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20. Materials and Waste

20.1. Introduction

20.1.1. This chapter of the Environmental Statement (ES) provides an assessment of the potential impacts and effects as a result of the construction, operation (including maintenance) and decommissioning of the Proposed Development on materials and waste.

20.1.2. 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 from herein as the 'IEMA Guidance') (IEMA, 2020).

20.2. Legislation, Planning Policy, and Guidance

20.2.1. This section outlines the legislation, planning policy and guidance of relevance to the assessment of materials and waste effects.

Legislation

20.2.2. The assessment has taken account of the relevant waste legislation including but not limited to:

- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) (2017 No. 572) (HM Government, 2017);
- Waste Framework Directive (2008/98/EC) (EU, 2008);
- Environmental Protection Act 1990 (1990) (HM Government, 1990);
- The Hazardous Waste (England and Wales) Regulations 2005 (2005 No. 894) as amended (HM Government, 2005);
- The Waste (England and Wales) Regulations 2011 (2011 No. 988) as amended (HM Government, 2011);
- The Environmental Permitting (England and Wales) Regulations 2016 (2016 No. 1154) (HM Government, 2016); and
- Environment Act 2021 (2021 c. 30) (HM Government, 2021).

20.2.3. The Waste (England and Wales) Regulations 2011 (as amended) (HM Government, 2011) transpose the requirements of the Waste Framework Directive (Waste FD) (EU, 2008) in England and Wales and require the Secretary of State to establish waste prevention programmes and waste

management plans that apply the waste hierarchy. The waste hierarchy is defined in the Waste FD and prioritises waste prevention, followed by preparing for reuse, recycling, recovery and finally disposal as means of managing waste.

20.2.4. The Waste (England and Wales) Regulations 2011 (as amended) (HM Government, 2011) require businesses to apply the waste hierarchy when managing waste, and require that measures are taken to ensure that, by the year 2020 and beyond, at least 70% by weight of non-hazardous construction and demolition waste is subjected to material recovery. The target specifically excludes naturally occurring materials with European Waste Catalogue (EWC) Code 17 05 04 (17 05 04 soil and stones other than those mentioned in 17 05 03* (soils and stone containing dangerous substances)).

20.2.5. A departure from the waste hierarchy can be undertaken to achieve the best overall environmental outcome where this is justified by lifecycle thinking on the overall impacts of the generation and management of the waste. However, the following considerations must also be taken into account:

- environmental protection principles of precaution and sustainability;
- proximity principle for treatment and disposal of waste to be as close to its source as possible;
- technical feasibility and economic viability;
- protection of resources; and,
- overall environmental, human health, economic and social impacts.

Planning Policy

20.2.6. The materials and waste assessment takes into consideration national policy that concerns the use of materials and waste generation and its management.

20.2.7. The following national policies statements (NPS) are relevant to the assessment.

Overarching National Policy Statement (NPS) for Energy (EN-1) (2023)

20.2.8. The National Policy Statements (NPS) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure

(Department for Energy Security and Net Zero (DESNZ), 2023). The Overarching NPS for Energy (EN-1) came into force on 17 January 2024.

NPS for Natural Gas Electricity Generating Infrastructure (EN-2) (2024)

20.2.9. NPS EN-2 does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.

NPS for Gas and Oil Pipelines (EN-4) (2023)

20.2.10. NPS EN-4 does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.

20.2.11. On 24 April 2025, DESNZ published a consultation on revisions to the NPS. Consultation on the amendments concluded on 29 May 2025 and draft revisions have since been published (DESNZ, 2023a). The outcomes from the consultation have not resulted in any material changes to the conclusions of this chapter.

20.2.12. **Table 20.1** identifies the policies in NPS EN-1 relevant to materials and waste.

Table 20.1: Relevant NPS EN-1 policies for waste and materials assessment (DESNZ, 2023)

Relevant NPS paragraph reference	Policies of NPS EN-1	Consideration within the Chapter
5.15.8	The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a report that sets out the sustainable management of waste and use of resources throughout any relevant demolition, excavation and construction activities.	Addressed in Section 20.6 and an OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP** (**Application Document Ref. 7.4)** which accompanies the Application.
5.15.9	The arrangements described and a report	Addressed in Section 20.6 and Section 20.7 and an

Relevant NPS paragraph reference	Policies of NPS EN-1	Consideration within the Chapter
	setting out the sustainable management of waste and use of resources should include information on how re-use and recycling will be maximised in addition to the proposed waste recovery and disposal system for all waste generated by the development. They should also include an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation.	OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP (Application Document Ref. 7.4**) which accompanies the DCO application.
5.15.10	The applicant is encouraged to refer to the 'Waste Prevention Programme for England' and should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome.	Addressed in Section 20.6 and an OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP (Application Document Ref. 7.4**) which accompanies the DCO application.

Relevant NPS paragraph reference	Policies of NPS EN-1	Consideration within the Chapter
5.15.12	The UK is committed to moving towards a more 'circular economy'. Where possible, applicants are encouraged to source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers. Construction best practices should be used to ensure that material is reused or recycled onsite where possible.	Addressed in Section 20.6 and an OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP (Application Document Ref. 7.4**) which accompanies the DCO application.
5.15.13	Applicants are encouraged to use construction best practices in relation to storing materials in an adequate and protected place on site to prevent waste, for example, from damage or vandalism. The use of Building Information Management tools (or similar) to record the materials used in construction can help to reduce waste in future decommissioning of facilities, by identifying materials that can be recycled or reused.	Addressed in Section 20.6 and an OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP (Application Document Ref. 7.4**) which accompanies the DCO application.

National Planning Policy Framework (2024)

20.2.13. The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2024) does not contain specific waste policies as these are detailed within the revised Waste Management Plan for England (MHCLG, 2021) and the National Planning Policy for Waste (MHCLG, 2014a), however **Table 20.2** identifies the overarching NPPF policies relevant to materials and waste.

Table 20.2: Relevant NPPF policies for waste and materials assessment

Relevant NPPF paragraph reference	Overarching Policy in the NPPF
8	The environmental objective set out at paragraph 8 of the NPPF is 'to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy'.
223	The environmental objective set out in paragraph 224 of the NPPF is to 'so far as practicable, take account of the contribution that substitute, or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously'.

National Planning Policy Guidance (NPPG) for Minerals (2014) and NPPG for Waste (2015)

20.2.14. The NPPG for Minerals (MHCLG, 2014b) and Waste (MHCLG, 2015) were published to provide more in-depth guidance than the NPPF. The guidance aims to make planning guidance more accessible and ensures that it is kept up to date.

National Planning Policy for Waste (2014)

20.2.15. The National Planning Policy for Waste (MHCLG, 2014a) sets out detailed waste planning policies to be applied in conjunction with the NPPF. It states that when determining planning applications for non-waste

development, local planning authorities should, to the extent appropriate to their responsibilities, ensure that:

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

Waste Management Plan for England (2021)

20.2.16. The Waste Management Plan for England (Department for Environment, Food and Rural Affairs (Defra), 2021a) provides an overview of waste management in England and reiterates the requirement for all waste producers and waste management providers to implement the waste hierarchy.

20.2.17. The Plan also highlights the need for waste to be managed using the proximity principle and confirms England's commitment to recovering at least 70% by weight of non-hazardous construction and demolition waste by 2020 (excluding soils and stones). Recovery is assumed in the context of this policy to include reuse, recycling and incineration with energy recovery.

