



West Winch Housing Access Road

Environmental Statement: Chapter 13: Material Assets and Waste

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Glossary of Abbreviations and Defined Terms

Abbreviations

Abbreviation	Description
CEP	Circular Economy Package
IEMA	Institute of Environmental Management and Assessment
Mm ²	Million square meters
Mm ³	Million cubic meters
MMP	Materials Management Plan
MSA	Mineral Safeguarding Area
Mt	Million tonnes
SWMP	Site Waste Management Plan

Glossary

Term	Description
Circular economy	A model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended.
Development study area	Used in the Material Assets and Waste Chapter to describe the study area. The Development study area is the extent of works within the Proposed Scheme route alignment. This comprises the site and any areas required for temporary access, site compounds, working platforms and other enabling activities
Expansive study area	Used in the Material Assets and Waste Chapter to describe the study area. The Expansive study area extends to the availability of construction materials and the capacity of waste management facilities within the UK and the East of England region (Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk).
Hazardous waste	Waste that contains substances or has properties that might make it harmful to human health or the environment.



Term	Description
Inert waste	Types of waste that meet one or more of the following criteria: <ul style="list-style-type: none">■ Does not undergo any substantial physical, chemical or biological transformations;■ Are unreactive (biologically and chemically); and■ Does not pose a risk to surface water or groundwater through any leachate or pollutant content or ecotoxicity.
Landfill void capacity	Used in the Material Assets and Waste chapter to describe the remaining space within landfill sites to accept waste generated by the Proposed Scheme.
Material resources	Used in the Material Assets and Waste chapter to consider the bulk construction materials required for the Proposed Scheme, such as aggregate, concrete etc.
Non-hazardous waste	Waste that is classified neither as inert nor hazardous.
Waste hierarchy	Ranks waste management options according to what is best for the environment, giving priority to preventing waste, followed by reuse, recycling, recovery, and last of all, disposal.



1 Introduction

1.1.1 This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Scheme upon material assets and waste.

1.1.2 This chapter is intended to be read as part of the wider Environmental Statement (ES). Where within scope, impacts associated with transport of materials and waste are detailed in **Chapters 6 - Air Quality, Chapter 10 - Noise and Vibration, and Chapter 14 – Climate**. Other indirect impacts associated with material resource consumption and waste generation are assessed, where in-scope, in **Chapter 9 - Landscape and Visual, Chapter 11 - Water Environment, Chapter 12 - Geology and Soils; and Chapter 15 - Population and Human Health**.

1.2 Legislative framework, Policy and Guidance

Legislative Framework

1.2.1 A summary of the international, national, and local legislation relevant to the Material Assets and Waste assessment for the Proposed Scheme is set out below. Whilst it is acknowledged that following the UK's departure from the EU, compliance with EU Directives is no longer necessary, the Directives provide useful legislative context, and a summary has been included.

The Revised EU Waste Framework Directive 2008/98/EC (Ref 13.1)

1.2.2 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 (Ref 13.2)

1.2.3 The Landfill Directive aims to protect both human health and the environment. 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.

The Environment Act, 2021 (Ref 13.3)

- 1.2.4 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.

Waste (Circular Economy) (Amendment) Regulations 2020 (Ref 13.4)

- 1.2.5 The Regulations transpose the EU's 2020 Circular Economy Package (CEP) which plans to make sustainable products, services and business models the norm. The bulk of substantive changes to laws, regulations and administrative provisions made under the CEP affect The Waste Framework Directive and The Landfill Directive. Key measures under the regulations include prevention of waste generation and establishing waste prevention programmes, greater segregation of waste and more detailed records.

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020 (Ref 13.5)

- 1.2.6 These regulations make provisions and amendments to the Environmental Protection Act 1990 and waste regulations to ensure that environmental permitting and waste regimes continue to operate effectively during the EU exit transition period.

The Controlled Waste (England and Wales) Regulations 2012 (as amended) (Ref 13.6)

- 1.2.7 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 (as amended) (Ref 13.7)

- 1.2.8 The Waste (England and Wales) (Amendment) Regulations 2014 amend the Waste (England and Wales) Regulations SI 2011/988 in order to clarify that the transfer of controlled waste can be recorded on alternative documentation, such as invoices, instead of waste transfer notes.

The Clean Neighbourhoods and Environment Act 2005 (Ref 13.8)

- 1.2.9 The Clean Neighbourhoods and Environment Act 2005 implements proposals contained in the Clean Neighbourhoods consultation launched on 25 July 2004. The Act states that it is the responsibility of construction workers on site to guarantee that waste is disposed in the appropriate manner. In accordance with this requirement, employees must undertake waste disposal activities as outlined in national law.

The Hazardous Waste (England and Wales) Regulations 2005 (Ref 13.9)

- 1.2.10 The Hazardous Waste (England and Wales) Regulations 2005 introduce 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 Waste Minimisation Act 1998 (Ref 13.10)

- 1.2.11 The Waste Minimisation Act 1998 enables Local 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 (Ref 13.11)

- 1.2.12 The Environmental Protection Act, as of 2008, 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 (Ref 13.12)

1.2.13 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 (Ref 13.3)

1.2.14 The Act makes provisions with respect to the generation and revision of 'waste disposal plans' and prohibits the unlicensed disposal of waste.

Policy

1.2.15 Planning policy relevant to the Materials and Waste assessment for the Proposed Scheme includes:

- National Planning Policy Framework (2023) (**Ref 13.14**);
- Environmental Improvement Plan 2023 (2023) (**Ref 13.15**);
- Waste Management Plan for England (2021) (**Ref 13.16**);
- National Policy Statement for Hazardous Waste (2013) (**Ref 13.17**);
- National Planning Policy for Waste (2014) (**Ref 13.18**);
- Our Waste, Our Resources: A Strategy for England (2018) (**Ref 13.19**);
- Norfolk Minerals and Waste Development Framework Core Strategy and Minerals and Waste Development Management Policies Development Plan Document 2010-2026 (2011) (**Ref 13.20**); and
- Norfolk Minerals and Waste Local Plan Publication (2022) (**Ref 13.21**).

