# A12 Chelmsford to A120 widening scheme TR010060

# 6.1 ENVIRONMENTAL STATEMENT CHAPTER 11 MATERIAL ASSETS AND WASTE

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# A12 Chelmsford to A120 widening scheme

Development Consent Order 202[ ]

## ENVIRONMENTAL STATEMENT
## CHAPTER 11 MATERIAL ASSETS AND WASTE

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# 11 Material assets and waste

## 11.1 Topic introduction

11.1.1 This chapter presents the information required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) to be provided in the Environmental Statement for the proposed A12 Chelmsford to A120 widening scheme (the proposed scheme) in respect of material assets and waste.

11.1.2 This chapter considers the following matters:

- The use and consumption of 'material assets': this includes materials and products from primary, secondary, recycled, sustainable and renewable sources, and the use of excavated and other arisings that fall within the scope of waste exemption criteria.
- The production and disposal of 'waste': this includes surplus materials which can become waste, as well as other substances which the holder discards, intends to discard, or is required to discard.

11.1.3 This chapter includes an assessment of the likely significant environmental impacts and effects that can reasonably be predicted during the construction of the proposed scheme. Operational impacts have been scoped out of this assessment in accordance with the Scoping Opinion (Planning Inspectorate, 2021) as specified in Section 11.9 of this chapter. It identifies measures for mitigating likely significant effects where practicable, and describes the significance of the residual effects that are predicted to remain after mitigation.

11.1.4 Constructing the proposed scheme would require the use of large quantities of material assets and hence may result in potential impacts on the environment through the depletion of non-renewable natural resources, and sterilisation of mineral safeguarding sites. Conversely, constructing the proposed scheme would also result in large quantities of surplus materials and waste, leading to potential impacts on the available landfill void capacity.

11.1.5 Where practicable, those surplus materials and wastes that would arise during construction of the proposed scheme would be reused, recycled or recovered on or offsite in accordance with the waste hierarchy (as described in Section 11.8 of this chapter), which would reduce the need for offsite disposal to landfill.

11.1.6 Diverting materials from landfill and maximising the use of reused, recycled and responsibly sourced materials would reduce the attendant environmental impacts associated with materials production, thereby supporting a circular economy (as described in Section 11.10 of this chapter).

11.1.7 Where reasonably practicable, the proposed scheme has reduced the unnecessary sterilisation of mineral resources and prevented prejudicing the continuing efficient operation of existing, allocated and safeguarded minerals and waste sites.

11.1.8 This chapter is supported by the following figure [TR010060/APP/6.2]:

- Figure 11.1: Minerals and Waste Infrastructure and Designations

11.1.9 This chapter is also supported by the following appendices [TR010060/APP/6.3][1]:

- Appendix 11.1: Mineral Resource Assessment
- Appendix 11.2: Mineral Infrastructure Assessment
- Appendix 11.3: Waste Infrastructure Assessment

11.1.10 This chapter is further supported by the following appendices of the first iteration of the Environmental Management Plan (EMP) [TR010060/APP/6.5]:

- Appendix D: Contaminated Land Management Plan
- Appendix J: Materials Management Plan
- Appendix L: Site Waste Management Plan
- Appendix M: Soil Handling Management Plan

11.1.11 The assessment of effects on material assets and waste has been informed by relevant information collated by other environmental aspect chapters of the Environmental Statement, notably Chapter 10: Geology and soils [TR010060/APP/6.1] for sources of potentially hazardous waste; and Chapter 15: Climate [TR010060/APP/6.1] for a unified schedule of material types and quantities associated with construction of the proposed scheme.

11.1.12 Material assets and waste can affect the full range of environmental assessment aspects and matters. Where materials are consumed, and waste is generated, it is acknowledged that, depending on how they are managed, indirect effects may arise (from greenhouse gas emissions, water consumption and pollution, visual impacts, dust, noise, vibration, vehicle emissions, disruption to traffic and other potential causes of nuisance).

11.1.13 While these indirect impacts would typically be assessed as part of the Environmental Statement, this would not form part of a material assets and waste assessment. Such impacts, effects and mitigation measures are considered as part of the other aspect chapters in the Environmental Statement [TR010060/APP/6.1], notably:

- Chapter 6: Air quality
- Chapter 8: Landscape and visual
- Chapter 9: Biodiversity

[1] The Mineral Resource Assessment, Mineral Infrastructure Assessment and Waste Infrastructure Assessment have been prepared in line with Essex County Council's generic schedule of requirements for when an application for non-minerals development is proposed in land designated as a Mineral Safeguarding Area, Mineral Consultation Area or Waste Consultation Area, as detailed in the Scoping Opinion (Planning Inspectorate, 2021). With regards to the Mineral Infrastructure Assessment and Waste Infrastructure Assessment, the level of detail provided is in proportion to the nature of the proposed scheme.

