

ENVIRONMENTAL STATEMENT (VOLUME II)

Chapter 14 – Material Assets and Waste

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 –
Regulations 5(2)(a)

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14. MATERIAL ASSETS AND WASTE

14.1. INTRODUCTION

14.1.1. This Chapter reports the outcome of the assessment of the likely significant environmental effects of the Development Consent Order (DCO) Proposed Development on Material Assets and Waste. It describes:

- Relevant, legislation, policy and guidance;
- Consultation undertaken;
- Scope of the assessment;
- Assessment methodology;
- Baseline conditions;
- Sensitive receptors;
- Design development and embedded mitigation;
- Assessment of likely impacts and effects;
- Mitigation and enhancement measures;
- Residual effects;
- Monitoring; and
- Next steps.

14.1.2. This Chapter intended to be read as part of the wider ES, with particular reference to **Chapters 6 - Air Quality, Chapter 10 - Greenhouse Gases; Chapter 15 - Noise and Vibration and Chapter 17 - Traffic and Transport (Volume II)**. Other indirect impacts associated with material resource consumption and waste generation are assessed, where in-scope, in **Chapter 11 - Land and Soils; Chapter 12 - Landscape and Visual; Chapter 16 - Population and Health and Chapter 18 - Water Resources and Flood Risk (Volume II)**.

14.1.3. This Chapter has been prepared by competent experts with relevant and appropriate experience, as outlined in **Appendix 5.1 – Relevant Expertise and Competency (Volume III)**.

14.2. LEGISLATIVE AND POLICY FRAMEWORK

14.2.1. A summary of the international, national, and local legislation, planning policy and guidance relevant to the Material Assets and Waste assessment for the DCO Proposed Development is now set out.

LEGISLATIVE FRAMEWORK

International

The Revised EU Waste Framework Directive 2008/98/EC

- 14.2.2. The Directive provides a comprehensive foundation for the management of waste across the European Community and provides a common definition of waste. A definition of waste is provided in the predecessor to this Directive (European Directive 2006/12/EC) which defines waste as: “*any substance or object that the holder discards, or intends or is required to discard*”.

Council Directive 1999/31/EC of 26 April 1999 on the Landfill of Waste

- 14.2.3. The Landfill Directive aims to protect both human health and the environment. In particular, it provides measures, procedures and guidance to reduce as much as possible negative impact from landfill. In particular to surface water, groundwater, soil, air; on the global environment including greenhouse effect; and risks to human health. The Directive introduces rigorous operational and technical requirements.

- 14.2.4. The provisions of these Directives continue to have effect as transposed into domestic law by virtue of The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020. These regulations make provisions and amendments to the Environmental Protection Act 1990 and waste regulations to ensure that environmental permitting and waste regimes continued to operate effectively following the EU exit transition period.

National

The Environment Act 2021

- 14.2.5. The Act sets out clear statutory targets for the recovery of the natural world in four priority areas, one of which is waste: Part 3 specifically refers to waste and resource efficiency, incorporating producer responsibility obligations; resource efficiency; managing waste; and waste enforcement and regulation.

The Clean Neighbourhoods and Environment Act 2005

- 14.2.6. The Clean Neighbourhoods and Environment Act 2005 provides that it is the responsibility of construction workers on site to guarantee that waste is disposed in the appropriate manner.

The Waste Minimisation Act 1998

- 14.2.7. The Waste Minimisation Act 1998 enabled local planning authorities to take the appropriate steps to reduce and minimise the generation of household, commercial or industrial waste within their area.

The Environmental Protection Act 1990

- 14.2.8. The Environmental Protection Act defines, within England and Wales and Scotland, the fundamental structure and authority for waste management and control of emissions into the environment. The Act outlines the requirement of the manager of a development to ensure that any excess materials or waste as a result of construction activities are recovered or disposed of without any subsequent adverse effects upon the surrounding environment.
- The Control of Pollution (Amendment) Act 1989
- 14.2.9. The Control of Pollution (Amendment) Act 1989 makes it a criminal offence for a person who is not a registered carrier to transport controlled waste to or from any place in Great Britain. The Act also provides for the seizure and disposal of vehicles used for illegal waste disposal.
- The Control of Pollution Act 1974
- 14.2.10. The Act makes provisions with respect to the generation and revision of 'waste disposal plans' and prohibits the unlicensed disposal of waste.
- Waste (Circular Economy) (Amendment) Regulations 2020
- 14.2.11. The Regulations transpose the EU's 2020 Circular Economy Package (CEP) which plans to make sustainable products, services and business models the norm. Key measures under the regulations include prevention of waste generation and establishing waste prevention programmes, greater segregation of waste and more detailed records.
- The Controlled Waste (England and Wales) Regulations 2012
- 14.2.12. The Controlled Waste (England and Wales) Regulations 2012 provide a definition of controlled waste and classifies waste as household, industrial or commercial waste. It allows Local Authorities to implement charges for the collection of waste from non-domestic properties.
- The Waste (England and Wales) Regulations 2011
- 14.2.13. These regulations allow for the transfer of controlled waste to be recorded on alternative documentation, such as invoices, instead of waste transfer notes.
- Waste (Wales) Measure 2010
- 14.2.14. The Measure sets out provisions for targets to be met by local authorities in relation to municipal waste recycling, re-use and composing and make provision about prohibiting or otherwise regulating the deposit of waste in a landfill. Section 12 of the measure allows the Welsh Government to make plans setting out how they will manage and dispose of waste during construction or demolition.
- The Hazardous Waste (England and Wales) Regulations 2005
- 14.2.15. The Hazardous Waste (England and Wales) Regulations 2005 introduced measures to control storage, transport and disposal of hazardous waste. The

Regulations provide a means to ensure that hazardous waste and any associated risks are appropriately managed.

The Hazardous Waste (Wales) Regulations 2005

- 14.2.16. In addition to the measures set out in the Hazardous Waste (England and Wales) Regulations 2005, the Hazardous Waste (Wales) Regulations requires annual notification to Natural Resources Wales where over 500kg of hazardous waste is produced or stored per year.

POLICY

National: England

Overarching National Policy Statement for Energy (EN-1)

- 14.2.17. The Applicant is aware that the Government is currently updating the Energy NPSs, and it is anticipated that this will be published in 2022. Accordingly, the updated draft version of the NPSs is also considered as part of the ES.
- 14.2.18. The Overarching National Policy Statement (NPS) for Energy (**Ref.14.1**) sets out the Government's policy for delivery of major energy infrastructure and will be the primary basis for decision making. Section 5.14 'Waste Management' outlines government policy on hazardous and non-hazardous waste and sustainable waste management implemented through the waste hierarchy. The overall aim is to produce less waste by reusing it as a resource wherever possible, or to dispose of it in a way that is least damaging to the environment and human health. Paragraph 5.14.6 of the NPS refers to the specific requirement to prepare a Site Waste Management Plan (SWMP), which should include information on the proposed recovery and disposal of waste, along with an assessment of the impact of waste arising from the development on the capacity of waste management facilities in the area.

Draft Overarching National Policy Statement for Energy

- 14.2.19. The draft NPS for Energy (**Ref. 14.2**) sets out national policy for energy infrastructure. In Section 5.15 of the policy (Resource and Waste Management), government expectations on hazardous and non-hazardous waste are outlined, which are intended to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Applicants should prepare a SWMP (as detailed in EN-1). Applicants should also ensure that through construction best practices, material is reused or recycled on site where possible, or sourced from recycled or reused sources, and low carbon materials, sustainable sources and local suppliers are used.

National Planning Policy Framework

- 14.2.20. The National Planning Policy Framework (**Ref. 14.3**) highlights that the purpose of the planning system is to contribute to the achievement of sustainable development through three overarching objectives: economic, social and environmental. The environmental objective requires the planning system to

contribute and enhance the natural and local environment by “*using natural resources prudently*” and “*minimising waste and pollution*”.

National Planning Policy for Waste

- 14.2.21. The National Planning Policy for Waste (**Ref. 14.4**) outlines the Government’s ambition to promote a sustainable approach to resource use and management. It sets out waste planning policies and should be read alongside: the National Planning Policy Framework; the National Waste Management Plan for England and any relevant successor policies, guidance or documents.

National Policy Statement for Hazardous Waste

- 14.2.22. The National Policy Statement for Hazardous Waste (**Ref. 14.5**) outlines the Government’s main objectives for hazardous waste and the key principles for management of hazardous waste.

Waste Management Plan for England

- 14.2.23. The Waste Management Plan for England (**Ref. 14.6**) provides a detailed analysis of the present state of waste management at the national level, and assesses how the objectives of the Waste Framework Directive will be effectively supported. It outlines the Waste Hierarchy, which gives top priority to waste prevention, followed by preparing for reuse, recycling, other types of recovery and finally disposal (e.g. landfill).

Our Waste, Our Resources: A Strategy for England

- 14.2.24. Our Waste, Our Resources: A Strategy for England (**Ref. 14.7**) sets out how the Government will preserve stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. The strategy also outlines the Government’s aims to minimise the damage caused to the natural environment by reducing and managing waste safely and carefully, and by tackling waste crime. It combines actions to take now with firm commitments for the coming years and gives a clear longer-term policy direction in line with the 25 Year Environment Plan.

