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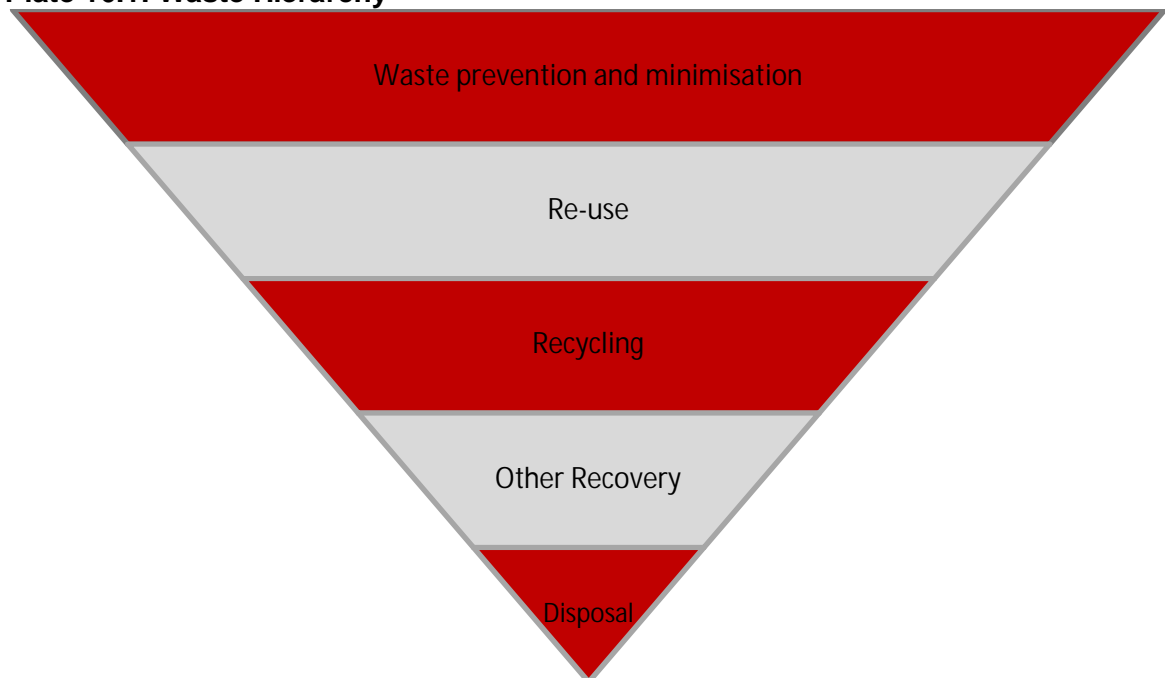
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## 16.0 WASTE MANAGEMENT

### 16.1 Introduction

- 16.1.1 This chapter addresses the potential effects of the Proposed Development on waste management.
- 16.1.2 Waste is defined as per the Waste Framework Directive (2008/98/EC) (Official Journal of the European Union, 2008) (WFD) as "*any substance or object which the holder discards or intends or is required to discard.*"
- 16.1.3 During construction, operation (including maintenance) and decommissioning of the Proposed Development, the aim is to prioritise waste prevention, followed by preparing for re-use, recycling, recovery and lastly disposal to landfill as per the internationally recognised waste hierarchy (see Plate 16.1).

**Plate 16.1: Waste Hierarchy**



- 16.1.4 There is potential for quantities of waste to be generated during the construction of the Proposed Development if the contractor determines that the top layer of ground within the Main Development Area is to be cut and filled to improve geotechnical conditions for construction (as outlined in Chapter 5: Construction Programme and Management).
- 16.1.5 Wastes will also be generated during the operation and maintenance of the Proposed Development, predominantly from combustion and flue gas treatment.

### 16.2 Legislation and Planning Policy Context

- 16.2.1 Relevant policies, legislation and guidance have been considered as part of the waste assessment, which have informed the identification of receptors and resources and their sensitivity, the assessment methodology, the potential for significant environmental effects, and required mitigation.

### National Legislation and Policy

#### *The Waste Management Plan for England (2013)*

- 16.2.2 The Waste Management Plan for England (Department for Environment, Food and Rural Affairs (Defra), 2013) fulfils the WFD Article 28 mandatory requirements, and other required content as set out in Schedule 1 to the Waste (England and Wales) Regulations 2011. The Waste Management Plan is a high level document, which outlines waste that is generated and how those materials are managed. The Waste Management Plan provides an analysis of current waste management practices in England, and evaluates implementation of the objectives and provisions of the revised WFD. In terms of demolition and construction waste, the plan details how the United Kingdom is committed to meeting its target under the WFD of recovering at least 70% by weight, of construction and demolition waste by 2020.

