

Connah's Quay Low Carbon Power

Preliminary Environmental Information Report
Volume II, Chapter 23: Materials and Waste

Uniper

The Planning Act 2008
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
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23. Materials and Waste

23.1 Introduction

Overview

- 23.1.1 This Preliminary Environmental Information Report (PEIR) presents an initial assessment of the likely significant environmental effects of Connah's Quay Combined Cycle Gas Turbine (CCGT) with Carbon Capture Plant (CCP) and supporting infrastructure (hereafter referred to as the Proposed Development) with respect to Materials and Waste during the construction, operation (including maintenance) phases of the Proposed Development. Decommissioning is scoped out of the assessment as outlined in paragraph 23.2.10.
- 23.1.2 The assessment has been undertaken in accordance with current best practice guidance and follows the methodology set out in the Institute of Environmental Management and Assessment (IEMA) Guide to Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach (referred to herein as the 'IEMA Guidance') (Ref 23-1) as outlined in the Scoping Report and Scoping Opinion.
- 23.1.3 This chapter is supported by the following appendices in PEIR Volume IV:
- **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics;** and
 - **Appendix 23-A: Materials and Waste Baseline Data Report.**

Legislation, Policy and Guidance

- 23.1.4 Legislation, planning policy, and guidance relating to Materials and Waste that are pertinent to the Proposed Development are listed in **Table 23-1**. Further detail regarding these can be found in **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics (PEIR Volume IV)**.

Table 23-1: Legislation, Planning Policy, and Guidance relating to Materials and Waste

Type	Legislation, Policy and Guidance
Legislation	<ul style="list-style-type: none"> • EU Waste Framework Directive 2008 (Ref 23-2); • Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 23-3); • Environmental Protection Act 1990 (as amended) (Ref 23-4); • The Hazardous Waste (England and Wales) Regulations 2005 (as amended) (Ref 23-5); • The Waste (England and Wales) Regulations 2011, as amended (Ref 23-6); • The Environmental Permitting (England and Wales) Regulations 2016 (Ref 23-7); • Environment Act 2021 (Ref 23-8); • Environment (Wales) Act 2016 (Ref 23-9); and

Type	Legislation, Policy and Guidance
	<ul style="list-style-type: none"> The Waste Separation Requirements (Wales) Regulations 2023 (Ref 23-10).
National Planning Policy	<ul style="list-style-type: none"> The Overarching National Policy Statement (NPS) for Energy (EN-1) (Ref 23-11); The NPS for Natural Gas Electricity Generating Infrastructure (EN-2) (Ref 23-12); The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 23-13); The NPS for Electricity Networks Infrastructure (EN-5) (Ref 23-14); Planning Policy Wales (PPW) (Ref 23-15); Beyond Recycling: A Strategy to Make the Circular Economy in Wales a Reality (Ref 23-16); Towards Zero Waste, One Wales: One Planet – The Overarching Waste Strategy Document for Wales (Ref 23-17); Towards Zero Waste, One Wales: One Planet – The Waste Prevention Programme for Wales (Ref 23-18); Future Wales: the National Plan 2040 (Ref 23-19); and Strategy for Hazardous Waste Management in England (Principle 2 - Infrastructure Provision) (Ref 23-20).
Local Planning Policy	<ul style="list-style-type: none"> Flintshire County Council (FCC) Local Development Plan (LDP) (2015-2030) (Ref 23-21); FCC LDP Proposal Maps (Ref 23-22); and FCC Waste Management Strategy (FWMS) 2009-2025 (Ref 23-23).
National Guidance	<ul style="list-style-type: none"> IEMA Guidance (Ref 23-1); Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (DoW CoP), v2 (2011) (Ref 23-24); Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (Ref 23-25); and Separate Collection of Waste Materials for Recycling – A Code of Practice for Wales (Ref 23-26).

23.2 Consultation and Scope of Assessment

Consultation

23.2.1 A request for an EIA Scoping Opinion was sought from the Secretary of State (SoS) through the Planning Inspectorate (PINS) in February 2024 as part of the EIA Scoping Process. The EIA Scoping Opinion was adopted on 20 March 2024 (**Appendix 1-B: Scoping Opinion PEIR Volume IV**).

23.2.2 **Appendix 2-B: Matters Raised in the Scoping Opinion (PEIR Volume IV)** provides a summary of how comments raised by stakeholders to date in relation to Materials and Waste have been considered and actioned where appropriate. No further materials and waste specific engagement has been undertaken to date.

Scope of the Assessment

23.2.3 For this PEIR, materials and waste comprise:

- the consumption of materials (key construction materials only); and
- the generation and management of waste during construction and operation (decommissioning is scoped out as outlined in 23.2.10).

23.2.4 Materials are defined in the IEMA Guidance (Ref 23-1) as “*physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt, and steel*”.

23.2.5 Other material assets considered include built assets such as landfill void capacity and allocated/safeguarded mineral sites (e.g. quarries, wharves, rail depots, concrete plants) and waste sites.

23.2.6 Waste is defined as per the Waste Framework Directive (2008/98/EC) (Ref 23-2) as “*any substance or object which the holder discards or intends or is required to discard.*”

23.2.7 Impacts upon Mineral Safeguarding Areas (MSAs) are not assessed in the materials and waste assessment in accordance with the IEMA Guidance (Ref 23-1). Potential severance and/or sterilisation of the resource is assessed as part of **Chapter 14: Geology and Ground Conditions**, as agreed by the Planning Inspectorate (PINS) as outlined in **Appendix 1-B: Scoping Opinion (PEIR Volume IV)**.

23.2.8 As indicated on the FCC Proposal Map (Ref 23-22), there is a Location for Waste Management Facilities (Policy EN21 Locations for Waste Management Facilities, Mostyn Docks and Old Power Station site, south of Flintshire Bridge) within the Indicative Site Boundary (Construction and Indicative Enhancement Area (C&IEA) and Temporary Abnormal Indivisible Load (AIL) Work Areas). These types of sites are ones which are considered to be suitable in principle for waste management uses. However, as stated in the FCC LDP, “*there is no identified need for further recovery or disposal infrastructure within the County*” and “*no strategic allocations for waste management are identified within the LDP.*” The areas are not considered to be allocated/safeguarded waste sites.