National: Wales

Future Wales The National Plan 2040

- 14.2.25. Future Wales The National Plan 2040 (**Ref. 14.9**) is the national development framework, setting the direction for development in Wales to 2040. Policy 19 – Strategic Policies for Regional Planning, states that “*Strategic Development Plans should embed placemaking as an overarching principle and should establish for the region (and where required constituent Local Development Plans):...*

- *a framework for the sustainable management of natural resources and cultural assets;...*

- *a co-ordinated framework for minerals extraction and the circular economy, including waste treatment and disposal.”*

Planning Policy Wales

- 14.2.26. Section 5.11 of Planning Policy Wales (**Ref. 14.8**) focuses on making the best use of material resources, through appropriate and sustainable use of finite resources and promoting the principles of a circular economy. These preferences should be taken into account when considering developments for planning decisions.

Towards Zero Waste One Wales: One Planet

- 14.2.27. Towards Zero Waste (**Ref.14.11**) is the overarching waste strategy for Wales setting out a long term framework (to 2050) for resource efficiency and waste management.

Technical Advice Note 21: Waste

- 14.2.28. The Technical Advice note (**Ref. 14.10**) provides advice on how the planning system can contribute to sustainable waste management and resource efficiency.

Local

Cheshire West and Chester Council Local Plan

- 14.2.29. Policy ENV8 of the Cheshire West and Chester Council Local Plan (Part One) Strategic Policies (**Ref. 14.12**) sets out the waste management needs of the Council. These include managing waste as a resource, promoting waste minimisation and awareness, delivering sustainable waste management and providing waste management infrastructure.
- 14.2.30. Although based on 2012 data, the plan indicates that additional facilities for non-hazardous landfill are expected to be required in 2024. All other waste management methods (such as transfer, recycling, composting, energy from waste, treatment, inert landfill and hazardous landfill) are noted to be sufficient until 2030.
- 14.2.31. Policy ENV9 of the Local Plan considers mineral support and safeguarding. The Plan includes maintenance of a minimum seven year landbank for aggregate land-won sand and gravel, delineating Mineral Safeguarding Areas for sand and gravel, salt and shallow coal; and supporting proposals which enable the use of secondary and recycled mineral resources.
- 14.2.32. Although based on 2012 data, the Local Plan indicates that aggregate landbank supplies will last for approximately 12 years. Data for 2018 taken from the North West Aggregate Working Party Annual Monitoring Report (**Ref. 14.26**) indicates the North West total aggregate landbank reserves of 22 years. It is noted that crushed rock reserves are anticipated to last 28 years, whereas land won sand and gravel reserves have only seven years and are below the ‘at least’ seven year landbank requirement under the NPPF.

Flintshire Unitary Development Plan

- 14.2.33. Chapter 18 of the Flintshire Unitary Development Plan (**Ref. 14.13**) describes how mineral resources can be protected for future use through Mineral Safeguarding Areas (MSAs). Where non-mineral developments are located within a MSA, evidence will be required to demonstrate the extent it may sterilise or restrict the working of mineral resources. It is noted in Paragraph 18.6 that *“On the basis of previous estimates of mineral demand and rates of extraction it is considered that North Wales benefits from a significant reserve of aggregate and sand and gravel reserves.”* *“... the mineral reserves in North Wales are extensive and are very likely to meet future mineral demands beyond the life of the Unitary Development Plan especially when considering new mineral permissions in neighbouring authorities.”*
- 14.2.34. Chapter 19 of the Development Plan discusses waste, with an overall objective to *“encourage a reduction in the amount of waste generated and support schemes which reuse and recycle waste materials.”*
- 14.2.35. The Local Development Plan has a Minerals Topic Paper (**Ref. 14.14**) which notes a key objective of the Plan is *“to facilitate the provision of a sustainable supply of mineral. This will include safeguarding minerals of economic importance from non-mineral development which would otherwise sterilise mineral resources”*. It is further noted that the Plan will need to balance the need for safeguarding minerals and facilitating economic growth.

GUIDANCE

- 14.2.36. The IEMA Materials and Waste in Environmental Impact Assessment (**Ref. 14.15**) (herein referred to as the ‘IEMA Guide’) has been used as guidance for the completion of the Material Assets and Waste assessment.

14.3. SCOPING OPINION AND CONSULTATION

RESPONSE TO THE SCOPING OPINION

- 14.3.1. An EIA Scoping Opinion (**Appendix 1.2 – EIA Scoping Opinion, Volume III**) was received by the Applicant from The Inspectorate on 14 July 2021, including formal responses from Statutory Consultees. A full list of the responses from The Inspectorate and how these requirements have been addressed by the Applicant are set out in **Appendix 1.3 – Scoping Opinion Responses (Volume III)**.

CONSULTATION UNDERTAKEN TO DATE

- 14.3.2. No consultation has been required to inform the Material Assets and Waste assessment due to the fact that all requisite data are publicly available.

14.4. SCOPE OF THE ASSESSMENT

14.4.1. The scope of this assessment has been established through an ongoing scoping process. Further information can be found in **Chapter 5 – EIA Methodology (Volume II)** of this ES.

14.4.2. The following section provides an update to the scope of the assessment (following the EIA Scoping Report (**Appendix 1.1 - EIA Scoping Report, Volume III**)) and re-iterates the evidence base for scoping out elements following further iterative assessment.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

14.4.3. The elements shown in **Table 14.1** are not considered to give rise to likely significant effects as a result of the DCO Proposed Development and have therefore not been considered within this assessment.

Table 14.1 – Elements Scoped Out of the Assessment

Element Scoped Out	Justification
Impacts and effects associated with the extraction of raw resources and the manufacture of products	<p>The level of assessment required to assess the extraction of raw resource and manufacture of products is disproportionate and would not add value to the assessment of significance within the EIA process.</p> <p>The Inspectorate agreed that this matter could be scoped out.</p> <p>Section 14.9 of this Chapter assessment considers the nature and quantity of materials and resources required to facilitate construction. Operational impacts and effects are scoped out.</p>
Consumption of material resources associated with the DCO Proposed Development during operation	<p>Operational activities of the DCO Proposed Development are not anticipated to require consumption of material resources beyond those necessary for routine repair and maintenance. As such, the impacts associated with material resource consumption are considered to be minimal and not significant.</p> <p>The Inspectorate agreed that this matter could be scoped out of the ES.</p>
Disposal and recovery of waste associated with the DCO Proposed Development during operation	<p>The operation of the DCO Proposed Development is anticipated to generate only minimal waste arisings from minor routine maintenance and repairs. As such, the impacts associated with waste generation and disposal during operation are considered to be minimal and not significant.</p> <p>The Inspectorate agreed that this matter can be scoped out of the ES.</p>
Consumption of material resources associated with all elements of the DCO Proposed Development during end of life decommissioning	<p>End of life decommissioning activities of the DCO Proposed Development are not anticipated to require consumption of material resources. As such, the impacts associated with material resource consumption are considered to be minimal and the associated effects, not significant.</p>
Disposal and recovery of waste associated with the DCO Proposed Development during	<p>The DCO Proposed Development has a design life of 25 years (for AGIs and BVSs) and 40 years for the Newbuild Carbon Dioxide Pipeline. At end of life, the Newbuild Carbon Dioxide Pipeline and existing Flint Connection to PoA Terminal Pipeline will be decommissioned safely, filled with nitrogen and left in situ. The AGIs and BVSs will be dismantled and cleared from the site. At the time of end of</p>

Element Scoped Out	Justification
end of life decommissioning	life decommissioning, all works will be undertaken in compliance with the necessary legislation, permits and best practice at that time. Due to the uncertainties relating to future technologies and infrastructure, it is not possible to proportionally assess impacts during decommissioning. This Stage of the DCO Proposed Development is therefore scoped out of the assessment.
Lifecycle assessment (including embodied carbon and water) of materials and site arisings, and waste	<p>The requirement for a full lifecycle assessment (including embodied carbon, water and other environmental impacts) of materials, waste and site arisings is not within the scope of this Chapter, as embodied emissions arising from the manufacture and transport of raw materials for the construction and / or operation of the Proposed Development will be conducted as part of Chapter 10 - Greenhouse Gases (Volume II). This is an approach that is proportionate to the EIA process for a scheme of this scale and nature.</p> <p>The Inspectorate agreed that the requirement for a lifecycle assessment of materials, site arisings and waste can be scoped out on the basis that embodied emissions arising from the manufacture and transport of raw materials to suppliers during construction of the DCO Proposed Development had been scoped into the assessment and reported in Chapter 10 - Greenhouse Gases (Volume II).</p>
Impacts and effects resulting from the transportation of material resources and waste to and from the Site	<p>The impacts associated with transportation of materials and waste will be considered as part of the air quality, climate, traffic and transport, and noise and vibration assessments – as appropriate to these specialist topics.</p> <p>The Inspectorate agreed that this matter can be scoped out of this Chapter on the basis that likely significant effects are considered in the relevant aspect chapters of the ES. Refer to Chapter 6 - Air Quality, Chapter 10 - Greenhouse Gases, Chapter 15 - Noise and Vibration and Chapter 17 - Traffic and Transport (Volume II) for the topic specific assessment relevant to transportation of material assets and waste to and from the Site.</p>
Impacts and effects on human health and controlled waters as a result of any contaminated site arisings from the DCO Proposed Development	<p>Impacts and effects on human health and controlled waters will be considered in the geology and soils assessment, as appropriate to this specialist topic.</p> <p>The Inspectorate agreed that this matter can be scoped out of the ES on the basis that likely significant effects are considered in the relevant aspect chapters of the ES, including the assessment of Land and Soils. Refer to Chapter 11 - Land and Soils (Volume II) for assessment of contaminated site arisings.</p>

ELEMENTS SCOPED INTO THE ASSESSMENT

Construction Stage

14.4.4. The Construction Stage elements which are in scope, due to the potential for significant adverse effects, are:

- Consumption of material resources associated with the construction of all elements of the DCO Proposed Development; and
- Disposal and recovery of waste associated with the construction and site clearance activities of all elements of the DCO Proposed Development.

