

A47 Wansford to Sutton Dualling

Scheme Number: TR010039

Volume 6

6.1 Environmental Statement

Chapter 10 – Materials Assets and Waste

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

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ENVIRONMENTAL STATEMENT
Chapter 10 – Materials Assets and Waste

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10. Material assets and waste

10.1. Introduction

- 10.1.1. Highways England (the Applicant) has submitted an application for a development consent order (DCO) for the A47 Wansford to Sutton Scheme (hereafter referred to as 'the Proposed Scheme'). The Proposed Scheme comprises the dualling of a section of the A47 between Wansford to Sutton; improvements to the A47 Wansford junction; creation of the A47 Relocated Nene Way Roundabout to replace the Nene Way roundabout; associated side road alterations; and walking, cycling and horse-riding connections.
- 10.1.2. This section of A47 road is currently unable to cope with the high traffic volume and there are limited opportunities to overtake slower moving vehicles on the single carriageway. The Proposed Scheme aims to reduce congestion related delay, improve journey time reliability and increase the overall capacity of the A47. Full details of the Proposed Scheme are provided in Environmental Statement Chapter 2 (**TR010039/APP/6.1**).
- 10.1.3. The key elements of the Proposed Scheme include:
- approximately 2.6km of new dual carriageway constructed largely offline of the existing A47, including the construction of two new underpasses
 - a new free-flow link road connecting the existing A1 southbound carriageway to the new A47 eastbound carriageway
 - a new link road from the Wansford eastern roundabout to provide access to Sacrewell Farm, the Petrol Filling station and the Anglian Water pumping station
 - closure of the existing access to Sacrewell Farm with a new underpass connecting to the farm from the link road provided
 - a new slip road from the new A47 westbound carriageway also providing access to the Petrol Filling station
 - a link road from the new A47 Sutton Heath roundabout, linking into Sutton Heath Road and Langley Bush Road
 - new junction arrangements for access to Sutton Heath Road and Langley Bush Road
 - closure of the existing accesses to the A47 from Sutton Heath Road, Sutton Drift and Upton Road
 - new passing places and limited widening along Upton Drift (also referenced as Main Road)
 - new walking and cycling routes, including a new underpass at the disused railway
 - new safer access to the properties on the A1, north of Windgate Way
 - installation of boundary fencing, safety barriers and signage
 - new drainage systems including:
 - two new outfalls to the River Nene

- a new outfall to Wittering Brook
- extension of the A1 culvert at the Mill Stream
- realignment and extension of the A47 Wansford sluice
- compensatory flood storage
- drainage ditch interceptors
- new attenuation basins, with pollution control devices, to control discharges to local watercourses
- River Nene compensatory flood storage area
- works to alter or divert utilities infrastructure such as electricity lines, water pipelines and telecommunications lines
- temporary compounds, material storage areas and vehicle parking required during construction
- environmental mitigation measures

10.1.4. Under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, the Proposed Scheme is an Environmental Impact Assessment (EIA) development and as such requires submission of an Environmental Statement (ES) presenting the likely significant environmental effects of the Proposed Scheme.

10.1.5. As part of the EIA process, this Environmental Statement (ES) chapter identifies, describes and assesses the potential impacts resulting from material assets and waste associated with the construction and operation of the Proposed Scheme. This chapter summarises the regulatory and policy framework related to material assets and waste and details the methodology followed for the assessment in the context of the environment in the area surrounding the Proposed Scheme. Following this, the design and mitigation (including the identification of proportionate enhancement measures) and residual effects of the Proposed Scheme are presented.

10.1.6. The approach to this assessment follows the Scoping Report (February 2018) (**TR010039/APP/6.5**) and subsequent agreed Scoping Opinion (March 2018) (**TR010039/APP/6.6**), in combination with the most up to date requirements set out in the Design Manual for Roads and Bridges (DMRB), LA 110 (version 0) Material assets and waste (DMRB LA 110) (Published August 2019).

10.1.7. In accordance with DMRB LA 110, the assessment of material assets and waste considers:

- consumption of materials and products (from primary, recycled or secondary and renewable sources), the use of materials offering sustainable benefits, and the use of excavated soils and other arisings that fall within the scope of waste exemption criteria; and
- production and disposal of waste

- 10.1.8. An overview of the Proposed Scheme has been included in ES Chapter 2 (The Proposed Scheme) (**TR010039/APP/6.1**) which also provides construction information used in the assessment.
- 10.1.9. This assessment is supported by preliminary ground investigation data (Soils Limited 2018) along the route of the Proposed Scheme reported in the 2020 A47 Wansford to Sutton Dualling Ground Investigation Report (GIR).
- 10.1.10. This chapter should be read in conjunction with Chapter 9 (Geology and soils) (**TR010039/APP/6.1**) which considers the potential significant effects on the geology and soils as a result of the Proposed Scheme.
- 10.1.11. The main chapter text is supported by appendices (**TR010039/APP/6.3**):
- Appendix 10.1: Legislation and policy framework
 - Appendix 10.2: Outline site waste management plan (SWMP)
 - Appendix 10.3: Mineral impact assessment (MIA)

10.2. Competent expert evidence

- 10.2.1. The competent expert for this assessment is a materials and waste specialist (BSc, MSc, Chartered Environmentalist, Contaminated Land: Application in Real Environments (CL:AIRE) Qualified Person) with over 17 years' experience in environmental consultancy including waste and materials management, geo-environmental risk assessment and EIA. Their specialism relates to sustainable materials management in line with the current waste regulatory framework. They have used their EIA knowledge, experience with road infrastructure projects and professional judgement in identifying the likely significant impacts associated with the Proposed Scheme and providing technical guidance through the assessment process.

10.3. Legislative and policy framework

Legislation

- 10.3.1. The assessment has taken account of the key European and national legislation listed in Appendix 10.1 (**TR010039/APP/6.3**) relevant to this chapter.
- 10.3.2. The European Union Waste Framework Directive 2008/98/EC (published November 2008) sets out the basic concepts and definitions in relation to waste management. Article 4 of the directive sets out five steps for dealing with waste, ranked according to environmental impact, the 'waste hierarchy'.
- 10.3.3. Prevention, which offers the best outcomes for the environment, is at the top of the priority order, followed by preparing for re-use, recycling, other recovery and

disposal, in descending order of environmental preference. These principles have been considered during the design.

Planning policy

- 10.3.4. The primary basis for deciding whether or not to grant a Development Consent Order (DCO) is the National Policy Statement for National Networks (NPSNN) (published December 2014) which sets out policies to guide how DCO applications would be decided and how the impacts of national networks infrastructure should be considered.
- 10.3.5. The NPSNN (published December 2014) policies relevant to material assets and waste assessment (and where in this ES chapter information is provided to address these policy requirements) are detailed within Appendix 10.1 (**TR010039/APP/6.3**).
- 10.3.6. The Resource & Waste Strategy for England (published December 2018) sets out how the country will preserve material resources by minimising waste, promoting resource efficiency and moving towards a circular economy in line with the government's 25 year Environment Plan (published December 2018).
- 10.3.7. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Core Strategy Development Plan Document (adopted on 19 July 2011) sets the framework for all minerals and waste developments until 2026. This includes the strategic vision and objectives including development control policies to guide mineral and waste development.
- 10.3.8. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Site Specific Proposals Development Plan Document (Adopted 22 February 2012) sets out site specific allocations for minerals and waste development and supporting site specific policies to support the strategic vision.
- 10.3.9. Other relevant national and local policies have been considered as part of the material assets and waste assessment. They have been considered where these have informed the identification of receptors, resources and their sensitivity, the assessment methodology, the potential for significant environmental effects and required mitigation and enhancement measures. These policies are detailed within Appendix 10.1 (**TR010039/APP/6.3**).

