CONVENTIONAL WASTE MANAGEMENT

7.1 Introduction to Waste

7.1.1 This chapter of the Environmental Appraisal (EnvApp) describes the framework and principles for the management of conventional waste arising from the construction, commissioning and operation of the proposed Hinkley Point C (HPC) Development. These management arrangements are presented in the context of national, regional and local legislation and policies and existing waste management infrastructure. Consideration is also given to the generation and management of municipal solid waste and commercial waste associated with the ancillary buildings within the HPC Development Site and the on-site and off-site Associated Developments. Management of radioactive waste generated throughout the operational life of the HPC Development is dealt with in Chapter 6 of this volume. Management of decommissioning wastes from the main HPC site is dealt with in Chapter 5 of this volume.

7.1.2 Work is ongoing to determine more precisely the types and quantities of waste which will have to be managed at each stage of the HPC Development. Further details will be presented within the DCO submission.

a) Definition of Waste

7.1.3 Waste is defined in UK law under the Environmental Permitting (England and Wales) Regulations 2010 (SI 676) (Ref. 7.1), which refer on to the definition of waste as set out in the Waste Framework Directive (2008/98/EC) (Ref. 7.2). The Directive defines waste as 'any substance or object ... which the holder discards or intends or is required to discard'.

7.1.4 Waste is interpreted broadly under EU and UK law, and there is no definitive list which specifies what is and is not waste. Whether or not a substance is discarded as waste and when waste ceases to be waste are matters that must be determined on a case by case basis. The producer or holder of a substance is required to decide whether it is being discarded as waste and the Environment Agency is responsible, as a "competent authority", for the enforcement of waste management controls in England and Wales (Ref. 7.3).

b) Types of Waste

7.1.5 The main categories of waste are defined below:

i) Inert Waste

7.1.6 Inert waste is considered as such if it meets the following criteria (as set out in the EU landfill directive (99/31/EC)(Ref. 7.4)):

- it does not undergo any significant physical, chemical or biological transformations;
- it does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health; and
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- its total leachability and pollutant content and the ecotoxicity of its leachate are insignificant and, in particular, do not endanger the quality of any surface water or groundwater.

7.1.7 Examples of inert waste include building rubble, waste glass and concrete.

ii) Non-Hazardous Waste

7.1.8 Non-hazardous waste is defined in the Environmental Permitting (England and Wales) Regulations 2010 (Ref. 7.1) as waste that is not hazardous waste. Examples include uncontaminated wood, metals, plastics, soil and stones and general office wastepaper.

iii) Hazardous Waste

7.1.9 Hazardous waste is also defined in Environmental Permitting (England and Wales) Regulations 2010 (Ref. 7.1); the definition refers to the Hazardous Waste (England and Wales) Regulations 2005 (as amended) (SI 894) (Ref. 7.5), which itself refers to Directive 91/689/EEC (as amended) on Hazardous Waste ("the Hazardous Waste Directive") (Ref. 7.6). The List of Wastes (England) Regulations 2005 (SI 895) (Ref. 7.7) lists specific types of waste and indicates whether it is hazardous waste by placing an asterisk next to the waste description. These wastes are considered hazardous pursuant to the Hazardous Waste Directive.

7.1.10 Examples of hazardous waste include oils, chemicals, fluorescent light tubes, batteries, materials contaminated with hazardous substances above threshold levels given in the Hazardous Waste Directive 91/689/EEC (as amended) (Ref. 7.6).

7.2 Potential Environmental Impact of Waste

7.2.1 Waste, if not managed responsibly during its handling, storage, transport, treatment and disposal, can cause contamination of environmental media (land, air and water) from accidental release and can also increase health risks, produce odour, litter and encouragement of pests and vermin. In addition, the treatment of waste to reduce its volume or hazardous properties can result in the production of emissions or discharges to the environment. The transport of waste uses fuel and contributes to carbon dioxide emissions.

7.2.2 In recent years the option of disposal of waste to landfill has become less attractive as a result of legislative, economic and environmental drivers that seek to promote the implementation of waste management in accordance with the Waste Hierarchy Section 7.3.2. In some circumstances, this results in incineration becoming a preferable alternative to landfill.

7.3 UK Waste Management

a) UK Government Waste Strategy

7.3.1 The Government’s strategy for non-radioactive wastes was published in 2007 (Ref. 7.8) and contains a clear commitment to the application of the principles of the Waste Hierarchy and emphasises the prevention of waste arisings, re-use and recycling as opposed to disposal. The main elements of the strategy are to:
• incentivise efforts to avoid waste arising, and where this is not possible, to reduce, re-use and recycle waste and recover energy from waste;
• reform regulation to drive the reduction of waste and diversion from landfill while reducing costs to compliant businesses and the regulator;
• target action on materials, products and sectors with the greatest scope for improving environmental and economic outcomes;
• stimulate investment in waste infrastructure and markets for recovered materials; and
• improve national, regional and local governance of waste management.

b) Waste Hierarchy

7.3.2 The key decision making framework in waste management is the Waste Hierarchy, which ranks potential waste management options in terms of their environmental impact based on underpinning environmental principles. Eliminating waste sits at the top of the hierarchy, with disposal being the least favourable option, at the bottom. The waste hierarchy is illustrated in Figure 7.3.1 below.