Operation and Decommissioning Stage

14.4.5. As noted in **Table 14.1**, elements within the Operational and Decommissioning Stages of the DCO Proposed Development have been scoped out.

14.5. ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

STUDY AREA

14.5.1. The Study Areas applicable to the DCO Proposed Development (as defined the IEMA Guide (**Ref 14.15**)) are:

- The **Development Study Area** - the extent of works of the Newbuild Infrastructure Boundary, including areas required for temporary access, Construction Compounds, working platforms and other enabling activities. This is described fully in **Chapter 3 – Description of the DCO Proposed Development (Volume II)** and (in summary) includes:
 - Laying of underground, onshore Newbuild Carbon Dioxide Pipeline and connection to existing Flint Connection to PoA Terminal Pipeline;
 - Construction of four AGIs and six BVSs.
- Where data are available, the **Expansive Study Area** extends to the availability of construction materials and the capacity of waste management facilities within the region where the DCO Proposed Development is located: the North West of England region (Cheshire, Cumbria, Greater Manchester, Lancashire, Merseyside, Warrington, and Halton) and North Wales (Conwy, Denbighshire, Flintshire, Gwynedd, Isle of Anglesey, Powys, and Wrexham)¹.

¹ Where no data for North Wales are available, data for Wales has been used.

METHOD OF BASELINE DATA COLLATION

Desk Study

14.5.2. Desk-based studies of publicly available data have been carried out to prepare the baseline data for materials resource availability; regional transfer, recovery and recycling; and remaining landfill capacity. The findings of the studies are presented in **Section 14.6** and include data from the following sources:

- Profile of the UK Mineral Products Industry (**Ref. 14.16**)
- Monthly Bulletin of Building Materials and Components (**Ref. 14.17**)
- Iron and Steel Production by Year, Measure and Area (**Ref. 14.18**)
- Waste Data Interrogator (**Ref. 14.19**)
- Remaining Landfill Capacity (**Ref. 14.20**)
- Waste Permit Returns Data Interrogator (**Ref. 14.21**)
- Environmental Permitting Regulations – Waste Sites (**Ref. 14.22**)
- Remaining landfill void in Wales (**Ref. 14.23**)
- Cheshire West and Chester Local Plan Interactive Policies Map (**Ref. 14.24**)
- Flintshire LDP 2019 (Interactive Map) Mineral Safeguarding Areas (**Ref. 14.25**)
- North West Aggregate Working Party Annual Monitoring Report 2019 (**Ref. 14.26**)
- Waste Planning Monitoring Report North Wales 2020 (**Ref. 14.27**).

Site Visit and Surveys

14.5.3. No site visit or surveys were required for the assessment of Material Assets and Waste as data to inform the baseline is publicly available through desktop research.

IMPACT ASSESSMENT METHODOLOGY

14.5.4. The IEMA Guide (**Ref 14.15**) has been used to assess the potential impacts and effects from the DCO Proposed Development, using the process and significance criteria it sets out. Method W1 (Void Capacity, as detailed in the IEMA Guide (**Ref 14.15**)) has been used to best reflect the scale and nature of the DCO Proposed Development.

14.5.5. In accordance with the IEMA Guide, the assessment is a quantitative exercise that aims to identify the following:

- The type and volume of materials to be consumed by the DCO Proposed Development, including details of any recycled materials content.
- The type and volume of waste to be generated by the DCO Proposed Development, with details of planned recovery and / or disposal method (for example on-site reuse, off-site recycling, disposal to landfill).

- The cut and fill balance.
- Details of any materials to be specified, where sustainability credentials (particularly those that improve resource efficiency) afford performance beyond expected industry standards.

14.5.6. The sensitive receptors incorporated into the assessment are:

- **Material resources** – consumption adversely impacts on natural resources' immediate and long-term availability, resulting in their depletion.
- **Landfill void capacity** – reductions in regional and national infrastructure result in unsustainable use or loss of resources, and temporary or permanent degradation of the natural environment.

14.5.7. The sensitivity of materials relates to the regional (and where justified, national) availability and type of resources to be consumed by the DCO Proposed Development.

14.5.8. The sensitivity of waste relates to the availability of regional (and where appropriate, national) landfill void capacity, in the absence of the DCO Proposed Development and future provision.

14.5.9. The magnitude of impacts from the DCO Proposed Development that have been considered in the assessment include:

- Anticipated reductions in availability (stocks, production and/or sales) of materials regionally and nationally; and
- Anticipated reductions in the landfill void capacity of regional and national infrastructure.

14.5.10. The likely types and estimated quantities of material resources required (including site arisings generated) for the DCO Proposed Development have been assessed. Impacts and effects have been evaluated against data for the regional and national materials markets, where information is available.

14.5.11. The likely types and estimated quantities of waste to be generated by the DCO Proposed Development have been assessed. Impacts have been evaluated against the capacity of regional (or where justified, national) waste management infrastructure.

SIGNIFICANCE CRITERIA

Sensitivity

14.5.12. The criteria for assessing sensitivity of Material Assets and Waste are set out in **Table 14.2**. The information provided is based on information in Section 10.2 of the IEMA Guide (**Ref. 14.15**). The sensitivity of materials will be determined by identifying where one or more of the criteria from the following thresholds are met.

- 14.5.13. The sensitivity of waste is determined by considering the baseline / future baseline of regional (or where justified, national) landfill void capacity across the Construction Stage.

Table 14.2 – Material Assets and Waste Sensitivity Criteria

Sensitivity	Materials Criteria <i>On balance, the key materials required for the construction of the Project...</i>	Inert and non-hazardous waste criteria <i>Landfill void capacity is expected to...</i>	Hazardous waste criteria <i>Landfill void capacity is expected to...</i>
Negligible	...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*	...remain unchanged or is expected to increase through a committed change in capacity.	...remain unchanged or is expected to increase through a committed change in capacity.
Low	...are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and / or ...are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials*.	...reduce minimally: by <1% as a result of wastes forecast.	...reduce minimally: by <0.1% as a result of wastes forecast.
Medium	...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*.	...reduce noticeably: by 1-5% as a result of wastes forecast.	...reduce noticeably: by 0.1-0.5% as a result of wastes forecast.
High	...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.	...reduce considerably: by 6-10% as a result of wastes forecast.	...reduce considerably: by 0.5-1% as a result of wastes forecast.

Sensitivity	Materials Criteria <i>On balance, the key materials required for the construction of the Project...</i>	Inert and non-hazardous waste criteria <i>Landfill void capacity is expected to...</i>	Hazardous waste criteria <i>Landfill void capacity is expected to...</i>
Very High	<p>...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.</p>	<p>... reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.</p>	<p>... reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.</p>
Notes	<p>* Assessment of the proportion of sustainable features (very high, high, some, none) is undertaken using professional judgement. Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that:</p> <ul style="list-style-type: none"> • 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. 		

Magnitude

14.5.14.

Table 14.3 describes the criteria for assessing the magnitude of impact on Material Assets and Waste. The table articulates information set out in Section 10.3 of the IEMA Guide (**Ref. 14.15**).

Table 14.3 – Material Assets and Waste Magnitude Criteria

Magnitude	Materials Criteria <i>The assessment of the Project is made by determining whether the consumption of...</i>	Inert and non-hazardous waste criteria <i>The percentage depletion of remaining landfill void capacity</i>	Hazardous waste criteria <i>The percentage depletion of remaining landfill void capacity</i>
No change	...no materials are required.	Zero waste generation and disposal from the development.	Zero waste generation and disposal from development
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional* baseline availability.	Waste generated by the development will reduce regional* landfill void capacity baseline\$ by <1%.	Waste generated by the development will reduce national landfill void capacity baseline\$ by <0.1%
Minor	...one or more materials is between 1-5% by volume of the regional* baseline availability; and / or the development has the potential to adversely and substantially# impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.	Waste generated by the development will reduce regional* landfill void capacity baseline\$ by 1-5%.	Waste generated by the development will reduce national landfill void capacity baseline\$ by <0.1-0.5%
Moderate	...one or more materials is between 6-10% by volume of the regional* baseline availability; and / or one allocated mineral site is substantially# sterilised by the development rendering it inaccessible for future use.	Waste generated by the development will reduce regional* landfill void capacity baseline\$ by 6-10%.	Waste generated by the development will reduce national landfill void capacity baseline\$ by <0.5-1%
Major	...one or more materials is >10% by volume of the regional* baseline availability; and / or	Waste generated by the development will reduce regional* landfill void capacity baseline\$ by >10%.	Waste generated by the development will reduce national landfill void capacity baseline\$ by >1%

Magnitude	Materials Criteria <i>The assessment of the Project is made by determining whether the consumption of...</i>	Inert and non-hazardous waste criteria <i>The percentage depletion of remaining landfill void capacity</i>	Hazardous waste criteria <i>The percentage depletion of remaining landfill void capacity</i>
	more than one allocated mineral site is substantially# sterilised by the development rendering it inaccessible for future use.		
Notes	* or where justified, national. # justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed. \$ forecast as the worst-case scenario to the end of the Construction Stage timeframe.		