23.2.9 The assessment of materials and waste considers the following:

- waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a licence, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves;
- as part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and

- Mineral Planning Authorities (MPAs) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

23.2.10 The following matters are not considered in the assessment of materials and waste:

- waste arising from extraction, processing and manufacture of construction components and products. This assumes that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the United Kingdom (UK) or the world and therefore outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed as they relate to procurement decisions that cannot be assured. Waste arising from extraction, processing and manufacture of construction components and products are scoped out of the assessment as agreed by PINS, as outlined in **the Scoping Opinion Appendix 1-B (PEIR Volume IV)**;
- other environmental impacts associated with the management of waste from the Proposed Development (e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste) are not included in this assessment, as they are addressed separately in other relevant chapters of this PEIR. Cross references to other chapters are included as appropriate, and are scoped out of the assessment as agreed by the PINS, as outlined in **Appendix 1-B (PEIR Volume IV)**;
- as noted above, impacts upon MSAs are not assessed in the materials and waste assessment in accordance with the IEMA Guidance (Ref 23-1). Potential severance and/or sterilisation of the resource is assessed as part of **Chapter 14 Geology and Ground Conditions** as agreed by the PINS, as outlined in **Appendix 1-B (PEIR Volume IV)**;
- changes to allocated/safeguarded mineral or waste sites. At scoping there were no allocated/safeguarded mineral or waste sites in the Indicative Site Boundary. The Indicative Site Boundary has been updated since scoping. Indicative Site Boundary is now within an allocated/safeguarded mineral site at Mostyn Docks (FCC LDP Policy PC11, Ref 23-21). No works are proposed in the docks which would compromise the essential infrastructure that supports the supply of minerals. There are no other allocated/safeguarded mineral or waste sites present in the Indicative Site Boundary;
- changes in availability of materials in operation are scoped out of the assessment as agreed by PINS, as outlined in Appendix 12-B (PEIR Volume IV). Forecast effects are (using professional judgement) considered negligible in relation to the scale and nature of the Proposed Development.
- effects associated with decommissioning of the Proposed Development. The Proposed Development has a long design life and as such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future as agreed by PINS, as outlined in **Appendix 1-B (PEIR Volume IV)**. A Decommissioning Environmental Management Plan (DEMP) (based on a Framework DEMP which will

accompany the Environmental Statement (ES)) will be prepared by the decommissioning contractor which would consider in detail most potential environmental risks on the Indicative Site Boundary and contain guidance on how risks can be removed or mitigated. The DEMP would consider the availability of materials and landfill capacity at the time of decommissioning.

Table 23-2: Outline Scope of the Material and Waste Assessment

Proposed Development Phase	Potential Effects	Scoped In/Out
Construction, Operation and Decommissioning	Waste arising from extraction, processing and manufacture of construction components and products	Scoped out
	Other environmental impacts associated with the management of waste from the Proposed Development	Scoped out (to be assessed in other relevant chapters e.g. water resources, air quality, noise or traffic)
	Changes to MSAs	Scoped out (to be assessed in the Geology and Ground Conditions chapter)
	Changes to allocated/safeguarded mineral site	Scoped out
	Changes to allocated/safeguarded waste site	Scoped out
Construction	Changes in demand for materials	Scoped in
	Changes in available landfill void capacity	Scoped in
Operation	Changes in availability of materials	Scoped out
	Changes in available landfill void capacity	Scoped in
	Changes in available hazardous waste management facility capacity	Scoped in
Decommissioning	Changes in demand for materials	Scoped out
	Changes in available landfill capacity	Scoped out

23.3 Assessment Methodology

23.3.1 This section outlines the methodology used for assessing the likely significant effects associated with materials and waste. The criteria used for materials and waste align with topic specific criteria in the IEMA Guidance (Ref 23-1), rather than the general significance criteria outlined in **Chapter 2: Assessment Methodology and Consultation**.

23.3.2 The IEMA Guidance (Ref 23-1) offers two methods for the assessment of materials and waste. Method W1 – void capacity and Method W2 – Landfill

Diversion, Method W1 has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects. A description of each method is provided below:

- W1 – void capacity:
 - the magnitude of impact from waste is assessed by determining the percentage of the remaining landfill void capacity that will be depleted by waste produced during the construction and/or operation phases of the development;
 - a detailed methodology;
 - robust approach based on industry data;
 - most likely to be approach for larger and more complex developments; and
 - recommended for statutory EIAs.
- W2 – landfill diversion:
 - developments are compared to a good practice landfill diversion rate of 90%;
 - a simpler approach;
 - less robust than W1;
 - appropriate for smaller and less complex developments; and
 - likely to be utilised only for non-statutory EIA.

23.3.3 The sensitive receptors for this assessment of construction impacts are:

- landfill void capacity in the expansive study area of Wales (non-hazardous landfill void capacity) and Wales and England (hazardous landfill void capacity). As defined in the IEMA Guidance *“landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing and develop new facilities. This requires the depletion of natural and other resources which, in turn, adversely impacts the environment”* (Ref 23-1); and
- construction material availability in Wales, Great Britain (GB) and UK. As outlined in the IEMA Guidance *“Consuming materials impacts upon their immediate and (in the case of primary material) long-term availability; this results in the depletion of natural resources and adversely impacts the environment”* (Ref 23-1).

23.3.4 The sensitive receptors for the assessment of operational phase waste impacts are:

- landfill void capacity in the expansive study area of Wales (for non-hazardous landfill void capacity) and combined Wales and England (for hazardous landfill void capacity).

23.3.5 The IEMA Guidance *“does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources”* (Ref 23-1).

23.3.6 However, since some of the operational hazardous wastes likely to be generated by the Proposed Development may not be suitable for landfill disposal (e.g. liquid waste), hazardous operational waste is compared to national hazardous waste management facility capacity (Wales and England).

Methodology for Determining Construction Effects

23.3.7 Materials will be used during the construction of the Proposed Development, the key construction materials expected to be used are steel, aggregates, asphalt, and concrete.

23.3.8 Waste will be generated during construction of the Proposed Development. A large proportion of this waste will be reused, recycled, or recovered.

Materials

23.3.9 Effects upon materials during construction of the Proposed Development will be assessed by:

- establishing the baseline for Wales, GB/UK consumption of key construction materials by weight;
- assessing the sensitivity of materials as related to the availability and types of materials to be consumed by the Proposed Development in construction;
- establishing the quantities of key construction materials required for the construction of the Proposed Development; and
- comparing the total quantities of key construction materials with the most recent national demand (utilising a percentage approach).

Waste

23.3.10 Effects upon waste during construction of the Proposed Development will be assessed by:

- establishing the baseline landfill void capacity in the expansive study areas;
- assessing the sensitivity of landfill void capacity;
- establishing the quantities of construction, demolition, and excavation waste to be generated during the construction of the Proposed Development; and
- comparing the total waste arising from the construction of the Proposed Development against the landfill void capacity (using a percentage approach) assuming a worst case that waste goes to landfill.

Methodology for Determining Operational Effects

23.3.11 The sensitivity of receptors and magnitude of impacts for waste for operation will be assessed through the following:

- establishing the baseline landfill void capacity in the expansive study areas;
- assessing the sensitivity of landfill void capacity;

- establishing the quantities of operational waste to be generated during the operation of the Proposed Development;
- comparing the total waste arising from the operation of the Proposed Development against the landfill void capacity (utilising a percentage approach); and
- comparing operational hazardous waste arisings from the operation of the Proposed Development against national hazardous waste management facility waste inputs (Wales and England) (utilising a percentage approach).

