

Tidal Lagoon Swansea Bay

Site Waste Management Plan

DCO Requirement 20

CEMP Supporting Information

April 2020

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1 Introduction

1.1 The TLSB project

- 1.1.1 Tidal Lagoon Swansea Bay (TLSB) will be the world's first purpose built tidal energy lagoon. The generating station will have an installed capacity of 320 megawatts (MW) and will enclose part of Swansea Bay, from the eastern side of the River Tawe to the eastern edge of the new Swansea University Bay-Campus. In total the seawall will form an approximately 9.5km-long, U-shape which will encompass approximately 11.5km² of the seabed, foreshore and intertidal area of Swansea Bay.
- 1.1.2 TLSB made an application to the Planning Inspectorate on 7 February 2014 for a Development Consent Order (DCO) for a tidal lagoon (the TLSB Project) in Swansea Bay, South Wales. Examination of the application closed on 10 December 2014 and development consent was granted by the Secretary of State (SoS) on 9 June 2015.

1.2 DCO Requirement

- 1.2.1 Agreement of a Site Waste Management Plan (SWMP) is Requirement 20 of the DCO, and as such has been prepared by TLSB for approval by the relevant planning authorities in accordance with the DCO.
- 1.2.2 DCO Requirement 20 – Site Waste Management Plan states:

20.—(1) No part of the authorised development is to be constructed until a plan for the management and disposal of waste produced as a result of the construction of the authorised development has been submitted to and approved by the relevant planning authorities.

(2) The construction of the authorised development must be carried out in accordance with the approved details.
- 1.2.3 DCO Requirement 20 includes elements that are relevant to the City and County of Swansea Council (CCSC) is provided to the relevant authorities for approval.
- 1.2.4 The SWMP has been produced to satisfy the criteria of DCO Requirement 20 in accordance with the Construction Phasing Scheme (DCO Requirement 3) and as set out in Section 2 below. This document will be updated, as appropriate, at the relevant phases of construction to include details relevant to that phase of DCO Works.

1.3 Construction Environmental Management Plan (CEMP)

- 1.3.1 The SWMP has been included as supporting information to the Construction Environmental Management Plan (CEMP), to ensure accordance with DCO Requirement 5 (CEMP) and to ensure that all construction related information is easily accessible to the relevant authorities, construction contractors and TLSB.

1.4 Linkages to other plans

1.4.1 The following DCO plans and environmental strategies provide information relevant to this SWMP:

- DCO Requirement 3 - Construction Phasing Scheme; and
- DCO Requirement 5 – Construction Environmental Management Plan; and
- DCO Requirement 12 – Contamination and groundwater

1.4.2 The plans and environmental strategies listed above are not required for approval of the SWMP but are listed for ease of reference only.

2 Construction phasing

2.1 Construction Phasing Scheme overview

- 2.1.1 The Construction Phasing Scheme is Requirement 3 of the DCO. The Scheme must set out which Requirements are to be approved in whole or in part and the relevant DCO Work phase to which the requirement relates. The Scheme must also set out the sequence of construction for the Authorised Development (the works set out in Parts 1A and 1B of Schedule 1 the DCO).
- 2.1.2 Accordingly, TLSB has produced a Construction Phasing Scheme for approval by the relevant planning authorities. The Scheme links DCO Requirements to DCO Work(s), as listed within Part 1A and 1B of Schedule 1 of the DCO. Each DCO Work represents a phase of construction for the Authorised Development (DCO Works Phase). Relevant DCO Works cannot commence until the DCO Requirements related to it are approved by the relevant planning authorities, in accordance with the Construction Phasing Scheme.
- 2.1.3 The Construction Phasing Scheme sets out the phasing of approvals for those DCO Requirements which relate to the construction of the Authorised Development only. DCO Requirements which relate to the operation of the Authorised Development will be approved by the relevant planning authorities prior to operation unless otherwise stated in the Scheme, as set out within the DCO.
- 2.1.4 The Construction Phasing Scheme sets out:
- Which DCO Requirements relate to which DCO Works;
 - Which DCO Requirements are to be approved in whole or in part; and
 - The sequence of construction of DCO Works.
- 2.1.5 The sequence of construction of those DCO Works relevant to DCO Requirement 20 with respect to the earliest commencement date, is set out in Appendix E.1.

2.2 Construction phasing in relation to DCO Requirement 20

- 2.2.1 The SWMP has been produced to satisfy the criteria of DCO Requirement 20 in accordance with the Construction Phasing Scheme (DCO Requirement 3). The criteria of DCO Requirement 20 relevant to the upcoming DCO Works are therefore included within this version of the SWMP.
- 2.2.2 Table 2.1 sets out the DCO Works relevant to each part of DCO Requirement 20. Table 2.1 also presents those details provided for approval, in relation to the relevant DCO Works and in accordance with the Construction Phasing Scheme.
- 2.2.3 Where parts of DCO Requirement 20 are not included, the SWMP will be updated and provided for approval to the relevant planning authorities prior to the relevant phase of DCO Works in accordance with the Construction Phasing Scheme.

Table 2.1 DCO Requirement 20 Construction Phasing

DCO Requirement 20		Relevant DCO Work(s)	Details provided for approval	Relevant section of the SWMP
20(1)	<i>No part of the authorised development is to be constructed until a plan for the management and disposal of waste produced as a result of the construction of the authorised development has been submitted to and approved by the relevant planning authorities.</i> <i>The construction of the authorised development must be carried out in accordance with the approved details.</i>	7a		

- 2.2.4 As set out in Table 2.1 above, this document is seeking to partially approve DCO Requirement 20 in accordance with the Construction Phasing Scheme (DCO Requirement 3) for works 7a.

