Immingham Green Energy Terminal

TR030008

Volume 6

6.2 Environmental Statement

Chapter 20: Materials and Waste

Planning Act 2008

Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

September 2023

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

Immingham Green Energy Terminal

Development Consent Order 2023

6.2 Environmental Statement

Chapter 20: Materials and Waste

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20.1 Introduction

20.1.1 This chapter presents the findings of the assessment of the likely significant effects of the Project on materials and waste.

20.1.2 This chapter presents details of the baseline for material and waste relevant to the Project and sets out the study area. In addition, the chapter provides an overview of the assessment methodology being followed for the environmental assessment and applies that methodology, so as to identify the likely significant effects taking account of any standard and embedded mitigation, then considering additional mitigation to establish the residual effects of the Project.

20.1.3 This assessment follows the methodology as set out in the Institute of Environmental Management and Assessment's ("IEMA") guide to: "Materials and Waste in Environment Assessment, Guidance for a Proportionate Approach" (referred to herein as the "IEMA Guidance") (Ref 20-1).

20.1.4 For the purpose of this chapter of the Environmental Statement ("ES"), reference to materials and waste relates to:

a. The consumption of materials (key construction materials only namely steel, aggregates, asphalt and concrete; operational materials are excluded).

b. The generation and management of waste (excluding dredged materials which are not anticipated to be brought onshore).

20.1.5 Materials are defined in the IEMA Guidance as "physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel". Operational materials are scoped out of the assessment.

20.1.6 Other material assets considered include landfill void capacity and safeguarded mineral and waste sites. The Project Site is not in the vicinity of any safeguarded mineral sites and as such they are scoped out of this assessment.

20.1.7 Waste is defined as per the Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste and Repealing Certain Directives ("Waste FD") (Ref 20-2) as "any substance or object which the holder discards or intends or is required to discard".

20.1.8 There are some interrelationships between potential effects on materials and waste and other disciplines. Therefore, reference should also be made to **Chapter 21: Ground Conditions and Land Quality [TR030008/APP/6.2]** for information on potential contaminated land that could give rise to waste requiring offsite waste management.

20.2 Consultation and Engagement

20.2.1 A scoping exercise was undertaken in August 2022 to establish the form and nature of the materials and waste assessment, and the approach and methods to be followed. The Scoping Report (**Appendix 1.A [TR030008/APP/6.4]**) records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria being applied in the assessment to identify and evaluate the likely significant effects of the Project on materials and waste. A Scoping Opinion was adopted by the Secretary of State on 10 October 2022 **[TR030008/APP/6.4]**. Matters scoped out of this assessment are outlined in **Paragraph 20.4.3**.

20.2.2 The first Statutory Consultation took place between 9 January and 20 February 2023 in accordance with the Planning Act 2008. Associated British Ports ("The Applicant") prepared a Preliminary Environmental Information Report ("PEI Report"), which was publicised at the consultation stage.

20.2.3 Through consideration of the responses to the first Statutory Consultation, the developing environmental assessments and through ongoing design-development and assessment, a series of changes within the Project were identified. A second Statutory Consultation took place between 24 May 2023 and 20 July 2023 in accordance with the Planning Act 2008 and a PEI Report Addendum was publicised to support the second Statutory Consultation.

20.2.4 The consultation undertaken with statutory consultees to inform this chapter, including a summary of comments raised via the formal scoping opinion (**Appendix 1.A [TR030008/APP/6.4]**) and in response to the formal Statutory Consultations and other pre-application engagement is summarised in **Table 20-1**. The full responses to consultation comments are included within the Summary of Consultation Responses document **[TR030008/APP/5.1]**.

Table 20-1: Consultation Summary Table

Reference/Date	Consultee	Summary of Response	How comments have been addressed in this chapter
Scoping Report August 2022	Planning Inspectorate	The Scoping Report assumes that waste arising from the extraction, processing and manufacture of construction components and products that would be used during the Project are being produced in manufacturing facilities with their own waste management plans, facilities, and supply chain (outside of the geographical scope of the assessment) and therefore seeks to scope this matter out of the assessment. The Inspectorate is content to scope this matter out on this basis.	The comment is noted.
		The Scoping Report states that other impacts associated with the management of waste (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 addressed separately in other relevant chapters of the ES and can therefore be scoped out of this aspect chapter. The Inspectorate agrees that this impact pathway should be considered separately in the other relevant chapters of the ES. The Materials and Waste aspect chapter should however cross reference to where this has been assessed elsewhere.	The comment is noted. This chapter includes cross references to other aspect chapters where appropriate.
		The Scoping Report seeks to scope out this matter as the project site is not in the vicinity of any safeguarded/ allocated mineral sites. The Inspectorate agrees that this matter can be scoped out due to the absence of this type of receptor in the development study area.	The comment is noted.

Reference/Date	Consultee	Summary of Response	How comments have been addressed in this chapter
		The Scoping Report seeks to scope out this matter as the project site is not in the vicinity of any Mineral Safeguarding Areas. The Inspectorate agrees that this matter can be scoped out due to the absence of this type of receptor in the development study area.	The comment is noted.
		The Scoping Report states that dredged materials would not be brought onshore for disposal and the effects associated would be addressed separately in other relevant chapters within the ES (**Chapter 8 Nature Conservation (Marine), Chapter 9 Ornithology, Chapter 11 Marine Transport and Navigation, Chapter 14 Historic Environment (Marine), Chapter 15 Physical Processes, Chapter 16 Marine Water and Sediment Quality**). On the basis that dredging arisals will not be disposed onshore, the Inspectorate considers that this matter is adequately addressed in the other aspect chapters and can therefore be scoped out of the materials and waste chapter.	The comment is noted. It is expected that the dredged materials would be disposed of at licensed sites within the estuary and are not anticipated to be brought onshore . A Waste Hierarchy Assessment ("WHA") which includes a more detailed consideration of the alternative options for the dredge material, is included as part of this ES (see **Appendix 2.A [TR030008/APP/6.4]**) concludes that the dredged material does not contain levels of contamination that would restrict the material being disposed of in the marine environment.
		The Scoping Report considers that any forecast effects (using professional judgement) on the availability of materials during operation would be negligible in relation	The comment is noted.

Reference/Date	Consultee	Summary of Response	How comments have been addressed in this chapter
		to the scale and nature of the development. The Inspectorate agrees given the nature of the development operational materials use can be scoped out of the assessment.	
		The Scoping Report argues that it is not possible to assess waste and material resources effects of decommissioning, since waste infrastructure, technologies and good practices are likely to be substantially different to those currently in place. It states that an outline of the approach to decommissioning will be provided within the ES, which will detail measures envisaged to be implemented to avoid or reduce impacts during the decommissioning of the landside elements. Given the nature and scale of the development the Inspectorate agrees that this matter can be scoped out of the ES, however the ES must provide an estimate of the types of quantities of waste that would arise from decommissioning.	An **Outline Decommissioning Environmental Management Plan** ("DEMP") **[TR030008/APP/6.6]** has been produced and includes an estimate of the types and quantities of waste that would arise from decommissioning of the landside elements. A detailed DEMP will be secured via a Requirement of the Development Consent Order ("DCO"). In a worst-case scenario, where the Project elements would be fully removed, the potential risks during the decommissioning phase would be similar to those encountered during the Project construction phase as stated in **Section** 20.8 of this chapter. The DCO application does not make any provision for the decommissioning of the marine infrastructure;

Reference/Date	Consultee	Summary of Response	How comments have been addressed in this chapter
			however, plant and equipment on the jetty topside would be decommissioned and this is discussed further in **Chapter 2: The Project [TR030008/APP/6.2]**.
Scoping Report August 2022	Environment Agency	We are pleased to see the acknowledgement in paragraph 19.6.2 that any waste producers have a legal duty to manage their wastes in accordance with regulations: wastes produced or imported must be moved with due regard to the legal requirements for registered Waste Carriers under The Waste (England and Wales) Regulations 2011. If wastes are used for any construction, they must be stored at an appropriately permitted or exempt site, in accordance with the Environmental Permitting (England & Wales) Regulations 2016. Any direct transfer and reuse of clean naturally occurring soil materials between sites must be done in accordance with the Definition of Waste: Development Industry Code of Practice. Site drainage must be engineered to prevent pollution to the environment. Any potentially contaminated or contaminating liquids must be held and disposed of appropriately.	The reuse of excavated material would be covered by a Contaminated Land: Applications in Real Environments ("CL:AIRE") Definition of Waste: Development Industry Code of Practice ("DoW CoP") Materials Management Plan ("MMP") developed by the Contractor before the commencement of construction. Details of the requirements for the contractor are set out in an **Outline Construction Environmental Management Plan** ("Outline CEMP") which accompanies the DCO application **[TR030008/APP/6.5]**.

Reference/Date	Consultee	Summary of Response	How comments have been addressed in this chapter
PEI Report January 2023	Polynt Composites	We note that the stated aim for delivery of the IGET Project is to 'minimise waste generation'. Further information as to how waste generation will be minimised during the construction phase. This is particularly important to Polynt as the Order Land will presumably be used for the storage of waste materials waiting removal from site.	As outlined in **Section 20.6**, the Project would aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly waste disposal to landfill as per the waste hierarchy. In addition, an **Outline Site Waste Management Plan** ("OSWMP") forms part of the **Outline CEMP**, which has been prepared and accompanies the DCO application **[TR030008/APP/6.5]**. The OSWMP has been developed to act as a guide to those involved in the construction of the Project on how to manage resources and waste, in accordance with best practice requirements. The Principal Contractor shall use this OSWMP as a framework for producing their own SWMP for use throughout the duration of construction.

Reference/Date	Consultee	Summary of Response	How comments have been addressed in this chapter
PEI Report January 2023	Environment Agency	Paragraphs 2.4.37 to 2.4.42 explain how the design of the project has evolved since the submission of the Scoping Report. The changes made on the landside of the project have resulted in an area of the Immingham Household Waste Centre now being included. This is a permitted waste site (Ref EAWML 73067/EPR/PP3192NP on Queens Road, Immingham, DN40 1QR – Grid Ref: TA20399 14765). We will require the Environmental Statement to explain what provision is being proposed to continue to allow access to, and protect the permitted area, during the construction and operation of the proposed development.	The Immingham Household Waste Centre is not included in the Site Boundary. Access to and operation of the Grimsby Operations Ltd, Household Waste Recycling Centre, Queens Road, Immingham is unaffected by the Project.
Second Statutory Consultation May 2023 – July 2023	Environment Agency	Change 1: Site Boundary Amendments We welcome the site boundary amendment, which now excludes the permitted Household Waste Site on Queens Road and resolves the issues we previously raised in paragraph 1.3 of our response to the original PEIR.	The Immingham Household Waste Centre is not included in the Site Boundary. Access to and operation of the Grimsby Operations Ltd, Household Waste Recycling Centre, Queens Road, Immingham is unaffected by the Project.

20.3 Legislation, Policy and Guidance

20.3.1 **Table 20-2** presents the legislation, policy and guidance relevant to the materials and waste assessment and details how their requirements will be met by the Project.