10.4. Assessment methodology

Update to standard and scope of assessment

- 10.4.1. This chapter uses the assessment methodology set in DMRB LA 110. The methodology within DMRB LA 110 differs from those examined in the Scoping Report (February 2018) (**TR010039/APP/6.5**).

- 10.4.2. Following a review of the slight changes contained in DMRB LA 110, the methodology of the assessment has been updated from that offered within the Scoping Report (February 2018) (**TR010039/APP/6.5**).
- 10.4.3. Table 10-1, in accordance with DMRB LA 110, sets out proposed scope for further assessment in the ES. Where the response to one or more of the scoping assessment questions was 'yes', further assessment was undertaken in the ES.

Table 10-1: Summary of proposed scope

Scoping question	Response	Scope in?
Is the Proposed Scheme likely to recover or re-use little on-site material hereby requiring materials to be imported to Proposed Scheme?	The Proposed Scheme would generate construction and demolition waste (CDW) during site preparation and demolition stages. On a conservative basis, it is possible that a proportion of these CDW wastes would not be recovered or re-used.	Yes
Is the Proposed Scheme likely to use little or no recycled or secondary materials thereby requiring the majority of materials used on the Proposed Scheme to comprise primary materials?	The schedule of quantities states a requirement to import materials for use in construction. On a conservative basis, it is likely that a proportion of these imported materials would be of a primary source.	Yes
Is the Proposed Scheme likely to sterilise (substantially constrain or prevent existing and potential future use of) mineral sites?	The Proposed Scheme intersects deposits of sands and gravels and chalk which have been allocated as mineral safeguarding sites under the Cambridge and Peterborough and Waste Core Strategy.	Yes
Is the Proposed Scheme likely to sterilise (substantially constrain or prevent existing and potential future use of) peat resources?	The ground investigation reported peat inclusions within the Head Deposits. These small areas of peat within the proposed construction boundary is not considered an existing or potential peat extraction site.	No
Would the Proposed Scheme generate large quantities of waste relative to regional landfill capacity?	There is a potential for the Proposed Scheme to generate significant volumes of waste. On a conservative basis, the requirement to dispose of this waste to landfill may result in a reduction in the capacity of waste infrastructure within the east of England region. On a worst-case basis the waste may require disposal to landfill outside of the region.	Yes
Would the Proposed Scheme have an effect on the ability of waste infrastructure within the region to continue to accommodate waste from other sources?		Yes

Consultation

- 10.4.4. Peterborough City Council: Planning control were consulted via email on 17 September 2020 to confirm requirements for a mineral impact assessment (MIA). No response was received so it was assumed an MIA is required (and adopted approach to the MIA acceptable).

- 10.4.5. No further consultation has been undertaken since the submission of the Scoping Report (February 2018) (**TR010039/APP/6.5**) and subsequent agreed Scoping Opinion (March 2018) (**TR010039/APP/6.6**).

Approach to assessment

- 10.4.6. The assessment of materials assets and waste in this chapter is in accordance with DMRB LA 104 (Environmental assessment and monitoring) (published August 2020) and recently updated Highways England requirements in DMRB LA 110 which notes that the assessment shall report on the construction phase and first year of operational activities (opening year).
- 10.4.7. For the construction phase and in accordance with the revised scoping process summarised in Table 10-1, the material assets and waste assessment includes an assessment of the following elements for the Proposed Scheme's permanent development:
- material assets use during the construction phase including site remediation, preparation and earthworks, demolition and construction (for example consideration of main construction material assets such as concrete, aggregate, asphalt and steel)
 - the potential sterilisation of mineral sites
 - waste generation during the construction phase including site remediation, preparation and earthworks, demolition and construction
- 10.4.8. In line with the EIA Scoping Opinion (March 2018) (**TR010039/APP/6.6**), the assessment of material assets and waste during the first year of operational activities (opening year) is not included and has been scoped out. Significant environmental effects from the use of material assets and generation of waste during this period are not predicted due to limited material use and waste generation from infrequent maintenance activities.
- 10.4.9. As detailed in Chapter 9 (Geology and soils) (**TR010039/APP/6.1**), estimates of earthworks quantities and suitability of material excavated on-site during construction have been used, together with other key materials quantities collated, to determine the likely percentage of material available for re-use within the Proposed Scheme and any modifications to the earthworks.
- 10.4.10. As detailed in 2020 Ground Investigation Report (GIR) ES Appendix 9.4 (**TR010039/APP/6.3**), the ground investigation data (Soils Limited 2018) has been reviewed in line with the current waste regulatory framework to assess the potential disposal options of excavated materials unsuitable for retention on the Proposed Scheme or surplus to requirements.

Baseline establishment

10.4.11. Publicly available information sources reviewed to establish the baseline include:

- European Union Waste Framework Directive 2008/98/EC (published November 2008) and the Waste Management Plan for England (published January 2021)
- National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 (published June 2009)
- The Environment Agency Waste Data Interrogator 2019 (published December 2020)
- Cambridgeshire and Peterborough Minerals and Waste Development Plan Local Aggregates Assessment for 2020 (covering calendar year 2019) (published December 2020)
- Cambridgeshire and Peterborough Minerals and Waste Core Strategy (published and adopted July 2011)
- East of England Working Party Annual Monitoring Report 2018 Data (published June 2019)
- Northamptonshire Minerals and Waste Local Plan Minerals and Waste Monitoring Report 2017 (published November 2018)

Assessing significance

10.4.12. In accordance with Table 10-1, receptors for this assessment are:

- Regional waste management infrastructure (specifically landfill capacity)
- Mineral and other finite raw material resources
- Safeguarded mineral sites

10.4.13. The capacity of landfill only is considered within this assessment and not the capacity of all waste management infrastructure as:

- Disposal to landfill and use of available landfill capacity is, overall, a permanent irreversible impact.
- Impacts on other types of waste management infrastructure (for example material recovery facilities) are temporary.
- Other types of waste management infrastructure are better placed to react to demands of the waste management market.

10.4.14. Table 10-2 details the significance categories for assessing the effects on material assets and waste from the Proposed Scheme. The significance categories are summarised from Table 3.13 from DMRB LA 110 Environmental assessment methodology. The potential sterilisation of mineral sites is assessed within the Appendix 10.3 (Minerals impact assessment) (**TR010039/APP/6.3**).