- Chapter 10: Geology and soils
- Chapter 12: Noise and vibration
- Chapter 13: Population and human health
- Chapter 14: Road drainage and the water environment
- Chapter 15: Climate

## 11.2 Competent expert evidence

11.2.1 The assessment has been undertaken and reported by a team of competent waste and resource efficiency specialists. The competent expert responsible for the assessment is a Senior Associate Director, holds a BEng (Hons) in environmental engineering, and is a Chartered Waste Manager (MCIWM). They have over 20 years' experience of undertaking materials and waste assessments for major infrastructure and linear projects, including highways, requiring the process of Environmental Impact Assessment (EIA).

## 11.3 Stakeholder engagement

11.3.1 Table 11.1 identifies the key feedback received from the Scoping Opinion (Planning Inspectorate, 2021) relevant to the scope of the material assets and waste assessment, and identifies any matters scoped out of the assessment as agreed with the Planning Inspectorate and other stakeholders.

11.3.2 The table also explains any changes to the assessment methodology as a result of this engagement, and as result of the meeting held with Essex County Council's (ECC's) Planning Services Team (Minerals and Waste) on 5 February 2021 to agree the responses to its Scoping Opinion comments and any necessary changes to the scope or methodology for this aspect.

11.3.3 A number of the Scoping Opinion responses included matters that are indirectly relevant to this aspect (such as impacts on the highway network from import of bulk materials). These comments have not been included in Table 11.1 as they are not directly related to the aspect scope and methodology and are assessed by other environmental aspects.

**Table 11.1 Key Scoping Opinion feedback for material assets and waste**

| Stakeholder | Comment | Response |
|---|---|---|
| Planning Inspectorate | The Inspectorate agrees that operational impacts (on material assets and waste) can be scoped out of the Environmental Statement on the basis of the reasoning presented. This is also supported by ECC. | Operational effects on material assets and waste have been scoped out of the Environmental Statement as per the rationale provided in Section 11.9 of this chapter. |

| Stakeholder | Comment | Response |
|---|---|---|
| Planning Inspectorate | The locations of waste facilities that may be used to dispose of the proposed scheme's waste should be described within the Environmental Statement. | The locations of waste facilities that may be used to dispose of the waste have been described within Section 11.8 of this chapter, with cognisance of the limitations described in Section 11.7 of this chapter. |
| Planning Inspectorate | The Environmental Statement should state how the design and mitigation measures, including the Site Waste Management Plan and Responsible Sourcing Plan, will be secured through the Development Consent Order (DCO) or other legal mechanism. | The Environmental Statement has specified how the design and mitigation measures, including the Site Waste Management Plan (SWMP) and Sustainable Procurement Plan (SPP), would be secured and monitored in Section 11.12 of this chapter. |
| Planning Inspectorate | The Environmental Scoping Report (ESR) proposed to scope out an assessment of material assets and waste, and climate change within the assessment of cumulative effects chapter due to these matters already being assessed at an appropriate scale within their respective aspect chapters. On this basis, the Inspectorate agrees that these matters can be scoped out of the cumulative assessment within the Environmental Statement. | The cumulative effects of material assets and waste have been scoped out of Chapter 16: Cumulative effects assessment, of the Environmental Statement [TR010060/APP/6.1]. |
| ECC | Where the proposed scheme has an impact on a Mineral Safeguarding Area, the Secretary of State should ensure that the applicant has put forward appropriate sterilisation mitigation measures to safeguard mineral resources as per national and local policy requirements. | A Mineral Resource Assessment has been prepared to establish the viability of extracting minerals in advance of or in conjunction with the proposed scheme (see Appendix 11.1 of the Environmental Statement [TR010060/APP/6.3]). |
| ECC | ECC has a schedule of information requirements to include when carrying out EIA on its mineral resources and active, permitted and/or allocated minerals and waste infrastructure. | A Mineral Resource Assessment, Mineral Infrastructure Assessment and Waste Infrastructure Assessment have been prepared in line with ECC's requirements (see Appendices 11.1, 11.2 and 11.3 of the Environmental Statement [TR010060/APP/6.3]). These requirements are set out in the Scoping Opinion (Planning Inspectorate, 2021). |