Table 20-2: Relevant legislation, policy and guidance regarding materials and waste

Legislation/Policy/Guidance	Consideration within this chapter
Waste Framework Directive (2008) (Ref 20-2)	
Establishes the wider regulatory context for waste management across Europe. In addition to defining waste, it also introduces the concept of the waste hierarchy and establishes landfill diversion targets for Member States. The requirements of the Waste Framework Directive are transposed into applicable national law through the *Waste (England and Wales) Regulations 2011* (Ref 20-3) as amended including via The Waste (Miscellaneous Amendments) (EU Exit) Regulations 2019 (Ref 20-4).	The assessment of materials and waste has taken account of the waste hierarchy in the management of waste (**Paragraph 20.7.4**), and of the targets for recovery of non-hazardous construction and demolition ("C&D") waste (**Paragraph 20.6.30**).
The Environmental Protection Act 1990 (Ref 20-5)	
The duty of care for waste management is set out under section 34 of the *Environmental Protection Act 1990* (Ref 20-5) and the *Waste (England and Wales) Regulations 2011 (as amended)* (Ref 20-3). It requires anyone who produces, imports, keeps, stores, transports, treats or disposes of waste to take all reasonable steps to ensure that waste is managed properly.	Details of the duty of care for waste management requirements for the contractor are set out in the OSWMP which forms part of the **Outline CEMP** which accompanies the DCO application **[TR030008/APP/6.5]** and which the contractor's SWMP (to be prepared before the commencement of construction) must be in accordance with.
The Waste (England and Wales) Regulations 2011 (Ref 20-3)	
Transposes the requirements of the Waste Framework Directive in England and Wales and requires the Secretary of State (SoS) to establish waste prevention programmes and waste management plans that apply the waste hierarchy (as defined in the Waste Framework Directive). The waste hierarchy prioritises waste prevention, followed by preparing for reuse, recycling, recovery and finally disposal to the management of waste. The Regulations require businesses to apply the waste hierarchy when managing waste, and also require that measures are taken to ensure that, by the year 2020, at least 70% by weight of non-hazardous C&D waste is subjected to material recovery.	The assessment of materials and waste has taken account of the waste hierarchy (**Paragraph 20.7.4**) in the management of waste, and of the targets for recovery of non-hazardous C&D waste (**Paragraph 20.6.30**).

Legislation/Policy/Guidance	Consideration within this chapter
The Environmental Permitting (England and Wales) Regulations 2016 (Ref 20-6)	
The Regulations require sites where waste is processed, treated or disposed of to hold a valid Environmental Permit issued by the Environment Agency ("EA"). The Regulations also include a schedule of activities that are exempt from the requirements of permitting. However, to comply with the Regulations, an exempt activity must generally be registered with the EA before commencing.	Details of the permits and exemption requirements for the contractor are set out in the OSWMP which forms part of the **Outline CEMP** which accompanies the DCO application (**[TR030008/APP/6.5]**) and which the contractor's SWMP (to be prepared before the commencement of construction) must accord with.
The Hazardous Waste (England and Wales) Regulations 2005 (Ref 20-7)	
The Regulations set out the regime for the control and tracking of the movement of hazardous waste for the purpose of transposing the requirements of the *Hazardous Waste Directive (Directive 91/689/EC)* (Ref 20-8).	Details of the hazardous waste management requirements for the contractor are set out in the OSWMP which forms part of the **Outline CEMP** which accompanies the DCO application (**[TR030008/APP/6.5]**) and which the contractor's SWMP (to be prepared before the commencement of construction) must accord with.
The Environment Act 2021 (Ref 20-9)	
The Act makes provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; for the establishment of the Office for Environmental Protection; about waste and resource efficiency; about air quality; for the recall of products that fail to meet environmental standards; about water; about nature and biodiversity; for conservation covenants; about the regulation of chemicals; and for connected purposes. The Act will deliver: • An extension of producer responsibility to make producers pay for 100% of the cost of disposal of products, starting with plastic packaging. • A Deposit Return Scheme for single use drinks containers. • Charges for single use plastics. • Greater consistency in recycling collections in England. • Electronic waste tracking to monitor waste movements and tackle fly-tipping. • Further tackling of waste crime. • The power to introduce new resource efficiency information (labelling on the recyclability and durability of products).	Key sections including Part 3 Waste and Resource Efficiency (producer responsibility, resource efficiency, managing waste and waste enforcement) which could be relevant to the Project in the *Environment Act 2021* have been considered in **Section 20.7** and in the OSWMP which forms part of the **Outline CEMP** which accompanies the DCO application **[TR030008/APP/6.5] and** which the contractor's SWMP (to be prepared before the commencement of construction) must be in accordance with.

Legislation/Policy/Guidance	Consideration within this chapter
• The regulation of the shipment of hazardous waste. • A ban or export restriction of waste to non-OECD countries.	
National Policy Statement for Ports ("NPSfP") (Ref 20-10)	
Paragraph 5.5.2 of Section 5.5: Waste Management states *"Sustainable waste management is implemented through the 'waste hierarchy':* • *prevention;* • *preparing for re-use;* • *recycling;* • *other recovery, including energy recovery; and* • *disposal.* *Disposal of waste should only be considered where other waste management options are not available or where it is the best overall environmental outcome."*	The assessment of materials and waste has taken account of the waste hierarchy in the management of waste (**Paragraph 20.7.4**).
Paragraph 5.5.3 states *"All large infrastructure projects are likely to generate hazardous and non hazardous waste during the construction, operation and decommissioning phases. The Environment Agency's (EA) Environmental Permitting (EP) regime incorporates operational waste management requirements for certain activities. When an applicant applies to the EA for an Environmental Permit, the EA will require the application to demonstrate that processes are in place to meet all relevant EP requirements."*	Details of the permits and exemption requirements for the contractor are set out in the OSWMP which forms part of the **Outline CEMP** which accompanies the DCO application **[TR030008/APP/6.5]** and which the contractor's SWMP (to be prepared before the commencement of construction) must accord with.
Paragraph 5.5.4 states *"The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a Site Waste Management Plan. The arrangements described and the Management Plan should include information on the proposed waste recovery and disposal system for all waste generated by the development and an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal, unless it can be demonstrated that this is the best overall environmental outcome."*	An OSWMP has been produced which forms part of the **Outline CEMP** which accompanies the DCO application **[TR030008/APP/6.5]**, and which the contractor's SWMP (to be prepared before the commencement of construction) must accord with. The assessment considers the impact of the waste arising from the construction and operation of the Project on the capacity of waste management facilities, specifically landfills in **Section 20.8**. The approach to minimising waste for the Project is outlined in **Section** 20.7.

Legislation/Policy/Guidance	Consideration within this chapter
Paragraph 5.5.5 states *"The decision-maker should consider the extent to which the applicant has proposed an effective system for managing hazardous and non-hazardous waste arising from the construction, operation and decommissioning of the proposed development. It should be satisfied that:* • *any such waste will be properly managed, both on-site and off-site;* • *the waste from the proposed facility can be dealt with appropriately by the waste infrastructure which is, or is likely to be, available. Such waste arisings should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area; and* • *adequate steps have been taken to minimise the volume of waste arisings, and of the volume of waste arisings sent to disposal, except where that is the best overall environmental outcome."*	An OSWMP forms part of the **Outline CEMP** which accompanies the DCO application **[TR030008/APP/6.5]**, which the contractor's SWMP (to be prepared before the commencement of construction) must accord with. The assessment considers the impact of the waste arising from the construction and operation of the Project on the capacity of waste management facilities, specifically landfill (**Section** 20.8). The approach to minimising waste for the Project is outlined in **Section 20.7.**
National Planning Policy Framework ("NPPF") (Ref 20-11)	
The NPPF does not contain specific waste policies as these are detailed within the National Planning Policy for Waste (Ref 20-12) and Waste Management Plan for England (Ref 20-13), however, the following overarching policies are relevant to materials and waste: • The environmental objective set out at paragraph 8 of the NPPF is *"to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."* • The environmental objective set out in paragraph 210 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."*	The approach to minimising waste for the Project is outlined in **Section 20.7**. A recycled content target would be considered for inclusion in the contractor's SWMP included within the Final CEMP.

Legislation/Policy/Guidance	Consideration within this chapter
National Planning Policy Guidance ("NPPG") for Minerals (Ref 20-14) **and Waste** (Ref 20-15)	
Published to provide more in-depth guidance to the NPPF. The NPPG aims to make planning guidance more accessible and ensures that the guidance is kept up to date.	The guidance provides further information in support of the implementation of waste planning policy and on the planning for mineral extraction in plan making and the application process. This information has been taken into consideration when reviewing local policy but is not directly used in the assessment.
National Planning Policy for Waste (Ref 20-12)	
The National Planning Policy for Waste sets out detailed waste planning policies to be applied in conjunction with the NPPF. It states: "*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*".	The likely impact of proposed, non-waste related development (the Project) on existing waste management facilities (specifically landfill) is considered in the assessment (**Paragraph 20.8.43** and **Paragraph 20.8.58**). Embedded mitigation measures include activities that would be undertaken during the design stage to minimise waste thus reducing the need for waste management and landfill disposal. These include the design of adequate provision for internal and external waste storage to allow waste segregation during Project operation (**Section 20.7**). The assessment of materials and waste has taken account of the waste hierarchy in the management of waste, and of the targets for recovery of non-hazardous construction and demolition waste. An OSWMP forms part of the **Outline CEMP** which accompanies the DCO application **[TR030008/APP/6.5]**, which the contractor's SWMP (to be prepared before the commencement of construction) must accord with.

Legislation/Policy/Guidance	Consideration within this chapter
The Waste Management Plan for England 2021 (Ref 20-13)	
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. It 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 C&D 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.	The assessment of materials and waste has taken account of the waste hierarchy in the management of waste (**Paragraph 20.7.4**), and of the targets for recovery of non-hazardous C&D waste (**Paragraph 20.6.30**).
A Green Future: Our 25 Year Plan to Improve the Environment (Ref 20-16)	
The plan "*sets out goals for improving the environment within a generation and leaving it in a better state than we found it*". It details how the government will work with communities and businesses to do this. The following policies are relevant: • 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 end of 2042. • Reducing food supply chain emissions and waste. • Reducing litter and littering. • Improving management of residual waste.	Key policies relevant to the Project such as waste minimisation have been considered in **Section 20.7**. The approach to minimising waste for the Project is outlined in **Section 20.7**.
Our Waste, Our Resources, A Strategy for England (Ref 20-17)	
The Strategy will help the government to meet the commitments outlined in the 25 Year Plan and "*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*." The strategy combines actions to be taken now and commitments for the coming years. Key targets and milestones and targets, which could be relevant to the Project, include: • Roll out of a deposit return scheme (subject to consultation) – 2023. • Legislation for mandatory separate food waste collections (subject to consultation) – 2023; • 75% recycling rate for packaging (subject to consultation) – 2023;	Key targets and milestones relevant to the Project such as how waste might need to be managed onsite (e.g. segregation) are considered in **Section 20.7**.

Legislation/Policy/Guidance	Consideration within this chapter
• 65% recycling rate for municipal solid waste – 2035. • Municipal waste to landfill 10% or less – 2035.	
North East Lincolnshire Local Plan 2013 to 2032 (Ref 20-18)	
Sets out the Council's approach to accommodating future requirements in relation to the demands on the Borough's mineral resource and waste needs. Relevant policies include: • Policy 44 – Safeguarding minerals and related infrastructure. • Policy 45 – Future mineral extraction and Secondary Aggregates. • Policy 47 – Future requirements for waste facilities. • Policy 48 – Safeguarding waste facilities and related infrastructure. • Policy 49 – Restoration and aftercare (waste). The Policy Map (Ref 20-19) shows the extent of Mineral Safeguarding Areas ("MSAs") for sand and gravel and blown sand and existing waste management facilities.	**Section 20.6** considers allocated / safeguarded mineral and waste sites in the vicinity of the Project. The Project Site is not in the vicinity of any safeguarded mineral sites and as such they are scoped out of this assessment.
IEMA Guidance (Ref 20-1)	
The document offers guidance and recommendations for EIA practitioners and stakeholders concerned with the impacts and effects of materials and waste on the environment. The guidance provides considerations for screening, scoping, consultation, assessment and subsequent reporting and monitoring.	The assessment has been completed in accordance with the IEMA Guidance as outlined in **Section 20.4**.
Contaminated Land: Applications in Real Environments ("CL:AIRE") Definition of Waste: Development Industry Code of Practice ("DoW CoP"), v2 (Ref 20-20)	
The DoW CoP provides a process which enables the reuse of excavated materials on-site or their movement between sites. Use of the DoW CoP supports the sustainable and cost-effective development of land. It can provide an alternative to Environmental Permits or Waste Exemptions.	The reuse of excavated material would be covered by a CL:AIRE DoW CoP Materials Management Plan ("MMP") developed by the Contractor before the commencement of construction. Details of the requirements for the Contractor are set out in an **Outline CEMP** which accompanies the DCO application **[TR030008/APP/6.5]**.