A Green Future: Our 25 Year Plan to Improve the Environment (2018)

20.2.18. A Green Future: Our 25 Year Plan to Improve the Environment (Defra, 2018a) '*sets out goals for improving the environment within a generation and leaving it in a better state than we found it'* (Defra, 2023a). It details how the government will work with communities and businesses to do this. The following policies are of note:

- make sure that resources are used more efficiently and kept in use for longer to minimise waste and reduce its environmental impacts by promoting reuse, remanufacturing and recycling;
- work towards eliminating all avoidable waste by 2050 and all avoidable plastic waste by the end of 2042;
- reducing food supply chain emissions and waste;
- reducing litter and littering; and

- improving management of residual waste.

Our Waste, Our Resources: A Strategy for England (Resources and Waste Strategy for England) (2018)

20.2.19. The Strategy for England (Defra, 2018b) aims to help the government to meet the commitments outlined in the 25 Year Environment Plan, it:

'Sets out how we will preserve our stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. At the same time, we will minimise the damage caused to our natural environment by reducing and managing waste safely and carefully, and by tackling waste crime'.

20.2.20. The strategy combines actions to be taken now and commitments for the coming years. Key targets and milestones which could be relevant to the Proposed Development include (dates in the 2018 have been updated to reflect current timescales):

- roll out of a deposit return scheme (subject to consultation) – 2027 (Defra, 2024);
- legislation for mandatory separate food waste collections (comes into effect) – 2025;
- 75% recycling rate for packaging– 2030;
- 65% recycling rate for municipal solid waste – 2035; and
- municipal waste to landfill 10% or less – 2035.

Environmental Improvement Plan 2023

20.2.21. The Environmental Improvement Plan (EIP) (Defra, 2023b) builds on the 25 Year Plan to Improve the Environment published in 2018, which covered topics including waste and resources, air quality and nature.

20.2.22. The EIP confirms that Defra will publish the new maximising resources and minimising waste programme in England. The programme will set out the Government's priorities for action across seven key sectors, including construction, to manage resources and waste in accordance with the waste hierarchy.

20.2.23. The Government is working to publish a revised Code of Practice for the sustainable use of soil on construction sites, which will help to reduce the amount of soil sent to landfill.

20.2.24. In addition, a Soil Reuse and Storage Depot scheme will be developed to help prevent soil that would otherwise be classified as waste going to

landfill and encourage remediation and reuse of soil. The scheme will be piloted by Defra by 2026.

20.2.25. In the longer term, the EIP includes commitments to eliminate avoidable plastic waste by 2042 and avoidable waste by 2050.

Local Planning Policy

20.2.26. The Proposed Development materials and waste assessment will take into consideration local policy that concerns the use of material and waste generation and management. Details of local planning policy relevant to the Proposed Development are presented below.

North Lincolnshire Core Strategy (2011)

20.2.27. The North Lincolnshire Core Strategy (North Lincolnshire Council (NLC), 2011a) is one of multiple Development Plan Documents (DPDs) which make up the North Lincolnshire Local Development Framework (NLC, 2024a). The Strategy outlines the long-term spatial planning framework for development in North Lincolnshire up to 2026. A Minerals and Waste DPD is mentioned in the Core Strategy, however, this document was not produced.

20.2.28. Under C**ore Strategy policy CS18 (Sustainable Resource Use and Climate Change)** the council will actively promote development that utilises natural resources as efficiently and sustainably as possible. This includes:

- Supporting development that minimises the consumption and extraction of minerals by making the greatest possible reuse or recycling of materials in new construction, and by making best use of existing buildings and infrastructure;
- Supporting development that seeks to minimise waste and facilitates recycling and using waste for energy where appropriate.

20.2.29. Other relevant spatial objectives and core strategies (CS) include:

- **Spatial Objective 7**: Efficient Use and Management of Resources - To ensure the efficient use of resources, maximising recycling of minerals and waste products, minimising pollution, maintaining and improving air, soil and water quality, and employing sustainable building practices in new development.
- **CS20: Sustainable Waste Management** - The Council will promote sustainable waste management by:

  - Requiring Site Waste Management Plans for future major developments to minimise waste;
  - Requiring the integration of facilities for waste minimisation, re-use, recycling and composting, in association with the planning, construction and occupation of new development.

- **CS21: Minerals** - The Council will safeguard mineral resources in North Lincolnshire from other development that would prejudice future mineral extraction. Mineral Safeguarding Areas along with Specific Sites, Preferred Areas, and Areas of Search will be identified as appropriate in the Minerals and Waste DPD, through formal consultation with operators, landowners and others. The Minerals and Waste DPD is mentioned in the Core Strategy however this document is not available in the NLC Development Framework suite of DPDs. Therefore, safeguarded mineral and waste sites are not allocated.

20.2.30. NLC are currently preparing a new Local Plan (2020-2038) (NLC, 2024b). Once agreed (formally adopted), it will replace the current North Lincolnshire 2023 Local Plan and the 2011 Core Strategy (above). NLC intends to carry out initial engagement on the new Local Plan in Spring 2025, followed by two further consultations on full draft versions of the Plan prior to being submitted for Examination in Public by the Planning Inspectorate in Spring 2026. The new Proposals Map does not indicate any safeguarded mineral and waste sites (mineral infrastructure, existing consented extraction sites, proposed site allocations and landfill sites) in the Proposed Development Site.

North Lincolnshire Proposals Map (2016)

20.2.31. The North Lincolnshire Proposals Map (a general map covering the whole area) provides inset areas. The relevant inset areas for the Proposed Development are Inset 22 and Inset 25. The insets indicate the locations of wharves (saved policies from the North Lincolnshire 2023 Local Plan, IN10), mineral inset areas and areas for future sand extraction (saved policies from the North Lincolnshire 2023 Local Plan, M12/M19). None of these locations are within the Proposed Development Site. Safeguarded minerals and waste sites are not allocated in the Proposals Map.

Other Relevant Policy, Standards and Guidance

20.2.32. Additional guidance documents relevant to the materials and waste assessment which have been considered include:

- Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (WRAP, undated a);

and WRAP Designing Out Waste: A Design Team Guide for Buildings (WRAP, undated b); and

- Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (DoW CoP), v2 (CL:AIRE, 2011)

20.3. Assessment Methodology

Consultation

20.3.1. The consultation undertaken with statutory consultees to inform this chapter, including a summary of comments raised via the formal Scoping Opinion (**ES Volume II Appendix 1B**: Scoping Opinion (**Application Document Ref. 6.3**)) and in response to the formal consultation and other pre-application engagement is summarised in **Table 20.3**.

Table 20.3: Consultation summary table

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
Planning Inspectorate	April 2024 Scoping Opinion	The Scoping Report proposed to scope out waste arising from extraction, processing and manufacture of construction components and products. The Inspectorate agreed that this matter can be scoped out from the ES on the basis that the associated construction materials and products are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain.	Waste arising from the extraction, processing and manufacture of construction components and products has been scoped out, as per **Table 20.4** and paragraph 20.3.17.
		The Scoping Report proposed that other environmental impacts, associated with the management of materials and waste to or from the Proposed Development, would be addressed in other relevant environmental aspect chapters of the ES. On this basis, the Inspectorate is content to scope this matter out. It was noted that cross-references should be made between aspect chapters, where appropriate, to ensure a comprehensive assessment.	Other environmental impacts, associated with the management of waste, have been scoped out, as per **Table 20.4** and paragraph 20.3.17. Where appropriate cross-references have been made to other aspect chapters.

