

REPORT

Boston Alternative Energy Facility – Preliminary Environmental Information Report

Chapter 23 Waste

Client: Alternative Use Boston Projects Ltd

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HASKONINGDHV UK LTD.

Rightwell House
Rightwell East
Bretton
Peterborough
PE3 8DW
Industry & Buildings
VAT registration number: 792428892

+44 1733 334455 **T**
+44 1733 262243 **F**
email **E**
royalhaskoningdhv.com **W**

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Author(s): Isabel O'Mahoney

Drafted by: Isabel O'Mahoney

Checked by: Gary Bower

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Approved by: Gary Bower

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Table of Contents

23	Waste	1
23.1	Introduction	1
23.2	Waste Planning Policy Context	1
23.3	Consultation	14
23.4	Methodology Criteria	16
23.5	Existing Environment	18
23.6	Construction Waste Assessment	27
23.7	Operational Waste Composition and Quantities	42
23.8	Decommissioning Waste Composition and Quantities	51
23.9	Cumulative Impacts	51
23.10	Transboundary Impacts	51
23.11	Inter-Relationships with Other Topics	51
23.12	Summary	52
23.13	References	57

Table of Tables

Table 23.1	Summary of NPS Requirements	2
Table 23.2	The Waste Hierarchy*	13
Table 23.3	Consultation and Responses	15
Table 23.4	List of Waste Management Facilities within 10km from the Facility	20
Table 23.5	Number of Waste Management Facilities in East Midlands (2017)	22
Table 23.6	Remaining Landfill Capacity East Midlands (2017)	23
Table 23.7	Transfer, Treatment and Metal Recycling Volumes in East Midlands (2017)	24
Table 23.8	Incineration Capacity in East Midlands (2017)	25
Table 23.9	Deposit in Landfill for Recovery Inputs East Midlands (2017)	26
Table 23.10	Use of Waste East Midlands (2017)	26
Table 23.11	Estimated Quantity of Construction Waste	29
Table 23.12	Summary of the Estimated Total Quantity by Waste Category	30
Table 23.13	Typical Wastes Produced over 12 Months per Element	45
Table 23.14	Summary of the Estimated Total Quantity by Waste Category	52
Table 23.15	Typical wastes produced over 12 months per element	54

Non-Technical Summary

This chapter has been completed as part of the Preliminary Environmental Information Report (PEIR). It provides a preliminary report of waste generation during the construction, operation and decommissioning phases, considering the proposed options for recycling, recovery or disposal of waste in accordance with the Waste Hierarchy, and the capability of the existing local or regional waste management facilities to manage the waste.

There are no formal guidelines for assessing the impacts for waste. In this PEIR, the preliminary assessment for waste management were derived based on professional judgement, relevant policy, legislation, relevant technical guidance associated waste management and the requirements of the Waste Hierarchy.

The baseline data on existing waste management infrastructure shows that there are numerous waste management facilities providing a wide variety of waste management options at a regional scale, including provision for hazardous waste landfill, however, options are limited at a local level. A formal assessment of the significance of waste impacts on waste management infrastructure at a local, regional and national scale will be provided in the Environmental Statement (ES).

The BRE (Building Research Establishment) SMART Waste Data Report (2013) was used to estimate volumes of waste arisings from the construction. The predicted arisings are:

Cumulative arisings by category	Predicted arisings (tonnes)	Averaged monthly arisings (tonnes)	%
Inert	25656	534	13.9%
Non-hazardous	153483	3198	83.3%
Hazardous	5090	106	2.8%
Total	184228	3838	

The main operational arisings are predicted to be:

Element	Waste Stream	Amount	Management in accordance with the Waste Hierarchy
Wharf	Damaged refused derived fuel (RDF) bales on the vessel	n/a ¹	Rejected – Not removed from the vessel and sent back on the vessel to the supplier for re-baling. These will then be returned for energy recovery to the Facility

Element	Waste Stream	Amount	Management in accordance with the Waste Hierarchy
	Damaged RDF bales on land	Covered in the RDF total below	Recovery - Re-baled on-site and processed with other RDF for energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process
RDF storage area	RDF	1,300,000 tonnes	Recovery - energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process
Three gasification units, turbine hall and air cooled condenser	Gasification ash	248,000 tonnes	Recycled in the LWA to a market specification product.
	Air pollution control residues	63,500 tonnes	Recycled in the LWA to a market specification product.
Carbon capture facility	Hazardous liquid waste 40 % Monoethanolamine (MEA) / 60 % water	60,000 litres	Disposal via Liquid hazardous waste treatment
	Water dosed with sodium hydroxide (pH 7.5-9.0)	11,000 litres	Discharge to sewer in accordance with an agreed trade effluent agreement with the sewerage undertaker
Associated infrastructure	Mixed municipal waste from site workers	To be confirmed in the ES	Recycled – source segregation of metal, paper and card, plastics and glass Recovered – residual waste that cannot be recycled will be collected for recovery.
RDF Processing Facility	Non-ferrous metal	9,000 tonnes	Recycled off-site
	Ferrous metal	33,000 tonnes	Recycled off-site
	Medium / heavy inert material	90,000 tonnes	Recycled off-site
	Light inert material (e.g. glass) suitable for LWA	60,000 tonnes	Recycled in the LWA to a market specification product
	Light inert material (e.g. glass) not suitable for LWA	60,000 tonnes	Recycled off-site
	Processed RDF	1,000,000 tonnes	Recovery - energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process



The chapter identifies several embedded mitigation measures have been proposed to reduce potential impacts on waste.

The operation of the Facility will be governed by the Conditions associated with an Environmental Permit issued by the Environment Agency. This will set specific standard associated with the management of wastes produced on-site (amongst other things) to ensure the wastes are handled in accordance with Best Available Techniques.

The measures proposed for waste management during the construction phase of the works will be adhered to during decommissioning, in accordance with a decommissioning plan that will accord with relevant policy, legislation and guidance relevant at the time. The Decommissioning Plan will be agreed with relevant authorities prior to the decommissioning starts and will contain relevant measures to manage waste.

23 Waste

23.1 Introduction

23.1.1 This Waste Assessment forms part of the Preliminary Environmental Information Report (PEIR) for the proposed Boston Alternative Energy Facility ('the Facility').

23.1.2 This chapter provides a preliminary report of waste generation during the construction, operation and decommissioning phases, considering the proposed options for recycling, recovery or disposal of waste in accordance with the Waste Hierarchy, and the capability of the existing local or regional waste management facilities to manage the waste.

The Facility

23.1.3 The full description of the Facility is provided in **Chapter 5 Project Description**.

23.1.4 The Facility will comprise:

- A wharf;
- Refused derived fuel (RDF) storage area;
- RDF processing facility;
- Three gasification units, turbine hall and air cooled condenser;
- Grid connection and substation;
- A lightweight aggregate (LWA) manufacturing plant;
- Carbon capture facility; and
- Associated development, including welfare areas, workshops, control room and visitor centre.

23.1.5 The construction and operation of these facilities will produce a variety of wastes that fall within the control requirements of English waste legislation.

23.2 Waste Planning Policy Context

23.2.1 This section presents a summary of the key waste planning policy that is associated with the Facility.

National Planning Policy

National Policy Statement (NPS)

23.2.2 The policy framework for examining and determining applications for Nationally

Significant Infrastructure Projects (NSIPs) is provided by National Policy Statements (NPSs). Section 104 of the Planning Act 2008 requires the Secretary of State to determine applications for NSIPs in accordance with any relevant NPS, unless:

- it would lead to the UK being in breach of its international obligations;
- It would be in breach of any statutory duty that applies to the Secretary of State;
- It would be unlawful;
- the adverse impacts of the development outweigh its benefits; or
- it would be contrary to any Regulations that may be made prescribing other relevant conditions.

23.2.3 In July 2011, the Secretary of State for the Department of Energy and Climate Change ('DECC' who's functions were replaced by the Department for Business, Energy and Industrial Strategy (BEIS)) designated several NPSs relating to nationally significant energy infrastructure.

23.2.4 The assessment of waste has been made with specific reference to the relevant NPS. These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIP). Those relevant to the Facility are:

- Overarching NPS for Energy (**EN-1**) (DECC 2011a);
- NPS for Renewable Energy Infrastructure (**EN-3**) (DECC 2011b).

23.2.5 The specific assessment requirements for waste, as detailed in the NPSs are summarised in **Table 23.1**, together with an indication of where each is addressed within the PEIR.

Table 23.1 Summary of NPS Requirements

NPS Requirement	NPS Reference	Chapter Section Where Consultation Comment is Addressed
Sustainable waste management is implemented through the "waste hierarchy", which sets out the priorities that must be applied when managing waste. Disposal of waste should only be considered where other waste management options are not available or where it is the best overall environmental outcome.	EN-1 , paragraph 5.14.2, 5.14.3	Refer to Section 23.6, 23.7 and Chapter 2 Project Need, Section 2.3 and 2.4

NPS Requirement	NPS Reference	Chapter Section Where Consultation Comment is Addressed
<p>The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a Site Waste Management Plan.</p> <p>The arrangements described and Management Plan should include information on the proposed waste recovery and disposal system for all waste generated by the development, and an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome.</p>	<p>EN-1, paragraph 5.14.6</p>	<p>Refer to Section 23.6</p>
<p>Government policy encourages multi-modal transport and the IPC should expect materials (fuel and residues) to be transported by water or rail routes where possible. (See Section 5.13 of EN-1 on transport impacts). Applicants should locate new biomass or waste combustion generating stations in the vicinity of existing transport routes wherever possible.</p>	<p>EN-3, paragraph 2.5.25</p>	<p>Refer to Chapter 5 Project Description – all source RDF will be delivered by vessel.</p>
<p>An assessment of the proposed waste combustion generating station should be undertaken that examines the conformity of the scheme with the waste hierarchy and the effect of the scheme on the relevant waste plan or plans where a proposal is likely to involve more than one local authority.</p>	<p>EN-3, paragraph 2.5.66</p>	<p>Refer to Section 23.6, 23.7 and Chapter 2 Project Need, Section 2.3 and 2.4</p>
<p>The application should set out the extent to which the generating station and capacity proposed contributes to the recovery targets set out in relevant strategies and plans, taking into account existing capacity</p>	<p>EN-3, paragraph 2.5.66</p>	<p>The Facility will receive waste from the UK, so is a national-scale Facility, therefore, targets at a National level are considered. Refer to Chapter 2 Project Need; Chapter 3 Policy and Legislation; Chapter 5 Project Description; and Sections 23.2, 23.4, 23.6 and 23.7 of this chapter.</p> <p>The Facility will not take or divert waste out of any local household source-segregated recycling</p>

NPS Requirement	NPS Reference	Chapter Section Where Consultation Comment is Addressed
		scheme. The Facility will increase recycling by segregating metals, and inert material in the RDF processing Facility – see Chapter 5 Project Description
The results of the assessment of the conformity with the waste hierarchy and the effect on relevant waste plans should be presented in a separate document to accompany the application to the IPC	EN-3, paragraph 2.5.69	Chapter 2 Project Need; Chapter 3 Policy and Legislation; Chapter 5 Project Description; and Sections 23.2, 23.4, 23.6 and 23.7 of this chapter.

National Planning Policy Framework

23.2.6 The National Planning Policy Framework (NPPF), which was updated in February 2019 (DCGL, 2019), does not contain specific waste policies. In terms of achieving sustainable development, the NPPF identifies that minimising waste and pollution is a fundamental part of the environmental role of the planning system.

23.2.7 The NPPF encourages Planning Authorities to prepare Local Plans that, so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously. The Facility should therefore have regard to the requirements of the relevant Local Plan in terms of waste management. This is discussed further below in the context of the South-East Lincolnshire Local Plan.

National Planning Policy for Waste 2014

23.2.8 The Government has published the National Waste Planning Policy 2014 for England (DCLG, 2014) as a replacement of Planning Policy Statement 10: Planning for Sustainable Waste Management (PPS 10) 2011 (DCLG, 2011). The updated policy maintains the core principles of the ‘plan led’ approach, with a continued focus of moving waste up the Waste Hierarchy.