| Stakeholder | Comment | Response |
|---|---|---|
| ECC | Policy S4 of the Essex Minerals Local Plan requires that all development proposals shall ensure that mineral waste is minimised and that minerals on development and redevelopment sites are reused and recycled. It further requires the application of procurement policies which promote sustainable design and construction in the proposed development. | Information has been provided to address the issues identified by ECC and has been reported in various chapters of the Environmental Statement, including but not limited to this aspect (which is supported by the SPP, Mineral Resource Assessment and SWMP). |
| ECC | When considering the impact of the proposed scheme on local aggregate supply, the anticipated annual take of the project versus recent annual sales of this mineral over an appropriate geographic area should be reported. | Recent annual sales information obtained from ECC (2021a) has been added to the baseline conditions in Section 11.8 of this chapter. An assessment of the aggregates consumption of the proposed scheme versus recent annual sales has been provided in Section 11.11 of this chapter. |
| ECC | Landfill capacity assessments should not amalgamate inert and non-hazardous landfill capacity. Whilst it is recognised that non-hazardous landfill sites can accept inert waste, ECC requests that future assessments are based on dedicated inert landfill capacity, particularly in Essex, in the first instance. | Baseline landfill capacity assessments have been separated into inert and non-hazardous landfill classes for the East of England region and Greater Essex sub-region in Section 11.8 of this chapter. Impacts to landfill capacity have been primarily assessed on a regional basis, recognising that cross-boundary movements of waste are likely to occur. A degree of sub-regional assessment has also been provided in Section 11.8 of this chapter. These assessments have been undertaken separately for inert and non-hazardous landfill capacity. |
| ECC | An assessment of disposal capacity over the lifetime of the construction should also consider the economics of inert disposal and whether counting all available capacity in the East of England is appropriate. Whilst the desire to scope in capacity at the regional level is understood, there is a need to demonstrate that the various landfill capacities that are being relied upon would be capacity that could realistically serve the project. Future landfill forecasts should include commentary regarding when sites are expected to close. | The rationale for setting the second study area at the regional level (East of England) has been provided in Section 11.7 of this chapter. The baseline assessment has provided a detailed assessment of the current and future landfill capacity likely to be available at the regional and sub-regional levels. While closure dates are not publicly available at the regional level, the information provided by ECC at the sub-regional level has been considered in the baseline assessment. |

| Stakeholder | Comment | Response |
|---|---|---|
| ECC | Commentary will be needed to say that waste from the project may 'push out' waste that would otherwise be disposed of in Essex, and what that means for the Environmental Statement's intended approach. Proposed scope recognises the proximity principle but not the concept of net self-sufficiency which is another main driver for waste planning. | The estimated quantity of residual waste, to be disposed of to landfill in the region split by inert and non-hazardous classifications, is provided in Section 11.11 of this chapter. These arisings have been contextualised against the baseline levels of construction and demolition (C&D) waste disposed of to landfill at both the regional and the sub-regional level. |
| ECC | Commentary to be provided in the study area or baseline conditions sections to reflect what distance materials are likely to be imported from and wastes disposed of to. | Indicative transport distances, which have been used in estimating the radius of imported material assets and exported wastes, are provided in Section 11.7 of this chapter. |
| ECC | It is considered appropriate that assessments of mineral take and waste arising are presented annually and linked to the various phases of development. | The estimated minerals consumption and waste generation in Section 11.11 of this chapter, associated with constructing the proposed scheme, has been divided equally across the four-year construction programme to obtain a 'per annum' figure which has been directly compared to the baseline in Section 11.8 of this chapter. |
| Suffolk County Council | Consideration should be given to the origin of the materials for construction of the proposed scheme. As East Anglia One North, East Anglia Two and Sizewell C have all been submitted to the examining authority, consideration should be given to cumulative impacts given that the current programmes of each project could coincide. Consideration should also be given to the project's potential to disrupt deliveries and the programmes of the aforementioned Nationally Significant Infrastructure Projects (NSIPs) and how this can be managed. | The origin of materials has been considered in Sections 11.6, 11.7 and 11.9 of this chapter. The cumulative effects of material assets and waste have been scoped out of Chapter 16: Cumulative effects assessment, of the Environmental Statement [TR010060/APP/6.1]. |
| Public Health England | The applicant should demonstrate compliance with the waste hierarchy (e.g. with respect to reuse, recycling or recovery and disposal).<br>For wastes arising from the development, the Environmental Statement should assess: the implications and wider environmental and public health impacts of different waste disposal options and | Waste would be managed in accordance with duty of care requirements (which includes applying the waste hierarchy as a priority order) as detailed in the Department for Environment, Food and Rural Affairs' (Defra's) (2018c) Waste Duty of Care Code of Practice. |