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
		The Scoping Report did not identify any allocated/ safeguarded mineral or waste sites present within the site boundary; therefore, the Inspectorate is content to scope this matter out.	Changes to safeguarded mineral and waste sites have been scoped out of this assessment because there are none present within the Proposed Development, as per **Table 20.4** and paragraph 20.2.31.
		The Scoping Report proposed to scope out changes in the availability of maintenance materials during the operation of the Proposed Development on the basis that the forecasted effects, based on professional judgement, are negligible given the nature and scale of the Proposed Development. The Inspectorate agrees that changes in the availability of materials during the Proposed Development's operation are unlikely to result in significant effects; therefore, this matter was agreed to be scoped out from the ES.	Changes in the availability of maintenance materials during the Proposed Development's operation have been scoped out of this assessment, as per **Table 20.4** and paragraph 20.3.17.
		The Scoping Report did not deem forecasting the availability of materials and landfill capacity an accurate reflection and states that it could be unreliable, noting the time periods involved. The	It is not possible to undertake a quantitative assessment of the changes in availability of materials and available landfill capacity during

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
		Inspectorate agrees with this and is content to scope out a detailed quantitative assessment. The ES should however include an estimate of materials and waste produced by the Proposed Development in the decommissioning phase. The Inspectorate notes the commitment to a Decommissioning Environmental Management Plan which would consider in detail all potential environmental risks on the Site and contain guidance on how risks can be removed or mitigated.	the Proposed Development's decommissioning phase. The ES includes a qualitative assessment of the impacts of materials and waste during the decommissioning phase (see paragraphs 20.7.26 to 20.7.30). Section 4.6 of **ES Volume I Chapter 4**: Proposed Development (**Application Document Ref. 6.2**) notes that a Decommissioning Plan (including Decommissioning Environmental Management Plan (DEMP)) will be produced in advance of cessation of operations within the period specified in the relevant legislation in force at the time of cessation of operations and agreed with the Environment Agency as part of the Environmental Permit and site surrender process. The DEMP will consider in detail all potential environmental risks and contain

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
			guidance on how risks can be removed, mitigated or managed.
Environment Agency (EA)	May 2024 review of the Scoping Report (consulted by the Planning Inspectorate)	Section 3.5 of the Scoping Report notes that material will need to be imported to raise areas of the site and also later considers the disposal of waste to landfill. The definition of Waste Code of Practice provides a mechanism for the re-use of excavated materials on, and between sites, that may assist in the minimization of the production of waste and requirement for disposal to landfill. The EA advise the applicant to refer to the Definition of Waste Code of Practice.	An Outline Site Waste Management Plan (OSWMP) covering these aspects has been produced and is within Appendix A of the **Outline Construction Environmental Management Plan** (CEMP) (**Application Document Ref. 7.4**) which accompanies the DCO application.
		The Environmental Protection (Duty of Care) Regulations 1991 for dealing with waste materials are applicable to any off-site movements of wastes. The code of practice applies if you produce, carry, keep, dispose of, treat, import or have control of waste in England or Wales. The law requires anyone dealing with waste to keep it safe and make sure it's dealt with responsibly and only given to businesses authorised to take it.	An OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP** (**Application Document Ref. 7.4**) which accompanies the DCO application.

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
		If materials that are potentially waste are to be used on-site, the applicant will need to ensure they can comply with the exclusion from the Waste Framework Directive (WFD) (article 2(1) (c)) for the use of, '*uncontaminated soil and other naturally occurring material excavated in the course of construction activities, etc…*' in order for the material not to be considered as waste. Meeting these criteria will mean waste permitting requirements do not apply. Where the applicant cannot meet the criteria, they will be required to obtain the appropriate waste permit or exemption. A deposit of waste to land will either be a disposal or a recovery activity. The legal test for recovery is set out in Article 3(15) of WFD as: • any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.	At the time of assessment, the reuse/recovery route of excavated material is yet to be confirmed. If required, a Materials Management Plan (MMP) would be developed under the CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) by the appointed construction Contractor to support the reuse of excavated materials, minimise off-site disposal; and to demonstrate the necessary lines of evidence to support the proper reuse/offsite disposal of materials and ensure compliance with regulatory guidance. An OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP** (**Application Document Ref. 7.4**) which accompanies the DCO application.

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
		Non-waste activities are not regulated by us (i.e. activities carried out under the CL:AIRE Code of Practice), however you will need to decide if materials meet End of Waste or By-products criteria (as defined by the Waste Framework Directive).	
		Where a development involves any significant construction or related activities, the EA recommends using a management and reporting system to minimise and track the fate of construction wastes, such as that set out in PAS402: 2013, or an appropriate equivalent assurance methodology. This should ensure that any waste contractors employed are suitably responsible in ensuring waste only goes to legitimate destinations.	The Proposed Development will follow waste duty of care as outlined in the OSWMP within the **Framework CEMP** (**Application Document Ref. 7.4**) which accompanies the DCO application. Waste contractors will be asked to provide details of how they meet the requirements of PAS402: 2013, or an appropriate equivalent assurance methodology.
		Excavated materials that are recovered via a treatment operation can be re-used on-site under the CL:AIRE Definition of Waste: Development Industry Code of Practice. This voluntary Code of Practice provides a framework for determining whether or not excavated material arising from site during	If required, an MMP would be developed under the CL:AIRE Definition of Waste: Development Industry Code of Practice by the appointed construction Contractor to support the reuse of excavated materials, minimise off-site disposal;

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
		remediation and/or land development works are waste. Developers should ensure that all contaminated materials are adequately characterised both chemically and physically, and that the permitting status of any proposed-on site operations are clear. If in doubt, the Environment Agency should be contacted for advice at an early stage to avoid any delays. The Environment Agency recommends that developers should refer to our: • position statement on the Definition of Waste: Development Industry Code of Practice; and • website for further guidance.	and to demonstrate the necessary lines of evidence to support the proper reuse/offsite disposal of materials and ensure compliance with regulatory guidance. An OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP** (**Application Document Ref. 7.4**) which accompanies the DCO application.
		Contaminated soil that is, or must be disposed of, is waste. Therefore, its handling, transport, treatment and disposal is subject to waste management legislation, which includes:	An OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP** (**Application Document Ref. 7.4**)

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
		• Duty of Care Regulations 1991; • Hazardous Waste (England and Wales) Regulations 2005; • Environmental Permitting (England and Wales) Regulations 2010; and • The Waste (England and Wales) Regulations 2011. Developers should ensure that all contaminated materials are adequately characterised both chemically and physically in line with British Standards BS EN 14899:2005 'Characterisation of Waste - Sampling of Waste Materials - Framework for the Preparation and Application of a Sampling Plan' and that the permitting status of any proposed treatment or disposal activity is clear. If in doubt, the Environment Agency should be contacted for advice at an early stage to avoid any delays.	which accompanies the DCO application.

Consultee or organisation approached	Date and nature of consultation	Summary of consultee response	How comments have been addressed in this chapter
EA	February 2025 review of the PEIR	There is no mention of waste classification technical guidance WM3 when discussing the characterisation and classification of wastes. Failure to characterise and classify wastes in line with WM3 requirements may lead to difficulty removing wastes from site and/or unexpected contamination from those removed wastes being treated and/or disposed of at inappropriate facilities. Ensure that WM3 is recognised, and the requirements of the document are considered when classifying and characterising wastes.	Waste classification technical guidance WM3 is referenced in an OSWMP covering these aspects has been produced and is provided in Appendix A of the **Outline CEMP** (**Application Document Ref. 7.4**) which accompanies the DCO application.