23.2.9 It requires local planning authorities to *“have regard to its policies when discharging their responsibilities to the extent that they are appropriate to waste management”*. Increasingly local authorities are working together in partnerships to deliver full and efficient waste services; a requirement of the duty to cooperate in section 110 of the Localism Act 2011. The document sets out detailed waste planning policies to facilitate a *“more sustainable and efficient approach to resource use and management”*, for example by ensuring the design and layout of new infrastructure complements sustainable waste management.

23.2.10 When determining planning applications for non-waste development, the Policy requires that local planning authorities should, to the extent appropriate to their responsibilities, ensure that:

- *“The likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities;*
- *New, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development; and*
- *The handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities and minimises off-site disposal.”*

23.2.11 The Facility is a waste-related development, however, the relevant principles described above will be relevant to the management of waste during the construction phase. The operation phase of the Facility would be authorised by an environmental permit that requires efficient management of waste.

National Waste Management Plan for England 2013

23.2.12 Defra published a National Waste Management Plan for England in July 2013 (Defra, 2013a). The key aim of the Waste Management Plan for England was to set a direction towards a zero-waste economy as part of the transition to a sustainable economy. In particular, this means using the “waste hierarchy” (waste prevention, re-use, recycling, recovery and finally disposal as a last option) as a guide to sustainable waste management.

23.2.13 The Waste Management Plan for England was a high-level document which is non-site specific. It evaluated how it would support implementation of the objectives and provisions of the revised Waste Framework Directive (rWFD) (2008/98/EC; European Parliament, 2008).

23.2.14 The rWFD established the principle of 'proximity'. This is within the context of the requirement on Member States to establish an integrated and adequate network of waste disposal facilities for recovery of mixed municipal waste collected from private households. The requirement included where such collection also covers waste from other producers.

23.2.15 The plan identified the measures to be taken to ensure that by 2020 at least 70% by weight of construction and demolition waste is subjected to material recovery.

23.2.16 Note: The construction, demolition and excavation sector is the largest contributing sector to the total waste generation. The UK generated 222.9 million tonnes of total waste in 2016. 66.2 million tonnes of this was non-hazardous construction and demolition waste. The Government keeps progress towards the 2020 targets under review by monitoring actual recycling rates and by modelling future recycling. The recovery rate from non-hazardous construction and demolition waste in the UK in 2016 **Error! Bookmark not defined.** was 91.0%. This already exceeds the 2020 target of recovering at least 70% by weight, of non-hazardous construction and demolition waste (Defra & Government Statistical Service, 2019).

Waste Prevention Programme for England 2013

23.2.17 The Government developed Waste Prevention Programme for England in 2013 (Defra, 2013b) to set out the key roles and actions which should be taken to move towards a more resource efficient economy. As well as describing the actions the government is taking to support this move, it also highlights actions businesses, the wider public sector, the civil society and consumers can take to benefit from preventing waste. Using resources more efficiently, designing and manufacturing products for optimum life and repairing and reusing more items could save money and provide opportunities for economic growth at the same time as improving the environment.

23.2.18 The waste prevention programme is a requirement of the rWFD. It sets out detailed actions to:

- Encourage businesses to contribute to a more sustainable economy by building waste reduction into design, offering alternative business models and delivering new and improved products and services;
- Encourage a culture of valuing resources by making it easier for people and businesses to find out how to reduce their waste, to use products for longer, repair broken items, and enable reuse of items by others;

- Help businesses recognise and act upon potential savings through better resource efficiency and preventing waste, to realise opportunities for growth; and
- Support action by central and local government, businesses and civil society to capitalise on these opportunities.

23.2.19 To measure progress against the aim of the programme, the government measures changes in overall waste arising, assesses the environmental impacts of this waste and considers how these factors relate to changes in the resource efficiency of the economy.

Local and Regional Planning Policy

South-East Lincolnshire Local Plan

23.2.20 The South-East Lincolnshire Local Plan (SELLP) was adopted in March 2019. It was produced jointly by Boston Borough Council (BBC), Lincolnshire County Council (LCC) and South Holland District Council (SHDC).

23.2.21 The SELLP guides development in South East Lincolnshire over the next twenty years and will identify opportunities for growth and will set out clear guidance on what planning applications will be permitted.

23.2.22 The Riverside Industrial Estate is identified as site BO006 in the SELLP. The allocations for the site are identified below in **Plate 23.1**.

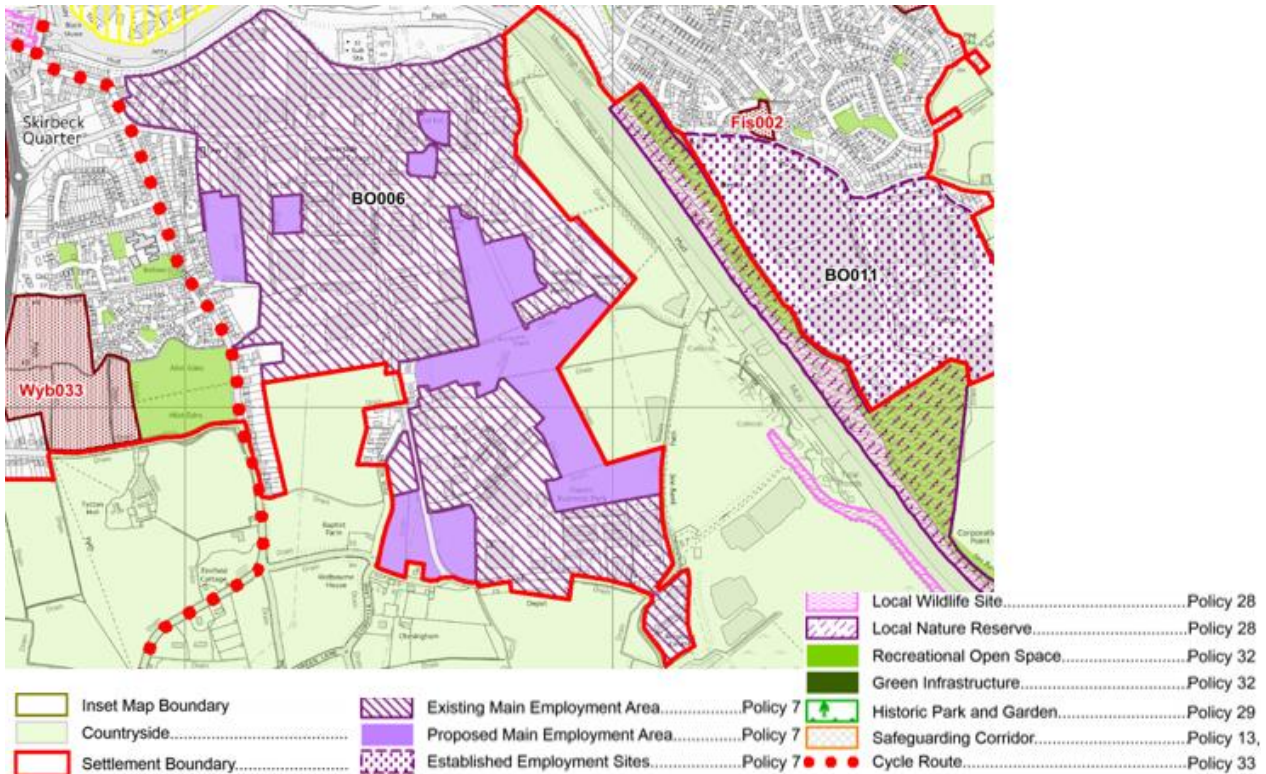


Plate 23.1 SELLP Allocation for Riverside Industrial Estate, BO006, (South East Lincolnshire Joint Strategic Planning Committee)

23.2.23 Part of the proposed Application Site is included within proposed or existing Employment Areas.

23.2.24 The SELLP deals with all land use and development issues affecting South East Lincolnshire, except for minerals and waste – these are covered in the Lincolnshire Minerals and Waste Local Plan (see below).

23.2.25 However, the SELLP refers to principles that the Development Consent Order (DCO) application for the Facility can take into account. Policy 3: Design of New Development, seeks to ensure that development would not be wasteful in its use of energy or in its depletion of natural resources. Policy 3 provides guidance about waste minimisation, utilising renewable energy, and the sustainable use of existing materials on-site (e.g. reuse of excavated materials for landscaping or raising ground levels).

Lincolnshire Minerals and Waste Local Plan (2016)

23.2.26 The Lincolnshire Minerals and Waste Local Plan (LMWLP) (LCC, 2016) is made up of two documents – the Core Strategy and Development Management Policies (2016) and Site Locations (2017) documents.

23.2.27 The Core Strategy and Development Management Policies (CSDMP) document was adopted in June 2016 and replaces the Lincolnshire Minerals Local Plan (1991) and the Lincolnshire Waste Local Plan (2006) (with the exceptions of Policies WLP2, WLP6 and WLP12). The CSDMP document outlines the future of waste management in the Lincolnshire up to 2031, as well as a guide to future winning and working of materials. The criteria against which waste planning applications are considered are also set out in the CSDMP document.

23.2.28 The policies contained within the CSDMP document that are applicable to waste developments are explained in **Chapter 3 Policy and Legislative Context**. They include:

- **Policy W1: Future requirement for new waste facilities**, which states:

“The County Council will, through the Site Location document, identify locations for a range of new or extended waste management facilities within Lincolnshire where these are necessary to meet the predicted capacity gaps for waste arisings in the County up to and including 2031

[...]

subject to any new forecasts published in the Council’s Annual Monitoring Reports.”

- **Policy W3: Spatial Strategy for New Waste Facilities**, which states:

“Proposals for new waste facilities, including extensions to existing waste facilities, will be permitted in and around the following main urban areas as indicated on the key diagram subject to the criteria of Policy W4:

- *Lincoln;*
- ***Boston;***
- *Grantham;*
- *Spalding;*
- *Bourne;*
- *Gainsborough;*
- *Louth;*
- *Skegness;*
- *Sleaford; and*
- *Stamford.”*

- **Policy W4: Locational Criteria for New Waste Facilities in and around main urban areas**, which states:

“Proposals for new waste facilities, including extensions to existing waste facilities, in and around the main urban areas set out in Policy W3 will be permitted provided that they would be located on:

- *previously developed and/or contaminated land; or*
- *existing or planned industrial/employment land and buildings; or*
- *land already in waste management use; or*
- *sites allocated in the Site Locations Document; or*
- *in the case of biological treatment the land identified in Policy W5.*

[...]

Proposals must accord with all relevant Development Management Policies set out in the Plan.”

23.2.29 The Site Locations document was adopted in December 2017 and outlines specific proposals and policies for land provision for waste (and mineral) developments.

23.2.30 The policies contained within the Site Locations document that are applicable to waste for the Facility include:

- **Policy SL3: Waste Site and Area Allocations**, which states:

“Future requirements for new waste facilities in order to meet capacity gaps, in accordance with Policy W1 of the Core Strategy and Development Management Policies document, will be provided through:

[...]

- *the granting of planning permission for waste uses within the following areas where the applicant can demonstrate that the proposal is in accordance with the development plan:*

[...]

Site Reference	Name	Town	Area
WA22-BO	Riverside Industrial Estate	Boston	119 ha

[...]

The allocated site and areas shall be developed in accordance with the Development Briefs in Appendix 1 of this plan.”

23.2.31 The Site Locations Document identifies that the Application Site is located in WA22-BO Riverside Industrial Estate, Boston. The allocation designates land allocated for industrial use, including Resource Recovery Park, Treatment Facility, Waste Transfer, Materials Recycling Facility, Household Waste Recycling Centre, Metal Recycling / End of Life Vehicles, Re-Use Facility, C&D Recycling, Energy

Recovery. Therefore, the criteria for Policies SL3, W1, W2 and W4 are met.

- **DM1 Presumption in favour of sustainable development**

“7.22 Waste management is significant in tackling greenhouse gas emissions because the treatment and disposal of waste generates carbon dioxide and methane. Methane emissions from biodegradable waste in landfill accounts for around 40% of all UK methane emissions. This equals about 3% of UK greenhouse gas emissions. Methane is more damaging than carbon dioxide as a greenhouse gas. Waste management therefore has an important role in mitigating the levels of greenhouse gases emitted into the atmosphere.