| Stakeholder | Comment | Response |
|---|---|---|
| | disposal route(s) and transport method(s) and how potential impacts on public health will be mitigated.<br><br>If the development includes wastes delivered to the installation: consider issues associated with waste delivery and acceptance procedures (including delivery of prohibited wastes) and assess potential offsite impacts and describe their mitigation. | The Code of Practice is pursuant to Section 34(9) of the Environmental Protection Act 1990 (as amended) and makes inherent provision for the safe management of waste to protect human health and the environment.<br><br>While the impacts of construction traffic would be covered by other aspects (notably air quality, noise and vibration, population and human health, and climate), waste vehicles would be covered where required and waste secured appropriately for transport purposes.<br><br>Please refer to the assessment assumptions and limitations identified in Section 11.6 of this chapter. |

11.3.4 The full Scoping Opinion (Planning Inspectorate, 2021), as well as the Applicant's response regarding how and where comments have been addressed in the Environmental Statement and draft DCO, is included within Appendix 5.1 of the Environmental Statement [TR010060/APP/6.3].

11.3.5 Table 11.2 identifies the key feedback received from statutory consultation. All comments raised during the statutory consultation, as well as the Applicant's full responses, are included in the Consultation Report [TR010060/APP/5.1]. A meeting was also held with ECC's Planning Services Team (Minerals and Waste and National Strategic Infrastructure Projects) on 19 November 2021 to agree the responses to its statutory consultation comments and any necessary changes to the scope or methodology for this aspect.

11.3.6 A number of the statutory consultation responses included matters where minor changes were required, no response was required or where the comment is not directly relevant to this aspect. These comments have not been included in Table 11.2 as they are not directly related to the aspect scope and methodology and have been considered by other environmental aspects.

**Table 11.2 Key statutory consultation feedback for material assets and waste**

| Stakeholder | Comment | Response |
|---|---|---|
| ECC | Request that relevant information is clearly signposted within a future material assets and waste chapter if it is not to be included directly within that chapter. | The material assets and waste assessment has cross-referenced to those aspect chapters in Section 11.1 of this chapter, where other material assets and waste related issues would be assessed. |

| Stakeholder | Comment | Response |
|---|---|---|
| ECC | Data pertaining to Essex County and Greater Essex should be correctly referenced and assessed. The Environmental Statement should be based on the latest available information. | It has been clarified, throughout this chapter, whether the presented data is for Essex, Greater Essex or Essex and Southend-on-Sea. The use of Greater Essex data is more prevalent in the assessment given that this is typically how data is published. The assessment has been based on the latest available published information. |
| ECC | Updated information pertaining to operational landfill facilities in Essex County was provided. | The list of operational landfills has been updated in Section 11.8 of this chapter and factored back into the assessment. |
| ECC | It cannot be assumed that primary aggregate supply will just be there. The aggregate demand of this project, alone and in combination with other major projects, should be assessed and compared with recent sales, scaled to an appropriate market area, to justify that the impact on primary aggregate demand would not go significantly beyond 'business as usual'.<br><br>The demand on waste capacity of this project, alone and in combination with other major projects, should be assessed and compared with recent waste arisings, scaled to appropriate market areas, to justify that the impact on waste recycling capacity would not go significantly beyond 'business as usual'. | The impact of primary aggregates consumption of the proposed scheme has been compared against recent annual regional and sub-regional baseline sales in Section 11.11 of this chapter.<br><br>The impact of those wastes, forecast to be diverted from landfill, have been compared in Section 11.11 of this chapter against baseline annual quantities of C&D waste received at all regional and sub-regional waste facilities.<br><br>The ESR (Highways England, 2020c) scoped out an assessment of material assets and waste within the assessment of cumulative effects due to these matters already being assessed on a regional scale within the aspect chapter. On this basis, the Planning Inspectorate agreed that these matters can be scoped out of the cumulative assessment reported within Chapter 16 of the Environmental Statement [TR010060/APP/6.1]. |
| ECC | A more realistic forecasting methodology is required to inform the future baseline landfill capacity.<br><br>The legitimacy of taking an average of remaining landfill capacity from a set of forecasted annual remaining landfill capacity figures is questioned. Irrespective of this, the unit of measurement would be tonnes, not tonnes per annum. | The future landfill void capacity has been forecast in Section 11.8 of this chapter, using statistical trend analysis that takes account of the historic addition and subtraction of landfill capacity at both the regional and sub-regional level.<br><br>The erroneous text stating that '*these forecasts do not include any additional capacity that may open in the future in the region*' has been removed, and this has been clarified in the revised baseline.<br><br>This methodology is as per that utilised in the ESR (Highways England, 2020c), but |