1.2.16 In addition, this chapter has been prepared in accordance with the Government's National Planning Practice Guidance on Waste (**Ref. 13.22**).

Guidance

1.2.17 The following guidance documents have been used during the preparation of this chapter:



- Institute of Environmental Management and Assessment (IEMA) Guide to Materials and Waste in EIA (**Ref. 13.23**) (herein referred to as the 'IEMA Guide').

1.3 Consultation, Scope, Methodology and Significance Criteria

Consultation Undertaken to Date

- 1.3.1 The Local Authority have been consulted through the submission of the EIA Scoping Report on the approach to the Material Assets and Waste assessment, as detailed in **Appendix 1.2: Scoping Opinion**. No other consultation has been required to inform the Material Assets and Waste assessment due to all requisite data being publicly available.

Scope of the Assessment

- 1.3.2 The scope of this assessment has been established through an ongoing scoping process. Further information can be found in **Chapter 5: Approach to the EIA**.
- 1.3.3 This section provides an update to the scope of the assessment and updates the evidence base for scoping out elements following further iterative assessment.

Elements scoped out of the assessment

- 1.3.4 The elements shown in Table 1.1 were scoped out via the Scoping Report (**Appendix 1.1: EIA Scoping Report March 2021**) and agreed to in the Local Authority consultation of the EIA Scoping Report (as detailed in **Appendix 1.2: Scoping Opinion**.) As they are not considered to give rise to likely significant effects as a result of the Proposed Scheme and have therefore not been considered within this assessment:



Table 1-1 – Elements scoped out of the assessment

Element scoped out	Justification
Material resources required during operation	The quantity of material resources required, during the operational phase (for example routine maintenance and repairs) is considered negligible and is not expected to have significant adverse effects.
Waste generation and disposal during operation	The quantity of waste generated during the operational phase (e.g. routine maintenance and repairs) is considered negligible and is not expected to have significant adverse effects.
Material resources required during end-of-life decommissioning	Decommissioning activities of the Proposed Scheme are not anticipated to require consumption of material resources. As such, the impacts associated with material resource consumption are considered to be negligible and is not expected to have significant adverse effects.
Waste generation and disposal during end-of-life decommissioning	The Proposed Scheme has a design life of 40 years for the road, and 120 years for structures, and may remain operation beyond that time. Due to the decommissioning phase being so far into the future, there are inherent uncertainties relating to waste technologies and infrastructure that will be available at that time. Therefore, it is not possible to proportionally assess impacts during decommissioning. This phase of the project is therefore scoped out of the assessment.



Elements scoped into the assessment

Construction Phase

1.3.5 The following elements are considered to have the potential to give rise to likely significant effects during construction of the Proposed Scheme and have therefore been considered within this assessment:

- Material resources required for the construction phase; and
- Waste generation and disposal of waste during construction.

Extent of the Study Area

1.3.6 The study areas that are applicable to the Proposed Scheme (as defined in the IEMA Guide) are:

- The **development study area** – the extent of works within the Proposed Scheme route alignment. This comprises the Site and any areas required for temporary access, site compounds, working platforms and other enabling activities; and
- The **expansive study area** extends to the availability of construction materials and the capacity of waste management facilities within the UK and the East of England region (Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk).

Method of Baseline Data Collation

Desk Study

1.3.7 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 13.7 and include data from the following sources:

- Profile of the UK Mineral Products Industry (**Ref. 13.24**);
- Monthly Bulletin of Building Materials and Components (**Ref. 13.25**);
- East of England Aggregate Working Party (**Ref. 13.26**);



- Iron and Steel Production by Year, Measure and Area (**Ref. 13.27**);
- Environment Agency, 2021 Waste Data Interrogator (**Ref 13.28**); and
- Environment Agency, Landfill Capacity – England 2023 – Version 1 (**Ref 13.29**).

Site Visit and Surveys

1.3.8 No site visits or surveys have been required for the assessment of material assets and waste.

Assessment Methodology

1.3.9 The IEMA Guide (**Ref 13.23**) has been used to assess the potential impacts and effects from the Proposed Scheme, using the process and significance criteria it sets out. For the assessment of waste, “*Method W1-Void Capacity*” has been used, as detailed in the IEMA Guide.

1.3.10 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 Proposed Scheme, including details of any recycled materials content;
- The type and volume of waste to be generated by the Proposed Scheme, 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; and
- Details of any materials to be specified, where sustainability credentials (particularly those that improve resource efficiency) afford performance beyond expected industry standards.

1.3.11 The sensitivity of materials relates to the regional (and where justified, national) availability and type of resources to be consumed by the Proposed Scheme. The sensitivity of waste relates to the availability of regional (and where appropriate, national) landfill void capacity, in the absence of the



Proposed Scheme and future provision. Landfill void capacity is commonly split into three classifications: inert, hazardous and non-hazardous, based on the waste type that is accepted at the landfill.

1.3.12 The magnitude of impacts from the Proposed Scheme 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.

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

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

Significance Criteria

1.3.15 The criteria for assessing sensitivity of materials and waste are set out in Table 1.2. The information provided is based on Section 10.2 of the IEMA Guide (**Ref. 13.23**). The sensitivity of materials will be determined by identifying where one or more of the criteria from the following thresholds are met.

1.3.16 The sensitivity of waste is determined by considering the baseline / future baseline of regional (or where justified, national) landfill void capacity across the construction phase.