3 TLSB construction works 7a

3.1 Works 7a

3.1.1 The proposed 7a works which this specific Site Waste Management Plan refers to is for works including: -

- the construction of a paved access road adjacent to the existing ABP eastern access gate together with associated drainage, security fencing, gates and barriers indicated as area 2A on the attached plan;
- the construction of paved access stubs to laydown areas the preparation of laydown areas, and
- the demolition of buildings.

3.2 Construction management

3.2.1 Design embedded measures and adherence to best practice and guidance will be implemented throughout Works 7a construction. The implementation of such measures will be managed by the Construction Environmental Liaison Officer (ELO).

3.2.2 The Construction ELO will submit monthly progress reports to the TLSB Environmental Compliance Team. The role of the TLSB Environmental Compliance Team is to monitor the implementation of contractor best practice and mitigation measures where required. Relevant responsibilities and pathways of communication are presented in Figure 3.1.

3.2.3 Full details of the construction management measures, including monitoring and reporting, are provided in the upfront TLSB Project CEMP (DCO Requirement 5).

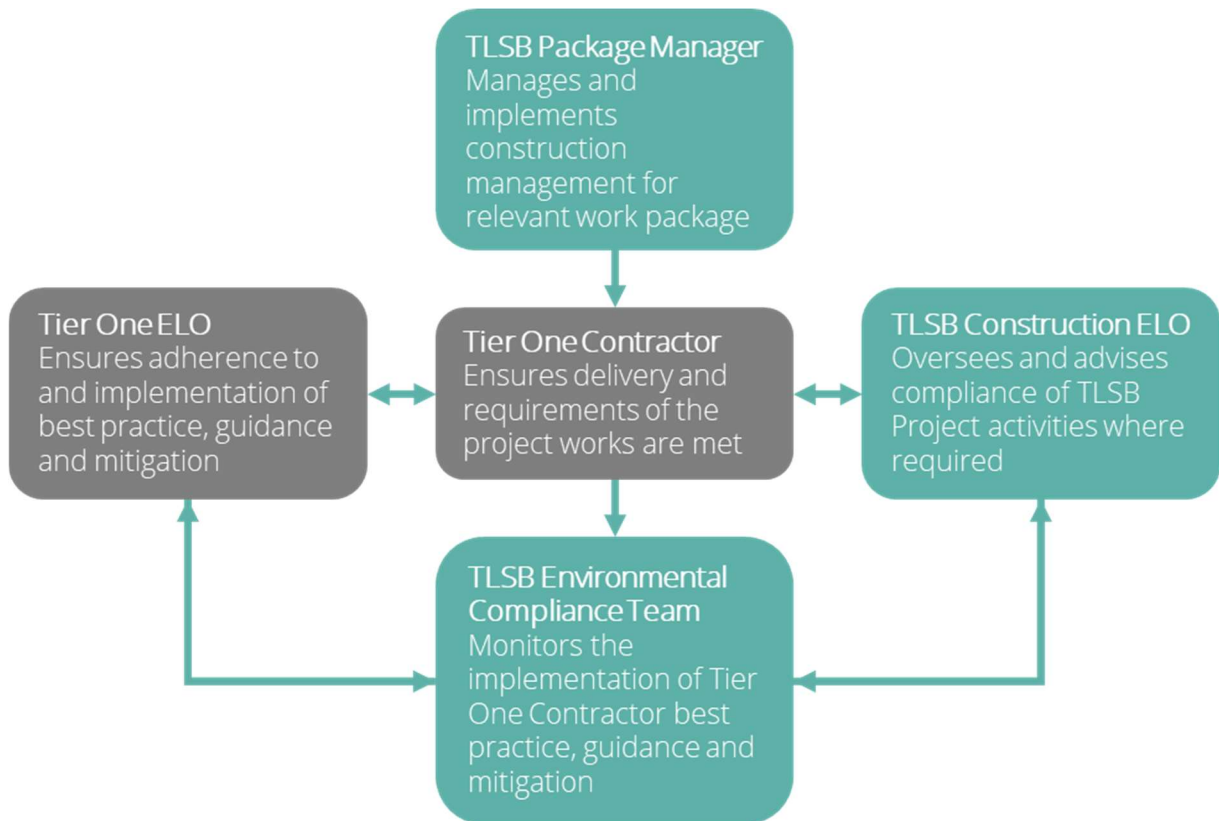


Figure 3.1 Responsibilities and communication pathways

4 Scope

4.1 Aims and objectives

- 4.1.1 This document defines the SWMP for the Works 7a at site, to be followed by the contractor and their subcontractors during the construction phase.

4.2 Scope

- 4.2.1 The SWMP considers the types and quantities of waste that would be generated during the construction of the Project and identifies how the waste will be managed. This document demonstrates the waste hierarchy (Figure 8.1, Section 8) applied and identifies ways that the volume of waste generated, and the volume of waste sent for disposal will be minimised. Specifically, the SWMP covers the following:

- Allocation of responsibilities for the delivery of the SWMP;
- The types of waste that will be generated;
- How waste will be managed; and
- The methods used to measure and record the quantity of waste generated.