Assessment methods

20.3.2. For this assessment, materials and waste comprise:

- the consumption of materials (key construction materials only); and
- the generation and management of waste during construction, operation and decommissioning.

20.3.3. Materials are defined in the IEMA Guidance (IEMA, 2020) as:

'Physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel'.

20.3.4. 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. Mineral Safeguarding Areas are not considered to be allocated/safeguarded mineral sites.

20.3.5. Waste is defined as per the Waste FD (2008/98/EC) (European Union (EU), 2008) as 'any substance or object which the holder discards or intends or is required to discard'.

20.3.6. This section outlines the methodology employed for assessing the likely significant effects associated with materials and waste. The IEMA Guidance (IEMA, 2020) offers two methods for the assessment of waste. Method W1 '*void capacity'* has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects.

20.3.7. 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. Therefore, in addition to Method W1 – void capacity, hazardous operational waste is considered in the context of national hazardous waste management facility waste inputs.

Extent of Study Area

20.3.8. The study areas for the assessment of impacts related to materials and waste have been defined in line with the IEMA Guidance. Two study areas are defined:

- a Proposed Development Study Area (within which waste associated with the Proposed Development is generated, construction materials are used and allocated/safeguarded mineral and waste sites are present); 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 constructional materials are available).

20.3.9. Together the Proposed Development Study Area and Expansive Study Area are referred to in this Chapter as 'the Study Areas'.

Proposed Development Study Area

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

20.3.11. The Proposed Development Study Area for impacts on allocated/ safeguard mineral and waste sites is also the Site. Impacts on allocated/ safeguarded waste sites are not included in the IEMA Guidance, however, they are included in this chapter for completeness.

Expansive Study Area

20.3.12. The Expansive Study Area for non-hazardous and inert waste management comprises the Yorkshire and the Humber region. The Expansive Study Area includes the following sub-regions as outlined in the Environment Agency's (EA) 2023 Waste Summary Tables for England - Version 1 (EA, 2024a):

- Former Humberside (including North Lincolnshire);
- North Yorkshire;
- South Yorkshire; and
- West Yorkshire.

20.3.13. The Expansive Study Area for hazardous waste management is England.

20.3.14. The Study Area for hazardous waste management is defined based on professional judgement and informed by consideration of the proximity principle. The proximity principle for hazardous waste in England is outlined in 'Principle 2 - Infrastructure Provision in the Strategy for Hazardous Waste Management in England', and states:

'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' (Defra, 2010).

Planning for hazardous waste management is also undertaken at a national level.

20.3.15. The Expansive Study Areas for the availability of key construction materials (aggregates, asphalt, concrete and steel) are national (United Kingdom (UK) or Great Britain (GB) and the Yorkshire and the Humber region (dependent upon baseline information availability).

Scope of Assessment

20.3.16. The assessment of waste and materials 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 license, 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 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.

20.3.17. The following matters (summarised in **Table 20.4**) are not considered in the assessment of materials and waste:

- Waste arising from extraction, processing and manufacture of construction components and products are scoped out of the assessment as agreed by the Planning Inspectorate. 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 UK or the world and therefore outside of the geographical scope of this study.

Such matters cannot be accurately predicted and assessed in this ES as they relate to procurement decisions that cannot be assured.

- 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 scoped out of the assessment as agreed by the Planning Inspectorate, as they are addressed separately in other relevant chapters of this ES (e.g., **ES Volume I Chapter 10**: Traffic and Transport (**Application Document Ref 6.2**).
- Quantified effects associated with decommissioning as 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. A qualitative assessment is included in this chapter of the ES. As noted within paragraph 20.6.11, a DEMP would consider in detail all potential environmental risks on the Proposed Development Site, and contain guidance on how risks can be removed or mitigated;
- Changes to safeguarded mineral and waste sites as agreed by the Planning Inspectorate, as there are no such sites within the Proposed Development Site; and
- Changes in availability of maintenance materials during the operation of the Proposed Development as agreed by the Planning Inspectorate. Forecast materials effects are (using professional judgement) considered negligible in relation to the scale and nature of the Proposed Development.

Table 20.4: Scope of the Materials and Waste Assessment

Proposed Development Phase	Potential Effects	Scope 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
	Changes to allocated/safeguarded mineral site	Scoped out
	Changes to allocated/safeguarded waste site	Scoped out
Construction	Changes in availability of construction materials	Scoped in
	Changes in available landfill void capacity	Scoped in
Operation	Changes in availability of maintenance materials	Scoped out
	Changes in available landfill void capacity	Scoped in
	Changes in available waste management facility capacity (liquid waste only)	Scoped in
Decommissioning	Changes in availability of decommissioning materials	Scoped in (qualitative assessment only)
	Changes in available landfill capacity	Scoped in (qualitative assessment only)

Sensitive Receptors

20.3.18. The sensitive receptors for the assessment of the construction phase material and waste impacts are:

- Landfill void capacity in the Expansive Study Area of the Yorkshire and the Humber region (non-hazardous and inert landfill void capacity), and England (hazardous landfill void capacity) – as defined in the IEMA Guidance (IEMA, 2020): '*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*'; and
- Materials, national and regional availability of key construction materials – as outlined in the IEMA Guidance (IEMA, 2020): 'Materials are, in their own right, sensitive receptors. 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'.

20.3.19. The sensitive receptors for the assessment of operational phase material and waste impacts are:

- Landfill void capacity in the Expansive Study Area of the Yorkshire and the Humber region (non-hazardous and inert landfill void capacity), and England (hazardous landfill void capacity).
- The IEMA Guidance (IEMA, 2020) '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'. 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 in this assessment.

Methodology for Determining Construction Effects

20.3.20. 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.

20.3.21. Waste will be generated during construction of the Proposed Development. A large proportion of this waste will be recycled, with the remainder disposed off-site by a licensed waste contractor.

Materials

20.3.22. Effects upon materials during construction of the Proposed Development is assessed by:

- establishing the baseline for national and regional availability (inferred from consumption, sales and requirement) 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 and regional availability (utilising a percentage approach).

Waste

20.3.23. Effects upon waste during construction of the Proposed Development is 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

20.3.24. As described in **ES Volume I Chapter 4**: The Proposed Development (**Application Document Ref. 6.2**), operational waste will predominantly comprise process waste, which will be managed in accordance with the relevant environmental regulations using licensed waste contractors. The estimated volumes and waste management methods for these operational wastes are considered in this assessment.

20.3.25. Effects upon waste during operation of the Proposed Development is assessed by:

- 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 (using a percentage approach); and
- considering the operational hazardous waste arising from the operation of the Proposed Development in the context of national hazardous waste management facility waste inputs.

Methodology for Determining Decommissioning Effects

20.3.26. Whilst it is not possible to provide a quantitative assessment of decommissioning effects as 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, an estimate of materials and waste produced by the Proposed Development in the decommissioning phase and a qualitative assessment has been provided using information on the approach to the design of the Proposed Development (i.e. to use recyclable materials wherever possible).

Significance Criteria

Sensitivity

20.3.27. The sensitivity of materials relates to the availability of construction materials to be consumed by the Proposed Development. The IEMA Guidance (IEMA, 2020) criteria described within **Table 20.5** is used to determine the sensitivity of materials.

Table 20.5: Materials Receptor Sensitivity

Effects	Criteria for Materials Receptor Sensitivity
Negligible	On balance, 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. *And/or* are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials. *
Low	On balance, 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. *And/or* are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	On balance, 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. *And/or* are available comprising some sustainable features and benefits compared to industry-standard materials.
High	On balance, 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. *And/or* comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	On balance, the key materials required for the construction of the Proposed Development are forecast are known to be insufficient in terms of production, supply and/or stock. *And/or* 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

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

20.3.28. The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development. As outlined in the IEMA Guidance (IEMA, 2020) "*landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste*". 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.