7.23 The Waste Hierarchy is a key policy objective in terms of mitigating impacts on climate change by focusing on reducing the amount of waste produced, and increasing the amount of waste that is reused, recycled, composted or has energy recovered. This is important in terms of diverting biodegradable waste from landfill and reducing associated methane emissions. In addition, in terms of maximising the potential for reuse, recycling and recovery of resources, it also helps to minimise the demand for new resources and the greenhouse gases generated in their production.

7.24 Maintaining high recycling rates is therefore a key part of the Council’s climate change strategy in order to divert as much biodegradable waste away from landfill as possible to lower methane emissions. The Council will also encourage proposals for new waste technologies/processes which bring about reduced levels of biodegradable waste being disposed of to landfill.

7.25 The objective of minimising impacts on climate change will be focused on carbon reduction/capture measures, efficient use of resources and renewable energy (where practicable and viable), and on minimising traffic generation. It will be important that proposals demonstrate how these factors have been taken into account in their design.

7.26 The objective of reducing greenhouse gas emissions will be achieved by encouraging:

- *waste treatment processes that reduce the amount of waste going to landfill (with all waste management facilities being required to provide evidence of how much waste will be diverted from landfill);*
- *decentralised, low-carbon/renewable energy generation and carbon reduction measures at new mineral working sites and waste management developments (including landfill gas collection);*
- *low carbon energy recovery facilities, such as combined heat and power (CHP), where possible, to be suitably sited in close proximity to suitable*

potential heat customers to enable the utilisation of the heat produced as an energy source;

- *increased energy efficiency measures in plant, buildings and operations; and*
- *good practice in transport related matters to reduce vehicle miles.”*

Legislation

23.2.32 In terms of waste, UK legislation is underpinned by several international (e.g. European Union (EU)) agreements. Following the 2016 referendum on UK withdrawal from the EU, the UK will continue to be committed to EU agreements until finalisation of the withdrawal agreement and / or until two years after initiation of Article 50 of the Treaty on European Union (TEU). Following withdrawal, the exact nature of amendments to UK legislation which had an origin in EU law will depend on the agreements made with the EU and the extent to which EU measures continue to apply (e.g. to achieve trading agreements) as well as the ongoing political agendas of the UK government.

Waste Framework Directive

23.2.33 The key European legislation is the revised Waste Framework Directive (2008/98/EC) ('rWFD'), which consolidates several separate waste Directives and amendments. It establishes the basis for the management of wastes across the European Union (EU). It defines certain terms, such as “waste”, “recovery” and “disposal”, to ensure that a uniform approach is taken across the EU.

23.2.34 UK legislation is underpinned by several international (e.g. European Union (EU) agreements). Following the 2016 referendum on UK withdrawal from the EU, the UK will continue to be committed to EU agreements until finalisation of the withdrawal agreement and / or until two years after initiation of Article 50 of the Treaty on European Union (TEU). Following withdrawal, the exact nature of amendments to UK legislation which had an origin in EU law will depend on the agreements made with the EU and the extent to which EU measures continue to apply (e.g. achieve trading agreements) as well as the ongoing political agendas of the UK government.

Duty of Care

23.2.35 The waste duty of care is a legal requirement, originally implemented by Section 34 of the Environmental Protection Act 1990, to ensure that producers and holders handle their waste safely and in compliance with the appropriate regulations. One of the fundamental aspects of duty of care requires the holder of waste to make sure that anyone else dealing with their waste has the necessary authorisation to do so. If the holder does not do this and their waste is subsequently found to have

been illegally disposed, the holder could be held responsible and may face prosecution.

23.2.36 The provisions for the waste duty of care are provided in the Waste (England & Wales) Regulations 2011 SI 2011 (No. 988).

The Waste Hierarchy

23.2.37 The Waste Hierarchy is set out at Article 4 of the rWFD and has been implemented by The Waste (England and Wales) Regulations 2011.

23.2.38 The Waste Hierarchy requires the producer/holder of a waste to demonstrate that the priorities identified in **Table 23.2** have been considered in the priority order, to determine the most suitable waste management option for all wastes prior to removal from site.

Table 23.2 The Waste Hierarchy*

Waste Hierarchy	Relevant activity
Prevention	Using less material in design and manufacture, keeping products for longer, re-use, using less hazardous materials.
Preparing for re-use	Checking, cleaning, repairing, refurbishing, whole items or spare parts.
Recycling	Turning waste into a new substance or product, includes composting if it meets quality protocols
Other recovery	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste, some backfilling.
Disposal	Landfill and incineration without energy recovery.

*Table reproduced from Defra website: <https://www.gov.uk/waste-legislation-and-regulations>

23.2.39 It is a legal requirement for waste producers/holders to follow the Waste Hierarchy when making decisions about waste management options. Waste holders must demonstrate the highest possible hierarchical option for their wastes. Lower hierarchical options cannot be justified by cost alone. They require environmental justification over available higher options, for example the location of a site may justify sending waste to a lower hierarchical option (e.g. local landfill), rather than sending it hundreds of miles to the nearest facility that could provide a higher option.

Hazardous Waste

23.2.40 The Hazardous Waste Regulations (HWR) provide the rules for assessing if a waste is hazardous or not. As part of the assessment of waste, the HWR refer to the List of Wastes (which is often referred to as the European Waste Catalogue

(EWC)) for the relevant thresholds for some of the hazardous properties; and to assign the formal description and code for the waste. The regulatory framework to do this is contained in:

- Hazardous Waste (England and Wales) Regulations 2005 SI 894;
- Hazardous Waste (England and Wales) (Amendment) Regulations 2009 SI 507; and
- The Hazardous Waste (Miscellaneous Amendments) Regulations 2015 SI 1360.

23.2.41 Detailed technical guidance on the hazardous waste assessment process is provided by 'Waste Classification and Assessment (Technical Guidance WM3)' issued in July 2015 and updated in May 2018 (EA, 2018).

23.2.42 This document is jointly approved by all the UK environmental regulators. It provides thresholds and criteria for assessing each of the 15 hazardous properties and Persistent Organic Pollutants (POPs).

Waste Standards and Guidance

23.2.43 The waste assessment has also been guided and informed by additional standards and guidance documents, including:

- The Definition of Waste: Development Industry Code of Practice (The CoP) (Version 2) (CL:AIRE, 2011);
- Defra's Guidance on applying the waste hierarchy (Defra, 2011);
- Technical Guidance WM3: Waste Classification – Guidance on the classification and assessment of waste (Joint Agencies, 2018);
- EA Guidance on Waste recovery plans and permits (EA, 2016);
- EA Waste & Resources Action Programme (WRAP) Aggregates Quality Protocol (EA, 2015); and
- EA Model Procedures for the Management of Land Contamination (Contaminated Land Report (CLR) 11) (Defra & EA, 2004).

23.3 Consultation

23.3.1 Consultation undertaken throughout the pre-application phase informed the approach and the information provided in this chapter. A summary of the

consultation of particular relevance to Waste is detailed in **Table 23.3**.

Table 23.3 Consultation and Responses

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
The Planning Inspectorate Scoping Opinion, July 2018	The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to ... quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.	Sections 23.6 and 23.7
The Planning Inspectorate Scoping Opinion, July 2018	Baseline Any assumptions made in predicting the quantity and type of waste arising generated from the Proposed Development should be stated within the ES.	Sections 23.5, 23.6 and 23.7
The Planning Inspectorate Scoping Opinion, July 2018	Baseline-future capacity The ES should ensure that the future baseline takes into account the availability/ capacity of the waste infrastructure, including from the first year of construction when waste arisings are likely to be at their greatest level. This assessment should include the availability of hazardous waste facilities, if applicable.	Sections 23.5, 23.6 and 23.7
The Planning Inspectorate Scoping Opinion, July 2018	Mitigation A full description of any measures used to minimise or mitigate waste should be included within the ES.	Sections 23.6 and 23.7
The Planning Inspectorate Scoping Opinion, July 2018	Potential effects – transportation of waste The Scoping Report does not state how waste will be transported off-site or provide details of the proposed transportation route. The ES should include the transportation route of waste from the Proposed Development to the appropriate waste infrastructure facility and state whether waste will be transported via the road network or by other means eg boat from the proposed wharf. Cross reference should be made to the relevant sections of the Transport chapter. The ES should also include an assessment of the anticipated effects resulting from transporting waste from the Proposed Development to existing waste infrastructure facilities. In undertaking the assessment the ES should state if any assumptions have been made, for example the maximum distance waste is likely to be transported.	For transport related assessments, refer to Chapter 19 Traffic and Transport Maximum anticipated distances to waste management facilities will be confirmed in the ES.
The Planning Inspectorate Scoping Opinion, July 2018	The Scoping Report does not refer to contaminated/ hazardous waste. This matter will be relevant to both the construction and operation of the Proposed Development and should be assessed in the ES. The ES and Site Waste Management Plan (SWMP) should include the appropriate	Section 23.6 SWMP will be prepared for the ES.

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
	protocols for handling, transporting, disposing of contaminated/ hazardous waste with reference to applicable guidance.	
Environment Agency meeting April 2018	<p>A general introduction about the Facility (and what was known at the time) was presented.</p> <p>The Environment Agency raised questions about the permitting of the Facility and who would be the Operator. They questioned the validity of mixing air pollution control residues with gasification ash in the lightweight aggregate plant. This could be seen as dilution.</p> <p>The wanted to know where the waste was coming from. They requested an air quality model for the stack to be included in the application.</p>	<p>The environmental permit application process would follow the DCO application and the application for the permit would clarify whether this would be a single-operator site or multi-operator site. See also Section 23.7.</p> <p>The process for the LWA plant was changed so that air pollution control residues and ash would be processed separately.</p> <p>For source of waste, see Chapter 2 Project Need and Chapter 5 Project Description.</p> <p>For air quality issues, see Chapter 14 Air Quality (note stack modelling will be confirmed in the ES).</p>

23.4 Methodology Criteria

Methodology Approach

23.4.1 There are no formal guidelines for assessing the impacts for waste. In this PEIR, the preliminary assessment for waste management were derived based on professional judgement, relevant policy, legislation, relevant technical guidance associated waste management and the requirements of the Waste Hierarchy.

23.4.2 The chapter considers the likely quantity and composition of waste materials predicted to be generated during the construction, operation and

decommissioning phases. On-site re-use and recovery of the waste in the development are explored, along with the capability for existing local and regional waste management infrastructure to manage the arisings according to the principles of the Waste Hierarchy.

- 23.4.3 A formal assessment of the significance of waste impacts on waste management infrastructure at a local, regional and national scale will be provided in the Environmental Statement (ES).
- 23.4.4 Other topic chapters have covered the impacts of waste generated on-site according to relevant receptors for each topic. For example, **Chapter 11 Contaminated Land, Land Use and Hydrogeology** has considered the impact of waste stockpiles during construction; and operational waste arisings on human and environmental receptors. These inter-relationships are identified in **Section 23.11**.

Assumptions and Limitations

- 23.4.5 The site area is approximately 23.4 hectares.
- 23.4.6 At this stage in the application process for the Facility, it is estimated that the construction phase would last for 48 months.
- 23.4.7 There are no buildings or structures on-site which will need to be demolished.
- 23.4.8 The amount of excavated material that is anticipated to be required, along with the proposed cut and fill balance for the Application Site has yet to be confirmed.
- 23.4.9 The quantity of biodegradable waste from vegetation clearance is currently unknown has yet to be confirmed.
- 23.4.10 Given these uncertainties the BRE (Building Research Establishment) SMART Waste Data Report (2013) was used to estimate volumes of waste arisings from the construction.

Cumulative Impact Assessment

- 23.4.11 The approach and assessment to Cumulative Impact Assessment and the relevant cumulative schemes that have been determined in discussion with Boston Borough Council (BBC) will be provided in the ES.