- 4.2.2 This SWMP is based on the information currently available and best practice. Appendices E.3 Key Waste Forecasts, E.4 Waste Estimates Data Sheet and E.5 Waste Management Data Sheet of this SWMP will be regularly updated during the construction phase to ensure accurate forecasting and recording of waste generated during construction. Where the SWMP is updated it will be re-submitted to the relevant authorities for information.

4.3 Structure

- 4.3.1 WRAP is a U.K. non-profit organisation. WRAP was established in 2000 and receives funding from the Department for Environment, Food and Rural Affairs (Defra), the Northern Ireland Executive (NIE), Zero Waste Scotland (ZWS), the Welsh Government (WG) and the European Union (EU). It works with businesses, individuals and communities helping them reduce waste, develop sustainable products and use resources in an efficient way.

- 4.3.2 This SWMP has been developed using the WRAP guidance. It should be noted that WRAP is not a legal requirement in the development of a SWMP, however, in line with best practice this document has taken into consideration the defining principles and stages of WRAP. In addition, WRAP guidance will continue to be followed throughout the construction period and where necessary the SWMP will be updated accordingly.

- 4.3.3 WRAP guidance defines nine key steps (Figure 4.1) which should be followed in the development of a SWMP. This SWMP has taken into consideration each of these steps and the relevant information is presented in the following sections:

- WRAP Step One: Plan and prepare – Section 5;
- WRAP Step Two: Allocate responsibility – Section 6;
- WRAP Step Three: Identify your waste – Section 7;
- WRAP Step Four: Identify how to manage your waste – Section 8;
- WRAP Step Five: Identify where and how to dispose of your waste – Section 9;
- WRAP Step Six: Organise your materials and waste – Section 10;

- WRAP Step Seven: Communicate the plan and carry out training – Section 11;
- WRAP Step Eight: Measure your waste and update the SWMP – Section 12; and
- WRAP Step Nine: Review the success and learn – Section 13.



Figure 4.1 WRAP steps for development of a SWMP

4.3.4 This SWMP is to be used in conjunction with the Waste Management Data Sheet included as Appendix E5 in this plan. The Waste Management Data Sheet has been developed in line with WRAP guidance and as such follows the waste hierarchy (Figure 8.1, Section 8) and details arrangements for waste management and handling.

4.4 CL:AIRE- Definition of Waste: Development Industry Code of Practice (DoWCoP)

4.4.1 DCO requirement 12 sets out the need to consider ground and ground water contamination in accordance with recognised practice and regulatory requirements. A ground contamination delivery strategy (Materials Management Plan) has been developed in and which will provide information to enable the provision of detailed Risk Assessments, Options Appraisal and a Remediation Strategy associated with the proposed temporary and permanent works. TLSB have agreed with the regulators the use of the CL:AIRE: Definition of Waste: Development Industry Code of Practice (DoWCoP) to manage the processes associated with potentially contaminated material across the existing Works 7a development site both above and below ground.

4.4.2 The DoWCoP sets out a streamlined process with regard to re-use of site won materials and supports the sustainable and cost effective re-use of excavated material. In addition it provides an alternative to Environmental Permits or Waste Exemptions.

4.5 Materials Management Plan

- 4.5.1 A requirement of the DoWCoP is the production of a Materials Management Plan (MMP) which will set out how materials will be managed/reused on site and the DoWCoP actively supports the waste hierarchy referenced within this SWMP.
- 4.5.2 The MMP has been developed with the contractor and will be updated during and after construction to accurately identify the whole life cycle of identified waste streams associated with contaminated land. The Materials Management Plan will also form Appendix F of the CEMP.
- 4.5.3 TLSB consider the MMP will act as a supporting document to this SWMP and the two will be managed in parallel. Supporting information developed within the DoWCoP will be cross referenced with the SWMP as appropriate to assist with monitoring.
- 4.5.4 Upon completion of the works the Verification Plan produced as required under the DoWCoP will be appended to the SWMP to assist in the final review of waste management targets.

5 WRAP Step One: Plan and prepare

5.1 Legislation and guidance

5.1.1 The legislative framework applicable for the management of construction waste for Works 7a is detailed in Table 5.1.

Table 5.1 SWMP Legislative Framework

Legislation
Waste (England and Wales) Regulation 2011
Waste (England and Wales) Regulation 2011 (as amended)
The Waste (England and Wales) (Amendment) Regulations 2012
Waste (Miscellaneous provisions) (Wales) 2011
Waste (England and Wales) (Amendment) Regulations 2014
Waste Management (England and Wales) Regulations 2006
Environmental Protection Act 1990
Environmental Protection Act 1990, Section 34 Waste Management Duty of Care
Environmental Protection Act 1991, Part II, Section 34
Environmental Act 1995
The Environmental Permitting (England and Wales) Regulations 2016
The Clean Neighborhoods and Environmental Act 2005
Revised Waste Framework Directive (2008/98/EC)
The List of Wastes (Wales) Regulations 2005
Waste Management The Duty of Care Code of Practice (HMSO 1996) (currently being revised)
Hazardous Waste (England and Wales) Regulations 2005
Hazardous Waste (England and Wales) Regulations 2005 (as amended)
Controlled Waste (England and Wales) Regulations 2012
The Waste Electrical and Electronic Equipment Regulations 2006
Scrap Metal Dealers Act 2013
Waste Minimisation Act 1998
Landfill Directive 91/91/31/EC)
Environment (Wales) Act 2016