Significance Criteria

- 14.5.15. In accordance with Section 11 of the IEMA Guide (**Ref. 14.15**), the significance of effects on Material Assets and Waste will be determined by comparing sensitivity and magnitude using the matrix provided in **Table 14.4**.

Table 14.4 – Matrix to Assign Significance of Effect Category

		Sensitivity of Receptor				
		Negligible	Low	Medium	High	Very high
Magnitude of Impact	No change	Neutral	Neutral	Neutral	Neutral	Neutral
	Negligible	Neutral	Neutral or slight	Neutral or slight	Slight	Slight
	Minor	Neutral or slight	Neutral or slight	Slight	Slight or moderate	Slight or moderate
	Moderate	Neutral or slight	Slight	Moderate	Moderate or Large	Large or Very Large
	Major	Slight	Slight or moderate	Moderate or Large	Large or Very Large	Very Large

- 14.5.16. Effects that are classified as moderate, large or very large are considered to be **significant**, for both material assets and waste (noted in bold text in **Table 14.4**). Effects classified as slight or neutral are considered to be *not significant* in either case.

ASSUMPTIONS AND LIMITATIONS

- 14.5.17. The assessment of effects on material assets and landfill void capacity is based upon collated information, including third party data, which is assumed (by accessing reputable industry-recognised sources) to be valid.
- 14.5.18. Data to inform the material and waste types and quantities has been based on the Preliminary Design of the DCO Proposed Development and may be refined through the procurement and Construction Stage. The data assessed comprises the key bulk materials for the construction works and estimated generation of arisings and waste. Excluded materials, as well as waste generated by construction workers and welfare facilities, are considered de minimis and are not anticipated to materially impact on the assessment findings.
- 14.5.19. Where excavated earthworks (predominately soil and small quantities of peat) are generated for the trenched pipeline installation, the quantities have been excluded from the assessment as this will be backfilled in-situ. It is assumed that excavated earthwork material will be reused onsite through backfilling where chemically and physically suitable, through measures put in place by the Materials Management Plan (MMP) that will be produced by the Construction

Contractor(s) as included as a Requirement of the **Draft DCO (Document Reference: D.3.1)**. In the event that excavated materials are unsuitable for reuse, such as contaminated soils or hazardous materials (not soils i.e. anthropogenic material), the Construction Contractor will follow appropriate legislative requirements and best practice. In the event that there is a requirement for these unsuitable materials to be disposed of off-site, the material will be appropriately classified prior to transport to a suitably licenced landfill /treatment centre. However, it is assumed that if present these quantities will be de-minimis.

- 14.5.20. No data (tonnage) are available to quantify organic matter (trees, hedges and shrubs) removed as part of the Construction Stage. Arising generated will be shredded on site and used as a mulch or taken for off-site recycling or composting. As such, the arisings will be diverted from landfill and will not impact the findings of the assessment.
- 14.5.21. For material resources, the assessment baseline uses the most recent available published data, which is up to and including 2020 (unless stated otherwise). Future trends are not available for scrutiny and are – at the time of publication – generally accepted to be relatively unpredictable (particularly with supply chain impacts resulting from COVID-19 or the UKs departure from the EU).
- 14.5.22. For waste, baseline data and publicly available information for the assessment uses the latest available data. Where used in the Chapter, the date at which data has been acquired is – in all cases – stated.
- 14.5.23. Landfill operators can claim commercial confidentiality for their data at time of submission; data for sites with a commercial confidentiality agreement in place are therefore unavailable for the analyses presented in this Chapter. As publicly available data from Natural Resources Wales and the Environment Agency has been used to inform the assessment, any absence of data through confidentiality agreements are considered, as they represent the minority of cases, unlikely to materially affect the findings of this Chapter.

14.6. BASELINE CONDITIONS

- 14.6.1. This section describes baseline material consumption and waste disposal for the current land use. It also provides regional and national information and data in the context of which environmental assessment will be undertaken.
- 14.6.2. The most up to date sources of information at the time of writing have been used to collate data for material resource availability, landfill capacity and waste recovery. The baseline data collected and presented in this section were obtained by desk study, from publicly available sources.

EXISTING BASELINE: MATERIALS

Material Resources Currently Required

- 14.6.3. The current land uses for the Development Study Area predominantly includes agricultural land, with some industrial and residential estates. Other assets and environmental attributes include highways, rail infrastructure, a canal, and rivers.
- 14.6.4. The types of material that are expected to be required for the existing land uses identified comprise (mainly) aggregate, concrete, steel, and asphalt – their use will be associated with routine maintenance and repair works, and typically for highway assets.
- 14.6.5. Although no data are currently available, professional judgement can be used to assert that by comparison with regional and national availability of resources, consumption of construction and other materials for routine activities currently required within the current land uses, is minimal.

Material Resource Availability

- 14.6.6. **Table 14.5** provides a summary of the availability of the main construction materials in North West of England region, Wales (in the absence of data specific to North Wales), and the UK. The materials listed are considered to be appropriate to the bulk construction materials required for the DCO Proposed Development. It should be noted that **Table 14.5** excludes technological products but still provides a proportionate context in which the assessment of impacts and significant effects from material consumption can be undertaken.

Table 14.5 - Construction Materials Availability in the North West of England, Wales, and the UK

Material Type	North West England	Wales	UK
Sand and gravel * (Ref. 14.16)	2.8 million tonnes (Mt)	1.6 Mt	(refer to primary aggregate)
Permitted crushed rock * (Ref. 14.16)	5.7 Mt	12.0 Mt	
Primary aggregate (comprises sand and gravel and crushed rock) * (Ref. 14.16)	(no data)	(refer to sand and gravel and crushed rock)	198.8 Mt
Concrete blocks (2021) * (Ref. 14.17)	5.3 million square meters (Mm ²) (North)	0.9 Mm ² (Wales and Scotland)	74.2 Mm ² (GB)

Material Type	North West England	Wales	UK
Recycled and secondary aggregate⁺ and *	8.6 Mt (2017) (Ref. 14.26)	(no data)	71.0 Mt (GB) (Ref. 14.16)
Ready-mix concrete * (Ref. 14.16)	1.6 million cubic meters (Mm ³)	0.6 (Mm ³)	24.7 Mm ³
Steel + (Ref. 14.18)	(no data)	4.3 Mt	7.2 Mt
Asphalt * (Ref. 14.16)	2.4 Mt	1.4 Mt	27.4 Mt
# stocks + production * sales Data availability: 2019 unless otherwise stated Data for Wales has been used, as data for North Wales were not available at the time of publication GB: Great Britain (England, Wales, and Scotland) figures used where UK figures (including Northern Ireland) are unavailable			

14.6.7. Across the North West of England, Wales and the UK, the availability of construction materials typically required for construction schemes indicates that stocks / production / sales remain buoyant. The available data shows that the North West of England region has, in general, a higher than average availability of some construction materials by comparison with other UK regions. For example, stocks of concrete block and sales of recycled and secondary aggregate are amongst the highest in the UK. Within Wales, the sales of permitted crushed rock are above the average for all UK regions. Sales and sand and gravel within the North West of England and Wales are, however, below the UK average, as are stocks of concrete blocks and sales of ready-mix concrete within Wales.

14.6.8. Whilst it is recognised that political and pandemic issues (such as the departure of the UK from the EU and COVID-19, respectively) continue to adversely impact construction supply chain security, no definitive data in this context is available for this document. For the purposes of this assessment, any interruptions to the supply chain due to such influences are considered temporary and it is likely that these will have been resolved prior to the year of commencement of construction of the DCO Proposed Development (2024).

Mineral Safeguarding Areas

14.6.9. Policy ENV9 of the Cheshire West and Chester Council Local Plan (Ref. 14.12) sets out mineral supply and safeguarding provisions. Sand and gravel reserves

within the Local Authorities' region are noted to contribute to national land-won resources. The Flintshire Unitary Development Plan (**Ref. 14.13**) details the protection of mineral interests under Policy MIN8. Mineral Safeguarding Areas (MSAs) are represented on the Cheshire West and Chester Local Plan Interactive Policies Map (**Ref. 14.24**) and the Flintshire LDP 2019 (Interactive Map) Mineral Safeguarding Areas (**Ref. 14.25**).

- 14.6.10. The Development Study Area includes, and is close to, a number of sand and gravel reserves. In Cheshire West and Chester, these include sand and gravel reserves between Junctions 14 and 15 of the M56, north of Caughall and south of Backford. These MSAs are partly sterilised by existing road infrastructure and the Shropshire Union Canal.
- 14.6.11. Within Flintshire, MSAs to the north of Ewloe are partially sterilised by existing road and building infrastructure, and an area to the east of Allt-Goch Lane (south east of Flint) currently comprises farmland (at the Flint AGI location). Pentre Halkyn and Babell BVSs are located within a large MSA extending from Mold to Prestatyn, covering an area of approximately 9,000 hectares. The MSA is sterilised in places by existing road and buildings infrastructure.