Figure 7.3.1: Waste Hierarchy (Ref. 7.9)

![Waste Hierarchy Diagram]

c) Prevention and Reduction of Waste

7.3.3 The preferred option is to eliminate the production of waste from the outset through the following examples:

• Correct Classification;
• Reduction in use of packaging;
• 3D modelling; and
• Just in Time Delivery.
Correct Classification

Implementation of a waste classification process will enable a clear distinction to be made between waste and materials that have the potential to be re-used. The re-use of certain materials without any further treatment, for the purpose for which it was originally conceived, is considered a form of waste prevention as the material is never classified as waste.

In cases where materials from earthworks are produced which have the potential to be re-used on the same site as is the case for the HPC Development, they can be controlled effectively using the CL:AIRE Definition of Waste: Development Industry Code of Practice (Ref. 7.10). The Code of Practice recommends the implementation of a Materials Management Plan (MMP) to identify the types and quantities of materials which will require management and to outline how these materials will be reused. A MMP will be produced for the HPC Development. The Code of Practice signals a move from prescriptive waste management regulations to a risk-based approach. Developers can self-regulate when re-using surplus soil, speeding up site preparation works and reducing the amount of spoil disposed of to landfill.

Reduction in Use of Packaging

A high percentage of the waste produced on a construction site arises from packaging materials. Reduction in packaging waste can be achieved by cutting down on the amount of packaging or through the use of returnable transit packing such as pallets and crates.

3D Modelling to Identify Exact Quantities of Material

The use of 3D modelling during plant design, which seeks to enable the exact quantification of materials needed, can contribute to waste prevention and reduction through:

- reduction in fabrication and construction errors;
- significant improvement in design integration; and
- reducing ordering of materials surplus to needs.

Where practicable, reduction of waste at the design stage can result, for example, in a reduction in off-site prefabrication and less need for temporary works. Extra thought put in at design stage can result in the use of construction materials with high recyclable content.

Just in Time Delivery

'Just in time' delivery (JIT) is an effective concept in the reduction of waste. JIT can be defined as the delivery of parts and materials timed to the needs of the production system. Where practicable, this can prevent over ordering and reduce the potential for damage to site stored materials. This results in a reduction of stockpiles of materials on site and a reduction in the production of waste, since materials may be lifted directly into place during delivery.

Preparation for Re-use

Preparing for re-use can include checking, cleaning or repairing activities on products or components of products to enable them to be re-used rather than becoming waste. Examples of preparation for re-use include:

- concrete from demolition being crushed and used for fill; and
- re-sizing of timber for formwork and walkways.
7.3.11 Although the materials may not be classified as a waste, preparation for re-use is a waste recovery activity and may be subject to waste permitting controls (examined on a case by case basis) under the Environmental Permitting Regulations 2010 (Ref. 7.1). To aid this process, the Waste and Resource Action Programme (WRAP) has developed a Quality Protocol (Ref. 7.11). The purpose of this Quality Protocol is to provide a uniform control process for producers to reasonably state and demonstrate that their product has been fully recovered and is no longer waste. It also provides purchasers with a quality-managed product to common standards, which increases confidence in performance. Also, the framework created by the Quality Protocol provides a clear audit trail for those responsible for ensuring compliance with relevant waste management legislation.

e) Recycle

7.3.12 Some manufacturers run recycling schemes for their products (e.g. plasterboard). These schemes can be included in the supply trade contract or provided via a waste management company.

7.3.13 The hierarchy highlights the importance of sustained effort to source such recycling routes for wastes that cannot be re-used on site.

f) Other Recovery (e.g. energy recovery)

7.3.14 Where re-use and recycling are not viable options, the hierarchy directs attention to exploring and where practicable employing other waste recovery processes. This generally involves consigning the waste for incineration incorporating energy recovery (e.g. combined heat and power plant, energy from waste, pyrolysis). (However, the characteristics and location of the HPC Development may constrain such options in this case).

g) Other Disposal (except Landfill)

7.3.15 If re-use, preparation for re-use, recycling and other recovery processes are not practicable, then other disposal options should be considered before disposal to landfill is used. This will generally include incineration without energy recovery.

h) Disposal to Landfill

7.3.16 In line with the requirements of the Landfill Directive (99/31/EC) (Ref. 7.4), to minimise the environmental impact of the construction phase of the proposed development, disposal to landfill will be used as the last option for the HPC Development. Final disposal to landfill will be avoided whenever possible by utilising the options listed above as fully as is practicable, and considering other disposal methods such as incineration for waste to energy. Landfill is quickly becoming the least economically and environmentally acceptable option due to the rapid reduction in landfill void space availability, increases in landfill tax, adverse amenity effects, land contamination and greenhouse gas production potential.

i) Local Government Waste Policy

7.3.17 In addition to national policies and strategies, there are also relevant local policies relating to waste management. The Somerset Waste Local Plan 2001-2011 (Ref. 7.12) sets out a number of policies which indicate a commitment to sustainable waste management practices. These include:
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- the Proximity Principle i.e. the management of waste as close to its source of generation as possible and regional self-sufficiency in terms of waste management facilities; and
- the Waste Hierarchy including support for practices which minimise waste production, maximise the re-use of waste and the management of residual waste material in accordance with the principles of sustainable development.

7.3.18 The use of the Proximity Principle, whereby the off-site movement of waste is minimised, is important to reduce environmental impact arising from the transport of waste. Practically, this includes the treatment of waste on-site (with the relevant permit in place) or the use, where possible, of local waste treatment and disposal facilities. The Proximity Principle does not exclude the use of facilities further from the site, as there may be particular reasons for using these, but relevant facilities closest to the site of waste production should be given preference where practicable. It does ensure, however, that due consideration is given to this principle.