- 5.1.2 The Waste (England and Wales) Regulations 2011 and the Waste (Miscellaneous Provisions) (Wales) Regulations 2011 came into force on 29 March 2011. These regulations bring the Waste Framework Directive (rWFD) into law in Wales and make changes to other Welsh regulations, revoking the Environmental Protection (Duty of Care) (Amendment) (Wales) Regulations 2003.
- 5.1.3 These regulations require all businesses and organisations that produce waste to take all reasonable measures to prevent waste, to apply the waste hierarchy (refer to Section 8.1) when transferring waste using the definitions in Article 3 of Directive 2008/98/EC, and to include a declaration on their Waste Transfer Notes or consignment notes to that effect. Standard Industry Classification (SIC) Codes 2007 (Office for National Statistics 2009)) of the waste producer must also be provided in the Waste Transfer Note.
- 5.1.4 Hazardous Waste (England and Wales) Regulations 2005 (as amended) set out the requirements for controlling and tracking the movement of hazardous waste and bans the mixing of different types of waste. Under the Regulations “mixing” includes mixing of different categories of hazardous waste, non-hazardous wastes or any other substance or material. Businesses or organisations generating 500 kg of hazardous waste a year must register with the Natural Resources Wales as a hazardous waste producer.
- 5.1.5 Although National Policy Statement EN1 (Overarching Energy) (2011) and Technical Advice Note 21: Waste (TAN21) (2014) set an expectation that in relation to construction and demolition waste Site Waste Management Plans are required. However the Welsh Government subsequently announced that preparation of SWMP was not mandatory for all construction projects in Wales and instead adopted a voluntary code based on best practice within the sector. Amongst other things, a Site Waste Management Plan should set out how waste will be prevented, managed and disposed as part of a construction project.

6 WRAP Step Two: Allocate responsibility

6.1 Waste management roles and responsibilities

6.1.1 TLSB will nominate a Waste Champion for the construction works. The TLSB Waste Champion will provide an overseeing role to ensure the SWMP is implemented across contractors. The Works 7a contractor Waste Champion will have the following responsibilities:

- Implementation of the SWMP;
- Identification and classification of waste that may be generated using the Waste Forecast sheets (Appendix E.3) (WRAP step 3);
- Waste minimisation and management planning (WRAP step 4);
- Allocation of targets for waste generation using the Waste Estimates Data Sheet (Appendix E.4) (WRAP step 4);
- Designation of suitable waste storage areas in accordance with the principles outlined in Section 4.3 (WRAP step 5)
- Monitoring and enforcing appropriate waste segregation through inspections (WRAP step 5);
- Completion of Waste Management Data Sheets (Appendix E.5) (WRAP step 5);
- Completion of Waste Transfer and Consignment Notes as required (WRAP step 5);
- Ensuring waste minimisation actions are undertaken where appropriate (WRAP step 6);
- Provision of training on the SWMP to all relevant members of staff and engaging with work force on best practice measures (WRAP step 7);
- Undertaking of site inspections to ensure compliance of site operations with the SWMP;
- Monitoring of waste generation on site and production of appropriate reports (WRAP step 8); and
- Reviewing the success of the SWMP upon completion of the Project (WRAP step 9).

7 WRAP Step Three: Identify your waste

7.1 Waste Types

- 7.1.1 Waste is defined under Article 1a of the European Waste Framework Directive as “any substance or object... which the holder discards or intends or is required to discard”.
- 7.1.2 Wastes can be broadly classified into the following categories:

7.2 Controlled waste:

- 7.2.1 Controlled waste is defined as any waste subject to the provisions of the Control of Pollution Act 1989 (COPA, as amended) and the Environmental Protection Act (EPA).
- 7.2.2 Controlled wastes include commercial and industrial waste (including construction and demolition waste; and household waste. Agricultural and mining waste are not controlled waste.
- 7.2.3 All controlled wastes are listed in the List of Waste (LoW) (formerly European Waste Catalogue (EWC)) and are assigned a classification code. This number will be used when describing the waste during the completion of Waste Transfer Notes (see Section 9.3).
- 7.2.4 Controlled waste can be further divided into:
- Hazardous;
 - Hazardous Inert;
 - Non Hazardous;
 - Waste Electrical and Electronic Equipment recycling (WEEE), construction and demolition wastes are classified as Controlled Waste unless they have hazardous properties i.e. contain substances which are hazardous to health or the environment (see Hazardous Waste below) such as, asbestos, oil, heavy metals, toxic substance, etc. As controlled waste they are regulated by legislation. The principal piece of waste legislation is the ‘Waste Management Regulations’; and
 - Non-controlled Waste – anything which is not controlled waste i.e. certain wastes from agriculture, mines, quarries and sewage treatment works.

7.3 Hazardous waste:

- 7.3.1 The ‘co-disposal’ of Hazardous Waste and Non-hazardous Wastes in landfill is illegal. If Hazardous Waste is to be disposed of to landfill, that landfill will be authorised to accept it.
- 7.3.2 Article 1(4) of the Hazardous Waste Directive (HWD, Council Directive 91/689/EC) defines Hazardous Waste as wastes featuring on a list drawn up by the European Commission, because they possess one or more of the hazardous properties set out in the HWD. There are 14 hazardous properties set out in Annex III of the HWD and each is given a Hazard Reference H1 to H14. This information is reproduced below as Table 7.1.