Table 1-2 – Materials and waste sensitivity criteria

Sensitivity	Materials Criteria On balance, the key materials required for the construction of the Project...	Inert and non-hazardous waste criteria Landfill void capacity is expected to...	Hazardous waste criteria Landfill void capacity is expected to...
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 (see note 1).	...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 (see note 1).	...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 (see note 1).	...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	Inert and non-hazardous waste criteria	Hazardous waste criteria
Very high	<p>On balance, the key materials required for the construction of the Project...</p> <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>Landfill void capacity is expected to...</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>Landfill void capacity is expected to...</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>



1.3.17 The following note applies to Table 1.2. Note 1: identifies where an assessment of the proportion of sustainable features (very high, high, some, none) is undertaken using professional judgement.

1.3.18 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.

13.1.1. Table 1.3 sets out the criteria for assessing the magnitude of impact on materials and waste. The table articulates information set out in Section 10.3 of the IEMA Guide (**Ref. 13.23**).

Table 1-3 – Materials and waste magnitude criteria

Magnitude	Materials Criteria	Inert and non-hazardous waste criteria	Hazardous waste criteria
No change	The assessment of the Project is made by determining whether the consumption of... ...no materials are required.	The percentage depletion of remaining landfill void capacity Zero waste generation and disposal from the development.	The percentage depletion of remaining landfill void capacity Zero waste generation and disposal from development.
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional (or where justified national) baseline availability.	Waste generated by the development will reduce regional (or where justified, national), landfill void capacity baseline by <1%. Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.	Waste generated by the development will reduce national landfill void capacity baseline by <0.1%. Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.
Minor	...one or more materials is between 1-5% by volume of the regional (or where justified, national) 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. The level of impact is justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed	Waste generated by the development will reduce regional (or where justified, national) landfill void capacity baseline by 1-5%. Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.	Waste generated by the development will reduce national landfill void capacity baseline by <0.1-0.5%. Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.
Moderate	...one or more materials is between 6-10% by volume of the regional (or where justified, national) baseline availability; and / or one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use. The level of impact is justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed.	Waste generated by the development will reduce regional (or where justified, national) landfill void capacity baseline by 6-10%. Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.	Waste generated by the development will reduce national landfill void capacity baseline by <0.5-1%. Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.

Magnitude	Materials Criteria	Inert and non-hazardous waste criteria	Hazardous waste criteria
Major	<p>The assessment of the Project is made by determining whether the consumption of...</p> <p>...one or more materials is >10% by volume of the regional (or where justified, national) baseline availability;</p> <p>and / or</p> <p>more than one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.</p> <p>The level of impact is justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed</p>	<p>The percentage depletion of remaining landfill void capacity</p> <p>Waste generated by the development will reduce regional (or where justified, national) landfill void capacity baseline by >10%.</p> <p>Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.</p>	<p>The percentage depletion of remaining landfill void capacity</p> <p>Waste generated by the development will reduce national landfill void capacity baseline by >1%.</p> <p>Landfill void capacity is forecast as the worst-case scenario to the end of the construction phase timeframe.</p>



Effect Significance

1.3.19 In accordance with Section 11 of the IEMA Guide (**Ref. 13.23**), the significance of effects on material assets and waste will be determined by comparing sensitivity and magnitude using the matrix provided in Table 1.4.

Table 1-4 – Matrix to assign significance of effect category

Significance matrix	Negligible sensitivity	Low sensitivity	Medium sensitivity	High sensitivity	Very high sensitivity
No change in magnitude	Neutral	Neutral	Neutral	Neutral	Neutral
Negligible change in magnitude	Neutral	Neutral or slight	Neutral or slight	Slight	Slight
Minor change in magnitude	Neutral or slight	Neutral or slight	Slight	Slight or moderate	Moderate or large
Moderate change in magnitude	Neutral or slight	Slight	Moderate	Moderate or large	Large or very large
Major change in magnitude	Slight	Slight or moderate	Moderate or large	Large or very large	Very large

1.3.20 Effects that are classified as moderate, large, or very large are considered to be significant, for both materials and waste (noted in bold text in Table 1.4). Effects classified as slight or neutral are considered to be not significant in either case.

1.4 Baseline Conditions

1.4.1 This section of the Material Assets and Waste Chapter 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.

1.4.2 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 data sources.

Existing Baseline - Material Resources

1.4.3 The current land use for the Proposed Scheme (development study area) is predominantly agricultural farmland, interspersed with existing road infrastructure. No data is available to quantify material resource use in the ‘do-minimum’ scenario (where the Proposed Scheme is not built). However, the use of construction material resources on the existing land is considered to comprise materials for repair works, such as asphalt for road repairs. The agricultural land is not anticipated to require construction materials.

1.4.4 The do-minimum scenario would be unlikely to change this situation. Therefore, the current use of resources is deemed negligible.

Material Resources Availability

1.4.5 Table 1.5 provides a summary of the availability of the main construction materials in the East of England region (Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk) and the UK (the expansive study area). The materials listed are considered to be appropriate to the bulk construction materials required for typical highway construction works, such as the Proposed Scheme. Table 1.5 describes the method of recording material type (such as sales, stocks or production), the material type and the quantity available for the latest recorded year. Figures for Great Britain (England, Wales and Scotland) are used where UK figures (including Northern Ireland) are unavailable.

Table 1-5 – Construction materials availability in the East of England region and the UK

Material Type	East of England	UK
Sales of sand and gravel (Ref 13.24)	10.3 million tonnes (Mt) (2022)	53.2 Mt (GB) (2022)
Sales of permitted crushed rock	0.1 Mt (2020) (Ref 13.26)	116.5 Mt (GB) (2019) (Ref 13.24)



Material Type	East of England	UK
Sales of primary aggregate (comprises sand and gravel and crushed rock)	10.6 Mt (2020) (Ref 13.26)	198.8 Mt (2019) (Ref 13.24)
Stocks of concrete blocks (Ref 13.25)	1.1 million square meters (Mm ²) (Midlands) (2022)	5.2 Mm ² (2022)
Sales of recycled and secondary aggregate	No data.	71.0 Mt (2018) (GB) (Ref 13.24)
Sales of ready-mix concrete (Ref 13.24)	1.5 million cubic meters (Mm ³) (2019)	24.7 Mm ³ (2019)
Production of steel (Ref 13.27)	No data.	7.2 Mt (2021)
Sales of asphalt (Ref 13.24)	2.5 Mt (2019)	27.4 Mt (2019)

1.4.6 Note: It is noted that the quantities for sales or primary aggregate do not exactly correlate with the combined sand and gravel and crushed rock quantities reported in Table 1.5. This is due to the difference in the published data dates.