Impact Assessment Methodology

Sensitivity

23.3.12 The sensitivity of materials relates to the availability and type of construction material to be consumed by the Proposed Development. The IEMA Guidance (Ref 23-1) criteria summarised in **Table 23-3** will be used to evaluate the sensitivity of materials.

Table 23-3: Criteria for Materials Receptor Sensitivity (Ref 23-1)

Effects	Criteria for Materials Receptor Sensitivity
Negligible	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock. <i>And/or</i> are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*.
Low	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. <i>And/or</i> are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock. <i>And/or</i> are available comprising some sustainable features and benefits compared to industry-standard materials.
High	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock. <i>And/or</i> Comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	The key materials required for the construction of the Proposed Development are forecast to be insufficient in terms of production, supply and/or stock. <i>And/or</i> Comprise no sustainable features and benefits compared to industry-standard materials.

*Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content

Effects	Criteria for Materials Receptor Sensitivity
(including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.	

23.3.13 The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development. As outlined in the IEMA Guidance “*landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste*” (Ref 23-1). The sensitivity of landfill capacity is assessed based on a review of historic landfill void capacity trends, where available, and information from relevant policy documents.

23.3.14 The criteria described within **Table 23-4** and **Table 23-5** has been used to evaluate the sensitivity of landfill capacity.

Table 23-4: Inert and Non-hazardous Landfill Capacity Sensitivity (Ref 23-1)

Effects	Criteria for Inert and Non-Hazardous Landfill Capacity
Across construction and/or operation phases, the baseline/future baseline (i.e. without development) of Wales inert and non-hazardous landfill void capacity is expected to...	
Negligible	Remain unchanged or is expected to increase through a committed change in capacity.
Low	Reduce minimally by <1% as a result of wastes forecast.
Medium	Reduce noticeably by 1-5% as a result of wastes forecast.
High	Reduce considerably: by 6-10% as a result of wastes forecast.
Very High	<ul style="list-style-type: none"> • Reduce very considerably (by >10%); • End during construction or operation; • Already be known to be unavailable; or • Require new capacity or infrastructure to be put in place to meet forecast demand.

Table 23-5: Hazardous Landfill Capacity Sensitivity (Ref 23-1)

Effects	Criteria for Hazardous Landfill Capacity Sensitivity
Across construction and/or operation phases, the baseline/future baseline (i.e. without development) of Wales and England hazardous landfill void capacity is expected to...	
Negligible	Remain unchanged or is expected to increase through a committed change in capacity.
Low	Reduce minimally by <0.1% as a result of wastes forecast.
Medium	Reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Reduce considerably by 0.5-1% as a result of wastes forecast.
Very High	<ul style="list-style-type: none"> • Reduce very considerably (by >1%); • End during construction or operation; • Already be known to be unavailable; or • Require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude

23.3.15 The magnitude of impact describes the degree of variation from the baseline conditions as a result of the Proposed Development. The methodology for

assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of construction materials use on the baseline national demand from the construction of the Proposed Development. The IEMA Guidance (Ref 23-1) criteria is used to assess the magnitude of impact for materials are provided within **Table 23-6**.

Table 23-6: Criteria for Materials Magnitude of Impacts (Ref 23-1)

Effects	Criteria for Materials Magnitude of Impacts
No Change	Consumption of no materials is required.
Negligible	Consumption of no individual material type is equal to or greater than 1% by volume of the baseline availability*.
Minor	Consumption of one or more materials is between 1-5% by volume of the baseline availability*.
Moderate	Consumption of one or more materials is between 6-10% by volume of the baseline availability*.
Major	Consumption of one or more materials is >10% by volume of the baseline availability*.
	*a Wales baseline is used for concrete, aggregates and asphalt and a UK baseline is used for steel.

23.3.16 The IEMA Guidance methodology for assessing the magnitude of impact for waste comprises a percentage-based approach that determines the influence of waste generation from the construction of the Proposed Development on the baseline landfill capacity. The criteria used to assess the magnitude of impact for waste are provided within **Table 23-7**.

Table 23-7: Waste Magnitude of Impacts (Ref 23-1)

Effects	Criteria for inert and non-hazardous waste magnitude of impacts	Criteria for hazardous waste magnitude of impacts
No Change	Zero waste generation and disposal from the Proposed Development.	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by <1%.	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by <0.1%.
Minor	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by 1-5%.	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by <0.1-0.5%.
Moderate	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by 6-10%.	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by <0.5-1%.
Major	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by >10%.	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by >1%.

*Forecast as the worst-case scenario, during a defined construction and/or operational phase.

Potential Effects

23.3.17 **Table 23-8** describes the IEMA Guidance effect thresholds used in determining the effects. **Table 23-9** shows the likely significance of the effect.

Table 23-8: Effect Thresholds (Ref 23-1)

Sensitivity of Receptor	Magnitude of Impact				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate or Large	Large or very large	Very large
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or very large
Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or moderate
Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Table 23-9: Likely Significance of Effect (Ref 23-1)

Effects	Materials	Waste
Neutral	Not significant	Not significant
Slight		
Moderate	Significant	Significant
Large		
Very Large		

Rochdale Envelope

23.3.18 The setting of design parameters using the 'Rochdale Envelope' approach is described in **Chapter 2: Assessment Methodology and Consultation**. Table 4-1 of **Chapter 4: The Proposed Development** sets out the maximum parameters currently envisaged for the principal components of the Proposed Development. These parameters, together with assumptions regarding the future plans for the existing Connah's Quay Power Station set out in **Chapter 2: Assessment Methodology and Consultation** have been used to inform the representative worst-case scenario that has been assessed in this chapter, in order to provide a robust assessment of the impacts and likely significance of environmental effects of the Proposed Development at its current stage of design.

23.3.19 In particular, a focused use of the Rochdale Envelope has been adopted for the following aspects:

- the Proposed Development will be constructed over a number of years, as a worst case of five years for Single Phase Construction (both Train 1

and Train 2 constructed simultaneously) is taken rather than a Phased Approach (Train 1 constructed in full, then Train 2 constructed in full, in sequence);

- it is assumed that all excavated materials will be generated in one calendar year (for both construction scenarios), as the majority of excavated material will be generated at the start of construction;
- there are three cases for excavated material, Case 3 has been used in the assessment (since this is considered to be a reasonable worst-case scenario, as it is assumed that a large majority of the excavated material will be pulverised fuel ash, which is non-hazardous):

Case 1, all excavated material is non-hazardous;

Case 2, all excavated material is hazardous (this is not considered to be a realistic scenario for the Proposed Development); and

Case 3, 20% of excavated material is hazardous.

- it is assumed for the purpose of the assessment that all construction waste will be sent to landfill (excluding liquid waste which cannot be disposed of to landfill). This ensures that a robust, worst-case assessment of the waste impacts of the Proposed Development is provided, however, it is anticipated that in practice the majority of waste would be recycled or recovered; and
- the exact types and quantities of operational waste are not yet available. A worst-case assumption that all operational waste (excluding liquid waste which cannot be disposed of to landfill) will be sent to landfill has been made to inform this assessment, ensuring that a robust assessment is provided.