Table 7.1 Hazardous waste and properties

H1	‘Explosive’ – substances or preparations which may explode under the effects of flame or which are more sensitive to shocks or friction than dinitrobenzene.
H2	‘Oxidising’ – substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances.
H3A	‘Highly Flammable’ - Liquid substances having a flashpoint of below 21°C, or - Substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or - Solid substances and preparations which may readily catch fire after brief contact with a source of ignition, or - Gaseous substances and preparations which are flammable in air at normal pressure, or - Substances and preparations which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities.
H3B	‘Flammable’ – liquid substances and preparations having a flashpoint equal or greater than 21°C and less than or equal to 55°C.
H4	‘Irritant’ – non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with skin or mucous membrane, can cause inflammation.
H5	‘Harmful’ – substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks.
H6	‘Toxic’ – substances and preparations (including very toxic substances and preparations) which, if they are inhaled or ingested, or if they penetrate the skin, may involve serious, acute or chronic health risks and even death.
H7	‘Carcinogenic’ – substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence.
H8	‘Corrosive’ – substances and preparations which may destroy living tissue on contact.
H9	‘Infectious’ – substances containing viable micro-organisms or their toxins which are known or believed to cause disease in man or other living organism.
H10	‘Toxic to Reproduction’ – substances or preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce and increase in the incidence of non-heritable adverse effects in the progeny and/or of male or female reproductive functions or capacity.
H11	‘Mutagenic’ - substances or preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce hereditary genetic defects or increase their incidence.

H12	Substances and preparations which release toxic or very toxic gases in contact with water, air or an acid.
H13	Substances and preparations capable by means, after disposal, of yielding another substance, e.g. a leachate, which possesses any of the characteristics listed above.
H14	'Ecotoxic' – substances or preparations which present immediate or delayed risks for one or more sectors of the environment.

- 7.3.3 The first stage in ascertaining whether a waste is a Hazardous Waste is to determine whether it is a Directive Waste or a Controlled Waste. If it is neither of these it cannot be classified as a Hazardous Waste. A directive waste is a waste as defined in Article 1(a) of Council Directive 75/442/EEC and a controlled waste is defined in Section 75(4) of the Environmental Protection Act. These are both relatively complex pieces of legislation but with some exceptions they describe controlled or directive wastes as those specified in the LoW and hence given a unique classification code.
- 7.3.4 The Act then outlines a procedure for classifying hazardous wastes. Certain wastes are designated as being Absolute Entries and LoW and others are categorised as being Mirror Entries.
- 7.3.5 An absolute entry is one which is deemed hazardous regardless of its composition i.e. it does not matter what percentage of the waste is composed of hazardous properties. If a waste is deemed an absolute entry no further assessment is required. Potential Absolute Wastes from the construction industry include:
- 08 01 21 – Waste paint or varnish remover;
 - 16 01 07 – Oil filters; and
 - 17 03 03 – Coal tar or tarred products.
- 7.3.6 Absolute entries are highlighted with an asterisk in the LoW. There are, however, a number of absolute entries which have corresponding non-hazardous entries, which should be used when the absolute entry is not appropriate.
- 7.3.7 Mirror entries are wastes which have potential to be hazardous or non-hazardous depending on their composition and concentration of 'dangerous substances'. The majority of hazardous mirror entries are easily identified because they make a general reference to 'dangerous substances' and include the phrase 'containing dangerous substances'. To ascertain whether a mirror entry is hazardous, an assessment has to be carried out of the waste. This will involve assessing the substances within the waste, which can often be done from manufacturers data sheets but if no data sheets are available 'waste acceptance criteria tests' (WAC) will need to be performed by a laboratory. The exact nature of these tests will depend on the likely composition and nature of the waste (providing there is sufficient knowledge regarding the likely composition of the waste, there is no point testing for substances which it is known will not be present). A laboratory or consultant could offer advice on this. Information on waste composition can also be found in the Approved Supply List which gives hazard information for many common chemicals.

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- 7.3.8 Hazardous Wastes likely to be encountered during the construction of the project include:
- Aerosols – Paints, cleaners, oils, etc;
 - Grease Cartridges – Grease inserts from grease guns used for lubricating machines;
 - Wastes Oils and Oily Materials – Oil from machines, oily rags and gloves, oil filters, etc;
 - Surplus Paints and Sealants and their Containers – Tack coat, bituminous paints, other paints;
 - Batteries – All types of batteries are now covered under the EU Batteries Directive but to all intents and purpose should be treated as Hazardous; and
 - Fluorescent Lighting Tubes – These should be kept intact as they contain hazardous gasses and metals, including mercury.
- 7.3.9 These wastes will be segregated from the controlled waste stream and will be assessed for their acceptance to landfill.
- 7.3.10 If a site produces more than 500kg of hazardous waste per year, it must register as a hazardous waste producer and pay a designated fee. This will be done via the NRW web site.