7.4 Waste Management Regulation in the UK

7.4.1 The UK Government’s waste management strategy is supported by a regulatory framework which aims to ensure that all waste is safely and appropriately managed in ways that pose no unacceptable risks to people or the environment.

7.5 Waste Regulatory Framework

a) Regulatory Bodies

7.5.1 The main bodies in England with responsibilities for waste regulation are:
- DEFRA, the Government department responsible for policy and regulations on a number of environmental issues including waste and recycling;
- Environment Agency, which is responsible in England and Wales for the enforcement of environmental protection legislation in the context of sustainable development. It authorises and regulates non-radioactive discharges and disposals to air, water (both surface water and groundwater) and land; and
- County Councils, which are the authorities responsible for waste management. They are required to ensure that the waste infrastructure needs of their area are planned and appropriate and to make arrangements for the collection and management of domestic and commercial waste.

b) Applicable Legal Framework for Waste Management and Relevant Guidance

7.5.2 The principal statutory legislation and guidance that is relevant to conventional waste management is outlined below. This is not an exhaustive list and is intended to provide a broad overview of the most relevant items of legislation.
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7.5.3 In accordance with the Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991 (Ref. 7.13), all waste material to be transported off site shall be disposed of by registered waste carriers, using vehicles licensed for the transport of waste materials and taken to appropriately licensed waste management facilities. The Environmental Protection (Duty of Care) Regulations 1991 (Ref. 7.14) further require that waste producers manage their waste responsibly and check that the person to whom they give their waste is authorised to receive it and disposes of it correctly. The Regulations require the waste producer to characterise the waste to enable the recipients of the waste to deal with it safely and appropriately. This is done through waste transfer notes, which must accompany the waste when it is transferred or disposed of. These must be completed and kept for 2 years.

ii) Guidance: Waste Management: The Duty of Care, a Code of Practice, Defra (Ref. 7.15)

7.5.4 The Duty of Care Code of Practice contains reference to the commonly accepted legal definition of waste under EU and UK law (i.e., any substance that the holder discards, intends to discard or is required to discard). It recommends a series of steps which should normally be enough to meet the requirements of the Duty of Care requirements. The Code cannot cover every contingency. The legal obligation is to comply with the legislation itself rather than with the Code. Annex A of the Code gives a detailed explanation of the applicable law.

iii) Hazardous Waste (England and Wales) Regulations 2005 SI 894 (as amended) (Ref. 7.5)

7.5.5 The Hazardous Waste (England and Wales) Regulations 2005 require the waste producer to characterise the waste to enable recipients of it to deal with it safely and appropriately. Waste is required to be removed from site and taken to an appropriately licensed facility for treatment or disposal. A consignment note must accompany the waste. Consignment Notes must be kept for 3 years.

7.5.6 A waste producer who produces over 500kg of hazardous waste in a year must also notify the Environment Agency of this on an annual basis, as part of the hazardous waste registration process.


7.5.7 The Guide to the Hazardous Waste Regulations (commonly referred to as WM2) is a guide to help determine if waste is hazardous or not. The document provides background information on the Hazardous Waste Regulations and how wastes are assessed. It contains advice on dangerous substances and/or properties that could be associated with particular hazardous waste entries and an explanation on classification is provided through case studies, along with discussion points to highlight key issues. In addition, advice on the 14 hazardous properties, determining assessment methods, threshold concentrations and advice on which test methods to use are also provided, along with advice on the use of data sources that may be used when trying to find appropriate data for substances within the waste.
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The Site Waste Management Plans Regulations 2008 (SI 314) (Ref 7.17)

7.5.8 The Site Waste Management Plans Regulations 2008 (SWMP Regulations) aim to make the construction industry more sustainable by ensuring that those responsible for development of projects are aware of the waste being produced, so that it can be reduced.

7.5.9 The purpose of a SWMP is to ensure that building materials are managed efficiently, waste is disposed of legally, and that material recycling, reuse and recovery is maximised. A SWMP must be prepared for all construction projects meeting the requirements outlined below if the project has an estimated value greater than £300,000 (excluding VAT). Additional requirements are described in the Schedule for projects over £500,000 (which is the case for the HPC Development).

7.5.10 A SWMP must be prepared for the following types of project:

- the construction, alteration, conversion, fitting out and commissioning of a structure;
- the preparation for an intended structure, including site clearance, exploration, investigation (but not site survey) and excavation, and the clearance or preparation of the site or structure for use or occupation at its conclusion;
- the assembly on site of prefabricated elements to form a structure or the disassembly on site of prefabricated elements which, immediately before such disassembly, formed a structure;
- the removal of a structure or of any product or waste resulting from demolition or dismantling of a structure or from disassembly of prefabricated elements which immediately before such disassembly formed such a structure; and
- the installation, commissioning, maintenance, repair or removal of mechanical, electrical, gas, compressed air, hydraulic, telecommunications, computer or similar services which are normally fixed within or to a structure.


7.5.11 This guidance provides an overview of the additional, non-statutory guidance on SWMPs, which is currently available from various organisations.

7.5.12 The available tools and guidance are briefly described, with links to further information. The information available is suitable for all sizes of project and can be used for projects below £300,000 in value. The list also includes the DTI (now Business Innovation and Skills (BIS)) Code of Practice (2004), which can also be used for projects falling under the threshold of £300,000.