Assessment Assumptions and Limitations

Assumptions

23.3.20 Since the Proposed Development will be constructed over a number of years, total construction materials and construction waste quantities have been divided equally across the number of years of construction (as a worst case five years for Single Phase Construction (both Train 1 and Train 2 constructed simultaneously)). A Phased Approach, with construction material use and construction waste generated over a longer period, would have a lower magnitude of impact.

23.3.21 It is assumed that all excavated materials will be generated in one calendar year, as the majority of excavated material will be generated at the start of construction.

23.3.22 It is assumed for the purpose of the assessment and as a worst case that all construction and operational waste will be sent to landfill (excluding liquid waste which cannot be disposed of to landfill) since exact waste management routes and waste recovery targets are not confirmed. In practice, a large proportion of non-hazardous waste from the Proposed Development is likely to be recovered rather than disposed of to landfill, further reducing the overall quantities of waste for disposal. It is assumed that key construction materials (aggregates, asphalt, and concrete) will be sourced locally (e.g. within Wales

and North West England), taking into account the proximity principle. Other materials may be sourced from the rest of the UK or imported into the UK.

23.3.23 Data on the bulk density of materials has been used to convert quantities between volume (m³) and weight (tonnes) where required.

Limitations

23.3.24 The assessment is based on information available at the time of writing.

23.3.25 Future availability of construction materials is not available; therefore UK/GB and Wales and North West England data has been used to establish a quantitative baseline of the consumption of key construction materials which is used as a proxy for availability.

23.3.26 There is no publicly available information regarding any potential changes to landfill capacity by the time of the Proposed Development's construction and operation. Therefore, landfill capacity is assumed to remain the same as the current baseline.

23.4 Baseline Conditions and Study Area

Study Area

23.4.1 The study areas for the assessment of impacts related to materials and waste have been defined in line with the IEMA Guidance (Ref 23-1). Two study areas are defined in the following sections: a Proposed Development study area (within which waste associated with the Proposed Development is generated and construction materials are used, and an expansive study area (within which landfills and other waste facilities that manage waste generated by the Proposed Development are likely to be located and construction materials are available). Together, the Proposed Development study area and expansive study area are referred to in this chapter as 'the study areas'.

Proposed Development Study Area

23.4.2 The Proposed Development study area for construction and operational waste generation, and for use of construction materials (key construction materials only), comprises the Indicative Site Boundary (i.e. the footprint of the proposed works, together with any temporary land requirements during construction). This includes temporary offices, compounds, laydown, and storage areas.

Expansive Study Area

23.4.3 The expansive study area for non-hazardous and inert waste management comprises Wales.

23.4.4 The expansive study area for non-hazardous and inert waste management comprises the whole of Wales, within which waste management infrastructure (specifically landfill capacity) is located. The expansive study area for non-hazardous and inert waste management is defined based on professional judgement and informed by consideration of the proximity principle (waste should generally be managed as near as practicable to its place of production) and value for money.

- 23.4.5 The expansive study area for hazardous waste management is combined Wales and England.
- 23.4.6 The expansive study area for hazardous waste management is Wales and England. This study area is defined based on professional judgement and informed by consideration of the proximity principle and value for money. The proximity principle *“must be applied in Wales when decisions are taken on the siting of appropriate waste facilities”* as outlined in the Towards Zero Waste, One Wales: One Planet – The Overarching Waste Strategy Document for Wales. The proximity principle for hazardous waste in England is outlined in Principle 2 - Infrastructure Provision in the Strategy for Hazardous Waste Management in England, *“We look to the market for the development of hazardous waste infrastructure, which implements the hierarchy for the management of hazardous waste and meets the needs of the UK to ensure that the country as a whole is self-sufficient in hazardous waste disposal, facilities are put in place for hazardous waste recovery in England, and the proximity principle is met”*. Planning for hazardous waste management is also undertaken at the UK level, however Scotland has not been included in the study area.
- 23.4.7 The expansive study areas for the availability of concrete, aggregates and asphalt is Wales, whereas a GB/UK baseline is used for steel.

Existing Baseline

- 23.4.8 Baseline information for Materials and Waste has been reviewed and consists of:
- a. the national availability (consumption/sales) for key construction materials (see **Table 1** and **Table 2** of **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**):
 - i. UK steel, 17 million tonnes per year;
 - ii. Wales aggregates (12.7 million tonnes per year (crushed rock), 1.9 million tonnes per year (sand and gravel));
 - iii. Wales asphalt, 1.1 million tonnes per year; and
 - iv. Wales concrete (0.5 million m³ or 1.2 million tonnes per year) and combined Wales and North West England (4.6 million tonnes per year).
 - b. the potential recycled content for the main construction materials, as outlined within WRAP's Designing Out Waste Tool for Civil Engineering (Ref 23-25) (See **Table 3** of **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**).
 - c. the non-hazardous and inert landfill void capacity in Wales (8.3 million m³ and 1.8 million m³ respectively (see **Table 4** of **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**)).
 - d. the hazardous landfill void capacity in Wales (14,000 m³) and hazardous landfill void capacity in England (9.9 million m³) (see **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**).

- e. The national hazardous waste management facility inputs in Wales and England (see **Table 6** and **Table 7** of **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**, respectively).
 - f. the national non-hazardous construction and demolition waste recovery rate (92.6% in 2020) (Ref 23-29).
 - g. the historic and permitted landfills as outlined by Natural Resources Wales' (NRW) Permitted Waste Sites Data Map (Ref 23-27) identifies three historic and zero permitted landfill sites located within the Indicative Site Boundary (see **Table 8** of **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**).
 - h. the standard, good, and best practice recovery rates by material are provided by WRAP (Ref 23-25) (see **Table 9** of **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**).
- 23.4.9 For further information on the baseline for the materials and waste assessment see **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**.

Future Baseline

- 23.4.10 There is no publicly available information on any potential changes to national material availability by the time of the construction of the Proposed Development. Construction material demand, such as ready-mix concrete, is closely aligned to both the quantity of construction taking place and the general economy. It is deemed inappropriate to forecast future demand as the demand is unlikely to be linear and it is not possible to set a future baseline for material resources. As such, future consumption is assumed to remain the same as the current baseline as outlined in Table 1 and Table 2 of **Appendix 23-A: Materials and Waste Baseline Report, PEIR Volume IV**.
- 23.4.11 Considering the decline of landfill capacity and forecasting into the future would lead to the inevitable conclusion that there would be no void space remaining. However, this is not a credible scenario as if there is still a need for landfill, then the Waste Planning Authority will need to consent new landfill capacity to replace that which has been used up. Therefore, landfill capacity is assumed to remain the same as the current baseline as outlined in **Table 4** of **Appendix 23-A: Waste Baseline and Methodology Report, PEIR Volume IV**. However, although the current baseline is used in the assessment, a 'very high' sensitivity is applied to landfill capacity recognising the potential for landfill capacity to decline in future.