20.3.29. The criteria described within **Table 20.6** and **Table 20.7** is used to determine the sensitivity of landfill capacity.

Table 20.6: Inert and Non-Hazardous Landfill Capacity Sensitivity

	Criteria for Inert and Non-Hazardous Landfill Capacity Sensitivity
Negligible	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce minimally by <1% as a result of wastes forecast.
Medium	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce noticeably by 1-5% as a result of wastes forecast.
High	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed

	Criteria for Inert and Non-Hazardous Landfill Capacity Sensitivity
	Development) of regional inert and non-hazardous landfill capacity is expected to reduce considerably by 6-10% as a result of wastes forecast.
Very High	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is: • expected to reduce very considerably (by >10%); • end during construction or operation; • is already known to be unavailable; or • would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 20.7: Hazardous Landfill Capacity Sensitivity

	Criteria for Hazardous Landfill Capacity Sensitivity
Negligible	Across the construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	Across the construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce minimally by <0.1% as a result of wastes forecast.
Medium	Across the construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national)

	Criteria for Hazardous Landfill Capacity Sensitivity
	hazardous landfill capacity is expected to reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Across the construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce considerably by 0.5-1% as a result of wastes forecast.
Very High	Across the construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is: • expected to reduce very considerably (by >1%); • end during construction or operation: • is already known to be unavailable; or, • would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude of Impact

20.3.30. The criteria used to assess the magnitude of impact for materials are provided in **Table 20.8**.

Table 20.8: Materials Magnitude of Impacts

	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.

20.3.31. The criteria used to assess the magnitude of impact for inert and non-hazardous waste and hazardous waste are provided within **Table 20.9** and **Table 20.10** respectively.

Table 20.9: Inert and Non-hazardous Waste - Magnitude of Impact

	Criteria for Inert and Non-Hazardous Waste Magnitude of Impact
No change	Zero waste generation and disposal from the development.
Negligible	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <1%.
Minor	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by 1-5%.
Moderate	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by 6-10%.
Major	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by >10%.
# Forecast as the worst-case scenario, during a defined construction and/or operational phase.	

Table 20.10: Hazardous Waste - Magnitude of Impact

	Criteria for Hazardous Waste Magnitude of Impact
No change	Zero waste generation and disposal from the development.

Negligible	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <0.1%.
Minor	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <0.1-0.5%.
Moderate	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <0.5-1%.
Major	Waste generated by the 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.

Significance of Effects

20.3.32. **Table 20.11** describes the effect thresholds used in determining the significance of potential effects, whilst **Table 20.12** indicates which effects are deemed to be significant. Materials and waste are assessed using a subject specific IEMA Guidance (IEMA, 2020) and does not use the thresholds outlined in **ES Volume I Chapter 2:** Assessment Methodology (**Application Document Ref. 6.2**).

Table 20.11: Effect Thresholds

		Magnitude of Impact				
		No Change	**Negligible**	**Minor**	**Moderate**	**Major**
Sensitivity of Receptor	**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 20.12: Significance of Effects

Effect	Materials	Waste
Neutral	Not Significant	Not Significant
Slight		
Moderate	Significant	Significant
Large		
Very large		

Data Sources

20.3.33. The following sources of information have been reviewed and have informed the materials and waste assessment:

- EA's 2023 Waste Summary Tables for England - Version 1 (EA, 2024a) including remaining land capacity;
- EA's 2023 Waste Data Interrogator – Wastes Received (Excel) – Version 1 (EA, 2024b);
- EA's Permitted Waste Sites - Authorised Landfill Site Boundaries (EA, 2024c);
- EA's Historic Landfill Sites (EA, 2024d);
- EA's Environmental Permitting Regulations - Waste Sites and waste site applications (EA, 2024e);
- UK Steel's Key Statistics Guide May 2023 data (UK Steel, 2024);
- Mineral Products Association (MPA's) Minerals and mineral products sales in Great Britain, 2021 data (MPA, 2023); and
- Relevant legislation and national and local policy e.g. policies maps, as per Section 20.2.

20.4. Use of Rochdale Envelope

20.4.1. As set out in **ES Volume I Chapter 4:** The Proposed Development (**Application Document Ref 6.2**), there are areas for which there is currently variability in the design that could affect the assessment. The Rochdale Envelope defined for building sizes and limits of deviation for building locations set out in **ES Volume I Chapter 4:** The Proposed Development (**Application Document Ref 6.2**) does not affect this assessment as it has been assumed that the buildings and structures are to the maximum extent specified in the Rochdale Envelope.

20.4.2. A focused use of the Rochdale Envelope has been adopted for the following aspects:

- it is assumed for the purpose of the assessment that all construction and operational 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.

20.5. Baseline Conditions

20.5.1. A baseline has been developed in accordance with IEMA Guidance (IEMA, 2020) and consists of:

- National (UK or GB) and regional data for key construction materials (steel, aggregates, asphalt and concrete);
- Landfill void capacity in Yorkshire and the Humber (non-hazardous and inert landfill void capacity), and England (hazardous landfill void capacity); and
- Waste received at relevant hazardous waste management facilities nationally.

Existing Baseline

National and Regional Availability of Key Construction Materials

20.5.2. **Table 20.13** summarises national consumption and sales in 2023 for steel, and 2021 aggregates, asphalt and concrete (the most recent years for

which data is available), which are the key construction materials expected to be used during Proposed Development construction.

Table 20.13: National Consumption and Sales for Key Construction Materials

Material	National Consumption (Million Tonnes, Year)	Baseline Data Year	Data Description
Steel	15	2023	UK requirement (UK Steel, 2024).
Aggregates of which:	279.8	2021	Minerals and mineral products sales in Great Britain (MPA, 2023).
• Crushed rock	148.2		
• Sand and gravel - land won	47.7		
• Sand and gravel - marine	14.3		
• Recycled and secondary	69.6		
Cementitious of which:	11.2		
• Cement	9.0		
• Other cementitious materials (Fly ash, Ground Granulated Blast-furnace Slag (GGBS))	2.1		

Material	National Consumption (Million Tonnes, Year)	Baseline Data Year	Data Description
Asphalt	28.3		
Concrete of which:	77.5		
• Ready-mixed concrete	52.7		
• Concrete products	24.8		

20.5.3. Construction material sales by region are provided for the regions surrounding the Proposed Development (**Table 20.14**). It is assumed that the majority of key construction materials (aggregates, asphalt and concrete) will be sourced locally (e.g. within the region), taking into account the proximity principle. Other materials may be sourced from the rest of the UK or imported into the UK.

Table 20.14: Construction Material Sales by Region (MPA, 2023)

Construction Material	Yorkshire and the Humber
Crushed rock (million tonnes)	9.2
Sand and gravel (million tonnes)	2.1
Ready-mixed concrete (converted to million tonnes from m^3 using a density of 2.4 t/m^3)	2.6
Asphalt (million tonnes)	1.9

20.5.4. Potential recycled contents for the main construction materials are outlined in **Table 20.15**. These 'good practice' rates are derived from WRAP's Designing Out Waste Tool for Civil Engineering (WRAP, undated c).