EXISTING BASELINE: SITE ARISING AND WASTE RECOVERY

Site Arisings Currently Generated

- 14.6.12. The current land use within the Development Study Area is expected to generate minimal volumes of site arisings, limited to potential earthwork arisings from agricultural activities and surplus materials generated during minor repair works on existing road, rail and canal infrastructure (such as the use of aggregate and stone). Although no live data exist in this context, it is anticipated (using professional judgement) that the current generation of site arisings is minimal.

Existing Waste Transfer, Recovery and Recycling Management Facilities

- 14.6.13. Data in **Table 14.6** from the UK Statistics on Waste (**Ref. 14.28**) show that within England and the UK, the recovery rate for non-hazardous construction and demolition wastes has remained above 90% since 2011. Data specific to Wales is only available for the year 2012, at which time the recovery rate was 87% (**Ref. 14.29**). Recovery rates therefore exceed the EU target of 70% (by weight) which the UK was required to meet by 2020. Note that this target excludes naturally occurring materials (specifically, category 17 05 04 in the list of waste defined as non-hazardous soils and stones) (**Ref. 14.30**).

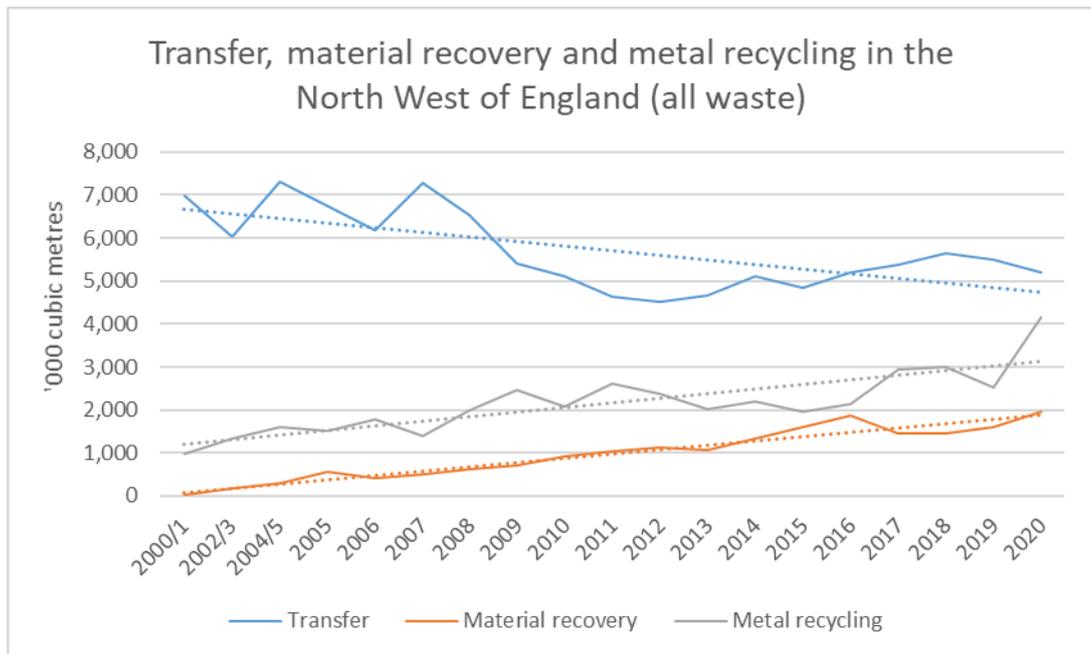
Table 14.6 - Non-hazardous Construction and Demolition Waste Recovery in England (all years)

Year	Generation (Mt)		Recovery (Mt)		Recovery rate (%)	
	England	UK	England	UK	England	UK
2010	53.6	59.2	49.4	53.1	92.2%	89.7%
2011	54.9	60.2	50.8	55.0	92.5%	91.4%
2012	50.5	55.8	46.4	50.8	92.0%	91.1%
2013	51.7	57.1	47.6	52.0	92.0%	91.2%
2014	55.9	61.5	51.7	56.3	92.4%	91.5%
2015	57.7	63.8	53.3	58.0	92.3%	91.0%
2016	59.6	66.2	55.0	60.0	92.1%	90.7%
2017	62.2	68.7	57.9	62.9	93.1%	91.5%
2018	61.4	67.8	57.5	62.6	93.8%	92.3%
2019	62.3	(no data)	58.3	(no data)	93.6%	(no data)
2020	53.6	(no data)	50	(no data)	93.2%	(no data)

Note: Defra's 2022 update of this table does not extend the data range beyond 2018 for the UK and 2020 for England.

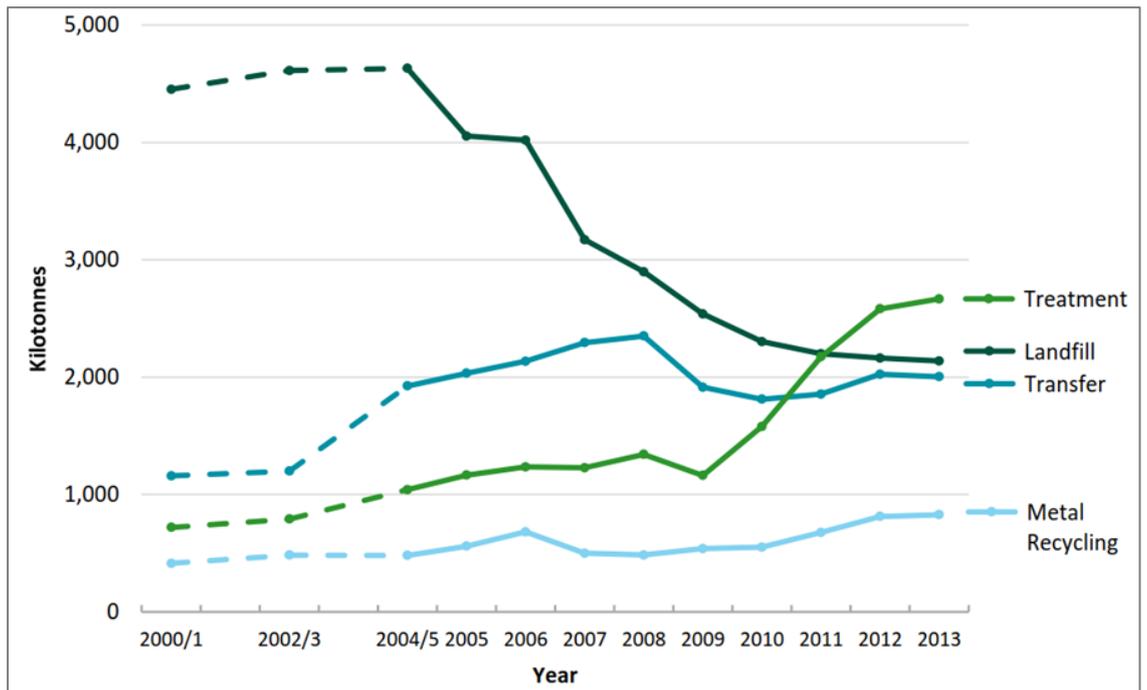
14.6.14.

Data in **Insert 14.1** has been collated to show that trends for waste recovery (material recovery and metal recycling) in the North West of England region (no data for Wales exists) have risen steadily over the past 19 years (**Ref. 14.19**). Data are provided for all waste types in the North West of England and hence will include, but are not specific to, Construction, Demolition and Excavation (CDE) wastes.



Insert 14.1 - Transfer, Material Recovery and Recycling in the North West Region (2000/1 - 2020)

14.6.15. Recent regional data for CDE wastage and recovery trends are not available for Wales. Instead, data in **Insert 14.2** show that rates of waste recovery for all types of waste (including CDE) have increased (treatment) or remained relatively constant (metal recycling) since 2004 until the latest available data in 2013 (**Ref. 14.31**).



Insert 14.2 - Waste Recovery Rates in Wales (2000/1 – 2013)

14.6.16.

The trends for transfer, treatment, recovery and metal recycling in the North West of England and Wales indicate that there is likely to be regional infrastructure and capacity for managing CDE wastes from the DCO Proposed Development. This assertion is further affirmed by the number of permitted waste recovery sites presented in **Table 14.7 (Ref. 14.19, Ref. 14.22)**.

Table 14.7 - Permitted Waste Recovery Sites in the North West of England Region (2020) and Wales (2021)

Waste recovery facility type	Number of sites (North West England) (2020)	Number of sites (Wales) (2021)	Total
Incineration	20	3	23
Transfer	375	230	605
Treatment	432	131	563
Metal recovery	316	93	409
Use of waste	1	5	6
Total	1,144	462	1,606

14.6.17.

Data in **Table 14.8**, as sourced from the Waste Data Interrogator (**Ref. 14.19**) and Waste Permit Returns Data Interrogator (**Ref. 14.21**), show that 79% of construction and demolition waste (European Waste Catalogue, Chapter 17) received in the North West of England region and 94% of the waste received in North Wales was diverted from landfill through waste management and recovery methods. Data include the total waste received from both within the subject region and from other regions in the UK.

Table 14.8 - Waste Management Routes for Waste Received in the North West of England and North Wales regions (2020)

Waste Management Route		Inert and non-hazardous waste (tonnes)	Hazardous wastes (tonnes)	Total waste (tonnes)	Percentage
Recovery	NW England	5,787,975	2,563	5,790,539	79%
	North Wales	285,990	1,044	287,034	94%
Landfill	NW England	1,133,452	18,458	1,151,910	16%
	North Wales	17,126	410	17,536	6%
Other fate	NW England	414,431	10	414,431	6%

Waste Management Route		Inert and non-hazardous waste (tonnes)	Hazardous wastes (tonnes)	Total waste (tonnes)	Percentage
Totals	NW England	7,335,858	21,031	7,356,899	100%
	North Wales	303,116	1,454	304,507	100%

Recovery comprises treatment, reprocessing, transfer, use of waste in or on land (e.g. composting), incineration and long-term storage.