Legislation/Policy/Guidance	Consideration within this chapter
Waste and Resources Action Programme ("WRAP") Designing Out Waste: A Design Team Guide for Civil Engineering (Ref 20-21) **and Designing Out Waste: A Design Team Guide for Buildings** (Ref 20-22).	
The guides outline the case for taking action to designing out waste, provides a detailed explanation of the key principles that designers can use during the design process and how these principles can be applied to civil engineering and building projects to maximise opportunities to reduce construction waste and use materials more efficiently. It gives examples of technical solutions and how, in practice, designers have helped achieve significant waste reductions.	Designing out waste key principles have been considered and will continue to be considered during the design of the Project and are outlined in **Section 20.4.**

20.4 Assessment Methodology

20.4.1 The general approach for Environmental Impact Assessment ("EIA") provided in **Chapter 5: EIA Approach [TR030008/APP/6.2]** is not used for materials and waste since specific topic guidance and assessment criteria for materials and waste has been developed by IEMA (Ref 20-1) however the overarching approach is broadly in line.

20.4.2 Embedded measures are considered prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice i.e. do not take account of such measures even though they are standard practice (standard mitigation) and/ or form part of the Project design (embedded mitigation). Taking these measures into account means that realistic likely environmental effects are identified. Where likely significant adverse effects are identified after considering these embedded measures, Project specific mitigation measures are considered, developed and proposed, where necessary and possible.

Scope of the Assessment

20.4.3 Having regard to the information presented within the Scoping Report (**Appendix 1.A [TR030008/APP/6.4]**), the Planning Inspectorate's Scoping Opinion (**Appendix 1.B [TR030008/APP/6.4]**) has confirmed the Applicant's view that some materials and waste aspects are unlikely to generate significant effects and can thus be scoped out of consideration in this chapter as follows:

a. Waste arising from extraction, processing and manufacture of construction components and products.

b. Other environmental impacts associated with the management of waste from the Project which are assessed elsewhere in this Environmental Statement (on water resources (**Chapter 18: Water Use, Water Quality, Coastal Protection, Flood Risk and Drainage [TR030008/APP/6.2]**), air quality (**Chapter 6: Air Quality [TR030008/APP/6.2]**), noise (**Chapter 7: Noise and Vibration [TR030008/APP/6.2]**) or traffic (**Chapter 11: Traffic and Transport [TR030008/APP/6.2]**) resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste).

c. Direct impacts on safeguarded/allocated mineral sites.

d. Direct impacts on MSAs.

e. Materials arising from marine dredging (**Chapter 17: Marine Water and Sediment Quality, Chapter 16: Physical Processes [TR030008/APP/6.2]**) (unless material is not suitable for management in the estuary).

f. Effects on the availability of materials during operation.

g. Effects associated with decommissioning of the Project.

20.4.4 The assessment of materials and waste considers the following:

a. 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.

b. 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.

c. 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.

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

20.4.5 The sensitive receptors for the materials and waste assessment are:

a. Landfill void capacity in the expansive study areas of East Midlands and Yorkshire and the Humber (non-hazardous landfill void capacity) and England (hazardous landfill void capacity). As defined in the IEMA Guidance (Ref 20-1) "*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*."

b. Materials, national and regional consumption of key construction materials. As outlined in the IEMA Guidance (Ref 20-1) "*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*."

c. Safeguarded/ allocated waste sites.

20.4.6 The IEMA Guidance (Ref 20-1) "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."

20.4.7 The materials and waste assessment entails the following:

Materials

a. Establishing the baseline for national and regional consumption of key materials (construction materials) by weight.

b. Assessing the sensitivity of materials as related to the availability and types of materials to be consumed by the Project during construction.

c. Establishing the quantities of key construction materials required for the construction of the Project.

d. Comparing the total quantities of key construction materials with the most recent national and regional demand (using a percentage approach).

e. Considering whether any allocated/safeguarded waste sites would be impacted by the Project.

Waste

a. Establishing the baseline landfill void capacity in the defined study areas.

b. Assessing the sensitivity of landfill void capacity.

c. Establishing the quantities of construction, demolition and excavation waste to be generated during the construction of the Project.

d. Comparing the total waste arising from the construction of the Project against the landfill void capacity (using a percentage approach).

Assessment Criteria

Sensitivity

20.4.8 The sensitivity of materials takes into account the availability and type of construction material to be consumed by the Project. The IEMA Guidance criteria described within **Table 20-3** have been used to determine the sensitivity of materials.

Table 20-3: Materials Receptors Sensitivity

Effects	Criteria for Materials Receptor Sensitivity
Negligible	On balance, the key materials required for the construction of the Project 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 Project are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. *And/or*

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

20.4.9 The sensitivity of waste relates to the availability of landfill capacity in the absence of the Project. As outlined in the IEMA Guidance "*landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste*". The sensitivity of landfill capacity has been assessed based on a review of historic landfill void capacity trends where available and information from relevant policy documents.

20.4.10 The criteria described within **Table 20-4** and **Table 20-5** have been used to determine the sensitivity of landfill capacity.

Table 20-4: Inert and Non-hazardous Landfill Capacity Sensitivity

Effects	Criteria for Inert and Non-hazardous Landfill Capacity Sensitivity
Negligible	Across construction and/or operational phases, the baseline/future baseline (i.e. without the Project) of regional inert and non-hazardous landfill capacity expected to remain unchanged, or is expected to increase through a committed change in capacity.

Effects	Criteria for Inert and Non-hazardous Landfill Capacity Sensitivity
Low	Across construction and/or operational phases, the baseline/future baseline (i.e. without the Project) 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 operational phases, the baseline/future baseline (i.e. without the Project) 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 operational phases, the baseline/future baseline (i.e. without the Project) 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 operational phases, the baseline/future baseline (i.e. without the Project) 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. • Would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 20-5: Hazardous Landfill Capacity Sensitivity

Effects	Criteria for Hazardous Landfill Capacity Sensitivity
Negligible	Across the construction and/or operational phases, the baseline/future baseline (i.e. without the Project) 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 operational phases, the baseline/future baseline (i.e. without the Project) 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 operational phases, the baseline/future baseline (i.e. without the Project) of regional (or where justified, national) 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 operational phases, the baseline/future baseline (i.e. without the Project) 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 operational phases, the baseline/ future baseline (i.e. without the Project) of regional (or where justified, national) hazardous landfill capacity is: • Expected to reduce very considerably (by >1%).

Effects	Criteria for Hazardous Landfill Capacity Sensitivity
	• End during construction or operation. • Is already known to be unavailable. • Would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude

20.4.11 The magnitude of impact describes the degree of variation from the baseline conditions as result of the Project. The methodology for assessing the magnitude of impact associated with materials comprises a percentage-based approach that determines the influence of construction materials used during the construction of the Project on the baseline national and regional demand. The criteria used to assess the magnitude of impact for materials are provided within **Table 20-6**.

Table 20-6: Materials Magnitude of Impacts

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 regional* baseline availability.
Minor	Consumption of one or more materials is between 1-5% by volume of the regional* baseline availability.
Moderate	Consumption of one or more materials is between 6-10% by volume of the regional* baseline availability.
Major	Consumption of one or more materials is >10% by volume of the regional* baseline availability.
**A national baseline is used for steel in the absence of regional consumption data.*	

20.4.12 The 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 Project on the baseline landfill capacity. The criteria used to assess the magnitude of impact for waste are provided within **Table 20-7** and **Table 20-8** for inert and non-hazardous waste and hazardous waste respectively.

Table 20-7: Inert and Non-Hazardous Waste - Magnitude of Impact

Effects	Criteria for Waste Magnitude of Impacts
No change	Zero waste generation and disposal from the Project.
Negligible	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by <1%.
Minor	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by 1-5%.
Moderate	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by 6-10%.
Major	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by >10%.
# Forecast as the worst-case scenario, during a defined construction and/ or operational phase.	

Table 20-8: Hazardous Waste - Magnitude of Impact

Effects	Criteria for Waste Magnitude of Impacts
No change	Zero waste generation and disposal from the Project.
Negligible	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by <0.1%.
Minor	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by <0.1-0.5%.
Moderate	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by >0.5-1%.
Major	Waste generated by the Project would reduce expansive study area landfill capacity baseline# by >1%.
# Forecast as the worst-case scenario, during a defined construction and/ or operational phase.	

Significance

20.4.13 **Table 20-9** describes the effect thresholds used to determine the significance of potential materials and waste effects (taking into account receptor sensitivity and the magnitude of impact), whilst **Table 20-10** shows that effects assessed as being moderate, large or very large are deemed to be significant. Where an effect is between two effect thresholds, professional judgement has been applied (for example between Slight and Moderate).

Table 20-9: 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 20-10: Significance of Effect

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

Limitations and Assumptions

20.4.14 The information presented in this assessment reflects that obtained and evaluated at the time of reporting, and is based on the proposed parameters for the Project and the maximum identified extents of land required for its construction and operation in accordance with the principles of the Rochdale Envelope approach.

20.5 Study Area

20.5.1 The study areas for the assessment of impacts related to materials and waste have been defined in line with the IEMA Guidance. Two types of study area are defined in the IEMA Guidance, namely a 'Project Study Area' relevant to waste generation, material use and impacts on allocated/ safeguarded sites; and an 'Expansive Study Area' relevant to management of waste and the availability of materials. Within this section, study areas are defined for the following:

a. Construction and operational waste generation.

b. Use of construction materials (key construction materials only - steel, aggregates, asphalt and concrete).

c. Impact on allocated/safeguarded mineral and waste sites.

d. Presence of MSAs.

e. Non-hazardous, inert and hazardous construction waste management.

f. Non-hazardous, inert and hazardous operational waste management.

g. Availability of key construction materials.

Project Study Area

20.5.2 The Project study area for construction and operational waste generation and the use of construction and materials (key construction materials only) comprises the Site Boundary (Order Limits as presented in **Figure 2.1: Application Site Boundary [TR030008/APP/6.3]**). The study area includes the footprint of the proposed works, together with any temporary land requirements during construction which may include temporary offices, compounds and storage areas.

20.5.3 The Project study area for the impacts on allocated/ safeguard mineral and waste sites is defined by the Site Boundary. Impacts on allocated/ safeguarded waste sites which are not included in the IEMA Guidance are included in this assessment for completeness.

20.5.4 Impacts on MSAs are not assessed in the materials and waste assessment in accordance with the IEMA Guidance. However, MSAs are included for context in the baseline since MSAs are a planning consideration.

Expansive Study Area

20.5.5 The expansive study area for non-hazardous waste management (construction and operation) comprises the East Midlands and Yorkshire and the Humber. The expansive study area includes the following sub-regions as outlined in the *EA's 2021 Waste Summary Tables for England* - Version 2 (Ref 20-23):

a. Lincolnshire, Derbyshire, Leicestershire, Northamptonshire and Nottinghamshire.

b. Former Humberside, North Yorkshire, South Yorkshire, West Yorkshire.

20.5.6 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 and value for money. The study area has been determined to comprise the wider region within which landfill capacity is located i.e. East Midlands region and the Yorkshire and the Humber region since the Project is located close to the northern border of the East Midlands and waste could be managed in either region.

20.5.7 The expansive study area for hazardous waste management (construction and operation) is England. The expansive study area is defined based on professional judgement and informed by consideration of the proximity principle and value for money. 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*" (Ref 20-24). Planning for hazardous waste management is also undertaken at a national level.