Table 10-2: Significance category descriptions

Significance category	Description
Very Large	<p><u>Material assets</u></p> <p>1) No criteria: use criteria for large categories.</p> <p><u>Waste</u></p> <p>1) Greater than 1% reduction or alteration in national capacity of landfill, as a result of accommodating waste from the Proposed Scheme.</p> <p>2) Construction of a new (permanent) waste infrastructure is required to accommodate waste from the Proposed Scheme.</p>
Large	<p><u>Material assets</u></p> <p>1) The Proposed Scheme achieve less than 70% overall material recovery and or recycling (by weight) of non-hazardous CDW to substitute use of primary materials.</p> <p>2) Aggregates required to be imported to the Proposed Scheme comprise less than 1% re-used and or recycled content.</p> <p>3) Proposed Scheme sterilises greater than or equal to one mineral safeguarding site.</p> <p><u>Waste</u></p> <p>1) Greater than 1% reduction in the regional capacity of landfill as a result of accommodating waste from the Proposed Scheme.</p> <p>2) Greater than 50% of Proposed Scheme waste requires disposal outside of the region.</p>
Moderate	<p><u>Material assets</u></p> <p>1) The Proposed Scheme achieves less than 70% overall material recovery and or recycling (by weight) of non-hazardous CDW to substitute use of primary materials.</p> <p>2) Aggregates required to be imported to the Proposed Scheme comprise re-used and or recycled content below east of England regional percentage target of 31%.</p> <p><u>Waste</u></p> <p>1) Greater than 1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from the Proposed Scheme.</p> <p>2) 1% to 50% of Proposed Scheme waste requires disposal outside of the region.</p>
Slight	<p><u>Material assets</u></p> <p>1) The Proposed Scheme achieves 70% to 99% overall material recovery and or recycling (by weight) of non-hazardous CDW to substitute use of primary materials.</p> <p>2) Aggregates required to be imported to the Proposed Scheme comprise re-used and or recycled content in line with the east of England regional percentage target of 31%.</p> <p><u>Waste</u></p> <p>1) Less than or equal to 1% reduction or alteration in the regional capacity of landfill.</p> <p>2) Waste infrastructure has sufficient capacity to accommodate waste from the Proposed Scheme, without compromising integrity of the receiving infrastructure (design life or capacity) within the region.</p>
Neutral	<p><u>Material assets</u></p> <p>1) The Proposed Scheme achieves greater than 99% overall material recovery and or recycling (by weight) of non-hazardous CDW to substitute use of primary materials.</p> <p>2) Aggregates required to be imported to the Proposed Scheme compromise more than 99% re-used and or recycled content.</p> <p><u>Waste</u></p> <p>1) No reduction or alteration in the capacity of waste infrastructure within the region.</p>
<p><u>Note:</u></p> <p># Whilst excavated soil materials would be generated during construction, where chemically and geotechnically suitable, the material would be re-used on or off the Proposed Scheme. Consequently, excavated soil materials are not considered to comprise CDW. The government's recovery target of 70% does not include hazardous waste and excavated materials relating to List of Waste 17 05 04. This approach is consistent with the waste hierarchy and the objectives of minimising waste generation and reusing materials.</p>	

10.4.15. The significance of effects on material assets are reported in accordance with the following significance criteria provided in Table 3.14 of DMRB LA 110:

- **Significant (one or more criteria met):** category description met for a moderate or large effect

- **Not significant:** category description met for a neutral or slight effect

10.4.16. The significance of effects on landfill capacity are reported in accordance with the following significance criteria provided in Table 3.14 of DMRB LA 110:

- **Significant (one or more criteria met):** category description met for a moderate, large or very large effect
- **Not significant:** category description met for a neutral or slight effect

10.5. Assessment assumptions and limitations

- 10.5.1. Estimates of earthwork quantities and the suitability of excavated materials for retention on the Proposed Scheme have been considered. This has been supported by a review of available ground investigation (Soils Limited 2018) data to determine the likely percentage of material available for retention on the Proposed Scheme.
- 10.5.2. Material assets and waste quantities used during this assessment were provided by the Principal Contractor's Bill of Quantities. On the assumption of no substantial changes to the overall design; subsequent changes to these quantities during the progression of the detailed design are not considered significant enough to alter the outcomes of this assessment.
- 10.5.3. This assessment does not consider the environmental impacts associated with the extraction of raw materials and the manufacture of products. In addition, it does not consider the impact at non-landfill facilities (as detailed in 10.4.13). The impacts associated with the extraction of raw materials and the manufacture of products are subject to the applicable environmental assessment and or permitting and planning approval requirements for the relevant facilities.
- 10.5.4. There are limitations associated with the use of baseline information from the Environment Agency Waste Data Interrogator 2019 (published December 2020). Although updated in September 2020, landfill data contained within may not have been updated between 2018 and 2020. Previous updates to the files have related to the usability of the information files and error correction rather than updates to its content. In addition, the Environment Agency state that details of operators who have claimed commercial confidentiality are not provided.
- 10.5.5. There is the potential during construction that a proportion of the site won excavation arisings deemed suitable for retention on the Proposed Scheme in this assessment are not chemically or geotechnically suitable and require disposal off the Proposed Scheme.
- 10.5.6. There is the potential for encountering previously unencountered ground conditions across the site. Specifically, data gaps may be present where

insufficient information is available for a comprehensive waste assessment to be made across the Proposed Scheme in its entirety.

10.6. Study area

- 10.6.1. In accordance with paragraph 3.5 of DMRB LA 110, the assessment has established two geographically different study areas to examine the use of material assets and management of waste.

First study area

- 10.6.2. In accordance with paragraph 3.6 of DMRB LA 110, the first study area covers land within the Proposed Scheme boundary. This includes areas where site clearance, earthworks and construction are proposed and materials would be consumed (used, re-used and recycled) and waste generated.
- 10.6.3. As well as including the footprint of the Proposed Scheme, in accordance with paragraph 3.6 of DMRB LA 110, the first study area includes any temporary land requirements during the construction phase such as temporary offices, compounds and storage.

Second study area

- 10.6.4. In accordance with paragraphs 3.7 and 3.10 of DMRB LA 110, the second study area covers:
- Feasible sources and availability of construction materials required to construct the main elements of the Proposed Scheme.
 - Suitable landfill infrastructure that could accept arisings and or waste generated by the Proposed Scheme.
- 10.6.5. The study area for the source of material assets is the east of England region.
- 10.6.6. The study area for the management of inert and non-hazardous wastes comprises the wider east of England region, with landfills licenced to accept these located within this region. The east of England region comprises the ceremonial counties of Norfolk, Bedfordshire, Cambridgeshire, Essex, Hertfordshire and Suffolk.
- 10.6.7. There are no hazardous waste landfill sites within the east of England region. In accordance with paragraph 2.4 of DMRB LA 110, using the proximity principle, the study area for the management of hazardous wastes is the adjacent east midlands region. The closest hazardous waste landfill is in Northamptonshire (in the district of North Northamptonshire).
- 10.6.8. The study area for considering mineral safeguarded site sterilisation is defined by the Proposed Scheme boundary.

10.7. Baseline conditions

Waste generation: first study area

- 10.7.1. In the Do Nothing Scenario, waste generated and disposed of from the operation of the existing A47 is considered to be limited and associated with infrequent maintenance activities.
- 10.7.2. A waste assessment using the available ground investigation data (Soils Limited 2018) was undertaken to establish the likely classification of waste (inert, non-hazardous or hazardous). This information was then used to assess the effects on landfill capacities where disposal of materials is required. The assessment of waste disposal is provided within the 2020 GIR and summarised as follows:
- inert and non-hazardous waste
 - localised hazardous asphalt rich soils and stones encountered in the vicinity of exploratory hole BH21A
 - asphalt road pavement was encountered in TP07. This asphalt road pavement was not tested and assessed to inform waste classification during the ground investigation. Where requiring disposal as part of the Proposed Scheme, these wastes may potentially be classified as hazardous waste

Landfill infrastructure: second study area

- 10.7.3. Baseline information comprises the current landfill capacity in the waste disposal authority (Cambridgeshire and Peterborough), and in the wider east of England region as defined in paragraph 10.6.6.
- 10.7.4. Environment Agency Waste Data Interrogator 2019 (published December 2020) includes information about remaining landfill capacity in Peterborough and the wider east of England region. Statistics on remaining landfill capacities for Cambridgeshire and Peterborough (against those in the east of England and east midlands region) are summarised in Table 10-3.
- 10.7.5. In lieu of hazardous waste landfill sites within the east of England, using the proximity principle within LA 110 (paragraph 2.4), the data interrogator was used to assess remaining hazardous landfill capacity for the adjacent east midlands' region as defined in paragraph 10.6.7.
- 10.7.6. Regional statistics indicate that the east of England region has a total landfill capacity of approximately 50,455,835m³.

