reduce waste at source and reduce the quantity of waste arisings that requires final disposal to landfill.

11.3.2 These are translated to the proposed Scheme with the aim of maximising reuse of site-won materials (either onsite or offsite), segregating construction and demolition materials onsite and ultimately maximising diversion from landfill by reuse, recycling and recovery.

11.4 Management of excavated materials and waste arisings

- 11.4.1 All waste will be managed by the Contractor in accordance with the waste hierarchy (i.e. prevention, preparing for reuse, recycling, other recovery and disposal as set out in the Waste (England and Wales) Regulations 2011) and in such a way as to prevent harm to human health, amenity and the environment.
- 11.4.2 The Contractor will be responsible for the storage and management of the earthworks material excavated from the Scheme. This material will be used wherever practicable to construct the engineering earthworks and to mitigate the environmental effects of the Scheme. The reuse of site-won materials will be maximised through the further development and delivery of the Outline MMP.
- 11.4.3 The Contractor will be responsible for the reduction of waste arisings from the Scheme where reasonably practicable. This will include measures such as careful storage of materials on site and 'just in time' deliveries which will be secured through the development and implementation of the MMP and Logistics Plan.
- 11.4.4 There will be dedicated areas for handling and storing excavated material. The Contractor will be responsible for managing these areas in such a way as to prevent harm to human health, amenity and the environment. The earthworks material excavated from areas of cutting and borrow pits will vary in its engineering properties and these will need to be assessed and utilised to ensure the best use of all materials.
- 11.4.5 Due to the dynamic nature of the Scheme's construction, opportunities to reuse excavated materials (within areas of the Scheme which have a requirement for these excavated materials to be reused as fill) will have to be addressed on an ongoing basis.
- 11.4.6 The Outline SWMP has been prepared in accordance with industry best practice WRAP guidance and will updated and delivered by the Contractor in accordance with the same guidance.

- 11.4.7 The Outline SWMP sets a framework to facilitate good practice and will be developed further by the Contractor to:
- a) identify the volume and tonnes of excavated materials and other waste streams and volume and tonnes (for example wood, brick, concrete, soils, plastics) likely to be produced during construction and demolition, to establish the potential for reuse (onsite or offsite) and recycling;
 - b) identify opportunities for waste minimisation and management;
 - c) identify possible options for designing out waste;
 - d) identify the most significant opportunities to increase reuse and recycling rates (termed "Waste Recovery Quick Wins") and the realistic recovery rates for each waste type;
 - e) identify suitable waste management contractors and record appropriate licences, permits, waste transfer notes and hazardous waste consignment notes;
 - f) consider appropriate site practices such as how waste materials will be segregated and the measures that will be used for raising awareness among site operatives for waste reduction, reuse and recycling; and
 - g) set out the method for measuring and auditing Construction, Demolition and Excavation ("CD&E") waste to enable more effective waste management through the setting of performance targets for segregation, recycling, and monitoring sub-contractors.
- 11.4.8 Opportunities will be considered and measures will be implemented in the design and construction of the Scheme by the Contractor to reuse waste or surplus materials, as appropriate. The Contractor will need to demonstrate that where possible reuse has been maximised, and where this is not possible it will need to be recorded. The Contractor will also be expected to investigate, secure and record where the reuse of materials and waste has been used elsewhere offsite.
- 11.4.9 The Contractor will develop a register for primary materials used on the Scheme to inform potential future reuse opportunities.
- 11.4.10 Collection points will be provided at site offices and compounds and the Contractor will arrange for the appropriate segregation and transfer of materials to recycling and disposal facilities as appropriate.

- 11.4.11 Necessary waste management permits will be obtained, or applications to the EA will be made, by the Contractor for registration of any relevant exemption from permitting waste that is necessary during construction works.

11.5 Identification and classification of waste

- 11.5.1 The SWMP will be used to identify the specific types and quantities of waste likely to arise during the construction process. Where generated, waste will be classified in accordance with the statutory controls governing the management of inert, non-hazardous and hazardous wastes.

11.6 Segregation and storage of waste

- 11.6.1 The Contractor will ensure that waste materials are sorted into separate waste groups, (according to the waste streams generated by the scope of the works), either onsite or offsite by a licensed contractor for reuse, recycling or recovery.
- 11.6.2 Onsite hazardous excavated material or other hazardous waste arisings will be kept separate from other materials and removed and managed by the Contractor. The management of these materials will also be carried out in accordance with the Outline MMP.
- 11.6.3 Any waste leaving the Scheme will be accompanied by appropriate duty of care documentation in line with the relevant statutory requirements for waste transfer and hazardous wastes (as appropriate). Duty of care documentation will be retained by the Contractor in line with these statutory requirements. The EA e-doc online system may also be used as an alternative to paper waste transfer notes and season tickets.

11.7 Duty of care

- 11.7.1 The Contractor will comply with all legal 'duty of care' requirements to protect the interests and safety of others from the potential effects of handling, storing, transporting and depositing excavated materials and demolition/construction wastes arising from the project.
- 11.7.2 The Contractor will manage material use with the aim of maximising the environmental and development benefits from the use of surplus material and reducing the adverse environmental effects and risks associated with disposal offsite.

- 11.7.3 All waste arisings will be appropriately transported and disposed of by the Contractor (or their sub-contractors) at permitted or designated sites.
- 11.7.4 The SWMP will include detailed procedures for compliance with the requirements for waste transfer notes, in accordance with the Waste (England and Wales) Regulations 2011, and arrangements for auditing the actions of other parties in the waste handling chain.
- 11.7.5 The arrangements for registering the Scheme, consigning, handling and transporting hazardous wastes will be followed by the Contractor in the context of duty of care and the specific consignment note procedures applicable under the Hazardous Waste (England and Wales) Regulations 2005 (SI 2005 No.894) or any succeeding relevant legislation.
- 11.7.6 Where appropriate the Contractor will consider using the EA e-doc system with regards to fulfilling the duty of care requirements.

11.8 Use of materials

- 11.8.1 Supported by the further development and implementation of the Outline MMP, the Contractor will where practicable implement measures to manage material resources use during construction including:
- a) using sustainably sourced materials;
 - b) using recycled or secondary materials; and
 - c) minimising the use of materials that have the potential to harm human health or the environment.
- 11.8.2 Where reasonably practicable the Contractor will source recycled or secondary materials from the relevant local area.