20.5.8 The expansive study area for availability of key construction materials (aggregates, asphalt, concrete and steel) covers the United Kingdom ("UK") or Great Britain ("GB") or East Midlands region and the Yorkshire and the Humber region dependent on baseline information availability. Regional information on the availability of key construction materials is included in the baseline where available.

20.6 Baseline Conditions

Regional and National Availability of Key Construction Materials

Current Baseline

20.6.1 UK and GB data and regional data has been used to establish a quantitative national baseline of the consumption for key constructional materials. **Table 20-11** summarises national consumption in 2018 for aggregates, asphalt, concrete and steel (the most recent year for which data is available), which are the key construction materials expected to be used during the construction of the Project.

Table 20-11: National Consumption for Key Construction Materials

Material	National Consumption (million tonnes, year)	Baseline Data Year	Data Description
Steel	17	2018	UK total consumption (Ref 20-25)
Aggregates **of which:**	251	2018	Minerals and mineral products sales in GB (Ref 20-26)
• Crushed rock	117.3		
• Sand and gravel - land won	48.9		
• Sand and gravel - marine	13.7		
• Recycled and secondary	71		
Asphalt	25.4		
Concrete **of which:**	86.2		
• Ready-Mixed Concrete	54.2		
• Concrete products	32		

20.6.2 Construction material sales data by region are provided for the regions surrounding the Project in **Table 20-12**. It is assumed that the majority of key construction materials (e.g. aggregates, asphalt and concrete) required for the Project would be sourced regionally, taking into account the proximity principle and value for money. Other materials such as steel may be sourced at a national level.

Table 20-12: Construction Material Sales by Region 2018 (Ref 20-26)

Construction Material	East Midlands	Yorkshire and the Humber
Crushed rock (million tonnes)	26.5	11.5
Sand and gravel (million tonnes)	6.1	2.3
Ready-mixed concrete (million m^3)	1.4	1.2
Asphalt (million tonnes)	2.8	2.1

20.6.3 Potential recycled contents for the main construction materials likely to be used during Project construction are outlined in **Table 20-13**. These "good practice" rates are derived from WRAP's Designing Out Waste Tool for Civil Engineering (Ref 20-27).

Table 20-13: Potential Recycled Content

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

Future Baseline

20.6.4 There is no publicly available information on any potential long-term changes to national material demands by the time of construction of the Project. Construction material demand such as ready mixed concrete is closely aligned to both the quantity of construction taking place and the general economy. Therefore, it is deemed inappropriate to forecast future demand as it is unlikely to be linear. It is, therefore, not possible to set a future baseline for materials. As such, the future baseline is assumed during Project construction to be the same as the current baseline as outlined in **Table 20-11**.

Allocated/Safeguarded Mineral and Waste Sites and MSAs

20.6.5 As outlined in the North East Lincolnshire Local Plan 2013 to 2032 (adopted 2018) (Ref 20-18) "*the area features some mineral deposits of economic importance, however, no primary extraction occurs in the Borough"*. However, *"significant existing and planned infrastructure identified on the Policies Map, that supports the supply of minerals in the Borough would be safeguarded against development that would unnecessarily sterilise or prejudice its use, including development of incompatible land uses nearby. This includes strategic rail freight links, sites for concrete batching, manufacture of coated materials and concrete products, and sites associated with the handling, processing, and distribution of substitute, recycled and secondary aggregate material."*

20.6.6 There are no active mineral extraction "*sites in North East Lincolnshire contributing to primary aggregate production and the Council's call for sites has not identified any potential minerals sites.* (Ref 20-18)*"* Therefore, there are no allocated/ safeguarded mineral sites within the Site.

20.6.7 Three sites producing secondary and recycled aggregates are listed in the North East Lincolnshire Local Plan: these sites are not within close proximity (over 1km) from the Site. There are no concrete batching/aggregate sites within close proximity of the Site as outlined on the MSA and Waste Sites Policy Map (Ref 20-19).

20.6.8 North East Lincolnshire Council safeguards the existing waste management facilities identified on the Policies Map (Minerals and Waste) "*from the encroachment of incompatible development unless the planning permission has expired and/ or it can be demonstrated that the site is no longer required. The Council would seek to ensure that new development in proximity to a waste site is not incompatible with the waste management facility and would not prejudice its ongoing operation*". The details of waste sites adjacent or within the Site are presented in **Table 20-14**.

Table 20-14: Safeguarded Waste Sites Adjacent to the Project

North East Lincolnshire Local Plan reference	Operator	Site Location	Details
WM05	Grimsby Operations Ltd	Household Waste Recycling Centre, Queens Road, Immingham	Access to and operation of the Grimsby Operations Ltd, Household Waste Recycling Centre, Queens Road, Immingham is unaffected by the Project. Access to the site will be maintained at all times.
WM07	Integrated Waste Management Ltd	Queens Road, Immingham	Access road to the permitted landfill is within the Site Boundary however operational access to the landfill will be maintained at all times.

20.6.9 Three other safeguarded waste sites are located within 1km of the Site as presented in **Table 20-15**.

Table 20-15: Other Safeguarded Waste Sites Within 1km of the Project

North East Lincolnshire Local Plan Reference	Operator	Site Location
WM03	Associated British Ports	Immingham Dock Olive Residue Storage

North East Lincolnshire Local Plan Reference	Operator	Site Location
WM08	Selvic Shipping Services Ltd and FBM Metals (UK) Ltd (licence name F B M Metals (UK) Ltd and F B M Holdings Ltd	Kiln Lane Treatment Plant, Netherlands Way, Stallingborough
WM09	SJP Trading Ltd (licence name Stokesley Metals Ltd)	Huckers Yard, Netherlands Way, Stallingborough

20.6.10 North East Lincolnshire Council has designated MSAs for sand and gravel and blown sand, however these areas are not located within close proximity of the Site (in the Stallingborough area and Habrough area over 4km away).

Landfill Capacity

Current Baseline

20.6.11 **Table 20-16** presents remaining landfill capacity at the end of 2021 as outlined on the EA's 2021 Waste Summary Tables for England – Version 3 (last updated 30 September 2022) (Ref 20-23) for the non-hazardous and inert waste expansive study area (East Midlands and Yorkshire and the Humber) and the hazardous waste study area (England).

20.6.12 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) and therefore additional capacity associated with such facilities is excluded from the baseline. Some non-hazardous landfills have a Stable Non-Reactive Hazardous Waste Cell ("SNRHW") e.g. for asbestos.

Table 20-16: Landfill Capacity (2021) in East Midlands, Yorkshire and The Humber, and England

Landfill Type	Sub-Region			
	East Midlands	Yorkshire and the Humber	Total in East Midlands and Yorkshire and the Humber	England
	Capacity ('000s m^3)			
Hazardous Merchant	800	700	1,500	12,107
Non-hazardous with SNRHW cell	15,884	1,243	17,127	52,006
Non-hazardous	17,570	45,196	62,766	162,369

Landfill Type	Sub-Region			
	East Midlands	Yorkshire and the Humber	Total in East Midlands and Yorkshire and the Humber	England
	Capacity ('000s m^3)			
Inert	21,574	25,283	46,857	129,078
Sub-total (non-hazardous and inert)	55,028	71,722	126,750	343,453

20.6.13 **Table 20-16** indicates that total non-hazardous and inert landfill capacity in the non-hazardous study area is 127 million m^3. Total hazardous landfill capacity in the hazardous waste study area is 12.1 million m^3.

Future Baseline

20.6.14 The EA has published landfill capacity trends for 2004 to 2021 in 2022 within the EA's 2021 Waste Summary Tables for England – Version 3 (last updated 13 January 2022) (Ref 20-23).

20.6.15 **Plate 20-1** presents the historic trend for the remaining landfill capacity for the East Midlands and Yorkshire and the Humber.

20.6.16 **Plate 20-2** presents the historic trend for remaining landfill capacity for England.

20.6.17 Collated data is only available for "Inert" (inert landfill only) and "Non-Inert" (non-hazardous landfill sites, non-hazardous landfill sites with a SNHRW cell and merchant hazardous landfill sites) therefore the categories do not align with the 2021 landfill capacity data which is split by hazardous, non-hazardous and inert as shown in **Table 20-16**.

Plate 20-1: Historic Trend for Landfill Void Capacity in East Midlands and Yorkshire and the Humber (Ref 20-23)

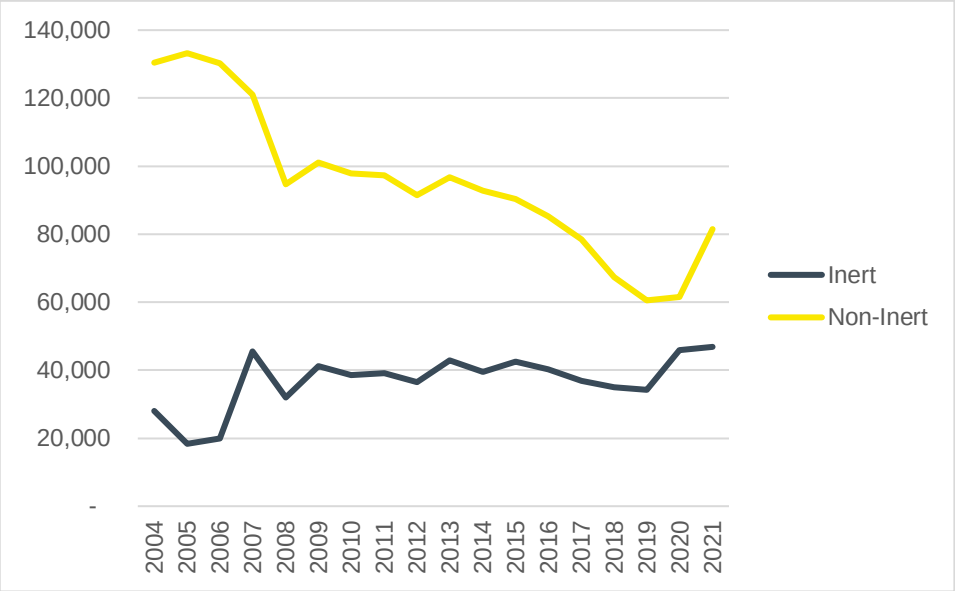
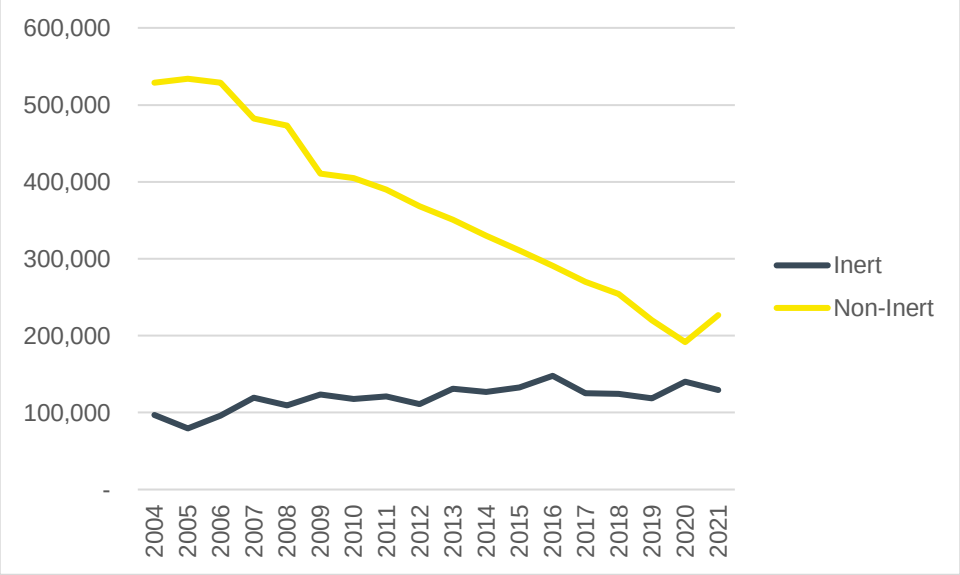


Plate 20-2: Historic Trend for Landfill Void Capacity in England (Ref 20-23)



20.6.18 There is no publicly available information on any potential changes to landfill capacity by the time of Project construction in early 2025. Due to the cyclic nature of inert landfill capacity, it is not realistic to forecast future landfill capacity since this may result in an increase in landfill capacity. Therefore, future inert landfill capacity during Project construction is assumed to be the same as the current baseline as outlined in **Table 20-16**.