Table 10-3: Remaining landfill capacity summary (end 2019)

Landfill type	Cambridgeshire and Peterborough sub-region remaining capacity ^A	East of England remaining capacity
Hazardous	No hazardous waste landfill sites within Cambridgeshire and Peterborough.	No hazardous waste landfill sites within east of

Landfill type	Cambridgeshire and Peterborough sub-region remaining capacity ^A	East of England remaining capacity
		England. The closest hazardous waste landfill is East Northants Resource Management Facility (Permit Ref: EPR/TP3430GW) located in North Northamptonshire approximately 43km from the Proposed Scheme. Remaining capacity (2019) of 1,156,170m ³ .
Stable non-reactive hazardous waste (SNRHW) cell# within non-hazardous landfill	Total remaining permitted SNRHW capacity estimated to be 1,921,300m ³ (See note A).	4,986,939m ³
Non-hazardous	Total remaining permitted non-hazardous landfill capacity estimated to be 7,373,132m ³ (See note A).	23,537,406m ³
Inert (including quarry restoration sites)	Total remaining permitted inert landfill capacity estimated to be 5,210,050m ³ (See note A).	21,921,490m ³
<p><u>Note</u></p> <p># Some non-hazardous sites can accept some SNRHW into a dedicated cell, but this is usually permitted as a small part of the overall capacity of the site.</p> <p><u>Data Source</u></p> <p>A. Environment Agency Waste Data Interrogator 2019 (published December 2020).</p>		

10.7.7. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Annual Monitoring Report 2018 (published February 2020) includes details of additional landfill allocations that have been allocated, implemented or almost completed comprising two inert landfills (Cottenham and Block Fen / Langwood Fen), one non-hazardous landfill (Puddock Hill) and one SNRHW landfill (Grunt Fen).

10.7.8. The Cambridgeshire and Peterborough Minerals and Waste Core Strategy (published and adopted July 2011) outlines the planned development of Block Fen and Langwood Fen (located 20km from the Proposed Scheme) as a strategic resource for the recycling of construction waste and disposal of inert waste that cannot be recycled, using inert waste and peat soils to create the lowland wet grassland and provide enhancement habitat. Block Fen/ Langwood Fen will provide approximately 14,000,000m³ of void space for inert construction waste that cannot be recycled over the period of 2011 to 2026 and beyond.

Use of materials assets: first study area

10.7.9. In the absence of the Proposed Scheme, the use of material assets from the operation of the existing A47 is considered to be limited and associated with infrequent maintenance activities.

Baseline target for recovery of construction and demolition waste

- 10.7.10. The baseline target for recovery of CDW is 70% by weight, as set out in the European Union Waste Framework Directive 2008/98/EC (published November 2008) and the Waste Management Plan for England (published January 2021). Uncontaminated excavated soil and stones (List of Waste (LoW) Code 17 05 04) are specifically excluded from this target.
- 10.7.11. Alternative aggregates comprise both secondary aggregates, which are by-products from industrial and mining operations, and recycled aggregates, which are produced from construction waste. Baseline targets for these alternative aggregates are set out in the National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 (published June 2009). As detailed in Table E/1.2 (recycled aggregate targets for England 2005-2020 (National and regional guidelines) of DMRB LA 110, the target for the Proposed Scheme is the 31% guideline set for the east of England region in 2018.

Source of material assets: second study area

- 10.7.12. In the absence of the Proposed Scheme, the availability of material assets from the operation of the existing A47 is unlikely to be affected by the use of materials associated with infrequent maintenance activities.

Primary (virgin) materials

- 10.7.13. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Local Aggregates Assessment for 2020 (covering calendar year 2019) (published December 2020) estimates sand and gravel reserves in Cambridgeshire and Peterborough of 39,170,000 tonnes, equating to a minimum land bank of 13.06 years (156.7 months). This will provide sufficient aggregates to 2026 and beyond.
- 10.7.14. The East of England Working Party Annual Monitoring Report 2018 Data (published June 2019) notes that of the distribution of permitted sand and gravel reserves amongst the Mineral Planning Authorities within the East of England, Cambridgeshire and Peterborough had the largest proportion of sand and aggregate reserves within the east of England (34%).
- 10.7.15. The annual monitoring report for 2018 lists 15 primary sand and gravel extraction sites within Cambridgeshire and Peterborough and numerous additional sites within the east of England region.

Alternative (secondary and recycled) aggregates

- 10.7.16. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Local Aggregates Assessment for 2020 (covering calendar year 2019) (published December 2020) estimates a total of approximately 710,000 tonnes of recycled aggregate was produced. This is below the 31% target level set for the east of

England region in 2018 as detailed in Table E/1.2 (recycled aggregate targets for England 2005-2020 (National and regional guidelines) of DMRB LA 110.

However, it is understood there are data quality issues concerned with supply, sales, uses and definitions relating to quality standards.

- 10.7.17. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Local Aggregates Assessment for 2020 (covering calendar year 2019) (published December 2020) lists 37 active sites in Cambridgeshire and four active sites in Peterborough that have contributed to recycled/ secondary aggregate production during 2019.
- 10.7.18. The East of England Working Party Annual Monitoring Report 2018 Data (published June 2019) states that 64.6 million tonnes of aggregates used were derived from recycled sources and 7.4 million tonnes were derived from secondary sources within Great Britain. No data has been generated for the volumes of secondary and recycled aggregates produced in the east of England region.
- 10.7.19. The Annual Monitoring Report 2018 data lists 15 aggregate recycling sites within Cambridgeshire and Peterborough and numerous additional sites within the east of England region.
- 10.7.20. There are numerous regional concrete batching and coating plants, with two plants local to the Proposed Scheme at March (4 miles south).

Safeguarded mineral site sterilisation: second study area

- 10.7.21. Cambridgeshire County Council and Peterborough City Council have several core strategy policies regarding minerals and wastes under the Cambridgeshire and Peterborough Minerals and Waste Development Plan.
- 10.7.22. Policy CS26 of the Cambridgeshire and Peterborough Minerals and Waste Development Plan Core Strategy Development Plan (adopted July 2011) concerns the safeguarding of mineral sites and mineral resources. Minerals are a finite natural resource and safeguarding mineral sites protects sources for future use. As part of the framework, deposits of sand and gravel, silica sand and limestone within the county are safeguarded.
- 10.7.23. Safeguarding mineral sites does not necessarily prevent other forms of development being undertaken but ensures that issues of compatibility across the different forms of development are considered within the planning process.
- 10.7.24. The Proposed Scheme boundary intersects sand and gravel deposits (River Terrace Deposits and Alluvium) and limestone (Upper and Lower Lincolnshire

Limestone). These sand deposits form part of the council's safeguarded mineral resources (sands and gravels).

Future baseline

- 10.7.25. To identify the effects of the Proposed Scheme on environmental receptors, it is necessary to understand the baseline at both the year of construction commencement and at the year it would become operational. Baseline conditions for these years may be different to current conditions. Changes in conditions could potentially alter sensitivities of existing identified environmental receptors and introduce new sensitive receptors.
- 10.7.26. In the absence of the Proposed Scheme, material use on, and waste generation and disposal from the operation of the existing A47 is considered to be limited and associated with infrequent maintenance activities.
- 10.7.27. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Local Aggregates Assessment for 2020 (covering calendar year 2019) (published December 2020) states that Cambridgeshire and Peterborough have sand and gravel reserves of 39,170,000 tonnes, equating to a minimum land bank of 13.06 years (156.7 months). In addition to the permitted reserves, the plan makes allocations for the future supply of sand and gravel which would provide a total of 21,900,000 million tonnes of additional estimates reserves. A further 14 million tonnes of sand and gravel are allocated post-2026 associated with the Block Fen and Langwood Fen restoration projects.
- 10.7.28. The Cambridgeshire and Peterborough Minerals and Waste Core Strategy (published and adopted July 2011) outlines the planned development of Block Fen and Langwood Fen, using inert waste and peat soils to create the lowland wet grassland and provide enhancement habitat. Block Fen and Langwood Fen will provide approximately 14,000,000m³ of void space for inert construction waste that cannot be recycled over the period of 2011 to 2026 and beyond.
- 10.7.29. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Site Specific Proposal Development Plan Document (adopted 22 February 2012) in accordance with the spatial strategy for waste management facilities, the Core Strategy Policy CS20 makes future provision for inert landfill. There has been no identified need for additional non-hazardous landfill provision during the Plan period and therefore proposals for additional non-hazardous landfill will be resisted.
- 10.7.30. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Annual Monitoring Report 2018 (published February 2020) includes details of additional landfill allocations that have been allocated, implemented or almost completed) comprising two inert landfills (Cottenham and Block Fen / Langwood

Fen), one non-hazardous landfill (Puddock Hill) and one SNRHW landfill (Grundy Fen).