| Stakeholder | Comment | Response |
|---|---|---|
| | It is questioned whether it would be more appropriate to compare the annual capacity take of the scheme individually and cumulatively with other major infrastructure projects versus baseline fill rates, and how that might impact an appropriately forecasted remaining capacity at the end of the construction period.<br><br>More realistic remaining capacity forecasts would assess likely capacity increases in the context of inert landfill site allocations yet to be brought forward in relevant Waste Local Plans whilst taking into account average rates of deposition. | having provided separate inert and non-hazardous forecasts at the request of ECC in its Scoping Opinion response.<br><br>Historic data (for 2005–2020) has been added to the baseline conditions to highlight these historic trends in landfill capacity addition and subtraction, and to improve the transparency in the forecasting method.<br><br>In addition to the operational landfills in Greater Essex (see Table 11.15), a separate table (see Table 11.16) has been included in Section 11.8 of this chapter to highlight those landfill site allocations yet to be brought forward by the Essex and Southend-on-Sea (2017) Waste Local Plan. This has not, however, been used within the statistical forecast of future landfill capacity. |
| ECC | The preliminary assessment does not acknowledge that the road corridor would impact the existing Colemans Farm Quarry processing plant footprint. A consequence of the road going ahead could be the need to relocate the processing plant facilities, and this would either need to be accomplished in the DCO or as a separate planning application. | The impact of the road corridor on the existing quarry processing plant footprint, and the resultant consequences, has been acknowledged in Section 11.11 of this chapter and assessed in the Mineral Resource Assessment and Mineral Infrastructure Assessment that have been prepared for the proposed scheme (see Appendix 11.1 and Appendix 11.2 of the Environmental Statement respectively [TR010060/APP/6.3]). |
| ECC | It seems appropriate to present a more rounded acknowledgement of the impact of this scheme on the mineral resources of the County. | The preliminary environmental assessment concluded that no likely significant effects are predicted to occur to safeguarded mineral sites, as a result of constructing the proposed scheme, in accordance with Design Manual for Roads and Bridges (DMRB) LA 110 (Highways England, 2019b).<br><br>Nevertheless, the impacts of the proposed scheme on safeguarded mineral resources and infrastructure have been separately assessed (outside of the EIA process) through the Mineral Resource Assessment, in Appendix 11.1 [TR010060/APP/6.3], and Mineral Infrastructure Assessment, in Appendix 11.2 [TR010060/APP/6.3], that have been prepared to accompany the DCO application in line with the requirements of the Essex Minerals Local Plan (ECC, 2014). |

## 11.4 Legislative and policy framework

11.4.1 The use and consumption of material assets and the production and disposal of waste are subject to a complex framework of legislative and policy instruments at the national, county, local and applicant level.