#### *The National Planning Policy for Waste (2014)*

- 16.2.3 The National Planning Policy for Waste (Department for Communities and Local Government, 2014) provides the planning framework to enable Local Authorities to put forward, through local waste management plans, strategies that identify sites and areas suitable for new or enhanced facilities to meet the waste management needs of their areas. Information is also included concerning non-waste developments, including any development whose end function is not directly related to waste. Waste developments include landfills, waste disposal, waste treatment, waste recycling plants, and Household Waste Recycling Centres (HWRCs).

### Local Policy

- 16.2.4 The waste disposal authority for the Site is North East Lincolnshire Council. The Council's Local Plan 2013 to 2032 (Adopted 2018) includes policies relating to waste management. Policy 47 includes the statement that:

*"The Council will also seek to secure the recycling of Construction, Demolition and Excavation (CD&E) waste at the locations where waste is produced, including the temporary provision for recovery, separation and where appropriate processing of on-site materials."*

- 16.2.5 The above mentioned plans and policies have informed the assessment methodology.
- 16.2.6 The assessment has also taken account of the key legislation relevant to waste management for the Proposed Development, including, but not limited to:
- The Waste (England and Wales) Regulations 2011;
  - The Environmental Permitting (England and Wales) Regulations 2016;
  - Environmental Protection Act 1990;
  - Hazardous Waste (England and Wales) Regulations 2005; and
  - Waste Framework Directive 2008/98/EC.

## **16.3 Assessment Methodology and Significance Criteria**

### Assessment Scope

- 16.3.1 Waste was not identified for inclusion within the EIA as a result of the scoping process. However, subsequent to the Scoping Opinion being received, it has been determined that there may be a requirement to cut and fill the top layer of ground within the Main Development Area to improve geotechnical conditions for construction. Consequently,

a waste assessment has been undertaken for completeness, as reported in this chapter.

#### *Construction*

16.3.2 Waste will be generated during construction. The majority of construction waste types will be generated in small quantities, and a large proportion of these would be recycled, with the remainder disposed off-Site by a licensed waste contractor. This assessment therefore focusses on the potential surplus excavated materials that may arise if geotechnical ground improvement works are identified as being necessary by the appointed construction contractor following ground investigation and detailed design. This could require the removal of c. 2 m depth of ground from the Main Development Area to be replaced with engineering fill material.

16.3.3 This assessment considers the cut and fill of the entire Main Development Area, as a worst case.

#### *Operation*

16.3.4 As described in Chapter 4: The Proposed Development, operational waste will predominantly comprise combustion residues (bottom ash) and flue gas treatment (FGT) residues, which will be managed in accordance with the relevant environmental regulations using licensed waste contractors. The estimated volumes for the full Proposed Development (two streams, as a worst case) and waste management methods for these operational wastes are assessed.

16.3.5 Aside from foul water from domestic facilities (kitchens, toilets etc) at the Proposed Development, under normal plant operation liquid waste volumes will be minimal and will be returned to the process for re-use. Any excess liquid effluent would be stored on site and tankered off by a suitable contractor, or discharged to Anglian Water foul sewer under trade effluent consent. Liquid effluent is therefore not considered further in this chapter.

16.3.6 Waste from maintenance activities would be of significantly lower volumes than those generated from normal plant operation and therefore are not assessed further in this chapter.

#### *Decommissioning*

16.3.7 Waste generated during decommissioning and demolition of the Proposed Development has been scoped out of this assessment because:

- there is no information on waste policies, regional waste arisings or facilities that may be in place when the Proposed Development is decommissioned (2052 or later), and hence it is not possible to define a baseline;
- any future decommissioning contractor will be required to comply with relevant legislation and policy at that time;
- the majority of materials generated during future decommissioning will comprise concrete and steel, both of which are likely to be recycled rather than disposed; and
- there is no certainty on the timing or method of decommissioning, and hence it is not possible to determine the quantities or types of waste that may be generated.

#### *Development Scenarios*

16.3.8 As described in Chapter 4: The Proposed Development, there are a number of possible development scenarios – a single stream plant, a two stream plant built in a single phase, or a two stream plant built in two phases.