Transboundary Impact Assessment

- 23.4.12 The RDF that will be sent to the Facility will be derived from UK sources. None of the wastes that are created by the Facility in construction or Operation will be

exported for disposal or recovery. Therefore, there will be no Transboundary Impacts. As such, Transboundary Impacts are not covered further in this PEIR.

Study Area

23.4.13 The Study Area related to waste management is dictated by the availability of relevant waste management infrastructure according to the types of wastes generated. It has the potential to be at a national scale, depending upon the availability of facilities to treat specific types of waste according to the Waste Hierarchy; or for relevant disposal options. Some facilities, for example hazardous waste landfills, are not available locally or regionally, therefore a national scale is considered in these circumstances.

23.4.14 As such, it is not possible to provide a visual representation of the Study Area. However, data is provided at a local scale (i.e. within 10 km of the Application Site) and at a Regional scale (i.e. within the 'East Midlands' area – this is according to regional groupings of data held by the Environment Agency).

Data Sources

23.4.15 The relevant data sources used are identified throughout this document where they are referred to or used.

23.5 Existing Environment

Existing Conditions at the Application Site

Application Site Location

23.5.1 The Application Site is located in Boston, Lincolnshire, within the administrative area of Boston Borough Council (BBC) and Lincolnshire County Council (LCC), England. It is located approximately 2 km south of the town of Boston, to the east of the Riverside Industrial Estate.

23.5.2 The eastern site margins are defined in part by a sea defence back along The Haven (the tidal waterway of the River Witham between The Wash to the east and Boston town).

Application Site Details

23.5.3 The Application Site is accessed from the Riverside Industrial estate existing road network from Nursery Road and from Marsh Lane via Bittern Way.

23.5.4 The land use on Application Site is predominantly open ground of semi-improved grassland, as the Application Site comprises former agricultural fields bounded by drainage ditches and forms part of a wider emerging industrial / commercial area,

as defined by local planning documents.

- 23.5.5 Large and small industrial business units are located to the north, west and south of the Application Site as well as car parks and storage units.
- 23.5.6 An overhead powerline on pylons traverses the site from north to south and bisects the Application Site.
- 23.5.7 There are no buildings or structures on-site which will need to be demolished.
- 23.5.8 A water main transects the Application Site from the south-west corner to the north-east corner. It is proposed that this water main is diverted to avoid the main footprint of the proposed gasification plant. This diversion is subject to a separate application and at the time of writing, the application for this diversion had been submitted to Anglian Water. The route for the proposed diversion will be confirmed later in the design stage for the Facility, in accordance with the requirements of Anglian Water.
- 23.5.9 The Preliminary Risk Assessment (PRA) reported in **Chapter 11 Contaminated Land, Land Use and Hydrogeology** was undertaken to identify whether there are potentially unacceptable risks to human health or the environment posed by the site. Refer to **Chapter 11 Contaminated Land, Land Use and Hydrogeology** for the findings of the PRA.

Waste Management Facilities in the Local Area

- 23.5.10 Local waste management facilities were identified from the Environment Agency Public Register (EA, 2019). The search radius was limited to 10 km of the Application Site (based on postcode PE21 7RQ).
- 23.5.11 The list of facilities on the Public Register includes all waste management facilities that hold an existing permit within 10 km radius. This would include facilities that are not likely to receive waste from the Facility, e.g. Household Waste Recycling Centres (HWRC), etc.
- 23.5.12 The waste management facilities that could receive waste from the Facility are shown in **Table 23.4**. Waste management facilities on the Public Register that are not likely to receive waste from the construction phase or the completed development were not included in the Table.
- 23.5.13 In addition to the facilities presented below, the Environment Agency Public Register identifies that there are >150 registered exemptions for the management of waste recorded within 10 km.

Table 23.4 List of Waste Management Facilities within 10km from the Facility

Name	Permit No.	Address	Distance from site (km)	Facility type
Biomass UK No.3 Limited	UP3131DF	Boston Energy Production Facility, Riverside Industrial Estate, Marsh Lane, Boston, PE21 7TN	0.36	Biomass gasification
Mick George Limited	DB3708GV	Nursery Road Transfer Station, Nursery Road, Marsh Lane Ind Estate, Boston, Lincolnshire, PE21 7TN	0.47	Non-hazardous & Hazardous Household, Commercial and Industrial Waste Transfer Station with Treatment
Lincolnshire County Council	AB3104KY/A001	Boston Waste Transfer Station, Off Slippery Gowt Lane, Boston, Lincolnshire, PE21 7AA	0.48	S0801 – HCI Waste Transfer Station
T Shooter Ltd	GP3198NL	Land / Premises At, Slippery Gowt Lane, Wyberton, Boston, Lincolnshire, PE21 7AA	0.57	Metal Recycling Facility
Silver Skips Lincolnshire Ltd	CP3797EP/V002	The Warehouse, Nursery Road, Riverside Ind Est, Boston, Lincolnshire, PE21 7TN	0.63	S0805 – HCI Waste TS + asbestos
Lincwaste Ltd	LP3939HN	Land / Premises At, Slippery Gowt Lane, Wyberton, Boston, Lincolnshire, PE21 7AA	0.87	A01 – Co-Disposal Landfill Site
Peterborough Metal Recycling Ltd	KP3495EJ/A001	Port of Boston, The Docks, Boston, Lincolnshire, PE21 6BN	1.52	A20 – Metal Recycling Site (mixed MRS's)
Mid U K Recycling Limited	CB3900KG	Port Of Boston, Boston, Lincolnshire, PE21 6BN	1.52	A20 – Metal Recycling Site (mixed MRS's)
Peterborough Metal Recycling Ltd	FP3398NX/V003	Broadfield Lane Industrial Estate, Broadfield Lane,	2.12	A20 – Metal Recycling Site (mixed MRS's)

Name	Permit No.	Address	Distance from site (km)	Facility type
		Boston, Lincolnshire, PE21 8DR		
Tyre Processors Ltd	MP3898NQ/A001	50, London Road, Kirton, Boston, Lincolnshire, PE20 1JB	5.03	A14 – Transfer Station taking Non-Biodegradable Wastes
E. F. W. Limited	TP3097EL/A001	Holme Farm, Boston Road, Swineshead, Boston, Lincolnshire, PE20 3NL	7.82	SR/04 – Mobile Plant for land spreading
Envirotyre UK Limited	QP3096EJ/V003	Reed Point, Spalding Road, Sutterton, Boston, Lincolnshire, PE20 2EP	9.19	A15 – Material Recycling Treatment Facility

Regional Waste Management Facilities

23.5.14 The potential regional waste management capacity was assessed. The Environment Agency publishes waste capacity data on the gov.uk website¹. This data set was assessed to identify the remaining capacity according to waste management options in the East Midlands (Lincolnshire is covered by East Midlands data). This provides an indication of whether the predicted waste types from the Facility can be managed within the Region in accordance with the 'Proximity Principle' (i.e. managing wastes as close to the source of production as possible).

23.5.15 The rWFD (Article 16) establishes the Principle of Proximity for managing waste as close to the source of production. The Proximity Principle recognises that transporting waste has environmental, social and economic costs so, as a rule, waste should be dealt with as near to the place of production as possible.

23.5.16 The data in **Table 23.5** to **Table 23.10** inclusive provides an indication of the widespread availability of a range of types of waste management facilities within the East Midlands.

23.5.17 Note: the facilities identified in **Table 23.4** would also be included within the summarised data below. There are too many regional sites to list individually.

¹ <https://www.gov.uk/government/publications/waste-management-data-for-england>

Table 23.5 Number of Waste Management Facilities in East Midlands (2017)

England: Permitted waste facilities in 2017

Site type		Former Planning Region								ENGLAND	
		North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South East		South West
Landfill	Number of sites with an environmental permit at end 2017	26	48	70	62	51	92	9	98	60	516
	Number of sites that accepted waste in 2017	22	35	45	43	33	52	5	60	35	330
Land Disposal	Number of sites with an environmental permit at end 2017	14	52	47	35	35	61	13	79	96	432
	Number of sites that accepted waste in 2017	8	28	25	16	12	32	7	44	71	243
Incineration	Number of sites with an environmental permit at end 2017	13	16	21	19	23	14	11	27	17	161
	Number of sites that accepted waste in 2017	5	9	11	7	15	6	7	17	10	87
Transfer	Number of sites with an environmental permit at end 2017	176	397	395	272	340	360	210	403	349	2,902
	Number of sites that accepted waste in 2017	133	315	293	211	270	291	161	331	296	2,301
Treatment	Number of sites with an environmental permit at end 2017	155	425	353	294	342	382	142	399	347	2,839
	Number of sites that accepted waste in 2017	116	307	293	232	245	279	106	316	270	2,164
Metal Recovery	Number of sites with an environmental permit at end 2017	154	373	403	229	373	286	99	194	262	2,373
	Number of sites that accepted waste in 2017	77	171	200	121	196	167	53	118	148	1,251
Use of Waste	Number of sites with an environmental permit at end 2017	1	2	2	4	3	5	1	3	20	41
	Number of sites that accepted waste in 2017	1	1	-	-	2	-	1	1	9	15
Total	Number of sites with an environmental permit at end 2017	539	1,313	1,291	915	1,167	1,200	485	1,203	1,151	9,264
	Number of sites that accepted waste in 2017	362	866	867	630	773	827	340	887	839	6,391

Table 23.6 Remaining Landfill Capacity East Midlands (2017)

East Midlands: Landfill capacity 2017

All figures are provided in 000s cubic metres

Landfill Type	Sub-Region					EAST MIDLANDS
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	
Hazardous Merchant	-	-	-	948	-	948
Hazardous Restricted	-	-	-	-	-	-
Non Hazardous with SNRHW cell*	5,749	10,594	-	1,729	-	18,072
Non Hazardous	2,849	258	9,660	509	179	13,455
Non Hazardous Restricted	-	-	114	-	3,411	3,525
Inert	850	2,365	14,299	1,261	4,021	22,796
Total	9,448	13,217	24,073	4,447	7,611	58,796

*Some non-hazardous sites can accept some Stable Non Reactive Hazardous Wastes (SNRHW) into a dedicated cell, but this is usually a small part of the overall capacity of the site.

Table 23.7 Transfer, Treatment and Metal Recycling Volumes in East Midlands (2017)

East Midlands: Transfer, treatment and metal recycling site inputs 2017

All figures are provided in 000s tonnes

Site Type	Sub-Region					EAST MIDLANDS
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	
Hazardous waste	193	81	32	138	165	610
HIC	555	682	791	439	317	2,785
Clinical	10	1	0	1	1	12
Civic amenity site	80	90	94	70	95	429
Non Biodegradable	-	11	79	-	78	168
Transfer Total	838	866	996	648	656	4,005
Material recovery	131	215	82	146	131	705
Physical	672	711	346	349	1,155	3,233
Physico-chemical	99	2	94	343	80	617
Chemical	39	0	-	0	-	39
Composting	84	66	115	269	85	619
Biological	123	508	300	296	324	1,551
Treatment Total	1,148	1,501	937	1,404	1,774	6,765
Vehicle depollution	12	10	5	23	55	106
Metal recycling site	275	22	270	46	355	967
Metal Recycling Sector Total	287	32	275	69	409	1,073

Table 23.8 Incineration Capacity in East Midlands (2017)

East Midlands: Incineration capacity 2017

All figures provided in 000s tonnes

Incineration Type	Sub-Region					East Midlands
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	
Animal By-Product	-	-	-	-	-	-
Animal Carcasses	-	-	-	-	-	-
Clinical	-	-	-	-	-	-
Co-Incineration of Hazardous Waste	40	-	461	-	-	501
Co-Incineration of Non Hazardous Waste	188	-	-	-	-	188
Hazardous	-	-	-	-	-	-
Municipal and/or Industrial & Commercial	-	-	170	85	260	515
Sewage Sludge	-	-	-	-	-	-
Biomass/Waste Wood	-	-	-	-	-	-
Total	228	-	631	85	260	1,203

*This database is for operational incineration facilities that accepted waste from off-site sources. It does not include facilities that burned waste from their own in-house processes or were non or pre-operational.