Environmental Permitting (England and Wales) Regulations 2010 (SI 675) (Ref. 7.1)

7.5.13 These regulations have been developed and implemented in stages, ultimately bringing together several permitting regimes into a single regime in 2010. The Regulations encompass former IPPC Permits, Radioactive Substances Authorisation, Water Discharge Consents, Groundwater Authorisations, Landfill Directive requirements and Waste Management Licensing.

7.5.14 An environmental permit may be needed under the Regulations for mobile waste treatment facilities which may be required on the Development Site. A permit will also be required if
waste produced on-site (or off-site) is stored there for over a specified time. The time periods differ according to the characteristics of the waste stream.

7.5.15 Those storing, treating or disposing of waste may require an environmental permit to do so.

7.5.16 Certain activities can be exempt from the requirements of the regulations.

7.5.17 The Regulations also implement the requirements of the Landfill Directive in the UK and regulate disposal to landfill. Under the Landfill Directive, waste inputs to landfill are restricted in two ways; by banning certain wastes from all landfills and by applying waste acceptance criteria to the different types of landfill.

7.5.18 There are certain types of waste that cannot be disposed of to landfill. These must either be recovered or recycled or disposed of in other ways, for example incineration. Wastes which are banned from landfilling under the Landfill Directive include:

- any liquid waste;
- infectious medical or veterinary waste;
- whole or shredded used tyres;
- waste that might cause a problem in the landfill (e.g. hot or chemically active waste); and
- any waste that does not meet the waste acceptance criteria for that class of landfill.

7.5.19 Waste is required to be pre-treated to reduce the amount which goes to landfill. Waste going to landfill must meet the Waste Acceptance Criteria (WAC) of the landfill site. This will differ by landfill.

viii) List of Wastes (England) Regulations 2005 (SI 895) (as amended) (Ref. 7.7)

7.5.20 The List of Wastes (LOW) Regulations contains the European Waste Catalogue list of codes used to classify wastes. The LOW is divided into twenty chapters, many of which are industry sector based but some are based on materials and processes. There are codes for individual waste streams, each of which is assigned a six-digit code.

7.5.21 Hazardous wastes are identified by an asterisk (e.g. 03 01 04*, 03 02 01*). There are two types of hazardous waste entries in the List of Wastes:

- mirror entries – used where the waste description contains a reference to dangerous substances. These entries are mirrored with a corresponding non-hazardous six-digit code for those wastes which do not contain dangerous substances. The six-digit code with the asterisk is only appropriate if the waste contains dangerous substances, or the specific dangerous substance at or above the appropriate threshold;
- absolute entries - so called because they are always hazardous regardless of the composition of substances in the waste, e.g. 03 02 04* inorganic wood preservatives.

ix) Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (SI 871) (as amended) (Ref. 7.19)

7.5.22 These regulations apply to those who produce packaged products, design or specify packaging, import packaged goods or filled packaging into the UK, sell packaged goods or filled packaging and/or place packaging or packaged goods on the market.
7.5.23 The packaging waste obligations can be met by assessing how much packaging the business handles, registering with the environmental regulator, submitting an operational plan, recycling and recovering packaging waste, confirming recovery and recycling obligations and the provision of information to customers.

x) Other Potentially Applicable Waste Legislation

7.5.24 Other regulations which may be of relevance to the HPC Development include:

- Waste Electrical and Electronic Equipment Regulations 2006 (SI 3289) (as amended); and
- Waste Batteries and Accumulators Regulations 2009 (SI 1890).

7.6 Hinkley Point C Waste Management Strategy

a) EDF Energy Vision for Waste Management

7.6.1 The following sections describes in generic terms the framework and principles EDF Energy intends to use for the management of conventional waste arisings throughout the phases of the HPC Development. This is based upon a top down approach driven by an overarching waste management vision, as detailed below.

“To safely and consistently manage the production, treatment and disposal of waste in compliance with all relevant waste legislation, taking into account external and internal policy drivers, environmental and waste management principles, best practice and using innovative technologies where practicable and applicable to actively minimise impact on the environment and to protect workers and the public.”

7.6.2 EDF Energy is committed to managing and minimising its impacts on the environment. The Company sees waste as a key area where successful planning and control can ensure a significant benefit to the local and global environment.

7.6.3 The delivery of the vision will be ensured through the implementation of integrated waste management principles and detailed site waste management planning, which in turn will be underpinned by appropriate operating procedures and instructions throughout the supply chain.

7.7 Hinkley Point C Integrated Waste Management

7.7.1 Strategic planning of waste management for construction is a regulatory requirement and will be implemented by the production of a Site Waste Management Plan for the construction phase. An Integrated Waste Statement has been developed that states how EDF Energy intends to manage wastes generated at all stages of the project lifecycle from design and procurement through construction, operation, decommissioning and site restoration in accordance with the principles of integrated waste management.

7.7.2 The Integrated Waste Strategy (IWS) currently being developed will build on the statement and describe the expected wastes and discharges, both radioactive and conventional and will set out the logic behind the development of individual waste strategies and how their integration results in the best approach for effective management of all the wastes generated by the site.
7.7.3 The principal objectives of the IWS will be to ensure that a consistent and safe approach is adopted when making decisions on waste management issues and to ensure that compliance with environmental protection principles is maintained for all waste types, including materials that may become waste in the future. The IWS will aim to ensure that, during the construction, operation and decommissioning of the HPC Development, workers, the public, and the environment (including non-human species) are protected. These objectives are achieved by minimising discharges of wastes to the environment through the application of waste management principles including the waste hierarchy and proximity principle and Best Available Techniques (BAT). BAT may be considered as the most effective economically and technically viable technology and methods designed to prevent and where this is not practicable, to reduce, emissions and their impacts on the environment as a whole.