‘Other fate’ is not defined by the Environment Agency.

Data for England identifies the ‘fate’ of the waste (such as recovery, treatment and transfer), however this data is not provided for Wales. Instead, the category of the waste site e.g. material recovery facility (MRF), treatment, transfer has been used to allow a comparison of similar data.

Non-hazardous soils and stones (EWC 17 05 04) contributed 4,075,937 tonnes of waste in 2020, of which 1,072,388 tonnes (26%) was disposed of to landfill and 3,003,549 tonnes (74%) recovered in North West England.

Non-hazardous soils and stones (EWC 17 05 04) contributed 744,139 tonnes of waste in 2020, of which 125,884 tonnes (17%) was disposed of to landfill and 618,255 tonnes (83%) recovered in North Wales.

- 14.6.18. The data presented in this section (Existing Waste Transfer, Recovery and Recycling Management Facilities) confirm the availability of waste management facilities across the in-scope region. The availability of materials recovery infrastructure regionally and across England and Wales, suggests that there is strong potential to divert from landfill site arisings generated by the DCO Proposed Development. The importance of this infrastructure will maximise the reuse / recycling value of site arisings. Recovering arisings and diverting them from landfill has the potential to materially influence the findings of the assessment of impacts and effects from material resource consumption and waste disposal to landfill.

EXISTING BASELINE: WASTE GENERATION AND DISPOSAL

Waste Currently Generated and Disposed

- 14.6.19. The current land use within the Development Study Area is expected to generate minimal quantities of waste from agricultural activities and routine maintenance on the existing highway, rail, and canal infrastructure. Wastes may comprise (for example) asphalt from minor repairs to roads, steel, and

aggregate from repairs to rail infrastructure, litter, light and signage replacement and vegetation from verge clearance. Material dredged and cleared from canals and rivers may also be generated. The magnitude of impact associated with disposing of this waste is expected – using professional judgement – to be negligible in the context of available regional landfill capacity.

Remaining Landfill Capacity

- 14.6.20. The latest available remaining landfill data (**Ref. 14.20, Ref. 14.27**) is provided for 2020 for North West England and 2019 for North Wales. These data confirm that in North West England, 32 landfill sites were recorded as having 39Mm³ of remaining capacity. Data for North Wales confirm remaining landfill capacity to be in the region of 3.7Mm³. The recently published North Wales Waste Planning Monitoring Report (**Ref. 14.27**) confirms there are no permitted landfill sites accepting hazardous waste in North Wales. Three inert landfill sites are anticipated to have capacity for approximately eight years and non-hazardous landfill sites capacity for 14 years.
- 14.6.21. Data in **Table 14.9** summarise this information by landfill type; the change in capacity from 2019 to 2020 (for the North West of England) is also shown and indicates that additional landfill capacity had been implemented in 2020.

Table 14.9 - Remaining Landfill Capacity in the North West of England and North Wales

Landfill Type	Location	Remaining capacity in 2019 (m³)	Remaining capacity in 2020 (m³)	2019 to 2020 remaining capacity trend (NW England)
Hazardous (merchant)	North West England	6,000,084	6,122,589	+2.0%
	North Wales	0	(no data)	
Inert	North West England	5,498,334	5,203,894	-5.4%
	North Wales	880,000	(no data)	
Non-hazardous (including stable hazardous waste cells)	North West England	24,655,629	27,987,559	+13.5%
	North Wales	2,800,000	(no data)	

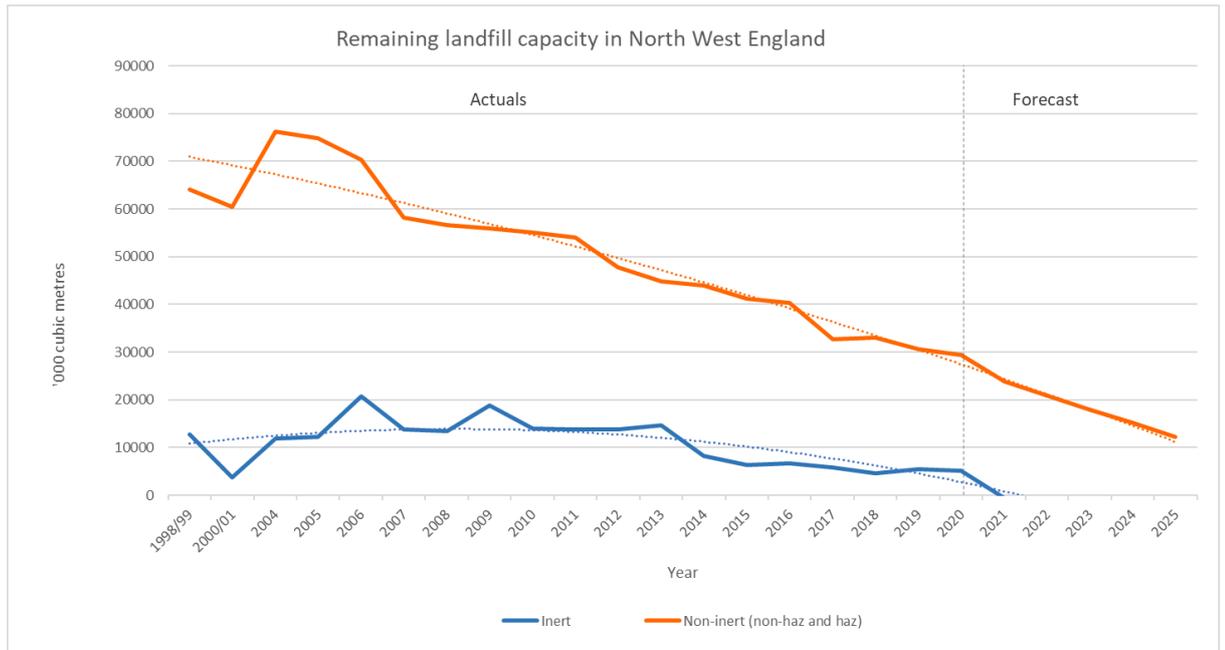
Landfill Type	Location	Remaining capacity in 2019 (m ³)	Remaining capacity in 2020 (m ³)	2019 to 2020 remaining capacity trend (NW England)
Total	North West England	36,154,047	39,314,042	+8.7%
	North Wales	3,680,000	(no data)	

14.6.22. Further to the regional data provided in **Table 14.9**, the assessment of magnitude, as set out in the IEMA Guide, also considers the national remaining landfill capacity for hazardous waste. **Table 14.10** provides the remaining hazardous waste landfill capacity in England (from 2020) and Wales (from 2018) (**Ref. 14.20, Ref. 14.22**).

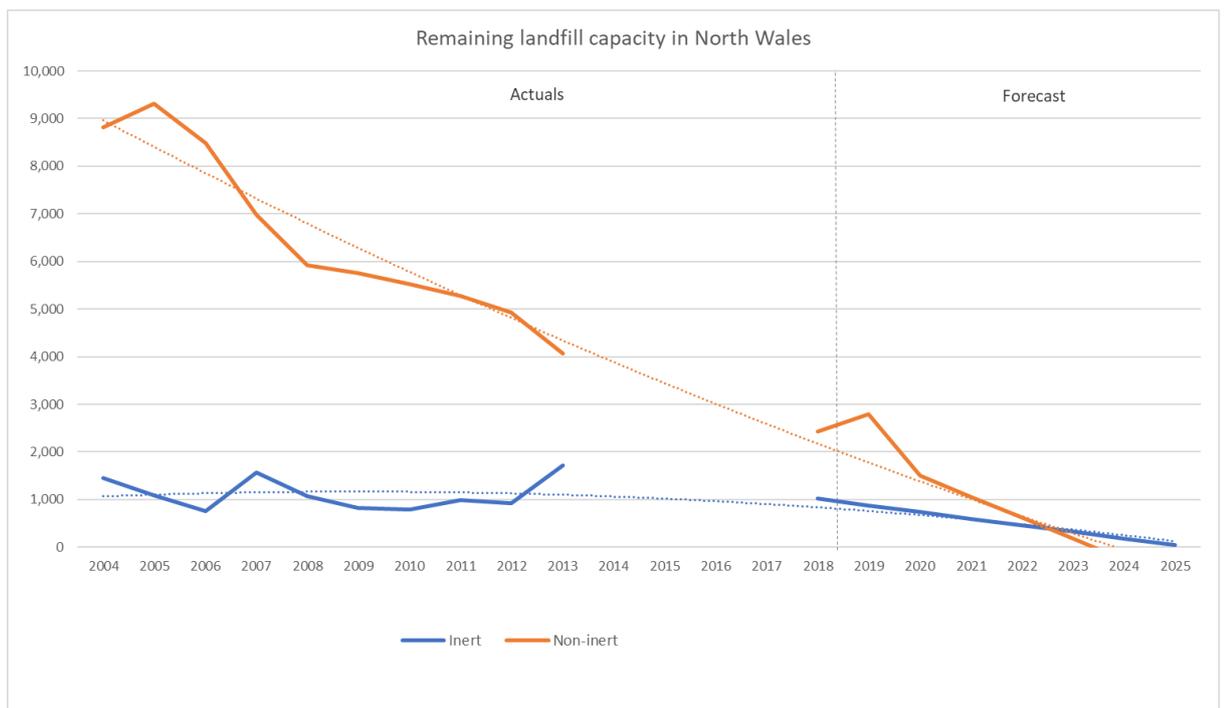
Table 14.10 - Remaining Hazardous Landfill Capacity in England and Wales