7.4 Completing the SWMP data sheets

- 7.4.1 The indicative types of waste that may be generated from the construction of the Project will be forecasted (using Appendix E3, Key Waste Forecasts). The forecast spreadsheet is a useful planning tool to record the types of waste that may be generated and forecast targets for re-use and/or recycling. This will be updated as the detailed design of the Project progresses.
- 7.4.2 Further detailed targets set for different waste types will be entered into a Waste Estimates Data Sheet (Appendix E4) prior to construction. This will identify how different the waste types will be managed during Works 7a construction (i.e. re-used on site, recycled off site etc.).
- 7.4.3 During construction, the Waste Management Data Sheet (Appendix E5) will be completed. These sheets will be updated every time waste is removed from the site and will record:
- The types and quantities of waste produced;
 - The types and quantities of waste that have been re-used/ recycled/ recovered/ landfilled or otherwise disposed of on or off site;
 - The identity of the person removing the waste;
 - The registration number of the waste carrier (for wastes taken off site);
 - A copy of or reference to the written description of the waste; and
 - Details of the site where the waste is taken and license / permit details.
- 7.4.4 The information derived from Appendix E.5 will be reviewed throughout the construction period. Where necessary, an updated plan will be produced to accommodate any changes, in order to reflect the progress of the project and

meeting the SWMP targets. When updates are made, the updated SWMP will be submitted to the relevant local authorities for their information.

8 WRAP Step Four: Identify how to manage your waste

8.1 Waste hierarchy

- 8.1.1 WRAP provides guidance on the management of waste through the application of a SWMP. Its philosophy is based on the waste hierarchy (Defra 2011).
- 8.1.2 Waste generated as part of the construction of the Project will be managed according to the principles of the waste hierarchy. The waste hierarchy ranks waste management options according to what is best for the environment, giving top place to waste prevention (by either waste elimination or reduction).
- 8.1.3 When waste has been generated, priority is given to re-use, then recycling, then recovery, and last of all disposal (for example, landfill), Figure 8.1. The waste hierarchy is a key element of sustainable waste management and is a requirement of the revised EU Waste Framework Directive and the Waste (England and Wales) Regulations 2011.

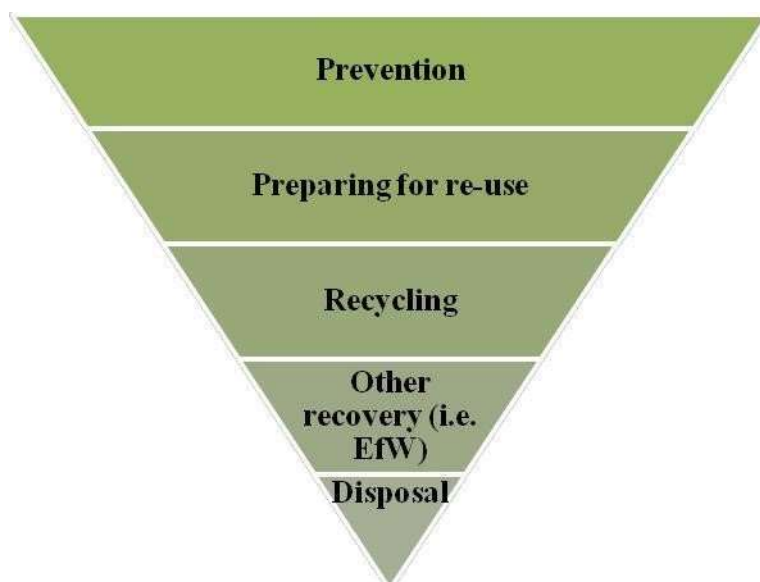


Figure 8.1 Waste hierarchy

- 8.1.4 The Construction ELO will ensure that all reasonable and available measures are considered to apply the waste hierarchy in order to achieve the best overall environmental outcome.
- 8.1.5 When considering the waste hierarchy, the ELO will give consideration to the following:
- The general environmental protection principles of precaution and sustainability;
 - Technical feasibility and economic viability;
 - Protection of resources; and
 - The overall environmental, human health, animal health, economic and social impacts.
- 8.1.6 Further details on the opportunities for waste prevention and minimisation are provided within Section 10.

- 8.1.7 The opportunities available for re-use, recycling and recovery of waste currently identified include:
- Vegetation site clearance arising will be chipped and removed to a composting facility;
 - Excavated materials (free from invasive species such as Japanese knotweed) will be incorporated into the works wherever possible; and
 - Cementitious materials will be crushed and screened into recycled aggregate which will be used as a capping material in carriageway construction.
- 8.1.8 Further opportunities will be investigated prior to construction and the ELO will ensure implementation of any such measures wherever possible.
- 8.1.9 Waste that cannot be reused, recycled or recovered will be collected and transferred to the site waste storage area for disposal. Further details on disposal can be found in Section 9.

9 WRAP Step Five: Identify where and how to dispose of your waste

9.1 Storage of waste

9.1.1 Waste will be stored in dedicated waste storage areas. The location and design of waste storage areas will have consideration to the following:

- Security – waste storage areas will be sufficiently secure to ensure that wastes cannot be tampered with;
- Containment – the waste within the container will be prevented from polluting the surrounding environment. This will include prevention of contaminated runoff, wind-blown waste and odours through the use of waterproof covers. If liquid waste is being stored, an appropriate bund will be put in place;
- Nuisance – waste containers will not be situated near residential properties or other sensitive receptors;
- Ease of access – waste containers will be positioned so that waste can be placed into them using the appropriate method. This will prevent spillage of wastes and contamination of the local area;
- Sufficient space – waste storage areas shall have sufficient space to allow for the appropriate number of containers to be stored and to allow the necessary level of waste segregation;
- Signage – waste storage containers will be appropriately labelled to clearly display the types of waste being stored; and
- Hazardous Waste – Hazardous Waste will be segregated from Non-hazardous Waste. Hazardous Waste will be contained in a manner where they cannot cause 'harm'. Hazardous Wastes will be stored in sealed containers which in turn will also be stored in a secure controlled location. Sealed containers can range from specialised skips to 205 litre barrels with sealable lids. A secure controlled location will be a bunded area within a plant yard or a container from which liquids cannot escape. If bunded, areas exposed to the elements will be covered to minimise the quantity of contaminated water that will need to be disposed of in an appropriate manner.