7.7.4 The IWS is intended to provide confidence that the challenges associated with the management of wastes from the construction and operation of the HPC Development are fully understood and planned for and that solutions are available within the envelope of current UK and international experience.

7.7.5 The IWS will set out the core principles which will be used to underpin waste management strategies for the proposed HPC Development project. These are expected to include:

- minimise the generation of wastes, as far as is reasonably practicable, through application of the Waste Hierarchy;
- protect the environment and people by minimising the impact of discharges and disposals to the environment;
- document, retain and record appropriate information relating to the management and disposal of wastes;
- safely store wastes in robust and adequate containment, to prevent leakages resulting in the generation of additional waste, contaminated land, groundwater or the broader environment;
- provide access to Suitably Qualified and Experienced People (SQEP) as a resource for advice to ensure that anyone involved in activities that impact on the generation and/or disposal of wastes will be provided with adequate and appropriate training and information;
- to keep the IWS up to date by maintaining consistency of the IWS with Government policy, regulatory requirements, the availability of waste storage and disposal facilities, advances in waste management technologies and any internal changes in operating conditions; and
- review operational experience to enable ongoing development and continual improvement in waste management practices, to support the key principles of application of the Waste Hierarchy and BAT.

7.8 Waste Generated during Construction of Hinkley Point C and Associated Developments

7.8.1 This section provides a discussion of the waste types and indicative waste volumes which may be generated during the construction of HPC and the Associated Developments.

a) Enabling Works

7.8.2 The HPC Development Site currently comprises agricultural land. Part of the Development Site falls within the Nuclear Site Licence area (the Built Development Area East, BDAE). Within the
BDAE there is a mound feature which comprises reworked natural soils and made ground containing construction and demolition waste. These materials were derived from construction of the Existing Hinkley Point Power Station Complex. Within the mound and locally elsewhere within the BDAE there are limited areas where Asbestos Containing Materials (ACMs) have been encountered.

7.8.3 The Enabling Works will involve the removal of a proportion of the materials present within the mound feature and re-use of this material where possible. The localised asbestos contamination within the mound and elsewhere within the BDAE will also be removed prior to the commencement of the Preliminary Works.

7.8.4 Management of the materials during the works described above will be controlled under a Materials Management Plan using the CL:AIRE Definition of Waste: Development Industry Code of Practice (Ref. 7.10). Materials will be re-used, treated to render them suitable for re-use or disposed of in line with the requirements of environmental legislation.

7.8.5 In addition to the materials described above, other potential materials and wastes may be generated from the following activities including:

- land clearance (rerouting of underground low voltage cables or existing underground services);
- demolition of derelict barn buildings;
- temporary fencing;
- the construction of temporary NDA/BE overflow parking and access on eastern licensed area;
- construction of a temporary water supply; and
- contractor compound (new roundabout construction including lighting and drainage).

7.8.6 These activities may produce spoil which, as far as reasonably practicable, will be re-used on the Development Site. Stone arisings from the demolition of the barns and vegetation and wood arising from the clearance of hedges and trees will either be re-used on-site or transferred into the local recycling market to undergo the optimum waste recycling technique for that particular waste such as chipping or shredding etc. As well as the environmental benefits of recycling versus disposal, this activity has the additional benefit of contributing positively to the local waste market.

b) Preliminary Works (Site Preparation and Temporary Jetty)

7.8.7 The Preliminary Works consist of Site Preparation (substantial Stage 1 earthworks) and building of the temporary jetty. The earthworks include drainage, terracing, construction of embankments, stockpiling and construction of retaining structures.

7.8.8 A comprehensive programme of site investigation work has been conducted and is ongoing at the current time. The programme has included an extensive radiochemical and non-radiochemical soil sampling programme. The results to date indicate that with the exception of the ACM contamination within the BDAE (which will be addressed during the enabling works) no substantive contamination of soils exists on the HPC Development Site. The major proportion of the soils present on-site can be re-used without the requirement for treatment with respect to contamination.

7.8.9 The materials arising from soil stripping and excavations will be re-used, in accordance with a Materials Management Plan, to create the various construction and development platforms and
for agricultural land restoration, ecological habitat creation, soft landscaping and visual screening/noise attenuation bunds as appropriate.

7.8.10 Construction of the temporary jetty may also produce spoil which can be re-used on-site.

7.8.11 An estimated 2.1 million cubic metres of material including soil, overburden and weathered and fresh rock will be generated by the required earthworks and excavations to be undertaken for on the HPC Development Site. Any material found to be contaminated as the Preliminary Works progress will be treated using the best environmental option at the time for the particular contaminant characteristics which have been identified.

7.8.12 The Preliminary Works will produce wastes associated with welfare facilities for staff and contractors working on the site (i.e. food wastes, sanitary wastes, sewage from the temporary treatment plant, paper, glass, card and plastic). The quantity of these types of waste will depend upon the number of people working on the site during this stage of the project. There may be some small quantities of hazardous wastes produced at this stage of development, for instance, minor quantities of waste oil and chemicals.

c) Main Civil Construction Phase on HPC Development Site

7.8.13 The main plant construction activities will commence with Stage 2 earthworks and marine works. Specifically these works include drainage, ripping and blasting of fresh rock in areas where deep structures and foundations are required, sea wall construction, tunnel excavations and construction of the nuclear island and ancillary buildings.