Landfill Type	Location	Remaining capacity (m ³)
Hazardous (merchant*)	England	15,571,171 (2020)
Hazardous**	Wales	13,868 (2018)
Total	England and Wales	15,585,039
<p>*Hazardous landfill sites in England are separated into merchant and restricted sites. Restricted landfill sites only accept waste from restricted sources and producers, e.g. site operator / managing site. As such, only merchant sites are considered.</p> <p>** Data provided by Natural Resources Wales (NRW) does not distinguish between merchant and restricted hazardous waste sites.</p>		

14.6.23. Baseline regional capacity is detailed in **Inserts 14.3 and 14.4**. Simple statistical forecasting (using the Microsoft Excel forecasting function) has been used to demonstrate long term void capacity to the year of planned completion of the DCO Proposed Development (currently anticipated to be 2025) in the absence of future provision. Data between 2014 and 2018 for North Wales are not publicly available. Data for non-inert waste includes non-hazardous and merchant hazardous waste.



Insert 14.3 - Remaining Landfill Capacity in North West England



Insert 14.4 - Remaining Landfill Capacity in North Wales

14.6.24.

Baseline data indicates that in the absence of future provision, inert, non-inert and total landfill capacity will become an increasingly sensitive receptor throughout the duration of the Construction Stage and in Operation. **Table 14.11** summarises the forecasts remaining capacity of inert and non-inert waste in the year 2025 (planned completion of the DCO Proposed Development). In

the absence of future provision, inert landfill capacity is expected to reduce by as much as 95%, and non-inert landfill capacity by 58%.

Table 14.11 - Forecast Waste Capacity

Waste type	Forecast remaining capacity (2025)	Forecast reduction in capacity (2025)
Inert waste (North West England)	0 Mm ³	100%
Inert waste (North Wales)	0.4 Mm ³	95%
Non-inert waste (North West England)	12.3 Mm ³	58%
Non-inert waste (North Wales)	0 Mm ³	100%

- 14.6.25. Policy ENV9 of the Cheshire West and Chester Council Local Plan (**Ref. 14.24**) notes, in 2015 (when it was published), that additional non-hazardous landfill capacity will be needed in 2024; it also notes that there is sufficient capacity of hazardous and inert landfill sites until 2030. Comparable information is not provided in the Flintshire County Council Unitary Development Plan.

FUTURE BASELINE

- 14.6.26. In the future baseline (in the absence of the DCO Proposed Development) it is considered that the current land use within the Development Study Area (which is predominantly agricultural) area will remain the same. It is noteworthy that as the road, rail and canal infrastructure ages, increased maintenance and repair work may be required, which could result in changes to material consumption, site arisings and waste generation.
- 14.6.27. However, given the scale of the current infrastructure within the Development Study Area, the consumption of materials resources and the recovery of site arisings is expected to remain minimal. Similarly, the potential for waste generation to landfill in the future baseline is anticipated to remain minimal.

14.7. SENSITIVE RECEPTORS

- 14.7.1. The sensitive Receptors in **Table 14.12** have been assessed in this Chapter.

Table 14.12 – Sensitive Receptors

Receptor	Value / Sensitivity
<p>Material resources – consumption impacts on materials’ immediate and long-term availability, and results in depletion of natural resources.</p> <p>The availability of construction materials typically required for construction schemes, indicates that stocks / production / sales remain buoyant.</p>	Adverse / Low
<p>Landfill void capacity – reductions in regional and national infrastructure result in unsustainable use and loss of resources, and temporary or permanent degradation of the natural environment.</p> <p>In the absence of future provision, landfill void capacity for inert and non-hazardous waste in North Wales is forecast to elapse in 2023, with no current provision for hazardous waste.</p> <p>In North West England, inert waste capacity was - in the absence of future provision - forecast to elapse in 2021. Non-inert waste capacity (incorporating hazardous and non-hazardous waste) in North West England will reduce by 68% by 2026, when construction is complete.</p>	Adverse / Very High

14.8. DESIGN DEVELOPMENT, IMPACT AVOIDANCE, AND EMBEDDED MITIGATION

14.8.1. The assessment of material resources required, and waste anticipated to be generated and disposed of, for the DCO Proposed Development are based on the most recent design available at the time of writing. The DCO Proposed Development aligns to the Applicant’s policy (**Ref. 14.32**) which outlines minimum requirements to be applied during project engineering design to enable environmental impacts to be as low as reasonably practicable. In relation to material resources and waste generation and disposal, this includes:

- Application of circular economy principles by the Construction Contractor implemented in the detailed CEMP including:
 - Designing solutions to prevent the generation of waste where feasible, and to send waste for recovery, wherever possible.
 - Considering all Stages of construction, operation and decommissioning in a lifecycle approach.
 - Identification of resource streams that might be considered by-products (i.e. not wastes, as per applicable legislation) and reused or recycled (**D-MW-001** of the **Register of Environmental Actions and Commitments (REAC)**, **Document Reference: D.6.5.1**).

- The Waste Management Plan will adhere to the highest tiers of the Waste Hierarchy, all relevant legislation and the Applicant’s waste management procedures as detailed in the Applicant’s policy (**Ref 14.32**) (**D-MW-002** of the **REAC, Document Reference: D.6.5.1**).
- Waste storage areas will be incorporated into the Detailed Design. Waste segregation measures will be put in place by the Construction Contractor as implemented in the detailed CEMP and Waste Management Plan (**D-MW-003** of the **REAC, Document Reference: D.6.5.1**).

14.8.2. In addition, the following construction methods have the potential to reduce adverse impacts and will be adopted:

- The Construction Contractor will ensure that the backfilling of earthworks generated through trenching activities (subject to suitability of material) will be undertaken (**D-MW-004** of the **REAC, Document Reference: D.6.5.1**).
- Use of trenchless installation techniques (such as horizontal directional drilling or auger boring) will prevent additional material resource consumption and waste generation and disposal through the avoidance of infrastructure removal and replacement (**D-MW-005** of the **REAC, Document Reference: D.6.5.1**).

14.9. ASSESSMENT OF LIKELY IMPACTS AND EFFECTS

14.9.1. This Section details the preliminary assessment of predicted impacts and effects for the DCO Proposed Development during the Construction Stage. As noted in **Section 14.4**, the Operational and End of Life Decommissioning Stages are out of scope of the Material Assets and Waste assessment.

Construction Stage: Material Resources

14.9.1. Key (indicative) bulk construction materials required for the DCO Proposed Development, are set out in **Table 14.13**. Data is based on the current design estimates and has been rounded up to the nearest 10 tonnes.

Table 14.13 - Indicative Bulk Material Resources Required for Construction

Material Asset	Estimated Quantity (tonnes)	Use of Material in the DCO Proposed Development	Consumption compared to baseline (material availability)
Aggregate	51,380	Required for road subbase and gravel.	0.29% of Welsh baseline 0.07% of UK baseline
Concrete	13,960	Required for foundations and paving.	0.26% of Welsh baseline 0.02% of UK baseline

Material Asset	Estimated Quantity (tonnes)	Use of Material in the DCO Proposed Development	Consumption compared to baseline (material availability)
Copper (cabling)	40	Copper cabling, including plastic sheathed copper cable.	No baseline data available
Earthworks	35,840	Imported earthworks material.	No baseline data available
Glass / Plastic	50	Fibre optic cabling.	No baseline data available
Sand	80,300	Pipeline bedding, trench backfilling, and as a sand and cement grout mixture for filling microtunnels.	1.83% of Welsh baseline (incorporated in aggregate for the UK baselined)
Steel	17,190	Required for the pipeline, associated valves, fencing, kiosks, control cabinets, etc.	0.40% of Welsh baseline 0.24% of UK baseline

- 14.9.2. Using the baseline data for material resource availability in the North West of England and Wales, it can be asserted that there are currently no supply issues regarding the stock and supply of key construction materials; however, it is recognised that political and pandemic issues (such as the departure of the UK from the EU and COVID-19, respectively) could continue to adversely impact the construction supply chain security.
- 14.9.3. Using data for the anticipated material resources required for the DCO Proposed Development (as detailed in **Table 14.13**) and comparing these to data (where available) from the baseline, the consumption of sand is greatest, at 1.83% of the Welsh baseline. Although no baseline data exist for copper, this material is readily recycled across industry and high in value, so is highly likely to be subject to recovery, reuse and recycling across its lifetime, reducing the need to consume new, primary materials.
- 14.9.4. As reported in the baseline (**Section 14.6**), the DCO Proposed Development passes through and close to several MSAs. The DCO Proposed Development has the potential to further sterilise these mineral sites by preventing future extraction of the mineral resource.
- 14.9.5. The locations of Flint AGI, Pentre Halkyn BVS and Babel BVS have the greatest potential to impact the MSA due to their location on agricultural land. The Development Study Area in the vicinity of the Flint AGI would potentially impact on approximately five hectares (ha) of the MSA which covers an area in the region of 75ha. The Development Study Area around Pentre Halkyn and

Babell BVSs covers approximately 6 hectares of the large MSA, which covers over 9,000 hectares.