### Legislation

11.4.2 The key legislation for this aspect is identified in Table 11.3.

**Table 11.3 Legislative requirements for material assets and waste**

| Legislation | Description |
|---|---|
| Environment Act 2021 (as amended) | The Environment Act provides the relevant national authorities with wide-ranging powers to implement secondary legislation covering areas such as extended producer responsibility obligations; provision of resource efficiency information; deposit schemes and charges for single use items; managing waste; and waste enforcement and regulation. The Act also amends existing legislation, for example by amending the sections of the Environmental Protection Act 1990 dealing with the separation of waste, hazardous waste, the transfrontier shipment of waste, enforcement, and enabling the establishment of an electronic waste tracking system, as well as amending the powers under the Environment Act 1995 to make charging schemes. |
| Environmental Protection Act 1990 (as amended) | The Environmental Protection Act 1990 defines the meaning of 'waste' and household, commercial and industrial waste and hazardous waste for the purposes of UK waste legislation. The Act also requires anyone who produces, carries, keeps, disposes of, treats, imports or has control of waste to keep it safe and to make sure it is dealt with responsibly and only given to businesses authorised to take it. This is known as 'duty of care'. |
| The Environmental Permitting (England and Wales) Regulations 2016 (as amended) | The Environmental Permitting Regulations 2016 require that operators of regulated waste installations, mobile plant or waste operations obtain an environmental permit for certain activities involving the storage, treatment, use or disposal of waste. |
| The Waste Electrical and Electronic Equipment Regulations 2013 (as amended) | The Waste Electrical and Electronic Equipment Regulations 2013 set out the producer responsibility regime for waste electrical and electronic equipment in England and Wales. These regulations implement the requirements of the Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU). In particular, they ensure that producers of electrical and electronic equipment finance the cost of collection, treatment, recycling and recovery of that equipment when it becomes WEEE. |

| Legislation | Description |
|---|---|
| The Controlled Waste (England and Wales) Regulations 2012 (as amended) | The Controlled Waste (England and Wales) Regulations 2012 classify waste as household waste, industrial waste or commercial waste for the purposes of Part 2 of the Environmental Protection Act 1990 and in consequence determine the meaning of 'controlled waste' for the purposes of Part 2 of the Act. Certain waste is not to be classified as household, industrial or commercial waste, in particular waste which falls outside the scope of Directive 2008/98/EC on waste. |
| The Waste (England and Wales) Regulations 2011 (as amended) | Enacts the Revised European Union (EU) Waste Framework Directive (2008/98/EC). The Waste Regulations 2011 require that waste holders must take all such measures as are reasonable to apply the waste hierarchy of prevention, preparing for reuse, recycling, other recovery and disposal when transferring waste. However, waste holders can depart from the priority order so as to achieve the best overall environmental outcome. Sets the recycling and recovery targets to be achieved by 2020 for C&D waste (70%). |
| The Hazardous Waste (England and Wales) Regulations 2005 (as amended) | The Hazardous Waste Regulations 2005 set out the regime for the control and tracking of the movement of hazardous waste; banning the mixing of hazardous wastes with non-hazardous waste and imposing a duty to separate different categories of hazardous waste where technically feasible. |
| The Landfill (England and Wales) Regulations 2002 (as amended) | The Landfill (England and Wales) Regulations 2002 enacts Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste. The Landfill Regulations prohibit certain kinds of waste being disposed of to landfill, for example liquid waste, certain hazardous wastes and tyres. They classify landfills according to whether they can accept hazardous, non-hazardous or inert wastes; mandate that wastes can only be accepted at a landfill if they meet the waste acceptance criteria for that class of landfill; and require all waste to be treated before it is disposed of to landfill with the exception of inert waste, for which treatment is not technically feasible, and where treatment would not reduce its quantity or the hazards that it poses to human health or the environment. |
| The Landfill Tax Regulations 1996 (as amended) | The Landfill Tax Regulations 1996 and associated orders encourage businesses to produce less waste, to dispose of less waste in landfill sites, and to recover value from more of the waste produced, for example through recycling. Unless it is specifically exempt, or excepted, Landfill Tax applies to disposal of material at a landfill site that is covered by a permit under specific environmental legislation or at an unauthorised waste site. |

## National policy

### National Policy Statements

11.4.3 The National Networks National Policy Statement (NNNPS) (Department for Transport, 2014) sets out the Government's policies to deliver the development of Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. The Secretary of State uses the NNNPS as the primary basis for making decisions on DCO applications.

11.4.4 The NNNPS sets out policies in relation to the safeguarding of mineral resources (paragraphs 5.169 and 5.182) and the management of waste (paragraphs 5.39 to 5.45) on transportation schemes. Key policy from the NNNPS relevant to this aspect is set out in Table 11.4.