7.8.14 Any excess material which cannot be re-used on the HPC Development Site will be re-used, where possible, at one of the Associated Developments or at another appropriate location in accordance with the Materials Management Plan. Any of the material found to be contaminated as the Main Civil Construction Phase progresses will be treated using the best environmental option at the time for the particular contaminant characteristics which have been identified.

7.8.15 As with the Preliminary Works, the Main Civil Construction phase will produce wastes associated with welfare facilities for staff and contractors working on the site. The quantity of waste will be significantly greater than that produced during the Preliminary Works and will vary with time over this phase as workforce numbers fluctuate in relation to the programmed activities. For the main civil works, it has been assumed that 5% of the construction materials used will end up as waste. These materials include wood, concrete, metals, paper etc.

d) Construction of Associated Developments

7.8.16 The Associated Developments, considered in this section, include the Hinkley Campus and Bridgwater A and C accommodation sites, Junction 23 and 24, Williton and Cannington Park and Ride locations and the Cannington Bypass. For these activities, data has been derived using the Smartwaste benchmark calculator (www.smartwaste.co.uk). The total amount of potential waste produced on these sites will be approximately 45,000 tonnes. This is made up of wastes generated from the demolition of existing structures, excavation of foundations and construction of new facilities.

7.8.17 The inert wastes will be made up of bricks, tiles and ceramics and concrete. The non-hazardous waste arising from the Associated Developments is likely to include insulation, metals, packaging, gypsum, binders, plastics, timber, floor coverings, electrical and electronic equipment, furniture, canteen and office waste and non-hazardous liquids. Hazardous wastes may include asphalt and tar, oils, chemicals and asbestos. It is likely that the majority of these
wastes will be produced in the first 1 to 2 years of the Associated Development works from 2012 to 2014.

i) **Contaminated soils**

7.8.18 The Bridgwater A site, and potentially other Associated Development, is likely to be contaminated from previous land use. The Bridgwater A site currently has a disused cellulose factory located on it. Contaminated soils will be assessed and remediated using a risk assessment approach as provided for in UK legislation and guidance. Remediation will be based on the principles of:

- ensuring that remediated land is suitable for its intended use both for the period of use as an Associated Development site and its legacy use;
- minimising the amount of contaminated soil that requires remediation through adequate site investigation to delineate contamination and use of a risk assessment approach; and
- preference for the use of in-situ and on-site remediation techniques to bring contaminated soil back into beneficial use.

ii) **Topsoil and Subsoil**

7.8.19 Topsoil and subsoil is not included in the 45,000 tonnes. This soil will not be classed as waste as it is not likely to be contaminated and has the potential to be re-used on site. It will be stockpiled either in a soil storage area or will be used to create noise attenuation bunds or landscaping features. Soil that is stockpiled will be used to reinstate the Associated Development sites at the end of the power station construction phase.

iii) **Operational Wastes**

7.8.20 Wastes associated with the operational phase of the Associated Developments during the Main Civil Construction Phase (from 2012 to 2019) have not yet been fully quantified. However, preliminary waste estimates can be made for this phase by taking the total number of people expected to be present at the accommodation facilities (i.e. Hinkley Campus, Bridgwater A and Bridgwater C) and adopting an assumed rate of production of 500kg of waste per person per year. A total of 1925 people producing 500kg of waste per year over a period of eight years equals a total of 770 tonnes of waste from the operation of the accommodation facilities over the construction phase.

iv) **Associate Development Demolition and Removal**

7.8.21 Towards the end of the HPC construction programme, Associated Development sites that do not have an agreed legacy use will be decommissioned and demolished. In most cases they will be returned to their pre-existing agricultural uses. The process will involve the removal of all buildings and infrastructure (roads, pavements, lighting etc.), the replacement of subsoil and topsoil and landscaping of sites to restore them to their previous condition as far as is practicable to do so. The demolition and relocation of soil will involve managing a total quantity of materials of approximately 250,000 tonnes. This will mainly comprise soils that will be taken from storage areas for reuse and inert waste materials (e.g. brick, concrete) that will be re-used or recycled.
7.9 Arrangements for Construction Waste Management

7.9.1 All construction wastes will be managed via a Site Waste Management Plan (SWMP).

7.9.2 The SWMP will outline how waste will be managed throughout the construction phase to minimise impact upon the environment. The SWMP will establish Key Performance Indicators and define how performance will be monitored. It will also set out the way in which the management of waste will be incorporated into plant design, procurement and will describe procedural tools for the estimation of waste arisings and for decisions relating to the method of waste treatment and disposal.

7.9.3 The SWMP will identify the roles and responsibilities in relation to waste management within EDF Energy and within the supply chain.

7.9.4 The SWMP will refer to, and has been written in conjunction with, other documents including:

- Materials Management Plan – management of clean waste for re-use;
- Contaminated Land and Groundwater Strategy – management of potentially contaminated land; and

a) Roles and Responsibilities

7.9.5 Roles and responsibilities will be designated in relation to the management of waste. The roles and responsibilities defined within the Site Waste Management Plans Regulations 2008 (SI 314) (Ref. 7.17) mirror those of the Construction (Design and Management) (CDM) Regulations 2007 (SI 320) (Ref. 7.20) in terms of ‘Client’ and ‘Principal Contractor’ (PC). It is assumed, at this stage, that the waste will be managed by the PC or by a single waste broker working for the PC. References below to "Client" are references to EDF Energy as the project developer.