10.7.31. The Northamptonshire Minerals and Waste Local Plan Minerals and Waste Monitoring Report 2017 (published November 2018) indicates that there is sufficient hazardous waste landfill capacity up to 2026. This is relevant to the assessment as the closest hazardous waste landfill site to the Proposed Scheme is located within North Northamptonshire.

10.8. Potential impacts

Construction

10.8.1. The likely potential impacts are:

- Depletion of natural resources through the predominant use of primary aggregates and the use of recycled and or secondary aggregates below the 31% east of England regional target.
- Depletion of natural resources through recycling and or recovery of CDW below the 70% recovery target.
- Sterilisation of one or more mineral safeguarding site.
- Reduction in the capacity of regional inert and non-hazardous landfill facilities through generation of surplus excavation materials, generation and disposal of CDW from the demolition of any existing buildings or structures and generation of packaging materials and construction material wastage through damage and overordering.
- Generation of hazardous waste requiring disposal to hazardous waste landfill outside of the region.

Operation

10.8.2. In line with the EIA Scoping Opinion (March 2018) (**TR010039/APP/6.6**), the assessment of material assets and waste during the first year of operational activities (opening year) is not included and has been scoped out. Significant environmental effects from the use of material assets and generation of waste during this period are not predicted due to limited material use and waste generation from infrequent maintenance activities.

10.9. Design, mitigation and enhancement measures

Embedded mitigation

10.9.1. The Proposed Scheme is designed to avoid and minimise the environmental impacts of material assets and waste (as far as reasonably practicable) through the process of the assessment of alternatives and 'embedded mitigation' as defined in paragraph 3.24 of DMRB LA 104 (Environmental assessment and monitoring) (published August 2020).

- 10.9.2. The design has incorporated measures for the purpose of minimising environmental effects. The design of the Proposed Scheme is reported in ES Chapter 2 (The Proposed Scheme) (**TR010039/APP/6.1**).

Essential mitigation

- 10.9.3. This section reports on essential mitigation required in addition to embedded mitigation to reduce and offset likely significant adverse environmental effects as a result of material assets and waste. In accordance with the table of terms and definitions on page 8 of LA 104 (Environmental assessment and monitoring) (published August 2020), essential mitigation is defined as '*Mitigation critical for the delivery of a project which can be acquired through statutory powers*'.
- 10.9.4. Through the design, mitigation and enhancement measures detailed in this section (10.9), the Proposed Scheme aims to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill in accordance with the European Union Waste Framework Directive 2008/98/EC (published November 2008) 'waste hierarchy'.

Waste hierarchy:



Source: <http://ec.europa.eu/environment/waste/framework/>

- 10.9.5. Mitigation measures deemed necessary would be secured in the EMP and are set out below:
- Design for re-use and recovery by identifying, securing and using materials that already exist on the Proposed Scheme, or can be sourced from other projects. A CDW recovery and or recycling rate of 70% is set in the Environmental Management Plan (EMP) (**TR010039/APP/7.5**).
 - Design for materials optimisation by simplifying layout and form to minimise material use. Using standard design parameters, maximising the use of renewable materials and materials with recycled content in line with the 31% target for the east of England region as provided in the National and Regional Guidelines for Aggregates Provision in England 2005 and 2020.

- Design for offsite construction by maximising the use of prefabricated structures and components, encouraging a process assembly rather than construction on the site.
- Design for the future by considering extent to which key materials can be demounted and recycled.
- Design for waste efficient procurement.
- Engineering plan configurations and layouts that show how the most effective use of materials assets (including site-won arisings) can be achieved.
- As part of their construction assessment, the Principal Contractor will include the option of using local waste management facilities for waste management, in line with the proximity principle, which is to manage waste as close to the point of generation as possible, so as to reduce the carbon footprint of managing waste from the Proposed Scheme.

Environmental management plan

- 10.9.6. In accordance with DMRB LA 120 (Environmental management plan) (published March 2020), an EMP (first iteration) (**TR010039/APP/7.5**) has been prepared in parallel to the development of the Proposed Scheme design and construction methodologies.
- 10.9.7. Measures and procedures within the EMP (**TR010039/APP/7.5**) include design, construction and operational mitigation, which have been developed in-line with the requirements arising from this ES.
- 10.9.8. The Principal Contractor would further develop the EMP (second iteration) prior to commencement of works based on the EMP (first iteration) (**TR010039/APP/7.5**). It will include the implementation of industry standard practice and control measures for environmental impacts. Specifically, the EMP (**TR010039/APP/7.5**) will require that waste management measures and strategies are implemented in order to minimise the likelihood of any localised impacts of waste on the surrounding environment through the minimisation of waste generation and the increase in materials re-use and recycling.
- 10.9.9. The EMP (first iteration) (**TR010039/APP/7.5**) includes a site waste management plan (SWMP). Use of a SWMP is regarded as best practice. The focus of the SWMP is to provide an auditable record of the management of wastes on the Proposed Scheme during the construction phase. It will monitor the quantities and types of waste generated, as well as the duty of care information for the contractors transferring the waste and the sites the waste is taken to for management. The SWMP will also include procedures for monitoring the overall construction waste recovery rate. An outline SWMP for the Proposed Scheme is provided within Appendix 10.2 (**TR010039/APP/6.3**).

- 10.9.10. The re-use of excavated materials (on or off the site) during the Proposed Scheme construction will be governed by a materials management plan (MMP) which will form part of the EMP (**TR010039/APP/7.5**). The MMP shall be developed in accordance with the findings of this assessment and mitigation recommended, but also in accordance with CL:AIRE DoW CoP (published March 2011). This approach offers the most effective method of ensuring materials can be re-used on or off the Proposed Scheme. Suitability for re-use requires chemical and geotechnical assessment to demonstrate that surplus materials do not constitute waste. The MMP will detail the procedures and measures to be implemented to classify, track, store, re-use and dispose of all excavated materials encountered during the construction phase.
- 10.9.11. The EMP (and SWMP and MMP therewithin) require the Principal Contractor to adopt best practice in the management of construction waste to reduce waste generation and subsequent landfill disposal. Further to paragraph 10.9.5, additional mitigation measures in the EMP include:
- Consideration, in accordance with the waste hierarchy, to the re-use of waste generated on-site before it is transported off-site for re-use or disposal.
 - Use of construction, demolition and excavation waste (with treatment) within the Proposed Scheme boundary that meets the appropriate Waste and Resources Action Programme (WRAP) Quality Protocols.
 - Use of site won recycled material assets within the Proposed Scheme boundary without the need for treatment, and without the need for waste exemption (<https://www.gov.uk/government/collections/waste-exemptions-using-waste>), or the application of the CL:AIRE Definition of Waste Code of Practice (DoW CoP), Version 2 (published March 2011).
 - Re-use of site won excavated materials within the Proposed Scheme boundary without the need for treatment, and by meeting waste exemption, or CL:AIRE DoW CoP (published March 2011) criteria.
 - The adoption of the good practice in construction waste management principles outlined in WRAP guidance document Achieving good practice Waste Minimisation and Management, Guidance for construction clients, design teams and contractors.
 - Re-use and recycling of materials offsite where re-use within the Proposed Scheme boundary is not possible.
 - Use of material logistics planning to manage procurement, storage and use of material assets and minimise damage, over ordering and wastage.
 - Measures to encourage local and responsible resourcing of material assets (for example through adoption of Buildings Research Establishment (BRE) developed BES (BRE Environmental and Sustainability standard) 6001 Responsible Sourcing of Construction Products and efficiencies by minimal ordering of materials.