1.4.7 The Norfolk Minerals and Waste Local Plan Publication (Ref 13.21) which represents the most recent data on remaining landbank reserves, describes the remaining reserves for sand and gravel, carstone and silica sand. Sand and gravel and carstone (a type of sandstone) are often used in the construction of roads, however silica sand is for more specialised industry (such as glass manufacture). It is noted that the sand and gravel landbank would last until 2031, and the carstone landbank is anticipated to last until 2043, based on current sales. The silica sand landbank is only anticipated to last until the end of 2024, however this is not a mineral resource that would be required for the Proposed Scheme construction.

1.4.8 By comparison with other UK regions, the East of England has a slightly lower than average availability of some construction materials, in particular sales of permitted crushed rock, most of which is imported from outside the region.



1.4.9 However, the availability of other construction materials typically required for highways construction schemes in the East of England and across the UK, indicates that stocks / production / sales remain buoyant.

Mineral safeguarding areas

1.4.10 The Norfolk County Council interactive map of Mineral Safeguarding Areas (MSA) (**Ref 13.30**) indicates that the development study area passes over sand and gravel and silica sand safeguard mineral resources. The MSA in the region of the Proposed Scheme are currently partially sterilised by the existing road networks (A10, A47 and other minor roads) and existing dwellings. The Norfolk Minerals and Waste Development Framework Core Strategy and Minerals and Waste Development Management Policies Development Plan Document 2010-2026 (**Ref 13.20**) notes under Policy CS16 that the *“Mineral Planning Authority will object to development which would lead to the sterilisation of the mineral resource, and it would be for the relevant district council to decide whether there are compelling planning reasons for overriding this safeguarding.”* In relation to sand and gravel resource, Policy CS16 states *“Mineral Planning Authority will expect to see appropriate investigations carried out to assess whether any mineral resource there is of economic value, and if so, whether the material could be economically extracted prior to the development taking place.”* These sentiments are echoed in the Norfolk Minerals and Waste Local Plan Publication (**Ref 13.21**) under Section 4.1, which states *“Resources of sand and gravel, carstone and silica sand within defined Mineral Safeguarding Areas will be safeguarded from needless sterilisation by non-mineral development.”*

Existing Baseline – Site Arising and Waste Recovery

Site Arisings Currently Generated

1.4.11 No data is available to quantify site arising and waste recovery in the do-minimum scenario. However, the current land use within the development study area is expected to generate negligible volumes of site arisings, limited to potential earthworks on agricultural land and minor repairs to roads. The do-minimum scenario would be unlikely to change this situation.



Existing Waste Transfer, Recovery and Recycling Management Facilities

1.4.12 Existing waste transfer, recovery and recycling management facilities are a key factor in diverting waste from landfill. An overview of the availability of materials recovery infrastructure in the East of England, and across England, is presented herein.

1.4.13 Defra data (Table 1.6) shows that within England, the recovery rate for non-hazardous construction and demolition wastes have remained above 90% since 2015 (Ref 14.31). Defra’s 2023 update of this data does not extend the data range beyond 2020.

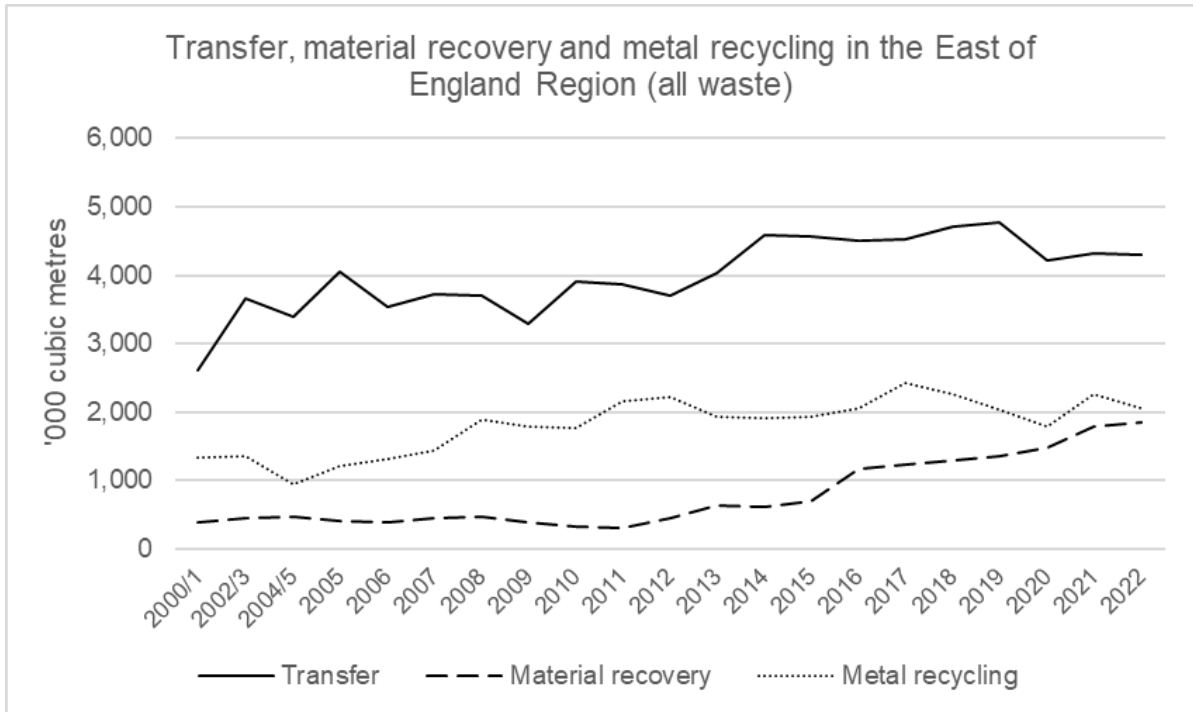
Table 1-6 – Non-hazardous construction and demolition waste recovery in England