9.1.2 The ELO will be responsible for designating the waste storage areas in accordance with the principles outlined above. The ELO will undertake regular inspections to ensure waste is stored and segregated appropriately.

9.2 Disposal

- 9.2.1 Waste that cannot be reused, recycled or recovered on site will be collected by a licensed waste management contractor. The appointed waste contractor will have further provision for the segregation of recyclable waste, therefore maximising the percentage of waste diverted from landfill.
- 9.2.2 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 Controlled Waste (Registration of Carriers and Seizures of Vehicles) Regulations 1991 detail a system for the registration of carriers and also specific procedures for the seizure and disposal of vehicles used for the illegal transport of controlled waste and therefore all waste generated will only be transported by registered carriers. All sites receiving waste will have an appropriate permit, license or registered exemption form from the relevant environmental regulator.

9.3 Waste Transfer Notes

- 9.3.1 Waste Transfer Notes are required when waste is transferred from one person to another. The person accepting the waste must have a description of that waste in order for them to correctly transport, store and dispose of the waste. This is achieved through the use of a Waste Transfer Note which contains details on the waste producer, the waste acceptor and the nature of the waste via a physical description and a classification code which is taken from the List of Wastes (LoW). Waste Transfer Notes will be kept for a minimum of two years after the completion of the Project construction and three years after the completion of Project construction for Hazardous Waste Consignment Notes.
- 9.3.2 The ELO will be responsible for ensuring completion of Waste Transfer and Consignment Notes when waste is transferred and maintaining records.

10WRAP Step Six: Organise your materials and waste

10.1 Designing out waste

- 10.1.1 Waste will be carefully considered during the detailed design stage of Works 7a to minimise the amount of waste produced during construction. A key tool for reducing project waste is the Sustainable Design process. Sustainable Design principles that will be followed include:
- Good design – consideration to the form in which materials are supplied shall be given when materials are specified. i.e. consideration should be given to specify materials which require minimal amounts of trimming;
 - Good storage of materials – materials will be stored in such a manner to prevent damage during storage, from collisions with vehicles, water damage, vandalism and crushing damage from being staked too high. Provision shall therefore be made for the storage of materials under cover in a secure shelved environment;
 - Wastage through over ordering – A logistics system which allows ‘just in time’ deliveries to minimise the amount of time materials are stored on site; and
 - Wastage through over supply – A system will be put in place to ensure accurate estimates of material and equipment requirements to prevent any wastage through over supply.
- 10.1.2 A Waste Estimates Data Sheet (Appendix E.3) will be completed prior to construction to set targets for different types of waste. This will identify how different the waste types will be managed during Works 7a construction (i.e. re-used on site, recycled off site etc.).
- 10.1.3 During construction, the Waste Management Data Sheet (Appendix E.5) will be completed. These sheets will be updated every time waste is removed from the site and will record actual volumes and allow comparison with the targets set in Appendix E.4.

11WRAP Step Seven: Communicate the plan and carry out training

11.1 Waste management training

- 11.1.1 SWMP training will be implemented by the ELO to ensure that all relevant members of staff are competent in carrying out their duties in accordance with the SWMP. Information relevant to the SWMP will be included in the Site Induction and provided through regular toolbox talks.
- 11.1.2 The relevant staff members shall be provided with training to enable them to:
- Identify waste types and be aware of the potential re-use/disposal route. For the majority of staff on site this will take the form of a basic understanding of waste types. For members of the engineering and supervisory team further training will be given on accurately designating materials and wastes and the optimal recovery/disposal route; and
 - Review designs and ability to specify alternative materials such as site won, re-usable or recycled materials or materials with recycled content. This training shall be confined to senior engineers and management staff. Training should include a basic understanding of the legislation involved and how it affects the scheme, sources of advice on the re-use, recycling of materials and the availability of materials with recycled content.
- 11.1.3 The SWMP will be kept on site and staff will be briefed as to its location. All training records will be maintained and kept on site and be available for inspection on request.

12WRAP Step Eight and Nine: Measure your waste and update the SWMP, Review the success and learn

12.1 Site inspections

- 12.1.1 The ELO will be responsible for ensuring that waste is being disposed of in the most suitable manner and stored and disposed of within the duty of care. The ELO will therefore undertake regular inspections of the waste storage area and maintain audit record reports.

12.2 Monitoring of the SWMP

- 12.2.1 Records of the movements of waste (Waste Transfer and Consignment Notes) will be maintained and kept on site throughout Works 7a construction.
- 12.2.2 The Waste Management Data Sheet (Appendix E.5) will be completed as construction progresses. These sheets will be updated every time waste is removed from the site and will record actual volumes and allow monitoring against the targets set in the Waste Estimates Data Sheet (Appendix E.4).

12.3 Review the success of the SWMP

- 12.3.1 Upon the completion of the works, the SWMP will provide a record of how materials in the site have been managed and will allow a review of the waste management targets to be conducted.
- 12.3.2 In line with WRAP guidance, the SWMP will be kept for at least two years following the completion of construction of the Project.