11.9 Monitoring

- 11.9.1 The Contractor will undertake regular audits and inspection of waste management activities to ensure compliance with the requirements of this Outline CEMP, statutory controls and other Scheme policies and procedures relevant to the management of surplus excavated material and waste.
- 11.9.2 The types, quantities and destination of waste arisings from the Scheme will be identified, measured and recorded in the SWMP. This information will be reported on a periodic basis.

11.9.3 A register of all waste loads leaving the site will be maintained by the Contractor to provide a suitable audit trail for compliance purposes and to facilitate monitoring and reporting of waste types, quantities and management methods.

11.10 Site documentation

11.10.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:

- a) copies of the SWMP;
- b) all relevant duty of care documentation, including waste transfer notes (where the EA e-doc has not been utilised) and consignment notes;
- c) a Control of Substances Hazardous to Health (“COSHH”) Register will be maintained by the Contractor for each site compound and updated throughout the works as required; and
- d) copies of the Site compound plan are to be kept on Site, the plan is to clearly indicate where potentially polluting substances and COSHH stores are to be located.

12 NOISE AND VIBRATION

12.1 Introduction

12.1.1 This procedure addressed in this section of the Outline CEMP applies to the management of noise and vibration throughout the works for the Scheme. All staff are responsible for complying with the requirements of the procedure.

12.2 Measures to reduce potential noise and vibration impacts

12.2.1 The Contractor will assess, consider and implement best practicable means (“BPM”) at all times throughout the construction of the Scheme in order to control noise and vibration resulting from the construction works.

12.2.2 Section 72 of the Control of Pollution Act 1974 and s79 of the Environmental Protection Act 1990 define BPM as measures which are *‘reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications’*.

12.2.3 The Contractor will be required to detail the application of BPM within the final CEMP for the construction works. BPM should be included in the following order:

- a) control of noise and vibration at source - such as the provision of acoustic enclosures and the use of less intrusive alarms and the screening of equipment;
- b) should the application of BPM at source not prove effective and noise exposure exceeds the criteria defined in this Outline CEMP, the Contractor may offer:
 - i. noise insulation; or ultimately
 - ii. temporary re-housing.

12.2.4 BS 5228-1:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites – Noise², and BS 5228-2:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites – Vibration³, will be implemented, together with the specific requirements of the final CEMP.

² Hereafter referred to as BS 5228-1

³ Hereafter referred to as BS 5228-2

12.3 Noise and vibration management

- 12.3.1 Management and monitoring processes will be introduced across all construction sites and compounds to ensure that the effects of noise and vibration are controlled and that BPM are planned and employed during construction period. As part of the final CEMP, a noise and vibration management plan will be prepared and will set out these processes. The plan will include management and monitoring processes to ensure:
- a) integration of noise control measures into the preparation of all method statements for the works;
 - b) preparing details and locations of all site hoardings, screens or bunds that will to provide acoustic screening during construction;
 - c) procedures for the installation of noise insulation (if deemed to be required) or provision of temporary re-housing and to ensure such measures are, where required, in place as early as reasonably practicable;
 - d) developing noise and vibration monitoring protocols including a monitoring locations and stages during construction of which monitoring will be undertaken;
 - e) the preparation and submission of all s61 consent applications required;
 - f) undertaking and publishing all monitoring required to ensure compliance with all acoustic commitments and consents associated with the DCO consent; and
 - g) processes to ensure ongoing compliance with all controls and consent for the works and any improvement and rapid corrective actions that are required to avoid any potential non-compliance.
- 12.3.2 The noise and vibration management plan will also include details of inspection and maintenance schedules to be undertaken by the Contractor's Project Manager and the EAD.
- 12.3.3 A piling strategy for any piling works close to sensitive receptors.
- 12.3.4 It is considered unlikely that risk assessments will be required to inform structural surveys of buildings and structures which may be affected by vibration from construction. However, simple appraisals will be carried out to confirm this.

12.4 Section 61 consents

- 12.4.1 The Contractor will seek (where considered to be required) consents from the relevant local authority under s61 of the Control of Pollution Act 1974. Section 61 consent applications will be required to be made to the relevant planning authority at least 28 days before the relevant work is due to start.
- 12.4.2 The consent application will be required to include:
- a) details of construction activities;
 - b) prediction methods;
 - c) location of sensitive receivers; and
 - d) noise and vibration levels.
- 12.4.3 The consent applications will be discussed with the relevant local authority, or authorities, both prior to construction work and throughout the construction period.
- 12.4.4 Noise levels will be predicted in accordance with the methods set out in BS 5228 – 1 within which Annex A provides a flow diagram demonstrating the process of a s61 application.
- 12.4.5 All construction noise levels will be predicted or measured at a distance of 1m from any affected eligible facade, which must have windows to bedrooms or living rooms.
- 12.4.6 The Contractor will consult with the relevant local authorities in relation to a common format and model consent conditions for s61 applications.
- 12.4.7 The application for a s61 consent will require noise and vibration (where deemed to be required in consultation with the relevant local authority) predictions and assessments to be undertaken and BPM measures determined and set out to manage noise associated with construction of the Scheme.
- 12.4.8 Where works requiring a s61 consent are re-scheduled or modified the Contractor will apply for a dispensation or variation from the appropriate local authority, before commencing those works.
- 12.4.9 Dispensations will be sought by means of an application to vary the agreed matters, setting out the revised construction programme or method and the relevant noise calculations.