7.9.6 The main advantage of employing a single waste broker is to provide integrated management of the power station site and the Associated Development sites. This is important to ensure compliance with applicable regulations in terms of control of waste and record keeping, but also to enable efficient and practical waste management - for instance the use of the same type of waste collection facilities at each site and the use of shared waste management facilities.

b) Design

7.9.7 In accordance with the Waste Hierarchy, minimising the creation of waste is a primary objective. The SWMP will make clear that it is the responsibility of the Principal Contractor, wherever possible, to reduce potential waste arisings at the design stage.

7.9.8 There are two main areas where minimising the creation of waste is possible:

i) Design of Construction Works

7.9.9 Careful planning and design of site layouts will enable as much spoil as possible to be re-used on the main site and Associated Developments for construction and development platforms and for features such as noise attenuation bunds and/or landscaping mounds.
7 Conventional Waste Management

ii) Design and Manufacture of Plant Items

7.9.10 It is possible to carry out 3D modelling to calculate the quantity of material required for a specific use. This can potentially reduce wastage. Packaging can be designed to protect materials, plant and equipment but also to be reduced as far as practical. Packaging can also be made of material that has already been recycled or which could readily undergo recycling after use.

c) Procurement

7.9.11 The Principal Contractor has a procurement process to allow contracts to be placed. To ensure that all contractors who work on the Hinkley Point C main site or any of the Associated Developments are legally compliant and work according to the expectations of the Client, the following controls will be in place:

- Tender Specifications will include clear expectations of contractors, in relation to waste and other environmental management responsibilities, whilst working on the project.
- Tender Submissions will be reviewed by the Principal Contractor and by the Client to ensure that the submissions meet the expectations set out in the specification.

d) Waste Arisings

7.9.12 At this stage, it is difficult to provide accurate estimates of quantities of waste produced during the construction phase. However as the project design progresses and the scope and schedule of individual packages of work are identified, waste arisings associated with these packages will become more accurately known.

7.9.13 The PC or appointed Waste Broker will be expected to provide and record estimates of the waste which are expected to be produced during each phase of the project. These figures will provide a good basis for understanding the waste types and quantities in relation to their treatment and disposal requirements.

7.9.14 As the project progresses, contractors will be required to further define waste types and quantities, specific to their work, prior to work commencing. This will provide greater clarity as to the required waste management controls and facilities and when they are needed. The PC or Waste Broker will be required to provide facilities and management arrangements for the wastes and decide upon the correct method of treatment and/or disposal for each waste type, again before work commences. If on-site treatment is required, communication with the Client, who is responsible for securing the relevant environmental permit, may be necessary.

7.9.15 In the early phases of the project, the activities taking place will produce significant quantities of spoil. The spoil, if found to be clean, can be re-used on the site. This spoil will be classed as a material for re-use rather than a waste and will be managed in accordance with a Materials Management Plan (MMP). In addition to eliminating the production of waste, this management strategy minimises the movement of material off-site therefore minimising the environmental impacts associated with waste movements.

e) Waste Treatment and Disposal

7.9.16 All waste will be treated or disposed of in accordance with legal requirements. The PC or Waste Broker will be responsible for ensuring contractor compliance and for discharging waste producer responsibilities in terms of control, transfer and documentation.
In line with the waste hierarchy, and using the strategies for design and materials management described in the previous sections, the amount of waste should be limited to those materials for which there is no other option but to class them as waste and thus to treat and/or dispose of them.

In line with the Waste Hierarchy, utilisation of the best available options to minimise the environmental impact of waste will be considered.

To this end, where reasonably practicable, construction waste will be managed as follows:
- segregation on site (nominally into metal, bricks and blocks, paper and cardboard, wood, plasterboard and gypsum products, hazardous waste, mixed non-hazardous construction waste).
- further on or off-site segregation of mixed non-hazardous construction waste at a Materials Recycling Facility (MRF).
- potentially energy recovery from waste (waste to energy – W2E).

The use of MRFs alone has the potential to achieve a diversion of approximately 85% of waste away from landfill. If waste is segregated on-site prior to further segregation of residual mixed waste at an off-site MRF then diversion rates in excess of 90-95% can be achieved. This will leave 5-10% of the waste stream that will require to be sent to landfill or to a waste to energy plant.

The achievement of these aims is dependent primarily on the regional infrastructure in terms of waste management contractors and the presence and capacity of appropriate waste treatment facilities.

Local Waste Infrastructure

There is limited waste management infrastructure within Somerset. There is a suitable MRF in Taunton but this is not expected to be of sufficient capacity. Further afield there are additional MRFs in Exeter and Bristol that could be used. However, it is preferable, in terms of environmental best practice, that construction waste is managed locally within the County. To service the project, it is expected that waste management contractors will need to invest in the creation of additional waste management infrastructure within Somerset. This will provide a beneficial legacy to the County once the construction works have been completed.

Presently there are no W2E plants in the region. There are several W2E plants and other waste management facilities that are proposed for construction in the Avonmouth area of Bristol, but it is not expected that these would become operational until 2013 or beyond. Therefore in the short term, until these facilities are developed and operational, there will be a need to either dispose of residual waste (that is suitable for W2E plants) to landfill or to take this material to the nearest commercial waste to energy plant in Colnbrook near Heathrow. There is a suitable landfill site located near Junction 23 of the M5.