Table 23.9 Deposit in Landfill for Recovery Inputs East Midlands (2017)**East Midlands: Deposit in landfill for recovery inputs 2017**

All figures are provided in 000s tonnes

Site Type	Sub-Region					EAST MIDLANDS
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	
Deposit in landfill for recovery	2	-	254	78	363	696
Total	2	-	254	78	363	696

*This activity is the deposit of waste in land for benefit and recovery purposes. Landfilling is the deposit in land for the purposes of final disposal. Both activities require an environmental permit under the Environmental Permitting Regulations.

Table 23.10 Use of Waste East Midlands (2017)**East Midlands: Use of waste inputs 2017**

All figures provided in 000s tonnes

Site Type	Sub Region					EAST MIDLANDS
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	
Use of waste in construction	-	-	-	-	-	-
Use of waste in reclamation	-	-	-	-	-	-
Use of waste for timber manufacturing	-	-	-	-	-	-
Total	-	-	-	-	-	-

Note: These activities are for use of waste permitted under Standard Rules Permits for waste operations.

Availability and Capacity of Regional Facilities

23.5.18 The specific waste streams that are predicted to be generated from the Facility are identified in **Sections 23.6** and **Section 23.7** below. These sections provide a discussion on the types of waste that are predicted to be generated; and whether those wastes would be recovered on-site; or would be recovered or disposed off-site. Off-site management would involve the use of facilities identified in **Table 23.4** and **Table 23.5** to **Table 23.10**.

23.5.19 The information shows that there are numerous waste management facilities providing a wide variety of waste management options at a regional scale, including provision for hazardous waste landfill (Augean PLC, Kings Cliffe, Northamptonshire) (**Table 23.5** to **Table 23.10** inclusive), however, options are limited at a local level (**Table 23.4**).

Evolution of baseline

23.5.20 The current level of waste management infrastructure both locally and regionally is dependent upon market forces in the waste sector. It is anticipated that there would be fluctuations in the availability of facilities at both scales, however, it is also anticipated that the distribution of the available types of waste management infrastructure would be largely the same; and are not influenced by the absence or presence of the Facility

23.6 Construction Waste Assessment

Construction Waste Arisings

23.6.1 Waste material will be generated at all stages of the construction. The type of development, ground conditions and on-site waste management practices will influence the composition of the waste.

23.6.2 In the absence of site-specific information regarding the potential earthworks cut and fill volumes and quantity, an estimate of the potential quantities was produced from available industry data. The BRE (Building Research Establishment) SMART Waste Data Report (2013) was used to estimate volumes of waste arisings from the construction phase of the Facility. BRE produced the SMART Waste data report by assessing actual data from approximately 10,000 completed new build, refurbishment and civil engineering projects (Building Research Establishment, 2013).

23.6.3 A detailed breakdown of the predicted composition of construction waste for the entire Facility is set out in **Table 23.11** below. This represents waste inclusive of the estimated earthworks quantity. The colour coding provided categorises

wastes types as inert (green); non-hazardous (yellow) and hazardous (orange).

- 23.6.4 The predicted waste types and volumes are derived from BRE's SMART Waste Data Report for Industrial Buildings projects according to the approximate tonnes of waste per 100 m², based upon a proposed site area of 23.4 ha. This was identified as the most relevant data set to derive the predicted arisings for the Facility across the construction phase.
- 23.6.5 In addition to the predicted volumes identified for the site construction works, a further 150,000 m³ capital dredged material is anticipated to be created. The sediment will be non-hazardous based upon anticipated levels of contamination being reported at levels below Cefas (Centre for Environment, Fisheries and Aquaculture Science) Action Level 2 thresholds (See **Chapter 15 Marine Water and Sediment Quality**).
- 23.6.6 This sediment will not be disposed to sea. Instead it will be brought to land for management in accordance with the Waste Hierarchy. Where possible, and subject to the material being suitable for use, the sediment will be used on-site as part of the site construction works; otherwise, it will be removed from site for recovery elsewhere, for example, soil conditioning, or use and restoration material for landfill.

Table 23.11 Estimated Quantity of Construction Waste

Waste Product (European Waste Catalogue number)	BRE data: (m ³ /100m ²)	Predicted volume across full Site	WRAP Conversion factor	Predicted arisings (tonnes)	Averaged monthly arisings (tonnes)
Asphalt (17 03 02)	0.8	1872	0.82	1535.04	31.98
Bricks (17 01 02)	0.5	1170	1.2	1404.00	29.25
Canteen/office/adhoc waste (20 03 01)	0.4	936	0.21	196.56	4.10
Concrete (17 01 01)	2.4	5616	1.27	7132.32	148.59
Gypsum (17 08 02)	0.3	702	0.33	231.66	4.83
Hazardous (17 09 03*)	2.5	5850	0.87	5089.50	106.03
Inert (17 01 07)	5.9	13806	1.24	17119.44	356.66
Insulation (17 06 04)	0.2	468	0.25	117.00	2.44
Metals (17 04 07)	0.7	1638	0.42	687.96	14.33
Mixed (17 09 04)	4.6	10764	0.87	9364.68	195.10
Packaging (15 01 06)	0.8	1872	0.21	393.12	8.19
Plastics (17 02 03)	0.2	468	0.23	107.64	2.24
Soils (17 05 04)	47.8	111852	1.25	139815.00	2912.81
Timber (17 02 01)	1.3	3042	0.34	1034.28	21.55
Total	68.4	160056		184228.2	3838.09

23.6.7 The estimated quantity according to the generic category of waste is summarised in **Table 23.12**.

Table 23.12 Summary of the Estimated Total Quantity by Waste Category

Cumulative arisings by category	Predicted arisings (tonnes)	Averaged monthly arisings	%
Inert	25656	534	13.9%
Non-hazardous	153483	3198	83.3%
Hazardous	5090	106	2.8%

Embedded Mitigation

23.6.8 Good environmental practices during construction works will be followed in accordance with Considerate Contractor Scheme (CCS) principles and wastes will be managed in accordance with the Construction Environmental Management Plan (CEMP).

Construction Waste Management Measures

Construction Phase

23.6.9 This section describes the measures that can be implemented to eliminate or reduce the anticipated quantity of waste sent to landfill by implementing the Waste Hierarchy. These measures would increase reuse; recycling or recovery opportunities, thereby reducing the effect of significant environmental impacts. The waste management measures for the construction phase are split in the section below, into those that can generally be applied to one or more waste type; and those that are applied to specific waste streams.

23.6.10 A Site Waste Management Plan (SWMP) will be prepared for the final ES to record any decisions given to materials resource efficiency when designing and planning the works. Any assumptions on the nature of the project; its design; the construction method or materials employed, to minimise the quantity of waste produced on-site; or maximise the amount of waste reused, recycled or recovered, will be captured within the SWMP.

23.6.11 The SWMP will provide information on each waste type that is expected to be produced in the project with the appropriate European Waste Catalogue (EWC) code and description for each waste type. It will provide an estimate of the quantity of each type of waste and the proposed waste management option for each waste produced (i.e. re-use, recycling, recovery or disposal; on or off-site).

General Waste Management Measures

23.6.12 There are certain principles of waste management that can be applied to most of the wastes that would be created during the construction phase. These are:

- Adhere to waste legislation for storage and handling on-site; and also ensure that the relevant regulatory controls have been applied to the reuse, recycling or recovery of waste on-site.
- No waste from the Facility shall be deposited outside the boundary of the site, unless it is at a facility that holds a valid environmental permit or suitable authorised exemption. Off-site waste management facilities are legally obliged to operate under an environmental permit (or an authorised exemption), which is in place to ensure that the site is operated in a manner to prevent emissions causing harm to human health or the environment.
- Ensure that those who remove waste from Application Site have the appropriate authorisation (i.e. are registered waste carriers); and those facilities that receive waste from the site hold a valid environmental permit or authorised exemption.
- Allocate space on-site for the storage of waste materials and ensure that storage areas and containers are clearly labelled so site workers know which wastes should be put there.
- Hazardous waste must be stored separately from non-hazardous wastes to avoid contamination. The Hazardous Waste Regulations make it illegal to mix hazardous waste with non-hazardous waste.
- Provide separate containers for dry recyclables, such as paper & cardboard, plastic, glass, wood and metal. This would encourage recycling and increase the potential value of the recyclable items by avoiding contamination.
- Monitor the actual quantities of wastes produced during construction, and update the SWMP to allow comparison with waste arisings estimated prior to construction. Record the proposed waste management option (e.g. reuse on-site, recycle off-site, or dispose off-site) for each waste produced.
- All wastes that are removed off the Application Site would be described on a waste transfer note or hazardous waste consignment note (as appropriate) that tracks the movement of the waste to the specified disposal or recycling facility.
- The appointed contractors should identify appropriate staff that are responsible for waste management; and ensure that all contractor staff are aware of the appropriate reuse, recycling or disposal routes for each waste.

23.6.13 These measures would promote sustainable waste management practices by maximising waste prevention, re-use and recycling for material destined for offsite waste management. This would actively discourage sending waste to landfill and would promote the Waste Hierarchy, which is a legal requirement. It is recommended that these measures are incorporated into the Construction Environmental Management Plan (CEMP) for the Facility.

Waste-Specific Management Measures

Inert Waste

23.6.14 Waste inert materials (for example concrete, bricks, rubble) could be crushed and processed in accordance with the Waste and Resources Action Programme (WRAP) Aggregates Quality Protocol (Environment Agency, 2013). This would allow for on-site reuse as engineering fill material complying with an appropriate engineering standard for fill (for example the Manual of Contract Documents for Highway Works Volume 1 - Specification for Highway Works, Department for Transport (DfT), 2009).

23.6.15 Aggregate will normally be regarded as having ceased to be waste, and therefore no longer subject to waste management controls, provided:

- it conforms to the requirements of the European standard appropriate to the use it is destined for;
- the aggregate is produced under Factory Production Control;
- inputs are limited and controlled within Factory Production Control;
- it requires no further processing, including size reduction, for the use it is destined for;
- it is destined for a use within designated market sectors; and
- it conforms with CE conformity marking requirements contained in the Construction Products Regulations, which applies to all aggregates placed on the market to harmonised European Aggregates Standards from July 2013.

23.6.16 Control procedures must be in place to ensure that only the appropriate types of inert materials are received (these are listed in Appendix C of the Quality Protocol); therefore, waste acceptance criteria and procedures are required.

23.6.17 The acceptance criteria must include:

- a list of the types of waste that are accepted (including waste codes);
- source/place of origin of the waste;

- supplier and transporting agent; and
- method of acceptance.

23.6.18 Every load must be inspected visually, both on initial receipt and after tipping, to ensure compliance with the acceptance criteria. A procedure for dealing with non-conforming incoming waste must be set up, for example, rejection of loads, quarantine or disposal. Records must be kept of how the procedure has been implemented.

23.6.19 The facility that receives the inert waste for processing into the aggregate must have an environmental permit, which can include a mobile plant where appropriate site-specific information has been provided to the Environment Agency and agreed. The processing of the inert waste must be carried out in accordance with the environmental permit and under Factory Control Procedures.

23.6.20 A rigorous sampling and testing regime is required to ensure that the processed material meets the required market specification according to the type of product produced.

23.6.21 To be able to demonstrate compliance with the Quality Protocol, producers must maintain delivery documentation for every load of recycled aggregate despatched.

23.6.22 Delivery documentation must include:

- date of supply;
- customer's name and contact details;
- product description to aggregates standard and customer specification;
- the name and contact details of the producer, including the address of the site of production;
- quantity supplied by weight/volume; and
- a statement that the product was produced in compliance with the Quality Protocol.

23.6.23 Where requested by the purchaser further documentation should also include:

- test results and procedures in accordance with the relevant aggregate industry standard or specification and for any further tests required to assess suitability for a particular end use;
- outline details of the Factory Production Control manual; and

- information on good practice relating to the storage, transportation and handling of aggregate.

23.6.24 For the purposes of the Quality Protocol the producer must keep and retain specified records for a minimum of two years; and make them available for inspection by the regulator (if requested).