12.5 Noise insulation and temporary re-housing policy

- 12.5.1 The Agency will ensure that a noise insulation and temporary rehousing policy is implemented for the Scheme to provide additional protection to residents in the event that it is not practicable to mitigate airborne noise, to levels that are tolerable during the construction works. The policy will set out all roles, responsibilities and actions required in respect of these measures.
- 12.5.2 A noise insulation/temporary rehousing appraisal will be submitted to the relevant local authority via the Agency by the Contractor at least six months prior to starting each phase of work in the vicinity of residential properties to ensure that (if required) noise insulation can be installed before the start of the works predicted to exceed noise insulation or temporary re-housing criteria.
- 12.5.3 Details of the noise insulation package will be required to be set out by the Contractor but would typically include secondary glazing, an alternative method of ventilation and on certain aspects venetian blinds.
- 12.5.4 Notwithstanding the measures set out in this Outline CEMP and any s61 consents, noise insulation or temporary re-housing will be offered to qualifying parties when:
- a) noise levels are predicted or measured by the Contractor to exceed the relevant trigger level (as set out in Table 12.1) at least 10 days out of any period of fifteen consecutive days or alternatively 40 days in any six month period at affected properties;
 - b) the property complies with all other requirements of the Noise Insulation (Amendment) Regulations 1988;
 - c) the property is be lawfully occupied as a permanent dwelling; and
 - d) noise insulation does not already exist that is of an equivalent standard to that which would be allowed for under the Noise Insulation (Amendment) Regulations 1988.
- 12.5.5 The relevant trigger levels as defined by BS5228-1 are shown in Table 12.1.

Table 12.1 Noise thresholds for noise insulation/temporary re-housing.

Day	Time (hrs)	Average period T	Noise insulation trigger level $L_{Aeq,T}$ (dB) */**	Temporary re-housing trigger level $L_{Aeq,T}$ (dB) */**
Monday to Friday	07:00-08:00	1 hr	70	80
	08:00-18:00	10 hrs	75	85
	18:00-19:00	1 hr	70	80
	19:00-22:00	1 hr	65	75
Saturday	07:00-08:00	1 hr	70	80
	08:00-13:00	5 hrs	75	85
	13:00-14:00	1 hr	70	80
	14:00-22:00	1 hr	65	75
Sunday and public holidays	07:00-22:00	1 hr	65	75
Any day	22:00-07:00	1 hr	55	65

*Proposed Scheme construction sound only. Trigger levels are defined as 1m in front of the closest facade of a habitable room.

**Where the current ambient noise level is greater than the noise insulation trigger level:

- a) the ambient noise level will be used as the noise insulation trigger level, and
- b) the ambient noise level +10dB will be used as the temporary rehousing trigger level.

12.5.6 The Agency will consider all applications supported by evidence for noise insulation or temporary rehousing from occupiers who may have special circumstances. Special circumstances could include night workers, those working in home occupations, local businesses or buildings that provide community facilities requiring a particularly quiet environment and those with a medical condition which will be seriously aggravated by construction noise, and provide noise insulation or temporary re-housing where it is demonstrated that this is necessary.

12.6 Vibration thresholds and actions

12.6.1 Criteria and/or procedures for vibration control are specified for three purposes and assessed using three different sets of parameters:

- a) to protect the occupants and users of buildings from disturbance, for which vibration dose values are assessed (vibration dose values (“VDVs”) are defined and their application to occupants of buildings is discussed in BS 6472- 1 Guide to evaluation of human exposure to vibration in buildings – vibration sources other than blasting, 2008);

- b) to protect buildings from risk of physical damage, for which peak component particle velocities are assessed in accordance with BS 7385-2 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration, 1993; and
- c) to protect particularly vibration-sensitive equipment and processes from damage or disruption, for which peak component acceleration, velocity or displacement are assessed as appropriate to each process or item of equipment.

12.6.2 In some buildings, two or three of the above parameters may apply, and in those cases the Agency will require its Contractor to evaluate the criteria separately. In establishing criteria, controls and working methods, the Contractor will take account of guidance in BS 6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting 2008: BS 5228 – 1 and BS 5228 – 2 , ISO 4866: Mechanical vibration and shock, vibration of fixed structures. Guidelines for the measurement of vibrations and evaluation of their effects on structures and BS 7385- 2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration 1993.

12.6.3 In the following sections vibration thresholds are set out. The thresholds are trigger levels at which a set of actions will be carried out by the Contractor. Except where stated otherwise, they are not designed to be maximum permitted levels.

Protection of building occupants from disturbance

12.6.4 To protect the occupants and users of buildings from disturbance, BPM will be used by the Contractor to control vibration levels so that the vibration dose values in Table 12.2, as measured in accordance with BS6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting (2008) are not routinely exceeded (considered to be ten days in any 15 consecutive days) as a result of the works.

Table 12.2 Vibration trigger levels for protection of occupants of buildings from disturbance

Building type	Period	VDV (ms ^{-1.75})
Eligible dwellings ⁴	07:00 to 23:00	0.4
	23:00 to 07:00	0.2
Education buildings, offices and similar ⁵	Over normal period of use (daytime)	0.8
Commercial ⁶	Over normal period of use (daytime)	1.6

- 12.6.5 The vibration thresholds in Table 12.2 will be weighted in accordance with BS6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting, 2008.
- 12.6.6 For application of threshold levels, it will be assumed that people are standing or sitting during daytime, and lying down during night-time hours as defined in the table.
- 12.6.7 The orientation of the person is important as it determines the vibration weighting factor to be applied.
- 12.6.8 When considering human response to vibration BS 5228 – 2 provides other guidance levels in terms of peak particle velocity (“PPV”), which are presented in Table 12.3. Where information is not available to complete an assessment against the trigger levels in Table 12.2, an assessment will be undertaken using the guidance in BS5228- 2.

⁴ Measured on a normally-loaded floor of any bedroom or living room. For this purpose, eligible dwellings include dwelling houses, residential institutions, hotels, and residential hostels.

⁵ Measured on a normally-loaded floor of areas where people normally work. This category of receiver will include all areas where clerical work meetings and consultations are regularly carried out (e.g. Doctors' surgeries, day-care centres but not shop floors of industrial premises).

⁶ Measured on a normally-loaded floor of areas where people normally work. Commercial premises include retail and wholesale shops.

Table 12.3: Guidance on effects of vibration levels

Vibration level ^{7 8 9}	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

12.6.9 Temporary respite will be provided by Contractor if the following levels are triggered (using the same temporal scope as the noise insulation and temporary rehousing policy):

- a) the predicted or measured vibration exceeds the following trigger values set at the centre of any floor inside the property (highest vibration):
 - i. daytime (7am to 11pm): a vibration dose value (“VDVb”) of 0.8m/s^{1.75}; and
 - ii. night-time (11pm to 7am): a vibration dose value (“VDVb”) of 0.4m/s^{1.75}.
- b) the predicted or measured groundborne noise exceeds as 45 dB LASmax measured near, but not at, the centre of any room in a property; and
- c) the predicted or measured groundborne noise or vibration exceeds the relevant trigger value for a period exceeding one day.