If no suitable treatment facility is available in the region, a judgement will have to be made by EDF Energy, in terms of environmental impact, whether to landfill the waste locally or to transport the waste outside the local area to be treated. These judgements will be carried out for individual waste streams as they arise to take into account the facilities available at that time.
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7.9.25 EDF Energy will maintain an awareness of current and potential future waste facilities in the region. The Company will seek, where possible, to support the development of local and regional waste facilities to benefit the local environment in terms of waste management, traffic and pollution and to benefit the local area in terms of waste infrastructure.

**g) Setting and Monitoring of Key Performance Indicators**

7.9.26 The waste estimates, produced by the PC or the Waste Broker prior to work commencing will be used to set Key Performance Indicators (KPI’s). For example:

- how much of the estimated material will be classified as a material rather than waste and be re-used on site; or
- how much of the waste, which would otherwise end up in landfill, can be recycled.

7.9.27 Performance against these KPI’s will be monitored by the PC or the Waste Broker using estimated and actual waste figures provided by each contractor as required for the Site Waste Management Plan.

7.9.28 Any issues with performance will be raised with the Client and discussions held to investigate and ascertain the reasons for any differences. Depending on the outcome of these discussions, further actions may be necessary to improve performance.

**h) Records**

7.9.29 Legal waste documentation, SWMP data (waste estimates and arisings etc), KPI’s and performance monitoring data will be held by the PC or the Waste Broker for the required length of time. This information will be available to the Client and the regulator upon request.

**i) Audit**

7.9.30 Regular audits will be undertaken, by the PC or the waste broker, to ensure that all waste contractors are controlling, treating and disposing of waste in accordance with legal requirements and in line with best practice and guidance. The findings will be addressed and recorded along with the actions which are to be taken to prevent a reoccurrence. The findings and actions will be fed back to the Client. The Client will also undertake, as it sees fit, its own audits.

**7.10 Waste Generated During Commissioning of Hinkley Point C**

7.10.1 No significant volumes of solid waste arisings related to the commissioning tests are anticipated. The tests of water circulation systems will require water intake and generate effluents and the testing of other plant such as the essential diesel generators will produce emissions to the atmosphere. These discharges and their potential environmental impacts will be managed under Operational Environmental Permits.

7.10.2 There will be office, welfare facility and canteen wastes, along with wastes from the preparation of plant for service including oils and cleaning chemicals and materials. However, the solid waste arisings associated with the commissioning period are likely to be more consistent with operational wastes.
a) Arrangements for Commissioning Waste Management

7.10.3 Detailed arrangements for waste management will be covered in EDF Energy procedures. These procedures are anticipated to cover minimisation, segregation, characterisation/assessment, packaging, labelling, record keeping and consignment for transfer/disposal. Arrangements will be put in place to ensure that the wastes requiring disposal will be minimised by the use of the Waste Hierarchy and other relevant environmental principles.

7.11 Waste Generated During Operation of Hinkley Point C

7.11.1 Information available in the Generic Design Assessment (GDA) Pre-Construction Environmental Report (PCER), Chapter 3 (Ref. 7.21) has been used to determine the types and quantities of solid conventional wastes which are likely to arise during the operation phase. These figures are estimates and have the potential to change depending on activities which take place on the site.

7.11.2 During operation, there will be waste arising from regular maintenance activities, offices, canteens, welfare facilities and workshops. Some of this waste, mainly from the workshops and maintenance activities, will be classed as hazardous. During maintenance outages, the number of people present on the site will increase and the amount of work will increase. These outage periods will generate a higher quantity of waste than periods of normal operation.

7.11.3 Of an estimated total of 1140 tonnes per year, it is expected that around 940 tonnes will be classified as either inert or non-hazardous and around 200 tonnes will be hazardous.

a) Arrangements for Operational Waste Management

7.11.4 Detailed arrangements for waste management will be covered in EDF Energy procedures required to demonstrate effective environmental performance. These procedures are anticipated to cover minimisation, segregation, characterisation/assessment, packaging, labelling, record keeping and consignment for transfer/disposal. Arrangements will be put in place to ensure that the wastes requiring disposal will be minimised by the use of the Waste Hierarchy and other relevant environmental principles.

7.11.5 Arrangements for conventional wastes will be produced alongside, and in some cases, together with those arrangements for radioactive wastes to ensure that wastes, as a whole, are managed correctly.
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7.12 References

7.1 Environmental Permitting (England and Wales) Regulations 2010 (SI 676)
7.3 http://www.defra.gov.uk/environment/waste/topics/index.htm#what
7.4 Landfill Directive, 99/31/EC
7.5 Hazardous Waste (England and Wales) Regulations 2005 (as amended) (SI 894)
7.6 Hazardous Waste Directive 91/689/EEC, as amended by 94/31/EC.
7.7 List of Wastes (England) Regulations 2005 (SI 895)
7.9 Consultation on a Strategy for Hazardous Waste Management in England, DEFRA, July 2009
7.10 CL:AIRE Definition of Waste: Development Industry Code of Practice
7.13 Controlled Waste (Registration of Carriers and Seizure of Vehicles Regulations 1991 (SI 1624)
7.14 Environmental Protection (Duty of Care) Regulations 1991 (SI 2839)
7.15 Duty of Care Code of Practice, Defra, Environmental Protection Act 1990, Section 34
7.17 The Site Waste Management Plans Regulations 2008 (SI 314)
7.19 Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended) (SI 871)
7.20 Construction (Design and Management) Regulations 2007 (SI 320)
7.21 GDA PCER UKEPR-003-030 Issue 02 “PCER Chapter 3 – Aspects having a bearing on the environment during operation phase”