M42 Junction 6 Improvement
Scheme Number TR010027
Volume 6
6.11 Outline Environmental Management Plan

Regulation 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

January 2019

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2018

M42 Junction 6 Improvement Scheme Development Consent Order 202[ ]

6.11 Outline Environmental Management Plan

	Planning Act 2008 Section 5(2)(1)
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1 Introduction and background to the project

1.1 Purpose of the Outline Environmental Management Plan

1.1.1 This document is the Outline Environmental Management Plan (OEMP) for the M42 Junction 6 Improvement (the Scheme). Powers to construct, operate and maintain the Scheme are being sought by Highways England through an application for a Development Consent Order (DCO) (refer to draft DCO [**TR010027/APP/3.1**]).

1.1.2 An Environmental Impact Assessment (EIA) has been undertaken for the Scheme and an Environmental Statement (ES) [**TR010027/APP/6.1**] has been prepared in accordance with the Infrastructure Planning (EIA) Regulations 2017 (EIA Regulations). In accordance with the requirements of the EIA Regulations, the ES contains the assessment of the potential impacts on the environment that may be caused during construction, operation and maintenance of the Scheme and describes proposed mitigation measures.

1.1.3 This OEMP is based on the design for which the DCO for the Scheme is being applied. It has been prepared in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11 Section 2, Manual of Contract Documents for Highways Works and Interim Advice Notes (IAN) 183/14 Environmental Management Plans and IAN 182/14 Major Schemes: Enabling Handover into Operation and Maintenance.

1.1.4 As set out in **Figure 1**, this OEMP will be developed into a more detailed Construction Environmental Management Plan (CEMP) by the Principal Contractor (PC)[1] once the detailed design has been finalised

1.1.5 This OEMP contains a number of outline Management Plans (OMP) for key environmental disciplines to be developed into the final Management Plans, by PC, prior to construction as considered below. Each final Management Plan must be based on the relevant OMP and must incorporate and reflect the requirements of the sections of the OEMP and CEMP.

1.1.6 The purpose of this OEMP is to:

a. manage the environmental effects of the Scheme as identified in the ES;

b. provide the equivalent of a Code of Construction Practice (CoCP), a suggested item for inclusion within the DCO application (The Planning Inspectorate's Advice Note 6, Appendix 1). The scope of this OEMP is such that it includes all those measures that would be expected within such a CoCP;

c. provide the 'blueprint' for the more detailed CEMP that will follow; and

[1] To accord with the requirements in Schedule 2, paragraph 4 of the draft DCO (document reference TR010027/APP/3.1)

d. enable the Examining Authority and the Secretary of State to identify those mitigation measures proposed within the Scheme which are secured within this OEMP.

1.1.7 Measures within the OEMP include proposed design, construction and operational mitigation, which, in part, arise from the technical assessments presented in the ES. The technical assessments within the ES have taken account of the measures within the OEMP as 'embedded mitigation'. The design mitigation measures included in the ES can also be seen in the Environmental Masterplan **Figure 8.8** of the ES. [**TR010027/APP/6.2**].

1.1.8 The ES and the assessments within it are based on the works proposed in the DCO Works Plans [**TR010027/APP/2.3**] and Engineering Sections [**TR010027/APP/2.8**] and the maximum area of land anticipated as likely to be required, taking into account the proposed limits of deviation for the Scheme, provided for in the draft DCO. All distances, directions, areas and lengths referred to in this document are approximate.

1.1.9 For the purposes of the OEMP, the following definitions apply:

a. the **Authority** is Highways England. The Authority is Highways England. The Authority will agree the CEMP and other Management Plans defined within this OEMP and also in Schedule 2, Requirement 4 of the draft DCO [**TR010027/APP/3.1**] before it is submitted to the Secretary of State for approval.

b. the **PC** means any contractor appointed by Highways England to deliver the construction works (and shall also include any sub-contractors appointed by the PC to carry out any part of the main construction works); and

c. the **maintenance authority** is a body tasked with the maintenance of the Scheme once operational. The Strategic Road Network (SRN) elements of the Scheme would be maintained in the longer term by the Authority. Local Road elements of the Scheme would be maintained by Solihull Metropolitan Borough Council (SMBC).

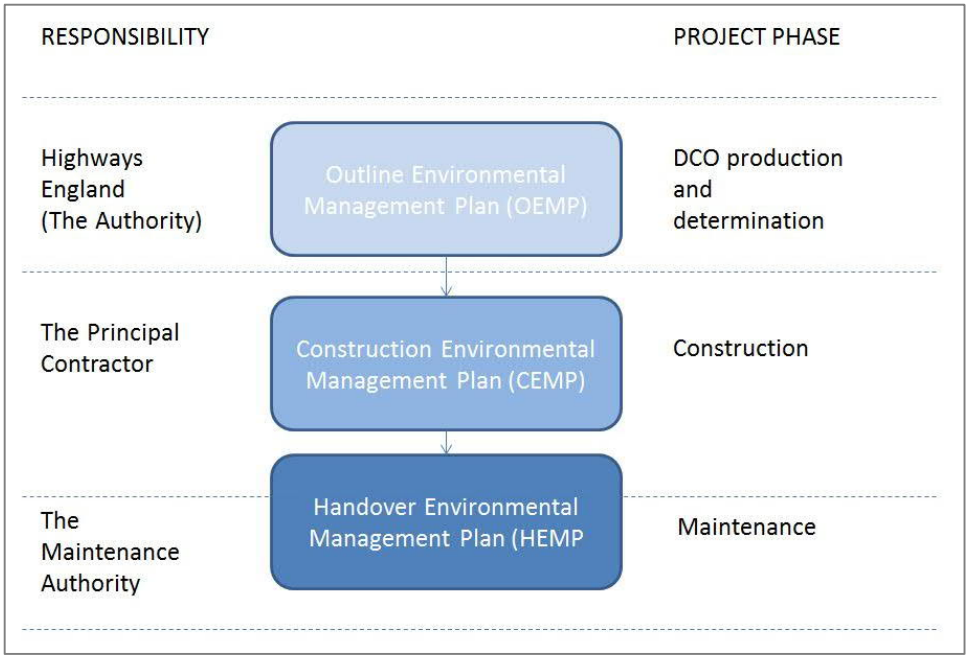

Figure 1.1: Development of the OEMP through construction and handover

1.1.10 The CEMP[2] will be a live document that will be maintained by the PC throughout the construction phase. As a minimum, the CEMP will be reviewed annually to ensure it is kept up to date.

1.1.11 In addition to the commitments and measures specified in the CEMP, the PC must comply with applicable environmental legislation together and other requirements and controls that will be put in place by the DCO. Accordingly, such statutory requirements are not stated within this OEMP.

1.1.12 Towards the end of construction phase, the PC will develop the CEMP into a Handover Environmental Management Plan (HEMP) for the operational and maintenance phase of the Scheme, which will be subject to the approval of the Authority. The indicative contents of a HEMP are set out in IAN 182/14 (Enabling Handover into Operation and Maintenance).

1.1.13 This will then be implemented by the maintenance authority responsible for the maintenance of the Scheme during the operational phase.

1.2 The Project

Location

1.2.1 The Scheme would be implemented within an area broadly defined by M42 Junction 7 to the north, Birmingham Airport and Catherine-de-Barnes village to the west, Middle Bickenhill and Hampton in Arden village to the east, and M42 Junction 5 to the south.

[2] Hereafter any reference to the CEMP is intended to refer to both the CEMP and the associated Management Plans that will form part of it.

1.2.2 Junction 6 of the M42 sits on the eastern side of Birmingham. It is an important junction on the SRN and part of a collection of roads referred to as the Birmingham Box (M5 on the west side, M6 on the north side, M42 east and south side).

1.2.3 The junction lies at the heart of an area of dynamic growth and is surrounded by a unique mix of major assets that serve both the local and wider economy. It is located north of Solihull and provides the main access on to the SRN for Birmingham Airport, the National Exhibition Centre (NEC), Birmingham International Railway Station, Birmingham Business Park, Jaguar Land Rover (JLR), the National Motorcycle Museum and National Conference Centre (NMM), and the High Speed 2 (HS2) Birmingham Interchange station.

1.2.4 In addition to these major assets, the area adjacent to Junction 6 of the M42 (immediately to the north-east) is earmarked for development by others to maximize the growth opportunity HS2 will bring.

Need for the Scheme

1.2.5 The Roads Investment Strategy (RIS) for the period 2015-2020, sets out a long-term approach to improve England's motorways and major roads. The Scheme forms part of the RIS and has been identified by Government as one of a number of nationally important infrastructure projects which are required to revitalise the economy and accordingly Government funding has been allocated for its delivery.

1.2.6 The Scheme is required to offset current congestion issues facing the M42 around Junction 6, as well as to accommodate predicted increasing traffic flows beyond 2019. A lack of infrastructure investment is likely to increase the current congestion and reliability issues at the junction, which have been identified as significant constraints to future investment and economic growth. This major investment opportunity of national significance is therefore necessary to improve the junction and regional and national economic outlook.

1.2.7 Junction 6 of the M42 is a key junction on the SRN being the gateway to an expanding Birmingham Airport, the NEC, Birmingham Business Park and JLR at Solihull. With the planned addition of HS2's Birmingham Interchange Station in this area in 2026, in which there are further aspirational plans for a surrounding 350 acre mixed-use development site called Arden Cross (housing, commercial, retail and leisure space), the demand on Junction 6 and the surrounding network is predicted to substantially rise.

1.2.8 The Scheme is part of a larger £1.63 billion government Growth Strategy which is being developed with local partners, through UK Central Solihull Urban Growth Company, to maximise the economic benefits of HS2. The HS2 project gained Royal Assent in February 2017 and has been designed to link London, Birmingham, the East Midlands, Leeds and Manchester through a high speed rail network.

1.2.9 To address the current constraints and issues associated with M42 Junction 6, the following objectives were identified for the Scheme:

a. Objective 1: promote the safe and reliable operation of the network;

b. Objective 2: increase the capacity of the junction;

c. Objective 3: improve access to key business and support economic growth;

d. Objective 4: helping walkers, cyclists and other vulnerable users of the network.

Brief outline of proposed works

1.2.10 The Scheme will create a new junction (Junction 5A) approximately 1.8km south of the existing Junction 6 of the M42 and a new 2.4km long dual carriageway link road (mainline link road) between Junction 5A and Clock Interchange, on the A45 Coventry Road (A45) west of M42 Junction 6, will also be created, with a free flow slip road to the A45 westbound. Subsequently there will be capacity and junction improvements at Clock Interchange roundabout.

1.2.11 The development will comprise of the realignment and modification of the B4438 Catherine-de-Barnes Lane, Clock Lane and St. Peters Lane located west of the M42, and of East Way to north east of M42 Junction 6. The Scheme will also include the necessary diversion or protection of statutory undertakers assets affected by the Scheme, modification and improvements to public rights of way, footbridges and private accesses, environmental mitigation works, emergency refuge areas, overhead gantries and message signing along the M42.

1.2.12 The development also includes the provision of a reconfigured sports facility for the Warwickshire Gaelic Athletic Association (WGAA) at Páirc na hÉireann off Catherine-de-Barnes Lane to the west of Bickenhill.

Programme

1.2.13 Subject to the outcome of the DCO application, construction of the Scheme would commence in the first half of 2020 and would continue until spring 2024.

1.2.14 As described in Chapter 3 The project of the ES [**TR010027/APP/6.1**], the works would be undertaken in phases across different areas of the Scheme, in order to reduce the level of disruption to residents, local businesses, statutory undertakers' assets and road users.

1.2.15 Notwithstanding this, some overlapping of activities within the phases would be necessary during the construction period, and the majority of the Scheme would be open to traffic before full completion of the works in 2024.

1.2.16 The construction of Junction 5A and the mainline link road has been planned such that the traffic flow is maintained along Catherine-de-Barnes Lane and B4012 Solihull Road (Solihull Road). This is achieved through the use of temporary road alignments.

1.2.17 The key construction programme dates are provided in **Table 1.1**.

Table 1.1: Key construction programme dates (indicative)

Key programme element	Date
DCO application granted by the Secretary of State for Transport	Spring 2020
Notice to proceed (construction begins)	Spring 2020
Scheme open to traffic	Autumn 2023
M42 Junction 6 works complete	Spring 2024
Defects correction period (1 year)	Autumn 2024
Landscape maintenance period ends (up to 5 years)	Spring 2029

1.3 Structure of this document

1.3.1 The remainder of this document is structured as follows:

a. Section 2: Roles and responsibilities. This section defines the roles which the PC will identify within the CEMP, in order to deliver the environmental commitments.

b. Section 3: Register of Environmental Actions and Commitments (REAC). This section identifies the environmental commitments to address the potential environmental effects of the works (**Table 3.2)**, including commitments to certain key items of embedded mitigation. As discussed above, the specific measures set out in **Table 3.2** will form part of the CEMP developed by the PC for the works.

c. Appendices: OMPs which will be used by the PC to prepare final Management Plans, as appropriate, for each work site:

Appendix A: Outline Dust, Noise and Nuisance Management Plan;

Appendix B: Outline Site Waste Management Plan;

Appendix C: Outline Environmental Control Plan: Invasive Species;

Appendix D: Outline Environmental Control Plan: General Ecology;

Appendix E: Outline Soil Management Plan;

Appendix F: Outline Surface Water Management Plan;

Appendix G: Outline COSHH (Control of Substances Hazardous to Health) Material, Waste Storage and Refuelling Plan;

Appendix H: Outline Energy and Resource Use Management Plan;

Appendix I: Outline Materials Management Plan;

Appendix J: Outline Contaminated Land Management Plan;

Appendix K: Outline Archaeological Control Plan;

Appendix L: Outline Pollution Prevention Plan; and

Appendix M: Outline Bird Strike Management Plan.

Appendix N: Outline Crane Management Plan.

2 Roles and responsibilities

2.1 Site roles and responsibilities

2.1.1 The roles, identified in **Table 2.1**, define the responsibilities associated with the roles for construction works, that the PC must establish and maintain. The responsibilities defined in the table include those relating directly to the development and implementation of the CEMP and final Management Plans and the wider environmental responsibilities. The PC will be required to delegate responsibilities to onsite personnel within key areas of the site and compounds. The delegation of responsibility will be clearly identified within relevant documents and site files.

2.1.2 Individual names and contact details will need to be confirmed and inserted where applicable by The Authority and the PC once appointed. The PC shall establish a management structure that includes an organisational chart encompassing all staff responsible for delivery of environmental mitigation measures and shall include this chart within the CEMP. The chart will set out the respective roles and responsibilities with regard to the environment.

2.1.3 It is anticipated that prior to the commencement of each stage of the Scheme, individuals would be identified to fulfil the relevant roles, and that as the CEMP and relevant final Management Plans are developed, and ultimately as the HEMP is produced, the roles and responsibilities would be further defined and clarified upon each iteration.

Table 2.1: Roles and responsibilities

Roles	Responsibilities
The Authority	CEMP responsibilities: • approval of the CEMP/Management Plans (as required by Schedule 2 of the draft DCO [**TR010027/APP/3.1**] and any detailed schemes required by this CEMP (for example, protected species protection). Overall responsibilities: • to monitor the PCs' performance against the contract including any environmental commitments and targets agreed for the Scheme.
The Principal Contractor's Project Manager (PM)	CEMP responsibilities: • approval of the CEMP/Management Plans, prepared by the Environment Manager (EM), for the relevant phase of works; and • ensure that all controls specified within the CEMP/Management Plans are implemented by employees and sub-contractors. Overall environmental responsibilities: Responsible for the delivery the Scheme. Has overall responsibility for the environmental performance and all staff. The PM will be required to: • provide information on contract requirements to the EM following contract award and prior to start of works on site; • ensure environmental and waste requirements are included on requisitions and in subcontracts and orders; • ensure that all required consents/licences are in place in line with the relevant project phase; • log and monitor incidents and non-compliances. Report incidents and non-compliances to the Authority at the earliest possible opportunity;

Roles	Responsibilities
	• ensure that the Authority 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 EM to ensure that the environmental controls as set out within the CEMP/Management Plans are in place and working effectively; and • ensure all records are retained and readily available on site.
Principal Contractor's Environmental Manager (EM)	CEMP responsibilities: • preparing the CEMP/Management Plans based on the OEMP/OMPs; • undertake site inspections to monitor compliance with the environmental licences/consents for the works and the measures within the CEMP/Management Plans; • prepare any changes to the CEMP/Management Plans in consultation with the PM; • maintaining and updating the CEMP/Management Plans on an ongoing basis as required during the relevant project phase; • managing the delivery of the various Management Plans defined within the appendices of this CEMP (and Schedule 2 of the draft DCO [**TR010027/APP/3.1**], using appropriate technical expertise as required; and • managing the delivery of the monitoring required under the CEMP/Management Plans, alongside relevant specialists, and reporting to relevant stakeholders at a frequency to be defined in the CEMP.

Roles	Responsibilities
	Overall responsibilities: Responsible for ensuring that the Scheme complies with all environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the ES throughout the relevant project phase. The EM will be required to: • provide Tool Box Talks and environmental inductions to all staff involved in the relevant phase of the Scheme; • deal with queries and correspondence on environmental issues; • approve by way of sign off, that the environmental elements of the Scheme have been created and maintained in accordance with the CEMP/Management Plans to the appropriate standard; • implement follow-up corrective actions to ensure compliance with UK regulations and legislation; • 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 PCs, consultants and project team members associated with environmental and ecological issues and where appropriate resolve issues in a practical and efficient way.
Principal Contrator's Environmental Clerk of Works (ECoW)	CEMP responsibilities: • review of relevant sections of the CEMP; • responsible for ensuring that all ecological elements of the CEMP are complied with; and Overall responsibilities: Responsible for ensuring that the Scheme complies with all ecological legislation and consents, including the DCO and those arising from the ES throughout the relevant project phase. The Ecological Clerk of Works (ECoW) will be required to: • ensure compliance with relevant DCO Requirement; • undertake watching briefs during site clearance activities, to ensure that any unanticipated discoveries of notable flora and fauna, including invasive species, are appropriately dealt with;

Roles	Responsibilities
	• approve by way of sign off, that the ecological elements of the Scheme have been created and maintained in accordance with the CEMP/Management Plans to the appropriate standard; • monitor works during construction at sensitive sites, including but not limited to, Bickenhill Meadows SSSI; • monitor and provide guidance during the creation of these habitats; and • give Tool Box Talks, where required, to inform all site personnel of the ecological constraints on site.
Principal Contractor's Environmental Specialist(s) *(Including: Contamination and remediation specialist.* *Project Waste Management controller - may be* *member of PC's dedicated Quality and Safety Team* *Ecologist/Ecological Clerk of Works: Supervision if protected species presence* *confirmed or risk identified during works.* *Landscape Manager to supervise planting and* *aftercare.)*	CEMP responsibilities: • review of relevant sections of the CEMP/Management Plans; • responsible for ensuring that all ecological elements of the CEMP/Management Plans are complied with; and • preparing relevant sub-ordinate plans to the CEMP as listed in Requirement 4 of the draft DCO [**TR010027/APP/3.1**]. Overall responsibilities: • responsible for ensuring that the Scheme complies with all ecological legislation and consents, including the DCO and those arising from the ES throughout the relevant project phase; • ensure compliance with draft DCO Requirement 4 [**TR010027/APP/3.1**]; • provide appropriate professional and practical advice to PCs, consultants and project team members associated with environmental and ecological issues and where appropriate resolve issues in a practical and efficient way; and • other responsibilities as necessary and appropriate.
Community Liaison Officer	CEMP responsibilities: • review of relevant sections of the document. Overall responsibilities: Communications with the public, stakeholders and other interested parties, outreach and education, where

Roles	Responsibilities
	appropriate. The role will include the following responsibilities: • responding to any concerns or complaints raised by the public in relation to the works; • liaising with the PM and EM on landowner and community concerns relating to the works and act as the main interface with these stakeholders, alongside any the Authority presence that is required; • maintain a log of complaints relating to the environment; • ensuring that the PM and the EM are informed of any complaints relating to the environment; • keeping the public informed of project progress and any construction activities that may cause inconvenience to local communities; • engaging with local schools and colleges to inform pupils and students about the Scheme, advise on careers within the construction industry and point out the dangers of trespassing on construction sites; and • ensuring that the needs of groups with protected characteristics as identified within the Equality Act 2010 are considered during the construction process.
All Site Staff	CEMP. Overall responsibilities: To receive general environmental awareness training, and undertake work in accordance with all works Method Statements and Tool Box 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: • all staff are to be appropriately trained to carry out their respective tasks; • adhere to legislation and where appropriate codes of practice and guidance notes relevant to their work; and • Report breaches of legislation and where appropriate codes of practice and guidance notes, to the EM.

3 The Register of Environmental Actions and Commitments

3.1 Introduction

3.1.1 The REAC identifies the environmental commitments (including commitments to certain key items of embedded mitigation) proposed to address the potential environmental effects of the preliminary works and the main works.

3.1.2 The REAC table will be updated by the PC when it prepares the CEMP and then as required as the Scheme progresses. The CEMP must be prepared in accordance with the principles of this OEMP, and will require approval from the Authority. Where actions are modified, this should be justified as being consistent with the principles of the CEMP to the satisfaction of the Authority.

3.1.3 The extant (final) version of the CEMP at the end of construction will be developed by the PC into a HEMP, which will then be the main document containing essential environmental information passed to the Authority and to the Maintenance Authority responsible for the future maintenance of the Scheme once it is operational.

3.2 Guide to the REAC table

3.2.1 The table does not define general legislative requirements. It is assumed that in addition to compliance with the measures in this table, all activities will comply with applicable legislation.

3.2.2 **Table 3.1** provides a summary of the scope of each column within the REAC tables.

Table 3.1: Explanatory guide to REAC table columns

Column	Explanation
Reference (Ref.).	A unique identifier defined within these REAC tables to enable simple reference to individual measures.
Source Reference (Source Ref.)	An identifier which is directly relevant to the action or commitment, for example a source such as a mitigation reference in the ES. Where no Source Reference is given, the measure is normally one which is relevant across a range of technical areas and is a broader control measure (e.g. Working Hours).
Action/ commitment *(including specific location and any monitoring required)*	The action that is required is defined. **The location for the action is Scheme wide, unless otherwise stated**. Any monitoring that is required in relation to the action is defined.

Column	Explanation
Reporting criteria	The criteria which define the successful implementation of the action, such as a document approval which confirms the action has been undertaken.
Responsible person(s)	The person or body responsible for delivery of the action; this will often be the PC.

3.2.3 In order to provide for future flexibility and unless otherwise stated, the REAC (**Table 3.2**) does not typically define how the action is to be implemented or achieved, and do not consider the risk management of individual items, unless these elements are implicit within the action.

3.2.4 The references to guidance documents within the REAC tables are not intended to be exhaustive and in preparing the CEMP and final Management Plans, the PC shall have due regard to any relevant technical guidance in individual subject areas and draw upon and reference these as appropriate.

3.2.5 The table includes those actions to be incorporated into the works for the Scheme and where relevant the operation and maintenance of the Scheme by the PC or the maintenance authority.