20.6.19 For non-inert landfill (which includes hazardous waste) capacity 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 would need to consent new landfill capacity to replace that which has been used up. Therefore, future non-hazardous and hazardous landfill capacity during Project construction (see **Chapter 2: The Project [TR030008/APP/6.2]** for details of construction phasing) is assumed to be the same as the current baseline as outlined in **Table 20-16**.

Waste Management Infrastructure

20.6.20 The permitted capacity of other types of waste infrastructure is publicly available (e.g. Environmental Permitting Regulations - Waste Sites (Ref 20-28)), however, the permitted capacity is not necessarily representative of the actual operational capacity of the infrastructure since waste inputs may not be as high as permitted capacity. Therefore, inputs data are collated from the EA's Waste Data Interrogator 2021 – Waste Received (Excel) – Version 2 (Ref 20-29) and presented in **Table 20-17**.

20.6.21 Inputs are not totalled since the double counting of waste in the Waste Data Interrogator cannot be discounted. Double counting results from the same waste making multiple movements through multiple facilities e.g., transfer station to treatment facility with residues going to an energy from waste plant.

Table 20-17: Summary of Waste Inputs by Facility Type 2021 (Ref 20-29)

Facility Type	East Midlands (tonnes received)	Yorkshire and the Humber (tonnes received)
Landfill	4,238,163	4,501,192
MRS (Metal Recycling)	843,958	1,817,180
On/In Land	551,542	1,397,745
Transfer	4,588,886	5,394,163
Treatment	7,389,323	14,703,527
Combustion	72,986	71,810
Incineration	1,006,895	2,908,832
Mining	4,575	752
Storage	146,905	315,692
Processing	185,618	534,065

20.6.22 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."* Therefore, a full list of waste management infrastructure is not included in the baseline as presented herein.

20.6.23 Since some of the operational hazardous wastes likely to be generated by the Project will 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.

20.6.24 Due to the specialised nature of hazardous waste management, hazardous waste facilities typically receive wastes from a wide region, and therefore this assessment considers the national capacity for managing hazardous wastes.

20.6.25 There are a number of high-temperature hazardous waste incinerators in England (excluding facilities which manage only clinical waste and received less than 500 tonnes).These facilities as reported EA's Waste Data Interrogator 2021 – Waste Received (Excel) – Version 2 (Ref 20-29) and are shown in **Table 20-18**.

Table 20-18 Hazardous Waste Incineration Facilities

Facility	Location	2021 Waste Received (Tonnes of Hazardous Waste Received)
Hazardous Waste Incinerators		
Avonmouth Treatment Centre	Bristol	6,318
East Kent Waste Recovery Facility	Kent	4,615
Ellesmere Port Incinerator	Cheshire	56,488
Fawley HT Incinerator	Hampshire	30,287
Kirk Sandall Thermal Treatment Plant	Doncaster	5,304
Fine Environmental Services – Seal Sands	Tees Valley	19,018
Twinwoods Co-incinerator	Bedford	3,583
Total		**125,613**

20.6.26 The EA's Waste Data Interrogator 2021 – Waste Received (Excel) – Version 2 (Ref 20-29) shows the following quantities (**Table 20-19**) of liquid hazardous waste were treated by permitted facilities in England (excluding waste in European Waste Catalogue ("EWC") Code Chapter 13 "Oil Wastes and Wastes of Liquid Fuels"). In how these inputs are totalled, however, double counting of waste in the Waste Data Interrogator cannot be discounted.

Table 20-19 Hazardous Liquid Waste Treatment Facilities in England

Facility Permit Type	2021 Waste Received (Tonnes)
T05: Physico-chemical treatment installation	290,279
T06: Chemical treatment installation	143,314
T10: Haz waste treatment installation	178,591
T11: Haz waste transfer/treatment installation	32,651
Total	**644,836**

Historic Landfills

20.6.27 Historic landfills are potentially relevant to this assessment since excavations in historic landfill can give rise to waste that would require appropriate management. The Environment Agency's Historic Landfill Sites spatial data (Ref 20-30) does not present any historic landfills in close proximity to the Project Site. The dataset includes sites that existed before landfills were regulated. Much of this pre-licensing data was derived from a national survey in the early 1990s so it may be incomplete.

20.6.28 There is one historic landfill 100m to the north of the Project on the northern side of the railway line (i.e. Dock South East, Immingham). First waste inputs to the landfill occurred in 1986, whilst the licence was surrendered in 1990. The landfill was licensed to accept inert and industrial waste.

20.6.29 **Chapter 14: Historic Environment (Terrestrial) [TR030008/APP/6.2]** provides information on a landfill that is not listed in the Environment Agency's Historic Landfill Sites spatial data (Ref 20-30). This is a mid- 20th century landfill site, Immingham H.C.C Landfill (MNL1063) and is recorded on the southern edge of the West Site, the very northern extent of this asset overlapping with the southern boundary of West Site. The extent of the landfill is visible today as a series of earthworks and "scars". A small part of the landfill is located within the Site Boundary, however the asset itself would be entirely unaffected by the Project.

Targets

20.6.30 The national target for recovery of C&D waste is 70% by weight, as set out in the Waste FD and the Waste Management Plan for England (Ref 20-13). The target specifically excludes naturally occurring materials with EWC Code 17 05 04 (soil and stones other than those mentioned in 17 05 03* (soils and stones containing dangerous substances)). Recovery is deemed to include reuse, recycling and other recovery e.g. energy recovery.

20.6.31 A good practice landfill diversion target of 90% has been achieved and exceeded by major UK developments as outlined in the IEMA Guidance. In 2018, the UK generated 67.8 million tonnes of non-hazardous C&D waste, of which 62.6 million tonnes was recovered. This represents a recovery rate of 92.3% (Ref 20-31).

20.6.32 Standard, good and best practice recovery rates by material are provided by Waste & Resources Action Programme ("WRAP") (Ref 20-32). Recovery rates for key construction materials and other construction wastes relevant to the Project construction phase are provided in **Table 20-20**.

Table 20-20: Standard, Good and Best Practice Recovery Rates by Material

Material	Standard Practice Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste e.g. asbestos must be landfilled.	

Receptor Sensitivity

20.6.33 Materials required for Project construction are determined to be receptors of 'low' sensitivity. On balance, the key materials required for the construction of the Project are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. Key materials required for the construction are likely to be available comprising a high proportion of sustainable features and benefits (e.g. recycled content).

20.6.34 Potential recycled content for the main Project construction materials are outlined in **Table 20-13**.

20.6.35 Waste receptors of relevance to the Project are determined to have a 'very high' sensitivity. Since there is no publicly available information on any potential changes to landfill capacity by the time of the Project construction and operation, a worst-case scenario has been considered.

20.6.36 It is assumed that (without the Project) non-hazardous landfill void capacity in the expansive study area is expected to:

a. Reduce very considerably (by >10%).
b. End during Project construction and operation.
c. Is already known to be unavailable.
d. Would require new capacity or infrastructure to be put in place to meet forecast demand.

20.6.37 It is assumed that (without the Project) hazardous landfill void capacity in the expansive study area is expected to:

a. Reduce very considerably (by >1%).
b. End during Project construction and operation.
c. Is already known to be unavailable.
d. Would require new capacity or infrastructure to be put in place to meet forecast demand.

20.7 Development Design and Impact Avoidance

Embedded Mitigation

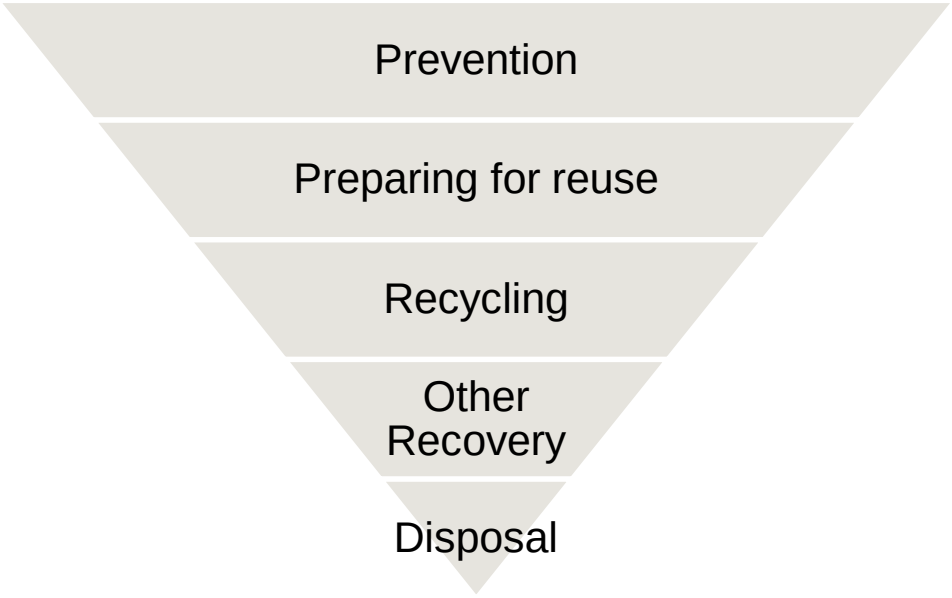
20.7.1 As described in the IEMA Guidance, embedded (primary) mitigation is the prevention or reduction of adverse effects through the resource-efficient design, construction and/or lifetime operation of a project.

20.7.2 Primary mitigation measures are an intrinsic part of the Project, and do not require additional action to be taken. Such measures are often identified as a result of the interaction between the environmental and engineering specialists within a project team, who are able to identify and agree by consensus resource-efficient design solutions.

20.7.3 Embedded mitigation measures of relevance to materials and waste for the Project are described below.

20.7.4 The Project will aim to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly waste disposal to landfill as per the waste hierarchy as detailed in **Plate 20-3**.

Plate 20-3: The Waste Hierarchy (Ref 20-35)



20.7.5 The following designing out waste mitigation measures will be implemented during the Project design and subsequent construction phase and are included in the OSWMP which is appended to the **Outline CEMP [TR030008/APP/6.5]**:

a. Design for reuse and recovery: identifying, securing and using materials that already exist on site, or can be sourced from other projects.

b. Design for materials optimisation: simplifying the Project 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.

c. Design for off-site construction: maximising the use of pre-fabricated structures and components, encouraging a process of assembly rather than construction.

d. Design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how deconstructability and demountability of elements can be maximised at end of first life.

e. Design for materials and waste efficient procurement: identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard.

20.7.6 As per the IEMA Guidance, embedded measures are considered prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice i.e. do not take account of such measures even though they are likely to be standard practice and/ or form part of the Project design. Taking these measures into account is necessary to identify the realistic likely environmental effects. Where likely significant adverse effects are identified after considering these embedded measures, Project specific mitigation measures will be considered, developed and proposed, where necessary and possible.