23.6.25 It is important to note that even if the Quality Protocol is complied with, the material will become waste again and subject to waste management controls at any stage if it is discarded or there is an intention or requirement to discard. For example, if it is:

- disposed; or
- stored indefinitely with little prospect of being used.

23.6.26 These measures would reduce the amount of waste sent off-site; and promote on-site recycling into engineering-standard product, therefore, reducing the amount of material classed as waste on-site. The remaining surplus inert material would be sent off-site to a local recycling facility for processing into aggregate. This is a waste recycling measure in accordance with the Waste Hierarchy.

Non-hazardous Wastes

Biodegradable Waste from Vegetation Clearance

23.6.27 Some biodegradable waste is anticipated to be generated from the site clearance part of the construction works. This would be effectively managed by being sent for recovery at a local composting or an anaerobic digestion facility. None of this material is anticipated to require landfill disposal.

Excavated Material – non-hazardous

23.6.28 Excavated material would comprise concrete hardstanding, bitumen, made ground and subsoil according to the specific parts of the Application Site. The inert concrete hardstanding would be dealt with as inert waste (see above). Contaminated excavated material would require assessment to determine whether the contaminants were present at or above hazardous waste thresholds. Any contaminated excavated material that was hazardous waste would be stockpiled and dealt with separately to other non-hazardous excavated material (see below).

23.6.29 It is anticipated that some of the excavated soil would be retained on-site for reuse as general fill as part of the cut and fill balance associated with the construction

process and for moving the flood defence to enable the construction of the wharf. Any excavated soil that is surplus to requirements would be sent to a soil conditioning facility or local landfill for beneficial use as restoration material or daily cover, where possible as a preference over landfill depending upon availability.

23.6.30 Effective stockpile management would be essential within the Application Site. It would maximise the amount of material that can be beneficially reused on-site. Where excavated material is proposed to be used on-site for construction purposes (e.g. backfill), the appropriate regulatory mechanism must be followed prior to use to demonstrate that it will not cause unacceptable harm to the environment when used.

23.6.31 As the site is comprises some areas of greenfield, there are two proposed approaches for the use of excavated material within the development:

- Use of the exclusion from the rWFD; or
- Use of the CL:AIRE Code of Practice (CoP).

23.6.32 The use of naturally occurring, uncontaminated material is excluded from the scope of the waste regulatory framework according to very specific circumstances. This is because of Article 2(1)(c) of the rWFD, which states that “*uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated*” is excluded from the scope of the rWFD. The use is not subject to any waste regulatory controls if it can be demonstrated that the use is recovery. Overarching principles of rWFD must be adhered to. These are:

- “... *take the necessary measures to ensure that waste management is carried out without endangering human health, without harming the environment and, in particular:*
 - a) *Without risk to water, air, soil, plants or animals;*
 - b) *Without causing a nuisance through noise or odours; and*
 - c) *Without adversely affecting the countryside or places of special interest.”*

23.6.33 The exclusion does not apply to material removed from the Application Site.

23.6.34 The rWFD does not define ‘uncontaminated’. However, the Environment Agency has a strict interpretation based on environmental risk: “At its most basic or

general, in this context, 'contamination' means the presence of substances *in soil that produce a risk of harm or pollution. In the Environment Agency's opinion, the presence or absence of "contamination" has to be assessed on a site specific basis having regard to a risk assessment e.g. some soil may not be considered contaminated for one land use but may be for another. It is not just a matter of what levels of substances are present within a soil but where and how that soil is used.*"

23.6.35 Therefore a risk assessment would be required, which is one of the fundamental requirements of the CL:AIRE CoP. In using the exclusion, it is recommended that the principles of the CoP are followed (including the use of Materials Management Plans (MMP)) but without the formal signoff.

23.6.36 The Contaminated Land: Applications In Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (the CoP) is anticipated to provide the framework for the reuse of the remaining excavated material and provides principles that allows the excavated to cease to be waste when used. This would also apply to contaminated material (including excavated material classified as hazardous waste – see below), where the risk assessment demonstrated that there was no unacceptable level of risk to human health or the environment.

23.6.37 The CoP is supported by the Environment Agency and is subject to self-regulation, via the use of an independent assessment by a Qualified Person, who is a person that fulfils the required experience, qualifications and professional membership criteria set by CL:AIRE. The CoP sets out the principles for achieving a non-waste status by setting a risk-based approach when excavated material is used within a development. The principles are:

- **The proposed use of the material must not cause any harm to human health or the environment.**
 - A risk assessment for the specific end use would be required following the principles defined in Environment Agency Contaminated Land Report 11, ('CLR11') (Environment Agency, 2004). This would find out whether any contaminants from anthropogenic and/or natural sources present an unacceptable level of risk to human health, controlled waters, ecosystems and/or the built environment, based on the available pathways and receptors. If the level of risk is unacceptable after treatment, the CoP cannot apply to the material, therefore, it would be a waste and an environmental permit would be required to allow the reuse of the material.

- **The proposed use of the material must not cause any harm to human health or the environment.**
 - A risk assessment for the specific end use would be required following the principles defined in Environment Agency Contaminated Land Report 11, ('CLR11'). This would find out whether any contaminants from anthropogenic and/or natural sources present an unacceptable level of risk to human health, controlled waters, ecosystems and/or the built environment, based on the available pathways and receptors. If the level of risk is unacceptable after treatment, the CoP cannot apply to the material, therefore, it would be a waste and an environmental permit would be required to allow the reuse of the material.
- **The excavated material is suitable for its proposed use.**
 - This would take into account the chemical and geotechnical requirements of the material in relation to a specification defined for their end use.
- **The excavated material must not require further treatment prior to use.**
 - The material must be suitable for use in all respects without treatment. If it requires treatment, it is waste.
- **The use of the excavated material is certain.**
 - The holder must be able to demonstrate that all of the material would be used and that use is a certainty, not a probability. The use of the excavated material must form part of the final design, so it can be clearly identified where in the scheme the material would be used; and how much would be used. This requires a Materials Management Plan to be prepared to show how and where all materials on the ground are to be dealt with; and a tracking system to monitor any waste/material movements; and also contingency measures must be defined, i.e. who takes responsibility and what happens in the event that the material is not suitable for use.
- **Only a sufficient quantity of material would be used.**
 - The material must be destined for a defined purpose, which is defined in the scheme design. The quantity of material required for that purpose must be known prior to construction. If excess material is deposited to undertake that purpose this is an indication that it is being discarded and it would be waste.

23.6.38 The benefit of the CoP is that an environmental permit is not required for the use of excavated material where the principles can be met; and therefore, this promotes waste reduction, because the material ceases to be waste when it is used.

23.6.39 These measures would promote on-site recovery and reduce the amount of waste on-site.

23.6.40 A proportion of the excavated material may not be suitable for reuse due to the presence of large rocks/stones or fibrous material. This material would be stockpiled separately for off-site management in accordance with the Waste Hierarchy.

Surface Planings – Bitumen

23.6.41 It is anticipated that bitumen-based surface planings would be treated at an authorised mobile treatment unit by crushing, grinding and screening, and used again on-site in the construction of paving structures similar to those from which the waste arose, in accordance with a 'U1' Waste Exemption (Use of Waste for Construction).

Dry Recyclables from Site Workers

23.6.42 Site workers will create waste produced by themselves, by taking refreshment and from site welfare activities. The most effective waste management solution for waste generated by site workers taking refreshment on-site is to introduce a policy to require them to take their own waste home. This is likely to reduce the amount of waste produced.

23.6.43 In terms of the waste that would be produced on-site from site workers in the temporary office locations and in the site temporary works areas, this is similar in composition to mixed municipal waste and is therefore considered to be non-hazardous. Space should be made available to provide receptacles to collect different waste streams and allow the separate collection of dry recyclables from residual waste.

23.6.44 Segregation of the different streams of plastic waste (e.g. Polyethylene terephthalate (PET), High-density polyethylene (HDPE) and mixed plastics) would maximise opportunities for recycling. Some source segregated plastics, particularly PET and HDPE, can generate income. Card and paper should be separately collected as should aluminium and steel cans. Glass should be separated into different receptacles where possible. These measures would

ensure that the maximum amount of waste is diverted for reuse, recycling and recovery. The food waste should also be separately collected and sent for anaerobic digestion.

23.6.45 All receptacles for contractor waste should be clearly labelled and have lids to prevent wind-blown litter.

23.6.46 Frequent collections of waste should be arranged to ensure that quantities on the Application Site are within the capacity of one skip and waste is not retained on the Application Site for long periods to reduce scavengers and vermin; and to reduce odour issues.

23.6.47 The remaining residual waste should be sent to an off-site materials recycling facility.

23.6.48 It should be noted that the level of recycling / separate collection will be dependent on the amount of space at the site temporary works and availability of different types of container; and waste management and recycling policies introduced by the Contractor.

Excess Construction Materials

23.6.49 Timely procurement and buying only the required amount of material should ensure that the material is delivered at the time when it is needed and only in sufficient quantities. This would prevent waste from unused or spoiled items because of bulk purchasing.

23.6.50 Ensure that perishable materials are stored so that they are protected from the local climate.

23.6.51 All damaged or off-specification material should be immediately returned to the supplier where possible, which would reduce the amount of waste held on the Application Site.

23.6.52 These measures are anticipated to reduce the amount of this type of waste on the Application Site at any one time.

Metal Wastes

23.6.53 Metal waste (i.e. from overhead line modifications, off-cuts and scrap metal that cannot be reused) should be collected in containers/skips or stored in an allocated area and removed off-site for recycling. There is an active metal recycling market in the UK to deal with this waste.

Imported Material

23.6.54 Local and sustainable products would be used to minimise the effects on the environment by reducing carbon emissions from transport, promoting local businesses and saving natural resources.

Packaging

23.6.55 To minimise the effects of packaging, suppliers should be required to take back any packaging associated with their products. This would assist the suppliers in fulfilling their own producer responsibility obligations under Packaging Waste Regulations 2007 (as amended) (HMSO, 2007).

23.6.56 Packaging materials that cannot be returned should be kept for on-site use (e.g. use of pallets for storage).

23.6.57 Any residual packing that cannot be used on-site should be segregated into distinct dry recyclable waste streams and sent for recycling off-site. No waste packaging would be landfilled.

Wood

23.6.58 Waste timber will arise from waste packaging e.g. pallets. This should be returned to suppliers as described above.

23.6.59 The condition of any other timber waste would determine whether they can be recycled at a wood processing facility; or whether they would have to be chipped or treated and prepared for recovery at a biological treatment facility, such as composting; or prepared for use as a fuel in an energy from waste facility.

Hazardous Wastes

23.6.60 Empty fuel or oil drums should be retained for reuse on the Application Site for storing waste oil where possible. Those that cannot be retained should be sent to a drum reconditioning facility to enable the container to be prepared for re-use. Damaged drums should be sent for recycling.

23.6.61 These measures are anticipated to maximise waste managed at the highest waste hierarchical option and reduce the amount of waste sent off-site.

23.6.62 The use of an active maintenance regime on plant and equipment should reduce the potential for machinery to cause leaks. Valves, stopcocks and pipes should be regularly checked for leakages. Fuelling activities should be carried out in bunded areas, or off-site.

23.6.63 The storage of fuels and liquids should be in accordance with the Oil Storage Regulations 2001 (HMSO, 2001) and the appropriate pollution prevention control guidelines to protect the environment from both storage and spillages of hazardous substances, which can be obtained from the government archive website²:

- PPG 2 - Choosing and using oil storage tanks;
- PPG 7 – Operating Refuelling facilities;
- PPG 8 - Safe storage and disposal of used oils;
- PPG 22 - Dealing with spills; and
- PPG 26 – Storage and handling drums and intermediate bulk containers.

23.6.64 Although these guidelines are no longer supported by the Environment Agency, they represent good practice. Using these guidelines as good waste management practice against leaks would reduce the potential for leakages, therefore reducing the volume of absorbent required to clean up spillages.

23.6.65 Hazardous materials should be stored securely, away from non-hazardous or incompatible materials. Small items of hazardous waste should be prevented from being disposed of in general waste skips to avoid contamination. Hazardous material should be collected frequently to minimise the total volume on-site at any one time.