12.6.10 Details of the temporary respite process will be included within the noise insulation and temporary rehousing policy.

⁷ The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.

⁸ A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.

⁹ Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

Protection of buildings from damage

- 12.6.11 To protect buildings from damage, BPM will be used to control vibration levels so that the PPV in Table 12.4, as measured in accordance with BS6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting 2008, are not exceeded as a result of the works at the building foundation.

Table 12.4: Vibration trigger levels for building damage.

Category of building	Impact criteria: (PPV at building foundation)	
	Transient vibration	Continuous vibration
Structurally sound buildings	≥12 mm/s	≥6 mm/s
Potentially vulnerable buildings ¹⁰	≥6 mm/s	≥3 mm/s

- 12.6.12 To determine whether a detailed appraisal needs to be undertaken or whether the levels in Table 12.4 are likely to be exceeded, or whether there is a potential for building damage, the Contractor will carry out a scoping vibration appraisal. Activities requiring an appraisal could include vibratory compaction, impact or vibratory piling and other driven processes.
- 12.6.13 If predicted vibration levels exceed 1mm/s component PPV at occupied residential buildings or 3mm/s PPV at occupied commercial buildings more detailed appraisal should be carried out in accordance with BS 7385-2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration 1993. If this identifies that people occupying buildings may experience levels in excess of the threshold values in Table 12.4 those potentially affected will be notified as soon as practicably possible in advance of the works. The notification will describe the nature and duration of the works and any associated proposals for vibration monitoring.
- 12.6.14 The Agency will require its Contractor to be cognisant of the advice given in BS ISO 4866 Mechanical vibration and shock, vibration of fixed structures. Guidelines for the measurement of vibrations and evaluation of their effects on structures and BS 7385-2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration 1993.

¹⁰ BS7385 highlights that the criteria for aged buildings may need to be lower if the buildings are structurally unsound. The standard also notes that criteria should not be set lower simply because a building is important or historic (e.g. listed). Where information about these structures is not currently known, the more onerous criteria on this row of the table will be adopted on a precautionary basis until condition surveys have been undertaken.

- 12.6.15 The Agency will require its Contractor to notify and consult it and the relevant local authority regarding any works predicted to generate a PPV above 10mm/s. Where it is determined that there is no reasonable or practicable means to reduce predicted or measured vibration then the Contractor will:
- a) agree with the Agency and consult with the local authority under the relevant s61 consent, monitoring for vibration and strain induced in the building during the works;
 - b) consult occupiers of properties about:
 - i. the surveys to be carried out and any consequent actions; and
 - ii. any additional reasonable and practicable mitigation to be provided for occupants;
 - c) carry out a condition survey before and after the relevant works; and
 - d) advise the local authority through the relevant s61 consent application.
- 12.6.16 In addition, any old buildings, or buildings that may be unusually vulnerable to vibration, that are located within 50m of any activities that may give rise to significant vibration will be identified.
- 12.6.17 Where the predicted vibration at the foundations of such buildings exceeds 5mm/s PPV then the Agency will require its Contractor to undertake an initial structural survey of the building. Based on the survey, the level of vibration above which condition surveys and continuous vibration monitoring are required will be confirmed with the building owner. The local authority will be notified through the relevant s61 consent application.
- 12.6.18 Where the condition and vibration monitoring surveys demonstrate that vibration from the works has given rise to building damage then the Agency's representative will require its Contractor to make good that damage.

Protection of particularly vibration-sensitive equipment/processes

- 12.6.19 The Contractor will endeavour to avoid any impact on sensitive equipment. Any actions to control or mitigate impacts will be agreed between its contractors and the operator of the equipment. The local authority will be notified through the relevant s61 consent application.

12.7 Monitoring

- 12.7.1 Monitoring will include physical measurements and observational checks/audits.
- 12.7.2 The Contractor will undertake and report noise and vibration monitoring, including real time noise and vibration monitoring, as is necessary to ensure and demonstrate compliance with all noise and vibration commitments, the requirements of this Outline CEMP and any s61 consent(s).
- 12.7.3 Regular onsite observation monitoring and checks/audits will be undertaken to ensure that BPM is being employed at all times. The site reviews will be logged and any remedial actions recorded. Such check will include:
- a) hours of working;
 - b) presence of mitigation measures, equipment (i.e. engines doors closed, airlines not leaking, etc.) and screening (i.e location and condition of local screening, etc.);
 - c) number and type of plant;
 - d) construction method; and
 - e) where applicable, any specific s61 consent conditions.
- 12.7.4 The monitoring and compliance assurance process will be set out in the noise and vibration management plans, as part of the final CEMP.
- 12.7.5 Proposals for monitoring locations will be set out in the final CEMP.
- 12.7.6 The s61 applications will include a detailed description of the monitoring and monitoring locations proposed for the particular works covered by the consent application.

12.8 Site documentation

12.8.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:

- a) noise and vibration monitoring records;
- b) details of corrective action taken if complaints are received or excessive noise is identified; and
- c) plant maintenance records.

13 EFFECTS ON ALL TRAVELLERS

13.1 Introduction

13.1.1 The procedure set-out in this section of the Outline CEMP applies to the management of effects upon all travellers throughout the works. All staff are responsible for complying with the requirements of the procedure.

13.2 General provisions

13.2.1 The Contractor will implement traffic management measures during the construction of the Scheme on all public roads and non-motorised user (“NMU”) paths as detailed within the Outline CTMP (refer to Annex E). A notice period may be required prior to the implementation of certain temporary traffic management measures including the occupation or temporary closure of existing roads. Traffic management works will be required to comply with the provisions of the Traffic Signs Manual: Chapter 8: Traffic Safety Measures and Signs for Road Works and Temporary Situations. Traffic signs will comply with the Traffic Signs Regulations and General Directions (Highways Agency, 2002).