3.2.6 The CEMP, each final Management Plan and the HEMP will require the approval of the Authority.

3.3 Register of Environmental Actions and Commitments (REAC)

Table 3.2: REAC Table

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
GENERAL PROVISIONS				
G1	n/a	***Preparation of a CEMP*** The PC must prepare and have approved by Secretary of State for Transport, a CEMP for their works (as per the agreed scope of the contract) prior to the commencement of their works and which details the measures that shall be undertaken prior to, and during construction of, the Scheme. The construction of the authorised development must be carried out in accordance with the approved CEMP. The CEMP must be based on, and incorporate, the requirements of the OEMP [**TR010027/APP/6.11**], and shall include the implementation of industry standard practice and control measures for environmental impacts arising during construction. The CEMP shall incorporate (as a minimum) and adhere to the supporting management plans presented within the OEMP. These plans include: • Outline Dust, Noise and Nuisance Management Plan • Outline Site Waste Management Plan • Outline Environmental Control Plan; Invasive Species • Outline Environmental Control Plan: General Ecology • Outline Soil Management Plan • Outline Surface Water Management Plan • Outline COSHH (Control of Substances Hazardous to Health) Material, Waste Storage and Refuelling Plan • Outline Energy and Resource Use Management Plan • Outline Materials Management Plan • Outline Contaminated Land Management Plan • Outline Archaeological Control Plan • Outline Pollution Prevention Plan • Outline Bird Strike Management Plan • Outline Crane Management Plan The approved CEMP will be written in accordance with the PC's obligations to adhere to ISO 14001 (Environmental Management Systems) and the Considerate Constructors Scheme (CCS).	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
G2		**Handover Environmental Management Plan** The PC is responsible for the preparation of a HEMP during the contract period.	Requirement 4 within Schedule 2 of the DCO	Principal Contractor
G3		**Traffic Management** No part of the authorised development is to commence until a traffic management plan for that part has been submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority on matters related to its function. The authorised development must be constructed in accordance with the traffic management plan.	Requirement 10 within Schedule 2 of the DCO	Highways England/Principal Contractor
G4		**Traffic Management** No part of the authorised development is to commence until a traffic management plan for that part has been submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority on matters related to its function. The authorised development must be constructed in accordance with the traffic management plan.	Requirement 12 within Schedule 2 of the DCO	Highways England/Principal Contractor
AIR QUALITY				
G5	[**TR010027/APP/6.1**] Chapter 6	***Preparation of a CEMP*** A CEMP (Ref G1) must include an Air Quality Management Plan. .	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor
CULTURAL HERITAGE				
G6	[**TR010027/APP/6.1**] Chapter 7	***Lighting*** The Scheme shall be designed positioned and directed so as not to unnecessarily intrude on adjacent buildings, and on the setting of the identified heritage assets of Bickenhill Conservation Area and the listed features within it. Lighting shall be confined to locations where road safety is a priority so as to limit spill at night**.**	Final design	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
G7	[**TR010027/APP/6.1**] Chapter 7	***Preparation of a CEMP*** A CEMP (Ref G1) shall be prepared by the contractor which details the measures that shall be undertaken prior to, and during, the construction of the Scheme to mitigate the effects as a result of construction activities as presented within the Scheme-specific OEMP [**TR010027/APP/6.11**]. In summary these measures include: • raising the awareness of construction workers and operatives to any control and reporting procedures to be followed, should archaeological deposits be encountered during the works, for example through toolbox talks and regular briefings; • the protection of built heritage assets and archaeological sites during construction, for example through the demarcation of buffer zones around such interests with fencing and signage; and • the control of light spillage, noise and dust within construction compounds and working areas, for example implementing good site layout and working practices to minimise light spill temporary impacts on the setting of built heritage and conservation areas.	Published document/ Requirement within Schedule 2 of the DCO.	Principal Contractor
G8	[**TR010027/APP/6.1**] Chapter 7	***Written Scheme of Investigation (WSI)*** No part of the authorised development is to commence until for that part a written scheme for the investigation of areas of archaeological interest, reflecting the relevant mitigation measures set out in the REAC, has been submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority on matters related to its function. Following archaeological evaluation trenching, the PC must prepare a Written Scheme of Investigation (WSI) based upon the broad principles and approaches within the Outline Archaeological Control Plan, to mitigate potential impacts on buried archaeological remains. .	Published document/ Requirement within Schedule 2 of the DCO.	Principal Contractor
LANDSCAPE				
G9	[**TR010027/APP/6.1**] Chapter 8	***Planting Strategy*** No part of the authorised development is to commence until a landscaping scheme applicable to that part has been submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority on matters related to its function The landscaping scheme prepared by the PC must reflect the mitigation measures set out in the REAC and must be based on the landscape strategy/proposed landscape planting in **Figure 8.3** [**TR010027/APP/6.2**].	Prepared document/ Requirement within Schedule 2 of the DCO.	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
G10	[**TR010027/APP/6.1**] Chapter 8	***Landscape Management*** Highways England shall be responsible for undertaking landscape management within the contract period for a minimum period of five years from the first operational day of the Scheme.	Requirement 5 within Schedule 2 of the DCO	Highways England/ Principal Contractor
G11	[**TR010027/APP/6.1**] Chapter 8	***Preparation a CEMP*** A CEMP (Ref G1) shall be prepared by the PC which details the measures that shall be undertaken prior to, and during construction of, the Scheme as presented within the Scheme OEMP [**TR010027/APP/6.11**]. In summary these measures include: • maintaining well-managed and tidy construction working areas and site compounds to minimise their visual impact and appearance in the landscape; • materials are delivered on an "as and when" basis (where applicable), to minimise the potential for stockpiling and associated visual impact; • So far as is practicable, minimise the height of soils and other stockpiled materials in order to reduce their visual impact; • the protection and retention of trees in proximity to construction working areas, to avoid damage to existing vegetation; • finishing site offices and facilities within the main site compound in a recessive colour to blend into the local landscape and immediate surroundings; and • keeping construction lighting to the minimum luminosity necessary within site compounds and working areas, and directing and positioning this sympathetically and, where possible, fitting it with motion sensors to minimise potential light spill in night time views.	Published Document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor
G12	[**TR010027/APP/6.1**] Chapter 8 and Chapter 9	***Compensation Measures*** Highways England will ensure that compensatory planting is provided south of Aspbury's Copse, in accordance with the Environmental Masterplan (**Figure 8.8**. [**TR010027/APP/6.2**]) and Chapter 9 Biodiversity of the Environmental Statement [**TR010027/APP/6.1**] to offset the loss of ancient woodland within Aspbury's Copse.	Contract	Highways England/ Principal Contractor
BIODIVERSITY				
G13	[TR010027/APP/6.1] Chapter 9	***Habitat Translocation*** The strategy for grassland translocation at Castle Hill Farm Meadows Local Wildlife Site (LWS) will be based on best practice as outlined within Chapter 9 Biodiversity of the ES [**TR010027/APP/6.1**]. The key points of the approach are summarised below, the final details of which will be informed by a soil survey of donor and receptor sites:	Environmental Masterplan	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
		• the translocation will be completed under the supervision of an appropriately qualified ECoW; • every effort will be made to ensure the translocation will only take place during the autumn, but if this is not possible then it will be completed in early spring and will avoid periods when ground conditions are unsuitable, i.e. too wet and/or frosty and/ or during extreme weather conditions; • the full extent of the donor grassland and receptor sites will be identified and marked out from the outset, with fencing and signage used to protect the area as appropriate; • controlled access routes and low ground-pressure vehicles will be used to avoid unnecessary compaction of soils; • the translocation will involve only the soil A-horizon from the donor site to a depth of up to 40 cm as determined by the on-site conditions; • there will be no storage of any soils prior to use; translocation of soils will be undertaken in the same 24 hour period; • the laying of soils will be undertaken in strips the working width of an excavator; no machinery will run on the re-laid soils; and • the laying of soils will be arranged as far as it practicable in a manner that replicates the existing topography and aspect of the donor site.		
G14	[**TR010027/APP/6.1**] Chapter 9	***Soil Sampling*** Highways England will undertake a soil survey of donor and receptor sites associated with the habitat translocation associated with loss of 1.17ha of Castle Hill Farm Meadows local wildlife site.	Environmental Masterplan	Highways England/Principal Contractor
G15	[**TR010027/APP/6.1**] Chapter 9	***Soil Sampling*** Highways England will undertake a soil survey of donor and receptor sites associated with the soil translocation associated with the replanting area identified for Aspbury's Copse.	Contract	Highways England/ Principal Contractor
G16	[**TR010027/APP/6.1**] Chapter 9	***Hedgerow Translocation*** The loss of hedgerows that are considered to be of County importance hedgerows [H35 and H42, see Section 9.9] of the ES [**TR010027/APP/6.1**]) and **Figure 9.3** [**TR010027/APP/6.2**] will be mitigated through their translocation into the retained habitats within the Order Limits where gaps have been created to facilitate the construction of the Scheme. Any sections of these hedgerows that cannot be retained and translocated as a consequence of construction will be replaced or gaps filled where necessary.	Environmental Masterplan	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
G17	[**TR010027/APP/6.1**] Chapter 9	***Bickenhill Meadows SSSI*** Highways England will continue to refine the mitigation solution using: data obtained from the ongoing dipwell monitoring; and information gathered from further analysis of the local topography and existing water sources. These refinements will seek to identify a sustainable drainage mechanism to mitigate the effects of the Scheme on Bickenhill Meadows Site of Special Scientific Interest (SSSI). Highways England will seek to agree any refinements to the mitigation approach with Natural England prior to commencement of the Scheme.	Continued engagement with Natural England	Highways England/ Principal Contractor
G18	[**TR010027/APP/6.1**] Chapter 9	***Bickenhill Meadows SSSI*** Highways England commits to the ongoing dipwell monitoring associated with Bickenhill Meadows SSSI. This is currently being undertaken on a monthly basis within the SSSI and will continue for a period of two years post-submission of the DCO application in order to record water table levels, the outcomes of which will be shared with Natural England.	Continued engagement with Natural England	Highways England
G19	[**TR010027/APP/6.1**] Chapter 9	***Bickenhill Meadows SSSI Pumping Solution*** A pumped mitigation solution has been developed to mitigate for the loss of surface water catchment at Shadowbrook Meadows South East (SE) unit (site). The design principles of the pumped solution consist of a collection drain on the western slope of the mainline link road cutting to intercept surface water flows that would otherwise have drained towards the SSSI. The collection drain would discharge to a sealed collection sump, from where water would be pumped and/or captured from an alternative water source(s) to an appropriate reed bed/ditch feature in the vicinity of Shadowbrook Meadows SE unit. This feature would act as a recharge trench, from which water would drain through to the sand, gravel and clay deposits in the upper layers of the substrata within the SSSI. The above design principle has been developed in consultation with and agreed in principle with Natural England. Highways England will continue to refine the mitigation solution using: data obtained from the ongoing dipwell monitoring; and information gathered from further analysis of the local topography and existing water sources. These refinements will seek to identify a sustainable drainage mechanism to mitigate the effects of the Scheme on Bickenhill Meadows SSSI. Highways England will seek to agree any refinements to the mitigation approach with Natural England prior to commencement of the Scheme.	Continued engagement with Natural England	Highways England/ Principal Contractor
G20	[**TR010027/APP/6.1**] Chapter 9	***Preparation of a CEMP*** A CEMP (Ref G1) shall be prepared by the PC which details the measures that shall be undertaken prior to, and during construction of, the Scheme as presented within the Scheme-specific OEMP [**TR010027/APP/6.11**]. In summary these measures include: • the development and implementation of environmental constraints plans and working methods to protect retained vegetation, designated sites and other areas of biodiversity value;	Published Document/ Requirement 4 of Schedule 2 of the DCO	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
		• the retention of all mature trees and boundary features within the Order Limits that are outside the limits of the permanent works **Figure 8.4** [**TR010027/APP/6.2**] in Appendix 9.1 of the ES [**TR010027/APP/6.3**], except where loss is required for construction of the Scheme, including temporary works; • the use of fencing, where necessary, to prevent access to retained important habitat, protect habitat, avoid accidental damage, and avoid species mortality (including areas to which species have been temporarily displaced); • the implementation of the protective measures for existing vegetation contained within BS5837:2012; • not locating construction compounds and access tracks within retained woodland, grassland and existing water habitats as identified on the Environmental Masterplan **Figure 8.8** [**TR010027/APP/6.2**]; • undertaking works near watercourses (including the River Blythe SSSI, Hollywell Brook potential Local Wildlife Site (pLWS), Kingshurst Brook pLWS, Shadow Brook and its tributaries) in accordance with Construction Industry Research and Information Association (CIRIA) guidance documents C532, C650, and C648; • designing and positioning construction lighting to minimise light spill onto adjacent habitats, including where there are potential roosts and important foraging or commuting habitat that is regularly used by the local bat population; • the supervision of construction works by an ECoW or a suitably qualified person, where these have the potential to impact on protected species, designated sites or other important ecological features (the ECoW will also ensure that all standard measures and methods detailed within the PC's CEMP, including monitoring surveys, are adhered to); • to implement measures to avoid injury or mortality of animals where possible within construction working areas, for example by excluding them from such areas and preventing them being trapped in excavations; • avoiding disturbance to breeding birds by not undertaking vegetation clearance and structure demolitions during the bird breeding season (March to August inclusive). Where this is not possible measures necessary to avoid harm to birds and their nests will be implemented, as appropriate, under the supervision of the ECoW, with checks regularly carried prior to and during construction to identify any active nests of Schedule 1 (Wildlife and Countryside Act 1981 as amended) bird species that may be at risk of disturbance; • deterring birds from nesting in construction working areas, where appropriate, through either physical means to prevent establishment of nests (for example coppicing) or other legal means of disturbance (for example the regular ploughing of soils or falconry). These measures will be implemented under the advice and supervision of a suitably experienced ecologist, and will not be used where there is considered to be a risk of disturbance to the active nests of Schedule 1 (Wildlife and Countryside Act 1981 as amended) bird species; • the communication of the requirements of the protected species licences, and the associated working practices to construction staff; and • the maintenance of wildlife dispersal corridors during construction (for example mammal tunnels, planting, retained habitat and dark corridors around the boundaries of the Scheme).		

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
G21	[**TR010027/APP/6.3**] Chapter 9 Appendix 9.3	***Retained Hedgerows and Trees*** Retained hedgerows, and associated mature trees, will be protected by the Scheme in accordance with BS5837:2012, which shall include erecting temporary fencing around a standard root protection zone and maintaining throughout the period Scheme construction.	By contract	Principal Contractor
G22	[**TR010027/APP/6.1**] Chapter 9	***Pre-construction Surveys*** Highways England will undertake pre-construction surveys to update the baseline survey findings, in order to avoid impacts on protected species during the construction phase and to update information required for protected species licencing. These will include, but not be limited to, surveys for: a habitat assessment; bats; GCN; badger, otter, and water vole.	By contract	Highways England/ Principal Contractor
G23	[**TR010027/APP/6.1**] Chapter 9	***Soil Translocation*** The Scheme would result in the loss of approximately 0.46ha of Aspbury's Copse ancient woodland resource and associated seed bank. The key points of the approach to soils translocation that has been agreed with Natural England is presented below, the final details of which will be informed by a soil survey of donor and receptor sites: • the translocation will be completed under the supervision of an appropriately qualified ECoW; • the translocation will only take place during the autumn/winter (September to early March, inclusive) and will avoid periods when ground conditions are unsuitable, i.e. when ground conditions are considered to be too wet and/or during extreme weather conditions; • the full extent of the donor woodland and receptor sites will be identified and marked out prior to the translocation of soils, with fencing and signage used to protect the area as appropriate; • coppice stools, saplings and deadwood will be retained and translocated with the soils; • controlled access routes and low ground-pressure vehicles should be used to avoid unnecessary compaction of soils; and • there will be no storage of soil and translocation undertaken in the same 24 hour period; and • subsequently the receptor site and surrounding area will be planted with native woodland species to achieve a minimum replacement ratio of 3:1 and managed over the long term. The long term management will be secured either as part of the Highways England soft estate or by separate legal agreement.	Environment Masterplan / Published Documents	Highways England/ Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
G24	[**TR010027/APP/6.1**] Chapter 9	***Habitat Creation*** Highways England will seek agreements with third parties to implement the ecological enhancement measures presented on the Environmental Masterplan (**Figure 8.8** [**TR010027/APP/6.2**]).	Environmental Masterplan	Highways England
G25	[**TR010027/APP/6.1**] Chapter 9	***Monitoring - Aspbury's Copse pLWS*** Highways England will undertake post construction monitoring within Aspbury's Copse pLWS and the ancient woodland receptor area to: • establish the composition and extent of ancient woodland indicator plant species (surveys are likely to be undertaken annually); and • confirm the presence and extent of associated fungi and lichen species, and the abundance of deadwood material (surveys are likely to be undertaken every three to five years). The monitoring will serve to update current baseline data, and will be used to measure the success of the establishment of the compensatory woodland planting and permit an evaluation of its ecological function (which will be evidenced by the colonisation of woodland plant, fungi and lichen species) Where necessary, the assessment of monitoring data will inform the prescriptions for the future management of Aspbury's Copse pLWS and the receptor area, in order to support the continued maintenance of the conservation status of this woodland resource.	By contract	Highways England/ Principal Contractor
G26		***Lichen and Fungi Surveys*** Highways England will undertake updated lichen and fungi surveys of Aspbury's Copse pLWS. The surveys will be carried out in early 2019.	By contract	Highways England/ Principal Contractor
G27		***Bird Management and Construction Monitoring and Liaison*** Measures relating to the management of bird movements during the construction phase of the Scheme will included within an outline Bird Strike Management Plan Appendix M within the OEMP [**TR010027/APP/6.11**] following consultation with Birmingham Airport.	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor
G28		***Protected Species*** In the event that any protected species which were not previously identified in the environmental statement or nesting birds are found at any time when carrying out the authorised development the PC must cease construction works and report it immediately to the ECoW. Highways England must prepare a written scheme for the protection and mitigation measures for any protected species that were not previously identified in the environmental statement or nesting birds found when carrying out the authorised development. Where nesting birds are identified works should cease within	Requirement 7 within Schedule 2 of the DCO	Highways England/Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
		10m of the nest until birds have fledged and the nest is no longer in use. The written scheme must be implemented and construction in an area specified in the scheme must not recommence until necessary licences are obtained.		
GEOLOGY AND SOILS				
G29	[**TR010027/APP/6.1**] Chapter 10	***Monitoring – Soil Management*** Highways England will implement the requirements for soil reinstatement, monitoring, and aftercare as detailed in the outline Soil Management Plan as presented within this OEMP - Appendix E [**TR010027/APP/6.11**].	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor
G30		**Contaminated Land** In the event that contaminated land, including groundwater, is found at any time when carrying out the authorised development which was not previously identified in the environmental statement, it must be reported as soon as reasonably practicable to the Secretary of State, the relevant planning authority and the EA, and Highways England must complete a risk assessment of the contamination in consultation with the relevant planning authority and the EA. Remediation must be carried out in accordance with the approved scheme.	Requirement 6 within Schedule 2 of the DCO	Highways England/Principal Contractor
MATERIALS				
G31	[**TR010027/APP/6.1**] Chapter 11	***Preparation of a CEMP and Supporting Plans*** In accordance with this OEMP the PC shall prepare a Site Waste Management Plan (SWMP) which includes procedures for the storage, handling and management of material resources and waste (including hazardous waste) arising throughout the construction.	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor
NOISE AND VIBRATION				
G32	[**TR010027/APP/6.1**] Chapter 12	To mitigate operational phase effects, M42 Junction 5A including slip roads and the mainline link road must be constructed with a thin surface course system, with the north facing slip roads and free flow links at Junction 6 also be constructed with a thin surface course system, which results in lower levels of noise generation.	The Environmental Masterplan.	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
G33	[**TR010027/APP/6.1**] Chapter 12	***Preparation of a CEMP*** • the PC must produce and implement a Traffic Management Plan which will present the haul routes and road management procedures used to manage traffic movements within the works, the construction compound and on the local road network in the vicinity of the closest Noise Sensitive Receptors (NSRs); • the PC will undertake noise and vibration surveys to demonstrate noise and vibration compliance during the construction period; • localised solid site hoarding shall be provided at locations where significant effects are identified. Where the installation of permanent hoarding is not feasible temporary hoarding will be erected around plant/ equipment. and • where feasible, alternative methods of working will be considered which may result in lower noise levels at receptors.	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor
POPULATION AND HEALTH				
G34	[**TR010027/APP/6.1**] Chapter 13	**Preparation of a CEMP** Highways England shall, in conjunction with the PC, implement the following standard measures that are relevant to agricultural interests: • the protection and maintenance of livestock water supply systems, where reasonably practicable; • the protection of agricultural land adjacent to the construction site, including the provision and maintenance of appropriate stock-proof fencing; • the adoption of measures to control the deposition of dust on adjacent agricultural crops; • the control of invasive and non-native species and the prevention of the spread of weeds generally from the construction site to adjacent agricultural land. The adoption of measures to prevent, insofar as reasonably practicable, the spread of soil-borne, tree, crop and animal diseases from the construction area; and • liaison and advisory arrangements with affected landowners, occupiers and agents, as appropriate.	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor
CLIMATE				
G35	[**TR010027/APP/6.1**] Chapter 15	**Preparation of a CEMP:** A CEMP will be prepared by the PC and be based upon the Scheme's OEMP [**TR010027/APP/6.11**], which details the measures that shall be undertaken prior to, and during construction of, the Scheme to mitigate temporary effects as a result of construction activities. The measures to be included broadly focus on: • a requirement for the PC to develop and implement a management plan to reduce energy consumption and associated greenhouse gas (GHG) emissions; • a requirement for the PC to record and report energy consumption and materials use;	Published document/ Requirement 4 within Schedule 2 of the DCO	Principal Contractor

Ref	Source Ref	Action/commitment	Reporting criteria/DCO Requirement	Responsible person (s)
		• a requirement for the PC to manage material resources including using materials with lower embedded GHG emissions, using sustainably sourced materials and using recycled or secondary materials; and • a requirement for the PC to utilise low carbon design specifications such as energy-efficient lighting; • a requirement for the PC to reuse material directly on site where possible. Measures relating to climate resilience focus on: • the use of construction materials with superior properties, such as increased tolerance to fluctuating temperatures; • implementation of standard operating procedures; • implementation of maintenance procedures for road or drainage systems to maintain or lengthen lifetime of assets; • implementation of emergency response procedures; and • landscape design and maintenance procedures.		
SURFACE WATER MANAGEMENT				
G36		***Surface and Foul Water Drainage*** No part of the authorised development is to commence until for that part written details of the surface and foul water drainage system, reflecting the mitigation measures set out in the REAC including means of pollution control, have been submitted and approved in writing by the Secretary of State following consultation with the relevant planning authority on matters related to its function. The surface and foul water drainage system must be constructed in accordance with the approved details.	Requirement 8 within Schedule 2 of the DCO	Highways England / Principal Contractor

Appendix A Outline Dust, Noise and Nuisance Management Plan

A.1 Background to the plan

A.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage dust, noise and nuisance generated by the construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

A.1.1.2 This OMP will be updated by the PC, into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

A.2 Responsibilities

A.2.1.1 In relation to the control and management of dust, noise and nuisance, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

A.3 Consent requirements

A.3.1.1 Construction of the Scheme shall be undertaken such that:

a. the works comply with any requirements of the Environmental Health Officer (EHO);

b. consent is sought for works variations and/or over-run of activities, and night-working;

c. data can be recorded, reviewed and provide to the EPO, when requested; and

d. the EPO can be informed of any work that is likely to require communication with members of the public.

A.4 General control measures

A.4.1 Control of noise

A.4.1.1 An Environmental Aspects Register shall be developed by the PC. This shall form part of the CEMP and shall detail the attributes of the works that are expected to give rise to nuisance from noise and vibration. Appropriate controls shall be identified from this register and applied to control or reduce impacts as far as reasonably practicable, based on the measures set out within this plan.

A.4.1.2 Noise and vibration from construction activities shall be controlled by employing Best Practicable Means (BPM), as defined under Section 72 of the Control of Pollution Act 1974 [REF A-1] and Section 79 of the Environmental Protection Act 1990 [REF 1PC-2], at all times.

A.4.1.3 BPM shall consider the recommendations of BS 5228: Code of practice for noise and vibration control on construction and open sites (parts 1 and 2) [REF 1-3, REF 1-4], and BS 7385-1: Evaluation and measurement for vibration in buildings [REF 1-5]. Guide to damage levels from groundborne vibration. BPM shall include, 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.

A.4.1.4 Should the application of BPM at source not prove effective and noise exposure exceeds the relevant trigger level (as defined in BS 5228-1) [REF 1-3], the PC may offer:

a. noise insulation; or

b. ultimately temporary rehousing.

A.4.1.5 The codes of practice for construction works and piling given in BS 5228-1 [REF 1-3] and the guidance therein for minimising noise emissions from the site shall be adhered to.

A.4.1.6 The careful programming of works shall be undertaken to minimise the requirement for potential nuisance-causing works, where practicable, taking into account the highway authority's statutory duties under the Traffic Management Act 2004 [REF 1-6].

A.4.1.7 Local residents shall be informed of construction works programmes, emergency or unscheduled works which may affect them, in order to maintain good relations.

A.4.1.8 The following noise control measures shall be implemented across all construction works:

a. all ancillary plant such as generators, compressors and pumps shall be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures shall be provided, where appropriate;

b. construction activities shall be restricted to a discrete working area in close proximity to residential premises, where controls can be better maintained;

c. working methods shall be developed specific to the area, and shall consider use of equipment and methods of operations to minimise nuisance;

d. whenever possible, fabrication of materials shall be undertaken off-site;

e. all plant and machinery in intermittent use shall be shut down in intervening periods between work, or throttled down to a minimum;

f. proper use of plant with respect to minimising noise emissions with regular maintenance shall be undertaken. All vehicles and mechanical plant used for the purpose of the works shall be fitted with exhaust silencers and be maintained in good working order; and

g. minimising the drop height of materials into hoppers, lorries or other plant.

A.4.2 Control of vibration

A.4.2.1 Where potential exists for significant vibration to arise as a consequence of construction activities, the following actions shall be carried out:

a. evaluate the potential for vibration (and thereby damage to buildings and structures);

b. carry out vibration monitoring at the associated location; and

c. inform neighbours of the works and the vibration control measures to be implemented.

A.4.2.2 The PC shall make efforts to minimise vibration effects during construction by implementing the following measures, as necessary:

a. the appropriate selection of plant e.g. piling, rollers;

b. consideration of low vibration working methods, including non-vibratory compaction plant where possible;

c. the removal of obstructions that can cause, or add, resonance e.g. concrete bases;

d. no start-up or shut down of vibratory plant within 50m of noise sensitive receptors; and

e. the use of cut-off trenches to disrupt direct vibration movement through the ground; and

f. the use of pre-bores for piles.

A.4.3 Control of dust

A.4.3.1 To minimise potential emissions of fugitive dust emissions during construction, best practice measures shall be employed during the works.

A.4.3.2 The following control measures within **Table A.1**, which are based on the measures set out within the Institute of Air Quality Management guidance [REF 1-7], shall be implemented to manage site-based risks associated with dust arising from demolition and general construction activities.

Table A.1: Dust mitigation measures

Activity	Measure
Dust management	Develop and implement a series of dust management and monitoring measures. The level of detail shall include, as a minimum, the measures set out in this table. Monitoring may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.
	Monitoring
	Undertake regular on-site and off-site inspections, as will be set out in the CEMP, where receptors are nearby, to monitor dust, record inspection results, and make the log available to SMBC on request. This shall include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be undertaken if necessary.
	Preparing and Maintaining the Site
	For specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Keep site fencing, barriers and scaffolding clean using wet methods where there is the risk of dust accumulation.
	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.
	Cover, seed or fence stockpiles to prevent wind whipping.
	Operating Vehicle/Machinery and Sustainable Travel
	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).
	Ensure all vehicles switch off engines when stationary - no idling vehicles.
	All construction plant should use fuel equivalent to ultra-low sulphur diesel where possible.
	Operations
	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	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.
	Avoid explosive blasting where possible, using appropriate manual or mechanical alternatives.
	Comply with measures set out in any Asbestos Management Plan prepared for the Scheme.
Surfacing works	Surfacing equipment (e.g. planer) only to be operated with any manufacturers dust abatement measures in place.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	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.

Activity	Measure
Trackout	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.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) where reasonably practicable.

A.4.3.3 Locations considered to be at a higher risk of, or more sensitive to, dust emissions, may require additional measures to achieve the required level of control and suppression. Such locations are likely to include sensitive receptors within 200m of construction works. Should the above measures be insufficient for the control of dust emissions, the following additional site-based measures within **Table A.2** shall be evaluated and implemented as necessary by the PC.

Table A.2: Additional dust mitigation measures

Activity	Measure
Liaison	During construction, appropriate mechanisms to communicate with local residents shall be set up to highlight potential periods of disruption (e.g. web-based, newsletters, newspapers, radio announcements etc.). An information web-page shall be provided and kept up-to-date on the Highways England website to reflect construction and community liaison requirements. The web-page shall provide up-to-date information on the progress of the construction works, areas affected by construction, mitigation in place to reduce adverse effects, information regarding planned construction works (including any proposed works outside normal hours) and works recently completed. The communication strategy shall minimise the likelihood of complaints. Residents shall be provided with a point of contact for any queries or complaints.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the construction site boundaries. This may be the environment manager or the site manager.
	Display the head or regional office contact information.
Dust management	**Site Management**
	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.
	Make the complaints log available to SMBC as soon as reasonably practicable.
	Record any exceptional incidents that cause dust and/or air emissions, either on-site or off-site, and the action taken to resolve the situation in the log book.
	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, an understanding of potential interactions of the off-site transport/deliveries which might be using the same strategic road network routes shall be established.

Activity	Measure
	Monitoring
	Carry out regular site inspections to monitor the effectiveness of mitigation measures, record inspection results, and make an inspection log available to SMBC promptly upon request.
	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.
	Undertake dust deposition, dust flux, or real-time PM_{10} 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.
	Preparing and Maintaining the Site
	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Avoid site runoff of water or mud.
	Operating Vehicle/Machinery and Sustainable Travel
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
	Manage the sustainable delivery of goods and materials through careful programming of delivery.
	Implement a travel plan that supports and encourages sustainable travel (e.g. public transport, cycling, walking, and car-sharing).
	Operations
	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).
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Waste Management
	Avoid bonfires and burning of waste materials.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
	Only remove the cover in small areas during work and not all at once.
Construction	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.
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	Maintain and inspect on-site haul routes for integrity and operate a programme of routing maintenance and where necessary carry out repairs to the surface as soon as reasonably practicable.
	Install hard surfaced haul routes if possible, which are regularly damped down

Activity	Measure
	with mobile sprinkler systems, or mobile water bowsers and are regularly cleaned.
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	In locations without hard standing it may be necessary to clean the vehicle bodies in addition to wheels.
	Access gates to be located at least 10m from receptors where possible.

A.4.4 Controlling construction traffic and visual Intrusion

A.4.4.1 Temporary lighting within the site compounds, and lighting used for night working, shall be designed to provide a safe and efficient working environment, and to prevent or minimise light spillage.

A.4.4.2 The following measures and strategies shall be implemented by the PC to minimise nuisance from construction lighting:

a. the use of appropriate directional lighting;

b. direct light downwards wherever possible;

c. if the above is not possible, use lighting designed to minimise light spread above the horizontal;

d. if up-lighting is unavoidable use baffles to keep light spill to a minimum; and

e. specific consideration and care shall be given in positioning floodlights to avoid light spill outside construction compounds, unless it is for lighting roads as part of the contract.

A.4.4.3 Where appropriate, barriers around the site perimeter shall be provided to contain the works and reduce visual impact of the site in available views, and to provide site security against theft and vandalism.

A.4.4.4 Site parking and delivery areas shall be clearly marked up within site compounds, and traffic deliveries shall be co-ordinated to reduce potential disruption on the road network and within local communities in proximity to the works.

A.4.4.5 A Traffic Management Plan shall be developed and communicated to all subcontractors and suppliers, detailing the measures to be implemented in respect of managing construction traffic to minimise disruption and nuisance.

A.4.5 Control of subcontractors

A.4.5.1 Subcontractors whose works are likely to give rise to dust, noise, vibration or other nuisance issues must develop appropriate control measures within method statements. These control measures shall be communicated to the subcontractors' staff through the use of site inductions and toolbox talks.

A.4.5.2 In addition, the requirements of the local authority Environmental Protection Officer, shall be communicated to subcontractors during site inductions, project briefings and start of shift briefs.

A.4.6 Noise monitoring and measurement

A.4.6.1 Noise level measurements during construction shall be carried out by the PC, if required, and as agreed with SMBC.

A.4.6.2 Suitably trained staff shall be tasked with undertaking the noise measurements on site.

A.4.6.3 In instances where a member of the public has made a noise complaint, the complaint shall be registered in accordance with the site complaints procedure.

Appendix B Outline Site Waste Management Plan

B.1 Introduction

B.1.1 Overview

B.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage waste generated by the construction of the Scheme.

B.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

B.1.2 Terminology

Table B.1: Terminology

Terminology	Definition
The Considerate Constructors Scheme (CCS)	The CCS – a non-profit making, independent organisation founded in 1997 by the construction industry to improve its image.
C&D waste	Construction and demolition waste
CD&E waste	Construction, demolition and excavation waste
CIRIA	Construction Industry Research and Information Association – a member-based research and information organisation dedicated to improvement in all aspects of the construction industry.
Controlled waste	Household, industrial and commercial waste (not agricultural waste, waste from mines or quarries and most radioactive waste).
Duty of Care	Legal responsibility to prevent waste from being mismanaged by any person who holds it and from escaping their control.
Duty of Care checks	Checks to ensure that only authorised persons transfer waste, and that the waste is managed legitimately, including checks on: • the waste carrier's registration certificate; • the waste broker's registration certificate (if used); and • the Environmental Permits for waste management facilities or proof of exemptions from permitting.
Environment Agency (EA)	The main environmental regulatory body in England.
European Waste Catalogue (EWC) code	A six-digit number used to classify a particular waste stream.
exempt activities	Activities not requiring an Environmental Permit (an exemption will require registration).
Hazardous Waste Consignment Note (HWCN)	A document that accompanies the movement of any hazardous waste from production (cradle) to disposal (grave).
hazardous waste	Waste with hazardous properties.
non-hazardous waste	Waste which does not display any of the hazardous properties listed in Annex III of The Hazardous Waste (England and Wales) Regulations 2005 (as amended).

Terminology	Definition
Principal Contractor	The main contractor appointed to deliver a project by the Client.
Registered Waste Carrier	A person who holds a registration certificate from the EA to transport waste.
Management Plan	SWMP - sets out how material resources and waste will be managed and controlled at all stages during a construction project.

B.1.3 Purpose and benefits

B.1.3.1 The SWMP Regulations 2008 were introduced with the objective to prevent the illegal disposal of waste and to improve resource efficiency in construction.

B.1.3.2 Although the SWMP Regulations were revoked in December 2013, SWMPs continue to be used as a good practice measure on construction projects and to support planning and consenting applications.

B.1.3.3 This OMP has been developed to act as a guide to Scheme personnel on how to manage material resources and waste, in accordance with best practice requirements. The PC shall use this OMP as a framework for producing the final Management Plan for use throughout the duration of the Scheme.

B.1.3.4 The purpose of the Management Plan is to describe the procedures by which material resources and waste will be managed during the construction of the Scheme.

B.1.3.5 The PC shall take all reasonable steps to ensure that:

a. all waste from the site is dealt with in accordance with the waste duty of care (defined in section 34 of the Environmental Protection Act 1990 and the Waste (England and Wales) Regulations 2011(as amended); and

b. materials are handled efficiently and waste managed appropriately.

B.1.4 Scope of this OMP

B.1.4.1 This OMP includes:

a. an overview of applicable legislation;

b. details of the Scheme;

c. management arrangements, including roles and responsibilities, training, key performance indicators (KPIs) and best practice measures;

d. estimates of material use and waste arising and how they will be managed;

e. design decisions;

f. materials and waste management on site; and

g. opportunities for waste minimisation, reuse, recycling and recovery in line with the requirements of the waste hierarchy.

B.2 Waste management legislation

B.2.1.1 This section summarises the key legal requirements with regards to waste management and control within England.

B.2.2 Definition of waste

B.2.2.1 The legal definition of waste is “any substance or object which the producer discards or intends or is required to discard”.

B.2.2.2 The legal definition of waste also covers substances or objects, which fall outside of the commercial cycle or out of the chain of utility. In particular, most items that are sold or taken offsite for recycling are wastes, as they require treatment before they can be resold or reused.

B.2.2.3 In practical terms, wastes include surplus earthworks materials and soil, scrap, unwanted surplus materials, packaging, recovered spills, office waste, and damaged, worn-out, contaminated or otherwise spoiled plant, equipment and materials.