- A requirement for waste to be appropriately segregated and stored or stockpiled on-site by waste type, to ensure waste remains in a suitable condition to be re-used.
- A requirement for wastes that cannot be re-used or recycled on-site to be transported only to appropriately permitted recycling or disposal sites.

Enhancement measures

10.9.12. In accordance with paragraph 3.20 of DMRB LA 110, the following enhancement opportunities have been identified and will be considered further in the second iteration of the EMP (**TR010039/APP/7.5**). Enhancement measures have not been taken into account during the assessment of likely significant effects of the Proposed Scheme on Material assets and waste.

- Potential opportunities include the re-use of suitable surplus excavated materials on local developments concurrent to the construction phase of the Proposed Scheme, providing materials for the Block Fen and Langwood Fen restoration schemes and quarry restorations (see Table 10-3 and section 10.7.8).
- Old Station House is proposed to be demolished as part of the Proposed Scheme. Potential opportunity includes re-use of materials (bricks) to create new features (such as 'bat-hotel') as part of the environmental mitigation.

10.9.13. More generic opportunities for environmental enhancement which could be included by the Principal Contractor include:

- Potential opportunities to re-use suitable surplus material outside of the Proposed Scheme boundary to improve environmental outcomes for a wide range of receptors. Opportunities include, for example, construction of noise and landscape bunding within other sections of the A47 where improvements are planned, and the need has been previously identified (where land availability allows).
- Use of surplus recycled or recovered materials in community projects. For example, utilising recycled mulch from tree felling on any adjacent community facilities.

10.9.14. Further enhancement measures relating to material assets and waste will be considered and implemented where applicable during subsequent stages of the Proposed Scheme.

10.10. Assessment of likely significant effects Quantities

10.10.1. The estimated main types and quantities of material assets anticipated to be used during construction are shown in Table 10-4.

- 10.10.2. The estimated recycled content for each material in Table 10-4 is based on the 'good practice' recycled content rates from WRAP's Designing Out Waste Tool for Civil Engineering and Net Waste Tool. The total recycled content is calculated as a percentage by weight. The actual recycled content achieved during construction will depend on the availability of material containing recycled content and technical suitability.
- 10.10.3. Data on the bulk density of materials has been used to convert quantities between volume (m³) and weight (tonnes). Information on the typical bulk density of materials was sourced from WRAP's Designing Out Waste Tool for Civil Engineering and Building Services Research and Information Association (BSRIA) guide Embodied Carbon: The Inventory of Carbon and Energy (ICE) (October 2011).

Table 10-4: Estimated main categories and quantities of materials to be used during construction

Activity	Material category	Material density (tonnes/m ³)	Quantity required to be imported to site		Recycled content (% by weight)
			m ³	tonnes	
Site preparation, earthworks and construction	Concrete	2.4	1,200	2,880	22
	Asphalt	2.4	10,306	24,735	90
	Aggregates	2.4	89,003	213,607	50
	Plastic	0.97	86	84	10
	Steel	7.85	31	242	15
	Aluminium	2.8	24	68	44
	Wood	0.5	236	118	0
Total			100,886	241,733	54% (129,773 tonnes)
Total (aggregate containing materials)			100,509	241,222	54% (129,699 tonnes)

- 10.10.4. The estimated main categories and quantities of CDW waste generated during construction are shown in Table 10-5. A 5% wastage rate has been applied to the main construction materials. The estimated recovery rates are based on the 'good practice quick win' recovery rates set out in the in the WRAP guidance document Achieving good practice Waste Minimisation and Management, Guidance for construction clients, design teams and contractors (undated). The overall recovery rate is calculated by tonnage.

Table 10-5: Estimated main types and quantities of CDW generated during construction

Activity	Waste Type	Waste density (tonnes/m ³)	Quantity		Potential management route(s)	Potential recovery rate (% by weight)
			m ³	Tonnes		
Site demolition, preparation and earthworks	Concrete	2.4	226	508	Off-site recycling	95%
	Asphalt	2.4	1,428	3,427	Off-site recycling	95%
	Steel	7.85	1	8	Off-site recycling	100%
	Aluminium	2.8	1	3	Off-site recycling	100%
	Wood	0.5	19,056	9,528	Off-site recycling	90%
Site construction	Concrete	2.4	60	144	Off-site recycling	95%
	Asphalt	2.4	515	1,237	Off-site recycling	95%
	Aggregates	2.4	4,450	10,680	Off-site recycling	95%
	Plastic	0.97	4	4	Off-site recycling	80%
	Steel	7.85	2	12	Off-site recycling	100%
	Aluminium	2.8	1	3	Off-site recycling	100%
	Wood	0.5	12	6	Off-site recycling	90%
Total			25,756	25,560	Total recovery rate	93% (23,806 tonnes)

10.10.5. Construction works are anticipated to generate approximately 45,453m³ (90,906 tonnes assuming an average density of 2 tonnes per m³ for general soils and stones) of excavation arisings which are unsuitable for retention on the Proposed Scheme or surplus to requirements. These excavated materials are not included in Table 10-6 or the calculations for waste recovery as the government's recovery target of 70% does not include uncontaminated, excavated soils and stones. These materials impact on landfill capacities are assessed separately in Table 10-6.

Assessment of significant effects

10.10.6. Potential impacts have been assessed prior to mitigation and the residual effects then evaluated taking account of committed design, mitigation and enhancement measures (see section 10.9). The predicted effects are presented in Table 10-6.

Table 10-6: Predicted residual effects

Predicted impact	Pre-mitigation significance category	Committed mitigation	Post-mitigation significance category	Predicted residual effects (and significance)
Depletion of natural resources through the predominant use of primary aggregates and the use of recycled and or secondary aggregates below the 31% east of England regional target.	Moderate	Design for re-use and recovery of existing materials on the Proposed Scheme or those that can be sourced from other projects. Maximising the use of renewable materials and materials with recycled content. Use of construction, demolition and excavation waste (with treatment) that meets the appropriate WRAP Quality Protocols. Re-use of site won excavated materials within the Proposed Scheme boundary without the need for treatment, and by meeting waste exemption, or CL:AIRE DoW CoP criteria.	Slight adverse	Achieving 'good practice' during construction, it is anticipated that an overall recycled content of 54% can be achieved. This exceeds the regional guideline target of 31% for the east of England relating to the use of secondary and recycled aggregates which will be adopted (as set in the EMP (TR010039/APP/7.5)), where it is technically appropriate and economically feasible. Given the local availability of secondary and recycled aggregates it is possible to achieve this target in practice. In accordance with DMRB LA 110 and ensuring the committed mitigation measures (as set out in the EMP (TR010039/APP/7.5)) are followed, the effects are assessed as being slight adverse and not significant.
Depletion of natural resources through recycling and or recovery of CDW below the 70% recovery target.	Large	Design for re-use and recovery of existing materials on the Proposed Scheme or those that can be sourced from other projects. Use of construction, demolition and excavation waste (with treatment) that meets the appropriate WRAP Quality Protocols. Re-use of site won excavated materials within the Proposed Scheme boundary without the need for treatment, and by meeting waste exemption, or CL:AIRE DoW CoP criteria.	Slight adverse	Achieving 'good practice' during construction, it is anticipated that an overall CDW recovery rate of 93% can be achieved. This exceeds the Government's 70% target for recovery of construction waste which will be adopted (as set in the EMP (TR010039/APP/7.5)), where it is technically appropriate and economically feasible. In accordance with DMRB LA 110 and ensuring the committed mitigation measures (as set out in the EMP (TR010039/APP/7.5)) are followed, the effects are assessed as being slight adverse and not significant.
Sterilisation of one or more mineral safeguarding site.	Large	Re-use of site won excavated materials within the Proposed Scheme boundary without the need for treatment, and by meeting waste exemption, or CL:AIRE DoW CoP criteria.	Slight adverse	The Proposed Scheme boundary intersects sand and gravel deposits (River Terrace Deposits and Alluvium) and limestone (Upper and Lower Lincolnshire Limestone). These sand deposits