- 14.9.6. Other MSAs within the Development Study Area experience some existing sterilisation through infrastructure (roads, buildings and the Shropshire Union canal).
- 14.9.7. Using professional judgement to apply the criteria set out in **Table 14.2**, the sensitivity of material resources is considered low. Using the criteria set out in **Table 14.3**, the magnitude of material resource consumption considering the impact on mineral safeguarding areas is *moderate*.
- 14.9.8. Taking into account the low sensitivity (materials production, stocks and supplies) and the moderate magnitude of impact, effects associated with the potential sterilisation of MSA are (in accordance with the criteria set out in **Table 14.4**) slight adverse and therefore *not significant*.
- 14.9.9. A Mineral Resource Assessment (MRA) has been prepared to support this ES (**Appendix 11.5 - Mineral Resource Assessment, Volume III**) to evidence the mineral resources available which may be impacted by the DCO Proposed Development. The MRA will be submitted as part of the DCO Application to the Local Planning Authority where agreement on avoidance or prior extraction methods will be determined. The MRA has not been taken into account as part of the Materials Assets and Waste assessment, as until agreement and actions have been committed to, any impact on the significance criteria for Material Assets and Waste cannot be assessed. Further details on the impacts on MSAs are assessed in **Chapter 11 - Land and Soils (Volume II)** of this ES.

Construction Stage: Site Arisings and Waste Recovery

- 14.9.10. Indicative site arising types and quantities for the DCO Proposed Development are detailed in **Table 14.14**. Excavated material from trenched installation of the Newbuild Carbon Dioxide Pipeline (predominately soils and small quantities of peat) have not been included as the material will be backfilled in situ following installation. **Outline Soils and Peat Management Plans (Appendix 1 and 2 of the OCEMP, Document reference: D.6.5.4)**, developed as part of the DCO Application, provide further details on appropriate management of excavated materials.

Table 14.14 - Indicative site arisings and waste for recovery

Arising / Waste for recovery	Estimated Quantity (tonnes)	Anticipated disposal route	Comments
Aggregate	39,200	Recycled	Generated through Construction Stage demobilisation, typically from Centralised Compounds.

Arising / Waste for recovery	Estimated Quantity (tonnes)	Anticipated disposal route	Comments
Concrete	10,920	Recycled	Generated through Construction Stage demobilisation, typically from Centralised Compounds.
Copper (cabling)	4	Copper elements will be recycled. Plastic will be disposed of to landfill.	Arisings generated from copper cabling. Cabling will have plastic sheath, which is referred to in Table 14.15 .
Earthworks	7,740	Reused on site where suitable, or taken to a soil recycling facility.	Site arising generated from Cornist Lane BVS and through trenchless installation techniques. This comprises surplus earthwork which are anticipated to be reused, subject to that material meeting legally-defined reuse criteria.
Hazardous Waste	10	Treatment	Waste paints and solvents will be sent for treatment.
Steel	90	Recycled	Arisings generated from pipe sections and fittings.
Timber	90	Off-site reuse / Recycled	Waste timber pallets and packing cases.
Total	58,054 tonnes of arising and waste diverted from landfill		

14.9.11. The anticipated diversion of waste from landfill through stockpiling and storage of earthwork arisings to maximise onsite reuse, and off-site recycling and treatment, will reduce the associated adverse impacts, and are hence material considerations in the assessment of likely effects on remaining landfill capacity.

Construction Stage: Waste Generation and Disposal

14.9.12. The key wastes likely to be generated for the DCO Proposed Development and disposed of to landfill are detailed in **Table 14.15**.

Table 14.15 - Forecast Waste Generation and Disposal Method

Waste	Estimated Quantity (tonnes)	Anticipated disposal route	Comments
General construction consumables (such as plastic / general waste)	90	Landfill	Waste for disposal to landfill

- 14.9.13. Baseline data (presented in **Section 14.6**) indicates that in the absence of future provision, inert waste landfill capacity in North West England and non-inert waste landfill capacity in North Wales is forecast to elapse before 2025. However, forecasting suggests that 0.4Mm³ of inert waste landfill capacity will remain in North Wales and 12.3Mm³ of non-inert waste landfill capacity will remain in North West England when construction is complete (refer to **Table 14.11**).
- 14.9.14. Using professional judgement to apply the criteria set out in **Table 14.2**, the sensitivity of remaining landfill capacity is considered *Very High* for both inert and non-hazardous waste and hazardous waste.
- 14.9.15. As demonstrated in **Table 14.14** and **Table 14.15**, the majority (99.8%) of waste and earthwork arisings are anticipated to be diverted from landfill. Of the waste anticipated to be disposed of to landfill, **Table 14.16** demonstrates the anticipated impact on forecast landfill capacity from the DCO Proposed Development. A conversion rate of 0.21 tonnes/m³ for packing waste (**Ref. 14.34**), has been used to convert the waste generated from tonnes to m³.

Table 14.16 - Forecast reduction in landfill capacity from the DCO Proposed Development

Waste generated	Estimated weight / volume	Forecast landfill capacity (NW England)	% reduction in landfill capacity
Plastic / General waste	90 tonnes / 430m ³	12,300,000 m ³	0.003%

- 14.9.16. Using the criteria set out in **Table 14.3**, the magnitude of change on remaining inert and non-hazardous waste landfill capacity consumption is *negligible*.
- 14.9.17. The significance of effect (detailed in **Table 14.4**) is slight adverse and therefore *not significant*.

14.10. MITIGATION AND ENHANCEMENT MEASURES

14.10.1. The assessment of material resource consumption and waste generation and disposal to landfill demonstrates that the DCO Proposed Development will have no significant adverse environmental effects. As such, no additional mitigation measures are required. However, the following are included in the **REAC (Document reference: D.6.5.1)** to apply where practicable and bolster the Applicant's existing policy (**Ref. 14.32**):

- (the Construction Contractor is to) implement a Materials Management Plan (MMP) in accordance with the CL:AIRE Definition of Waste: Code of Practice (**Ref. 14.34**) (**D-MW-006** of the **REAC, Document Reference D.6.5.1**).

14.11. RESIDUAL EFFECTS

14.11.1. **Table 14.17** summarises the residual effects associated with the DCO Proposed Development during construction, operation and end of life decommissioning.

Table 14.17 - Summary of Residual Effects

Description of the effect	Pre-mitigation significance of effects	Mitigation measure	Residual effect
Construction			
Material resource consumption	<i>Slight adverse (not significant)</i>	No additional mitigation measures required; however the detailed CEMP (developed and implemented by the Construction Contractor) would benefit from the implementation of a Materials Management Plan as included as a Requirement of the Draft DCO (Document Reference: D.3.1) . The Mineral Resource Assessment (Appendix 11.5, Volume III) will be used to agree with the Local Planning Authority any avoidance or 'prior extraction' methods to be adopted where the DCO Proposed Development interacts with MSAs.	<i>Slight adverse (not significant)</i>
Remaining landfill capacity	<i>Slight adverse (not significant)</i>	No additional mitigation measures required, however the detailed CEMP (developed and implemented by the Construction Contractor) would benefit the implementation of a Waste Management Plan and Materials Management Plan as included as a Requirement of the Draft DCO (Document Reference: D.3.1) . These measures are referenced in the REAC (Document reference: D.6.5.1) .	<i>Slight adverse (not significant)</i>

14.12. IN-COMBINATION CLIMATE CHANGE IMPACTS

- 14.12.1. The in-combination climate change impact assessment considers the extent to which climate change may alter the effects which have already been identified within this Chapter.
- 14.12.2. Whilst the effects associated with material resource consumption and waste generation and disposal for the Construction Stages of the DCO Proposed Development are not anticipated to alter in this context, extreme weather events may impact on the successful management of stockpiled materials, and stored wastes through (for example) intense downpours or strong winds.
- 14.12.3. It is understood that these impacts will be managed by (to be commissioned) the Construction Contractor through stockpile protection and waste management measures implemented in the detailed CEMP, as informed by the measures contained in the **REAC (Document reference: D.6.5.1)**.

14.13. MONITORING

- 14.13.1. In accordance with the Applicant's policy (**Ref. 14.32**), and as detailed in **Section 14.8** of this document, a detailed Waste Management Plan (as to be produced by the Construction Contractor) will include management and monitoring of site waste to reduce associated impacts, including potential harm to the environment.
- 14.13.2. A MMP, also produced by the Construction Contractor, will also be used to monitor the maximum reuse of both natural soils and Made Ground (contaminated or otherwise).

14.14. REFERENCES

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- **Ref. 14.6** – Defra. (2021). Waste Management Plan for England.
- **Ref. 14.7** – Defra. (2018). Our Waste, Our Resources: A Strategy for England.
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- **Ref. 14.17** - DBEIS. (2022). Monthly Bulletin of Building Materials and Components. Retrieved from <https://data.gov.uk/dataset/75ee36ed-21f7-4d7b-9e7c-f5bf4546145d/monthly-statistics-of-building-materials-and-components>
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- **Ref. 14.22** - NRW. (2022). Environmental Permitting Regulations - Waste Sites. Retrieved from <https://lle.gov.wales/catalogue/item/EnvironmentalPermittingRegulationsWasteSites/?lang=en>
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