B.2.3 Duty of care

B.2.3.1 The duty of care for waste management is set out under section 34 of the Environmental Protection Act 1990 and the Waste (England and Wales) Regulations 2011 (SI 2011 No. 988) (as amended). It requires anyone who produces, imports, keeps, stores, transports, treats or disposes of waste to take all reasonable steps to ensure that the waste is managed properly. Anyone in possession of waste must take all reasonable steps to:

a. prevent unauthorised or harmful deposit, treatment or disposal of waste;

b. prevent a breach (failure) by any other person to meet the requirement to have an environmental permit, or a breach of a permit condition;

c. prevent the escape of waste;

d. ensure that waste is transferred to an authorised person; and

e. provide an accurate description of the waste when it is transferred to another person, by using a compulsory system of Waste Transfer Notes (WTN) that control the transfer of waste between parties.

B.2.3.2 Failure to comply with the duty of care requirements is a criminal offence and could lead to prosecution.

B.2.4 Apply the waste hierarchy

B.2.4.1 The Waste (England and Wales) Regulations 2011 (as amended) transpose the requirements of the European Waste Framework Directive (2008/98/EC) (WFD), and require:

a. those undertaking waste management activities, such as the import, production, collection, transportation, recovery and/or disposal of waste, to take all reasonable measures to apply the waste hierarchy, in priority order, as follows:

   i. prevention;

   ii. preparation for reuse;

   iii. recycling;

iv. other recovery, such as energy recovery; and

v. disposal.

b. those producing waste to confirm that they have applied the waste hierarchy when transferring waste and to include a declaration on their WTN or consignment note.

B.2.5 Hazardous waste

B.2.5.1 The Hazardous Waste (England and Wales) Regulations 2005 (as amended) require that a consignment note be used to document the transfer and management of all hazardous waste.

B.2.6 Registration of waste carriers

B.2.6.1 Under The Control of Pollution (Amendment) Act 1989 it is a criminal offence for anyone not registered as a waste carrier to transport controlled waste. The Waste (England and Wales) Regulations 2011 (as amended) updated the system for the registration of waste carriers, including brokers and dealers.

B.2.6.2 Anyone undertaking any of the following activities as part of their business must register as a waste carrier, broker or dealer:

a. transporting their own waste;

b. transporting waste for someone else;

c. buying or selling waste; and

d. acting as a waste broker (arranging for someone to handle waste produced by someone else).

B.2.6.3 Details of all appointed waste carriers, brokers and contractors will be included in the SWMP, including copies of appropriate waste carrier licences/registrations. The register of waste carriers, brokers and dealers can be checked using the EA's Public Registers (at environment.data.gov.uk/public-register/view/search-waste-carriers-brokers).

B.2.7 Environmental permits and exemptions

B.2.7.1 The Environmental Permitting (England and Wales) Regulations 2016 (as amended) require sites where waste is processed, treated or disposed of to hold a valid Environmental Permit issued by the EA. These Regulations also include a schedule of activities that are exempt from the requirements of permitting. However, to comply with these Regulations, an exempt activity must generally be registered with the EA before commencing.

B.2.7.2 A permit is not usually required where waste is temporarily stored on the site where it is produced prior to management or disposal. Depending upon the types and quantities of waste to be stored, the duration and place of storage and compliance with other defined conditions:

a. a non-waste framework directive exemption may apply, which does not need to be registered; and

b. an exemption may need to be registered with the EA.

B.2.7.3 Information on the limits and conditions for storing waste exemptions and non waste framework directive exemptions are available at www.gov.uk/government/collections/waste-exemptions-storing-waste.

B.2.7.4 The PC will be responsible for obtaining the necessary permits and exemptions, where required.

B.3 Details of the Scheme

B.3.1.1 The PC shall complete **Table B.2** below prior to commencement of construction.

Table B.2: Project details

Project title	**M42 Junction 6 Improvement**					
Project location	Address					
	Town					
	Postcode					
Client	Name					
	Address					
	Contact		Email			
	Phone		Mobile			
PC	Name					
	Address					
	Contact		Email			
	Phone		Mobile			
SWMP Drafter	Name					
	Address					
	Contact		Email			
	Phone		Fax			
Construction cost (estimated)						
Site area (gross area)						
Construction programme:						
Start date	Day		Month		Year	
Completion date	Day		Month		Year	
Waste Management Champion						
Person responsible for SWMP						
Document Controller/ Secretary						
Location of SWMP						

B.3.2 Description of the Scheme

B.3.2.1 A description of the Scheme activities is presented in Section 1.2 of the OEMP.

B.4 Management arrangements

B.4.1 Roles and responsibilities

B.4.1.1 The main contract personnel responsible for producing the SWMP are shown in **Table B.3** below.

Table B.3: Responsibilities for producing the SWMP

POSITION	NAME	CONTACT DETAILS	SWMP RESPONSIBILITY
Main Contract personnel			
The Authority Project Manager			Monitor the PC's performance against the contract including any environmental commitments and targets agreed for the Scheme.
Project Manager (Principal Contractor (PC PM))			Approval of the SWMP for the relevant phase of works. Ensure that all controls specified within the SWMP are implemented by employees and sub-contractors.
EM (Principal Contractor PC EM))			Undertake site inspections to monitor compliance with the environmental licences/consents for the works and the measures within the SWMP. Ensure that the Scheme complies with all environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the ES throughout the relevant project phase.
Site Materials and Waste Manager (Principal Contractor)			Prepare the SWMP. Implement the SWMP throughout the construction of the Scheme and ensure that waste is disposed of legally, economically and safely in line with the SWMP and all relevant legislation. Provide appropriate professional and practical advice to contractors, consultants and project team members associated with materials and waste issues.
Sub-contractor details			
Individual Sub-contractor(s), as appointed			Read through, familiarise and understand the requirements of the SWMP. Produce waste documentation and a Management Plan. Comply with the requirements set out in the SWMP.

B.4.2 Instruction and training

B.4.2.1 The PC shall incorporate the SWMP requirements into the site induction shall provide onsite instruction of appropriate separation, handling, recycling, reuse and return methods to be used by all parties at all appropriate stages of the Scheme.

B.4.2.2 The PC shall ensure that all personnel working on the site, including sub-contractors, are inducted.

B.4.3 Key performance indicators

B.4.3.1 The environmental assessment of the Scheme is based on the Scheme achieving certain performance standards with respect to the use of recycled and secondary aggregates and the recovery of construction and demolition waste.

B.4.3.2 In order to achieve these performance standards, the PC shall adopt the following KPIs for the Scheme and shall record the necessary data to confirm compliance with these KPIs:

a. at least 27% (by weight) of aggregates imported to site for use within the Scheme should comprise reused, recycled or secondary aggregates, for those applications where it is technically and economically feasible to substitute these alternative materials for primary aggregates; and

b. recover (through reuse, recycling or recovery) at least 70% (by weight) of non-hazardous construction and demolition waste (excluding naturally occurring materials with waste code 17 05 04).

B.4.3.3 The Scheme is forecast to achieve a recycled aggregate use rate of 32.5% (see **Table B4)** and a total non-hazardous waste recovery rate of 94.7% (see **Table B6**).

B.4.4 Best practice measures

B.4.4.1 The PC shall apply the principles of the waste hierarchy to ensure best practice on site and to achieve high levels of sustainability in the Scheme as a whole.

B.4.4.2 The PC shall adopt BPM set out in construction industry guidance to reduce the potential impacts from material resources and waste. This may include, for example, guidance from the CCS, Waste & Resources Action Programme (WRAP) and CIRIA. The PC shall employ BPM, which go beyond statutory compliance.

B.4.4.3 The PC shall adopt good practice in construction material resources and waste management. The following approaches should be implemented, where practicable, to minimise the quantity of waste arising and requiring disposal:

a. agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;

b. implementation of a ‘just-in-time’ material delivery system to avoid materials being stockpiled, which can increase the risk of damage and subsequent disposal as waste;

c. attention to material quantity requirements to avoid over-ordering and the generation of waste materials due to surplus;

d. reuse of materials onsite wherever feasible, e.g. reuse of excavated soil for landscaping, recycling of demolition materials into aggregates;

e. offsite prefabrication, where practical, including the use of prefabricated structural elements;

f. segregation of waste at source, where practical, to facilitate a high proportion and high quality recycling; and

g. offsite reuse, recycling and recovery of materials and waste where reuse onsite is not practical, e.g. through use of an offsite waste segregation or treatment facility or for direct reuse or reprocessing offsite.

B.4.4.4 The PC shall implement the following waste management measures in order to minimise the likelihood of any localised impacts from pollution or nuisance from waste on the surrounding environment:

a. damping down of surfaces during spells of dry weather and brushing/water spraying of heavily used hard surfaces/access points across the site as required;

b. burning of waste or unwanted materials would not be permitted on-site;

c. all hazardous materials including fuels, chemicals, cleaning agents, solvents and solvent containing products to be properly sealed in containers at the end of each day prior to storage in appropriately protected and bunded storage areas;

d. all demolition and construction workers would be required to use appropriate Personal Protective Equipment (PPE) whilst performing activities on-site;

e. any waste effluent would be tested and, where necessary, disposed of at a correctly licensed facility by a licensed specialist contractor/s; and

f. materials requiring removal from the site would be transported using licensed carriers and records would be kept detailing the types and quantities of waste moved, and the destinations of this waste, in accordance with the relevant regulations.

B.5 Estimate of material use and waste arisings

B.5.1 Introduction

B.5.1.1 The OMP provide estimates of:

a. the types and quantities of aggregates required for the construction of the Scheme and the likely reused, recycled and secondary content;

b. the types and quantities of earthworks materials arising during construction of the Scheme and the likely cut and fill balance and surplus requiring alternative management; and

c. the types and quantities of waste arising during construction of the Scheme and the likely management route and resulting recovery rate.

B.5.1.2 The PC shall review, update and monitor these estimates throughout the design and construction of the Scheme, and incorporate these updates in the final Management Plan to ensure delivery of the Scheme KPIs (section B.4.3).

B.5.1.3 The PC shall ensure that the final Management Plan is updated to reflect current legal requirements and the waste management practices of the Scheme as necessary both prior to and during the construction works. The PC will ensure all required authorisations are obtained.

B.5.2 Material resources

B.5.2.1 The main types and quantities of aggregate required for the construction of the Scheme have been estimated based on information provided by the design and buildability team. This is shown in **Table B.4** along with the recycled content that is expected to be achievable by adopting good practice approaches.

B.5.2.2 The PC shall ensure that reused, recycled and secondary aggregates imported to site comply with all relevant technical and regulatory requirements.

Table B.4: Estimated main types and quantities of aggregates used during the construction of the Scheme and likely proportion of recycled content

Material Category	Material Subcategory	Material density (Note 1)	Quantity required for construction	Quantity to be imported to site (Note 2)		Recycled content (% by weight) (Note 3)
		(tonnes/m^3)	m^3	m^3	tonnes	
Unbound aggregates	Type 1 aggregate	1.9	58,000	58,000	110,200	50
	Class 6F aggregate	1.9	44,000	11,000	20,900	50
	Structural fill (class 6N and 6I/6J)	1.9	26,000	26,000	49,400	50
	Filter drain material	2.2	20,000	20,000	44,000	0
	Drainage pipe bedding	2.2	2,500	2,500	5,500	0
Asphalt	Asphalt	2.4	49,000	49,000	117,600	25
Insitu concrete	Insitu structural concrete	2.4	17,000	17,000	40,800	16
TOTAL			**216,500**	**183,500**	**388,400**	**32.5% (126,178 tonnes)**

Note 1: Data on the bulk density of materials has been used to convert quantities between volume (m^3) and weight (tonnes). Information on the typical bulk density of materials was sourced from WRAP's Designing Out Waste Tool for Civil Engineering[3].

[3] Waste & Resources Action Programme (WRAP). Designing Out Waste Tool for Civil Engineering. Available at: http://dowtce.wrap.org.uk/

Note 2: Approximately 75% of the required Class 6F aggregate is assumed to be sourced through the onsite recycling of demolition materials.
Note 3: The estimated recycled content for each material is based on the "good practice" recycled content rates from WRAP's Designing Out Waste Tool for Civil Engineering[3]. The total recycled content is calculated as a percentage by weight.

B.5.3 Earthworks materials

B.5.3.1 The main types and quantities of earthworks materials expected to be generated during construction of the Scheme have been estimated based on information provided by the design and buildability team. This is shown in **Table B.5** along with the expected cut and fill balance and the surplus requiring alternative management.

B.5.3.2 It is anticipated that the use of excavated materials within the Scheme will be will be undertaken in accordance with a Materials Management Plan (MMP) prepared under the CL:AiRE Definition of Waste: Code of Practice[4] and these materials would not be classified as waste.

B.5.3.3 The PC will be responsible for the management of surplus excavated materials and should apply the waste hierarchy in determining the most suitable options.

Table B.5: Estimated main types and quantities of earthworks materials arising and used during the construction of the Scheme

Earthworks material	Cut (m^3)	Fill (m^3) (Note 1)	Surplus (m^3)	Possible management route for surplus
Acceptable fill material	895,635	259,711	635,924	Offsite beneficial use or disposal (unknown location).
Unacceptable fill material	90,905	0	90,905	Offsite treatment, beneficial use or disposal (unknown location).
Topsoil	181,207	125,013	56,193	Onsite or offsite permanent storage, reuse, recovery or disposal (unknown location).
TOTAL	**1,167,747**	**384,724**	**783,022**	

Note 1: No bulking factor has been applied.

B.5.4 Waste

B.5.4.1 The main types and quantities of waste expect to arise during the construction of the Scheme have been estimated based on information provided by the design and buildability team. This is shown in **Table B.6** along with the recovery rate that is expected to be achievable by adopting good practice approaches.

B.5.4.2 The PC will be responsible for the management of waste and should apply the waste hierarchy in determining the most suitable options.

B.5.4.3 Where waste is reused or recycled for use in the Scheme, the PC shall ensure compliance with all relevant technical and regulatory requirements.

[4] CL:AIRE. Definition of Waste: Code of Practice. Available at: https://www.claire.co.uk/projects-and-initiatives/dow-cop

Table B.6: Estimated quantities of waste arising during the construction of the Scheme (excluding excavated materials) including potential management routes and estimated recovery rates

Project Activity	Waste type	Waste classification	Waste density (Note 1)	Quantity		Potential management route	Recovery rate (% by weight) (Note 2)
			(tonnes/m^3)	tonnes	m^3		
Site remediation /preparation/ earthworks/ tunnelling	Vegetation and wood from site clearance	Non-hazardous	0.7	4,375	6,250	Offsite composting or other recovery.	90%
Demolition	Asphalt planings	Non-hazardous	2.4	52,367	21,820	No surplus expected. Material recycled for use within the Scheme.	95%
	Concrete	Non-hazardous	2.4	3,134	1,306	No surplus expected. Material recycled for use within the Scheme.	95%
	Brick and block	Non-hazardous	2.4	119	50	No surplus expected. Material recycled for use within the Scheme.	95%
	Aggregates from temporary works	Non-hazardous	1.9	37,798	19,894	Material recycled for use within the Scheme where the construction programme allows. Part of the temporary works material is expected to arise at the end of construction. This surplus is expected to be recycled onsite or offsite for subsequent use offsite on the open market.	95%
	Timber	Non-hazardous	0.7	8	11	Offsite recycling or recovery.	90%
	Steel	Non-hazardous	7.85	507	65	Offsite recycling.	100%
Site construction	Aggregates/ inert	Non-hazardous	2.4	39	16	Offsite recycling or recovery.	95%
	Soil	Non-hazardous	1.44	4	3	Offsite reuse, recycling or recovery.	95%
	Timber	Non-hazardous	0.7	580	828	Offsite recycling or recovery.	90%
	Metals	Non-hazardous	7.85	276	35	Offsite recycling.	100%
	Plastic	Non-hazardous	1.4	183	131	Supplier packaging take back scheme for reuse, or offsite recycling, recovery or disposal.	80%

Project Activity	Waste type	Waste classification	Waste density (Note 1)	Quantity		Potential management route	Recovery rate (% by weight) (Note 2)
			(tonnes/m^3)	tonnes	m^3		
	Cardboard/Paper	Non-hazardous	0.7	74	106	Supplier packaging take back scheme for reuse, or offsite recycling, recovery or disposal.	85%
	Food	Non-hazardous	1	3	3	Offsite recycling, recovery or disposal.	50%
	Office/Canteen	Non-hazardous	1	5	5	Offsite recycling, recovery or disposal.	50%
	Other	Non-hazardous	1	59	59	Offsite recycling, recovery or disposal.	50%
	Hazardous	Hazardous	1	11	11	Offsite recycling, recovery or disposal.	50%
TOTALS		**Non-hazardous**		**99,532**	**50,581**	**Total non-hazardous waste recovery rate**	**94.7%**
		Hazardous		**11**	**11**	**Total hazardous waste recovery rate**	**50%**

Note 1: Data on the bulk density of waste types has been used to convert waste quantities between weight (tonnes) and volume (m^3). Information on the typical bulk density of waste / materials was sourced from WRAP's Designing Out Waste Tool for Civil Engineering[3]. Where data was not available, professional judgement was used.
Note 2: The estimated recovery rate for each waste type is based on the "good practice quick win" recovery rates published by WRAP[5]. The total non-hazardous waste recovery rate is calculated as a percentage by weight.

[5] Waste & Resources Action Programme (WRAP). Achieving good practice Waste Minimisation and Management. Guidance for construction clients, design teams and contractors. Available at: http://www.wrap.org.uk/sites/files/wrap/WMM%20guide%20Mid%20level.pdf

B.6 Design decisions

B.6.1.1 Decisions made at the design stage of the Scheme will impact on the quantity and types of materials used and waste arising and the management of waste.

B.6.1.2 In general, the following measures would be implemented during the design and construction phases of the Scheme, where technically, financially and environmentally practicable:

a. manage waste in accordance with the waste hierarchy;

b. design-out and prevent waste arising;

c. reuse excavated earthworks materials within the Scheme;

d. recycle demolition materials arising from Scheme within the construction of the Scheme;

e. divert waste from landfill through offsite recycling and recovery; and

f. use recycled and secondary materials in the construction of the Scheme.

B.6.1.3 At all stage of design and construction, the PC shall record, in the final Management Plan (**Table B.7**):

a. all opportunities for waste prevention; and

b. decisions taken regarding material resource use and waste management.

Table B.7: Waste prevention opportunities and design decisions

Material / waste	Estimated reduction in waste arising		Approach by which reduction achieved	Will planning permissions / authorisations be required for the change?	Estimated cost saving (£)	Persons responsible for completing action
	tonnes	m^3				

B.7 Materials and waste management on site

B.7.1 Waste management routes

B.7.1.1 The waste hierarchy sets out the priority order that should be considered when managing wastes. A basic representation of the waste hierarchy is provided below in **Figure B.1** and the PC shall use the hierarchy as a guide to encourage the prevention of waste and to define waste management options.

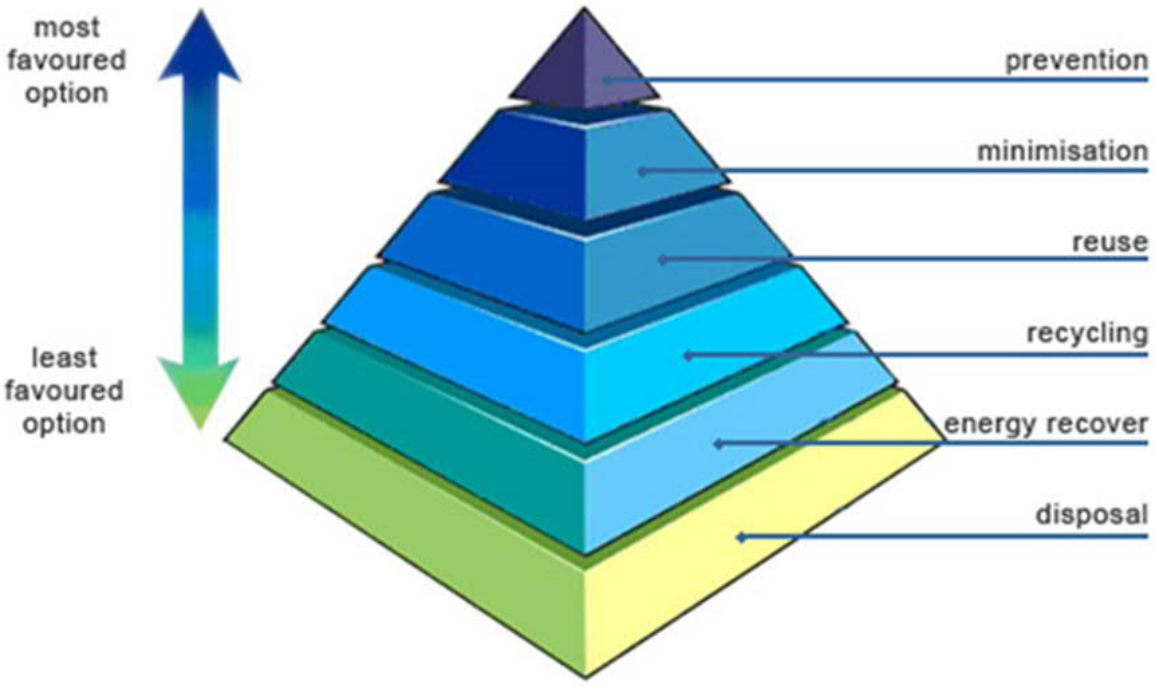

Figure B.1: Waste hierarchy

B.7.1.2 When considering waste management options for the Scheme, the PC shall take account of the site's location, natural environment and available infrastructure. The PC shall consider the following options when determining the preferred waste management option for each waste stream.

Preparing for reuse

B.7.1.3 The aim is to provide design features on the Scheme to use materials in their current state and form. Reuse can be undertaken either onsite or offsite.

B.7.1.4 Where possible, excavated earthworks materials and soils arising from the Scheme will be stockpiled on site and reused within the Scheme.

Recycling

B.7.1.5 The aim is to reuse materials won on site by recycling them into an alternative form that can be used for construction purposes (for example crushing concrete, brick or other inert wastes to produce aggregate material). By recycling on site, as far as practicable, the quantity of waste requiring offsite management is reduced and carbon emissions associated with transportation are eliminated.

B.7.1.6 Recycling may also be achieved by utilising materials with a recycled content, such as recycled aggregates produced offsite.

Recovery

B.7.1.7 This generally aims to recover energy from waste which cannot otherwise be reused or recycled. This may include waste materials such as hazardous liquids or solids that can be sent to energy from waste facilities.

B.7.1.8 Recovery may also include the beneficial use of materials on land for restoration (deposit for recovery).

Disposal

B.7.1.9 The least preferred option in the waste hierarchy is a final disposal route such as landfill. Some waste streams will inevitably end up with such a solution.

B.7.1.10 When placing waste disposal contracts, the PC shall consider the implications of long distance travel in terms of health and safety risk, commercial terms and increased emissions from vehicles.

B.7.1.11 The PC shall ensure the pre-treatment of all hazardous and non-hazardous wastes prior to disposal to landfill. The methods of pre-treatment will enable the waste to meet the 'three-point test':

a. it must be a physical, thermal, chemical or biological process including sorting;

b. it must change the characteristics of the waste; and

c. it must do so in order to:

i. reduce its volume, or

ii. reduce its hazardous nature, or

iii. facilitate its handling, or

iv. enhance its recovery.

B.7.1.12 Source segregation can be seen as a pre-treatment option and as such can be applied to waste generation on site including general waste and arisings, and will take place on the Scheme.

B.7.1.13 The PC shall ensure that a declaration stating the pre-treatment method applied to the waste is appended to any WTN for non-hazardous waste being sent for disposal.

B.7.2 Materials and waste storage and segregation options

B.7.2.1 The PC shall store excavated soils and earthworks materials on site in stockpiles until required for use.

B.7.2.2 Demolition materials that are to be recycled for use onsite should be separated at source and stored separately both before and after the recycling process.

B.7.2.3 Construction materials that are stored on site should be in designated areas that are flat, accessible and secure in order to avoid damage or loss. Materials should be stored in appropriate conditions to avoid damage through, for example, water ingress or vermin. Materials should be retained in their original packaging to protect them from damage.

B.7.2.4 The PC shall ensure that the construction site compounds incorporate designated waste storage areas for skips or similar waste receptacles. The PC shall ensure that these areas are surfaced with an impermeable barrier, such as hardstanding/tarmac or using impermeable membranes and the location of any existing drainage will be noted.

B.7.2.5 At the waste storage areas, the PC shall segregate waste into the following types as a minimum: inert; wood; metals; packaging; general waste; hazardous solid wastes; hazardous liquid wastes.

B.7.2.6 The PC shall implement the following waste management procedures:

a. all waste containers shall be secure and ensure that no waste is allowed to escape;

b. all waste containers shall be clearly labelled using a colour coding system so that users know what wastes can be placed in each container. Waste containers shall be appropriately colour coded using generic colour codes as shown below:

Grey: Inert 

Green: Wood 

Black: Mixed 

Brown: Packaging 

Blue: Metal 

Orange: Hazardous 

White: Gypsum 

c. lockable storage will be provided for all hazardous waste;

d. all waste containers shall be sited at least 10m away from watercourses, ditches and other areas of environmental sensitivity;

e. liquid wastes shall be stored in enclosed/lidded containers and stored within a suitable bunded area, or otherwise provided with secondary containment;

f. separate containers shall be provided for each type of hazardous waste;

g. sewage from the site offices/compounds will drain to septic tank and be collected by a suitable specialist waste contractor; and

h. portable toilet facilities on site (Portaloos etc.) shall be emptied by the facility provider as per their service agreement.

B.7.3 Waste carriers and facilities

B.7.3.1 The PC shall manage all waste generated on the Scheme in accordance with legal requirements. The PC shall record details of the proposed waste carrier for each waste stream in the registration table (Annex 1), with Waste Carriers Licence details appended to the final Management Plan.

B.7.3.2 The PC shall ensure that the following information is recorded for all waste facilities used:

a. contractors name;
b. date(s) of waste removal
c. type(s) of waste removed (i.e. non-hazardous waste, hazardous waste, inert (specify);
d. method of treatment, recovery or disposal (i.e. reuse, recycling, incineration, landfill etc.);
e. volume or weight of waste removed;
f. recovery rate achieved; and
g. costs associated with waste removal, transport and treatment, including Landfill Tax charges where applicable.

B.7.4 Waste documentation

Waste Transfer Notes (WTN)

B.7.4.1 The PC shall ensure that all movements of waste from site are accompanied by a WTN, which will detail specific information. The PC's Site Materials and Waste Manager or other competent person shall check that each WTN contains the following:

a. the name of the person receiving the waste and what they are authorised to do with that waste as a Registered Waste Carrier can only transport waste;
b. type of waste;
c. the Standard Industrial Classification (SIC) code;
d. the six-digit EWC code;
e. address of the producing site and details of the waste producer;
f. waste carrier's details including registration number;
g. quantity of waste;
h. how it is contained (e.g. 8 cubic yard skip);
i. address of the receiving site (e.g. landfill) and the Environmental Permit or Exemption No. associated with the receiving site;
j. the date to which the WTN applies;
k. if the material is non-hazardous waste and it is destined for disposal directly to landfill, pre-treatment must have been applied and a declaration detailing the treatment applied appended to the WTN; and

l. a declaration that the waste has been treated in line with the requirements of the waste hierarchy.

B.7.4.2 The site representative signing the WTN shall ensure all WTNs are placed in the Site Waste Management File and kept for a minimum period of two years (for non-hazardous waste).

B.7.4.3 By signing a WTN the site representative is confirming that all the details are correct and that the material is to be sent by a licensed waste carrier to a suitably licensed receiving site, permitted to receive that type of waste. The signature is binding of this fact and completes the WTN as a legal document.

B.7.4.4 The Site Materials and Waste Manager or other competent person signing the WTN shall additionally ensure that the Waste Carrier is using a suitable vehicle with adequate, covered containment for the waste.

Waste Consignment Notes (hazardous waste)

B.7.4.5 The PC shall ensure that a Hazardous Waste Consignment Note (HWCN) is completed for every movement of hazardous waste. Prior to signing, the Site Materials and Waste Manager or other competent person shall ensure that the HWCN includes:

a. Hazardous Waste Premises Code;

b. consignment note code;

c. SIC Code;

d. name and address of the site from which the waste is being moved;

e. date of removal;

f. type of waste produced, including the quantity and the EWC code;

g. the name of the person who is receiving the waste and what they are authorised to do with that waste e.g. Registered Waste Carrier can only transport waste;

h. the final disposal site that is authorised to accept the waste; and

i. retention period for hazardous waste.

B.7.4.6 The PC shall retain a copy of the Waste Consignment Note for a minimum of three years.

Waste documentation

B.7.4.7 The PC shall retain all waste documentation at the main site compound and, following completion of the Scheme, at the PC's head office. This includes:

a. The final Management Plan (two years after end of construction of the Scheme);

b. waste transfer documentation (two years for WTNs and three years for HWCNs);

c. copies of any exemptions or permits; and

d. copies of waste carrier and treatment/disposal site licences.

B.7.5 Fly-tipping

B.7.5.1 Fly-tipping of waste on or adjacent to ongoing construction projects can be a significant issue.

B.7.5.2 Should waste be fly-tipped on the site, the PC shall have a duty of care to ensure it is dealt with safely and disposed of correctly, even though not the producer of the waste. The PC shall report any instance of fly-tipping to the relevant authorities.

B.7.6 Reporting and auditing

B.7.6.1 The effectiveness of the final Management Plan will depend upon the enforcement of its requirements on site by the nominated Site Materials and Waste Manager and Site Manager. Responsibility for the formal recording of waste movements lies with the Site Materials and Waste Manager or PM.

B.7.6.2 The PC shall maintain a record of all materials that come on to site. The quantity of reused, recycled and secondary aggregate shall be recorded, alongside details of the supplier, the producing facility and records that demonstrate that the material meets all relevant technical and regulatory requirements (Annex 2).