Standard Mitigation

20.7.7 Construction of the Project would be subject to measures and procedures defined within a Construction Environmental Management Plan ("CEMP"), which would be produced prior to the commencement of construction by the Contractor and would be based on, and incorporate, the contents and requirements of the **Outline CEMP** submitted with the DCO Application (**[TR030008/APP/6.5]**). In addition, an OSWMP which forms part of the **Outline CEMP** has been prepared and accompanies the DCO application (**[TR030008/APP/6.5]**). The Contractor will prepare a SWMP before the commencement of construction, in accordance with the OSWMP. The OSWMP sets out the generic measures that will be implemented by the Contractor to manage waste generated by the Project construction. This OSWMP includes:

a. An overview of applicable legislation.

b. Details of the Project.

c. Management arrangements, including roles and responsibilities, training, targets and best practice measures.

d. Estimates of construction material use and waste arising and how they will be managed.

e. Design decisions.

f. Materials and waste management on-site.

g. Opportunities for waste minimisation, reuse, recycling and recovery in line with the requirements of the waste hierarchy.

20.7.8 Targets for waste recovery and recycled content will be included in the contractor's SWMP and could include for example:

a. Achieving a set percentage (by weight) for recovery of non-hazardous C&D waste. Such a target would specifically exclude naturally occurring materials with EWC Code 17 05 04 (soil and stones other than those mentioned in 17 05 03* (soils and stones containing dangerous substances)). Recovery is deemed to include reuse, recycling and other recovery e.g. energy recovery.

b. Achieving a set percentage (by weight) of materials imported to site for use within the Project containing alternative (reused, recycled or secondary) content, for those applications where it is technically and economically feasible to substitute these alternatives to primary materials.

20.7.9 The reuse of excavated material would be covered by a CL:AIRE DoW CoP (Ref 20-20) MMP developed by the Contractor before the commencement of construction and for obtaining all necessary approvals (in accordance with the CEMP) **[TR030008/APP/6.5]**. This would support the re-use of excavated materials; minimise off-site disposal; and demonstrate the necessary lines of evidence to support the proper reuse/ offsite disposal of materials and ensure compliance with regulatory guidance.

20.8 Assessment of Likely Impacts and Effects

Potential Impacts

20.8.1 Potential materials and waste impacts associated with the Project include:

a. Reduction in materials required for construction available in the relevant markets (key construction materials e.g. concrete, asphalt, steel, aggregates).

b. Effects that on-site generated materials (e.g. soils, waste arisings) have on the existing and future landfill void capacity during Project construction.

c. Effects that on-site generated waste arisings have on the existing and future landfill void capacity during Project operation.

d. Changes to allocated/ safeguarded waste site access.

Construction

20.8.2 **Table 20-21** summarises the likely types of materials that would be used and wastes that are likely to be generated during the Project construction phase.

Table 20-21: Construction Material Use and Waste Types Arising from Project Construction

Construction Activity	Materials Used	Waste Types Generated
Site remediation/ preparation/ earthworks	Fill material for construction purposes. Primary/secondary/recycled aggregates for ground stabilisation. 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.
Site clearance and demolition activities	Materials are not required for demolition works.	Waste arisings from demolition and clearance. Extensive demolition is not anticipated as the site is either hardstanding, brownfield or agricultural field.

Construction Activity	Materials Used	Waste Types Generated
Site construction	Main construction materials including: • Concrete • Steel • Pipe supports • Cables, cable trays and instruments • Asphalt • Piles • Gravel • Fill material	Excess, offcuts and broken/ damaged construction materials. Existing infrastructure removed during works. Packaging from materials delivered to site e.g. timber crates. Construction worker wastes from offices and welfare areas/ canteens. Waste oils from construction plant.

Construction Materials

20.8.3 The estimated main types and quantities of materials anticipated to be used during construction of the various Project phases (Phase 1-6) have been obtained from the Applicant, as presented in **Table 20-22**, **Table 20-24, Table 20-26** and **Table 20-28** alongside national and regional materials consumption. Regional material consumption is not available for steel.

20.8.4 Phase 1 is anticipated to be three years, and each subsequent Phase (2-6) would be two years each. Phase 4 Phase 5 and Phase 6 are anticipated to overlap by one year. A worst case that all material is used within one year for each Phase is taken in the assessment.

20.8.5 **Table 20-22**, **Table 20-24, Table 20-26** and **Table 20-28** also include potential material wastage estimates and a total construction waste estimate based on material wastage only. Asphalt material quantities have been converted from m^2 to m^3 by assuming a depth of 170mm.

20.8.6 Data on the bulk density of materials has been used to convert quantities between volume (m^3) and weight (tonnes). Information on the typical bulk density of materials has been sourced from the Bath Inventory of Carbon and Energy ("ICE") (Ref 20-33) and align with the Climate Change assessment in **Chapter 19: Climate Change [TR030008/APP/6.2]**. Material measured in metres and number have been converted to tonnes based on conversion factors from the National Highways Carbon Emissions Calculation Tool (Ref 20-34).

20.8.7 A wastage rate of 5% has been applied to all construction materials. The rate is based on the highest "good practice" rates from WRAP's Designing Out Waste Tool for Civil Engineering (Ref 20-27) for the key construction materials.

20.8.8 There is no baseline information for plastic and there is no regional baseline for steel.

Table 20-22: Estimated Construction Material Quantities and Wastage – Phase 1

Material	Material Density (t/m^3)	Quantity (tonnes)	Quantity (m^3)	Wastage Rate (%)	Waste Quantity (tonnes)	Waste Quantity (m^3)
Concrete	2.4	128,018	53,341	5	6,401	2,667
Rebar - steel	8	4,862	608	5	243	30
Structural steel	8	3,909	489	5	195	24
Pipe erection – pre-cast concrete	2.4	123,154	51,314	5	6,158	2,566
Pipe supports - CS - steel	8	96	12	5	5	1
Pipe supports - SS - steel	8	4	1	5	0.2	0.03
Electrical cable supply - plastic	8	107	13	5	5	1
Electrical cable trays - plastic	1.4	54	39	5	3	2
Instrument cables - steel	8	131	16	5	7	1
Instrument cable trays - plastic	1.4	242	173	5	12	9
Equipment - steel	8	11	1	5	1	0.1
Asphalt	2.3	20,969	9,117	5	1,048	456
Piles - steel	8	10,530	1,316	5	527	66

Material	Material Density (t/m^3)	Quantity (tonnes)	Quantity (m^3)	Wastage Rate (%)	Waste Quantity (tonnes)	Waste Quantity (m^3)
Gravel - aggregate	2	13,272	6,636	5	664	332
Fill material - aggregate	2	351,156	175,578	5	17,558	8,779
Total material construction waste					**32,826**	**14,933**

Table 20-23: Estimated Construction Material Quantities and % of National and Regional Consumption – Phase 1

Total Construction Materials	Quantity (tonnes)	National Material Consumption (million tonnes)	% of National Material Consumption	Magnitude of Impact	Sensitivity	Effect	Regional Material Consumption (million tonnes)	% of Regional material Consumption	Magnitude of Impact	Sensitivity	Effect
Concrete	251,172	86.2	0.3	Negligible	Low	Slight	6.2	4	Minor	Low	Slight
Steel (rebar and structural steel)	19,651	17	0.1	Negligible	Low	Slight	n/a	n/a	n/a	Low	n/a
Asphalt	20,969	25.4	0.1	Negligible	Low	Slight	4.9	0.4	Negligible	Low	Slight
Aggregates (fill material and gravel)	364,428	250.9	0.1	Negligible	Low	Slight	46.4	0.8	Negligible	Low	Slight

Table 20-24: Estimated Construction Material Quantities and Wastage – Phase 2

Material	Material Density (t/m^3)	Quantity (tonnes)	Quantity (m^3)	Wastage Rate (%)	Quantity (tonnes)	Quantity (m^3)
Concrete	2.4	29,640	12,350	5	1,482	618
Rebar - steel	8	1,061	133	5	53	7
Structural steel	8	717	90	5	36	4
Pipe erection – pre-cast concrete	2.4	48,428	20,178	5	2,421	1,009
Pipe supports - CS - steel	8	39	5	5	2.0	0
Pipe supports - SS - steel	8	1	0	5	0.06	0.0
Electrical cable supply - plastic	8	29	4	5	1.5	0
Electrical cable trays - plastic	1.4	16	11	5	1	1
Instrument cables - steel	8	71	9	5	3.5	0
Instrument cable trays - plastic	1.4	140	100	5	7	5
Equipment - steel	8	4	1	5	0.22	0.0
Asphalt	2.3	1,112	483	5	56	24
Piles - steel	8	3,640	455	5	182	23

Material	Material Density (t/m^3)	Quantity (tonnes)	Quantity (m^3)	Wastage Rate (%)	Quantity (tonnes)	Quantity (m^3)
Gravel - aggregate	2	3,474	1,737	5	174	87
Fill material - aggregate	2	-	-	5	-	-
Total material construction waste based on wastage					**4,419**	**1,778**

Table 20-25: Estimated Construction Material Quantities and % of National and Regional Consumption – Phase 2

Total Materials by Category	Quantity (tonnes)	National Material Consumption (million tonnes)	% of National Material Consumption	Magnitude of Impact	Sensitivity	Effect	Regional Material Consumption (tonnes)	% of Regional Material Consumption	Magnitude of Impact	Sensitivity	Effect
Concrete	78,068	86.2	0.09	Negligible	Low	Slight	6.2	1.3	Minor	Low	Slight
Steel (rebar and structural steel)	5,563	17	0.033	Negligible	Low	Slight	n/a	n/a	n/a	n/a	n/a
Asphalt	1,112	25.4	0.004	Negligible	Low	Slight	4.9	0.02	Negligible	Low	Slight
Aggregates (fill material and gravel)	3,474	250.9	0.001	Negligible	Low	Slight	46.4	0.007	Negligible	Low	Slight

Table 20-26: Estimated Construction Material Quantities and Wastage – Each Subsequent Phase (3-6)

Material	Material Density (t/m^3)	Quantity (tonnes)	Quantity (m^3)	Wastage Rate (%)	Quantity (tonnes)	Quantity (m^3)
Concrete	2.4	25,066	10,444	5	1,253	522
Rebar - steel	8	888	111	5	44	6
Structural steel	8	396	50	5	20	2
Pipe Erection – pre-cast concrete	2.4	28,680	11,950	5	1,434	597
Pipe supports - CS - steel	8	24	3	5	1.2	0
Pipe supports - SS - steel	8	1	0	5	0.06	0.0
Electrical cable supply - plastic	8	17	2	5	0.9	0
Electrical cable trays - plastic	1.4	8	6	5	0.4	0.3
Instrument cables - steel	8	67	8	5	3.3	0
Instrument cable trays - plastic	1.4	135	96	5	7	5
Equipment - steel	8	4	0	5	0.18	0.0
Asphalt	2.3	2,097	912	5	105	46
Piles - steel	8	2,822	353	5	141	18

Material	Material Density (t/m^3)	Quantity (tonnes)	Quantity (m^3)	Wastage Rate (%)	Quantity (tonnes)	Quantity (m^3)
Gravel - aggregate	2	2,648	1,324	5	132	66
Fill material - aggregate	2	-	-	5	-	-
Total material construction waste based on wastage					3,143	1,263

Table 20-27: Estimated Construction Material Quantities and % of National and Regional Consumption – Each Subsequent Phase (3-6)

Total Materials by Category	Quantity (tonnes)	National Material Consumption (tonnes)	% of National Material Consumption	Magnitude of Impact	Sensitivity	Effect	Regional Material Consumption (tonnes)	% of Regional Material Consumption	Magnitude of Impact	Sensitivity	Effect
Concrete	53,745	86.2	0.06	Negligible	Low	Slight	6.2	0.9	Negligible	Low	Slight
Steel (rebar and structural steel)	4,218	17	0.02	Negligible	Low	Slight	n/a	n/a	n/a	n/a	n/a
Asphalt	2,097	25.4	0.008	Negligible	Low	Slight	4.9	0.04	Negligible	Low	Slight
Aggregates (fill material)	2,648	250.9	0.001	Negligible	Low	Slight	46.4	0.01	Negligible	Low	Slight
Note: For the total quantity of construction material for Phases 3-6, the above figures should be multiplied by four, as they only show the estimates for one Phase.											