16.3.9 As described above the waste assessment considers construction waste arising from the potential cut and fill of material across the Main Development Area. As a worst case, quantities have been calculated based on the full extent of the Main Development Area, and as such the volumes of waste represent the worst case. Potential phasing of construction would not alter the total quantities of waste generated by the activity.

16.3.10 For the operational scenario, the quantities of waste presented in the assessment are for the two-stream plant. As a single stream plant would generate smaller quantities of waste the operational assessment is also therefore a worst case.

#### Significance of Effects

16.3.11 Waste management effects and their significance during construction have been assessed by:

- establishing the baseline for inert landfill capacity in Yorkshire and the Humber planning region;
- estimating the likely quantity of surplus excavated materials that will be generated by the Proposed Development; and
- comparing the quantity of surplus excavated materials from the Proposed Development to the baseline inert landfill capacity and assessing the likely impact on that capacity and ability of these sites to accept the waste.

16.3.12 Waste management effects and their significance during operation have been assessed by:

- establishing the current annual baseline for inert waste arisings in Yorkshire and the Humber planning region, and for hazardous waste arisings nationally (recognising that non-hazardous wastes are typically managed regionally, whereas hazardous wastes are often managed nationally, using a much smaller network of facilities);
- estimating the likely quantity of bottom ash and FGT residues that will be generated by the Proposed Development; and
- comparing the quantity of operational waste from the Proposed Development to the current annual baseline arisings of these wastes.

16.3.13 In the absence of other guidance on assessing the effects of developments on waste management arisings, the significance criteria used within this assessment have been derived from previous AECOM experience and on the basis of professional judgement.

16.3.14 The significance of waste management effects has been determined using the criteria set out in Table 16.1. This methodology for classification of effects is different to the standard methodology set out in Chapter 2: Assessment Methodology, but given the nature of this assessment (whereby receptor sensitivity does not form part of the assessment), this is considered to be appropriate.

**Table 16.1: Waste Management Assessment Criteria and Classification of Effects**

<b>EFFECT</b>	<b>CRITERIA FOR EFFECTS OF WASTE GENERATED (CONSTRUCTION)</b>	<b>CRITERIA FOR EFFECTS OF WASTE GENERATED (OPERATION)</b>	<b>SIGNIFICANCE</b>
Negligible	Negligible increase in waste arisings less than 0.1% of current available disposal capacity; causing insignificant burden to the local and regional waste management infrastructure.	Negligible increase in waste arisings less than 0.1% of current annual waste arisings in the region (for inert waste) and nationally (for hazardous waste).	Not significant
Minor	Minor increase in waste arisings between 0.1% and 1.9% of current available disposal capacity; causing a minor burden to the local and regional waste management infrastructure.	Minor increase in waste arisings between 0.1% and 1.9% of current annual waste arisings in the region (for inert waste) and nationally (for hazardous waste).	Not significant
Moderate	Moderate increase in waste arisings between 2% and 5% of current available disposal capacity; potentially causing moderate burden to the local and regional waste management infrastructure.	Moderate increase in waste arisings between 2% and 5% of current annual waste arisings in the region (for inert waste) and nationally (for hazardous waste).	Significant
Major	Large increase in waste arisings greater than 5% of current available disposal capacity; potentially causing significant burden to the local and regional waste management infrastructure..	Large increase in waste arisings greater than 5% of current annual waste arisings in the region (for inert waste) and nationally (for hazardous waste).	Significant

16.3.15 In line with the assessment methodology outlined in Chapter 2: Assessment Methodology, only moderate and major effects are considered to be significant for the purposes of the EIA.

## 16.4 Baseline Conditions

### Existing Baseline

16.4.1 The Environment Agency's Waste Management Information 2017 (published in 2018) includes the following information about waste sent to landfills in 2017 and remaining landfill capacity in former Humberside, and in the wider Yorkshire and the Humber region, as shown in Table 16.2 and Table 16.3.