13.2.2 The Contractor for the works will be required to implement a detailed Traffic Management Plan throughout the duration of the construction period to ensure the safe transition for road users from existing roads to the traffic managed sections of road. Temporary signs erected during the works will be consistent with permanent signs (as per the requirements of the Traffic Signs Manual), and signs will be located where they are clearly visible to road users and cause minimum disruption.

13.2.3 A traffic management working group (“TMWG”) will be formed for the Scheme at the construction phase. The Contractor will consult with the TMWG regarding traffic management and NMU issues. The members of the TMWG (including the employer’s representative) will agree a resolution procedure for disputes relating to traffic management and other traffic related measures to be implemented during the construction of the Scheme.

- 13.2.4 The operation of the final Scheme will include the provision of an intelligent transport system (“ITS”), which will include a system to implement variable speed limits, lane control and variable message signs. The Contractor will liaise with the Agency to use the ITS (where available) to complement the traffic management procedures set out for the Scheme in the Contractor’s final CTMP. The Contractor will log any complaints, and also provide the Agency with updates regarding any disruption caused by construction works on the road network.
- 13.2.5 The Contractor will prepare the final CTMP which will describe the traffic management, safety and control measures proposed during construction of the Scheme. The final CTMP will include details of the following, as appropriate:
- a) measures to provide for the safety of traffic, the public and construction staff during traffic management works and temporary traffic control measures;
 - b) procedures to be followed for the temporary or permanent closure or diversion of roads or accesses;
 - c) procedures to be followed to obtain consent to work on or over railways;
 - d) existing pedestrian, equestrian and cyclist routes, including whether the routes are used by one or more of these groups of road users;
 - e) measures to be implemented to reduce construction traffic impacts or impacts associated with over-parking on residential streets;
 - f) temporary and permanent access to the works;
 - g) permitted access routes for construction traffic;
 - h) monitoring requirements in relation to the plan;
 - i) a programme of traffic management measures to be implemented and details of traffic management proposals for the works on or adjacent to public roads;
 - j) details of phasing of works;
 - k) drawings showing traffic management layouts, signing and apparatus to be implemented, including proposed routes for pedestrians, equestrians and cyclists;
 - l) timing of operations;

- m) a list of roads which may be used by construction traffic in the vicinity of the site including any restrictions to construction traffic on these routes;
- n) the name and contact details of the Contractor's traffic safety and control officer and information and advice for the public regarding ways to raise complaints or request information; and
- o) a register of applications for consents associated with temporary traffic management measures.

13.2.6 The responsibilities of the traffic safety and control officer will include:

- a) management and implementation of traffic management measures associated with the Scheme;
- b) ensuring compliance with all relevant health and safety directives in liaison with the Contractor's HSM, relating to operations and live traffic;
- c) management of the layout of site access and egress points for all construction sites and compounds;
- d) arranging for site inspections at regular intervals, equipment attended to and maintained, and in the case of accidents or incidents having replacement signs, cones, bollards and lights and the like erected without delay; and
- e) maintaining a log of all complaints received in relation to traffic during Scheme construction.

13.2.7 The CEMP and associated CTMPs will include an organogram identifying the named traffic safety and control officer and their lines of reporting.

13.3 General measures to reduce construction traffic impacts

13.3.1 Haul routes through the works for use by construction vehicles will be provided by the Contractor in order to reduce the potential, for impacts upon the public road network. Site access points will be positioned to enable the use of haul routes to be maximised throughout the works.

13.3.2 The Contractor will be required to comply with the requirements of the national and local roads authorities regarding the layout and positioning of site accesses.

13.3.3 Traffic management measures will be provided by the Contractor where crossing of public roads are required at site compounds and construction site.

13.3.4 As per the mitigation set out in section 6 of this Outline CEMP the Contractor will keep all roads free from mud and other loose materials arising from the works, as far as reasonably practicable, in order to reduce the potential for nuisance impacts.

13.4 Construction workers travel plan

13.4.1 Construction workforce travel plans will be prepared by the Contractor to encourage the use of sustainable modes of transport where possible and to reduce the impact of workforce travel on the local road network and associated communities. The plans will include:

- a) key issues to consider for each site compound/construction site along the length of the Scheme;
- b) forecast trip generation for each compound/construction site the likely change to work force travel patterns during the construction period;
- c) mitigation measures to reduce the impact of the construction workforce on the local and strategic road networks;
- d) targets to reduce individual car journeys by the construction workforce; and
- e) the process for monitoring and reviewing the construction workforce travel plan.

13.5 Traffic safety and control

13.5.1 Throughout the construction of the Scheme the Contractor will consult with the following agencies/organisations to ensure safety on the road network is a priority consideration:

- a) relevant roads authorities;
- b) The Agency;
- c) the organisers of any major or significant local events, and owners of significant local visitor attractions; and

- d) other relevant organisations regarding traffic management and control measures to be implemented to accommodate abnormal traffic.
- 13.5.2 The Contractor will take appropriate actions, including the design and installation of traffic management schemes:
- a) to ensure safe passage of all traffic through the required road works;
 - b) to reduce the likelihood of ‘rat running’ onto local roads, which may have result in adverse impacts upon the local community; and
 - c) to mitigate impacts on the local road network and communities and to keep delays and disruptions to traffic to a minimum.
- 13.5.3 Traffic control on local roads will be implemented as necessary as part of the traffic management schemes. Local communities will be informed of these works in advance and the works will be clearly signposted throughout their duration.
- 13.5.4 The Contractor will consult the TMWG regarding the traffic management measures proposed and will undertake road safety audits in accordance with the DMRB where deemed necessary.
- 13.5.5 Where deemed necessary as a result of consultation with the relevant authorities (including the police force), the Contractor will provide speed detection cameras at temporary traffic management schemes.
- 13.5.6 When necessary during construction on the line of the trunk roads, the Contractor will operate a vehicle recovery system to minimise the impact of breakdowns or accidents on the flow of traffic.
- 13.5.7 CCTV systems will be implemented by the Contractor at agreed locations throughout the works to monitor the traffic management schemes.
- 13.5.8 The Contractor will consult with the operators of railways regarding construction works on, over or adjacent to railways or other works which may affect railways and will obtain any consents necessary for the works to be undertaken.
- 13.5.9 Where abnormal loads are required for the works the Contractor will be required to inform the police, the highway authorities or bridge and structure owners, as appropriate. The final procedures for the movement of abnormal loads will be set out in the final CTMP.