23.5 Development Design and Embedded Mitigation

- 23.5.1 The Proposed Development has been designed and will continue to be designed, as far as possible, to avoid or minimise impacts and effects on Materials and Waste through the process of design development, and by embedding measures into the design of the Proposed Development.

Design

- 23.5.2 The following embedded mitigation measures have been incorporated into the Proposed Development design, with detailed proposals and locations to be submitted with the DCO Application:

- design for reuse and recovery: identifying, securing and using materials that already exist on-site, or can be sourced from other projects (e.g. reuse of excavated soil for landscaping);
- design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content;
- design for off-site construction: maximising the use of prefabricated structure and components, encouraging a process of assembly rather than construction where practicable;
- design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how de-constructability and de-mountability of elements can be maximised at end of first life; and
- design for waste and material asset efficient procurement.

Construction

23.5.3 The Proposed Development will aim to prioritise waste prevention, followed by preparing for reuse, recycling and other recovery and lastly disposal to landfill as per the waste hierarchy illustrated in **Plate 23-1**.

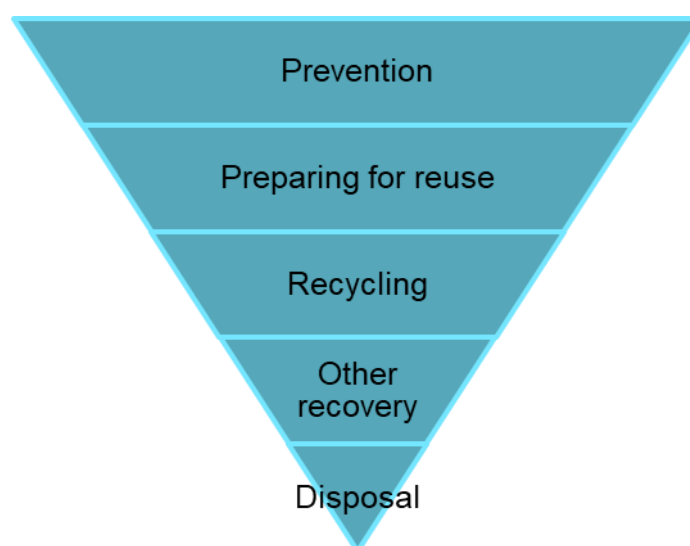


Plate 23-1: The waste hierarchy, from Defra's Guidance on Applying the Waste Hierarchy, recreated by AECOM (Ref 23-28)

23.5.4 The following standard construction practices are relevant to this assessment:

- implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled where possible, 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; and
- segregation of waste at source where practical.

23.5.5 A Framework Construction Environmental Management Plan (CEMP) will be included within the ES which will accompany the DCO Application. It will set out the key measures to be employed during the Proposed Development's

construction phase to control and minimise the impacts on the environment. The Framework CEMP will set out how waste will be managed during construction, and opportunities to prevent material waste and reuse materials and recycle waste will be explored in accordance with the waste hierarchy.

- 23.5.6 A final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the final CEMP will be secured by a Requirement of the DCO.
- 23.5.7 To manage and monitor waste generated on the Indicative Site Boundary during the construction of the Proposed Development, a Framework Site Waste Management Plan (SWMP) will be developed as part of the Framework CEMP which will allow for waste streams to be estimated and monitored. The Framework SWMP will require that the construction contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All waste removal from the Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

Operation

- 23.5.8 The Proposed Development will require an environmental permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. The permit will include procedures for the management of materials and waste in accordance with relevant legislation.
- 23.5.9 The Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environmental Management System (EMS) which will be certified to International Standards Organisation 14001. The EMS will outline requirements and procedures required to ensure that the Indicative Site Boundary is operating to the appropriate standard.

Decommissioning

- 23.5.10 A DEMP would be prepared prior to decommissioning commencing, which would consider potential environmental risks on the Site and contain guidance on how risks can be removed or mitigated. The submission, approval, and implementation of a DEMP prior to demolition will be secured by a Requirement of the DCO.

23.6 Preliminary Assessment of Likely Impacts and Effects

- 23.6.1 Taking into account the embedded mitigation measures as detailed in Section 23.5 above, the potential impacts and effects of the Proposed Development have been assessed using the methodology as detailed in Section 23.3 of this chapter.

Material Receptor Sensitivity

- 23.6.2 Material receptor sensitivity is determined as 'low'. On balance, the key construction materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be

generally free from known issues regarding supply and stock. Key materials required for construction and operation are likely to be available comprising a high proportion of sustainable features and benefits (e.g. recycled content).

23.6.3 Potential recycled content for the main construction materials is outlined in see **Table 3** of **Appendix 23-A: Material and Waste Baseline, PEIR Volume IV**.

Waste Receptor Sensitivity

23.6.4 The criteria described within **Table 23-4** and **Table 23-5** has been used to evaluate the sensitivity of landfill capacity.

23.6.5 Waste receptor sensitivity is determined as 'very high'. Since there is no publicly available information on any potential changes to landfill capacity by the time of the construction and operation of the Proposed Development, a worst-case scenario that landfill capacity will reduce very considerably is taken into account.

Construction Phase

23.6.6 **Table 23-10** summarises the likely types of materials that will be used, and wastes that are likely to be generated, during the Proposed Development construction phase.

Table 23-10: Construction Material Use and Waste Types Arising from the Construction of the Proposed Development

Construction Activity	Materials Used	Waste Types Generated
Site preparation/earthworks	<ul style="list-style-type: none"> fill material for construction purposes; primary/secondary/recycled aggregates for ground stabilisation; and topsoil and subsoil for landscaping and restoration. 	<ul style="list-style-type: none"> surplus excavated materials; surplus topsoil and subsoil; unsuitable and contaminated soils and excavated materials; vegetation from site clearance; and clearance of other materials.
Demolition	<ul style="list-style-type: none"> materials are not required for demolition works. 	<ul style="list-style-type: none"> waste arisings from the required demolition of existing Gas Treatment Plant (GTP), existing GTP Above-Ground Installation (AGI) and existing stores building.
Site Construction	<ul style="list-style-type: none"> aggregates; asphalt and bituminous materials; in-situ cast concrete; precast concrete products (structural components, curbs, drainage pipes, chambers and channels); structural steel; cabling; and pipework. 	<ul style="list-style-type: none"> excess, offcuts and broken/damaged construction materials; packaging from materials delivered to site; construction worker wastes from offices and welfare areas/canteens; waste oils from construction plant; and paints and coatings.