Year	Generation (Mt)	Recovery (Mt)	Recovery rate (%)
2015	57.7	53.3	92.3%
2016	59.6	55.0	92.1%
2017	62.2	57.9	93.1%
2018	61.4	57.5	93.8%
2019	62.3	58.3	93.6%
2020	53.6	50.0	93.2%

13.1.2. Data in Figure 1.1 has been collated to show that rates of waste recovery in the region have risen steadily over the past 20 years (Ref 13.28). Metal recycling shows a slight decline in recent years; however, the overall trend is one that is increasing. Data is provided for all waste types in the East of England and hence will include, but is not specific to, construction, demolition and excavation wastes.



Figure 1.1 – Transfer, materials recovery, and metal recycling in the East of England (2000/1 – 2022)



13.1.3. The trends for transfer, treatment, recovery and metal recycling in the East of England indicate that there is likely to be regional infrastructure and capacity for managing construction, demolition and excavation wastes from the Proposed Scheme. This assertion is further affirmed by the number of permitted waste recovery sites presented in Table 1.7 (Ref 13.28). It is noted that the majority of construction and demolition waste is unlikely to be suitable for incineration, however incineration may be a disposal option for packaging waste.

Table 1-7 – Permitted waste recovery management sites in East of England, 2022

Waste recovery facility type	Number of sites	Quantity received (tonnes, indicative of facility capacity)
Incineration	21	1,803,000
Transfer	334	4,826,000
Treatment	324	11,402,000
Metal recovery	263	2,061,000
Use of waste	2	1,000



13.1.4. Data in Table 1.8 (Ref. 13.28) shows that 64% of waste received in the region was diverted from landfill through waste management and recovery methods. Data includes the total waste received from both within the East of England and from other regions of the UK.

Table 1-8 – Waste management routes for waste received in East of England (2022)

Waste management route	Inert and non-hazardous waste (tonnes)	Hazardous waste (tonnes)	Total waste (tonnes)	Percentage
Recovery	7,419,654	85,778	7,505,432	64%
Landfill	4,167,432	66,595	4,234,027	36%
Other	44,354	0	44,354	0%
Totals	11,631,440	152,373	11,783,813	100%

1.4.14 The data presented in this section confirms that there is currently a variety of waste management infrastructure available in the East of England to enable suitable recovery of waste generated by the Proposed Scheme. The importance (positive value) of this infrastructure indicates there is potential to maximise the re-use / recycling value of site arisings, and hence also has the potential to materially influence the assessment of materials and waste.

Existing Baseline – Waste Generation and Disposal

Waste Currently Generated and Disposed

1.4.15 No data is available to quantify waste generation and disposal to landfill in the do-minimum scenario. The current agricultural land use within the development study area may generate plastic waste for disposal, however it is not anticipated to generate waste in significant quantities. Small volumes of waste may be generated from road maintenance, such as minor repairs to the pavement, littering, signage replacement, and vegetation from verge clearance. Therefore, the anticipated magnitude of impact associated with disposing of waste in the baseline situation is deemed negligible in the context of available regional capacity.



1.4.16 The do-minimum scenario would not be expected to change impacts associated with the generation and disposal of site arisings and waste.

Remaining Landfill Capacity

1.4.17 Environment Agency data (**Ref 13.29**) confirms that at the end of 2022, 61 landfill sites in the East of England were recorded as having 58 million cubic meters (Mm³) of remaining capacity; this information is presented in Table 1.9, which also shows the change in capacity from 2021 to 2022.

Table 1-9 – Remaining landfill capacity in East of England

Landfill type	Capacity in 2021(m ³)	Remaining capacity in 2022 (m ³)	2021 to 2022 capacity trend (Mm ³)
Hazardous (merchant)	0	0	0 (0%)
Inert	24,088,595	31,843,521	+7.8 (32.2%)
Non-hazardous (including stable hazardous waste cells)	23,189,639	25,942,277	+2.8 (11.9%)
Total	47,278,234	57,785,798	+10.5 (22.2%)

1.4.18 As the data in Table 1.9 shows, no hazardous waste landfill sites are present within the East of England region. The Norfolk Minerals and Waste Development Framework Core Strategy and Minerals and Waste Development Management Policies Development Plan Document 2010-2026 (**Ref 13.20**) states that since the ban on co-disposal of hazardous waste with non-hazardous waste to landfill in July 2004, and since much of East of England is hydrogeologically unsuitable for hazardous waste landfill sites, there are no such facilities in the region. The Norfolk Mineral and Waste Local Plan Publication document version 2022 (the emerging plan) (**Ref 13.21**) confirms this.