**Table 16.2: Yorkshire and the Humber landfill inputs 2017 (000 tonnes)**

LANDFILL TYPE	SUB-REGION				YORKSHIRE AND THE HUMBER
	FORMER HUMBER SIDE	NORTH YORKSHIRE	SOUTH YORKSHIRE	WEST YORKSHIRE	
Hazardous Merchant	15	-	-	58	73
Hazardous Restricted	-	-	-	-	-
Non Hazardous with SNRHW cell	13	-	-	511	524
Non Hazardous	736	340	343	935	2,354
Non Hazardous Restricted	10	269	13	-	292
Inert	215	212	162	227	816
<b>Total</b>	<b>989</b>	<b>821</b>	<b>518</b>	<b>1,731</b>	<b>4059</b>

\*SNRHW –Stable Non-Reactive Hazardous Waste

**Table 16.3: Yorkshire and the Humber landfill capacity 2017 (000 cubic metres)**

LANDFILL TYPE	SUB-REGION				YORKSHIRE AND THE HUMBER
	FORMER HUMBER SIDE	NORTH YORKSHIRE	SOUTH YORKSHIRE	WEST YORKSHIRE	
Hazardous merchant	851	-	-	1,815	2,666
Hazardous Restricted	-	-	-	-	-
Non Hazardous with SNRHW cell*	1,249	-	-	428	1,677
Non Hazardous	21,907	3,684	3,867	12,157	41,615
Non Hazardous Restricted	1,642	14,096	-	-	15,738
Inert	3,393	1,162	6,573	3,008	14,136
<b>Total</b>	<b>29,042</b>	<b>18,942</b>	<b>10,440</b>	<b>17,408</b>	<b>75,832</b>

16.4.2 Data on regional waste generation (see Table 16.4) is available in the 'Yorkshire and Humber Waste Position Statement February 2016' which was produced jointly by all seventeen Waste Planning Authorities in the Yorkshire and Humber area to help ensure appropriate coordination in planning for waste.

**Table 16.4: Estimated Annual Waste Arisings in Yorkshire and the Humber**

WASTE STREAM	ESTIMATED ARISING (000 TONNES)
Local Authority Collected Waste (LACW)	2,490
Commercial and Industrial waste (C&I)	6,944
C&I minus power and utilities	4,880
Construction, demolition and excavation waste (CD&E)	10,497
Hazardous waste	522

16.4.3 According to the 'Digest of Waste and Resource Statistics – 2018 Edition' (Defra, 2018), the UK generated 4.3 million tonnes of hazardous waste in 2014, the latest date for which data is presented.

#### Future Baseline

16.4.4 The Environment Agency does not publish information on future landfill capacity and it is therefore not possible to accurately establish a future baseline. Whilst existing capacity will be utilised, new capacity is expected to be developed in order to accommodate future flows of waste requiring disposal. For the purposes of this assessment, it is therefore assumed that the future baseline landfill capacity will be similar to the current baseline capacity. Similarly, there is insufficient information to estimate future levels of waste arisings in the region, and hence the future annual baseline waste arisings are assumed to be similar to the current baseline arisings.

## **16.5 Development Design and Impact Avoidance**

### Construction

16.5.1 Waste arisings will be prevented and designed out where practicable through working with suppliers to minimise wastage in materials and packaging.

16.5.2 Contractors will be required to adopt good practice in construction waste management which will reduce the quantity of waste generated. The following approaches will be implemented, where practicable, in order to minimise the quantities of waste requiring disposal:

- agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- re-use of materials wherever feasible, e.g. re-use of excavated soil for landscaping. concrete will be either taken off Site for crushing and re-use, or crushed and re-used on site;
- segregation of waste at source where practical; and
- re-use and recycling of materials off Site where re-use on Site is not practical (e.g. through use of an off Site waste segregation facility and re-sale for direct re-use or re-processing).



- 16.5.3 The following waste management measures will be implemented in order to minimise the likelihood of any localised impacts of waste on the surrounding environment:
- damping down of surfaces during spells of dry weather and brushing/ water spraying of heavily used hard surfaces/ access points across the Site as required;
  - off Site prefabrication, where practical, including the use of prefabricated structural elements, cladding units, toilets, mechanical and electrical risers and packaged plant rooms;
  - Open burning of waste or unwanted materials will not be permitted on Site;
  - all hazardous materials including fuels, chemicals, cleaning agents, solvents and solvent containing products to be properly sealed in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas;
  - any waste effluent will be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor/s; and
  - materials requiring removal from the Site will be transported using licensed carriers and records will be kept detailing the types and quantities of waste moved, and the destinations of this waste, in accordance with the relevant regulations.
- 16.5.4 A framework Construction Environmental Management Plan (CEMP) has been prepared as part of this ES and is presented within Appendix 5A in ES Volume III. This will be finalised by the contractor prior to the start of construction. The CEMP will set out how waste will be managed during construction, and opportunities to re-use and recycle waste will be explored in accordance with the waste hierarchy.