13.6 Temporary or permanent closure or diversion

- 13.6.1 Where the Contractor proposes to provide a temporary or substitute road or access or the like, the width and standard of construction and any lighting and signage required will be suitable for the traffic anticipated to use the route.
- 13.6.2 Temporary or substitute road access will be maintained by the contractor throughout the works to provide adequately for the traffic using the affected routes. The Contractor will apply for any consents and prepare any orders or regulations required for temporary traffic management schemes or road closures and comply with the requirements of the relevant roads authority in this regard to ensure that temporary or substitute roads have the appropriate legal status.
- 13.6.3 Where temporary road closures are required to facilitate construction works, the Contractor will consult with, and comply with the requirements of the Agency, the relevant local authority and the police. The Contractor will be required to demonstrate to the relevant authorities that the construction work cannot be carried out safely without the road closure. Agreement on diversion routes will also be required prior to works commencing

13.7 Public transport, pedestrian, equestrian or cycle routes

- 13.7.1 Consultation will be undertaken by the Contractor with relevant local authorities and public transport operators regarding the proposed traffic management procedures along the length of the Scheme. Where the proposed traffic management measures may affect the flow of public transport vehicles appropriate mitigation measures will be implemented.
- 13.7.2 Where separate routes used by pedestrians and other NMUs are affected, the Contractor will provide alternative routes within the traffic management Scheme being implemented. Once agreed, the specific right of way affected will need to be scheduled with appropriate nomenclature and diversion routes suitably signposted throughout the works. Diversion works will require to be confirmed in consultation with the relevant local authority and consent applied for under s257 of the Town and Country Planning Act 1990.

- 13.7.3 The final CTMP will be required to include information relating to traffic management layouts, signing and apparatus to be implemented on all affected NMU routes.

13.8 Access routes for construction traffic

- 13.8.1 The Contractor will consult with local highways authorities regarding access routes that may be used by the Contractor to access the construction sites. Final agreed routes will be detailed within the final CTMP and all sub-contractors will be provided with copies of the haul route throughout the duration of the works. The final CTMP will be consulted upon with the relevant authorities to ensure that agreement is reached regarding any timing restrictions on the use of roads. Signing will be provided by the Contractor.
- 13.8.2 Access routes for construction traffic will be via special and trunk road network(s) and main roads on the local road network unless it is considered necessary for other local roads to be used. Access along residential roads will generally be prohibited unless there are clear reasons for their use. Where residential roads are to be utilised the residents will be kept informed of the timing of the works in advance.
- 13.8.3 The Contractor will keep site access points clear at all times and will design and construct site access points to a suitable standard to enable the smooth access and egress of vehicles in a forward direction to limit disruption to road users due to use of the access points.

13.9 Monitoring

- 13.9.1 The Contractor will monitor traffic management schemes, traffic levels on roads and site accesses and public roads adjacent to access points to maintain their effectiveness and condition throughout the works and to provide for the safety of traffic, the public and construction staff during traffic management works. The Contractor will provide information regarding any delays to traffic due to construction works to the Agency.

13.10 Site documentation

- 13.10.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:
- a) copies of the final CTMP will be held on Site at all times.

14 ROAD DRAINAGE AND THE WATER ENVIRONMENT

14.1 Introduction

14.1.1 This section of the Outline CEMP presents the Scheme mitigation required for the impact associated with road drainage and the water environment during construction, focussing on the effects of highway drainage on the quality and hydrology of receiving waters.

14.2 General provisions

14.2.1 Measures will be implemented by the Contractor during construction for any works within or close to Water Framework Directive water bodies, other watercourses, lakes, reservoirs, or groundwater. Specific activities that might affect the water environment include borrow pits, pavement, structures (e.g. bridges, culverts and outfalls) and watercourse realignments (it is noted that there may be a requirement to realign some drainage channels and flood alleviation channels may also require realignment, for which mitigation measures have been detailed below).

14.2.2 The measures that will be implemented by the Contractor, and which will be detailed in the final CEMP, include:

- a) preventing access to adjacent areas to avoid impacts on watercourses and water bodies;
- b) preventing sediment being washed into the watercourses. Small bunds and silt traps to be employed to isolate areas of construction. Silt traps to be regularly maintained/de-silted. Use of straw bale traps;
- c) placing restrictions or controls with regards to excavating within watercourses to limit disturbance to watercourse;
- d) in-stream works only to be carried out during periods that will avoid impact on fish populations (to be agreed with the relevant EA officer). Where in-stream works are required the Contractor will develop and agreed specific method statements for the works. Works will be required in-stream at the following locations:
 - i. altering bridge supports at Bray Bridge on the River Thames;
 - ii. extending the Ashleys Arch culvert within Datchet Common Brook; and

- iii. extending the Chalvey culvert within Chalvey ditch;
 - e) identifying works not to be carried out during flood flows to avoid undue erosion of the river beds and or banks;
 - f) surfacing or re-vegetation of bare areas to be undertaken as quickly as possible;
 - g) ensuring that manageable parcels of land are only cleared of vegetation at times specified as specified in the final CEMP to allow time for land/topsoil to stabilise;
 - h) ensuring that demolition waste is contained either for re-use or recycling or disposed of immediately to an agreed landfill site (to avoid a build-up on site) as per the requirements of the SWMP; and
 - i) maintaining access and maintenance widths (as appropriate) on all watercourses.
- 14.2.3 The Contractor will comply with BS 6031 Code of Practice for earthworks (BSI, 2009c) regarding the general control of site drainage including, for example, all washings, dewatering, abstractions and surface water run-off, unless otherwise agreed by the employer's representative.
- 14.2.4 The Contractor will comply with The Control of Pollution (Oil Storage) (England) Regulations 2001 that apply in relation to storage of any oil-based materials including petrol, diesel, waste and vegetable and plant oil, but excluding uncut bitumen. Above ground fuel and oil storage tanks will also comply with Pollution Prevention Guideline No.2: Above ground oil storage tanks (EA et al., 2001) ("PPG 2") which sets out requirements including those relating to positioning, specification, capacity, secondary containment and ancillary equipment for storage tanks. Stationary plant used by the Contractor will be fitted with measures such as drip trays to retain any leakage of oil or fuel. The Contractor will empty trays at regular intervals to prevent overflow.
- 14.2.5 As with many major construction projects, working areas are likely to affect existing, minor drainage channels and ditches. The mitigation for such effects is well understood PPG 5 and 6) and will include:

- a) ensure appropriate bunding for construction areas and compounds, in particular compounds located within the floodplain (Compounds 5 and 6) and construction areas associated with works to the overbridges located in the floodplain at Ascot Road, Datchet Lane and Recreation Grounds, Marsh Lane, Monkey Island Lane, Old Slade Road, Riding Court Road and Wood Lane. For any bunding the base and bund walls should be impermeable to the material stored and able to contain at least 110% of the volume stored. Spill kits should be located near drains;
- b) the routes of any temporary traffic diversions should be planned and the routes should be covered by drainage incident plans;
- c) procedures for concreting, cement mixing and washing areas should be sited 10m from any watercourse or surface water drain to minimise the risk of run off entering a watercourse. Wash waters from any concrete and cement works should never be discharged in to the water environment;
- d) in any wash down areas ensure plant and wheel washing is carried out in a designated area of hard standing at least 10m from any watercourse or surface water drain; and
- e) the disposal of surface water runoff from excavations which may be contaminated with silt, consider the use of silt fences at the toe of slopes, made from geotextiles, to reduce silt transport. Minimise the amount of exposed ground and soil stockpiles from which the water drains and the period of time such water drains.

14.3 Surface water, groundwater and waste water

14.3.1 The Contractor will consult with the EA (and any other relevant statutory authorities) regarding the measures to be implemented to contain and manage surface water runoff from the construction of the Scheme.

Measures to be implemented will include the following, as appropriate:

- a) providing a suitable construction site drainage system including cut-off ditches or drains and Sustainable Drainage Systems (“SuDS”), or equivalent;
- b) U flow attenuation ponds, pollution control ponds, swales and oil interceptors required for the permanent works will be completed before the start of earthwork operations;

- c) appropriate measures will be required to be implemented adjacent to watercourses such as use of bunds of non-erodible material or silt or sediment fences to mitigate against the potential sedimentation of watercourses;
- d) the need for a surface water or groundwater monitoring plan will be dependent upon the results of the ground investigation works (refer to section 10.2 of this Outline CEMP). Following completion of the ground investigation the need for the plan will be reviewed and if necessary implemented; and
- e) adopting measures to comply with relevant PPG temporary construction methods and CIRIA publications including:
 - i. control of water pollution from construction sites. Guidance for consultants and contractors (C532);
 - ii. control of water pollution from linear construction projects. Technical guidance (C648);
 - iii. control of water pollution from linear construction projects;
 - iv. site guide (C649); and
 - v. site handbook for construction of SUDS (C698).

14.3.2 The measures set out in Section 6 (Air Quality) to limit adverse dust and air pollution effects associated with construction works will apply equally in relation to limiting the likelihood of polluted surface water run-off being generated.

14.4 Storage and control of oils and chemicals

14.4.1 The Contractor will comply with The Control of Pollution (Oil Storage) (England) Regulations 2001 that apply in relation to storage of any oil-based materials. Above ground fuel and oil storage tanks will also comply with PPG2 which sets out requirements including those relating to positioning, specification, capacity, secondary containment and ancillary equipment for storage tanks. The final CEMP will identify the specific procedures to be followed on site. Stationary plant used by the Contractor will be fitted with measures such as drip trays to retain any leakage of oil or fuel and spill kits will be stored at key locations on site as set out in the Contractor's pollution incident control plan and in particular at refuelling

areas. Where practicable, spill kits will also be kept with mobile fuel bowzers.

- 14.4.2 The Contractor will comply with Pollution Prevention Guideline No.26 Drums and intermediate bulk containers (EA et al., 2011).
- 14.4.3 The Contractor will consult with the relevant local authorities and the EA regarding specific requirements in relation to establishing and operating concrete and road surfacing material batching plants on site. Wash water from any batching plants will not be discharged to the water environment.
- 14.4.4 The Scheme is located within a Surface Water Safeguard Zone safeguarded for pesticides. Workers within the Safeguard Zone will take care if pesticides are used, as their use could cause pollution which may result in the need for additional, costly treatment. The contractor will be required to monitor the use of any pesticides and ensure site procedures are in place that promote best construction practice.

14.5 Control and management of foul drainage

- 14.5.1 The Contractor will manage and dispose of foul water and sewage effluents from site facilities complying with *Pollution Prevention Guideline No.4 Treatment and disposal of sewage* (EA et al., 2006). Where no foul sewer is available and the following measures, as appropriate:
 - a) containment by temporary foul drainage facilities and disposed off-site by a licensed contractor (to be named within the final CEMP);
 - b) connection to the local foul water and sewage system; and
 - c) where a foul sewer is not present, appropriate treatment and discharge to a watercourse or soakaway with prior authorisation from the EA.

14.6 Private water supplies

- 14.6.1 A risk assessment will be undertaken by the Contractor for excavation work associated with impacts on aquifers and private water supplies, the risk assessment will form part of the final CEMP.
- 14.6.2 Some of the construction phase impacts can be mitigated through design. With reference to groundwater construction phase impacts can be mitigated by Contractor through the following:
 - a) controlling run-off from construction;

- b) ensuring good vehicle maintenance at all times throughout the works;
- c) effective design of storage, refuelling and stock piling areas as per EA guidance;
- d) appropriate design of temporary drainage systems (to meet water quality objectives);
- e) use of an emergency response plan (as detailed within the final CEMP) to deal with spillages;
- f) special measures to prevent groundwater contamination; and
- g) groundwater quality and level monitoring (if the ground investigation works identify the requirement) to assess the performance of mitigation measures.

14.6.3 Particular attention needs to be given to areas where dewatering will occur. This will include the following measures:

- a) estimating surrounding area potentially impacted by dewatering (e.g. use anticipated pump rates, rate of recharge etc.);
- b) identifying all receptors susceptible to groundwater level changes (public and private);
- c) containing poor quality discharge water and treat prior to appropriate disposal; and
- d) undertaking measurements in boreholes (subject to permission).