B.7.6.3 The PC shall maintain a record of all wastes that are removed from the site and their management route. Each waste management contractor shall provide details of the types and quantities of waste removed from the site, the receiving waste management facility and the associated recycling, recovery and disposal rates for each waste stream (Annex 3).

B.7.6.4 The PC shall monitor and record details of the wastes placed in all waste receptacles to ensure that contamination has not occurred.

B.7.6.5 The PC shall continually review the types of surplus materials and waste being produced and change the site set up to minimise wastage rates and maximise reuse or recycling.

B.7.6.6 The Authority or its representatives may carry out ‘spot checks’ in relation to the completeness of any WTNs and any HWCNs.

B.7.7 Review of the final Management Plan

B.7.7.1 The PC shall review the final Management Plan at least once every six months during the lifetime of the Scheme to ensure that KPI targets are being achieved and that realistic solutions are provided for unplanned events or abnormal wastes. The PC shall also review the final Management Plan if there is any significant change in the Scheme. These reviews will involve the completion and submission of a monitoring report to The Authority (or its representative) in an agreed format.

B.7.8 Additional duty of care checks

B.7.8.1 The PC shall periodically, at intervals to be determined, follow waste loads to confirm that the waste has been transferred to the place stated on the WTN, with any irregularities investigated immediately, and reported as an environmental incident. Action may involve termination of contract and/or notification to the EA.

B.7.9 Site inspections

B.7.9.1 The Site Manager or nominated deputy shall undertake a daily inspection of the construction areas including all areas used for waste management. Any issues shall be recorded in the daily log along with any corrective action taken.

B.7.10 Closure reporting

B.7.10.1 Within three months of the completion of works under a contract, the PC shall submit a Waste Management Closure Report to The Authority (or its representative) to demonstrate the effective implementation, management and monitoring of construction materials and waste during the construction lifetime of the Scheme.

B.8 Annex 1: Waste carriers

Waste type(s)	EWC code	Waste carrier name	Contact details	Waste carriers registration number	Expiry date (dd/mm/yyyy)	Date checked with Environment Agency (dd/mm/yyyy)

B.9 Annex 2: Aggregates imported to site

Client Name:		**Key Performance Indicator:** **At least 27% (by weight) of aggregates imported to site for use within the Scheme should comprise reused, recycled or secondary aggregates, for those applications where it is technically and economically feasible to substitute these alternative materials for primary aggregates**
Project:		
Contractor:		

Material / aggregate	Material density	Quantity required for construction	Quantity to be imported to site		Supplier	Supplier facility	Facility permit / licence / exemption number	Evidence of compliance with specification	Evidence of compliance with aggregates from inert waste quality protocol	Recycled content (% by weight)
	(tonnes/m^3)	m^3	m^3	tonnes						

Overall proportion of reused, recycled and secondary aggregates	**% (by weight)**

B.10 Annex 3: Waste management

Client Name:		**Key Performance Indicator:** Recover (through reuse, recycling or recovery) at least 70% (by weight) of non-hazardous construction and demolition waste (excluding naturally occurring materials with waste code 17 05 04).
Project:		
Contractor:		

Waste type and quantity			Management route (% or quantity)						Waste carrier	Offsite waste management facility
Waste type	EWC Code	Quantity (tonnes)	Onsite		Offsite					
			Reused onsite	Recycled for use on site	Reused offsite	Recycled offsite	Recovered offsite	Disposal		

Non-hazardous construction and demolition waste recovered (excluding waste code 17 05 04)	**% (by weight)**

Appendix C Outline Environmental Control Plan: Invasive Species

C.1 Background to the plan

C.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to ensure invasive species (both animal and plant species) are identified and controlled during construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

C.1.1.2 This OMP will be updated by the PC in to a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

C.1.1.3 The following invasive species are confirmed to be present:

a. Japanese Knotweed; and

b. Signal Crayfish;

C.1.1.4 All of these species are listed in Schedule 9 of the Wildlife and Countryside Act 1981 [REF 1-1], and as such it is an offence to plant, or cause to grow, a non-native species in the wild.

C.2 Responsibilities

C.2.1.1 In relation to the control and management of invasive species, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP.

C.3 Consent requirements

C.3.1.1 All works affecting invasive species shall be completed in accordance with:

a. treatment and disposal of invasive non-native plants: RPS 178 [REF 1-2]; and

b. the Waste (England and Wales) Regulations 2011 [REF 1-3].

C.4 General invasive species control measures

C.4.1.1 All works in the vicinity of, or affecting, invasive species shall be managed to prevent the spread of such plants.

C.4.1.2 Details of the location and type of recorded invasive species shall be included as part of the project induction, and toolbox talks given to operatives working in areas where such species are growing, or have known to grow.

C.4.1.3 Any early regrowth of invasive plant species shall be reported and communicated through the above means. If plant disposal cells have been completed when new growth is discovered, this shall be excavated and taken for offsite disposal to an appropriately licenced facility.

C.4.1.4 A vehicle cleaning area shall be established adjacent to the burial zone and all vehicles used to transport invasive plant material shall be cleaned prior to leaving this area. This area shall not be located greater than 7m from the burial zone. Material left in the clean down zone shall be collected and deposited into the burial cell.

C.4.1.5 The excavation and transfer of invasive plant species material, and its haulage to the holding area, shall be supervised.

C.4.1.6 Areas where invasive contaminated plant material is buried shall be accurately recorded and details of this included within the HEMP.

C.4.1.7 Excavation shall begin from the furthest point of the works and shall move backwards to avoid traffic on excavated, potentially contaminated ground.

C.4.1.8 Vehicles collecting and removing material shall be positioned over geotextile prior to loading..

C.4.1.9 Once the works have been completed, the Excavator shall be thoroughly cleaned and all arisings placed into the final load of contaminated material.

C.4.1.10 In the event of material requiring storage prior to burial, this shall be stored in a designated location on an impermeable membrane to prevent spread of the plants. This area shall also have a clean down zone.

C.4.1.11 If any material is to be removed for offsite disposal, this shall be performed once an appropriately licenced disposal site has been identified and conformation received on their acceptance of the waste.

C.5 Specific identification and control measures

Japanese Knotweed

C.5.1.1 Identification of Japanese Knotweed:

a. fleshy red tinged roots when first breaking ground;
b. large oval green heart shaped leaves;
c. silver tinge to underside of leaves;
d. hollow green stem with red blotches/spots – bamboo like with a zig-zag pattern;
e. begins to grow in early Spring and grows at a rate of 3cm per day;
f. reaches height of 1.5/2m by May and 3m by June;
g. leathery leaves;
h. dense clumps;
i. clusters of creamy white flowers; and

j. dies back between September and November, leaving dead brown stems.

Figure C.1: Japanese Knotweed

C.5.1.2 The control of Japanese Knotweed shall be undertaken in accordance with the following steps.

C.5.1.3 Demarcation of the area of excavation, up to 7m from the edge of plant growth. Actual excavation depth shall be dependent on the depth of rhizome penetration, and accurate rhizome identification will help to minimise the amount of excavation required.

C.5.1.4 The rhizome shall be removed with care. As the crowns are typically located within the top 500mm, 0-500mm should be removed in one scrape to minimise the potential for breaking crowns and lessen potential risk of spread. This material should be stored separately from the rest of the excavation material.

C.5.1.5 Excavation down to 3m (or as appropriate when identifying rhizome), with excavated material used as the base or top layer in the burial pit. The middle layer shall comprise that containing the material excavated in the top 0-500mm scrape.

C.5.1.6 A haulage route from the excavation to the storage area shall be agreed, and if necessary, demarcated.

C.5.1.7 Excavated material shall be taken directly to the position of burial.

C.5.1.8 All vehicles used to transport Japanese Knotweed material shall contain a system to cover the hopper during transport, to minimise the potential for spread.

C.5.1.9 Japanese Knotweed shall be buried and covered with a membrane. The upper level of the cell shall be at least 2m below ground level to minimise risk of damage, and all material shall be treated with a glyphosate solution prior to covering.

Signal Crayfish

C.5.1.10 Identification of Signal Crayfish:

a. turquoise/white blotch on the hinge of the claw;

b. claws large in relation to body, particularly in males;

c. top of crayfish red/brown in colouration;

d. underside of claws are bright red; and

e. up to 16cm in size (from tail to top of head)

C.5.1.11 Signal Crayfish is a highly invasive freshwater crayfish that is now widespread in the UK. The species can exacerbate soil erosion on river banks due to tunnelling activity. It spreads the crayfish plague, which is fatal to the native White-clawed Crayfish.

C.5.1.12 The species spreads by walking or swimming from one waterbody to another, and by producing huge quantities on tiny larvae which can spread in water attached to construction vehicles, equipment and clothing, and by water flow.

Figure C.2: Signal Crayfish

C.5.1.13 The control of Signal Crayfish shall be undertaken in accordance with the following steps.

C.5.1.14 Where feasible, works near watercourses shall be carried out towards the end of the construction programme.

C.5.1.15 Should machinery enter watercourses within the construction working area, any portions of the machinery that comes in contact with the water must be cleaned using a jet wash to remove any potential Signal Crayfish larvae (not be visible to the naked eye). Such machinery shall be disinfected with Vircon and allowed to dry thoroughly, prior to being used in or near another waterbody.

C.5.1.16 If Signal Crayfish are removed from watercourses, specimens must not be returned to the water and must be disposed of properly.

C.5.1.17 If the specimen removed is carrying eggs i.e. 'berried', special care must be taken. Immediately place the crayfish into a polythene bag and seal up/tie off so that eggs are not washed into the river.

C.5.1.18 Operatives shall be made aware of this invasive animal, and any findings shall be reported to a suitably qualified ecologist.

C.6 Monitoring and measurement

C.6.1.1 Weekly and monthly inspections shall be undertaken as part of a review of the general techniques to be applied to control and manage invasive species during construction.

C.6.1.2 The movement of materials shall be undertaken in accordance with the Material Management Plan (MMP).

C.7 Reporting emergencies

C.7.1.1 If, during site works, any protected species is thought to have been identified or seen, works in that area must stop immediately and the relevant department must be contacted to report the location of discovery and works being undertaken.

C.8 References

REF 1-1	Wildlife and Countryside Act 1981. The Stationary Office (1981).
REF 1-2	Treatment and disposal of invasive non-native plants: RPS 178. Environment Agency (2016).
REF 1-3	The Waste (England and Wales) Regulations 2011. The Stationary Office (2011).

Appendix D Outline Environmental Control Plan: General Ecology

D.1 Background to the plan

D.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to protect (non-licensable) ecological species, including vegetation and watercourses forming ecological habitats, from impacts during construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

D.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

D.2 Responsibilities

D.2.1.1 In relation to the control and management of the general ecology, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

D.3 Consent requirements

D.3.1.1 Consents are required for any works that affect protected species and watercourses.

D.3.1.2 Within this plan are outlined the consent conditions that are contained within the flood defence consents for structures within watercourses.

D.4 General ecological control measures

D.4.1.1 All works affecting ecological features are to be completed under the guidance of the Licenced Ecologist.

D.4.1.2 The following control measure shall be applied within all areas of the Scheme during construction:

a. site compounds and storage areas shall, where practicable, be established away from areas known to be used for breeding by common toads or habitats with potential for use for breeding by amphibians;

b. an Ecological Clerk of Works shall be present during site clearance operations in sensitive habitats, such as works undertaken adjacent to ponds;

c. where possible, material from site clearance operations shall be used to create additional refugia and/or hibernacula to improve the suitability of terrestrial habitat;

d. night-time working shall be kept to a minimum wherever possible, and confined to locations that are away from nesting and roost sites to reduce the potential impact on nesting birds, barn owls and bats;

e. excavations shall be closed overnight, and where this is not feasible, an escape ramp shall be placed within the excavation to allow animals to escape; and

f. where any species or habitats protected by wildlife legislation are noted during the works, construction operations shall stop in those areas and the supervising ecologist contacted for further advice on how to proceed.

D.5 Specific ecological control measures

D.5.1.1 The following specific ecological control measures shall be implemented during construction of the Scheme.

Works affecting watercourses

D.5.1.2 To prevent the spread of Japanese Knotweed, all invasive works in proximity to watercourses and waterbodies shall be undertaken in accordance with the EA's Japanese Knotweed code of practice guidance [REF 1-1]

D.5.1.3 Prior to undertaking any herbicide spraying near watercourses, consent shall be obtained from the EA. Advice is available from the EA [REF 1-2].

D.5.1.4 Immediately prior to any works taking place within any Local Authority watercourse affected by the Scheme, a watching brief shall be conducted by the Licenced Ecologist to assess the area for activity of any of the following protected species (these are in addition to other species subject to their own licence):

a. otters;

b. water voles; and

c. crayfish

D.5.1.5 When travelling or working between watercourses, measures shall be employed to reduce the risk of transferring problem species or diseases between watercourses. Such measures shall include, but not be limited to, the checking for and cleaning mud and vegetation from boots, construction equipment and machinery, and allowing such items to dry in sunlight.

Works affecting vegetation

D.5.1.6 Prior to any vegetation being cleared within the bird nesting season (1 March to 31 August), this shall be inspected by a qualified ecologist to ensure no nesting birds are present

D.5.1.7 Any hedgerow to be removed within the bird nesting season shall be netted prior to 1st March to limit the potential for nesting birds. Even if netted, all vegetation to be cleared during the bird nesting season shall be subject to a nesting bird survey prior to felling or removal.

D.5.1.8 Only hedgerows marked on the site clearance plan shall be removed.

D.5.1.9 No bankside vegetation within 8m of any watercourse is to be removed unless absolutely necessary. In such cases, trees and shrubs shall be limbed or coppiced and the root base left intact.

D.5.1.10 Scrub vegetation shall be retained wherever possible, as this provides valuable wildlife habitat.

D.5.1.11 Trees shall be protected from construction works in accordance with BS 5837:2012 – Trees in relation to design, demolition and construction [REF 1-3]. PCs' working areas shall be clearly marked out and boundaries adhered to.

D.5.1.12 Works in relation to trees shall be in accordance with BS 3998:2010 – Tree Work: Recommendations [REF 1-4], and all trees to be retained shall be clearly demarcated.

D.5.1.13 Any bankside trees or vegetation damaged or removed during the works shall be replaced with native species of local provenance appropriate to the local habitat.

Works affecting nesting birds

D.5.1.14 Where appropriate, measures shall be implemented to deter birds from nesting in the working area of the Scheme. Measures shall include, but not be limited to, physical means to prevent establishment of nests (such as netting) or other legal means of disturbance, such as the regular ploughing of soils or falconry.

D.5.1.15 These measures shall be completed under the advice and supervision of a suitably experienced ecologist and are not be used where there is considered to be a risk of disturbance to any active nests of bird species listed under Schedule 1 of the Wildlife and Countryside Act 1981 [REF 1-5].

D.5.1.16 Should a nesting bird be uncovered during the works, works within a defined exclusion zone around the nest shall cease and a suitably qualified ecologist is to be contacted. The size of the exclusion zone shall be dependent on the nest location and type of work being undertaken, and would be reviewed on a case by case basis by the ecologist. The exclusion zone shall remain in place until the bird has fledged, unless alternative arrangements can be made with the local Police Wildlife Officer.

D.5.1.17 To avoid disturbance to nesting birds, site clearance works including the demolition of buildings and the removal of any woody vegetation and ground flora shall be conducted, where possible, outside the bird nesting season. If clearance has to take place during the bird nesting season, any works shall be preceded by a nesting bird survey conducted by a suitably qualified ecologist.

D.5.1.18 Ecological monitoring shall be undertaken prior to and during construction to identify any active nests of Schedule 1 [REF 1-5] bird species that may be at risk of disturbance from the works.

D.6 Specific ecological mitigation measures

Birds

D.6.1.1 Bird nest boxes shall be provided within the Order Limits of the Scheme, the number, type and location of which is to be determined.

Badger

D.6.1.2 The following precautionary mitigation measures shall be implanted during construction to minimise the potential risk of harm to badgers, the nature of which do not require a licence to be obtained from Natural England in advance of their implementation.

a. any pipework greater than 250mm in diameter shall be capped if they are left open overnight, thereby preventing badgers from accessing them and becoming trapped;

b. any pits or trenches shall be covered overnight, or fitted with a suitable means of escape; and

c. fencing shall be used (including badger fencing) to mark minimum stand-offs around active setts, or to exclude badgers from construction working areas where there is considered to be a risk of accidental collision with construction traffic.

D.6.1.3 Where required, badger fencing shall be based upon the specification set out in the Design Manual for Roads and Bridges: Volume 10, Section 4, Part 2 – Mitigating Against Effects on Badgers [REF 1-6].

D.6.1.4 A badger survey will be completed prior to works in order to ensure that the status of setts located within the scheme boundary has not altered significantly and that no setts have become established. Furthermore, checks will also be made at regular intervals throughout construction to ensure no setts become established within the working area, including any temporary stockpiles. In the event that there is reasonable likelihood that any newly established setts will be directly affected or disturbed by the proposals then further mitigation may be necessary, including, as appropriate, Natural England licences.

D.7 Monitoring and measurement

D.7.1.1 Inspections of watercourses and vegetation for nesting birds shall be conducted immediately prior to construction works taking place.

D.7.1.2 When any nesting birds are found, the state of the nest shall be reviewed on a weekly basis to minimise the potential for disturbance.

D.8 Reporting emergencies

D.8.1.1 If, during site works, any protected species is thought to have been identified or seen, works in that area must stop immediately and the relevant department must be contacted to report the location of discovery and works being undertaken.

D.9 References

REF 1-1	https://www.gov.uk/government/publications/japanese-knotweed-managing-on-development-sites. EA (accessed October 2018).
REF 1-2	https://www.gov.uk/government/publications/application-to-use-herbicides-in-or-near-water. EA (accessed October 2018).
REF 1-3	BS 5837:2012 Trees in relation to design, demolition and construction. British Standards Institution (2012).
REF 1-4	BS 3998:2010 – Tree Work: Recommendations. British Standards Institution (2010).
REF 1-5	Wildlife and Countryside Act 1981. The Stationary Office (1981).
REF 1-6	Design Manual for Roads and Bridges: Volume 10, Section 4, Part 2 – Mitigating Against Effects on Badgers. Highways Agency (2001).

Appendix E Outline Soil Management Plan

E.1 Background to the plan

E.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented for soil management on the Scheme, and details the arrangements for areas where soil material shall be stripped and stored before being returned to its original location or reused elsewhere on the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

E.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

E.2 Responsibilities

E.2.1.1 In relation to the control and management of soil, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

E.3 Legislation and best practice

E.3.1.1 Although not a regulatory requirement, the preparation of a Soil Management Plan (SMP) is good industry practice for all construction projects with an estimated cost greater than £300,000.

E.3.1.2 Topsoil management shall adhere to the Department for Environment, Food and Rural Affairs (DEFRA) published Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [REF 1-1] which details approaches and techniques for:

a. the identification of soil resources at an early stage in the development process;

b. improved planning of soil use;

c. better level of soil management during project implementation, including sustainable use of surplus soil;

d. the maintenance of soil quality and function both on and off site;

e. avoidance of soil compaction and erosion (with a consequent reduction in flooding and water pollution);

f. improved knowledge and understanding of soil at all levels in the construction industry, including soil amelioration techniques

g. areas of soil to be protected from earthworks and construction activities;

h. the areas and types of topsoil and subsoil to be stripped, haul routes and stockpile locations; and

i. the methods for stripping, stockpiling, re-spreading and ameliorating landscape soils.

E.4 Construction impacts on soil resources

E.4.1.1 Construction related activities can result in some of the most significate adverse impacts on soil properties and soil quality.

E.4.1.2 The DEFRA published Safeguarding our Soils: A Soil Strategy for England [REF 1-2] states that soil is often not considered until the landscaping phase of a project, by which time most of the damage has already been done. These adverse effects on soils can occur in a number of ways:

a. accidental spillages or the use of chemicals resulting in the contamination of soil resource;

b. the mixing of topsoil and subsoil reducing the overall soil quality;

c. offsite disposal of soils due to the mixing of soil and construction waste or contaminated materials which require treating before reuse or ultimately disposed of at landfill;

d. the use of heavy machinery or the storage of construction materials can result in the over-compaction of the soil;

e. the use of impermeable materials to cover soils, which can result in detrimental impacts on the soils' biological, chemical and physical properties. In addition, this can result in certain geotechnical parameters being altered such as drainage characteristics and structure; and

f. destruction of topsoil structure by incorrect storage, e.g. over high stockpiles (not to be stored in excess of 2m high) compressing soil structure.

E.4.1.3 Adverse effects on soils can be mitigated by adopting high standards of soil handling, storage and management during construction, and by avoiding the creation of bare areas of permanently exposed soil that would be vulnerable to erosion processes.

E.5 Outline proposals for soil management

Pre-construction activities

E.5.1.1 Prior to undertaking any stripping of soils, the soils shall be subject to an analytical testing regime to assess the quality of the soil against BS 3882:2015 – Specification for topsoil and requirements for use [REF 1-3].

E.5.1.2 The specification for soil testing shall include the following analyses:

a. visual examination (including description of soil structure, consistency and foreign matter);

b. particle size distribution (including stone content);

c. pH and salinity values;

d. major plant nutrients content;

e. organic matter content; and

f. maximum levels of potential contaminants (e.g. heavy metals, hydrocarbons, cyanide and phenols).

E.5.1.3 The sampling of soil for analysis shall be undertaken in line with the specification by suitably qualified personnel to the soil's full depth, with separate samples being obtained from each soil area and contrasting land use within them.

E.5.1.4 To provide an accurate representation for each sampling area, the mixing together of several incremental samples taken across a certain area shall be undertaken using the random 'figure of W' or rectilinear grid sampling methodologies presented within DEFRA's Code of Practice [REF1-1].

E.5.1.5 All samples obtained shall be submitted to a suitably qualified, quality assured laboratory and tested for parameters in line with the specification. Permeability and porosity testing shall be undertaken where such information will assist in establishing soil quality, for example to establish its required performance.

E.5.1.6 The depth of soil encountered shall be recorded at each location where soil stripping is to be undertaken, to ensure that the same thickness of topsoil is replaced at the end of the construction works.

Preparation

E.5.1.7 Soil stripping shall be undertaken only after analysis of the soil survey results has taken place.

E.5.1.8 Areas where soil stripping is required to be undertaken shall be demarcated and fenced ahead of any major construction plant, vehicles or machinery entering the works area.

E.5.1.9 Temporary ditches shall be excavated, where required, to act as cut-off drains to deal with surface water from adjacent fields, in accordance with the approaches and techniques presented within the Surface Water Management Plan.

E.5.1.10 Intrusive archaeological investigations shall be undertaken ahead of construction works to avoid soil stripping resulting in damage to buried archaeology, in accordance with the approach and techniques presented within the Archaeological Written Scheme of Investigation (WSI).

E.5.1.11 Stockpiles of soil shall be located away from watercourses or other water features, to reduce the potential risk of pollution from suspended solids.

Topsoil stripping

E.5.1.12 The following principles shall be adhered to during the stripping and handling of topsoil across all parts of the Scheme, in line with DEFRA's Code of Practice [REF 1-1]:

a. any surface vegetation shall be removed by blading off, by scarification and raking, or by kill off methods such as the application of a suitable non-residual herbicide applied not less than two weeks before stripping;

b. stripping of topsoil shall be restricted to those areas that are to be disturbed by construction activities such as where the soils would be likely to suffer damage associated with the engineering activities and or the installation of temporary buildings, haul routes or other areas of hardstanding. Topsoil from below any spread of trees proposed to be retained shall not be removed;

c. topsoil shall not be over-stripped such that subsoil becomes incorporated, as this will reduce quality and fertility of the material;

d. to avoid over compaction or damage to the existing topsoil, any dedicated haul routes shall be stripped first with all haul distances minimised;

e. during periods of high rainfall topsoil, stripping will be prohibited with soils allowed to dry out to mitigate any potential damage to (and degradation of) the soils;

f. if sustained heavy rainfall occurs during soil stripping operations (10mm in 24 hours), work shall be suspended until the ground has had at least one full dry day or agreed criteria (such as a specified moisture content) has been met. Operations shall not continue if pools of water remain on the surface;

g. in order to ensure that the works are undertaken under suitable weather conditions, the timing of all soil movements shall be conditional upon approval of the EM/Landscape Specialist for the Scheme;

h. the storage of stripped topsoil shall be in temporary stockpile bunds by end tipping articulated dump trucks, subsequently shaped by the use of a dozer. At the end of each shift the dozer shall seal stockpiles to prevent weather ingress by back blading. To avoid erosion and assist with stability, side batters to stockpiles shall not exceed a 1 in 2 slope;

i. topsoil shall be stored in segregated bunds constructed by stripping topsoil from the storage area and using this to form a windrow around the area. Topsoil from elsewhere shall then be stored in a bund no more than 2m in height within this area to prevent any compression on the topsoil originally in the area. Following completion of the works, stored topsoil shall be taken to final place of deposition and re-spread at its original location;

j. topsoil bunds shall be constructed where they cannot be mixed or contaminated with other soil types;

k. soils of different Agricultural Land Classification [REF 1.4] grading shall not be stored in the same bund;

l. stripping operations shall be appropriately supervised and follow a detailed plan showing soil units to be stripped, haul routes and vehicle movements throughout the works. Information relating to the range of thickness, types and layers of soils across the route should be available so as to allow for soil units to be defined on site;

m. earthmoving plant appropriate to the size of the site, the volume of soil to be striped and the haulage distances shall be used in accordance with appropriate work practices;

n. tracked equipment shall be used wherever possible to reduce topsoil compaction;

o. where mechanical excavators are to be used, topsoil should be stripped in accordance with the guidance and procedures set out in the DEFRA Code of Practice [REF 1-1], Section 5 of BS 3882:2015 [REF 1-3], and the Ministry of Agriculture Fisheries and Food (MAFF) published Good Practice Guidance For Handling Soils – Sheet 1: Soil Stripping with Excavators and Dump Trucks [REF 1-5]; and

p. the site shall be carefully examined for non-vegetative potentially hazardous debris (e.g. glass, bricks, concrete) and also any invasive weeds prior to soil stripping, with any such material encountered removed. Remaining vegetation shall be cut back to approximately 300mm in height and cleared. Vegetation shall not be incorporated into topsoil to be stored. Appropriate guidance should be sought from an Ecologist if invasive species are identified.

Subsoil stripping

E.5.1.13 Following topsoil stripping, the subsequent operation shall be to strip existing subsoil as required.

E.5.1.14 Subsoil stripping operations shall be undertaken using similar equipment and techniques as the topsoil strip, and undertaken immediately following topsoil strip operations to avoid any degradation of subsoil resources.

E.5.1.15 Subsoil stripping shall be undertaken to the depths specified on the Scheme earthworks plans.

E.5.1.16 The principles of the DEFRA Code of Practice [REF 1-1] shall be applied during the stripping and handling of subsoil, in addition to the following actions:

a. any haul routes shall be run on the underlying soils and not the subsoil being stripped;

b. subsoils of different quality and composition shall not be mixed; and

c. stockpiles of subsoil shall be segregated from topsoil to ensure that no mixing of the two soil types occurs.

Soil stripping controls and checks

E.5.1.17 Prior to undertaking any soil stripping operations, the following checks shall be undertaken:

a. ensure all necessary pre-construction surveys have been completed;

i. follow and implement all identified mitigation requirements for the location and method of stripping;

ii. ensure adequate stockpile storage designation areas are prepared; and

iii. check whether an archaeological watching brief is required by a suitably qualified archaeologist to supervise any soil stripping operations.

E.5.1.18 Detailed daily records shall be kept of operations undertaken. These shall include the removal of stones and damaging materials, site and soil conditions, and the results of any assessment of the need for additional decompaction (and the effectiveness of decompaction work undertaken).

E.6 Soil storage

Stockpile construction

E.6.1.1 Following soil stripping activities, topsoil and subsoil shall be stored in separate stockpiles, the construction and design of which shall be in accordance with MAFF published Good Practice Guide for Handling Soils – Sheet 2: Building Soil Storage Mounds with Excavators and Dump Trucks [REF 1.6].

E.6.1.2 Reference shall also be made to the DEFRA Code of Practice [REF 1-1] which details how stockpile size is dependent on multiple factors including the nature / composition of the soil, the prevailing weather conditions at the time of the stripping, space limitations and any planning-related conditions or requirements attached to the consent for the Scheme.

E.6.1.3 As the quality of soil within stockpiles needs to be maintained to reduce the potential for damage to the soil's physical condition and structure, and to facilitate the re-spreading and reinstatement of soil material, stockpiles shall:

a. be carefully formed with a slope no greater than a slope of 1:2, so as to reduce the potential for damage to the physical condition and future economic viability of soil resources;

b. segregate topsoil and subsoil to ensure no mixture and subsequent degradation of soil quality;

c. be designed to be as narrow and as low as practicable, to allow the core material to be within 1m of the surface (to prevent anaerobic conditions developing);

d. be shaped in a manner that facilitates the shedding of water;

e. be shaped in a manner that avoids the potential for ponding;

f. be located to avoid interference with rainwater runoff from adjacent areas, and to prevent the pollution of water bodies;

g. be located beyond tree canopies and identified root protection zones around trees and vegetation to be retained; and

h. be located in excess of 10m from any existing watercourse or drains.

E.6.1.4 When stockpiles are constructed during a period of inclement weather, stockpile cores shall be exposed and left for a minimum of one day to enable the soils to dry out prior to re-use.

E.6.1.5 Depending on the prevailing conditions, all stockpiling operations shall be undertaken in a manner consistent with either of the following methods, as detailed in the DEFRA Code of Practice [REF 1-1]:

a. Method 1: Dry non-plastic soils; or

b. Method 2: Wet plastic soils.

Soil stockpiling

Soil should be stored in an area of the site where it can be left undisturbed and will not interfere with site operations. Ground to be used for storing the topsoil should be cleared of vegetation and any waste arising from the development (e.g. building rubble and fill materials). Topsoil should first be stripped from any land to be used for storing subsoil.