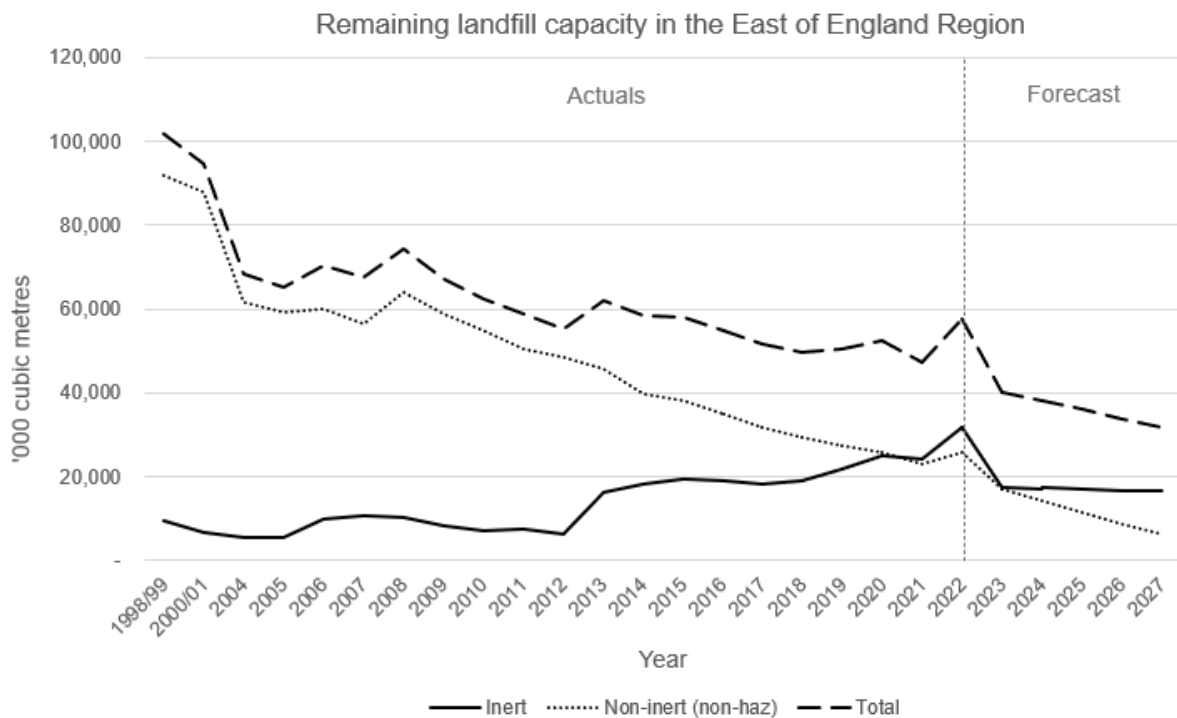
1.4.19 Further to this, the Core Strategy and Minerals and Waste Development Management Policies Development Plan Document 2010-2026 (**Ref 13.20**)



specifies that proposals for new inert waste landfill void space will not be acceptable unless there is a clear need for additional void space. Any new proposals will need to demonstrate that they will have advantages for one or more of: amenity, landscape, wildlife or similar. The emerging plan broadly concurs with this and notes the preferred disposal method is for restoration of former mineral workings for biodiversity, landscape and historic environment benefits.

1.4.20 Regional baseline landfill capacity is detailed in Figure 1.2. Simple statistical forecasting (using the Microsoft Excel forecasting function) has been used to demonstrate long term void capacity to the year of Proposed Scheme completion (2027) in the absence of future provision.

Figure 1.2 – Remaining and forecast landfill capacity in the East of England



1.4.21 Baseline data indicates that in the absence of future provision, inert, non-inert and total landfill capacity is likely to become an increasingly sensitive receptor throughout the duration of the construction phase and first full year of operation.



1.4.22 Figure 1.2 shows that from 2022 to 2027, in the absence of future provision, waste capacity in the East of England is forecast to reduce by as much as:

- 48% (inert) to 16.7 Mm³;
- 76% (non-inert – which also comprises non-hazardous waste) to 6.3 Mm³, and
- 45% (total) to 31.8Mm³.

1.4.23 Further to the regional data provided in Table 1.9, the assessment of magnitude, as set out in the IEMA Guide, also considers the national remaining landfill capacity for hazardous waste.

1.4.24 Table 1.10 provides the remaining merchant hazardous waste landfill capacity in England (from 2022) (Ref. 13.29).

Table 1-10 – Remaining hazardous landfill capacity in England (2021)

Landfill type	Remaining capacity in 2022 (m ³)
Hazardous merchant	7,921,608

Future baseline

1.4.25 In the future baseline (in the absence of the Proposed Scheme), it is considered that the land use would remain agricultural, interspersed by road infrastructure. Therefore, the future consumption of materials and generation and disposal of waste are considered to be negligible.

1.5 Design and Embedded Best Practice Mitigation Measures

1.5.1 The assessment of potential effects is based on the Proposed Scheme design. This includes embedded design measures to reuse site arisings (earthworks) where practicable, which are considered prior to the assessment of potential effects. Indicative quantities for the reuse of site arisings and diversion of wastes from landfill for the Proposed Scheme are detailed in Table 1.11. Quantities have been rounded up to the nearest five or ten tonnes proportionate to the quantity of the arising.



Table 1-11 – Indicative site arisings and waste for recovery

Arising / waste for recovery	Estimated quantity (tonnes)	Anticipated disposal route	Comments
Aluminium	5	Recycle	Generated from removed signage
Earthworks	130,560	On-site reuse	Excavated earthworks (cut) are anticipated to reach 201,785 tonnes. Of that material, 130,560 tonnes is currently anticipated to be reused on site, with the remainder going to landfill (refer to Table 1-14).
Precast Concrete	230	Recycle	Generated from removal of drainage infrastructure
Steel	280	Recycle	Generated from removed fencing and from demolished buildings
Zinc	90	Recycle	Generated from demolished buildings
Total diverted from landfill	131,165	(This cell is intentionally blank)	(This cell is intentionally blank)

1.5.2 The anticipated diversion of waste from landfill through maximising onsite reuse of earthworks and off-site recycling will reduce the adverse effects of the Proposed Scheme on remaining landfill capacity and are important to consider in the assessment of likely effects on remaining landfill capacity.



1.6 Sensitive Receptors

1.6.1 The following sensitive receptors have been assessed:

- **Material resources** – consumption impacts on materials' immediate and long-term availability, and results in depletion of natural resources; and
- **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.