14.6.4 Should any deterioration of groundwater occur the Contractor will be required to develop and implement a monitoring strategy of downstream watercourses in order to identify appropriate corrective action.

14.6.5 There are only a few cuttings on the Scheme and groundwater is anticipated to be below these cuttings. In the event that groundwater is encountered, there could be a need for the Contractor to establish a baseline and construction phase monitoring programme.

14.7 Flood risk

14.7.1 Construction activities will be undertaken by the Contractor taking into consideration the requirements to avoid any significant increase of flood risk. Appropriate measures, such as keeping watercourses clear of obstructions and debris to reduce blockage risk, will be implemented by

the Contractor throughout the works in order to prevent, potential flooding events. Suitable access and safe refuges are to be identified for use in the event of a flood and these will be communicated to all site personnel as part of the Contractor's site induction. Appropriate maintenance access will be made available to watercourses and associated flood risk structures, if required.

- 14.7.2 The Contractor will consult with the relevant regulatory bodies and other relevant risk management authorities on areas at risk of flooding and make appropriate use of the EA's Floodline flood warning service for works within areas at risk of flooding. Contact details will be provided to all site personnel as part of their site induction.
- 14.7.3 The Contractor will utilise the FRA for the Scheme to prepare site specific flood risk management plans (to be included within the final CEMP) for those areas of the site at risk of flooding. These plans would include all areas within Flood Zone 3, areas susceptible to groundwater flooding, and other flood risk sources, such as sewer flooding and areas at risk of reservoir flooding.
- 14.7.4 The Contractor will, as far as reasonably practicable, ensure that flood risk is managed safely throughout the construction and implementation period and consider potential flooding effects when planning sites and storing materials.
- 14.7.5 A risk based precautionary approach using the source – pathway – receptor concept will be applied to temporary and permanent works. Designers and the Contractor must prepare construction and permanent works proposals that are safe and to ensure that flood risk (including that to third parties and the proposed works) is managed appropriately.
- 14.7.6 Where practicable, the Contractor should avoid locating temporary structures, such as accommodation and stockpiles, and the placing of construction equipment within Flood Zone 3 areas or areas at significant risk of flooding from other sources.

Flood risk management plan

- 14.7.7 The Contractor will submit, as appropriate, a report on flood risk to the employer's representative. These reports will summarise:
- a) any applications made for flood defence consent, where required, for temporary and permanent works and the status of the works;

- b) any specific requirements or conditions of the approval that will be obtained from the relevant consenting bodies;
- c) any flood risk management or mitigation measures implemented in support of temporary and permanent works proposals; and
- d) a statement on the cumulative flood risk impact of temporary and permanent works.

14.7.8 Realignment of ditches and watercourses will only be considered if other options are not possible. Careful consideration of the design of the new channel will be undertaken to ensure that it is geomorphically stable (i.e. the design does not result in increased erosion or deposition). Any channel realignments would be designed to take into account the following:

- a) reduction/increase in the channel length due to alteration of channel planform, potentially impacting channel gradient and consequentially flow and sediment dynamics; and
- b) incorporation of geomorphological and ecological features.

14.8 Monitoring

14.8.1 Following the completion of the ground investigation works the consultation will be undertaken with the EA over any requirements for water quality monitoring of watercourses or groundwater potentially affected by construction works or discharge of surface water run-off, including the following, as appropriate:

- a) pre-construction monitoring to establish baseline water quality conditions;
- b) monitoring during construction works to enable the effectiveness of mitigation measures to limit pollution risk to be monitored and any pollution incidents to be identified; and
- c) monitoring of watercourses receiving surface water run-off during construction to enable the effectiveness of treatment and other SuDS measures to be determined.

14.8.2 The Contractor will carry out monitoring as appropriate to identify:

- a) pollution risks that are unacceptably high;
- b) spillages and leakages;
- c) non-compliance with the final CEMP; and

d) suspected pollution incidences.

14.8.3 The Contractor will undertake groundwater monitoring if ground investigation works identify the requirement. The monitoring works would inform the design of the Scheme and developing construction methods to mitigate potential impacts on the groundwater regime. The Contractor will also consult with the EA regarding the pollution incident control plan that will set out the measures to be implemented to address any adverse findings from the monitoring procedures during and following completion of construction works set out above.

14.9 Site documentation

14.9.1 In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:

a) flood defence consent documentation.

15 GLOSSARY

Borrow pit	An area where engineering fill material is extracted for use at another location, for example as part of the Scheme embankments.
BPM	Best practicable means - defined in the Control of Pollution Act 1974 and Environmental Protection Act 1990 as measures which are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.
BS	British standard.
CCTV	Closed circuit television.
CD&E	Construction demolition and excavation
CEMP	Construction Environmental Management Plan.
CIRIA	Construction Industry Research and Information Association.
CL:AIRE	Contaminated land: applications in real environments – an organisation dedicated to raise awareness of practical sustainable remediation technologies.
DCO	Development consent order - the means of obtaining permission for developments categorised as nationally significant infrastructure projects ("NSIP").
DEFRA	Department for Environment, Food and Rural Affairs.
EIA	Environmental impact assessment. A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision-making.
EMS	Environmental management system.
EOC	Explosive ordnance clearance.
ES	Environmental statement. A document produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations to report the results of an EIA.
Flood zones	Flood Zones refer to the probability of river and sea flooding. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's web site.
Network Occupancy Criteria	The time stipulated for the onset of traffic management up until the complete removal of the traffic management system. The times vary from road to road dependent upon traffic volumes.
NPPF	National Planning Policy Framework.
PPGs	Pollution prevention guidelines – EA guidance and advice on the law and good environmental practice.

s61	Section 61 of the Control of Pollution Act 1974 (which sets out procedures seeking and obtaining local authority consent to measures for the control of noise and vibration on construction sites).
SWMP	Site waste management plan.
SuDS	Sustainable drainage systems.
TMWG	Traffic management working group.
UXO	Unexploded ordnance.
WSI	Written Scheme of investigation (a programme for archaeological investigation works).