Method 1 – Dry non-plastic soils

The soil is loose-tipped in heaps from a dump truck (a), starting at the furthest point in the storage area and working back toward the access point. When the entire storage area has been filled with heaps, a tracked machine (excavator or dozer) levels them (b) and firms the surface in order for a second layer of heaps to be tipped. This sequence is repeated (c & d) until the stockpile reaches its planned height. To help shed rainwater and prevent ponding and infiltration a tracked machine compacts and re-grades the sides and top of the stockpile (e) to form a smooth gradient.

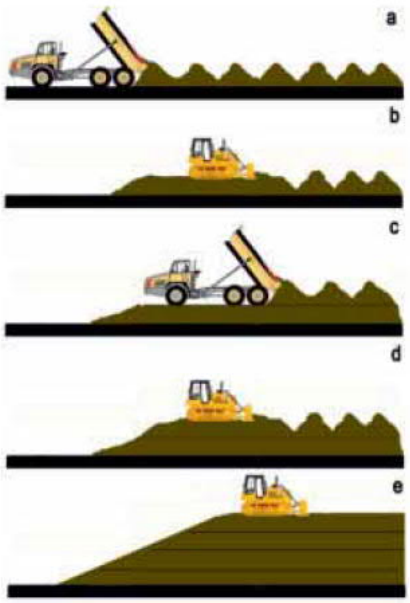

Figure E.1:Soil stockpiling: Method 1

Method 2 – Wet plastic soils

The soil is tipped in a line of heaps to form a 'windrow', starting at the furthest point in the storage area and working back toward the access point (a). Any additional windrows are spaced sufficiently apart to allow tracked plant to gain access between them so that the soil can be heaped up to a maximum height of 2m (b). To avoid compaction, no machinery, even tracked plant, traverses the windrow.

Once the soil has dried out and is non-plastic in consistency (this usually requires several weeks of dry and windy or warm weather), the windrows are combined to form larger stockpiles, using a tracked excavator (d). The surface of the stockpile is then regraded and compacted (e) by a tracked machine (dozer or excavator) to reduce rainwater infiltration.

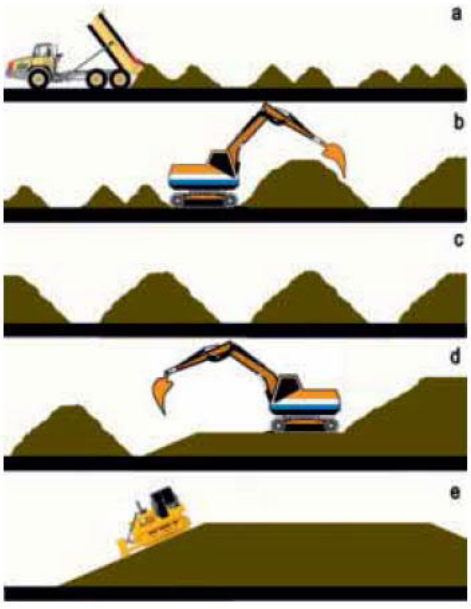

Figure E 2: Sol stockpiling: Method 2

Management of stockpiles

E.6.1.6 Soil stockpiles shall be placed on top of heavy-duty plastic sheeting to minimise any potential leaching of nutrients and contamination from underlying ground and construction materials. Soil stockpiles shall be covered with material adequate to prevent erosion and disbursement by wind or rainwater runoff, and covers shall be maintained in good condition.

E.6.1.7 Upon completion of formation, stockpiles shall be securely fenced off to prevent further disturbance and potential contamination by construction activities. Vehicles shall be prohibited from tracking over areas of stockpiled materials with clear visible signage in place to identify stockpile content and type e.g. topsoil or subsoil.

E.6.1.8 In order to mitigate the adverse effects of soil storage, the site shall be managed in such a way that soil storage periods are minimised in duration. Should stockpile durations be greater than six months, the application of a mix of grass and clover seeds to the stockpile surface shall be implemented to aid in reducing potential surface erosion and prevent potential nuisance weed infestation. Any weeds that have established on the stockpiles shall be managed during summer months by the application of appropriate herbicide by spraying techniques to kill off the weeds, or by cutting techniques such as mowing and strimming to prevent any possible seed dispersion.

E.7 Soil restoration

E.7.1.1 Reuse and restoration of soils

E.7.1.2 A structured, uncompacted and well-aerated soil profile shall be formed for the successful establishment and subsequent growth of vegetation.

E.7.1.3 Areas where soils are to restored shall be protected from the in-flow of water and ponding. In locations where ponding has occurred due to inclement weather, these areas shall be drained in advance of restoration and allowed to dry out.

E.7.1.4 Prior to restoration, the basal layer should be profiled to a level and clean state.

E.7.1.5 Restoration operations shall be undertaken in line with a detailed replacement plan, indicating which soil units are to be replaced, haul routes to be used, and the phasing of associated vehicle movements. Soil units shall be defined on the site with information to distinguish types, layers and thickness.

E.7.1.6 Soil health (as well as plant health) shall be closely monitored during the aftercare period to enable any deficiencies to be corrected as soon as possible after detection.

Substrate

E.7.1.7 The substrate shall be properly decompacted to break up any panning or sealing of the ground surface, in order to reduce flood risk and to promote deeper root growth.

E.7.1.8 Should the substrate material require ripping, then the utilisation of heavy duty ripper equipment (such as a single rigid tine device or large winged-tine rippers) shall be implemented.

E.7.1.9 Dedicated haul routes shall be utilised to transport the subsoil to the first placement site and, thereafter, adherence to designated haul routes shall continue.

E.7.1.10 The spreading of subsoil shall be undertaken from the furthest point from the area access point, to avoid over compaction of already placed subsoil. Spreading shall be undertaken in uniform thickness of an agreed thickness with subsequent layers applied, as required.

E.7.1.11 Should the ripping of subsoil material be deemed to be necessary, then:

a. the substrate material shall be thoroughly ripped to a depth of 500mm with a minimum of two passes;

b. where possible, the ripper blades used shall have wide, shallow wings fixed. If this is not the case, the spacing at the surface shall be reduced; and

c. following ripping, the subsoil windrow shall be spread to an agreed depth across the area using a dozer.

E.7.1.12 At the end of each day, the current strip/segment shall be completed in full if rain is forecast. If during a day it is evident that a full strip cannot be completed, then the current segment shall be completed as a minimum.

E.7.1.13 Subsoil placement works shall be suspended if sustained heavy rainfall (e.g. >10mm in 24 hours) occurs during the soil handling operations, and not restarted until the ground has had at least a full dry day or agreed moisture content criteria can be met.

Topsoil

E.7.1.14 The application of topsoil to each designated area will be excavated from temporary storage stockpiles by 360 degree excavator and placed using articulated dumper trucks.

E.7.1.15 Topsoil shall be placed in a windrow at appropriate centres from the edges of the site and spread evenly across the site. In spreading, the material operations shall commence at the furthest location from the access point and work backwards to avoid tracking over newly placed topsoil.

E.7.1.16 The topsoil shall be spread to an agreed depth, generally 300 to 350mm dependant on original soil depths, across the ripped subsoil by dozer.

E.7.1.17 Should the ripping of topsoil be deemed to be necessary, an agricultural subsoiler with wings and narrow legs shall be used to rip the topsoil to an agreed depth, generally 400mm dependant on soil depths, in order to remove any remaining compaction and to key into the underlying subsoil.

E.7.1.18 Topsoil placement works shall be suspended if sustained heavy rainfall (e.g. >10mm in 24 hours) occurs during the soil handling operations, and not restarted until the ground has had at least a full dry day or agreed moisture content criteria can be met.

E.8 References

REF 1-1	Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Department for Environment, Food and Rural Affairs (2009).
REF 1-2	Safeguarding our Soils: A Strategy for England. Department for Environment, Food and Rural Affairs (2009).
REF 1-3	BS 3882:2015 – Specification for topsoil. British Standards Institution (2015).
REF 1-4	Agricultural Land Classification of England and Wales. Ministry of Agriculture, Fisheries and Food (1988).
REF 1-5	Good Practice Guide for Handling Soils – Sheet 1: Soil Stripping with Excavators and Dump Trucks. Ministry of Agriculture Fisheries and Food (2000).
REF 1-6	Good Practice Guide for Handling Soils – Sheet 2: Building Soil Storage Mounds with Excavators and Dump Trucks. Ministry of Agriculture Fisheries and Food (2000).

Appendix F Outline Surface Water Management Plan

F.1 Background to the plan

F.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to mitigate effects during construction on the water environment; monitor construction activities and provides an action plan that would be used in the event of a pollution incident.

F.1.1.2 This OMP will be updated by the PC, as appropriate and necessary, prior to commencement of works in accordance with the Requirement 4 in Schedule 2 of the draft DCO [**TR010027/APP/3.1**].

F.2 Responsibilities

F.2.1.1 In relation to the control and management of surface water, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this Outline Environmental Management Plan (OEMP).

F.3 Purpose

F.3.1.1 The purpose of this OMP is to detail the water management principles and procedures throughout the construction period of the Scheme.

F.3.1.2 The OMP and the future detailed Surface Water Management Plan (SuWMP) will ensure that the requirements of relevant environmental legislation, the measures relied upon in the assessment of effects as reported in the Environmental Statement (ES), and any conditions of environmental permits or other permissions/licences are complied with during construction. It shall be the responsibility of the PC to ensure the Scheme is executed in a manner compliant with this OMP.

F.3.1.3 This OMP has been developed by Highways England and will be adopted and implemented by the PC. The PC will set out:

a. the site and scheme-specific measures to control, manage and treat construction site runoff, and reduce the risk from chemical spillages; and

b. a pollution incident response plan.

F.3.1.4 Any mitigation measures will be in keeping with the objectives, requirements and mitigation measures set out in this OMP, including how clean and dirty water will be kept separate, how fine sediment will be trapped and removed from construction run-off, and how chemical spillages will be managed. The Contractor will also have a duty of care to those who benefit from Private Water Supplies.

F.3.1.5 Overall, the PC will implement this plan and in doing so will need to ensure that:

a. The OMP is implemented in accordance with the OEMP and Pollution Control Plan;

b. Construction Method Statements are prepared in line with the minimum requirements set out in this OMP. Certain activities may require third party consultee approval of the specific construction method statement. In such cases the method statement will be submitted to the consultees for review and approval as per the requirements of the Development Consent Order (DCO); and

c. This OMP is reviewed regularly and under each of the specific circumstances set out later in this plan.

F.4 Existing watercourses and Flood Risk

F.4.1.1 The following surface water bodies have been identified within the Order Limits or are immediately downstream receptors and are shown in **Figure 14.1** of the ES (Volume 1: Chapter 14 Road drainage and the water environment [**TR010027/APP/6.1**):

a. River Blythe: SSSI and a WFD reportable watercourse;

b. Hollywell Brook, Shadow Brook and tributary, and the tributary of Low Brook: all are tributaries of the River Blythe SSSI or Hatchford-Kingshurt Brook WFD waterbodies. The tributary of Shadow Brook and the tributary of Low Brook also flow through the Bickenhill Meadows SSSI units;

c. Numerous drains and agricultural ditches;

d. Pendigo Lake;

e. Numerous ponds, some of which are identified as containing Great Crested Newt (ponds 6, 7, 11, 12, 13, 19 and 36 in ES Volume 3 **Figure 14.1** [**TR010027/APP/6.2**]); and

f. Tame Anker Mease Secondary Combined WFD groundwater body.

F.4.1.2 Full descriptions of the watercourses that are directly crossed by the

F.4.1.3 Scheme are provided in ES Volume 1 **Figure 14** Chapter 14 Road drainage and the water environment [**TR010027/APP/6.1**] (please also refer to ES Volume 3 **Figure 14.1** [**TR010027/APP/6.2**] for further detail).

Flood Risk

F.4.1.4 A Flood Risk Assessment (FRA) [**TR010027/APP/6.10**] is provided in the planning application, which assesses the present risk of flooding from all sources including fluvial, surface water, groundwater, artificial sources and sewer and water supply infrastructure. Please refer to the FRA [REF 1] for full details. The Scheme is mainly situated on Flood Zone 1, with a patch of Flood Zone 3 falling into the Scheme boundary at the source of Shadow Brook, and immediately around Hollywell Brook. There is a small patch of Flood Zone 2 located on the National Exhibition Centre (NEC) car parks at the northeast of the Scheme. There are also patches of Flood Zone 2 and 3 located at the M42 crossing of the River Blythe at the southernmost extent of the Scheme boundary. Hydraulic modelling indicates that there is no requirement to provide flood compensatory storage mitigation along Hollywell Brook.

F.4.1.5 Overall, the risk of flooding from surface water is considered to be low. The current risk of flooding from artificial sources, drains and sewers has been assessed to be low, including from Pendigo Lake. The Scheme is also classified as being at low flood risk from groundwater sources.

F.5 Prior to construction

Monitoring

F.5.1.1 In advance of any construction works, a programme of pre-construction water quality monitoring will be required to augment existing data and to provide a robust baseline against which any changes in water quality during construction works can be compared. This monitoring will include regular monthly (as a minimum) visits to all watercourses and major water bodies that could be impacted by the Scheme for the recording of visual and olfactory observations, in situ monitoring and collection of water samples for laboratory analysis.

F.5.1.2 The final scope of pre-construction (and any further) monitoring will be agreed during applications for Environmental Permits.

F.5.1.3 After completion of the baseline monitoring the Environmental Clerk of Works (ECoW)will prepare a Water Quality Baseline Report that will be issued to the Environment Agency (EA) and Solihull Metropolitan Borough Council (SMBC) in advance of construction works commencing on site.

F.5.1.4 The existence of PWS must be determined by the PC to identify potential pollution sources that could affect these supplies and the need for further monitoring (pre, during and post-construction).

Permissions

F.5.1.5 Under the Environmental Permitting (England and Wales) Regulations 2016 an Environmental Permit (Flood Risk Activity) is required from the EA if a regulated activity is to be undertaken on or near a Main River, on or near a flood defence structure, or in a flood plain, and exemptions do not apply. This includes any activity within 8m of the bank of a main river (for example Hollywell Brook and Shadow Brook), flood defence structure or culvert on a main river, or activities carried out on the floodplain of a main river.

F.5.1.6 An Environment Permit may also be required for the discharge to surface waters or ground of any unclean construction site runoff, again where exemptions do not apply. However, local highways authorities do not require permission from the EA to discharge runoff from highways to Controlled Waters (i.e. all watercourses, canals, lakes, groundwater etc.) under the Highways Act 1980 providing water pollution does not occur.

F.5.1.7 Land drainage consent will be required from SMBC as the lead Local Flood Authority for certain works that may affect the flow in Ordinary Watercourses (i.e. all other watercourses that are not Main Rivers) under The Floods and Water Management Act 2010 and The Land Drainage Act 1991.

F.6 During construction

Monitoring

F.6.1.1 During construction water quality monitoring will be undertaken to ensure that mitigation measures are operating as planned and preventing pollution. The purpose of the monitoring programme would also be to ensure that should pollution occur it is identified as quickly as possible and appropriate action is taken in line with the Pollution Control Plan. Although regular site visits to all water bodies that may be affected should be continued (as in the pre-construction monitoring), it is expected that daily observations by the Environmental Manager (EM)/ECoW would be carried out while works are ongoing that may cause impact, together with ad hoc sampling as required or in response to signs of pollution (for example as part of an investigation).

F.6.1.2 Once construction has commenced the ECoW will prepare monthly Water Quality Monitoring Reports to be issued to the PC and discussed at monthly progress meetings.

F.6.1.3 It is anticipated that post completion of the works water quality monitoring would continue to verify that the works have been completed without adversely affecting water quality. The monitoring period is to be confirmed but should be a minimum of three months and at least three water samples from each water body.

F.6.1.4 The EM/ECoW will be responsible for undertaking any investigations required as a consequence of the programme of water quality monitoring. This will include liaison with EA and SMBC about the production of Incident and Lessons Learned Reports. These reports will detail actual impacts, describe the outcomes of actions taken, proposals for additional monitoring of affected site and receptors, and potentially changes to method statements, works processes and staff training.

F.6.1.5 The final monitoring requirements will be determined as part of the Environmental Permitting process and in consultation with the EA.

Training

F.6.1.6 All site staff will attend a Tool Box Talk on the risks to the water environment from construction site runoff and chemical spillages and the proposed measures set out in this OMP.

F.6.1.7 The Tool Box Talk will be given by a suitably qualified person (i.e. an environmental professional, the EM or ECoW.

F.6.1.8 Construction workers shall not be authorised to work on site until they have received this Tool Box Talk.

F.6.1.9 Technical notes shall be provided to all staff and put up on notice boards in relevant locations.

General measures

F.6.1.10 Mitigation measures can be considered as source control (i.e. to prevent fine sediment-laden runoff forming and to treat contaminated runoff close to where it forms), barriers and conveyance measures (i.e. to prevent site runoff draining uncontrolled into water bodies and to direct and treat it en-route to storage areas), and storage and final treatment areas (i.e. where water is stored on site and treated to the required quality prior to it being discharged from the site).

F.6.1.11 In any construction site temporary drainage system and treatment management scheme, it is typical for a combination of sustainable drainage systems (SuDS) or proprietary measures (i.e. engineered device for treatment such as a lamella clarifier) to be used. Measures are often used in series to make maximum use of available space and to ensure adequate removal of fine sediment prior to any discharge being made from the site (for example runoff may be initially stored in a small storage lagoon before being pumped via settlement tanks or lamella clarifiers to final treatment storage areas). Examples of proprietary treatment devices can be found on the Siltbuster website: http://www.siltbuster.com/construction/products/clarifiers.

F.6.1.12 Information on the type of measures that could be implemented is provided in Appendix A with reference to good practice guidance C648 Control of Water Pollution from Linear Construction Projects – Technical Guidance (CIRIA, 2006). The specific treatment train will be determined by the PC and will be adapted throughout the works depending on the need and circumstances at any given time, and ensuring the same outcomes are achieved. However, measures that may be used include:

a. drainage cut-off ditches with check dams and/or sediment traps;

b. silt fences, sand bags and straw bales;

c. earth bunds and settlement lagoons;

d. settlement tanks, lamella clarifiers, and skips in series filled with clean aggregate or straw bales; and

e. baffle pads or other measures to dissipate flow energy on any temporary outfalls to water bodies.

Construction site establishment and general earthworks

F.6.1.13 During the initial preparation works prior to the start of construction, temporary measures to control runoff draining from the construction site will be implemented, and then managed and adapted by the PC accordingly as the works progress.

F.6.1.14 The proposed temporary drainage system will be developed in tandem with the detailed design and construction method statement prepared by the PC. However, this will be consistent with the objectives and treatment requirements of this plan, and the intended outcomes. The following measures are expected to be used to manage surface water:

a. pre-construction drainage would be installed to intercept the existing land drainage system and divert water away from the working area;

b. vehicle traffic to be limited to major path routes across the site to prevent soil compaction and associated increase in surface water runoff; and

c. SuDS to be used to ensure no increase in runoff rates or volumes from the construction sites and compound area (for example compound car park) to surrounding land drainage ditches and to manage surface water flood risk. Subject to consent, the SuDS would discharge to the local watercourses, ditches or to ground within the site boundaries.

F.6.1.15 Runoff from the construction site would not be allowed into any pond. It would only be allowed to be discharged directly into any watercourse under a Permit from the EA and following treatment and attenuation using a variety of measures alone or in combination including:

a. identification of all land drains and their sealing using purpose-built covers or sand bags (where the risk of damage is low and providing their condition is regularly checked);

b. sediment barriers such as silt fences, straw bales and earth bunds (used and positioned in appropriate locations);

c. proprietary treatment measures (for example lamella clarifiers); and

d. temporary storage areas (for example settlement lagoons, tanks and skips in series).

F.6.1.16 The arrangements of such drainage infrastructure would be prepared during the detailed design and, as appropriate, agreed with the EA prior to the commencement of construction. The above measures would ensure that any sediment (including any adsorbed pollutants) carried in suspension in the surface water runoff from the site would have settled out to an acceptable level before it can be discharged to receiving watercourses under an environmental permit from the EA. The PC will agree with EA the acceptable suspended sediment limits in runoff discharged from the site during the application for temporary works Environmental Permits.

F.6.1.17 All earthworks will be undertaken in accordance with BS6031:1981 Code of Practice for Earth Works. Land disturbance will be kept to a minimum and disturbed areas will be stabilised as soon as possible after construction by seeding with grass, using geotextile covers or other suitable means.

Measures to intercept and treat suspended fine sediments

F.6.1.18 Mitigation measures relevant to controlling surface runoff, focusing on those areas where there would be exposed soils, excavations, storage of top soil and other aggregate materials are summarised in this section and examples are illustrated and described in greater detail in Appendix A. Measures could include:

a. scheduling construction activities to minimise the area and period of time that soil would be exposed, particularly during the wetter months (autumn to early spring) or periods of forecast heavy or prolonged rain;

b. construction areas would be demarcated from the rest of the site to minimise the direct disturbance of land not required for development;

c. installation of cut-off drains around the working areas to intercept surface runoff and divert it around the working areas;

d. existing land drains are to be identified and covered or protected by sand bags;

e. minimising the stockpiling of materials and locating essential stockpiles as far away as possible from watercourses;

f. movement of construction vehicles and plant would be strictly controlled to minimise the potential for soil compaction and erosion;

g. exposed soils would be re-seeded to mitigate bare earth exposure and habitat loss as soon as possible. Rock rolls would be underlain by geotextile to prevent erosion of earth beneath the stone (which could also compromise the integrity of the armouring);

h. bio-security measures will be required to ensure that no invasive species are brought onto site. Measures will include checks of plant/vehicles and footwear to ensure clean and clear of potential contaminants with best practice implemented as necessary;

i. all mitigation measures would be subject to design and approval by construction managers for health and safety and environment, and by appropriate regulators for environmental compliance;

j. the rate of discharges to the watercourses of construction site runoff will be at a controlled rate agreed in advance with the EA and with appropriate measures to dissipate the flow energy at the temporary outfall to prevent erosion of the bed and banks of the receiving water body (for example correct orientation of the outfall and the use of baffle pads);

k. where temporary crossings of the watercourses are required, plant would not track along the channel without adequate protection being installed prior to works, and open-span crossings should be used as far as possible;

l. if needing to create a dry working area in the channel, the use of sand bags will be to be avoided if possible to avoid them breaking open and polluting the channel; and

m. all access roads or purpose-built haul roads shall be kept free of mud by the use of a road sweeper, and if deemed required by the PC, a vehicle wheel wash facility on the main accesses to the site.

F.6.1.19 In practice, the application of these measures will be a continuously adaptive process in response to site specific constraints and changing needs on site. For example, different types and levels of treatment of fine sediment in runoff may occur depending on the time of year, the location of the works, and the nature of works being undertaken at that point in time. It is therefore not appropriate to be entirely descriptive at this stage, but to focus on the range of measures that the PC can deploy to provide the necessary water environment protection.

Measures to reduce the risk of chemical spillages

F.6.1.20 Mitigation measures to reduce the risk of a chemical spillage include:

a. plant and machinery will be inspected before use to ensure they are clean and fit for operation on site;

b. all static plant or mobile plant parked for prolonged periods (for example overnight) will be fitted with 'plant nappies' or drip trays, which will be checked regularly and emptied if required by the PC in to the bunded waste oil containers;

c. all mobile plant will carry spill kits with other spill kits placed in seal containers and key locations close to watercourses (when there are works nearby). Spill kits are to be checked daily and replaced immediately after use;

d. all staff working on site to be trained in the use of spill kits;

e. fuel oil to be stored in the secure Construction Compound on an impermeable surface and within a self-bunded container (capacity of the bund must be 110% the maximum oil storage);

f. refuelling of mobile plant to be undertaken in the Construction Compound on an impermeable surface only;

g. drilling fluids and additives (if used) will be stored appropriately in bunded tanks holding 110% of its capacity. Any waste or used drilling fluid will be stored and tankered off-site;

h. other liquid chemicals to be used on site to be stored within a secure container;

i. no equipment or materials other than those used for flow control (but excluding pumps and pipes) are to be left in the channel outside of working hours;

j. where possible pre-fabricated concrete structures are to be used. Where this is not possible and wet concrete pours are to be made, extreme care is to be taken when delivering the concrete to the site and during the operation. Formworks should be secure and fixed tightly to reduce egress of concrete. Measures to catch any spillage are to be provided and removed before water is allowed back into the working area;

k. implementation of site working practices to minimise the risk of concrete spillages. In particular, specific concrete wash out facilities are to be provided away from any watercourse (minimum 20m), on flat land and operated to ensure no spillage of wet concrete to ground (for example by use of geotextiles, skips); and

l. the construction site and construction compound should be kept secure at all times to prevent vandalism and anti-social behaviour that could lead to a pollution incident.

Working in and over watercourses

F.6.1.21 All works in the channel of watercourses (including works to the banks) will be undertaken in a dry working area. This will require the PC over-pumping or fluming the watercourse through the working area or the creation of temporary dams and barriers (for example using sand bags, straw bales, geotextiles and pumping equipment). The PC will ensure that there are more than adequate pumps and pipes on site for the flows anticipated.

F.6.1.22 All works will be planned and scheduled to minimise impacts on ecology, such as nesting or migration seasons. Proposed works to Hollywell Brook and Shadow Brook should be programmed to minimise impacts during fish spawning (March – June) if possible.

F.6.1.23 For small areas of work within watercourses it may be possible to isolate an area of the bed using straw bales and/or sand bags (although the latter present greater risk of sediment pollution). Works to the banks may also be undertaken on scaffolding. However, scaffolding should be lifted from the channel at the end of the working shift and any temporary dams created by straw bales or sand bags partially breached to ensure the full channel is available for flows.

F.6.1.24 The PC should co-ordinate any works in the channel to periods when low flows are expected by monitoring weather forecasts on a monthly, weekly and daily basis.

F.6.1.25 The PC should undertake all works in accordance with the Pollution Control Plan and ensure that this includes measures alert workers and for removing equipment from the channel when high flows are expected.

F.6.1.26 If temporary crossings are installed for construction purposes that are not open span, then impermeable and over-long culvert or flume pipes will be used to prevent the ingress of fine sediment that may infiltrate to the watercourse from material used to form the haul road.

F.6.1.27 An oil boom should be positioned across watercourses downstream of sections of the watercourse to which work is undertaken and monitored on a daily basis.

F.6.1.28 If required, the PC should ensure that there is equipment on site for the installation of straw bale dams across the watercourses downstream of the works to trap fine sediments. However, this measure is only likely to be necessary if it is not possible to work in the dry or for in channel works that are required for longer periods and which may experience periodic periods of higher flows that are redirected along the main channel than via the pumped system.

F.6.1.29 Scaffolding or debris netting should be installed across the channel prior to the removal of any masonry walls etc, and works to the existing culverts. Any masonry material that falls into the channel should be removed by the PC.

Use of cement and wet concrete

F.6.1.30 It is not anticipated that large volumes of concrete batching will occur on site. Where possible, pre-fabricated concrete structures will be used. However, where this is not possible concrete will be delivered to the site in ready mixed lorries for casting in situ. However, some mixing of small quantities of cementitious substances is likely to take place. Where this is required it should be done on impermeable hard standing away from watercourses (minimum 20m on flat land and further or sloping ground subject to site specific risk assessment).

F.6.1.31 Cement (and wet concrete other than when as part of proposed works set out under the Method Statement for constructing the authorised development) will be prevented from entering any water bodies. Designated areas shall be set out for the purpose of concrete wash out and care shall be taken to ensure these are sited away from sensitive receptors such as watercourses and land drains. If these are shallow excavations they will be lined by a suitable geotextile membrane to prevent infiltration to groundwater.

F.6.1.32 The washing out of any concrete mixer and associated chute, tools or equipment will be carried out in a designated area away from drains and watercourses/bodies. Delivery drivers will be made aware of the requirement on arrival at site. Wash down activities will take place in designated areas consisting of impermeable and contained wash out lagoons.

F.6.1.33 Temporary drainage management associated with compound set ups

Foul water

F.6.1.34 All waste from toilet blocks shall be stored in storage tanks and disposed of by licensed waste company at regular intervals.

Surface water

F.6.1.35 The main site compound and any temporary or smaller secondary compounds should be located away from any waterbodies and not within a minimum distance of 20m from a watercourse on flat land (and further on land sloping towards a watercourse subject to site specific risk assessment).

F.6.1.36 Any surface flows from compound areas that could be contaminated (for example adjacent to fuel stores) will pass through suitable attenuation and treatment measures prior to discharge to any watercourse under a permit from the EA, such as an oil separator, or otherwise pumped out for off-site disposal and a suitably licensed waste facility.

F.6.1.37 The generator compound would include an impermeable concrete pad with a bund, bunded fuel tanks, oil/diesel traps and drains, in order to mitigate against impacts on the water quality of nearby watercourses.

F.7 Draft Action Plan

F.7.1.1 In the event of an incident or emergency where contaminants have entered or are at an imminent risk of entering a watercourse or drain (for example a large chemical spillage on site), the measures set out in this section will be implemented.

F.7.1.2 The Draft Action Plan sets out the triggers for action in the event that monitoring identifies anomalous or unusual results when compared to the baseline data and/or Environmental Quality Standards. The Draft Action Plan also describes the actions to be followed depending on the level of risk triggered. The final Action Plan will need to be prepared by the PC and agreed with the EA and SMBC.

F.7.1.3 It is proposed to align the Action Plan with the four point risk scale of the National Incident Reporting System (NIRS) where an incident is defined as a specific event or occurrence, in a single location or multiple sites, that has had or has the potential to cause environmental harm, pollution of surface and groundwater, an impact on human health, or nuisance to the local community.

F.7.1.4 **Table F.1** presents the four incident categories with a description of the likely effects that may occur. The descriptions of each category are indicative and do not represent specific risks that water receptors would be exposed to from the proposed development.

F.7.1.5 **Table F.2** presents the draft Action Plan including monitoring outcomes and proposed actions for each of the four classes of incident.

F.8 Incident and corrective action reporting

F.8.1.1 All environmental incidents shall be reported and investigated.