1.7 Assessment of Potential Effects, Mitigation and Residual Effects

1.7.1 This section details the assessment the predicted impacts and effects of the Proposed Scheme during the Construction Stage. As noted in **Section 13.3**, the operational phase has been scoped out of the assessment.

Construction Phase Potential Effects: Material Resources

1.7.2 Key (indicative) bulk construction material required for the Proposed Scheme are set out in Table 1.12. Data is based on the current design estimates and has been rounded up to the nearest 10 tonnes.

Table 1-12 – Indicative bulk material resources required for construction

Material Type	Estimated Quantity (tonnes)	Use of material in the Proposed Scheme	Consumption compared to baseline (material availability)
Aggregate	76,370	Subbase and capping.	0.7% of regional primary aggregate sales (includes aggregate and cement sand material types of the Proposed Scheme)
Aluminium	30	Signage posts and lighting columns	Not applicable
Asphalt	66,320	Pavement binder, surface course and hot rolled asphalt	2.7% of regional asphalt sales
Cement Sand	95	Sand cement mortar	Refer to Aggregate
Clay pipe	930	Drainage	Not applicable
Copper	1	Cabling	Not applicable
Earthworks	20,520	Imported earthworks material (fill) comprising topsoil	Not applicable
In-situ (poured) concrete	4,650	Foundations, continuous flight auger piling, bridge deck and columns	0.2% of ready mix concrete sales (baseline data converted to tonnes for percentage availability)
Plastic	50	Drainage	Not applicable
Precast Concrete	4,220	Kerbs, paving, headwall pipes, drainage	Not applicable
Steel	3,610	Reinforcing bar for bridges and piling, bollards	0.1% of UK steel production (regional baseline data is not available for steel)
Timber	210	Fencing and noise barrier	Not applicable



- 1.7.3 As reported in the baseline (**Section 13.4**), it is considered that there are no national or regional supply issues regarding the key construction materials. Using data for the anticipated material resources required for the Proposed Scheme (as detailed in) Table 1.12 and comparing these to data (where available) from the baseline, the consumption of asphalt is greatest at 2.7% of the baseline. Although no baseline data exists for aluminium, clay pipe, copper, plastic, pre-cast concrete or timber, the anticipated quantities required for the Proposed Scheme are considered to be relatively small, are not anticipated to materially affect the regional or national supply.
- 1.7.4 The volume of imported earthworks represents the largest material resource required for the Proposed Scheme. Whilst efforts to reuse excavated arisings have been made, they would not be of the required topsoil quality or composition. Whilst there is no production, stocks or sales data to inform the baseline for topsoil, sourcing of topsoil from excess cut on other construction projects or obtaining topsoil from sustainable sources should be applied where feasible.
- 1.7.5 The development study area passes over sand and gravel and silica sand safeguard mineral resources which are partly sterilized by the existing road networks (A10, A47 and other minor roads) and existing dwellings. The Material Assets and Waste assessment (as set out in the IEMA magnitude criteria (**Ref 13.23**)) assesses the potential for the Proposed Scheme to sterilise an MSA. Consideration of the impacts of the Proposed Scheme on the MSA is covered in the **Chapter 12: Geology and Soils** and the Minerals Resource Assessment produced for the Proposed Scheme in 2021 by WSP (**Appendix 12.2**).
- 1.7.6 Using professional judgement to apply the criteria set out in Table 1.2, the sensitivity of material resources is considered **Medium**. Using the criteria set out in Table 1.3, the magnitude of material resource consumption considering the impact on mineral safeguarding areas is **Minor**. The effects associated with material resource consumption (in accordance with Error! Reference source not found.) are **Slight adverse** and therefore not significant.



Construction Phase Additional Mitigation: Material Resources

1.7.7 The potential effects of the Proposed Scheme on material resources have been assessed as not significant. Therefore, no additional mitigation measures are required, however it is recommended that best practice design and construction measures are incorporated, such as specifying material resources in accordance with BES 6001 Responsible Sourcing of Construction Products (**Ref 13.33**), maximising efficient design practices, using recycled materials, and incorporating prefabricated components.

Construction Phase Residual Effects: Material Resources

1.7.8 The residual effects for Material Resources would remain **Slight Adverse** and therefore not significant.

Construction Phase Potential Effects: Waste Generation and Disposal

1.7.9 The key wastes likely to be generated for the Proposed Scheme are disposed of to landfill are described in Table 1.13.

Table 1-13 – Forecast waste generation and disposal method

Waste	Estimated quantity (tonnes)	Anticipated disposal route	Comments
Earthwork	70,540	Landfill	Disposal of unacceptable material
Timber	80	Landfill	Generated from removal of fencing
Total waste to landfill	70,620	(This cell is intentionally blank)	(This cell is intentionally blank)

1.7.10 Baseline data (presented in **Section 13.4**) indicates that in the absence of future provision, inert waste landfill capacity in the East of England is forecast to have 16.7Mm³ remaining capacity and non-inert would have approximately 6.3Mm³ remaining capacity by the end of construction phase in 2027.



1.7.11 Using professional judgement to apply the criteria set out in Table 1.2, the sensitivity of remaining landfill capacity is considered **Very High** for both inert and non-hazardous waste and hazardous waste.

1.7.12 As demonstrated in Table 1.11 and Table 1.13, it is anticipated that of the 201,785 tonnes of arisings and waste generated by the Proposed Scheme, 131,165 tonnes (65%) will be diverted from landfill, and 70,620 tonnes (35%) has the potential (as a worst case scenario) to be landfilled.

1.7.13 Of the waste anticipated to be disposed of to landfill, Table 1.14 demonstrates the anticipated impact on forecast landfill capacity from Proposed Scheme. For the purposes of assessment, it is assumed that earthworks would be classified as non-inert (also representing a worst-case scenario for disposal, based on the forecast remaining capacity of inert and non-inert landfill sites). A conversion rate of 0.87 tonnes/m³ for mixed construction waste (**Ref. 13.32**), has been used to convert the waste generated from tonnes to cubic meters.