Table 20-28: Estimated Construction Material Quantities and Wastage – Jetty

Material	Material Density (t/m^3)	Quantity (tonnes)	Quantity (m^3)	Wastage Rate (%)	Quantity (tonnes)	Quantity (m^3)
In situ concrete	2.4	15,927	6,636	5	797	332
Pre-cast concrete	2.4	7,031	2,929	5	352	146
Reinforcement - steel	8	1,912	239	5	96	12
Bracing and sleeves - steel	8	669	84	5	33	4
Piles - steel	8	18,411	2,301	5	921	115
Crosshead - steel	8	3,399	425	5	170	21
Road beams and structural PR - steel	8	3,804	475	5	190	24
Mooring dolphin jackets - steel	8	309	39	5	15	2
Fill - aggregates	2	5,350	2,675	5	268	134
Total material construction waste based on wastage					2,841	790

Table 20-29: Estimated Construction Material Quantities and % of National and Regional Consumption – Jetty

Total Materials by Category	Quantity (tonnes)	National Material Consumption (tonnes)	% of National Material Consumption	Magnitude of Impact	Sensitivity	Effect	Regional Material Consumption (tonnes)	% of Regional Material Consumption	Magnitude of Impact	Sensitivity	Effect
`Concrete	22,958	86,200,000	0.03	Negligible	Low	Slight	6,240,000	0.4	Negligible	Low	Slight
Steel (reinforcement, bracing and sleeves, piles, crosshead, road beams and structural PR, and mooring dolphin jackets)	28,504	17,000,000	0.2	Negligible	Low	Slight	n/a	n/a	n/a	n/a	n/a
Aggregates (fill)	5,350	250,900,000	0.002	Negligible	Low	Slight	46,400,000	0.012	Negligible	Low	Slight

Table 20-30: Estimated Construction Material Quantities and % of National and Regional Consumption – Phase 1, Phase 2, Each Subsequent Phase (3-6) and Jetty Total

Total Materials by Category	Quantity (tonnes)	National Material Consumption (tonnes)	% of National Material Consumption	Magnitude of Impact	Sensitivity	Effect	Regional Material Consumption (tonnes)	% of Regional Material Consumption	Magnitude of Impact	Sensitivity	Effect
Concrete	567,179	86,200,000	0.7	Negligible	Low	Slight	6,240,000	9.1	Moderate	Low	Slight
Steel	70,590	17,000,000	0.4	Negligible	Low	Slight	n/a	n/a	n/a	n/a	n/a
Asphalt	30,469	25,400,000	0.1	Negligible	Low	Slight	4,900,000	0.6	Negligible	Low	Slight
Aggregates	383,844	250,900,000	0.2	Negligible	Low	Slight	46,400,000	0.8	Negligible	Low	Slight

20.8.9 Materials required for Project construction are determined to be receptors of low sensitivity (in accordance with **Table 20-3**).

20.8.10 On a national scale during the Phase 1 construction phase no individual construction material requirement is equal to or greater than 1% by weight of the baseline national consumption (UK/GB) (i.e. concrete 0.3%, steel 0.1%, asphalt 0.1% and aggregates 0.1% as shown in **Table 20-23**).

20.8.11 The magnitude of impact is considered to be negligible (in accordance with **Table 20-6**). The overall effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.12 On a regional scale during Phase 1 construction, asphalt and aggregates requirements are less than 1% by weight of the baseline regional consumption (i.e. asphalt 0.4% and aggregates 0.8% as shown in **Table 20-23**). The magnitude of impact for asphalt and aggregates is considered to be negligible. The effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.13 Concrete requirements represent between 1-5% of the baseline regional consumption (i.e. concrete 4% as shown in **Table 20-23**). The magnitude of impact for concrete is considered to be minor. The effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.14 On a national scale during the Phase 2 construction phase no individual construction material requirement is equal to or greater than 1% by weight of the baseline national consumption (UK/GB) (i.e. concrete 0.09%, steel 0.03%, asphalt 0.004% and aggregates 0.001% as shown in **Table 20-25**).

20.8.15 The magnitude of impact is considered to be negligible (in accordance with **Table 20-6**). The overall effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.16 On a regional scale during Phase 2 construction, asphalt and aggregates requirements are less than 1% by weight of the baseline regional consumption (i.e. asphalt 0.02% and aggregates 0.007% as shown in **Table 20-25**). The magnitude of impact for asphalt and aggregates is considered to be negligible. The effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.17 Concrete requirements represent between 1-5% of the baseline regional consumption (i.e. concrete 1.3% as shown in **Table 20-25**). The magnitude of impact for concrete is considered to be minor. The effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.18 Since material quantity requirements for subsequent Project Phases (3-6) are lower than those required during Phase 1 and Phase 2 no individual construction material requirement is equal or greater than 1% at a national or regional scale (as outlined in **Table 20-27**) no significant effects are anticipated.

20.8.19 At a national scale during jetty construction, no individual construction material requirements are equal to or greater than 1% by weight of the baseline national consumption (UK/GB) (i.e. concrete 0.05% steel 0.1%, and aggregates 0.002%). The magnitude of impact is considered to be negligible. The effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.20 At a regional scale during jetty construction, no individual construction material requirements are equal to or greater than 1% by weight of the baseline regional consumption (i.e. concrete 0.7% and aggregates 0.012% as outlined in **Table 20-29**). The magnitude of impact is considered to be negligible. The effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.21 At a national scale in a worst-case scenario that Phase 1, Phase 2, Phases 3-6 and the jetty are constructed within a single year material requirement is less than 1% by weight of the baseline national consumption (UK/GB) (i.e. concrete 0.7%, steel 0.4%, asphalt 0.1% and aggregates 0.2% as outlined in **Table 20-30**). The magnitude of impact is considered to be negligible for concrete, asphalt, aggregates and steel. The overall effect is therefore assessed to be **slight adverse** which is **not significant**.

20.8.22 At a regional scale in a worst-case scenario that Phase 1, Phase 2, Phases 3-6 and the jetty are constructed within a single year, asphalt and aggregates requirements are less than 1% by weight of the baseline regional consumption (i.e. asphalt 0.6% and aggregates 0.8% as outlined in **Table 20-30**). Concrete requirements represent more than 5% of the baseline regional consumption (i.e. concrete 9.5% as outlined in **Table 20-30**).

20.8.23 For asphalt and aggregates the magnitude of impact is considered to be negligible. The overall effect is therefore assessed as **slight adverse** which is **not significant**.

20.8.24 For concrete the magnitude of impact is considered to be moderate. The overall effect is therefore assessed as **slight adverse** which is **not significant**.

Construction Waste

20.8.25 The construction waste estimates based upon wastage from construction material is likely to be an underestimation of total construction waste as this does not include worker waste, waste from vehicles etc. Therefore, construction waste volumes have also been estimated at a high-level based on the Project construction value.

20.8.26 The construction waste estimates (excluding demolition and excavation) have been calculated based on the construction value and published best practice benchmarks for industrial buildings (Ref 20-36). A best practice benchmark has been used since waste generation is expected to be at the lower end of the scale since much of the capital expenditure will be associated with modular process engineering components which will be manufactured off-site, and hence the on-site waste generation from assembly of these components is expected to be relatively small.

20.8.27 **Table 20-31** outlines the estimated construction waste based on construction value.

Table 20-31: Construction Waste Based on Construction Value

Phase	Construction Waste Based on Construction Value (m^3)
Phase 1	22,000
Phases 2-6	41,250
Phase 1 - jetty	10,450
Total	73,700

20.8.28 In a worst case that Phase 1, Phases 2-6 and the jetty are constructed within a single year construction waste volume is estimated to be 73,700m^3 and this is the construction waste estimate used in the assessment.

20.8.29 At this stage no estimates of hazardous waste generation during Project construction are available. Detailed waste quantities would be estimated by the contractor and included in the SWMP. The quantities of hazardous waste (e.g. oils, batteries, aerosol cans etc.) are anticipated to be small compared to the overall construction waste arisings.

Demolition and Clearance Waste

20.8.30 Large scale demolition works during the construction phase are not anticipated given that the Project site comprises hardstanding, brownfield and agricultural fields. Therefore, quantities of waste generated during site clearance activities and the demolition of existing buildings are anticipated to be small.

20.8.31 The quantity of waste estimated to arise from vegetation clearance for is based on the number of hectares (ha) expected to be cleared, the vegetation type (heavily wooded or medium wood) and a benchmark for m^3 and tonnes of waste per ha. The benchmarks are:

a. Heavily wooded - 429m^3 per ha, 300 tonnes per ha.

b. Medium wooded – 250m^3 per ha, 175 tonnes per ha.

20.8.32 Taking into account the above, during vegetation clearance works for Phase 1 it is estimated that 3,683m^3 of material would be generated. It is anticipated that all of this waste would be composted or recovered on or off site with a 100% recovery rate and therefore would not impact landfill void capacity.

Excavated Material

20.8.33 The Project 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. The Project design team aim is to achieve a cut-fill balance, however predicted cut and fill for the Phase 1 is currently imbalanced with import required i.e. cut volume of approximately 22,336m^3 and a fill volume of approximately 175,578m^3.

20.8.34 For the jetty predicted cut is 2,019m^3 which is associated with a 300m deep strip as part of the vegetation clearance. Fill requirements are 1,610m^3 for the

temporary crane platform and vehicle turning area and 1,065m^3 for the temporary vehicle access route. Since these elements are temporary it is assumed that this material would become a waste at the end of construction (a total of 2,675m^3). The fill requirements are also considered in the construction material assessment in **Table 20-29**.

20.8.35 The use of site-sourced excavated material within the Project engineering works activities would be undertaken in accordance with the MMP. This would be prepared by the Contractor in accordance with the CL:AIRE DoW CoP (Ref 20-20) with the material not being classified as waste.

20.8.36 For Phase 1 a worst-case scenario where all approximately 22,336m^3 of excavated material is sent to landfill has been applied.

20.8.37 In practice, it is likely that some of the excavated material could be reused on-site or recovered, rather than being disposed of to landfill. Information on previously developed land and potential sources of contamination that could give rise to materials and waste that require specific handling, storage and management arrangements, are set out in **Chapter 21: Ground Conditions and Land Quality [TR030008/APP/6.2]**.

Total Construction Phase Waste

20.8.38 **Table 20-32** presents a summary of construction phase waste. A worst case that all waste generation occurs within one year is taken in the assessment.

Table 20-32: Total Construction Phase Waste

Activity	Waste (m^3)
Construction waste Phase 1, Phase 2, subsequent Phases (3-6) and jetty (based on construction value)	73,700
Demolition and clearance waste Phase 1 and Jetty	Small quantities as outlined in **Paragraph 20.8.30.** Vegetation clearance unlikely to have an impact on landfill capacity
Excavated material Phase 1	22,336
Excavated material Jetty	2,019
Waste aggregates - at the end of construction from jetty temporary crane platform and vehicle turning area and temporary vehicle access route	2,675
Total	100,730
% of Inert and Non-Hazardous Landfill Capacity	0.08%

20.8.39 Based on the above, construction of the Project is estimated to result in less than a 1% (1,040,110m^3) reduction of landfill capacity within the waste management study area, representing a negligible magnitude of impact.

20.8.40 Waste receptors of relevance to the Project are determined to have a very high sensitivity. Therefore, a negligible magnitude of impact would result in a **slight adverse** effect which is **not significant**.

20.8.41 At this stage no estimates of hazardous waste generation during Project construction are available (see **Paragraph 20.8.29**). The quantities of hazardous waste (e.g. oils, batteries, aerosol cans etc.) are currently anticipated to be small compared to the overall construction waste arisings and anticipated to be less than 0.1% of the hazardous waste landfill capacity in England (12,107m^3) – as such the magnitude of impact is anticipated to be negligible.