F.8.1.2 Significant environmental incidents where water borne pollution is evident shall be reported to the EA immediately using their 24 hour incident telephone number 0800 80 70 60. Copies of the incident investigation shall be provided to the EA and SMBC.

F.8.1.3 Where problems are recognised, the corrective action will be identified by the PC in consultation with the EA and SMBC and corrective actions undertaken by the PC within a defined time frame.

Table F.1: Incident categories

Incident Category	Indicative Incident Description
Category 1 – major, serious, persistent and/or extensive impact or effect on the environment, people and/or property	1. Persistent impact on water quality lasting at least 7 days and affecting an extensive area over several kilometres of a watercourse or large area of a water body (for example 1 to 2 km's). 2. Pollution of a water body by levels of dangerous substance(s) exceeding Maximum Allowable Concentration, Environmental Quality Standards or other standards known to define conditions when serious harm/death to aquatic life or dissolved oxygen levels at critical levels may occur. 3. Necessary closure of a strategically important potable water supply to prevent contamination or further contamination. 4. Deterioration in ecological status or potential of a water body or prevention of reaching its objective (including physical impacts). 5. Damage to a statutorily protected site or species. This may include an impact on SSSI insofar that it may prevent them from reaching or maintaining their favourable conservation status; or damage to a European protected species or its habitat that has a significant adverse effect on reaching or maintaining its favourable conservation status. 6. Gross and extensive contamination or coverage of the bed of the watercourse, water column or surface by fungal/bacterial/algal growths, sewage debris or particulate matter. 7. Fatality or serious effect on human health from direct contact/exposure to pollutants in surface waters, or through the supply of contaminated potable water following an incident affecting surface water or groundwater. 8. Public exposed to concentration levels over a widespread area giving rise to serious and known health risks as a result of contamination of surface waters or groundwater following a pollution or algal incident. 9. Supply of contaminated drinking water with levels of pollutants/pathogens exceeding toxicological limits known to cause serious health problems. 10. Major adverse effect on an important recreational activity or national event such as the cancellation, partial or full suspension of recreational bathing, fishing activity or an organised water sports event. 11. Incidents that cause extensive damage to the physical habitat of a water body that would fall under the Environmental Damage Regulations. 12. The destruction of a large or important area of fish habitat (particularly spawning areas), sustained damage to fish spawning, such as by actively digging or removing bed material used by spawning fish, and/or the illegal construction of an obstruction to fish migration (please refer to EA Guidance Document "Incidents and their classification: the Common Incident Classification Scheme - Doc No. 04_01, 2014" for details of guidelines on incident class thresholds for numbers of fish mortality and types).

Incident Category	Indicative Incident Description
Category 2 – significant impact or effect on the environment, people and/or property	1. Significant effect on the quality or use of that water but normally localised. 2. Typically include fine sediment (>500 mg/l compared to background levels), low dissolved oxygen levels or high ammonia along hundreds of metres to potentially kilometres of a watercourse or area of a water body. 3. Precautionary closure of a strategically important potable water supply to prevent contamination of source. 4. Necessary closure of a minor un-licensed potable water supply. 5. Significant action / treatment by operator to address deterioration in water quality (for example blending with uncontaminated water). 6. Significant but localised or temporary deterioration in ecological status or potential of a WFD water body or delaying the water body reaching its ecological objectives (including physical impacts). 7. Damage to a statutorily protected site or species, but no significant effect on favourable conservation status. 8. Significant damage to Biodiversity Action Plan (BAP) species or habitats, which affects the viability of the species locally and/or extensive/significant damage to non-statutory protected site or BAP habitat that affects the nature conservation status of the site or habitat. 9. Gross but localised contamination or coverage of the bed of the watercourse, water column or surface by fungal/bacterial/algal growths, sewage debris or particulate matter. 10. Significant effect on human health from direct contact/exposure to pollutants in surface water or groundwater, or through the supply of contaminated potable water following an incident. 11. Public exposed to concentration levels giving rise to minor health problems due to contamination of surface waters or groundwater following a pollution or algal incident. 12. Supply of contaminated drinking water with levels of pollutants or pathogens known to cause minor health problems. 13. Significant adverse effect on a recreational activity or event appropriate to the surface water body such as the cancellation of a local event or short lived disruption (for example less than one week). 14. Significant but localised destruction of fish habitats, interference with spawning fish by creating disturbance, such as by sustained paddling/moving through a spawning area, and/or incidents involving the illegal obstruction to fish migration, including illegal alteration to a fish pass (please refer to EA Guidance Document “Incidents and their classification: the Common Incident Classification Scheme - Doc No. 04_01, 2014” for details of guidelines on incident class thresholds for numbers of fish mortality and types).

Incident Category	Indicative Incident Description
Category 3 – minor or minimal impact or effect on the environment, people and/or property	1. Limited and localised effect (around point of discharge but could include lower magnitude effects over a few kilometres) on a water body which has a minimal impact on the quality or use of that water. 2. Precautionary closure of a minor un-licensed potable water supply. 3. Minor action/treatment by operator to address deterioration in water quality (for example blending with uncontaminated water). 4. Very limited or no significant effect on the status or objectives of a WFD water body. 5. Bed, column or surface of watercourse only marginally contaminated around point of discharge or in localised area. Such as a limited growth of sewage fungus around an outfall pipe. 6. Very limited impact upon nature conservation sites. 7. Reversible small-scale, short-term damage to non-statutorily protected sites or BAP habitats or species. 8. Minor effect on human health from direct contact to pollutants in surface waters or groundwater, or through the supply of contaminated potable water following an incident (for example a few individuals with temporary sore throats). Public exposed to concentration levels that present no known or minimal risk to health. 9. Minor impact on amenity value, recreational fishing activity and/or aesthetic quality (for example small amount of litter, thin oil film, non-harmful colour changes). 10. Minor loss of fish habitat and/or interference with spawning fish resulting in localised, limited damage, such as by paddling/moving through a spawning area (please refer to EA Guidance Document “Incidents and their classification: the Common Incident Classification Scheme - Doc No. 04_01, 2014” for details of guidelines on incident class thresholds for numbers of fish mortality and types).
Category 4 – substantiated incident with no impact.	1. No measureable adverse impacts.

Table F.2: Incident category, monitoring evidence and actions

Incident Category	Monitoring Outcomes	Examples	Proposed Actions
Categories 1 & 2	Significant pollution incident evident by Visual Inspection and/or water quality monitoring.	Spillage of significant volumes of fuel, construction runoff containing high levels of fine sediment or powder cement into a watercourse.	1 Fully implement Incident and Emergency Response procedure as described in the Pollution Control Plan. 2 Immediately stop all relevant works (that may reasonably be the source of the pollution) until investigation completed and corrective actions agreed with EA/SMBC. 3 Inform EA/SMBC immediately and seek advice regarding pollution containment and remediation. 4 Notify any relevant third parties immediately (for example PWS). 5 Prepare Incident and Lessons Learned Report and issue to EA/planning authority. Report should detail actual impacts, outcomes of actions taken, and proposals for additional monitoring of affected site and receptors.
Category 3	Visual Inspections and/or water quality monitoring results deviate from baseline or now exceed Environmental Quality Standards (EQS.)	Moderate elevation in total suspended sediment levels, fine sediment deposits across river bed gravels or some minor evidence of oil sheen / odour on the surface of water.	1 Investigate likely causes and pause relevant construction works. 2 Confirm Construction Method Statements are being implemented correctly and mitigation measures operating as required. If yes, review Construction Method Statements and adequacy of mitigation measures. 3 Prepare Incident and Lessons Learned Report and issue to EA/planning authority to agree any remedial action if required. 4 Consider making additional Visual Inspections and water quality sampling.
Category 4	Water quality monitoring results slightly deviate from baseline.	No obvious visual impacts.	1 No immediate actions. 2 Continue to monitor in accordance with monitoring plan.

F.9 Legislation and policy context

F.9.1.1 The following legislation, national policy and guidance documents are relevant to the assessment of impacts of the proposed Scheme on the water environment:

a. Water Framework Directive 2000/60/EC;
b. Priority Substances Directive 2008/105/EC;
c. Groundwater Directives 2008/105/EC and 2006/118/EC;
d. Floods Directives 2007/60/EC;
e. The Environmental Liability Directive 2004/35/EC;
f. The Freshwater Fish Directive 2006/44/EC;
g. The Water Act 2014;
h. The Floods and Water Management Act 2010;
i. The Land Drainage Act 1991 (as amended);
j. The Water Resources Act 1991 (as amended);
k. The Salmon and Freshwater Fisheries Act 1975 (as amended);
l. The Reservoirs Act 1975 (as amended);
m. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
n. The Environmental Permitting (England and Wales) Regulations 2016;
o. The Environmental Damage (Prevention and Remediation) Regulations 2015;
p. The Flood Risk Regulations 2009;
q. The Eels (England and Wales) Regulation 2009;
r. The Groundwater (England and Wales) Regulations 2009;
s. The Control of Substances Hazardous to Health Regulations 2002 (as amended);
t. The Control of Pollution (Oil Storage) (England) Regulations 2001;
u. National Planning Policy Framework (Department for Housing, Communities and Local Government, 2018);
v. Flood Risk and Coastal Change National Planning Policy Guidance (Department for Communities and Local Government, 2015);
w. Future Water (Defra, 2011);
x. Non-statutory technical standards for SuDS (Defra, 2015);
y. HM Government (2015), Building Regulations 2010, Drainage and Waste Disposal Approved Document H; and
z. SMBC, Solihull Local Plan: Shaping a Sustainable Future.

F.9.1.2 Further details regarding these documents is described in the ES Chapter 14 Road drainage and the water environment [**TR01002/APP/6.1**].

F.10 Relevant guidance documents

F.10.1.1 As of the 17 December 2015 all Pollution Prevention Guidance (PPG) Documents published by the UK environment agencies were withdrawn [REF 2]. A new series of Guidance for Pollution Prevention (GPP) is in development, which provides updated good practice guidance to the UK. While this is not regulatory guidance in England where the UK government website outlines regulatory requirements, it remains a useful resource for best practice. The following relevant GPPs have been released in 2018 [REF 3] and should be considered as good practice:

a. GPP 2: Above ground oil storage;
b. GPP 5: Works and maintenance in or near water for construction or maintenance works near, in, or over water;
c. GPP 8: Safe storage and disposal of used oils;
d. GPP 13: Vehicle washing and cleaning;
e. GPP 19: Vehicles: Service and Repair;
f. GPP 21: Pollution Incident Response Plans; and
g. GPP22 Dealing with Spills;

F.10.1.2 Where new GPPs are yet to be published, previous PPGs may still provide useful advice on the management of construction to avoid, minimise and reduce environmental impacts, they should not be relied upon to provide accurate details of the current legal and regulatory requirements and processes. They are referred to in this document alongside other current guidance and in the context of the proposed Scheme and site-specific mitigation measures. Construction phase operations would be carried out in accordance with guidance contained within the EA PPG, including:

a. General Guide to the Prevention of Pollution: PPG1;
b. Use and Design of Oil Separators in Surface Water Drainage Systems: PPG3;
c. Working at Construction and Demolition Sites: PPG6;
d. Control of Spillages and Fire Fighting Runoff: PPG18; and
e. Storage and Handling of Drums and Intermediate Bulk Containers: PPG26.

F.10.1.3 Additional good practice guidance for mitigation to protect the water environment can be found in the following key CIRIA documents:

a. C741 (2015, 4th Edition) Environmental good practice on site guide [REF 4];
b. C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice [REF 5];
c. C624 (2004) Development and flood risk – Guidance for the construction industry [REF 6];

d. C522 (2001) Sustainable Urban Drainage Systems – Design manual for England and Wales [REF 7];

e. C523 (2001) Sustainable Urban Drainage Systems – Best practice manual for England, Scotland, Wales and Northern Ireland [REF 8]; and

f. C532 (2001) Control of water pollution from construction sites – Guidance for consultants and contractors [REF 9].

F.11 References

REF 1	Highways England (2018) M42 Junction 6 Flood Improvement Scheme: Flood Risk Assessment
REF 2	Environment Agency, Pollution Prevention Guidelines
REF 3	UK environmental agencies (2018) Guidance for Pollution Prevention (GPPs)
REF 4	C741 (2015, 4th Edition) Environmental good practice on site guide
REF 5	C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice
REF 6	C624 (2004) Development and flood risk – Guidance for the construction industry
REF 7	C522 (2001) Sustainable Urban Drainage Systems – Design manual for England and Wales
REF 8	C523 (2001) Sustainable Urban Drainage Systems – Best practice manual for England, Scotland, Wales and Northern Ireland
REF 9	C532 (2001) Control of water pollution from construction sites – Guidance for consultants and contractors

Appendix G Outline COSHH (control of substances hazardous to health) Material, Waste Storage and Refuelling Plan

G.1 Introduction to the plan

G.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage COSHH waste storage bunds, fuel storage and dispensing facilities during construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

G.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

G.2 Responsibilities

G.2.1.1 In relation to the control and management of the Outline COSHH, fuel storage and dispensing facilities, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

G.3 Storage of fuels, oils and COSHH materials

G.3.1.1 Fuel storage, dispensing facilities and COSHH waste storage bunds have the potential to cause significant damage to the environment which could threaten water supplies, human health and wildlife. Causes of environmental incidents linked to fuel, oil and COSHH waste management on construction sites include:

a. delivery and use of materials;
b. overfilling of storage containers;
c. plant or equipment failure;
d. containment failure;
e. accidents and vandalism; and
f. mixing of inappropriate wastes.

G.3.1.2 Any of these incidents could affect:

a. drainage systems, surface waters, groundwater and soil;
b. air quality by producing toxic fumes and airborne pollutants; and
c. land quality by contamination through spillages.

G.3.1.3 The following measure will be implemented on site to ensure oils, fuels and other potentially polluting materials, including COSHH wastes, are stored safely.

G.3.1.4 For the storage of oil, the Site will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 [REF 1-1].

G.3.1.5 All types of oil including diesel, vegetable, synthetic and mineral oils are covered by the regulations. The regulations do not apply to oil stored in buildings or to the storage of waste oil (covered by the Environmental Permitting Regulations). Fuel oil, lubricating oil, hydraulic oil and shutter release oil are included.

G.3.1.6 Fixed fuel tanks will be positioned within a bund at the main compound in a secure location. A fire risk assessment is to be undertaken to determine the final location of the tanks.

G.3.1.7 All bunds must be positioned to minimise any risk of damage by impact as far as reasonably practicable. The bund and the base of the storage area must be impermeable to water and oil and must remain so with proper maintenance.

G.3.1.8 Bunds for the storage of COSHH materials and oil will be designed to hold 110% of the capacity of the containers stored within it and will be constructed from either concrete or masonry with rendering to ensure that it is impermeable to oil and water. Examples of bunds can be found in the CIRIA publication: Construction of bunds for oil storage tanks (R163D) [REF 1-2].

G.3.1.9 Bunds, tanks and pipework should be inspected regularly for signs of damage, e.g. missing bricks in walls, broken pipes and water in the bund.

G.3.1.10 A notice giving details on safe delivery procedures and what to do in an emergency should be sited at the delivery point.

G.3.1.11 The Project Manager will appoint a member of the Site Team to inspect at least weekly all oil storage and refuelling facilities and arrange for them to be properly maintained.

G.3.1.12 The Environmental Manager will arrange for bunds to be emptied of any accumulated rainwater, oil or debris and for plant nappies to be regularly cleaned or changed to maintain their performance for oil entrapment

G.3.1.13 Appropriate Health & Safety precautions must be adopted when handling and storing COSHH wastes because of the possibility of chemical reactions between different types of waste.

G.3.1.14 Advice should be sought from the site COSHH Controller contractor prior to handling and storing waste.

G.3.1.15 When storing COSHH waste on site, the Waste Manager must maintain an inventory of the waste as the disposal contractor will need to know exactly what they will be removing from site. Where space permits the wastes should be segregated as much as possible e.g. separate containers for used aerosols, grease cartridges, paint tins, oily rags etc.

G.3.1.16 If the project produces or holds hazardous wastes, then it must ensure that the site is registered with the EA; this registration is valid for 12 months. Once the site has registered, the EA will supply a unique reference number that must be given

to the waste disposal contractors whenever hazardous wastes are removed from site.

G.3.1.17 A Consignment Note must accompany every off site movement of hazardous waste. Consignment notes may now be drawn up and completed by the waste producer (i.e. the PC or its subcontractors) or a template is available from the EA.

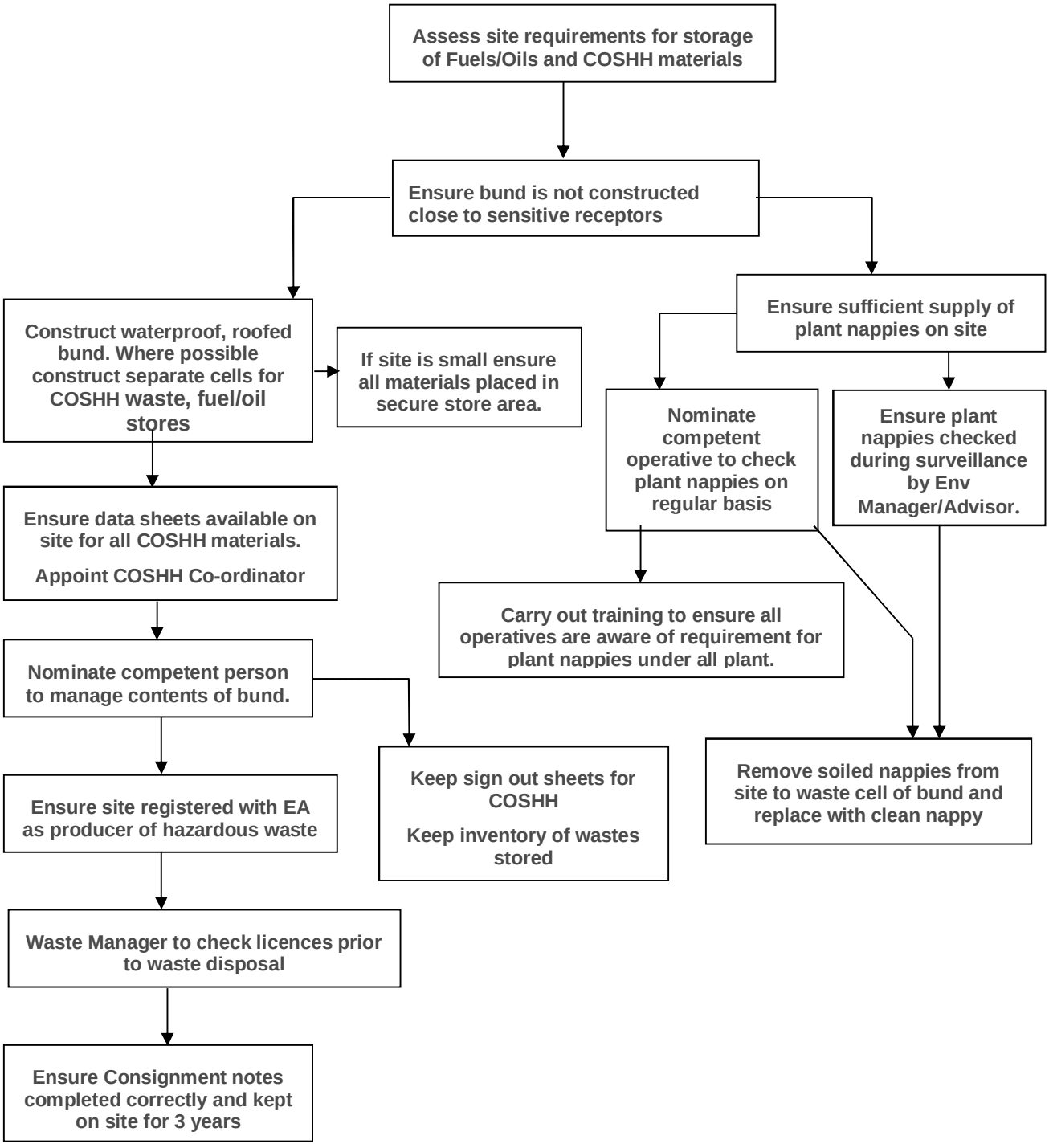

Figure G.1: Flowchart detailing fuel/oil and COSHH waste storage

G.4 Refuelling

G.4.1.1 The following measures will be implemented on the project to ensure that refuelling of all plant and equipment is undertaken in as safe a manner as possible.

G.4.1.2 No refuelling of plant will be undertaken within 20m of a watercourse, ditch or drainage gully/chamber.

G.4.1.3 Self-propelled fuel bowsers will have “pistol grip” or other appropriate delivery systems that switch off if not held open by hand and either be designed so that fuel delivery systems cannot operate whilst the vehicle is moving or, have an audible alarm fitted within the cab to warn that the pump is operating.

G.4.1.4 Trailer type bowsers will be double-skinned and have pistol grip or other appropriate delivery systems that switch off if not held open by hand. When in transit the entire delivery system will either be secured within the outer shell or isolated by a valve within the outer shell.

G.4.1.5 Fuel bowsers and stores will be lockable and, as far as is reasonably practical, vandal-proof.

G.4.1.6 When not in use, all fuel delivery hoses will be locked and left securely fixed in appropriate holsters within the secondary containment system.

G.4.1.7 All refuelling operations must be supervised all times. At no time should the operative refuelling plant or equipment be absent whilst refuelling is ongoing.

G.4.1.8 Spill kits will be provided at all oil/fuel storage facilities. All fuel bowsers will carry spill kits which will be inspected on a regular basis to ensure they are fully stocked.

G.4.1.9 The Stores Manager will maintain a list of operatives who have signed out spill kits and refills.

G.4.1.10 Drivers, operators and stores personnel will be trained in security and the use and safe disposal of spill kits.

G.4.1.11 Designated permanent refuelling areas will be paved with an impervious surface. Drainage from refuelling areas will be collected and passed through an oil interceptor prior to permitted discharge or removal by a registered Waste Carrier. Training will be given on the use, handling, storage and dispensing of fuels, oils, lubricants.

G.4.1.12 In the event of a pollution incident, the Environmental Incident Control Plan control measures will be implemented immediately.

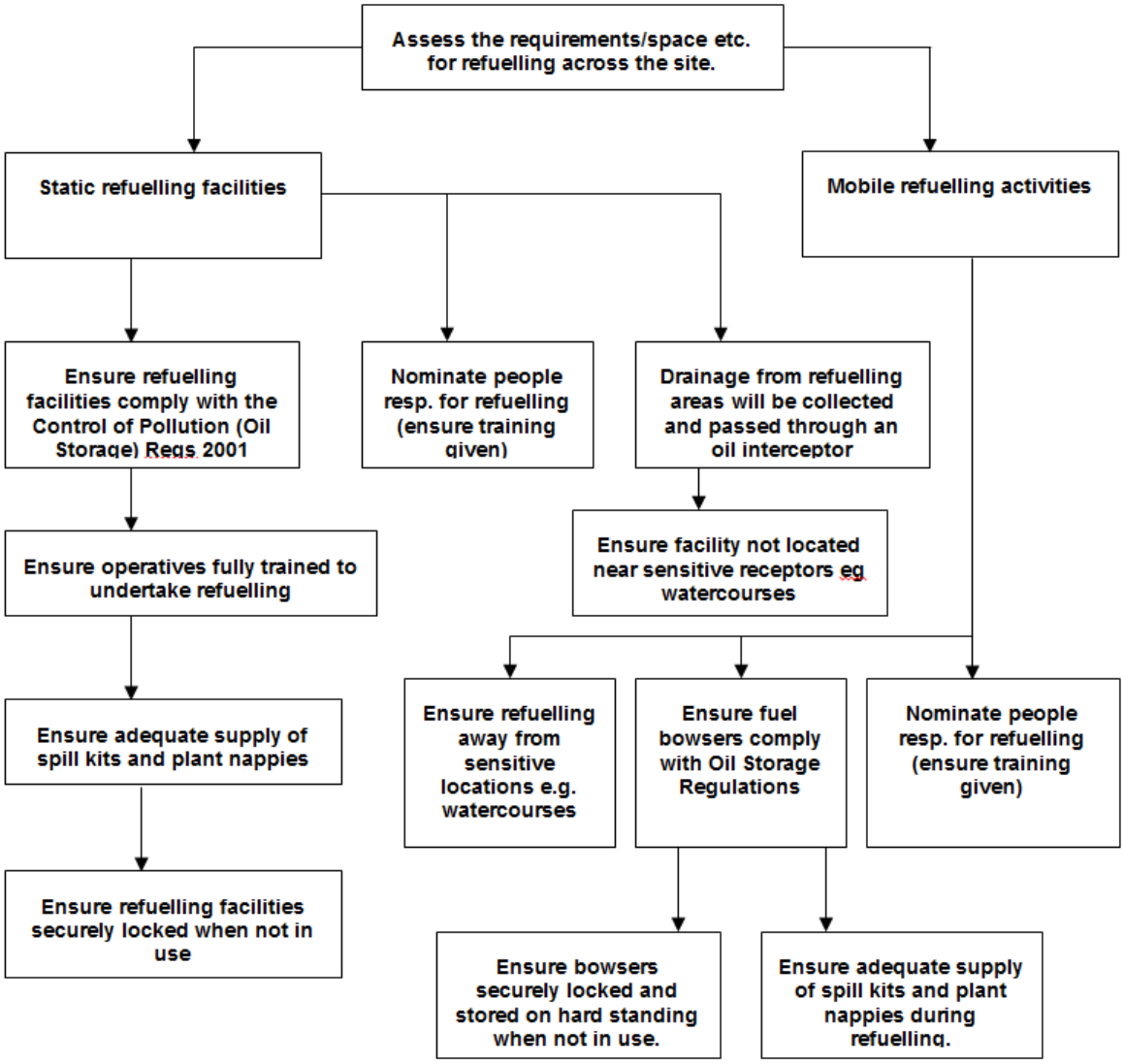

Figure G.2: Flowchart detailing the refuelling process

G.5 Waste storage and disposal

Principles of waste management

G.5.1.1 The PC will take all reasonable steps to ensure that:

a. all waste from the site is dealt with in accordance with the waste duty of care in section 34 of the Environmental Protection Act 1990 [REF 1-3] and the Environmental Protection (Duty of Care) Regulations 1991 [REF 1-4]; and

b. materials will be handled efficiently and waste managed appropriately.

Definition of waste

G.5.1.2 Waste is defined by the Council Directive on Waste (2008/98/EC), Article 3 [REF 1-5] as “any substance or object which the holder discards or intends or is required to discard”.

Duty of care background

G.5.1.3 Section 34 of the Environmental Protection Act 1990 [REF 1-3] places a duty on any person who imports, produces, carries, keeps, treats or disposes of controlled waste or, as a broker, has control of such waste, to take measures to:

a. prevent the unauthorised or harmful deposition, treatment or disposal of waste;

b. prevent the escape of the waste from his control or that of any other person on the transfer of the waste;

c. ensure that the transfer is only to an authorised person or to a person for authorised transport purposes; and

d. ensure that there is a written description of the waste that will enable other persons to avoid a contravention of the Environmental Protection Act 1990 [REF 1-3] and to comply with the duty as respects the escape of waste.

G.5.1.4 The Waste Duty of Care Code of Practice [REF 1-6] provides guidance on the measures that need to be taken to ensure that legal requirements are met. Specific guidance is given on the identification of waste, safe storage, transfer to the right person and requirements for checking up.

Waste Transfer Note

G.5.1.5 The Environmental Protection (Duty of Care) Regulations 1991 [REF 1-4] require a WTN to be provided on the transfer of waste between parties. The Regulations give specific requirements for the content of a WTN, which must:

a. contain a written description of the waste and the corresponding six-digit EWC code;

b. state the quantity of waste;

c. state whether the waste is loose or in a container, and if in a container, the type of container used;

d. state the time and place of the transfer;

e. state the name and address of the transferor and transferee;

f. state whether the transferor is the producer of the waste;

g. state to which category of person the waste is transferred to e.g. registered waste carrier, holder of a waste management licence; and

h. provide details of any Waste Carrier's Registration (WCR) or any waste management licence, where used.

G.5.1.6 Copies of WTNs must be retained for two years following the transfer of waste.

Waste carrier's registration

G.5.1.7 The Control of Pollution (Amendment) Act 1989 [REF 1-7] establishes the requirement for carriers of controlled waste to register with the EA. There are a number of exceptions to these requirements, including charities, a waste collection authority and emergency situations. Waste will only be removed from site using a subcontractor or supplier holding a valid WCR.

G.5.1.8 The Environmental Manager will verify the details on the WCR with the EA Public Register.

Environmental permitting

G.5.1.9 The Environmental Permitting (England and Wales) Regulations 2007 [REF 1-8] came into force on 6th April 2010.

G.5.1.10 A Waste Permit is normally required for disposal, recovery or recycling of waste, although there are a number of activities which are exempt, or considered low risk, that do not require a permit.

G.5.1.11 The Environmental Lead will verify that permits are valid using the EA Public Register.

Exempt activities

G.5.1.12 Certain activities or processes require an exemption from Environmental Permitting to be registered with the EA. These are listed in Schedule 3 of the Environmental Permitting (England & Wales) Regulations 2007 [REF 1-8]. Relevant exemptions are listed below;

a. waste from the physical processing of non-metalliferous materials such as waste sands and clays processed from site arisings;

b. wastes from power stations and other combustion plants such as pulverised fuel ash, bottom ash aggregate and slag; and

c. concrete arisings from demolition.

Hazardous waste premises registration

G.5.1.13 From 1 April 2016, premises are no longer required to register as hazardous waste producers.

Hazardous waste consignment notes

G.5.1.14 The Hazardous Waste (England and Wales) Regulations 2005 [REF 1-9] (HWR) require a HWCN to be produced for each consignment of hazardous waste removed from site. This may take the form of either:

a. a "Standard Procedure" (single movement) HWCN, where waste is moved from one premises to a Consignee in a single journey, or

b. a "Multiple Collection" HWCN, where waste is collected from a number of premises and taken to the same Consignee.