Table 1-14 – Forecast reduction in landfill capacity from the proposed scheme

Waste type anticipated for landfill disposal	Estimated weight / volume	Forecast landfill capacity (East of England)	% reduction in landfill capacity
Earthworks, timber	70,620 tonnes / 81,172m ³	6,300,000	1%

1.7.14 Using the criteria set out in Table 1.3, the magnitude of impact on remaining inert and non-hazardous waste landfill capacity consumption is **Minor**.

1.7.15 The significance of effect (detailed in Table 1.4) is **Slight Adverse** and therefore not significant. It is noted that Table 1.4 gives the option for ‘slight or moderate’ adverse to be selected. Given that the anticipated reduction in landfill void capacity is on the lower end of the threshold (a result of 1% within the criteria of 1% to 5%), the lower significance rating has been selected.

1.7.16 No hazardous waste generation is currently anticipated. In the event that hazardous waste is generated, the quantities are anticipated to be negligible



in comparison to the remaining capacity in England. A reduction in hazardous landfill void capacity of over 0.1% would trigger a minor magnitude of impact, which equates to approximately 12,106m³ or 10,532 tonnes. In the unlikely event that hazardous waste is generated by the Proposed Scheme, appropriate management of the hazardous waste would be mitigated by the Site Waste Management Plan (SWMP) as described below.

Construction Phase Additional Mitigation: Waste Generation and Disposal

1.7.17 The potential effects of the Proposed Scheme on waste generation have been assessed as not significant. Therefore, no additional mitigation measures are required, however it is recommended that the following best practice measures are incorporated..

1.7.18 The legal requirement to develop and implement a SWMP was repealed by UK Government in December 2013. Given the adverse effect of waste generation and disposal to landfill, the Principal Contractor will develop and implement a SWMP for the Proposed Scheme. A SWMP should:

- Detail the responsible parties for waste management during design and construction;
- Identify the types and amounts of waste to be generated and how this will be measured;
- Detail how waste generated will be managed to encourage circular economy activity, conform to the waste hierarchy and minimise waste generation and disposal to landfill; and
- Include details of the waste contractors / brokers employed to ensure waste is managed legally.

1.7.19 The Principal Contractor will implement a Material Management Plan in accordance with the CL:AIRE Definition of Waste: Code of Practice (**Ref 13.34**) to ensure excavated earthworks are suitable for reuse and maximised to their full potential.



1.7.20 The Principal Contractor should consider how 100% reuse, recovery or recycling could be achieved and provide justification where this is considered viable in terms of cost, safety and/or material quality or performance and must achieve not less than 90% inert and non-hazardous material recovery.

Construction Phase Residual Effects and Monitoring: Waste Generation and Disposal

1.7.21

Assessment against Future Baseline

1.7.22 In the future baseline, the Proposed Scheme would not occur. As such, the consumption of material resources and potential for waste generation and disposal (beyond that required for the current land use) is anticipated to be negligible and therefore result in no potential adverse significant effects.

Cumulative Effects

1.7.23 The Proposed Scheme is not anticipated to give rise to significant effects for material resource consumption and waste generation and disposal. As such, significant cumulative effects with other committed developments during operation are not anticipated.

1.8 Opportunities for Environmental Enhancement

1.8.1 At the current development stage, no environmental enhancement opportunities have been identified. Examples of potential opportunities which could be developed and incorporated into the Proposed Scheme include:

- Opportunities for using (or taking) surplus earthworks on (or from) other schemes being developed in similar timeframes to the Proposed Scheme; and
- Designing and constructing elements or assets to be deployed within the Proposed Scheme, in line with circular economy principles.



1.9 Difficulties and Uncertainties

- 1.9.1 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.
- 1.9.2 Data to inform the material and waste types and quantities has been based on the Preliminary Design of the Proposed Scheme and may be refined during detailed design and the 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.
- 1.9.3 In the event that excavated materials are unsuitable for reuse, such as contaminated soils or hazardous materials (not soils i.e. anthropogenic material), the Principal 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.
- 1.9.4 No data (tonnage) are available to quantify organic matter (trees, hedges and shrubs) removed during site clearance. Arising generated are typically shredded 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.
- 1.9.5 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 UK's departure from the EU).



- 1.9.6 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.
- 1.9.7 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 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.

1.10 Summary

- 1.10.1 Table 1.15 provides a summary of the findings of the assessment.

Table 1-15 – Summary of findings

Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Material resources	Depletion of material resources and sterilisation of MSAs. The sensitivity of material resources is considered medium and the magnitude of impact moderate.	Slight adverse (not significant) P / D / LT	None required	Slight adverse (not significant) P / D / LT	Not applicable
Landfill void capacity	Reduction in regional or national landfill void capacity. The sensitivity of landfill capacity is considered very high and the magnitude of impact minor	Slight adverse (not significant) P / D / LT	None required, however, following best practice, it is recommended that the Principal Contractor produces a a SWMP, Material Management Plan (MMP) and adheres to a non-hazardous material recovery target of at least 90%.	Slight adverse (not significant) P / D / LT	The Principal Contractor will monitor waste recovery against the minimum target of 90%. This will be monitored through the development, implementation and update of the SWMP.

Key to table:

P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable



1.11 References

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- **Ref 13.2:** European Commission (1999), Council Directive 1999/31/EC of 26 April 1999 on the Landfill of Waste. Available at: [European Union Law](#)
- **Ref 13.3:** HM Government (2021), The Environment Act, 2021. Available at: [UK Statute Law Database](#)
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- **Ref 13.24:** Mineral Products Association (2020), Profile of the UK Mineral Products Industry. Available at: [Mineral Products Association](#)
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- **Ref 13.29:** Environment Agency (2023), Landfill Capacity – England 2023 – Version 1. Available at: [Environment Agency](#)
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