20.8.42 Many hazardous waste types have well defined waste management routes, including recovery and are unlikely to be sent directly to landfill. Procedures for the storage and management of these wastes are set out in the OSWMP and would be further detailed in the Contractor's SWMP. Hazardous waste receptors have a very high sensitivity. Therefore, a negligible magnitude of impact would result in a **slight adverse** effect which is **not significant**.

Impacts on Safeguarded Waste Sites

20.8.43 Consultation in relation to the safeguarding of allocated / safeguarded waste sites in the vicinity of the Project (described in **Table 20-14**) has not been undertaken since the following has been confirmed:

a. Access to and operation of the Grimsby Operations Ltd, Household Waste Recycling Centre, Queens Road, Immingham is unaffected by the adjacent IGET development.

b. The access road to the permitted landfill operated by Integrated Waste Management Ltd, Queens Road, Immingham is outside of the west site perimeter fence and operational access will be maintained at all times.

20.8.44 Permanent impacts upon allocated/ safeguarded waste sites are not anticipated: any Project impacts on site access would be of limited duration (during construction only), whilst alternative access arrangements would be put in place during this time in order to avoid undue disruption.

20.8.45 No significant effects on safeguarded waste sites are anticipated.

Operation

20.8.46 Effects associated with the availability of materials during Project operation have been scoped out of the assessment.

20.8.47 Operational wastes from the Project include:

a. Waste from the control room, workshop e.g. general wastes.

b. Waste from the operation of hydrogen production units and liquefiers.

20.8.48 The main waste types and quantities of operational waste are outlined in **Table 20-33.**

20.8.49 Some wastes will be generated infrequently e.g. every 5-6 years, whereas some wastes will be generated annually or continuously. For the purpose of the

assessment a worst case that all operational wastes are generated within the same year has been used.

Table 20-33: Operational Waste Arisings

Waste Type	Waste Description	Frequency of Disposal	Waste Classification	Estimated Quantity (tonnes)	Estimated Quantity (m^3)
Catalyst (hazardous)	Solid	2-3 years	Hazardous	Not applicable (n/a), assessed in m^3 only	2
Catalyst (non-hazardous)	Solid	5-6 years	Non-hazardous		15
Diesel	Liquid	Annual total	Hazardous	1	n/a, assessed in tonnes only
Ammonia solution	Liquid	1-2 years	Hazardous	228	n/a, assessed in tonnes only
Compressor oil	Liquid	Annual total	Hazardous	1	n/a, assessed in tonnes only
General waste	Solid	Annual total	Non-hazardous	n/a, assessed in m^3 only	95
Packaging	Solid	Annual total	Non-hazardous		48
Scrap metals	Solid	Annual total	Non-hazardous		24
Total liquid hazardous waste (tonnes)				230	
Total solid hazardous waste (m^3)					7
Total solid non-hazardous (m^3)					182

20.8.50 The IEMA Guidance (Ref 20-1) recommends assessing impacts of hazardous waste with reference to the available landfill capacity nationally. However, since some of the operational hazardous wastes likely to be generated by the Project will 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.

20.8.51 In the event that non-hazardous solid wastes are disposed of to landfill, the annual quantity is likely to be a reduction of <1% (0.0003%) of regional non-hazardous waste landfill void capacity and is considered to be of negligible magnitude. Accordingly, as for inert and non-hazardous waste the sensitivity of the receptor is classified as 'very high' and the magnitude of impact is considered to be 'negligible', this is assessed to result in a **slight adverse** effect which is **not significant**.

20.8.52 In a worst case scenario where hazardous solid wastes are disposed of to landfill, the annual quantity is likely to be a reduction of <0.1% (0.0001%) of national hazardous waste landfill void capacity and is considered to be of negligible magnitude. Accordingly, as for hazardous waste the sensitivity of the receptor is classified as 'very high' and the magnitude of impact is considered to be 'negligible', this is assessed to result in a **slight adverse** effect which is **not significant**.

20.8.53 If hazardous liquids not suitable for landfill disposal (i,e. diesel, ammonia solution and compressor oil) are disposed of by high temperature incineration the waste from the Project would be equivalent to 0.18% of 2021 hazardous waste incineration waste input (at a national level).

20.8.54 If hazardous liquids are managed by hazardous liquid waste treatment facilities the waste from the Project would be equivalent to 0.04% of 2021 hazardous liquid waste treatment input (at a national level).

Decommissioning

20.8.55 The landside elements (Phases 1-6) of the Project have a design life of up to approximately 25 years although the operational life could be longer, and when appropriate, this infrastructure would be decommissioned and all materials removed would be reused or recycled where possible or disposed of in accordance with relevant waste disposal regulations at the time of decommissioning. The DCO application does not make any provision for the decommissioning of the marine infrastructure and this is discussed further in **Chapter 2: The Project [TR030008/APP/6.2]**. However, plant and equipment on the jetty topside would be decommissioned.

20.8.56 It is not possible to assess waste and material resources effects of decommissioning of landside elements and the jetty topside infrastructure at the present time, since waste infrastructure, technologies and good practices are likely to be substantially different to those currently in place: specific measures would be addressed as part of a DEMP produced prior to the decommissioning phase. The facility design is to, as far as possible use a flexible modular construction and this approach makes decommissioning easier, quicker and means it has lower environmental impact by preventing waste generation. The process plant is constructed mainly from metals that are easy to reuse or recycle, individual items of equipment may be removed and redeployed. There is no underground storage that would require removal.

20.8.57 An **Outline DEMP** (**[TR030008/APP/6.6]**) accompanies this DCO Application and a detailed DEMP will be secured via a Requirement of the DCO.

20.8.58 In a worst-case scenario, where the Project elements would be fully removed, the potential impacts during the decommissioning phase would be similar to those encountered during the Project construction phase. An estimate of decommissioning waste is provided in **Table 20-34**.

Table 20-34: Decommissioning Waste Estimate

Waste Type	Quantity (m^3)	Quantity (tonnes)
Concrete	119,292	286,300
Steel	5,235	41,879
Asphalt	13,247	30,469
Plastic	759	1,232
Total Waste Decommissioning	137,774	359,880

20.9 Mitigation and Enhancement Measures

20.9.1 The assessment presented in **Section 20.8** has indicated that no significant effects with regards to materials and waste are anticipated to arise as a result of the Project. Therefore, no additional mitigation or enhancement measures other than those set out in **Section 20.7** are considered necessary.

20.10 Assessment of Residual Effects

20.10.1 Based upon the assessment as detailed in **Section 20.8**, no significant residual effects with regard to materials and waste are anticipated.

20.11 Summary of Assessment

20.11.1 Based on the current understanding of material and waste quantities associated with the Project, no significant effects are anticipated.

20.11.2 A summary of potential materials and waste impacts, mitigation measures and residual effects is presented in **Table 20-35**.

Table 20-35: Summary of Potential Impact, Mitigation Measures and Residual Effects

Receptor	Impact Pathway	Effect Significance	Mitigation Measures	Residual Effect	Confidence
Construction Phase					
Waste - Non-hazardous landfill void capacity in the expansive study area of East Midlands and Yorkshire and the Humber.	Changes in available landfill capacity.	The sensitivity of the receptor is classified as very high, with a negligible magnitude of impact resulting in a slight adverse effect which is not significant.	Mitigation outlined in **Section 20.7**.	Slight adverse effect which is not significant.	Confidence level of significance of effects prediction is moderate-high. Assessment based on industry standard guidance and precautionary assumptions. Waste estimate is reasonable worst case based on industry benchmarks.
Waste - Hazardous landfill void capacity in the expansive study area England.	Changes in available landfill capacity.	The sensitivity of the receptor is classified as very high, with a negligible magnitude of impact resulting in a slight adverse effect which is not significant.	Mitigation outlined in **Section 20.7**.	Slight adverse effect which is not significant.	Confidence level of significance of effects prediction is moderate-high. Assessment based on industry standard guidance and precautionary assumptions. Waste estimate is reasonable worst case based on industry benchmarks and construction value.

Receptor	Impact Pathway	Effect Significance	Mitigation Measures	Residual Effect	Confidence
Materials - national and regional consumption of key construction materials.	Changes in demand for materials.	When each phase is considered individually the sensitivity of the receptor is classified as low, with a negligible or minor (dependent on material type) magnitude of impact resulting in a slight adverse effect which is not significant. In a worst-case scenario that Phase 1, Phase 2-6 and the jetty are constructed within a single year the sensitivity of the receptor is classified as low, with a negligible, or moderate (dependent on material type) magnitude of impact resulting in a slight adverse effect which is not significant.	Mitigation outlined in **Section 20.7**.	Slight adverse effect which is considered to be not significant.	Confidence level of significance of effects prediction is moderate-high. Assessment based on industry standard guidance and precautionary assumptions. Material estimate has been provided by the Applicant and Air Products based on professional judgement.
Waste – Safeguarded waste sites.	Impacts on safeguarded waste sites and associated access.	Not significant.	None	Not significant.	Confidence level of significance of effects prediction is high. Based on information from the Applicant and Air Products on the location of works.

Receptor	Impact Pathway	Effect Significance	Mitigation Measures	Residual Effect	Confidence
Operational Phase					
Waste - Non-hazardous landfill void capacity in the expansive study area of East Midlands and Yorkshire and the Humber.	Changes in available landfill capacity.	The sensitivity of the receptor is classified as very high, with a negligible magnitude of impact resulting in a slight adverse effect which is not significant.	Mitigation outlined in **Section 20.7**.	Slight adverse effect which is not significant.	Confidence level of significance of effects prediction is moderate-high. Assessment based on industry standard guidance and precautionary assumptions. Waste estimate is reasonable worst case based on information from the Applicant and Air Products.
Waste - Hazardous landfill void capacity in the expansive study area England.	Changes in available landfill capacity.	The sensitivity of the receptor is classified as very high, with a negligible magnitude of impact resulting in a slight adverse effect which is not significant.	Mitigation outlined in **Section 20.7**.	Slight adverse effect which is not significant.	Confidence level of significance of effects prediction is moderate-high. Assessment based on industry standard guidance and precautionary assumptions. Waste estimate is reasonable worst case based on information from the Applicant and Air Products.

20.12 References

Ref 20-1 IEMA, (2020), Guide to: Materials and Waste in Environment Impact Assessment, Guidance for a Proportionate Approach.

Ref 20-2 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.

Ref 20-3 His Majesty's Stationary Office (HMSO), (2011), Waste (England and Wales) Regulations 2011 as amended.

Ref 20-4 HMSO, (2019), The Waste (Miscellaneous Amendments) (EU Exit) Regulations 2019.

Ref 20-5 HMSO, (1990), Environmental Protection Act 1990 as amended.

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Ref 20-10 Department for Transport, (2012). National Policy Statement for Ports.

Ref 20-11 Ministry of Housing, Communities & Local Government, (2021), National Planning Policy Framework (NPPF).

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Ref 20-13 Department for Environment, Food & Rural Affairs, (2021), The Waste Management Plan for England.

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Ref 20-18 North East Lincolnshire Council, (2018), North East Lincolnshire Local Plan 2013 to 2032.

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Ref 20-32 WRAP, (2007), Waste Recovery Quick Wins. Improving Recovery Rates without Increasing Costs.

Ref 20-33 University of Bath, (2011), Bath Inventory of Carbon and Energy (ICE).

Ref 20-34 National Highways, (2022) Carbon Emissions Calculation Tool.

Ref 20-35 Department for Environment, Food & Rural Affairs, (2011), Guidance on Applying the Waste Hierarchy.

Ref 20-36 WRAP, (undated), SMARTWaste Data and Reporting (projects completed at the end of November 2012).