Contaminated Excavated Material

23.6.66 A Land Quality Phase 1 Preliminary Risk Assessment (PRA) was carried out by Royal HaskoningDHV as part of the scoping stage of this Facility. This PRA also included a site walkover in August 2017 to verify the current conditions at the Application Site. Details are provided in **Chapter 11 Contaminated Land, Land Use and Hydrogeology**.

23.6.67 The PRA identified potential sources of contamination, which include the historic landfill site, recycling centre and other historic activities around the Application Site.

23.6.68 The Preliminary Conceptual Site Model (PCSM) identified several plausible pollutant linkages that could represent an unacceptable risk to sensitive receptors and suggested potential contaminants of concern at on and off-site locations. Potential contaminants of concern include: metals and metal compounds; petroleum hydrocarbons; Polycyclic Aromatic Hydrocarbons (PAH)s; Volatile

² <http://www.nationalarchives.gov.uk/>

Organic Compounds / Semi Volatile Organic Compounds (VOCs/SVOCs); phenols; Polychlorinated Biphenyls (PCBs); and inorganic contaminants (e.g. ammonia, arsenic, cyanides, sulphides, phosphate); and asbestos.

23.6.69 Therefore, a precautionary approach should be adopted, which assumes that some contaminated material will be encountered.

23.6.70 A watching brief would be maintained during construction, in accordance with the Construction Environmental Management Plan, and any excavated material that is suspected of contamination (e.g. because of staining or odour) would be stockpiled separately and samples taken for analysis.

23.6.71 Any excavated material that is found to be contaminated (including material classified as hazardous) would be assessed against the principles of the CL:AIRE CoP and reused where there is a need for the material; and it is demonstrated to be suitable for use. This would reduce the amount of material on-site that is waste.

23.6.72 Any material found to be hazardous and unsuitable for reuse on the Application Site would be sent off-site for treatment and/or disposal as appropriate, to a facility holding a valid environmental permit that authorises treatment or disposal of such waste. Surplus hazardous material should be sent to a treatment facility, where it can be treated to remove or reduce the levels of contamination to a level acceptable for recovery of the material. This would reduce the amount of hazardous waste from the facility going to landfill and promotes the Waste Hierarchy and Proximity Principle.

23.6.73 If any excavated material is classified as hazardous and is required to be landfilled because it cannot be treated at a soil recycling facility, further testing would be carried out to ensure that it meets the Hazardous Waste Acceptance Criteria (WAC) (2003/33/EC; European Council, 2003) prior to landfill disposal – note that there is only one existing hazardous waste landfill within the region, in Northamptonshire.

23.7 Operational Waste Composition and Quantities

Operational Waste Arisings

23.7.1 The Facility comprises the following elements, with each considered separately for proposed waste arisings during construction:

- Wharf;
- RDF storage area;
- RDF processing facility;

- Three gasification units, turbine hall and air cooled condenser;
- Grid connection and substation;
- A LWA manufacturing plant;
- Carbon capture facility; and
- Associated development, including welfare areas, workshops, control room and visitor centre.

23.7.2 These facilities will produce a variety of wastes that fall within the control requirements of English waste legislation.

Embedded Mitigation

23.7.3 As part of the project design, several embedded mitigation measures have been proposed to reduce potential impacts on waste.

Supply of RDF

23.7.4 The supplier of the RDF bales will have several contractual requirements to minimise waste impacts.

23.7.5 The supplier will be required to check the bales to ensure that there are no unacceptable wastes (for example hazardous wastes, gas cannisters, infectious wastes etc.) baled along with the RDF. This is to ensure bales are not rejected at the Facility.

23.7.6 The supplier of the RDF will not be permitted to load any damaged bales onto the vessels prior to shipping to the Application Site. This will be a contractual requirement for the supplier.

23.7.7 At the wharf, it is proposed that no bales that are damaged in transit would be off loaded from the vessel. This is to prevent litter from damaged bales falling into The Haven.

Wharf and RDF Storage

23.7.8 At the wharf, no bales that have been damaged in transit will be removed from the vessel. They will be left on the vessel and will be returned back to the supplier for re-baling.

23.7.9 Any bale that is damaged whilst in transit to the storage area, or whilst being loaded onto the conveyors will be removed and taken to the re-baling facility behind the wharf.

23.7.10 Thermal cameras and thermal lances will be used to monitor temperature of bales and bale stockpiles. Thermal cameras will also be located along the sealed conveyor lines. Any bale that is detected to be increasing in temperature to unacceptable levels will be removed and dealt with in accordance with a Fire Prevention Plan, which will be developed in accordance with Environment Agency guidelines.

RDF Processing Facility

23.7.11 The RDF processing facility will recover ferrous metal, non-ferrous metal and inert materials such as stones, fines and glass. These materials are all recyclable and will be removed to local recycling facilities near the site as identified above. Light inert material, glass and fines will be recycled on-site in the LWA.

Gasification Facility

23.7.12 The gasification ash and the air pollution control (APC) residues will be transferred from the gasification unit to the LWA plant and will be converted into an aggregate product. These two residues will be processed separately in the LWA to avoid mixing the residues prior to treatment in the LWA. Separate streams of aggregate will be produced from each residue stream.

Lightweight Aggregate (LWA) Facility

23.7.13 The LWA will use maintenance dredge material from maintaining the berthing pocket at the wharf as binding material for manufacturing the aggregate. This will avoid disposal at sea; or recovery or disposal of this material off-site on land.

23.7.14 In operation, the main types of waste produced and the proposed means of managing these wastes in accordance with the Waste Hierarchy for each element are provided below (see **Table 23.13** for typical amounts):

Table 23.13 Typical Wastes Produced over 12 Months per Element

Element	Waste Stream	Amount	Management in accordance with the Waste Hierarchy
Wharf	Damaged RDF bales on the vessel	n/a ¹	Rejected – Not removed from the vessel and sent back on the vessel to the supplier for re-baling. These will then be returned for energy recovery to the Facility
	Damaged RDF bales on land	Covered in the RDF total below	Recovery - Re-baled on-site and processed with other RDF for energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process
RDF storage area	RDF	1,300,000 tonnes	Recovery - energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process
Three gasification units, turbine hall and air cooled condenser	Gasification ash	248,000 tonnes	Recycled in the LWA to a market specification product.
	Air pollution control residues	63,500 tonnes	Recycled in the LWA to a market specification product.
Carbon capture facility	Hazardous liquid waste 40 % Monoethanolamine (MEA) / 60 % water	60,000 litres	Disposal via Liquid hazardous waste treatment
	Water dosed with sodium hydroxide (pH 7.5-9.0)	11,000 litres	Discharge to sewer in accordance with an agreed trade effluent agreement with the sewerage undertaker
Associated infrastructure	Mixed municipal waste from site workers	To be confirmed in the ES	Recycled – source segregation of metal, paper and card, plastics and glass Recovered – residual waste that cannot be recycled will be collected for recovery.
	Non-ferrous metal	9,000 tonnes	Recycled off-site

Element	Waste Stream	Amount	Management in accordance with the Waste Hierarchy
RDF Processing Facility	Ferrous metal	33,000 tonnes	Recycled off-site
	Medium / heavy inert material	90,000 tonnes	Recycled off-site
	Light inert material (e.g. glass) suitable for LWA	60,000 tonnes	Recycled in the LWA to a market specification product
	Light inert material (e.g. glass) not suitable for LWA	60,000 tonnes	Recycled off-site
	Processed RDF	1,000,000 tonnes	Recovery - energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process

¹ not applicable is set here to avoid double counting, because this waste will eventually be returned back to the Facility for processing.

23.7.15 The Operation of the Facility will be governed by the Conditions associated with an Environmental Permit issued by the Environment Agency. This will set specific standard associated with the management of wastes produced on-site (amongst other things) to ensure the wastes are handled in accordance with Best Available Techniques. As such, these specific requirements are not explored further in this PEIR. General waste management provisions are identified below.

Operational Waste Management Measures

23.7.16 The operation of the Facility will produce conventional wastes, such as metals, office and 'household' type waste, plastics and waste electrical and electronic equipment (WEEE). Small quantities of hazardous wastes will also be produced, for example, waste oil and waste process and cleaning chemicals.

23.7.17 Separate receptacles should be provided for dry recyclables, such as paper & cardboard, plastic, glass, wood and metal. This would facilitate the most appropriate reuse, recycling or recovery option in accordance with the Waste Hierarchy.

23.7.18 There are general principles that would need to be followed to ensure effective management of conventional waste arisings. These are provided below.

Duty of Care

23.7.19 The operators of the Facility would be under a legal obligation to comply with the waste duty of care to ensure that they handle waste safely and in compliance with the appropriate regulations.

23.7.20 The duty of care involves making sure that the waste has been described properly and that all of the properties associated with the waste are known; and to ensure that persons involved in the transfer of waste hold the necessary authorisation to do so.

23.7.21 The basic responsibilities that the commercial occupiers would be expected to follow are:

- Know whether waste is hazardous or non-hazardous;
- Store waste in suitable containers at a secure location, in a manner that prevents releases of the waste;
- Label the waste containers so that it is clear what is in them;
- Check that the waste is subsequently handled by those who hold an appropriate environmental authorisation. This means checking that the waste carrier is registered (or is exempt from having to be a registered waste carrier).

It is also good practice to check that the facility that will receive the waste holds a suitable environmental permit that allows the waste to be handled on their site;

- Provide documentation with any waste transfer that accurately describes the waste and contains the relevant code for the waste; and
- Keep records of all waste transfers in a register.

Hazardous Waste

23.7.22 Servicing and maintenance personnel would be required to know the difference between hazardous waste and non-hazardous waste. The controls that are applied to hazardous waste are stricter. All hazardous waste must be segregated from non-hazardous wastes or other non-waste materials. All hazardous wastes must be accompanied by a hazardous waste consignment note when removed from site.

Producer Responsibility

23.7.23 Producer responsibility requires businesses to:

- Minimise waste arising and promote their re-use.
- Ensure the waste products are treated and meet recovery and recycling targets for the waste materials.
- Design products by reducing material use and enhancing reusability and recyclability.

23.7.24 The key requirements of the project in terms of producer responsibility would be to ensure batteries, WEEE and packaging wastes are managed appropriately.

WEEE

23.7.25 WEEE must be collected separately from other wastes and sent to the appropriate recycling facilities. If a business does have WEEE to recycle, it has a Duty of Care to act responsibly and ensure that the contractor it appoints to collect it is legitimate and has the appropriate licences and permits.

23.7.26 A business should ensure that the waste is taken to a suitable facility to be treated and recycled. The site must have a permit or licence that allows them to accept trade waste. For WEEE waste, it must obtain and keep proof that WEEE was given or sold to a waste management (or asset management) business and was treated and recycled appropriately.

23.7.27 All WEEE from a business should go through Approved/Authorised Treatment Facilities for treatment and recycling.

Storage

23.7.28 The design and location of waste storage areas would be confirmed at detailed design stage.

23.7.29 The required storage provision for the Facility would ensure that:

- The space would be adequate to store the predicted accumulation of waste between waste collections;
- The bin storage would be easily accessible to users of the facility;
- Waste collected from the bins would be accumulated in a waste compound for temporary storage prior to collection;
- The waste compound storage would be easily accessible to waste collectors; and
- The storage would be adequate to accommodate all of the different types of storage containers to meet current and proposed residual waste and waste recycling regimes by waste management companies collecting the waste.

23.7.30 Consideration would be given to vehicle access and egress to ensure the facilities can be easily serviced; and that waste compound areas are secure and can be accessed by waste collection vehicles.

23.7.31 All wastes shall be stored in dedicated areas which should be:

- Identified by appropriate signage;
- Paved or protected from direct contact with the ground; and
- Protected from bad weather conditions (rain, wind, extreme temperatures).

Packaging

23.7.32 The Packaging Waste Regulations 2007 (as amended) (HMSO, 2007) require businesses or organisations to:

- Reduce packaging;
- Reduce how much waste packaging goes to landfill; and
- Increase the amount of packaging waste that is recycled and recovered.