G.5.1.15 HWCNs may be obtained from the EA or produced by the Consignor (contractor) or Consignee (waste disposal contractor); however, they must contain all of the information required by the HWR [REF 1-9]. Each HWCN consists of 5 sections:

a. Part A – Notification Details;

b. Part B – Description of the Waste;

c. Part C – Carrier's Certificate;

d. Part D – Consignor's Certificate; and

e. Part E – Consignee's Certificate.

G.5.1.16 The Consignor must complete Parts A and B, or provide these details to enable the carrier to complete these sections. Each HWCN is completed in triplicate (Consignor's copy, Carrier's Copy and Consignee's Copy).

G.5.1.17 Detailed guidance on the requirements for completion of HWCNs is available on the EA's website [REF 1-10].

G.5.1.18 The HWR [REF 1-9] require details of consignments of hazardous waste to be maintained in a register. A Guide to the Hazardous Waste Regulations: Record Keeping [REF 1-11] indicates that this duty will be met by keeping copies of HWCNs and Consignee Returns.

G.5.1.19 Copies of HWCNs will be retained for 3 years.

Waste Electrical and Electronic Equipment

G.5.1.20 The Waste Electrical and Electronic Equipment Regulations 2006 [REF 1-24] apply to electrical and electronic equipment (EEE) The Regulations apply to anyone who manufactures, imports, re-brands, distributes or sells EEE and anyone who stores, treats, dismantles, recycles, disposes of, uses, repairs or refurbishes waste EEE.

G.5.1.21 The Regulations apply to 10 categories of EEE listed below, with a voltage of up to 1000 volts for alternating current or up to 1500 volts for direct current:

a. large household appliances e.g. refrigerators, microwaves, dishwashing machines, electric radiators, electric fans, air conditioning appliances;

b. small household appliances e.g. vacuum cleaners, toasters;

c. IT and telecommunications equipment e.g. personal computers (including mouse, keyboard and screen), copying equipment, calculators, facsimiles, telephones;

d. consumer equipment e.g. radio sets, television sets, video cameras, video recorders;

e. lighting equipment e.g. straight fluorescent lamps, compact florescent lamps, high intensity discharge lamps (including pressure sodium and metal halide);

f. electrical and electronic tools e.g. drills, saws;

g. toys, leisure and sports equipment;

h. medical devices;

i. monitoring and control equipment e.g. smoke detectors, thermostats, control instruments used in industrial installations; and

j. automatic dispensers e.g. dispensers for hot or cold drinks.

G.5.1.22 Certain types of waste EEE contain dangerous substances and will be classified and dealt with as hazardous waste. This includes polychlorinated biphenyls, ozone depleting substances, asbestos, cadmium, lead and cathode ray tubes.

G.5.1.23 Waste EEE will be sent for recovery, recycling and/or treatment to either an Approved Authorised Treatment Facility listed on the EA Public Register or a Producer take back/compliance scheme.

Identification and classification of waste

G.5.1.24 Waste materials will be assessed and classified in line with the EA Technical Guidance Note WM3: Hazardous waste: Interpretation of the definition and classification of hazardous waste [REF 1-13].

G.5.1.25 Waste materials will be classified by reference to a six-digit waste classification code, referred to as EWC, and associated description as required by the List of Wastes (England) Regulations 2005 [REF 1-14]. Waste can be solid, liquid or sludge.

G.5.1.26 The first stage of classification is to identify the source of the waste by reference to the chapter headings. In most cases waste produced during the project will be listed under Chapter 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) [REF 1-14], although other Chapters may be more appropriate for certain waste types.

G.5.1.27 Entries in the EWC that are not marked with an asterisk (*) are “non-hazardous” waste.

G.5.1.28 Entries in the EWC that are marked with an asterisk are hazardous waste e.g. “17 06 05* construction materials containing asbestos”. Hazardous waste can be listed as either absolute entry or mirror entry.

G.5.1.29 An absolute entry is automatically considered to be hazardous waste. These entries are marked by an asterisk in the EWC, but do not include a reference to dangerous substances in the description.

G.5.1.30 A mirror entry may be hazardous depending on the concentration of dangerous substances present in the waste. In this case the hazardous properties of the waste must be assessed in accordance with the EA Technical Guidance Note WM3 [REF 1-13]. This assessment may require reference to chemical analysis; manufacturer’s Material Safety Data Sheets (MSDS) or the Approved Supply List.

G.5.1.31 The procedure for disposal of non-hazardous waste and hazardous waste is described below.

Bulk materials

G.5.1.32 All bulk materials that are to be retained on site for reuse will be managed in accordance with the projects Soil Management Plan and Material Management Plan(s).

G.5.1.33 If bulk materials, such as soil arisings, are proposed to be removed off site as waste the conditions of the EA Technical Guidance Note WM3 [REF 1-13] will be followed.

G.5.1.34 A sampling plan will be prepared using the EA template documented in WM3 guidance [REF 1-13].

G.5.1.35 Sample(s) of the material to be disposed of will be taken by the Environmental Lead or Materials Technician and dispatched to the laboratory service provider.

G.5.1.36 Basic characterisation testing will be undertaken by a laboratory service provider to assist in the classification of the material. Indicative testing may include:

a. heavy metals;
b. pH;
c. chromium iii & iv;
d. phenol;
e. asbestos screen, qualification and quantification;
f. total petroleum hydrocarbons (and whether they have arisen from diesel or petrol);
g. BTEX; and
h. speciated polyaromatic hydrocarbons.

G.5.1.37 Persistent Organic Pollutants will only be analysed for if there is justifiable cause.

G.5.1.38 Waste Acceptance Criteria test may also be scheduled on the soil sample.

Waste management options

G.5.1.39 The following waste hierarchy will be taken into consideration when considering waste management options for each waste stream:

a. **eliminate:** avoid producing waste in the first place;
b. **reuse:** use as many times as possible;
c. **recycle:** recycle what you can only after you have reused it;
d. **recover:** using waste to produce energy or another material; and
e. **dispose:** dispose of what's left in a responsible way.

Onsite and offsite options

G.5.1.40 Consideration will be given to both on-site and off-site waste management options for each waste stream.

Storage and segregation of waste

G.5.1.41 Storage of waste prior to disposal will be such that risk of escape and/or pollution is minimised. Specific requirements will be determined by the characteristics of the particular waste and the sensitivity of the storage location e.g. within a groundwater source protection zone.

G.5.1.42 Where practicable, waste will be segregated into separate waste streams for disposal. Typically, this will be where an opportunity for recycling exists e.g. timber, metal, paper/cardboard, plastic etc.

G.5.1.43 The PC will provide labelled receptacles, such as skips and wheelie bins, at designated areas which may include main and satellite compounds.

G.5.1.44 All project personnel must utilise the provided vessels appropriately.

Disposal of inert or non-hazardous waste

G.5.1.45 The procedure for off site disposal of non-hazardous wastes is as follows:

a. the Waste Manager will raise a requisition for disposal of waste stating the waste type, six-digit waste code, container type, location and contact details for authorised signatories with any other details that may be relevant to the specific waste type;

b. a Purchase Order (PO) will be raised with a suitable supplier including the details listed in the requisition. The purchase order will also state the supplier's WCR number and expiry date with the name and Waste Management Licence (WML) number of the transfer station/recycling site/disposal site;

c. where details of the supplier's WCR and WML are not already contained in the final Management Plan, the Waste Manager will obtain copies and verify with the EA that they are valid. Details will be entered into the SWMP;

d. a WTN or Annual Transfer Note will be completed for each consignment of non-hazardous waste removed from site. This will be signed by an authorised signatory and the supplier removing the waste;

e. where possible details of the weight of waste removed from site will be obtained from the transfer station/disposal site;

f. the Waste Manager or designated appointee will enter details of each transfer of waste into the final Management Plan; and

g. periodic checks will be made to ensure that waste is disposed of legally, this may involve following a consignment or verifying with the disposal site that consignments have been received.

Disposal of hazardous waste

G.5.1.46 Hazardous waste is waste with one or more properties hazardous to health or the environment as defined by the HWR [REF 1-9]. Hazardous properties are listed H1 to H14 in Schedule 3 of the HWR [REF 1-9].

G.5.1.47 The procedure for off site disposal of hazardous wastes is as follows:

a. the Waste Manager will ensure that the waste is classified in accordance with EA guidance [REF 1-13]. This may involve sampling of the material to determine hazardous properties and where disposal is directly to landfill testing against Waste Acceptance Criteria (WAC);

b. the Waste Manager will raise a requisition for disposal of hazardous waste stating the waste type, six-digit waste code, hazardous properties, and container type, location and contact details for authorised signatories with any other details that may be relevant to the specific waste type;

c. a PO will be raised with a suitable supplier including the details listed in the requisition. The purchase order will also state the supplier's WCR number and expiry date with the name and Waste Permit reference number of the transfer station/recycling site/disposal site. It is recognised that disposal of hazardous waste will require discussion with the supplier to establish exact requirements and that suppliers that may need to be involved;

d. the Waste Manager will obtain copies of the supplier's WCR and details of WML(s) for disposal site(s). These will be verified with the EA;

e. a HWCN will be completed for each consignment of hazardous waste removed from site. This will be signed by an authorised signatory and the supplier removing the waste;

f. the EA's "Standard Procedure" or waste contractor HWCN will be used for single movements;

g. where possible details of the weight of waste removed from site will be obtained from the transfer station/disposal site; and

h. periodic checks will be made to ensure that waste is disposed of legally, this may involve following a consignment or verifying with the disposal site that consignments have been received.

Waste minimisation

G.5.1.48 The EM, in conjunction with the Waste Manager, will develop measures to ensure that the amount of waste produced during the construction period is minimised as far as practicable. These may include the following:

Table G.1: Waste reduction and reuse measures

Reduction measures	Reuse measures
Design elements to use standard module sizes of available material to reduce cutting and trimming operations on site.	Road sweeper dewatering to facilitate the reuse of water following onsite treatment set up. Currently being designed and to be approved for use by the EA.
Accurate measurement to ensure minimal wastage when ordering materials.	Use crushed aggregate in temporary works.
Materials are to be delivered just in time for the work package to minimise storage requirements and risk of damage onsite.	Reusable formwork to be employed wherever practicable.

Reduction measures	Reuse measures
Materials are to be stored and transported correctly so as to avoid damage.	Loose timber can be re-sized and used for formwork.
Materials while onsite are to be kept off the ground by the use of pallets or timber bites.	Where packaging is unavoidable, arrange with the supplier to take back packaging for reuse or recycling.
All operatives are to receive training on the agreed reduction measures.	Where timber pallets are delivered, these are to be sent back to the supplier for reuse if possible.
System shuttering to be used wherever practicable.	Consider different types of packaging such as heavy duty or permanent packaging which can be returned to the supplier and reused.

G.6 Key responsibilities

Project Manager

G.6.1.1 The PM is responsible for:

a. ensuring the implementation of environmental management on site; including the provision of sufficient resources to successfully deliver the requirements of this plan;

b. where required, appointing a Project Environmental Manager, Environmental Advisors and Environmental Specialists, including those required to be licensed (e.g. for removal of wildlife or destruction of wildlife habitat);

c. promoting continuous improvement in waste management and reduction;

d. ensuring that training programmes, including inductions are effectively undertaken;

e. ensuring that site inspections and internal audits are undertaken and reported

f. with the Environmental Manager, agreeing an authorised signatory list for WTNs; and

g. appointment of a member of the Site Team to inspect at least weekly all oil storage and refuelling facilities and arrange for them to be properly maintained.

EM/SHE/E Advisors

G.6.1.2 Responsible for implementing the final Management Plan during the construction phase to ensure that waste is disposed of legally, economically and safely.

G.6.1.3 Undertake internal audits to ensure compliance with the waste regulation, the requirements of this plan and the SWMP.

G.6.1.4 Provide appropriate training to make certain that all members of staff and the workforce are aware of all matters relating to refuelling of plant and equipment, storage of fuels, oils and COSHH, and the prevention of pollution. This will be achieved by:

a. site specific safety and environmental induction;

b. raising specific awareness of ecological issues on site through pre-work briefings;

c. environmental site notices and posters;

d. method Statements and Method Statement briefings; and

e. environmental 'tool-box' talks.

G.6.1.5 Undertake weekly inspections of all static refuelling facilities, mobile refuelling bowsers, bunds and COSHH stores will be carried out by the Environmental Manager.

Site Waste Manager

G.6.1.6 The Site Waste Manager is responsible for:

a. producing and updating the final Management Plan. (From December 2013 the legal requirement for a project worth greater than £300,000 to implement such a plan was removed. Construction companies are still intending on utilising them as they provide a structure for waste delivery and disposal at all stages of a construction project (currently not required in Wales, Scotland or Northern Ireland);

b. verification of WCR certificates, Waste Permits and hazardous Waste Premises Registrations using the EA Public Registers;

c. liaison with the buyer and Site Waste Manager with regard to appointment of suppliers of waste disposal services;

d. providing advice and guidance to the site team;

e. identifying and providing training and toolbox talks required to ensure that waste management is implemented effectively Liaison with the buyer with regard to appointment of suppliers of waste disposal services;

f. identifying opportunities for waste minimisation; and

g. recording and reporting details of waste disposal/recovery/recycling including input of data into the final Management Plan.

Supervisors/foremen

G.6.1.7 Section supervisors/foremen are responsible for:

a. ensuring that waste arising from their area of work, including subcontractors' waste is dealt with in accordance with the final Management Plan;

b. completing WTNs/HWCNs and returning them to the Office Manager;

c. the call off of waste disposal services as required to maintain the site in a clean and tidy condition;

d. providing training and toolbox talks required to ensure that waste management is implemented effectively; and

e. carrying out all the requisite plant/equipment checks and maintain all the relevant records.

Office manager

G.6.1.8 The office manager is responsible for:

a. retaining copies of WTNs/HWCNs; and

b. archiving copies of WTNs/HWCNs.

Subcontractors

G.6.1.9 Subcontractors are responsible for:

a. ensuring that waste arising from their subcontract works is dealt with in accordance with the site rules and in accordance with their subcontract agreement;

b. providing a nominated person for co-ordinating waste management in relation to their subcontract works; and

c. providing information to the Site Waste Manager, including details of waste disposal, as required to update the final Management Plan and to fulfil Duty of Care audit requirements.

Storeman

G.6.1.10 The storeman is responsible for:

a. minimising material wastage by ensuring that materials are stored in adequate location and in accordance with the manufacturer's recommendations;

b. informing the Site Waste Manager when waste receptacles require collecting/exchanging;

c. checking and signing WTN for removal of waste form the main compound and forward to office manager;

d. daily inspections of all fuel and COSHH stores;

e. reporting non-conformances immediately to the EM; and

f. maintaining a list of operatives who have signed out spill kits and refills.

G.7 References

REF 1-1	The Control of Pollution (Oil Storage) (England) Regulations 2001. The Stationary Office (2001).
REF 1-2	Construction of bunds for oil storage tanks (R163D). CIRIA (1997).
REF 1-3	Environmental Protection Act 1990. The Stationary Office (1990).
REF 1-4	The Environmental Protection (Duty of Care) Regulations 1991. The Stationary Office (1991).
REF 1-5	Council Directive of 15 July 1975 on Waste (2008/98/EC). European Union (2008).
REF 1-6	Waste Duty of Care Code of Practice. DEFRA (2016).
REF 1-7	The Control of Pollution (Amendment) Act 1989. The Stationary Office (1989).
REF 1-8	The Environmental Permitting (England and Wales) Regulations 2010. The Stationary Office (2010).
REF 1-9	The Hazardous Waste (England and Wales) Regulations 2005. The Stationary Office
REF 1-10	https://www.gov.uk/guidance/hazardous-waste-consignment-note-supplementary-guidance Environment Agency 8th February 2018.
REF 1-11	A Guide to the Hazardous Waste Regulations: Record Keeping HWR05 Ver 6.0, Environment Agency, June 2011
REF 1-12	Waste Electrical and Electronic Equipment Regulations 2006
REF 1-13	EA Technical Guidance Note WM3: Hazardous waste: Interpretation of the definition and classification of hazardous waste, 1st Edition, Version 1.1, Environment Agency, June 2018.
REF 1-14	The List of Wastes (England) Regulations The Stationary Office (2005)

Appendix H Outline Energy and Resource Use Management Plan

H.1 Background to the plan

H.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage general measures and techniques that shall be employed during construction of the Scheme to contribute to the aim of reducing the use of energy and resources, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

H.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

H.2 Responsibilities

H.2.1.1 In relation to the control and management of energy and resource use, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

H.3 Energy and resource efficiency

H.3.1.1 Opportunities exist to implement measures into the construction of the Scheme to provide more efficient and cost-effective use of energy and resources, and thereby reduce carbon and water footprints.

H.3.1.2 The following measures and techniques shall be investigated and evaluated by the PC and, where appropriate and feasible, be incorporated into the design and management of construction compounds and working areas on the Scheme:

a. the use of double-glazed windows within site offices and welfare units to reduce heat loss;

b. the control of lighting through passive infrared sensors to reduce energy consumption;

c. the control of heating and cooling units individually, allowing areas not in frequent use to be turned down or off when required, to reduce energy consumption;

d. the use of ‘switch off’ labels on electrical switches, lighting and appliances to encourage users to turn apparatus off when not in use, promoted by a ‘switch off campaign’ via a lunch and learn session covering energy and resource efficiency, to reduce energy consumption;

e. the use of rainwater harvesting equipment and greywater recycling equipment to recycle water resources and reduce reliance on mains water supplies;

f. the use of alternative energy sources for certain appliances, such as solar power for water heaters, to reduce energy consumption;

g. the deployment of toolbox talks to all site operatives to encourage the switching off of construction plant, equipment and machinery, to reduce fuel and energy consumption;

h. the use of green energy tariffs on the main site compound;

i. undertaking lifecycle costing for construction plant, equipment and machinery, and also the hiring of accommodation, taking low energy and water options into consideration; and

j. the tracking of resource use on-site to identify areas of high consumption and potential efficiencies.

H.4 Water efficiency

H.4.1.1 Water minimisation techniques shall be implemented and managed during construction through the application of a water hierarchy.

H.4.1.2 Where practicable, water management shall target techniques and measures at the top of the hierarchy. Where this is not feasible, a combination of options from within the hierarchy shall be applied:

a. **Eliminate** - eliminate water use by identifying if the water-using process or activity is really necessary and/or if there is a cost effective alternative to using water;

b. **Substitute** – identify and use alternative non-potable sources and eliminate inappropriate use of drinking (potable) water, and assess whether rainwater or greywater can be used for the activity or process;

c. **Reduce** - explore options that improve efficiency e.g. by regular maintenance of water using equipment to ensure they are working to maximum efficiency, metering and monitoring supplies, and the updating of fittings and/or processes;

d. **Re-use** – identify whether water, including greywater, can be treated or filtered for reuse in a process or activity e.g. wheel washing;

e. **Recycle** – identify if and where water can be recycled for use off-site; and

f. **Disposal** - dispose of excess water legally and responsibly to ensure there is no flooding, pollution or inconvenience to stakeholders.

H.4.1.3 Water conservation measures that shall be considered for implementation during construction of the Scheme include the following, the objective being to minimise potable water use and increase non-potable water use where practicable:

a. connections to mains water to be metered to determine consumption levels;

b. construction of attenuation tanks as early as possible to capture runoff for re-use;

c. utilisation of groundwater obtained from dewatered excavations;

d. utilisation of non-potable water;

e. circulate and treat water used for any piling and drilling operations;

f. utilisation of push taps and waterless urinals within welfare facilities; and

g. capturing and re-use of rainwater.

H.5 Environmental champion

H.5.1.1 The PC shall appoint appointment one or more environmental champion(s) for both the site office and the construction site, who shall be responsible for promoting good environmental practice, ensuring the works run efficiently, and identifying and recording resource savings across the Scheme during construction.

H.5.1.2 Duties shall include, but not be limited to, the following:

a. the monthly reporting of utilities consumption;

b. undertaking lifecycle costing;

c. the tracking of the carbon footprint and related emission streams, including utilities use;

d. targeting reduction in key materials, waste and fuel during the course of the contract; and

e. the tracking of the Scheme's water footprint, encompassing mains water usage, abstraction and beneficial re-use on site.

H.5.1.3 All beneficial re-use of materials, as well as resources saving measures and associated cost reductions on site, shall be recorded and monitored.

Appendix I Outline Materials Management Plan

I.1 Background to the plan

I.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage materials during construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

I.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

I.1.1.3 Under the voluntary CL:AIRE: The Definition of Waste: Development Industry Code of Practice [REF 1-1], a MMP must be produced for the Scheme, together with a declaration from a registered Qualified Person.

I.1.1.4 A MMP shall be prepared for the Scheme, a copy of which will be included here once developed.

I.2 Responsibilities

I.2.1.1 In relation to the control and management of materials, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

I.3 References

REF 1-1	The Definition of Waste: Development Industry Code of Practice – Version 2. Contaminated Land: Applications in Real Environments (2011).

Appendix J Outline Contaminated Land Management Plan

J.1 Background to the plan

J.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage the arrangements for undertaking risk assessments of potential areas of contaminated land, the storage and disposal of contaminated materials, the remediation of contaminated land and measures to be undertaken to avoid or reduce the potential for the contamination of geological and soils resources during construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

J.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

J.2 Responsibilities

J.2.1.1 In relation to the control and management of potential areas of contaminated land, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

J.3 Legislation and best practice

J.3.1.1 Under the voluntary CL:AIRE: The Definition of Waste: Development Industry Code of Practice [REF 1-1], a MMP must be produced for the Scheme, together with a declaration from a registered Qualified Person.

J.3.1.2 The CL:AIRE Code of Practice [REF 1-1] serves the following purposes:

a. it sets out good practice for the development industry to use when assessing on a site-specific basis whether excavated materials are classified as waste or not, and determining on a site-specific basis when treated excavated waste can cease to be waste for a particular use; and

b. it describes an auditable system to demonstrate that the code has been adhered to.

J.4 Encountering unanticipated contaminated land

J.4.1.1 Potential exists for previously unidentified contamination to be present within the ground in areas associated with the Scheme.

J.4.1.2 Potentially contaminated land may be identified by way of observation of any unusual physical, visual or olfactory characteristics of impacted soil or groundwater, such as changes in colour, texture, visual evidence, or odour.

J.4.1.3 Unexpected finds may include unexpected discovery of hazardous building materials, such as asbestos containing materials, or the unexpected discovery of contaminants in addition to the types already identified on-site, such as surface or buried material with visual or olfactory evidence of contamination.

J.4.1.4 To address the potential risk from encountering unexpected contamination a watching brief shall be maintained across all areas where excavation works are to be undertaken.

J.4.1.5 The person assigned to undertake the watching brief shall be vigilant and suitably qualified in identifying potential indicators of contamination.

J.4.1.6 Where contamination is encountered during excavation works, in accordance with best practice, work in the area of concern shall be halted until a suitably qualified specialist (in consultation with SMBC) is able to make an assessment.

J.4.1.7 The assessment may involve the sampling and testing of the suspected contaminated material, as deemed necessary by the qualified specialist.

J.4.1.8 Upon completion of this assessment, remediation may be considered necessary, then a remediation method statement will be produced, which will need to be agreed with SMBC. Following completion of the measures outlined within the remediation method statement a verification report must be prepared, which is subject to the approval in writing of SMBC.

J.4.1.9 Where identified contaminated materials have been, or are to be, disturbed, the following measures shall be adhered to:

a. the provision of Personal Protective Equipment (PPE) to construction (earthworks) personnel. PPE shall be proportionate to the risk and may include items such as gloves, barrier cream, overalls, dust masks and respirators to minimise direct contact exposure with contaminated materials. The precise PPE requirements shall be identified following an appropriate hazard assessment;

b. the provision of suitable hygiene facilities and clean welfare facilities for all construction site workers; and

c. the monitoring of confined spaces for the potential accumulation of ground gases, and the restricting of access to confined spaces to suitably trained personnel and use of specialist PPE where necessary. These measures shall also be implemented where concentrations of ground gases have been recorded above long term and/or short term workplace exposure limits.

J.4.1.10 Any temporary on-site storage of contaminated material shall be in designated areas on impermeable sheeting, covered with adequate perimeter leachate collection drains to minimise the potential for leachate and run off from the stockpiled material to be generated and migrate.

J.4.1.11 The disposal of soil waste, contaminated or otherwise to landfill sites shall be avoided or reduced by minimisation of the overall quantities of waste generated during construction, and by ensuring that excavated material consigned to landfill cannot, as an alternative, be put to use on elsewhere on the site or at an alternative off-site location.

J.5 Mitigation plan

Procedure for contaminated land encountered

J.5.1.1 Should contamination be identified during excavation works, the following mitigation procedures shall be implemented and adhered to:

a. works within the area of concern should be stopped immediately and made secure to prevent the spread of contamination;

b. report the discovery to the site management team, who must then inform and seek expert advice from a suitably qualified environmental consultant;

c. notify other construction workers in adjacent working areas to prevent their contact with the contaminated materials;

d. undertake a risk assessment to minimise the risk to health and safety of site workers, including the identification of suitable PPE to mitigate any potential exposure and acceptable working methods;

e. undertake an assessment of the contaminated material via laboratory testing of the material in order to characterise the material for off-site disposal;

f. contaminated materials that cannot be re-used on site shall be disposed off-site. A hazardous waste assessment shall be undertaken to first classify the waste material in accordance with the EA published Technical Guidance WM3: Waste Classification – Guidance on the classification and assessment of waste [REF 1-2]. Once classified, further Waste Acceptance Testing shall be undertaken, as required, to assist landfill operators determine if they can accept the waste. The disposal of contaminated materials shall comply with all prevailing and relevant waste management regulations;

g. should remediation be required, a written remediation method statement shall be produced outlining the appropriate methodology in order to remediate the affected area. This shall be agreed in advance with SMBC and, where appropriate, the EA;

h. inform the landowner and occupier of the identification of contamination; and

i. the location of any such contamination encountered shall be recorded, including the results of chemical testing, the volumes sentenced for treatment by remediation, the validation data showing compliance with the relevant Re-use Acceptability Criteria, and the location of the area of use of any remediated material within the Scheme.

Measures to protect geological and soils resources

J.5.1.2 Potential impacts on geological and soils resources from contaminated land and materials shall be avoided or minimised through the implementation of the following measures during construction of the Scheme:

a. the routine testing of soils during the ground works phase, in order to confirm suitability for their re-use and to identify potentially contaminated materials;

b. the sheeting of lorries when transporting ground materials off-site and the use of dust suppression equipment on site, to reduce potential migration dust that might contain potentially contaminated materials;

c. the provision of adequate fuel/chemical storage facilities, such as bunded tanks, hardstanding and associated emergency response/spillage control procedures;

d. the temporary on-site storage of contaminated material in designated areas, with materials placed on impermeable sheeting and covered to minimise the potential for leachate and run-off from stockpiles being generated;

e. employing good construction working practices and the correct re-use or disposal of contaminated arisings, in order to minimise the creation of pollution pathways;

f. the use of protective measures to prevent pathways between contaminants and groundwater and surface water bodies; and

g. the chemical testing of materials to be used in earthworks, including comparison of chemical test results against scheme-specific soil re-use acceptability criteria.

J.6 References

REF 1-1	The Definition of Waste: Development Industry Code of Practice – Version 2. Contaminated Land: Applications in Real Environments (2011).
REF 1-2	Technical Guidance WM3: Waste Classification – Guidance on the classification and assessment of waste. EA (2015).

Appendix K Outline Archaeological Control Plan

K.1 Background to the plan

K.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage construction supervision (archaeological watching brief) and appropriate methodologies for the recording of any archaeological resources to be undertaken during construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

K.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

K.1.1.3 Archaeological works to be undertaken as part of the Scheme shall be governed by a WSI.

K.1.1.4 The WSI shall be written by a suitably qualified archaeologist, the content of which shall be agreed with Solihull Metropolitan Borough Council's (SMBC) Archaeologist prior to its implementation.

K.1.1.5 The WSI is expected to include, but not be limited to, the recording of landscape features, open area excavation, watching briefs and palaeoenvironmental sampling.

K.1.1.6 An Archaeological Control Plan shall be prepared for the Scheme which will reflect the WSI and will set out the timing of archaeological works, a copy of which will be included here once developed.

K.2 Responsibilities

K.2.1.1 In relation to the control and management of archaeological resources, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

Appendix L Outline Pollution Prevention Plan

L.1 Background to the plan

L.1.1.1 This Outline Management Plan (OMP) sets out the generic measures that will be used by the Principal Contractor (PC) to be implemented to manage potential sources of pollution that could affect environmentally sensitive features and interests, potential pollution pathways, and the general control and response measures that are to be implemented to manage pollution risk during construction of the Scheme, which can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.

L.1.1.2 This OMP will be updated by the PC into a final Management Plan, as appropriate and necessary, prior to commencement of works in accordance with the Requirements in Schedule 2 of the draft Development Consent Order (DCO) [**TR010027/APP/3.1**] and must incorporate the requirements of the Outline Environmental Management Plan (OEMP) and the Construction Environmental Management Plan (CEMP).

L.1.1.3 Information contained within this plan shall form the basis of construction method statements and risk assessments, and shall also inform the induction and training of site operatives.

L.2 Responsibilities

L.2.1.1 In relation to the control and management of potential sources of pollution, the PC shall establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 2 of this OEMP shall be established by the PC.

L.3 Surface water and groundwater

L.3.1.1 Pollution control measures shall be adhered to during construction, in order to minimise the risk of pollution of groundwater and surface water bodies, including controlled waters.

Groundwater

L.3.1.2 Groundwater is defined as all water that is below the surface of the ground in the saturation zone and in direct contact with the soil or subsoil.

L.3.1.3 The Environmental Permitting Regulations (England and Wales) 2010 [REF 1-1] prohibit the discharge of certain substances (List I and II) into groundwater.