Table 20.15: Potential Recycled Content (Percentage by Weight) (WRAP, undated c)

Material Type	Potential Recycled Content (% by weight)
Concrete	16
Asphalt	25
Aggregates	50
Steel reinforcement	100
Structural steel	60

Landfill Capacity

20.5.5. The EA's Waste Management Information includes information about waste sent to landfills and remaining landfill capacity. Remaining landfill capacities at the end of 2021 as outlined on the EA's 2023 Waste Summary Tables for England – Version 1 (EA, 2024a) for the non-hazardous and inert waste Expansive Study Area (Yorkshire and the Humber) and the hazardous waste Expansive Study Area (England) are shown in **Table 20.16**.

20.5.6. Merchant landfills are operated for commercial purposes accepting waste from construction projects and operating businesses. Merchant landfills are therefore considered to form the baseline. In contrast, restricted landfills are sites that deal with their own produced waste (i.e. not operating for commercial purposes). Therefore, additional capacity is excluded from the baseline. Some non-hazardous landfills have a Stable Non-Reactive Hazardous Waste (SNRHW) cell (e.g. for asbestos). SNRHW cells usually form only a small fraction of the overall capacity.

Therefore, for assessment purposes non-hazardous landfills with SNRHW cells are considered in the same way as non-hazardous landfills.

Table 20.16: Landfill Capacity (end of 2023) in the Yorkshire and Humber Region and England

Waste Type	Yorkshire and the Humber Landfill Capacity ('000s m^3)	England
Hazardous merchant	466	9,912
Non-hazardous with SNRHW cell	1,243	45,270
Non-hazardous	40,813	148,062
Inert	24,866	122,249

Waste Management Infrastructure

20.5.7. There are no Permitted Waste Sites or waste sites applications within the Proposed Development Site as shown in the EA's Environmental Permitting Regulations – Waste Sites (EA, 2024e).

20.5.8. Capacity data for other types of waste infrastructure is publicly available (e.g., Environmental Permitting Regulations - Waste Sites (EA, 2024e). However, the permitted capacity is not necessarily representative of the actual operational capacity of the infrastructure. Therefore, inputs data are collated from the EA's Waste Data Interrogator for 2023 – Waste Received (Excel) – Version 1 (EA, 2024b) and presented in **Table 20.17** for the Yorkshire and the Humber region. Inputs are not totalled since the double counting of waste moving between the site types listed in the Waste Data Interrogator cannot be discounted.

Table 20.17: Summary of Waste Inputs by Facility for the Yorkshire and the Humber region 2023

Facility Type	Yorkshire and the Humber (Tonnes Received)
Landfill	2,869,844
Metal Recycling Site	1,668,279

Facility Type	Yorkshire and the Humber (Tonnes Received)
On/in land	1,053,191
Transfer	5,116,792
Treatment	14,109,019
Combustion	412,063
Incineration	3,552,552
Storage	205,678
Processing	261,891

Future Baseline

20.5.9. There is no publicly available information on any potential changes to national or regional material availability by the time of the construction of the Proposed Development. Construction material demand such as ready mixed 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 20.13**.

20.5.10. Regional data is presented in **Table 20.14**. Construction material sales by region are provided for the regions surrounding the Proposed Development. It is assumed that the majority of key construction materials (aggregates, asphalt and concrete) will be sourced locally (e.g. within the region), taking into account the proximity principle. Other materials may be sourced from the rest of the UK or imported into the UK.

20.5.11. There is no publicly available information regarding any potential changes to landfill capacity by the time of Proposed Development construction.

20.5.12. Due to the cyclic nature of inert and hazardous landfill capacity (e.g., landfill capacity decreasing, and then new sites or landfill cells being opened with landfill capacity increasing), it is not realistic to forecast future landfill capacity. Therefore, inert and hazardous landfill capacity is

assumed to remain the same as the current baseline as outlined in **Table 20.16.**

20.5.13. For non-hazardous waste, using the current rate of 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 WPA will need to consent new landfill capacity to replace that which has been used up. Therefore, non-hazardous landfill capacity is assumed to remain the same as the current baseline as outlined in **Table 20.16**.

Receptor Sensitivity

Material Receptor Sensitivity

20.5.14. 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).

20.5.15. Potential recycled content for the main construction materials is outlined in **Table 20.15**.

Waste Receptor Sensitivity

20.5.16. 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 is considered (e.g. a very considerable reduction in capacity cannot be discounted).

20.6. Development Design and Impact Avoidance

20.6.1. The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures'). Some embedded measures are required as a result of legislative requirements and/or standard sectoral practices. Some of these embedded mitigation

measures as applicable to the material and waste assessment are described below.

20.6.2. Embedded measures are taken into account prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic (i.e. effects do not take account of measures even though they are likely to be standard practice and/or form part of the design of the Proposed Development). These have then been followed through the assessment to ensure that realistic likely environmental effects are identified.

Construction

20.6.3. The Proposed Development will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy as illustrated in **Plate 20.1**.

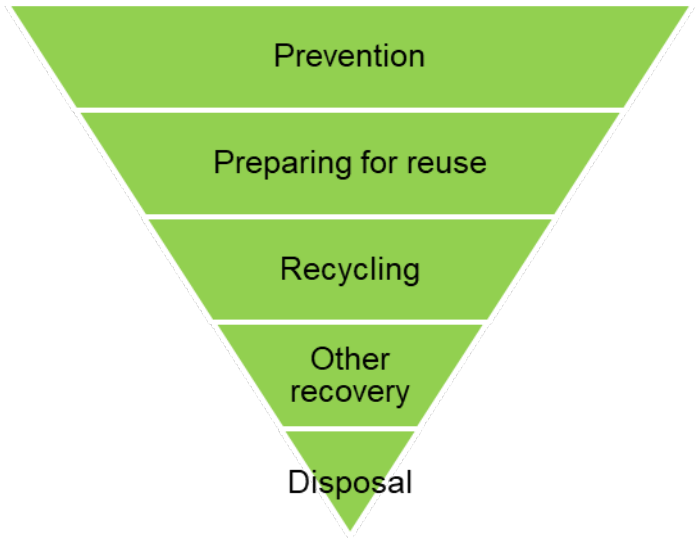

Plate 20.1 The Waste Hierarchy, from Defra's Guidance on Applying the Waste Hierarchy, recreated by AECOM (Defra, 2011

20.6.4. The following mitigation measures will be implemented where practicable during the design and construction of the Proposed Development:

- 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;
- 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 demountability of elements can be maximised at end of first life;
- design for waste and material asset efficient procurement;
- identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard;
- 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; and
- segregation of waste at source where practical.

20.6.5. An **Outline CEMP (Application Document Ref. 7.4**) has been prepared to accompany the DCO Application; this plan sets out the key measures to be employed during the Proposed Development's construction phase to control and minimise the impacts on the environment. The **Outline CEMP** (**Application Document Ref. 7.4**) includes an Outline Site Waste Management Plan (OSWMP) in Appendix A which sets out how waste would be managed during construction, and opportunities to prevent material waste and reuse materials and recycle waste would be explored in accordance with the waste hierarchy.

20.6.6. A final CEMP and detailed SWMP would be prepared by the construction contractor in accordance with the **Outline CEMP** (**Application Document Ref. 7.4**), prior to construction. The submission, approval, and implementation of the final CEMP will be secured by a Requirement of the **Draft DCO** (**Application Document Ref. 3.1**).

20.6.7. To manage and monitor waste generated within the Proposed Development Site during the construction of the Proposed Development, the OSWMP (Appendix A of the **Outline CEMP**, **Application Document Ref. 7.4**) provides the foundations for waste streams to be estimated and monitored. The OSWMP (Appendix A of the **Outline CEMP**, **Application Document Ref. 7.4**) requires 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 Proposed Development

Site would be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

Operation

20.6.8. The Proposed Development will require an environmental permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016 (HM Government, 2016). The permit will include procedures for the management of materials and waste in accordance with relevant legislation.