23.7.33 Compliance is facilitated by the segregation of packaging from other waste; and the segregation of different types of packaging from each other (e.g. separating plastic packaging from paper and cardboard packaging).

23.7.34 The amount of packaging waste held by a business or organisation can be reduced

by returning as much packaging back to the supplier as possible. This in turn will help suppliers achieve their obligations under the Packaging Waste regulations.

Batteries

23.7.35 The Waste Batteries and Accumulators Regulations 2009 (as amended) (HMSO, 2009) impose obligations on the producers and distributors of batteries to ensure that batteries are appropriately treated or recycled using compliance schemes that are financed by producers and distributors of batteries.

23.7.36 It is illegal to send waste industrial or vehicle and other automotive batteries for incineration or to landfill. Maintenance operatives must ensure that all batteries are sent to an Approved Battery Treatment Operator (ABTO) or an Approved Battery Exporter (ABE) for treatment and recycling.

Landfill Disposal

23.7.37 Before any waste can be sent to landfill, the waste producer/holder must ensure that the option for landfill has been justified in accordance with the Waste Hierarchy.

23.7.38 It is a legal requirement that all wastes going for landfill must be pre-treated, unless treatment is not technically possible (note, this applies to inert wastes only); or if treatment would not reduce the quantity or the hazards that it poses to human health or the environment. The proposed pre-treatment option must comply with the definition of 'treatment'. This involves a 'three-point test':

- It must be a physical, thermal, chemical or biological process including sorting.
- It must change the characteristics of the waste.
- It must do so to:
 - Reduce its volume; or
 - Reduce its hazardous nature; or
 - Facilitate its handling; or
 - Enhance its recovery.

23.7.39 If the waste is classified as hazardous waste and landfill has been determined as a suitable option in accordance with the Waste Hierarchy, it can only be disposed in a hazardous class of landfill and must pass the hazardous WAC. This must be confirmed through chemical WAC testing.

23.7.40 If the waste is inert, it can only be deposited in an inert class of landfill if it can be demonstrated that it meets the inert WAC.

23.8 Decommissioning Waste Composition and Quantities

Decommissioning Waste Arisings

23.8.1 It is anticipated that the waste arisings during decommissioning will be similar to those of construction, as discussed in **Section 23.6**.

Decommissioning Waste Management Measures

23.8.2 The measures proposed for waste management during the construction phase of the works will be adhered to during decommissioning.

23.9 Cumulative Impacts

23.9.1 The assessment of Cumulative Impact Assessment with the relevant cumulative schemes that have been determined in discussion with Boston Borough Council (BBC) will be provided in the ES.

23.10 Transboundary Impacts

23.10.1 The RDF that will be sent to the Facility will be derived from UK sources. None of the wastes that are created by the Facility in construction or Operation will be exported for disposal or recovery. Therefore, there will be no Transboundary Impacts. As such, Transboundary Impacts are not covered further in this PEIR.

23.11 Inter-Relationships with Other Topics

23.11.1 This chapter has inter-relationships with **Chapter 11 Contaminated Land, Land Use and Hydrogeology**. **Chapter 11 Contaminated Land, Land Use and Hydrogeology**, which has considered the impact of waste during construction associated with the potential excavation of contaminated ground and storage of waste material in stockpiles; and storage of operational waste arisings on human and environmental receptors.

23.11.2 The transport of materials to and from the Application Site (including waste materials) is considered within **Chapter 19 Traffic and Transport**.

23.11.3 The impacts associated with waste received by or produced by the Facility on the marine environment, including water and sediment quality and marine ecology is provided in **Chapter 15 Marine Water and Sediment Quality**, **Chapter 16 Estuarine Processes** and **Chapter 17 Marine and Coastal Ecology**.

23.12 Summary

Construction Phase

23.12.1 **Table 23.14** below provides a summary of the predicted waste arisings during construction.

Table 23.14 Summary of the Estimated Total Quantity by Waste Category

Cumulative arisings by category	Predicted arisings (tonnes)	Averaged monthly arisings	%
Inert	25656	534	13.9%
Non-hazardous	153483	3198	83.3%
Hazardous	5090	106	2.8%

Inert wastes

23.12.2 The proposed waste management measures would reduce the amount of inert wastes by recycling the maximum amount of this material into an engineering standard product in accordance with the Aggregates Quality Protocol for use.

23.12.3 Where this cannot be achieved, other on-site uses such as recovery in the construction of site access tracks or backfill would be prioritised over any off-site options. Therefore, the measures would reduce the amount of material requiring off-site management to a minimum; and there are sufficient facilities within the region to recycle this material. This promotes the Waste Hierarchy and the Proximity Principle.

Non-hazardous wastes

23.12.4 Most of the excavated material is likely to be non-hazardous because the Application Site is largely greenfield. The waste management measures proposed for excavated material would promote the reuse of this material in accordance with the rWFD exclusion or CoP, where possible. The proposed use on-site would be considered a justifiable option under the Waste Hierarchy and the Proximity Principle, because the retention of the material on-site would prevent emissions as a consequence of removal from the site. Therefore, the use of the CoP would reduce the quantity waste being managed, because if the principles of the CoP are followed, the excavated material ceases to be waste when used.

23.12.5 Any excavated material that is not suitable for use on-site or is surplus to requirements for use for construction purposes would be sent off-site in accordance with the Waste Hierarchy. Options for reuse or recovery, for example to a soil conditioning facility; or beneficial use as restoration material at a local landfill, would

be prioritised to ensure that the amount of waste excavated material being disposed to landfill is reduced to an absolute minimum.

23.12.6 Biodegradable waste generated from site clearance would be managed by being sent for recovery at a regional composting or an anaerobic digestion facility.

23.12.7 Waste produced by site workers in site welfare facilities can be dealt with by introducing a policy to require workers to take their own waste home. Receptacles should also be provided within the site compound areas to collect different waste streams and allow the separate collection of dry recyclables from residual waste. Segregation of the different waste streams would ensure that the maximum amount of waste is diverted for reuse, recycling and recovery. The food waste should also be separately collected and sent for anaerobic digestion.

23.12.8 Metal waste should be collected in containers/skips and removed off-site for recycling at local facilities.

23.12.9 Suppliers should be required to take back any packaging associated with their products. Packaging materials that cannot be returned should be kept for on-site use (e.g. use of pallets for storage). Any residual packing that cannot be used on-site should be segregated into distinct dry recyclable waste streams and sent for recycling off-site. No waste packaging would be landfilled.

23.12.10 Wood should either be recycled at a wood processing facility; or be chipped or treated and prepared for recovery at a biological treatment facility, such as composting; or prepared for use as a fuel in a biomass energy from waste facility.

23.12.11 Bitumen based surface planings would be treated at an authorised mobile treatment unit by crushing, grinding and screening, and used again on-site in the construction of paving structures similar to those from which the waste arose, in accordance with a 'U1' Waste Exemption (Use of Waste for Construction).

Hazardous wastes

23.12.12 The waste management measures proposed would effectively reduce the amount of hazardous excavation waste on-site because of the material ceasing to be waste when reused under the CoP. This would also reduce the amount that requires off-site disposal.

23.12.13 Off-site options for surplus material or material that would not be suitable for use would be prioritised towards soil treatment to reduce or remove contaminants to a level that would facilitate the reuse or recovery of the treated material; thereby promoting the Waste Hierarchy.

23.12.14 The region has one hazardous waste landfill facilities in Northamptonshire. The use of regional treatment facilities to treat any hazardous soil as an alternative to landfill would promote the Proximity Principle by avoiding the need to export the material out of the region.

23.12.15 There are sufficient facilities within the region to recycle or treat ad hoc hazardous wastes (such as waste oils, etc.).

Operational Phase

23.12.16 **Table 23.15** provides a summary of the predicted main waste arisings during operation.

Table 23.15 Typical wastes produced over 12 months per element

Element	Waste Stream	Amount	Management in accordance with the Waste Hierarchy
Wharf	Damaged RDF bales on the vessel	n/a ¹	Rejected – Not removed from the vessel and sent back on the vessel to the supplier for re-baling. These will then be returned for energy recovery to the Facility
	Damaged RDF bales on land	Covered in the RDF total below	Recovery - Re-baled on-site and processed with other RDF for energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process
RDF storage area	RDF	1,300,000 tonnes	Recovery - energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process
Three gasification units, turbine hall and air cooled condenser	Gasification ash	248,000 tonnes	Recycled in the LWA to a market specification product.
	Air pollution control residues	63,500 tonnes	Recycled in the LWA to a market specification product.
Carbon capture facility	Hazardous liquid waste 40 % Monoethanolamine (MEA) / 60 % water	60,000 litres	Disposal via Liquid hazardous waste treatment
	Water dosed with sodium hydroxide (pH 7.5-9.0)	11,000 litres	Discharge to sewer in accordance with an agreed trade effluent agreement with the sewerage undertaker

Element	Waste Stream	Amount	Management in accordance with the Waste Hierarchy
Associated infrastructure	Mixed municipal waste from site workers	To be confirmed in the ES	Recycled – source segregation of metal, paper and card, plastics and glass Recovered – residual waste that cannot be recycled will be collected for recovery.
RDF Processing Facility	Non-ferrous metal	9,000 tonnes	Recycled off-site
	Ferrous metal	33,000 tonnes	Recycled off-site
	Medium / heavy inert material	90,000 tonnes	Recycled off-site
	Light inert material (e.g. glass) suitable for LWA	60,000 tonnes	Recycled in the LWA to a market specification product
	Light inert material (e.g. glass) not suitable for LWA	60,000 tonnes	Recycled off-site
	Processed RDF	1,000,000 tonnes	Recovery - energy recovery in the gasifier. The plant is Waste Framework Directive R1 compliant and therefore a recovery process

¹ not applicable is set here to avoid double counting, because this waste will eventually be returned back to the Facility for processing.

23.12.17 The Operation of the Facility will be governed by the Conditions associated with an Environmental Permit issued by the Environment Agency. This will set specific standard associated with the management of wastes (amongst other things) arising from the processes at the Facility to ensure the wastes are handled in accordance with Best Available Techniques.

23.12.18 The operation of the Facility will also produce conventional wastes, such as metals, office and 'household' type waste, plastics and waste electrical and electronic equipment (WEEE). Small quantities of hazardous wastes will also be produced, for example, waste oil and waste process and cleaning chemicals.

23.12.19 Separate receptacles should be provided for dry recyclables, such as paper and cardboard, plastic, glass, wood and metal. This would facilitate the most appropriate reuse, recycling or recovery option in accordance with the Waste Hierarchy.

23.12.20 There are general principles that would need to be followed to ensure effective management of conventional waste arisings.

23.12.21 The operators of the Facility would be under a legal obligation to comply with the waste duty of care to ensure that they handle waste safely and in compliance

with the appropriate regulations.

23.12.22 Servicing and maintenance personnel would be required to know the difference between hazardous waste and non-hazardous waste. The controls that are applied to hazardous waste are stricter. All hazardous waste must be segregated from non-hazardous wastes or other non-waste materials. All hazardous wastes must be accompanied by a hazardous waste consignment note when removed from site.

23.12.23 The key requirements of the project in terms of producer responsibility would be to ensure batteries, WEEE and packaging wastes are managed appropriately. Producer responsibility requires businesses to:

- Minimise waste arising and promote their re-use.
- Ensure the waste products are treated and meet recovery and recycling targets for the waste materials.
- Design products by reducing material use and enhancing reusability and recyclability.

Decommissioning Phase

23.12.24 No decision has been made regarding the final decommissioning policy for the Facility, as it is recognised that industry best practice, rules and legislation change over time.

23.12.25 Decommissioning of the Facility is likely to create significant quantities of waste.

23.12.26 The measures proposed for waste management during the construction phase of the works will be adhered to during decommissioning, in accordance with a decommissioning plan that will accord with relevant policy, legislation and guidance relevant at the time. The Decommissioning Plan will be agreed with relevant authorities prior to the decommissioning starts and will contain relevant measures to manage waste.

23.13 References

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