Construction Materials

23.6.7 The estimated main types and quantities of key construction materials to be used during Proposed Development's construction are:

- aggregates – 234,960 tonnes per year (1.6% of Wales aggregate consumption/sales);
- concrete – 322,600 tonnes per year (26.9% of Wales concrete consumption/sales);
- steel – 21,200 tonnes per year (0.1% of UK steel availability); and
- asphalt – 520 tonnes per year (0.05% of Wales asphalt availability).

23.6.8 Total quantities per Train have been multiplied by two with the assumption that both Trains are constructed at the same time. This is considered a worst-case scenario. Total construction materials have been divided equally by the number of construction years (five years).

23.6.9 For aggregates, steel and asphalt, sensitivity of the receptor is classified as 'low' (as outlined in paragraph 23.6.2 and **Table 23-3**) whilst the magnitude of impact is considered to be 'negligible' (1.6% for aggregates, 0.1% for steel and 0.05% for asphalt, as outlined in **Table 23-6**) resulting in a slight adverse effect (as outlined in **Table 23-8**) which is **not significant** (as outlined in **Table 23-9**).

23.6.10 For concrete, sensitivity of the receptor is classified as 'low' (as outlined in paragraph 23.6.2 and **Table 23-3**) whilst the magnitude of impact is considered to be 'major' (26.9% for concrete, as outlined in **Table 23-6**) resulting in a slight or moderate adverse effect (as outlined in **Table 23-8**) which is **significant** when moderate is selected as a worst case (as outlined in **Table 23-9**).

23.6.11 Due to the location of the Proposed Development, close to the border between Wales and England, it is anticipated that concrete may be sourced from North West England. Therefore, when the concrete quantity required for construction is considered in the context of a combined Wales and North West England baseline (4.6 million tonnes), the quantity is 7% of the baseline.

23.6.12 For concrete, sensitivity of the receptor is classified as 'low' (as outlined in paragraph 23.6.2 and **Table 23-3**) whilst the magnitude of impact is considered to be 'moderate' (7% for concrete, as outlined in **Table 23-6**) resulting in a slight adverse effect (as outlined in **Table 23-8**) which is **not significant** (as outlined in **Table 23-9**).

23.6.13 A technical study to assess the risk of flooding at the Main Site is underway and will inform the flood risk assessment that will accompany the Application. It is currently anticipated that some targeted ground raising may be required to increase ground levels above the existing average ground height of between 6.8 metres (m) to 7.0 m Above Ordnance Datum (AOD) in order to protect critical operational infrastructure from flood events and considering the effects of climate change.

23.6.14 The estimated volume of material required to undertake any targeted land raising to mitigate flood risk will be reported in the ES.

Waste

Demolition

23.6.15 The Main Site will require site clearance and remedial works prior to the construction of the Proposed Development.

23.6.16 As outlined in **Chapter 5: Construction Programme and Management**, the demolition of the GTP, existing GTP AGI, and existing stores building, will take place prior to the Proposed Development's construction.

23.6.17 Estimated quantities of demolition waste are approximately 2,050 m³ of hardstanding waste and 17,050 m³ of building/ancillary equipment waste (19,010 m³ total) (**Table 23-11**). Estimated hardstanding is based on an assumed depth of 350 millimetres (mm) (200 mm of concrete/asphalt on a base of 150 mm of aggregate). Waste from buildings/ancillary equipment is based on an estimate of 0.47 tonnes per m³ of building/ancillary equipment volume (height x width x depth). Buildings and ancillary equipment height is assumed to be 6.1 m, except for stacks and a tank located in the GTP. Based on information about the operational use of the GTP, AGI and existing stores and the materials used in construction of those areas, it is assumed that the majority of demolition waste would be non-hazardous and would be recycled on-site (e.g. crushing of hardstanding) or recycled off-site with recovery rates over 90% achievable.

Excavated Material

23.6.18 The Main Site is located within the curtilage of the existing Connah's Quay Power Station. Given the nature of the former site operations, it is possible that subsurface contamination may be present. Accordingly, a Ground Investigation would be undertaken prior to commencing construction. However, it is anticipated that the majority of excavated materials would be non-hazardous since the areas to be excavated consist of pulverised fuel ash which is anticipated to be non-hazardous. It is assumed that non-hazardous excavated material would be reused on-site for land raising.

23.6.19 The Proposed Development's design is currently being progressed to optimise the requirements for cut and fill, and where possible, this will be minimised to reduce the import and export of materials and waste, although the design may generate excavated material that will require off-site treatment or disposal. Where possible surplus excavated material will be reused or recovered on-site, in accordance with the CL:AIRE DoW CoP (Ref 23-24) and a MMP, waste exemption or environmental permit. It is currently estimated that 87,100 m³ of material will be excavated with 20% of material (17,470 m³) currently being assumed (in a worst case) to be hazardous waste with the remaining 80% being non-hazardous and assume to be reused on-site for land raising (**Table 23-11**). It is assumed that 50% of hazardous waste would be recovered via off-site treatment at a waste management facility.

Construction Waste

23.6.20 The estimated main types and quantities of waste to be generated during Proposed Development construction are:

- 8,500 m³ of non-hazardous inert material (e.g. concrete, asphalt and aggregates), source separated recyclables (paper & card, plastic, metals and wood) and mixed construction waste;
- 50 m³ of hazardous construction waste (e.g. surplus paint/coatings, batteries and oil filters); and
- 500 m³ of non-hazardous municipal waste, source-separated recyclables (e.g. paper, card, plastics) and mixed municipal waste (**Table 23-11**).

Construction, demolition and excavation waste summary

23.6.21 Construction, demolition and excavation waste is summarised in **Table 23-11**.

Table 23-11: Construction, Demolition and Excavation Waste Summary

Construction Activity and Waste Type	Waste (m ³)
Demolition – hazardous waste	Minimal, it is assumed that the majority of demolition waste will be non-hazardous.
Demolition – non-hazardous waste	19,100
Excavation – hazardous waste	17,420
Excavation – non-hazardous waste	It is assumed that non-hazardous excavated material would be reused on-site for land raising and would not be sent to landfill.
Construction - hazardous waste	50
Construction – non - hazardous waste	9,000
Total hazardous waste	17,470 (assumed to be 50% sent to landfill and 50% recovered via off-site treatment at a waste management facility).
Total non-hazardous waste	28,100

23.6.22 In a worst-case scenario where all hazardous waste (17,470 m³) is sent to landfill within one calendar year this would be 0.18% of the hazardous waste landfill capacity in Wales and England (9.9 million m³). The threshold for a significant effect (based on a 'very high' sensitivity) is 0.1% of the hazardous waste landfill capacity in Wales and England.

23.6.23 For hazardous waste, the sensitivity of receptor is classified as 'very high' (as outlined in paragraph 23.6.4 and **Table 23-5**) whilst the magnitude of impact is considered to be 'minor' (0.18% of the hazardous waste landfill capacity in Wales and England, as outlined in **Table 23-7**), resulting in a moderate or large adverse effect (as outlined in **Table 23-8**) which is **significant** (as outlined in **Table 23-9**).