#### Operation

- 16.5.5 The Environmental Management System that will be developed and maintained for the operational Proposed Development as required by the Environmental Permit will include procedures for the management of waste in accordance with relevant legislation.

### **16.6 Likely Impacts and Effects**

#### Construction

- 16.6.1 A Site specific ground investigation will be carried out prior to construction. At the current stage of design, it is assumed that approximately 2 m depth of soil across the Main Development Area will be removed and replaced with engineering fill, to improve geotechnical conditions at the Site. Based on the topographical data available it is estimated this activity will generate approximately 160,000 m<sup>3</sup> of surplus excavated material that will require exporting from Site.
- 16.6.2 Although it may be possible to re-use some of this material on Site, or to find beneficial off Site uses, the realistic worst-case assumption is that this material will be disposed of to a landfill site.
- 16.6.3 Environment Agency data presented in Table 16.3 shows that there is approximately 14 million m<sup>3</sup> of inert waste landfill capacity in the Yorkshire and the Humber region. The surplus excavated material generated by the site comprises approximately 1.1% of this available capacity and is therefore considered to be a minor adverse effect, and not significant.

### Operation

16.6.4 The following quantities of operational process waste are anticipated:

- up to 179,000 tonnes per annum of bottom ash, which will either be landfilled or recycled as a secondary aggregate; and
- approximately 20,600 tonnes per annum of FGT residues, which will be disposed of as hazardous waste (due to their alkaline nature).

16.6.5 Bottom ash from energy from waste facilities is widely recycled in the UK, for use as a secondary aggregate. However, as a worst case, it is assumed that bottom ash may be disposed of to landfill.

16.6.6 Since bottom ash more closely resembles construction and demolition waste than commercial/industrial waste (being an inert material), the arisings of bottom ash from the Proposed Development are compared to the annual arisings of construction, demolition and excavation waste in Yorkshire and the Humber, which is approximately 10.5 million tonnes per year – see Table 16.4. The estimated annual quantity of bottom ash generated will therefore represent approximately 1.7% of Yorkshire and the Humber's annual construction, demolition and excavation waste arisings, and hence is assessed as a minor adverse effect, and not significant.

16.6.7 FGT residues will be disposed of to a hazardous waste landfill. The estimated annual quantity of FGT residues generated would represent approximately 0.48% of the UK's annual hazardous waste arisings (see Table 16.4), and hence is assessed as a minor adverse effect, and not significant.

## **16.7 Mitigation and Enhancement Measures**

### Construction

16.7.1 No further mitigation measures for waste management are required for the Proposed Development other than those identified in Section 16.5 Development Design and Impact Avoidance above.

16.7.2 During the detailed design stage, the construction contractor will seek to minimise the quantities of surplus excavated materials where practicable.

16.7.3 Prior to and during construction, the contractor will seek to identify beneficial uses for surplus excavated material both within the Site and on other sites, and landfill disposal will be used only as the final option, in accordance with the waste hierarchy.

### Operation

16.7.4 The operator will explore opportunities for the beneficial re-use of bottom ash as a secondary aggregate to avoid landfill if possible, in accordance with the waste hierarchy.

## **16.8 Limitations or Difficulties**

16.8.1 There are no significant limitations or difficulties associated with this topic. In the absence of detailed design and ground investigation information, estimates of construction waste arisings have been based on a worst case scenario as noted above. This has enabled a robust assessment to be carried out.

## **16.9 Residual Effects and Conclusions**

16.9.1 The potential need to dispose of surplus excavated material to an inert waste landfill has been assessed and no significant residual effects with respect to waste management are anticipated for the Proposed Development.

16.9.2 The potential impacts of managing operational waste have been assessed and no significant residual effects with respect to waste management are anticipated for the Proposed Development.

## 16.10 References

- Department for Communities and Local Government (2014) *National Planning Policy for Waste*;
- Department for Communities and Local Government (2018) *National Planning Policy Framework*;
- Department for Environmental Food and Rural Affairs (2013) *Waste Management Plan for England*;
- Department for Transport (2014) *National Policy Statement for National Networks (NPSNN)*;
- Environment Agency (2018) *Waste Management for England 2017*;
- European Commission (2008) *Waste Framework Directive (2008/98/EC)*;
- North East Lincolnshire Council (2018) *North East Lincolnshire Council Local Plan 2013 to 2032 (Adopted 2018)*; and
- Yorkshire and Humber Waste Planning Authorities (2016) *Yorkshire and Humber Waste Position Statement*.