Appendix E.1 DCO works sequence of construction

Construction Phasing Scheme - Phased Approvals Matrix

DCO Requirement 3

1. DCO Works Construction Sequence

Table 1: DCO Works Construction Sequence for commencing DCO Works (chronological order) *

Construction Phase	DCO Work Description Summary* [see Phasing Scheme for full details]	Work No.	Construction Year One				Construction Year Two				Construction Year Three				Construction Year Four				Construction Year Five				Construction Year Six			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Part 1A and Part 1B Work																										
1	New internal access road comprising 2 carriageways with a fence	7a																								
	Western Wall	1a																								
2	Eastern Seawall	1b																								
	Low voltage substation	1a(a)																								
	Construction of a jetty and floating pontoons and piles or dolphins	6a																								
	Temporary sediment berm cofferdam	2b																								
	Seaward safety zone including upto 16 dolphin piles	2c																								
	Landward safety zone	2d																								
	Buried pipeline extension of the existings long sea sewerage outfall	3																								
	New eastern channel training wall in the River Neath	4																								
New access track at eastern seawall landfill	7g																									
3	Turbine and Sluice Gate Housing	2a																								
	Dividing structures and wingwalls	2a(d)																								
	275kV grid connection	5a																								
4	Extension of the existing surface drainage outfalls serving Fabian Way	10(c)																								
	Switch room	2a(a)																								
	Scour protection	2a(b)																								
	Saltmarsh habitat area & coastal grassland habitat area	9																								
	New coastal grassland and dune area	10																								
	A beach area	10(a)																								
	transformers	2a(c)																								
	External gantry cranes & infrastructure for operating the turbines & sluices	2a(e)																								
5	Construction of onshore operation and maintenance facilities	6b(a)(i-vi)																								
	(i) parking spaces for O&M (ii) emergency access facilities	6b(b)(i-ii)																								
	O&M facilities and pilings to enable construction of offshore building	1a(e)																								
	Visitor/information point to serve Crymlyn Burrows SSSI	10(b)																								
	Provision of and for lighting	1a(b)																								
	Slipways, jetties and access points	1a(c)																								
	Landscaped area where the seawall makes landfill	1a(d)																								

* The sequence outlined in Table 1 indicates the intended timescales for commencement of DCO Works (including any development in connection with those Works, as set out at Schedule 1 Part 1A and 1B of the DCO), in line with the Construction Phasing (Appendix 1). The purpose of this schedule is to indicate the earliest stage of commencement (following approvals), incorporating seasonal factors. DCO Works may commence later than the phase shown, in line with the Construction Phasing (Appendix 1).

Appendix E.2 DCO Works location layout plan

Appendix E.3 Key Waste Forecasts

Appendix E.3 Key Waste Forecasts

Table 12.1 (Key Waste Forecasts) will be updated throughout the detailed design phase of the Project to identify and classify the types of waste that may be generated throughout the construction of the Project (WRAP Step 3). The table will also provide estimates as to the likely quantities of waste and set targets for re-use and recycling. The Works 7a contractor will complete the Key Waste Forecast table.

Table 12.1 Construction Key Waste Forecasts (to be updated through detailed design)

Construction Element	Material	Type of Waste	Estimated Quantity (m ³)	Target for Re-use/recycle %

Appendix E4 Waste Estimates Data Sheet

Appendix E.4 Waste Estimates Data Sheet

Table 12.2 (Waste Estimates Data Sheet) will be completed prior to Commencement of Works 7a and will allocate targets for waste generation and the re-use and recycling of waste (WRAP Step 8). The Works 7a contractor will complete the Waste Estimates Data Sheet prior to construction of the relevant works.

Table 12.2 Waste Estimates Data Sheet (to be completed prior to construction)

Waste Category & Type	Source of Waste	Re-used on site	Re-used off site	Recycled on site	Recycle off-site	Recovered on site-use off site	Sent to Permit exempt site	Sent to landfill site for disposal
unit		(m ³)	(m ³)	(m ³)	(m ³)	(m ³)	(m ³)	(m ³)
INERT								
Sub TOTAL								
NON-HAZARDOUS								
Sub TOTAL								
HAZARDOUS								
Sub TOTAL								
TOTAL VOLUMES								

Appendix E.5 Waste Management Data Sheet

Appendix E.5 Waste Management Data Sheet

Table 12.3 (Waste Management Data Sheet) will be completed each time waste is removed from site during construction and will record the actual volumes of waste generated, re-used and recycled and will allow monitoring against the targets set in Appendix E3 of the SWMP (Waste Estimates Data Sheet). The Works 7a contractor will maintain a Waste Management Data Sheet throughout construction of the works.

Table 12.3 Waste Management Data Sheet (To be completed each time waste is removed off site/re-used on site)

Waste Category & Type	Date	Waste Transfer Note Y/N	Name of Person Collecting Waste	Waste Carrier Registration No.	Name & Location of Waste Site	Permitted or Exempt Site	Permit Number	Re-used on site (tonnes)	Re-used off site (tonnes)	Recycled on-site (tonnes)	Recycled off-site (tonnes)	Recovered on site-use off site (tonnes)	Landfill (tonnes)	Load Cost £	Cost per Tonne £
Unit								(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	£	£
INERT															
Sub TOTAL															
NON-HAZARDOUS															
Sub TOTAL															
HAZARDOUS															
Sub TOTAL															
TOTAL VOLUMES															