Predicted impact	Pre-mitigation significance category	Committed mitigation	Post-mitigation significance category	Predicted residual effects (and significance)
		Consider use of surplus excavated material outside of the Proposed Scheme boundary.		form part of the council's safeguarded mineral resources (sands and gravels). As detailed in Appendix 10.3 Mineral Impact Assessment (TR010039/APP/6.3), it is not anticipated that these mineral safeguarding sites will be sterilised. In accordance with DMRB LA 110 and ensuring the committed mitigation measures (as set out in the EMP (TR010039/APP/7.5)) are followed, the effects are assessed as being slight adverse and not significant.
Reduction in the capacity of regional inert and non-hazardous landfill facilities through: <ul style="list-style-type: none"> generation of surplus excavation materials generation and disposal of CDW from the demolition of any existing buildings or structures generation of packaging materials and construction material wastage through damage and overordering. 	Very large	The adoption of best practice to promote the re-use of construction, demolition and excavation waste over transport off-site for re-use or disposal. Use of construction, demolition and excavation waste (with treatment) within the Proposed Scheme boundary that meets the appropriate WRAP Quality Protocols. Management of waste in accordance with the SWMP. A requirement for waste to be appropriately segregated and stored or stockpiled on-site by waste type, to ensure waste remains in a suitable condition to be re-used. Consider re-use of suitable surplus excavated material outside of the Proposed Scheme construction boundary. Wastes that cannot be reused or recycled on-site to be transported only to appropriately permitted recycling or disposal sites.	Slight adverse	Construction is anticipated to generate approximately 45,453 m ³ (90,906 tonnes) of site arisings unsuitable for retention on the Proposed Scheme or surplus to requirements. An excess of approximately 25,756 m ³ (25,560 tonnes) of materials is anticipated (including unacceptable, and surplus materials, and wastage from construction). The Proposed Scheme is unlikely to generate large quantities of inert and non-hazardous waste (as assessed in the 2020 GIR) relative to regional landfill capacities (regional statistics given in the Environment Agency Waste Data Interrogator 2019 (published December 2020) reported the east of England region as having a total inert and non-hazardous waste landfill capacity of approximately 45,458,896m ³). Based on a worst-case assumption that all waste generated from the Proposed Scheme would be disposed of to landfill (71,209 m ³), this would utilise approximately 0.16% of the regional landfill capacity. In practice a large proportion of waste from the Proposed Scheme is likely to be recovered rather than disposed of to landfill, further reducing the overall quantities of waste for disposal.

Predicted impact	Pre-mitigation significance category	Committed mitigation	Post-mitigation significance category	Predicted residual effects (and significance)
				<p>The Proposed Scheme would result in less than 1% reduction or alteration in the regional capacity of waste infrastructure (specifically landfill), and there is adequate disposal capacity within the region to accommodate all the waste from the Proposed Scheme. In practice however, a high proportion of waste would be recovered rather than disposed.</p> <p>In accordance with DMRB LA 110 and ensuring the committed mitigation measures (as set out in the EMP (TR010039/APP/7.5)) are followed, the effects are assessed as being slight adverse and not significant.</p>
Generation of hazardous waste requiring disposal to hazardous waste landfill outside of the region.	Large	<p>The adoption of best practice to promote the re-use of construction, demolition and excavation waste over transport off-site for re-use or disposal.</p> <p>Use of construction, demolition and excavation waste (with treatment) within the Proposed Scheme boundary that meets the appropriate WRAP Quality Protocols.</p> <p>Management of waste in accordance with the SWMP. A requirement for waste to be appropriately segregated and stored or stockpiled on-site by waste type, to ensure waste remains in a suitable condition to be re-used.</p> <p>Consider re-use of suitable surplus excavated material outside of the Proposed Scheme boundary.</p> <p>Wastes that cannot be reused or recycled on-site to be transported only to appropriately permitted recycling or disposal sites.</p>	Slight adverse	<p>Localised hazardous asphalt rich soils and stones encountered in the vicinity of exploratory hole BH21A.</p> <p>In addition, asphalt road pavement was encountered in TP07. This asphalt road pavement was not tested and assessed to inform waste classification during the ground investigation. Where requiring disposal as part of the Proposed Scheme, these wastes may potentially be classified as hazardous waste.</p> <p>Based on current design assumptions, less than 1% of the Proposed Scheme's total the volume of waste will require disposal to landfill outside of the region as hazardous waste.</p> <p>In accordance with DMRB LA 110 and ensuring the committed mitigation measures (as set out in the EMP (TR010039/APP/7.5)) are followed, the effects are assessed as being slight adverse and not significant.</p>

- 10.10.7. Based on the information provided in Table 10-6 the likely significant impacts are assessed as being slight adverse and not significant.

10.11. Monitoring

- 10.11.1. Monitoring of waste generation during the construction phase will be undertaken via the SWMP which is to be prepared as part of the EMP (**TR010039/APP/7.5**) by the Principal Contractor.
- 10.11.2. The focus of the SWMP will be monitoring the quantities and types of waste generated, as well as the duty of care information for the contractors transferring the waste and the sites the waste is taken to for management.
- 10.11.3. The EMP will provide detailed information on the duty of care documents that will be needed, such as the waste transfer notes and consignment notes, as well as strategies to be implemented to minimise waste generation and increase re-use and recycle.
- 10.11.4. The MMP will monitor and track the movement, storage and placement of excavated materials within the Proposed Scheme or outside the Proposed Scheme in accordance with the CL:AIRE DoW CoP (published March 2011).

10.12. Summary of effects

- 10.12.1. The potential impacts of the Proposed Scheme from the use of material resources and generation of waste were assessed against the baseline information on material assets (materials availability) and waste (landfill capacity) generated by the relevant authorities, based on predicted regional demand projections (including consideration for other significant projects within the east of England region).
- 10.12.2. Significant environmental effects from the use of material assets and generation of waste during the first year of operational activities (opening year) are not predicted due to limited material use and waste generation from infrequent maintenance activities.
- 10.12.3. Design, mitigation and enhancement measures will be implemented during construction and controlled through the EMP (**TR010039/APP/7.5**). Overall, the recycled content of the materials used are predicted to be in excess of the regional target of 31% (achieving 'good practice' during construction, it is anticipated that an overall recycled content of 54% can be achieved). In addition, over 70% (achieving 'good practice' during construction, it is anticipated that an overall recovery rate of 93% can be achieved). of the waste generated will be re-used or recycled in line with the Government's target for

the recovery of construction waste. Additionally, the Proposed Scheme is not likely to result in a 1% reduction or alteration in the regions landfill capacity. The residual effects during construction will be slight adverse and not significant.