20.6.9. The Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001 (ISO, 2015). The EMS will outline requirements and procedures required to ensure that the Site is operating to the appropriate standard.

Decommissioning

20.6.10. The design of the Proposed Development will seek to use recyclable materials wherever possible to aid recycling of materials during the decommissioning and demolition phase. It is expected that the bulk of the relevant plant and equipment will have some limited residual value as scrap or recyclable materials, and the demolition contractor will be encouraged to use demolition working practices that enable effective recycling of the construction materials used.

20.6.11. Section 4.6 of **ES Volume I Chapter 4**: Proposed Development (**Application Document Ref. 6.2**) confirms that a DEMP would be prepared prior to decommissioning commencing by the decommissioning contractor. This plan will consider potential environmental risks associated with the decommissioning of the Proposed Development and would contain guidance on how risks can be removed or mitigated. The submission, approval, and implementation of a DEMP prior to demolition is secured by a Requirement of the **Draft DCO** (**Application Document Ref 3.1**).

20.6.12. Availability of materials and landfill capacity will be considered over the lifetime of the Proposed Development, including decommissioning.

20.7. Likely Impacts and Effects

20.7.1. This section identifies the likely impacts and effects resulting from the Proposed Development as described in **ES Volume I Chapter 4**: The Proposed Development (**Application Document Ref 6.2**). The magnitude

of impacts is defined with reference to relevant baseline conditions, and effects determined in accordance with the identified methodology.

20.7.2. The prediction of impacts and the assessment of effects (and their significance) in relation to materials and waste associated with the Proposed Development takes into account the effectiveness of the mitigation measures as summarised in Section 20.6.

Construction

20.7.3. **Table 20.18** 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 20.18: Construction Material Use and Waste Types Arising from the Construction of the Proposed Development

Construction Activity	Materials Used	Waste Types Generated
Site preparation/ earthworks	• Fill material for construction purposes; • primary/secondary / recycled aggregates for ground stabilisation; and • topsoil and subsoil for landscaping and restoration.	• Surplus excavated materials; • surplus topsoil and subsoil; • unsuitable and contaminated soils and excavated materials; • vegetation from site clearance; • clearance of other materials; and • construction worker wastes from offices and welfare areas/canteens.
Demolition	• Materials are not required for demolition works.	• Waste arisings from the required demolition of existing buildings and assets.

Construction Activity	Materials Used	Waste Types Generated
Site construction	• Aggregates; • asphalt and bituminous materials; • in-situ cast concrete; • precast concrete products (structural components, kerbs, drainage pipes, chambers and channels); • structural steel; and • cabling.	• Excess, offcuts and broken/damaged construction materials; • existing infrastructure removed during works; • 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

20.7.4. The estimated main types and quantities of materials to be used during Proposed Development construction are presented in **Table 20.19** and **Table 20.20** below.

20.7.5. The following data is sourced from the National Highways Carbon Emissions Calculation Tool (National Highways, 2022):

- data on the bulk density of materials has been used to convert quantities between volume (m^3) and weight (tonnes) where required.

Table 20.19: Estimated Construction Material and Percentage of National Availability for the Proposed Development

Material Type	Material Density (t/m^3)	Quantity (m^3)	Quantity (tonnes)	National Material Availability (tonnes)	% of National Material Availability	Sensitivity	Magnitude	Effect	Significance
Concrete	2.4	18,055	43,332	77,500,000	0.06	Low	Negligible	Neutral or Slight, slight selected as a worst case.	Not Significant
Aggregates	2.0	224,400	448,800	279,800,000	0.002	Low	Negligible	Neutral or Slight	Not Significant
Steel	8.0	335	2,682	15,000,000	0.00018	Low	Negligible	Neutral or Slight	Not Significant
Asphalt	2.3	10,800	24,840	28,300,000	0.001	Low	Negligible	Neutral or Slight	Not Significant

Table 20.20: Estimated Construction Material and Percentage of Regional Availability (Yorkshire and the Humber) for the Proposed Development

Material Type	Material Density (t/m^3)	Quantity (m^3)	Quantity (tonnes)	Regional Material Availability (tonnes)	% of Regional Material Availability	Sensitivity	Magnitude	Effect	Significance
Concrete	2.4	18,055	43,332	2,640,000	1.64	Low	Minor	Neutral or Slight,, slight selected as a worst case.	Not Significant
Aggregates	2.0	224,400	448,800	11,300,000	3.97	Low	Minor	Neutral or Slight	Not Significant
Steel	8.0	335	2,682	No regional data	-	-	-	-	-
Asphalt	2.3	10,800	24,840	1,900,000	1.31	Low	Minor	Neutral or Slight	Not Significant

20.7.6. For the construction of the Proposed Development, no individual construction material is equal to or greater than 1% by weight of the UK/GB baseline availability (**Table 20.19**). The sensitivity of the receptor is classified as 'low' (as per **Table 20.5**) whilst the magnitude of impact is considered to be 'negligible' (as per **Table 20.8**), resulting in a Neutral/Slight Adverse (Not Significant) effect.

20.7.7. Individual construction materials expected to be used for the construction of the Proposed Development are between 1-5% by weight of the regional baseline availability (**Table 20.20**). The sensitivity of the receptor is classified as 'low' (as per **Table 20.5**) for all outlined materials, whilst the magnitude of impact is considered to be 'minor' (as per **Table 20.8**); this results in a Slight Adverse (Not Significant) effect.

Construction Phase Waste

Demolition

20.7.8. As outlined in **ES Volume I Chapter 5:** Construction Programme and Management (**Application Document Ref 6.2**), the demolition of the existing tank farm will take place prior to the Proposed Development's construction.

20.7.9. The estimated quantities of waste arising from the demolition of the tank farm are approximately 759 m^3 from buildings/ancillary equipment (i.e., tanks, pipes and piping, electrical unit building, and heat exchangers), 1,236 m^3 from bund and hardstanding waste, and 216 m^3 from asphalt waste with a total of 2,211 m^3.

20.7.10. Based on information about the operational use of the tank farm and the materials used in construction of this area, it is assumed that the majority of demolition waste would be non-hazardous and would be recycled off-site.

Excavated Material

20.7.11. At this stage the estimated quantity of excavated material generated during the Proposed Development's construction is 83,295 m^3.

20.7.12. It is anticipated that the majority of excavated materials would be non-hazardous (78,795 m^3), with this material being assumed to be sent to landfill as a worst-case scenario. The remaining excavated material (4,500 m^3) is expected to be generated from the on-site demolition of the tank farm. This material is anticipated to be hazardous since the areas surrounding the tank farm are expected to contain heavy fuel oils.

Hazardous excavated material is assumed to be sent to landfill as a worst-case scenario for the materials and waste assessment.

20.7.13. The Proposed Development 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 current design is expected to generate excavated material that may require off-site treatment or disposal.

Construction Waste

20.7.14. The estimated main types and quantities of waste to be generated during the Proposed Development's construction are:

- 4,274 m^3 of non-hazardous inert material (e.g. concrete, asphalt and aggregates), source separated recyclables (paper & card, plastic, metals and wood) and mixed construction waste;
- 37 m^3 of hazardous construction waste (e.g. surplus paint/coatings, batteries and oil filters); and
- 4,659 m^3 of non-hazardous municipal waste, source-separated recyclables (e.g. paper, card, plastics) and mixed municipal waste.