23.6.24 In practice, a proportion of hazardous waste generated by excavation from the Proposed Development could be non-hazardous and/or likely to be sent to a waste management facility rather than disposed of to landfill, further reducing the overall quantities of waste for disposal (e.g. <0.1% of hazardous waste landfill capacity in Wales and England). It is assumed that 50% of hazardous

waste would be recovered via off-site treatment at a waste management facility. This would reduce the resulting effect to minor adverse (**not significant**) however, the worst case outlined above is used in the assessment.

23.6.25 In a worst-case scenario where all non-hazardous waste (28,100 m³) is sent to landfill within one calendar year this would be 0.3% of the total inert and non-hazardous waste landfill capacity in Wales (10.1 million m³). The threshold for a significant effect (based on a 'very high' sensitivity) is 1% of the inert and non-hazardous waste landfill capacity in Wales.

23.6.26 For non-hazardous waste, the sensitivity of receptor is classified as 'very high' (as outlined in paragraph 23.6.4 and **Table 23-4**) whilst the magnitude of impact is considered to be 'negligible' (0.3% of the total inert and non-hazardous waste landfill capacity in Wales as outlined in **Table 23-7**), resulting in a slight adverse effect (as outlined in **Table 23-8**) which is **not significant** (as outlined in **Table 23-9**).

23.6.27 In practice, a large proportion of non-hazardous waste from the Proposed Development is likely to be recovered rather than disposed of to landfill, further reducing the overall quantities of waste for disposal. As set out in **Table 23A-9 of Appendix 23-A: Materials and Waste Baseline Report (PEIR Volume IV)**, good and best practice waste recovery (landfill diversion) for the Proposed Development is likely to be above 90% for the majority of construction wastes (excluding excavated material).

Operation Phase

23.6.28 The earliest year of operation for the Proposed Development is anticipated to be 2030, under a phased construction approach beginning in 2026 for a period of five years. If construction was to be undertaken in a single phased approach, the earliest year of operation is anticipated to be 2035. If a single phased construction approach was undertaken at the latest possible time, five years after DCO Consent, operation would be anticipated to occur in late 2036.

23.6.29 Operational waste from the Proposed Development will comprise waste from site offices and waste from the CCGT and CCP. The estimated main types and quantities of waste to be generated during the Proposed Development's operation are:

- 3,741 tonnes (2,961 m³) of amine reclaimer sludge per year;
- reflux purge (reflux drain drum, liquid) quantity per year to be confirmed; and
- acid wash purge (acid drain drum, liquid) quantity per year to confirmed.

23.6.30 All operational wastes (listed above) are assumed to be hazardous and may not be suitable for landfill disposal. It is assumed as a worst case that these wastes would be transferred off-site by tanker to suitable waste management facilities rather than being managed on-site in a wastewater treatment plant.

23.6.31 Since some of the operational hazardous waste likely to be generated by the Proposed Development will not be suitable for landfill disposal (e.g. liquid),

hazardous operational waste has been considered in the context of national hazardous waste management facility capacity (Wales and England).

- 23.6.32 Liquid hazardous waste from the operation of the Proposed Development may be managed by high-temperature incineration or by physico-chemical treatment. Alternatively, in the longer term, some form of waste treatment may be developed on or near to the Proposed Development to manage waste generated in the CCP and other carbon capture facilities in the area, should other developments seek to undertake carbon capture. However, in the absence of such facilities, this assessment conservatively does not consider the potential for such waste treatment facilities to be developed.
- 23.6.33 The quantities of reflux and acid wash purge waste are to be confirmed and will be provided and assessed in the Environmental Statement.
- 23.6.34 If amine reclaimer sludge from the CCP is disposed of by high-temperature incineration, the wastes from the Proposed Development (3,741 tonnes) would be equivalent to 1.3% of 2022 hazardous waste incineration waste inputs (286,940 tonnes at the Wales and England level).
- 23.6.35 If amine reclaimer sludge from the CCP is managed by hazardous liquid waste facilities, the wastes from the Proposed Development would be equivalent to 0.6% of 2022 hazardous liquid waste treatment inputs (658,884 tonnes at the Wales and England level).
- 23.6.36 Since the IEMA Guidance focuses on assessing the impacts on landfill capacity only, there is no assessment criteria for comparing waste against baseline waste management facility capacity and significance is not provided.
- 23.6.37 Non-hazardous commercial wastes from office and maintenance activities will be generated in smaller quantities. In the event that non-hazardous and inert wastes from the Proposed Development are disposed of to landfill, the annual quantity is likely to result in a reduction of <1% (83,000 m³ and 18,000 m³) of Wales non-hazardous and inert waste landfill void capacity. The sensitivity of receptor is classified as 'very high' (as outlined in paragraph 23.6.4 and **Table 23-4**) whilst the magnitude of impact is considered to be 'negligible' (<1% of Wales non-hazardous and inert waste landfill void capacity) as outlined in **Table 23-7**), resulting in a slight adverse effect (as outlined in **Table 23-8**) which is **not significant** (as outlined in **Table 23-9**).

23.7 Additional Mitigation and Enhancement Measures

- 23.7.1 A potential significant effect has been identified in relation to concrete availability. In practice due to the location of the Proposed Development, close to the border between Wales and England, it is anticipated that concrete may be sourced from North West England. Therefore, when the concrete quantity required for construction is considered in the context of a combined Wales and North West England baseline the effect is not significant.
- 23.7.2 A potential significant effect has been identified in relation to hazardous waste from excavation of material requiring disposal during construction of the Proposed Development. In practice, the proportion of material from the Indicative Site Boundary classed as hazardous may be lower; with any

hazardous excavated material potentially being sent to a waste management facility rather than disposed of to landfill with a 50% recovery rate. This would further reduce the overall quantities of hazardous waste for disposal to landfill. Waste management routes will be confirmed by the construction contractor. The volume estimates will be further refined with a Ground Investigation that would be undertaken prior to commencing construction.

- 23.7.3 No other significant effects have been identified, therefore mitigation is not proposed.
- 23.7.4 No enhancement measures related to materials and waste are proposed at this stage.

23.8 Summary of Likely Significant Residual Effects

- 23.8.1 **Table 23-12** summarises the likely residual significant effects of the Proposed Development in relation to Materials and Waste following implementation of mitigation. There are no residual effects associated with operation. Decommissioning is scoped out of the assessment.
- 23.8.2 An assessment of cumulative effects with other proposed developments that could interact with the effects of the Proposed Development will be carried out in the final ES, when the short-list of other developments has been finalised, as detailed in **Chapter 24: Cumulative and Combined Effects** will also assess the in-combination effects of multiple aspects on one receptor.