L.3.1.4 The following best practice methods and pollution prevention measures, as set out within the Environmental Agency's (EA) Pollution Prevention Guidelines[6] (PPG) [REF 1-2], shall be applied during construction to minimise the risk of an incident that could lead to contamination of groundwater:

[6] Although PPGs were withdrawn by the EA in 2015, they remain best practice until suitable replacements are published.

a. PPG1: General Guide to the Prevention of Pollution;
b. PPG2: Above Ground Storage Tanks;
c. PPG3: Use and design of oil separators in surface water drainage systems;
d. PPG4: Treatment and disposal of sewage where no foul sewer is available;
e. PPG5: Works and maintenance in or near water;
f. PPG6: Working at construction and demolition sites;
g. PPG7: Refuelling facilities;
h. PPG8: Safe storage and disposal of used oils;
i. PPG10: Highways depots;
j. PPG13: Vehicle washing and cleaning;
k. PPG18: Managing fire-water and major spillages;
l. PPG20: Dewatering underground ducts and chambers;
m. PPG21: Pollution Incident Response Planning.
n. PPG22: Dealing with spillages on highways;
o. PPG26: Storage and handling of drums and intermediate bulk containers (IBCs); and
p. PPG27: Installation, decommissioning and removal of underground storage tanks.

L.3.1.5 Other EA guidance presented relating to pollution prevention for businesses [REF 1-3] shall also be applied, as necessary.

Fuel handling and COSHH materials

L.3.1.6 In accordance with The Control of Substances Hazardous to Health Regulations 2002 [REF 1-4] (COSHH):

a. the storage of COSHH materials and waste shall be in secure, bunded and sheltered area;
b. waste shall be segregated;
c. COSHH liquids shall not be stored in areas within Flood Zone 3;
d. areas shall be supervised and records of materials and waste stored and removed from the area recorded; and.
e. the handling, storage and disposal shall be undertaken as described in the COSHH Assessment and any MSDS.

L.3.1.7 Fuel and oil (including mould oil) shall be stored in accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001 [REF 1-5], with fuels and oil handled in such a way that risk of pollution is minimised.

L.3.1.8 Specifically:

a. fuel and oil storage tanks shall comply with the Regulations [REF 1-5] and shall be locked when not in use i.e. outside working hours;

b. storage areas shall not be located within 20m of site drainage or within any areas of Flood Zone 3 or on a gradient;

c. refuelling shall not be permitted within 20m of a watercourse, within 20m of a highway drainage gully, or within areas of Flood Zone 3;

d. mobile bowsers shall be bunded/double skinned and shall comply with the Regulations [REF 1-5] and shall be secured when not in use i.e. outside working hours;

e. trained operatives shall carry out refuelling of plant and equipment;

f. plant nappies shall be used during refuelling;

g. drums shall be stored in bunded areas with a minimum capacity of 25% of the total volume contained within the bund, or 110% of the largest container, whichever is the greater. Where possible, these bunds shall be fitted with roofs to prevent the collection of rainwater. Individual drums in use shall be stored on a drip tray sufficient to contain 25% of the full capacity of the drum;

h. drums shall be maintained in a good condition, fitted with lids and labelled to indicate the contents;

i. static combustion engine plant (e.g. compressors, lighting sets) shall be integrally bunded or placed on plant nappies;

j. plant shall be regularly checked for leaks and shall be regularly maintained; and

k. spill kits shall be provided within close proximity to fuel and oil storage areas, with plant that is operating in isolated areas, and in welfare facilities.

Silt management

L.3.1.9 Contamination by silt from site runoff into adjoining water courses is a key risk if not properly controlled during construction. The main sources of water pollution on the Scheme are predicted to emanate from the following activities:

a. haul roads;

b. excavations;

c. drainage works;

d. embankments under construction;

e. soil and stone stockpiles;

f. concrete delivery and wash out; and

g. road sweeper tipping.

L.3.1.10 Site run off is made up of two components, which are the direct result of heavy rain.

L.3.1.11 The first component is runoff from adjoining land that is not affected by construction works.

L.3.1.12 This type of runoff shall be intercepted by early construction of pre-earthwork drained ditches (PED). For sections of road that are to be constructed within an earthwork cutting, the PED shall be located at the top of the cut. Any water entering this ditch would not require treatment.

L.3.1.13 The second component is runoff across the works once topsoil has been stripped. The following control measures shall be implemented, where practicable, prior to the works to minimise the potential for silt runoff to enter surface water systems:

a. in accordance with BS 6031:2009 Code of Practice for Earthworks [REF 1-6], land disturbance shall be kept to a minimum and disturbed areas shall be stabilised as soon as possible. Soil handling shall be undertaken with reference to best practice guidelines;

b. all roads shall be kept free from dust and mud deposits;

c. the amount of exposed ground shall be kept to a minimum, and where practicable, stripped areas shall be reseeded as soon as possible;

d. underground tanks forming part of the Scheme's permanent drainage system shall be dug first and used during the construction period to deal with any surface water, and to also act as sediment control;

e. earthworks ditches shall be dug, where required, to channel any surface from haul roads into the retention ponds. These shall be of minimum gradients and, where required, straw bales or clean stone shall be installed to act as weirs/filter medium. Lagoons shall be constructed, where practicable, to allow solids to settle;

f. cut-off drains shall be installed around construction working areas to intercept uncontaminated surface run off and divert it around and away from the works;

g. earthworks shall be programmed to take place during the spring/summer periods, where practicable; particularly in the vicinity of watercourses.

h. runoff from excavations shall not be pumped directly into watercourses, and silt mitigation measures shall be implemented, where required;

i. every effort shall be made to prevent water from entering excavations;

j. stockpiling of materials shall be minimised, and essential stockpiles shall be located as far away as possible from watercourses;

k. short term stockpiles shall be sealed;

l. any stockpile in place for an extended period of time shall be allowed to re-vegetate naturally;

m. cut off trenches shall be installed uphill of soil management areas, to divert flows away from potential sources of silt pollution;

n. silt fences (geotextile material) shall be used alongside all exposed ground where there is a pollution risk; and

o. flocculants may be used in conjunction with other silt management mitigation measures, subject to consultation with the EA prior to their use.

Settlement ponds and tanks

L.3.1.14 Site runoff or water pumped from excavations shall be channelled into the permanent reed beds and storage tanks to allow any suspended solids to settle out before discharge.

L.3.1.15 To minimise confined space working within the tanks, temporary settlement tanks shall be installed adjacent to the permanent tank.

L.3.1.16 Perimeter fencing and warning signage shall be erected around settle tanks, ponds and outfalls.

L.3.1.17 Access shall be provided for inspection, water quality testing, maintenance teams and emergency vehicles.

L.3.1.18 Emergency pollution spill equipment such as floating bunds shall be positioned by each pond and tank to capture any accidental discharges.

L.3.1.19 In areas where the permanent storage tanks are located too far away from working areas, water from excavations and runoff shall be pumped into local watercourses and/or drainage systems through temporary settlement tanks. This shall only be undertaken following liaison with SMBC and following receipt of the any temporary discharge consents (as required by the EA).

Imported materials

L.3.1.20 Construction of the Scheme shall require imported material requirement for general fill, in addition to the pavement construction and other construction materials e.g. dry stone, pipework and concrete.

L.3.1.21 A number of areas have been selected across the site to serve as both construction compounds and materials storage locations, the positions of which are in proximity to the location of final material use.

L.3.1.22 All materials shall be COSHH assessed and be stored in accordance with the manufacturer's details.

Stockpile management

L.3.1.23 Both imported granular material and site arising's (topsoil, subsoil and processed hard arisings) shall be stockpiled on site.

L.3.1.24 All stockpiles shall be carefully managed to control erosion and sediment runoff by implementing the following control measures:

a. stockpiles shall be located away from drains and watercourses where possible;

b. stockpiles shall be seeded or provided with other stabilisation measures appropriate to the length of time stored;

c. stockpile slopes shall be formed at a stable slope angle;

d. earth bunds or another form of diversion shall be installed to keep runoff away from stockpiles;

e. silt fences or barriers shall be installed at the toe of the stockpile to mitigate runoff during rain events; and

f. barriers and signage shall be installed to prevent unauthorised access to the stockpiles to prevent dross contamination.

Concrete washout

L.3.1.25 The PC shall engage with concrete suppliers prior to the works commencing to set up agreements that, where practicable, concrete washout activities are to be undertaken off-site.

L.3.1.26 A sock shall be fitted to the delivery chute temporarily whilst they drive back to their facility.

L.3.1.27 Designated areas shall be provided for washing out concrete delivery lorries, concrete pumps and grout lines, comprising of a small skip lined with an impermeable membrane. Concrete shall be allowed to harden in the skip before being removed for recycling.

L.3.1.28 Washout liquid shall be treated to allow safe reuse or discharge.

L.3.1.29 Loose cement and/or concrete shall be cleared as quickly as possible.

Maintenance of plant

L.3.1.30 Maintenance of plant, vehicles and equipment shall be carried out at least 20m from a watercourse or drain.

L.3.1.31 Spill kits shall be made available during all plant maintenance operations, and a drip tray shall be used to contain any leakage of oil. Where emergency repair is necessary within 10m of a drain, a drain seal shall be used to ensure that no contamination enters the drainage system.

L.3.1.32 Any plant, equipment or other vehicle considered a pollution risk shall be either repaired or removed from site.

L.3.1.33 The wash down of tools and plant shall not be permitted within 20m of a watercourse or drainage cover.

Pumping works

L.3.1.34 Pumping works shall be controlled to prevent pollution of drainage systems and surface water courses.

L.3.1.35 The Scheme shall operate a permit to pump system for temporary discharge of water collected, to ensure compliance with EA Pollution Prevention Guidelines [REF 1-2] and their regulatory position statement [REF 1-7]

L.3.1.36 In general, small volumes of localised pumping to dewater excavations shall be discharged to an area of vegetated ground close to the excavation under the permit to pump system.

L.3.1.37 Measures for the prevention of pollution during larger dewatering activities shall be agreed with the EA.

Protection of water supply boreholes

L.3.1.38 The following groundwater abstraction sources are present within 0.5km of the Scheme.

Table L.1: Groundwater abstraction sources

National Grid Reference	Approximate location	License number	Type of use
SP 19900 83900	North of the M42 Junction 6 southbound off-slip road.	03/28/11/0079	General Farming And Domestic
SP 19900 84600	East of the Scheme and west of Chester Road	03/28/11/0020	General Farming And Domestic
SP 20000 85100	East of the Scheme, off Chester Road	03/28/11/0081	Horticulture And Nurseries: General Use (Medium Loss) - DEEP WELL
SP 20000 84900	East of the Scheme, off Chester Road	03/28/11/0081	Horticulture And Nurseries: General Use (Medium Loss) - SHALLOW WELL
SP 20000 84900	East of the Scheme, off Chester Road	03/28/11/0020	General Farming And Domestic
SP 17590 79000	West of the southern extent of the Scheme where the M42 motorway crosses Henwood Lane	03/28/11/0131	Other Industrial/Commercial/ Public Services: Process Water
SP 20100 85300	East of the Scheme, off the A446 westbound approach to the A446/A452 interchange	03/28/11/0065	General Farming And Domestic
SP 20107 84932	East of the Scheme, off Chester Road	Md/028/0011/006	Horticulture And Nurseries: Spray Irrigation – Direct
SP 19400 86300	North west of the Scheme and west of the M42 Junction 7 off-slip.	03/28/12/0014	General Farming And Domestic

L.3.1.39 Best practice and pollution prevention measures relating to the protection of groundwater (described above) shall be implemented to minimise the risk of an incident that could lead to groundwater contamination.

L.4 Working in watercourses

Regulatory consent

L.4.1.1 Authorisation shall be sought from the relevant regulatory body where permanent or temporary construction works:

a. are within 10m of a main water course managed by the EA;

b. involve raising levels within the floodplain; and

c. are within 7m of a water course managed by the Internal Drainage Board (IDB).

L.4.1.2 Such works may include:

a. the temporary diversion of watercourses, to facilitate the construction of drainage outfalls or culvert extensions; and

b. overpumping around the works, to create a temporary dry working area for drainage connections and the installation of temporary ditch crossings.

L.4.1.3 The main watercourses within or adjacent to the Scheme that interface with construction works and require protection are:

a. Hollywell Brook: extension of the Hollywell Brook culvert under the M42 motorway for the construction of the new northbound and southbound slip roads;

b. Low Brook: drainage outfall for the mainline link road;

c. Pendigo Lake ditch: extension of the culvert for construction of the A45 to M42 northbound slip road;

d. Bickenhill Lane ditch: outfall construction for works to Clock Interchange;

e. Shadow Brook: Outfall construction for local and mainline drainage

f. highway ditch south of A45: construction of a temporary crossing to facilitate access road to main compound, and permanent outfall construction; and

g. overland flow/highway ditches: interception during earthworks and installation of new outfalls, and installation of temporary crossings for haul roads.

L.4.1.4 A number of other minor ordinary watercourses (ditches) also run through the area. If they drain overland flow from the adjacent land, they are regulated by the IDB. Otherwise, they are designated as highways ditches.

L.4.1.5 Any works (temporary or permanent) within 7m (above, below, longitudinal) of IDB watercourses shall require consent.

Flood risk management

L.4.1.6 Parts of the Scheme are located in areas identified as being at risk of flooding.

L.4.1.7 Hollywell Brook is identified as having a history of flood events, and is a watercourse that has interfaces with Scheme construction.

L.4.1.8 Construction working areas within Flood Zone 3 shall have signage containing the following information displaying the Scheme and its relationship to Flood Zone 3, and the measures to be implemented or followed during construction.

L.4.1.9 Mandatory conditions for working within Flood Zone 3 shall include:

a. where practicable, works shall cease during flood flows;

b. distribution of suitable weather forecasts to the construction team to provide warning of weather events;

c. where practicable, there shall be no storage of materials, plant or hazardous materials within the zone;

d. no refuelling or servicing of plant shall take place within the zone;

e. concrete washout facilities shall be contained and sited outside the zone;

f. all construction debris shall be removed from any watercourse immediately;

g. construction equipment shall be removed from the zone at the end of the working day;

h. all plant shall be checked for leakages at least once a day;

i. all minor plant shall be placed on plant nappies;

j. welfare facilities/stores are to be raised or located outside of the zone and its floodplain;

k. plant shall be parked outside of the floodplain at the end of the shift during periods of poor weather;

l. spill kits shall be sited adjacent to work areas and on designated site vehicles; and

m. haul roads shall be constructed at grade. If ground levels are elevated, consent shall be sought from the regulator and, potentially, flood compensation measures implemented.

L.4.1.10 The Scheme shall register with the EA Floodline Warnings Direct service, with nominated supervisors and section managers to receive automated telephone and text alerts.

L.4.1.11 If a flood alert is received, the following measures shall be implemented:

a. if the alert is received between 0700 to 1900 Monday to Friday, the Primary Contact shall alert the team working within the floodplain;

b. if the alert is received outside this period, the On-Call Duty Manager shall notify the site team;

c. once the team working in the flood zone receives the flood warning, the team shall monitor the flows. If levels reach the river bank works shall cease, and all machinery, plant and hazardous materials shall be removed to a designated area immediately; and

d. works shall only proceed on the advice of the Environmental Manager.

L.5 Dewatering

Dewatering excavations

L.5.1.1 Where practicable, water that has collected in excavations shall be recovered and reused, or otherwise, removed following one of the methods below:

a. pumped to an area of open vegetated ground/excavation/soakaway away from the excavation. Water shall be uncontaminated and, depending on the location, silt may need to be removed using a settlement tank, straw bales or a geotextile membrane/filter;

b. pumped into a newly created earthworks ditch, which shall flow into a newly formed attenuation pond prior discharge to a surface watercourse;

c. pumped into the existing highways drainage system, with consideration to the final discharge point (water may need treatment);

d. pumped to sewer. Consent shall be required from the sewerage undertaker for discharge to sewer, and conditions may be imposed on the water quality that is acceptable;

e. removed from site by vacuum tanker where water is contaminated, and the methods above are not suitable.

L.5.1.2 The appropriate regulator(s) shall be consulted to discuss and agree appropriate mitigation measures, where necessary, otherwise this shall be undertaken in accordance with the relevant EA Regulatory Position Statement (if greater than 3 months in duration) [REF 1-7].

L.5.1.3 The Scheme shall operate a permit to pump system for temporary discharge of water collected, to ensure compliance with EA PPG [REF 1-2] and their Regulatory Position Statement [REF 1-7]

Dewatering underground ducts, chambers and tanks

L.5.1.4 Water that has accumulated in underground ducts and chambers can contain contamination.

L.5.1.5 Where water is heavily contaminated with silt or oil, discoloured or has an unusual odour, it shall be removed using a vacuum tanker and disposed off-site.

L.5.1.6 Light contamination by oil shall be removed from the surface using absorbent materials, with water subsequently pumped to an open vegetated area away from the duct/chamber under the permit to pump system.

L.5.1.7 Uncontaminated water shall be pumped to an open vegetated area away from the duct/chamber under the project permit to pump system. Care shall be taken to avoid disturbing silt settled in the base of the duct/chamber, which can be removed once the water has been removed.

L.5.1.8 Good practice guidance provided in the EA PPG20: Dewatering of Underground Ducts and Chambers [REF 1-2] shall be followed.

L.6 Dust and emissions

Control of dust and noise emissions

L.6.1.1 Certain construction activities have the potential to result in dust and noise emissions. Such activities include, but aren't limited to, the following:

a. demolition including crushing and screening of materials;

b. the use of diesel powered plant and equipment;

c. earthworks and material storage;

d. dust from vehicle movements; and

e. cutting of hardstanding.

L.6.1.2 Pollution relating to construction-sourced dust and noise emissions shall be controlled in accordance with the measures and systems presented within the Dust, Noise and Nuisance Management Plan.

Plant and vehicle emissions

L.6.1.3 Emissions from construction plant, equipment and vehicles can affect local air quality.

L.6.1.4 The following measures shall be adopted to reduce such emissions, as far as practicable, during construction:

a. construction plant and equipment shall be regularly maintained in accordance with manufacturers' specifications to ensure that exhaust emissions do not breach statutory limits set for the vehicle/equipment type and mode of operation, and that black smoke is not visible from exhaust systems other than during start up;

b. exhausts shall be positioned at a sufficient height to ensure effective dispersal of exhaust emissions;

c. engines shall not be left idling or running unnecessarily, and shall be throttled back; and

d. the use of ultra-low sulphur diesel shall be considered and used where possible.

L.7 Monitoring

Groundwater and surface water

L.7.1.1 The Environmental Manager and site team shall be responsible for ensuring that checks are carried out during the construction phase, in order to ensure works are carried out in accordance with requirements of the environmental good practice, legislation and the requirements of the OEMP for the Scheme.

L.7.1.2 On-site monitoring may include the following using visual observation and field measurement devices:

a. oil and fuel;

b. pH levels; and

c. turbidity/suspended solids.

L.7.1.3 When required water samples may be sent to an accredited testing laboratory for more detailed analysis. Determinands may include, but not limited to:

a. suspended solids;

b. ammoniacal nitrogen;

c. electrical conductivity;

d. heavy metals;

e. petroleum hydrocarbons;

f. polyaromatic hydrocarbons;

g. volatile organic carbons; and

h. biological and chemical oxygen demand.

L.7.1.4 Monitoring locations shall be agreed prior to works commencing, and these may change depending on the phasing and location of certain works.

L.7.1.5 Background water quality data shall be obtained at all monitoring locations prior to construction works commencing in the area.

L.7.1.6 Monitoring records shall be compared to baseline data set to identify any impacts of the Scheme on the surface water environment and to identify any requirement for further remedial measures.

Air and noise

L.7.1.7 The Environmental Manager and site team shall be responsible for ensuring that visual checks are carried out during the construction phase, to ensure that the dust control measures set out in the Dust, Noise and Nuisance Environmental Management Plan are carried out to minimise nuisance.

L.7.1.8 Visual inspections for dust may be supplemented with quantitative monitoring in sensitive locations e.g. diffusion tubes (NO_2), sticky cylinder or “Frisbee” gauges (dust). Dust monitoring locations shall be agreed prior to works commencing, the locations of which may change depending on the phasing and location of works.

L.7.1.9 Background air quality data shall be obtained at all agreed monitoring locations prior to construction works commencing in the area.

L.7.1.10 Dust monitoring shall be undertaken at each specified monitoring location regularly for the duration of the Scheme’s construction, the results of which shall be recorded and, if required, made available to SMBC.

L.7.1.11 Weather conditions shall be taken into account before monitoring commences to ensure this is undertaken on dry days. Monitoring shall be carried out to assess activities with the highest potential dust generating impact and also the levels of dust during general site works.

L.7.1.12 Daily visual inspections of site activities, dust controls and site conditions shall be carried out by an appointed member of the construction team with observations kept in a daily dust log.

L.8 Welfare facilities

Compound pollution prevention

L.8.1.1 Pollution prevention measures shall be established to ensure that activities within site compounds do not result in pollution to the ground or watercourses.

L.8.1.2 Specific measures shall include:

a. fuel and oil shall be stored in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 [REF 1-1], with refuelling carried out in designated areas by trained personnel;

b. chemicals and other potentially polluting substances (typically COSHH materials) shall be stored in accordance with the manufacturer’s instructions.

The minimum possible inventory of such chemicals shall be stored on-site in a designated COSHH store at any one time;

c. emergency spill kits shall be readily available, and any spillage of fuel, oil or other chemical shall be promptly cleared;

d. waste segregation areas shall be established, and skips or containers shall be of an appropriate construction to ensure that any waste contained does not escape. They shall also be suitably signed to avoid cross-contamination of waste streams; and

e. measures for controlling any runoff from areas of hardstanding shall be installed including interception ditches/drains and pollution control interceptors.

Sewage effluent

L.8.1.3 Where direct connection to sewer is not possible or practical from the welfare facilities, any short-term sewage effluent shall be removed from site using a vacuum tanker.

L.9 Environmental incident response management

L.9.1.1 The following actions shall be taken in the event of an environmental incident or emergency.

Types of incident

L.9.1.2 An environmental near miss incident shall constitute a situation where no environmental consequences occur, but where:

a. a risk of environmental harm exists as a result of conditions on site; or

b. a risk of environmental harm exists as a result of individuals actions; or

c. there is site rule that is not being complied with.

L.9.1.3 A minor environmental incident shall constitute an incident that:

a. causes minor or very localised environmental harm; or

b. has minor environmental consequences that have no impact beyond the site boundary; or

c. in the case of off-site nuisance impacts such as noise, vibration, dust and lighting, has minor consequences beyond the site boundary that are recognised and rectified quickly; or

d. relates to an environmental regulation not being complied with.

L.9.1.4 An intermediate environmental incident shall constitute an incident that:

a. causes environmental harm beyond a small localised area of the site; or

b. causes minor environmental consequences beyond the site boundary, or

c. in the case of off-site nuisance impacts such as noise, vibration, dust and lighting, has moderate consequences beyond the site boundary that are recognised and rectified quickly.

L.9.1.5 A major environmental incident shall constitute an incident that:

a. causes significant environmental consequences that cannot be immediately rectified or contained; or

b. causes material environmental harm beyond the site boundary.

Notification of environmental incidents

L.9.1.6 All reportable incidents shall be subject to an investigation and an incident report shall be made of the circumstances, in order to identify measures to be taken to prevent recurrence.

L.9.1.7 An emergency plan shall be developed by the PC's Project Manager, Health and Safety Manager and Environmental Manager, which shall detail the site emergency contacts, the 24 hour out of hours contact arrangements and escalation process.

Arrangements for statutory notification

L.9.1.8 The PM shall ensure that the appropriate regulatory authority is notified of environmental incidents, where it is required by legislation and/or the contract.

L.9.1.9 The PM shall make suitable and adequate arrangements for notification of pollution incidents to the EA, both during and out of hours. These shall include the nomination of an appropriate senior manager to be available 24 hours a day, 365 days a year, with responsibility for contacting the EA. These arrangements shall be communicated to all security staff, emergency call out staff and duty managers.

L.9.1.10 The EA (England and Wales) emergency hotline number is 0800 80 70 60.

L.9.1.11 Records of telephone conversations with regulatory authorities shall be maintained in site diaries and the Environmental Team's inspection reports.

Pollution control equipment

L.9.1.12 Spill kits shall be located at strategic locations around the site, including fuel storage areas, security cabins, watercourses and close to areas where plant is operating.

L.9.1.13 Typical contents shall be as follows, but will vary depending on local circumstances:

a. wheelie bin;

b. absorbent granules;

c. absorbent mats;

d. PPE for fuel spills;

e. heavy-duty plastic sacks;

f. absorbent booms;

g. drainage gully seals;

h. yellow caution tape;

i. disposal bags; and

j. laminated copies of spill emergency plan and contact details.

L.9.1.14 Relevant project personnel shall be trained in the general use of spill kits during the site induction, and through regular toolbox talks.

Emergency call out services

L.9.1.15 The Environmental Manager shall ensure that emergency call-out services are established where appropriate e.g. vacuum tanker for removal of oily water from sumps/drains.

Investigating and reporting environmental incidents

L.9.1.16 An incident investigation shall be undertaken as a result of an incident or emergency.

L.9.1.17 This shall involve gathering evidence as the first part of the investigation, which is important to ensure that sufficient information is available to enable a thorough investigation of what happened, in order to prevent it happening again.

L.9.1.18 If an enforcing authority takes any photos, samples or conducts any monitoring, a representative from the PC shall also take photos, sample or monitor in the same way, at the same time, and in the same place. This might include the EA taking water, waste or soil samples, or Solihull metropolitan Borough Council's Environmental Health Officer carrying out noise, vibration or dust monitoring.

L.9.1.19 Important evidence that shall be gathered and recorded includes:

a. what happened before, during and after the event;

b. the consequences of the incident e.g. harm, damage, intervention by an enforcing authority, breach of a consent;

c. witness information and statement(s);

d. photographs of the incident and the area affected;

e. sketches showing what happened and where e.g. positions of people, plant and equipment, environmental receptors; and

f. other relevant factors e.g. weather.

L.9.1.20 Any investigation shall identify:

a. what happened before, during and after the incident – this should include a precise, step-by-step timeline of the sequence of events, where they happened, who was present;

b. details of instructions provided prior to and during the incident (verbal and written);

c. records of competence/training of all personnel present at the location of the incident;

d. plant and equipment records, including maintenance records;

e. all points of failure in methods, plans, processes, procedures, training, communication etc.;

f. immediate and root cause; and

g. actions to correct the incident and to prevent the incident from happening again.

L.9.1.21 Any environmental incidents shall be reviewed during Scheme progress meetings to ensure that everyone is aware of the incident, and the corrective and/or preventative measures to be (or that have been) taken.

L.9.1.22 Following any major environmental incident, a meeting shall be held to review the close out actions provided by the incident investigation.

L.10 Site security

L.10.1.1 Pollution risks associated with unauthorised access include:

a. attempted theft of materials and plant leading to fuel spills;

b. deliberate vandalism damaging plant; and

c. fly tipping of waste material.

L.10.1.2 Security arrangements shall be provided to deter and prevent unauthorised access to the site, the final details of which shall be developed by the PC.

L.10.1.3 The following arrangements shall be considered when developing the arrangements:

a. implementing gated access with 24-hour security at the main construction compound;

b. the manning of all site entrances throughout the day and locking during out of hours working;

c. the locking of static fuel tanks when not in use;

d. the locking and de-mobilisation of all mobile fuel tanks when not in use, and parking in the secure site compound out of working hours;

e. training of all security guards in fuel emergency procedures;

f. the use of post and mesh fencing to create a secure boundary around the main compound, and secure fencing to separate public rights of way when they run adjacent to the Scheme;

g. the use of security lighting and CCTV (undertake assessments to ensure residents and drivers are not exposed to light pollution);

h. the parking of construction plant in designated lit areas within sight of security measures;

i. the use of motion detection CCTV cameras or additional security guards at satellite compounds during extended periods of site shut down (Bank Holidays, Easter and Christmas);

j. the return of high value materials to be main compound for locking in secure stores;

k. the storage of cables, metal and other high risk materials in a designated, secure facility in the main compound, with delivery of these materials on a just-in-time basis; and

l. undertaking site assessment of pre-existing fly tipping hotspots (farm access roads, laybys) and provide security measures to prevent access.

L.11 Training

L.11.1.1 Appropriate training shall be developed and delivered to make certain that all members of staff and the workforce are aware of all matters relating to the prevention of pollution.

L.11.1.2 This shall be achieved by:

a. a Site Specific Safety and Environmental Induction;

b. raising specific awareness of ecological issues on site through pre-work briefings;

c. environmental inspections.

d. environmental site notices and posters;

e. risk assessment and risk assessment briefings

f. method statements and associated briefings; and

g. environmental toolbox talks.

L.11.1.3 All staff shall be trained in the emergency procedures and what to do in the event of a spill by the following measures:

a. inductions and toolbox talks to ensure people are aware of the contents and location of site spill kits and how to deploy in a safe and efficient manner;

b. spill response training (oil and chemical) to ensure operatives are aware of priorities to ‘protect people, environment and property’;

c. live spill demonstrations and drills to test and review emergency responses; and

d. waste disposal, restocking and documentation.

L.12 References

REF 1-1	The Environmental Permitting Regulations (England and Wales) 2010. The Stationary Office (2010).
REF 1-2	EA Pollution Prevention Guidelines. Available at: https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg (accessed October 2018).
REF 1-3	EA Pollution Prevention for Businesses. Available at: https://www.gov.uk/guidance/pollution-prevention-for-businesses (accessed October 2018).
REF 1-4	The Control of Substances Hazardous to Health Regulations 2002. The Stationary Office (2002).
REF 1-5	The Control of Pollution (Oil Storage) (England) Regulations 2001. The Stationary Office (2001).
REF 1-6	BS 6031:2009 Code of Practice for Earthworks. British Standards Institution (2009).
REF 1-7	EA Regulatory Position Statement. Available at: https://www.gov.uk/guidance/dewatering-building-sites-and-other-excavations-environmental-permits (accessed October 2018).

Appendix M Outline Bird Strike Management Plan

To be prepared in consultation with Birmingham Airport prior to the commencement of development

Appendix N Crane Management Plan

To be prepared in consultation with Birmingham Airport prior to the commencement of development