Total Construction Waste

20.7.15. A summary of construction waste associated with the Proposed Development is set out in **Table 20.21**.

Table 20.21: Construction Waste Summary

Construction Activity and Waste Type	Waste (m^3)
Demolition associated with the Proposed Development	*Hazardous waste* Minimal, it is assumed that the majority of demolition waste will be non-hazardous.
	Non-hazardous waste 2,211 m^3 consisting of waste from buildings/ancillary equipment, bund and hard standings waste, and asphalt.
Excavation associated with the Proposed Development	*Hazardous waste* A proportion of potentially contaminated material

Construction Activity and Waste Type	Waste (m^3)
	assumed to be hazardous with off-site disposal (currently assumed as 4,500 m^3, the volume estimates will be refined following further site investigation). *Non-hazardous waste* 78,795 m^3 of surplus excavated material (where possible the material will be reused on-site).
Construction of the Proposed Development	*Hazardous waste* 37 m^3
	Non-hazardous waste 4,659 m^3
	Inert waste 4,274 m^3
Total	**Hazardous waste** 4,537 m^3
	Non-hazardous waste 85,665 m^3
	Inert waste 4,274 m^3

20.7.16. Total non-hazardous and inert construction waste from the Proposed Development is estimated at 85,665 m^3 (including 2,211 m^3 of surplus excavated material) and 4,274 m^3 respectively (**Table 20.21**). A worst-case scenario where all waste is disposed of to landfill has been applied. This volume equates to 0.2% of the 42.1 million m^3 of non-hazardous landfill capacity and 0.017 % of the 24.8 million m^3 of inert landfill capacity

within the waste management Expansive Study Area (Yorkshire and the Humber region).

20.7.17. In practice, a large proportion of non-hazardous and inert 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.

20.7.18. Based on the above, construction of the Proposed Development is estimated to result in less than a 1% reduction of landfill capacity within the non-hazardous waste management Expansive Study Area. Accordingly, for non-hazardous and inert waste, the sensitivity of the receptor is classified as 'very high' (as per **Table 20.6**) whilst the magnitude of impact is considered to be 'negligible' (as per **Table 20.8**), resulting in a Slight Adverse (Not Significant) effect.

20.7.19. Total hazardous waste from the Proposed Development is estimated at 4,537 m^3 (**Table 20.21**). In a worst-case scenario where all hazardous waste is sent to landfill within one calendar year this would be 0.05 % of the hazardous waste landfill capacity in England (9.7 million m^3). The threshold for a significant effect (based on a 'very high' sensitivity) is 0.1% of the hazardous waste landfill capacity in England.

20.7.20. For hazardous waste, the sensitivity of receptor is classified as 'very high' (as outlined in **Table 20.7**) whilst the magnitude of impact is considered to be 'negligible' (as per **Table 20.10**), resulting in a Slight Adverse (Not Significant) effect.

20.7.21. 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 to landfill.

Operation

20.7.22. Operational waste from the Proposed Development will comprise waste from site offices and waste from the power station processes. The main waste types and quantities of waste associated with the operation of the Proposed Development are currently estimated to be 1,100 tonnes per year for non-hazardous wastes (municipal and industrial waste) and 70 tonnes per year for hazardous waste (including washing effluent and cleaning and passivation effluent).

20.7.23. In the event that inert and non-hazardous wastes from the Proposed Development are disposed of to landfill, the annual quantity is likely to result in a reduction of <1% (669,220 m^3) of regional inert and non-hazardous waste landfill void capacity. Accordingly, for inert and non-

hazardous waste, the sensitivity of the receptor is classified as 'very high' (as per **Table 20.6**) whilst the magnitude of impact is considered to be 'negligible' (as per **Table 20.9**), resulting in a Slight Adverse (Not Significant) effect.

20.7.24. IEMA Guidance (IEMA, 2020) recommends assessing impacts of hazardous waste with reference to the available landfill capacity nationally. In the event that hazardous wastes from the Proposed Development are disposed of to landfill, the annual quantity is likely to result in a reduction of <0.1% (9,680 m^3) of national hazardous waste landfill void capacity. Accordingly, for hazardous waste, the sensitivity of the receptor is classified as 'very high' (as per **Table 20.7**) whilst the magnitude of impact is considered to be 'negligible' (as per **Table 20.10**), resulting in a Slight Adverse (Not Significant) effect.

20.7.25. Since some of the operational hazardous wastes likely to be generated by the Proposed Development will not be suitable for landfill disposal (e.g., liquid waste), hazardous operational waste has been considered in the context of national hazardous waste management facility capacity in this assessment. In the event that wastes are sent to a hazardous waste management facility, the annual quantity is likely to be small in the context of national capacity.

Decommissioning

20.7.26. Quantified effects associated with decommissioning are scoped out as the Proposed Development has a long design life and such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future. Therefore, a qualitative assessment is included below.

20.7.27. There is no publicly available information regarding any potential changes to landfill capacity by the time of the Proposed Development's decommissioning however it is assumed capacity would be reduced by the time of decommissioning.

20.7.28. At the end of its operating life, it is anticipated that all above-ground equipment associated with the parts of the Proposed Development will be decommissioned and removed from the Site. Prior to removing the relevant plant and equipment, all residues and operating chemicals will be cleaned out from the plant and disposed of in an appropriate manner.

20.7.29. As noted in Section 20.6, the design of the Proposed Development will seek to use recyclable materials wherever possible to aid recycling of materials during the decommissioning and demolition phase. The

demolition contractor will be encouraged to use demolition working practices that enable effective recycling of the construction materials used.

20.7.30. Since the majority of waste generated during decommissioning is likely to be recyclable, the quantities of waste from decommissioning of the Proposed Development disposed of to landfill are anticipated to be small in the context of national and regional landfill capacity. Accordingly, the sensitivity of the receptor is classified as 'very high' (as per **Table 20.6**) whilst the magnitude of impact is considered to be 'negligible' (as per **Table 20.8**), resulting in a Slight Adverse (Not Significant) effect.

20.8. Mitigation, Monitoring and Enhancement Measures

20.8.1. As no significant adverse effects have been identified for construction or operation of the Proposed Development, no additional mitigation and monitoring is proposed.

20.9. Limitations and Difficulties

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

20.9.2. It is not possible to reliably forecast the future availability of construction materials; therefore, data for UK/GB and the Yorkshire and the Humber region has been used to establish a quantitative baseline of the consumption of key construction materials which is used as a proxy for availability.

20.9.3. It is assumed that all waste is sent to landfill. This ensures that a robust, worst-case assessment of the waste impacts of the Proposed Development is provided.

20.9.4. It is not possible to reliably forecast any potential changes to landfill void capacity by the time of the Proposed Development's construction and operation. Therefore, landfill void capacity is assumed to remain the same as the current baseline.

20.9.5. Since the Proposed Development would be constructed over several years, total construction materials and construction waste quantities have been divided equally across the number of years of construction.

20.9.6. It is assumed that key construction materials (aggregates, asphalt, and concrete) would be sourced locally (e.g. within the Yorkshire and the Humber region), taking into account the proximity principle. Other

materials may be sourced (e.g. steel) from the rest of the UK or imported into the UK.

20.9.7. Data on the bulk density of materials has been used to convert quantities between volume (m^3) and weight (tonnes) where required.

20.10. Summary of Likely Significant Residual Effects

20.10.1. No significant adverse residual material and waste effects resulting from the Proposed Development's construction, operation or decommissioning have been identified.

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