Table 23-12: Summary of Likely Significant Residual Effects (Construction)

Receptor	Sensitivity (value)	Description of Impact	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation/Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
Changes in material availability – concrete	Low	Major magnitude of impact which results in a Slight or Moderate Adverse effect (Moderate is selected as a worst case)	Significant	Due to the location of the Proposed Development, close to the border between Wales and England, it is anticipated that concrete may be sourced from North West England. Therefore, when the concrete quantity required for construction is also considered in the context of a combined Wales and North West England baseline.	Moderate magnitude of impact resulting Slight Adverse effect	Not significant effect
Changes in available hazardous landfill void capacity – excavated material	Very High	Large Adverse	Significant effect	No additional mitigation measures are proposed at this time, however, the hazardous excavated material volume estimates will be further refined with a Ground Investigation be undertaken prior to commencing construction. Waste management routes will be confirmed by the construction contractor.	Negligible magnitude of impact which results in a Slight Adverse effect	Not significant effect

References

- Ref 23-1 Institute of Environmental Management and Assessment (IEMA), 2020, Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach. Available at: <https://www.iema.net/resources/news/2020/03/30/iema-launches-guide-to-materials-and-waste-in-environmental-impact-assessment> (IEMA membership required)
- Ref 23-2 European Union, 2008, Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (2008/98/EC). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098>
- Ref 23-3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/572). London: His Majesty's Stationery Office (HMSO). Available at: [The Infrastructure Planning \(Environmental Impact Assessment\) Regulations 2017 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2017/572/contents)
- Ref 23-4 Environmental Protection Act 1990 (as amended) (c. 43). London: HMSO. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>
- Ref 23-5 The Hazardous Waste (England and Wales) Regulations 2005 (as amended) (SI 2005/894). London: HMSO. Available at: <https://www.legislation.gov.uk/uksi/2005/894/contents/made>
- Ref 23-6 The Waste (England and Wales) Regulations 2011 (as amended) (SI 2011/988). London: HMSO. Available at: <https://www.legislation.gov.uk/uksi/2011/988/contents/made>
- Ref 23-7 The Environmental Permitting (England and Wales) Regulations 2016 (SI 2016/1154). London: HMSO. Available at: [The Environmental Permitting \(England and Wales\) Regulations 2016 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/2016/1154/contents/made)
- Ref 23-8 Environment Act 2021 (c. 30). London: HMSO. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>
- Ref 23-9 Environment (Wales) Act 2016 (anaw. 3). London: HMSO. Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted>
- Ref 23-10 The Waste Separation Requirements (Wales) Regulations 2023. Wales Statutory Instruments. Available at: <https://www.legislation.gov.uk/wsi/2023/1290/regulation/1/made>
- Ref 23-11 Department of Energy Security and Net Zero (DESNZ), 2023, Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/65a7864e96a5ec0013731a93/overarching-nps-for-energy-en1.pdf>
- Ref 23-12 DESNZ, 2023, National Policy Statement for Natural Gas Electricity Generating Infrastructure (EN-2). Available at: <https://assets.publishing.service.gov.uk/media/655dc15a544aea000dfb3239/nps-natural-gas-electricitygenerating-infrastructure-en2.pdf>
- Ref 23-13 DESNZ, 2023, National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4). Available at: <https://assets.publishing.service.gov.uk/media/655dc2d4046ed4000d8b9dd9/nps-natural-gas-supply-infrastructurepipelines-en4.pdf>
- Ref 23-14 DESNZ, 2023, National Policy Statement for Electricity Networks Infrastructure (EN-5) [online]. Available at: <https://assets.publishing.service.gov.uk/media/655dc25e046ed400148b9dca/nps-electricity-networks-infrastructure-en5.pdf>
- Ref 23-15 Welsh Government, 2024, Planning Policy Wales: Edition 12. Available at: https://www.gov.wales/sites/default/files/publications/2024-02/planning-policy-wales-edition-12_1.pdf

- Ref 23-16 Welsh Government, 2021, Beyond Recycling: A strategy to make the circular economy in Wales a reality. Available at: <https://www.gov.wales/sites/default/files/publications/2021-03/beyond-recycling-strategy-document.pdf>
- Ref 23-17 Welsh Government, 2010, Towards Zero Waste One Wales: One Planet – The Overarching Waste Strategy for Wales. Available at: <https://gov.wales/sites/default/files/publications/2019-05/towards-zero-waste-our-waste-strategy.pdf>
- Ref 23-18 Welsh Government, 2013, Towards Zero Waste One Wales: One Planet – The Waste Prevention Programme for Wales. Available at: <https://gov.wales/waste-prevention-programme-wales>
- Ref 23-19 Welsh Government, 2020, Future Wales – the National Plan 2040. Available at: <https://www.gov.wales/sites/default/files/publications/2020-11/working-draft-national-development-framework-document-september-2020.pdf>
- Ref 23-20 Department for Environment, Food & Rural Affairs (DEFRA), 2010, A Strategy for Hazardous Waste Management in England. [online]. Available at: [A Strategy for Hazardous Waste Management in England \(richmond.gov.uk\)](https://www.richmond.gov.uk/a-strategy-for-hazardous-waste-management-in-england)
- Ref 23-21 FCC, 2023, Flintshire Local Development Plan 2015 – 2030, Adopted Plan 24th January 2023. Available at: <https://flintshire.gov.uk/en/PDFFiles/Planning/Examination-Library-Documents/FINAL-LDP-Written-Statement-English.pdf>
- Ref 23-22 FCC, 2023, Flintshire Local Development Plan 2015 – 2030 (Proposal Maps), Adopted Plan 24th January 2023. Available at [Flintshire County Council – Local Plan: Adopted Proposals \(opus4.co.uk\)](https://www.flintshire.gov.uk/flintshire-county-council-local-plan-adopted-proposals)
- Ref 23-23 FCC, 2009, Flintshire County Council Waste Management Strategy 2009-2025. Available at: [Flintshire Waste Management Strategy \(PDF 1MB new window\)](#)
- Ref 23-24 CL:AIRE, 2011, Definition of Waste Code of Practice (DoW CoP). Available at: <https://claire.co.uk/projects-and-initiatives/dow-cop/28-framework-and-guidance/111-dow-cop-main-document>
- Ref 23-25 WRAP, Designing Out Waste Tool for Civil Engineering. No longer available online.
- Ref 23-26 Welsh Government, 2024, Separate Collection of Waste Materials for Recycling – A Code of Practice for Wales. Available at: <https://www.gov.wales/sites/default/files/publications/2024-01/separate-collection-of-waste-materials-for-recycling-a-code-of-practice-for-wales.pdf>
- Ref 23-27 Natural Resources Wales, 2024, Permitted Waste Sites Data Map. Available at: [Natural Resources Wales / Find details of permitted waste sites](#)
- Ref 23-28 DEFRA, 2011, *Guidance on Applying the Waste Hierarchy*. Available at: <https://www.gov.uk/government/publications/guidance-on-applying-the-waste-hierarchy>
- Ref 23-29 DEFRA, 2024, UK Statistics on Waste. Available at: <https://www.gov.uk/government/statistics/uk-waste-data>