10.13. References

- Highways England (2019) Design Manual for Roads and Bridges LA 110 Material Assets and Waste (published August 2019). Available online at: <https://www.standardsforhighways.co.uk/ha/standards/>
- Sweco (2020). A47 Wansford to Sutton Dualling - Ground Investigation Report (Document Ref: HE551494-GTY-HGT-000-RP-CE-00001). HAGDMS (published November 2020)
- European Union Waste Framework Directive 2008/98/EC (published November 2008). Available online at: https://ec.europa.eu/environment/topics/waste-and-recycling/waste-framework-directive_en
- Department for Transport (2014) National Policy Statement for National Networks (NPSNN) (published December 2014). Available online at: <https://www.gov.uk/government/publications/national-policy-statement-for-national-networks>
- Department for Environment Food and Rural Affairs (2018) Resources and Waste Strategy for England (published December 2018). Available online at: <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england>
- Department for Environment Food and Rural Affairs (2018) 25 Year Environment Plan (published January 2018). Available online at: <https://www.gov.uk/government/publications/25-year-environment-plan>
- Department for Environment Food and Rural Affairs (2021) Waste Management Plan for England (published January 2021). Available online at: <https://www.gov.uk/government/publications/waste-management-plan-for-england-2021>
- Ministry of Housing, Communities and Local Government (2009) The National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 (published June 2009). Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7763/aggregatesprovision2020.pdf
- Highways England (2020) Design Manual for Roads and Bridges LA 120 (Environmental management plan) (published March 2020). Available online at: <https://www.standardsforhighways.co.uk/ha/standards/>
- Environment Agency (2020) Waste Data Interrogator 2019 (December 2020). Available online at: <https://data.gov.uk/dataset/d409b2ba-796c-4436-82c7-eb1831a9ef25/2019-waste-data-interrogator>

- Environment Agency (2020) Remaining Landfill Capacity (December 2020). Available online at: <https://data.gov.uk/dataset/237825cb-dc10-4c53-8446-1bcd35614c12/remaining-landfill-capacity>
- Cambridgeshire County Council and Peterborough City Council (2011) Cambridgeshire and Peterborough Minerals and Waste Development Plan Core Strategy Development Plan Document (adopted July 2011). Available online at: <https://www.cambridgeshire.gov.uk/business/planning-and-development/planning-policy/adopted-minerals-and-waste-plan>
- Cambridgeshire County Council and Peterborough City Council (2012) The Cambridgeshire and Peterborough Minerals and Waste Development Plan Site Specific Proposal Development Plan Document (adopted February 2012) Available online at: <https://www.cambridgeshire.gov.uk/business/planning-and-development/planning-policy/adopted-minerals-and-waste-plan>
- Cambridgeshire County Council and Peterborough City Council (2019) The Cambridgeshire and Peterborough Minerals and Waste Development Plan Local Aggregates Assessment 2020 (covering the calendar year 2019) (published December 2020). Available online at: <https://www.cambridgeshire.gov.uk/business/planning-and-development/planning-policy/local-aggregates-assessment>
- Cambridgeshire County Council and Peterborough City Council (2020). Cambridgeshire and Peterborough Minerals and Waste Development Plan Annual Monitoring Report 2018 (published February 2020). Available online at: <https://www.cambridgeshire.gov.uk/business/planning-and-development/planning-policy/annual-monitoring-report-development-scheme>
- Cambridgeshire County Council and Peterborough City Council (2011) Cambridgeshire and Peterborough Minerals and Waste Core Strategy (published and adopted July 2011). Available online at: https://www.cambridgeshire.gov.uk/asset-library/imported-assets/Core_Strategy_Adopted_19July_2011.pdf
- Northamptonshire County Council (2018) Northamptonshire Minerals and Waste Local Plan Minerals and Waste Monitoring Report 2017 (published November 2018). Available online at: <https://www.northamptonshire.gov.uk/councilservices/environment-and-planning/planning/planning-policy/minerals-and-waste-planning-policy/Pages/minerals-and-waste-monitoring-reports-local-aggregates-assessments.aspx>
- Highways England (2020) Design Manual for Roads and Bridges DMRB LA 104 (Environmental assessment and monitoring) (published August 2020). Available online at: <https://www.standardsforhighways.co.uk/ha/standards/>
- WRAP (undated) Achieving good practice Waste Minimisation and Management, Guidance for construction clients, design teams and contractors. Available online at:

<http://www.wrap.org.uk/sites/files/wrap/WMM%20guide%20Mid%20level.pdf>

- BES 6001 Responsible Sourcing of Construction Products.
- CL:AIRE (2011) Definition of Waste Code of Practice, Version 2, 2011 CL:AIRE Code of Practice (published March 2011). Available online at: <https://www.claire.co.uk/component/phocadownload/category/8-initiatives?download=212:definition-of-waste-development-industry-code-of-practice>
- WRAP Net Waste Tool. Available online at: <http://nwtool.wrap.org.uk/Home.aspx?intM=1>
- WRAP Designing Out Waste Tool for Civil Engineering. Available online at: <http://www.wrap.org.uk/sites/files/wrap/DoWT-CE%20User%20Guide1.pdf>
- BSRIA (2011) Embodied Carbon: The Inventory of Carbon and Energy (ICE) (published October 2011). Available online at: <https://greenbuildingencyclopedia.uk/wp-content/uploads/2014/07/Full-BSRIA-ICE-guide.pdf>
- The Waste (England and Wales) Regulations 2011 (as amended) (published March 2011). Available online at: <https://www.legislation.gov.uk/uksi/2011/988/contents/made>
- Hazardous Waste (England and Wales) Regulations 2005 (as amended) (published March 2005). Available online at: <https://www.legislation.gov.uk/uksi/2005/894/contents/made>
- Hazardous Waste Directive (91/689/EC) (published December 1991). Available online at: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31991L0689>
- Hazardous Waste (Miscellaneous Amendments) Regulations 2015 (published June 2015). Available online at: <https://www.legislation.gov.uk/id/uksi/2015/1360>
- Environmental Permitting (England and Wales) Regulations 2016 (as amended) (published December 2016). Available online at: <https://www.legislation.gov.uk/uksi/2016/1154/contents/made>
- Environment Agency (2016) Standard Rules SR2015 No 39 - use of waste in a deposit for recovery operation (published February 2016). Available online at: <https://www.gov.uk/government/collections/standard-rules-environmental-permitting>
- Department for Communities and Local Government (2014) National Planning Policy for Waste (published October 2014). Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/364759/141015_National_Planning_Policy_for_Waste.pdf
- Department for Environment Food and Rural Affairs (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, (published September 2009). Available online at:

<https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites>

- Environmental Protection Act 1990 (published November 1990). Available online at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>
- Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework (published February 2019). Available online at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- Environment Agency (2018), Technical Guidance WM3, Waste Classification, Guidance on the Classification and Assessment of Waste Version 1.1: (published May 2018). Available online at: <https://www.gov.uk/government/publications/waste-classification-technical-guidance>
- European Council Decision 2003/33/EC (published December 2002). Available online at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32003D0033>
- Health and Safety Executive (2002) Control of Substances Hazardous to Health Regulations 2002 (published October 2002). Available online at: <https://www.hse.gov.uk/nanotechnology/coshh.htm>
- Health and Safety Executive (1974) Health and Safety at Work Act 1974 (as amended) (published July 1974) Available online at: <https://www.hse.gov.uk/legislation/hswa.htm>
- Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991 (published July 1991). <https://www.legislation.gov.uk/uksi/1991/1624/contents/made>

10.14. Glossary

Term	Definition
BES	BRE Environmental and Sustainability standard
BRE	Buildings Research Establishment
BSRIA	Building Services Research and Information Association
CDW	Construction and Demolition Waste
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land Applications in Real Environments
DEFRA	Department for Environment Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
DoW CoP	Definition of Waste Code of Practice
EMP	Environmental Management Plan
EU	European Union
ES	Environmental Statement
GIR	Ground Investigation Report
ICE	Inventory of Carbon and Energy
KPI	Key Performance Indicators
LoW	List of Waste
MMP	Materials Management Plan
MIA	Minerals Impact Assessment
NPSNN	National Policy Statement for National Networks
SNRHW	Stable Non-reactive Hazardous Waste
SWMP	Site Waste Management Plan
WAC	Waste Acceptance Criteria
WM3	Technical Guidance WM3, Waste Classification, Guidance on the Classification and Assessment of Waste

WRAP	Waste and Resources Action Programme
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