**Table 11.4 NNNPS requirements for material assets and waste**

| NNNPS paragraph | NNNPS requirement | How this is addressed in the assessment |
|---|---|---|
| 4.29 | '*Applying "good design" to national network projects should produce sustainable infrastructure … efficient in the use of natural resources*.' | Those measures, identified in Section 11.10 of this chapter, would be implemented to reduce the potential impacts associated with both the consumption of material assets and the production and disposal of waste during the construction of the proposed scheme. |
| 5.169 | '*Applicants should safeguard any mineral resources on the proposed site as far as possible*.' | The alignment of the mainline around junction 22 (Colemans interchange) has been revised to reduce the impact on Colemans Farm Quarry, limiting impacts to the quarry's extraction programme. A Mineral Resource Assessment (Appendix 11.1 of the Environmental Statement [TR010060/APP/6.3]) has been prepared to establish the existence, or otherwise, of a mineral resource capable of having economic importance within the Order Limits. Where the proposed scheme could result in the sterilisation of mineral resources, the environmental, social and economic viability of prior extraction has been considered. |
| 5.182 | '*Where a proposed development has an impact on a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that the applicant has put forward appropriate mitigation measures to safeguard mineral resources*.' | |
| 5.42 | '*The applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include information on the proposed waste recovery and disposal system for all waste generated by the development. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome*.' | An initial SWMP has been prepared as part of the first iteration of the EMP [TR010060/APP/6.5] to plan, implement, monitor and review waste minimisation and management throughout the design and construction of the proposed scheme. The SWMP will be a live document, updated at varying points during design and construction. It would be used to quantify waste arisings and facilitate the identification and implementation of waste prevention at the detailed design stage, and the reuse, recycling and other recovery opportunities during the construction phase. The waste hierarchy would be followed as a priority order to achieve the best overall environmental outcome, and minimise waste generation and disposal to landfill in line with the prevailing national policy targets. |

11.4.5 As set out in Chapter 1: Introduction, of the Environmental Statement [TR010060/APP/6.1], the assessment has considered the Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Department of Energy and Climate Change, 2011a; 2011b) in relation to the diversion of an existing high pressure gas main (the 'gas main diversion') owned and operated by Cadent Gas Limited (Cadent). Draft versions of the updated EN-1 and EN-4 NPS have also been considered (Department for Business, Energy and Industrial Strategy (BEIS), 2021a; 2021b).

11.4.6 A review of the relevant requirements of EN-1 and EN-4 (including the draft updated versions), relating to the EIA of the gas main diversion works, identified that the requirements are not materially different to those set out in the NNNPS. As such, it is considered that by meeting the NNNPS requirements set out in Table 11.4, the requirements of EN-1 and EN-4 are also met. The notable exceptions to this are discussed below:

- Paragraph 5.14.6 and EN-1 (Department of Energy and Climate Change, 2011a) and paragraph 5.15.6 of the draft updated EN-1 (BEIS, 2021a) require that an assessment be undertaken of the impact of the waste arising from the development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation. Operational effects have been scoped out of this assessment for the reasons identified in Section 11.9 of this chapter. This rationale equally applies to the gas main diversion, which is unlikely to result in significant materials consumption or waste generation during the first five years of operation.

- Paragraph 5.15.7 of the draft updated EN-1 (BEIS, 2021a) encourages applicants to, where possible, source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers. It also states that construction best practices should be used to ensure that material is reused or recycled onsite where possible. As reported in Section 11.10 of this chapter, an SPP would be prepared for the proposed scheme that sets out a clear framework to increase the procurement and use of sustainably and responsibly sourced construction materials and products. Table 2.11 in Chapter 2: The proposed scheme, of the Environmental Statement [TR010060/APP/6.1] provides a summary of the types of construction materials and products to be consumed on the proposed scheme that are likely to hold certification to a recognised responsible sourcing standard. Additional mitigation regarding low carbon materials is provided in Chapter 15: Climate, of the Environmental Statement [TR010060/APP/6.1].

- Paragraph 5.15.8 of the draft updated EN-1 (BEIS, 2021a) encourages applicants to use construction best practices in relation to storing materials in an adequate and protected place onsite to prevent waste, for example, from damage or vandalism. The use of Building Information Management tools (or similar) to record the materials used in construction can help to reduce waste in future decommissioning of facilities, by identifying materials that can be recycled or reused. As reported in Section 11.10 of this chapter,

waste 'duty of care' requirements would be complied with throughout the construction of the proposed scheme. The detailed design of the proposed scheme would consider how materials can be designed to be more easily adapted over an asset lifetime and how de-constructability and de-mountability of elements can be increased at end of first life.

**National Planning Policy Framework**

11.4.7 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2021a) was adopted in March 2012 and last updated in July 2021. The NPPF sets out the Government's planning policies for England and how these are to be applied. It is a material consideration in planning decisions.

11.4.8 Paragraph 5 of the NPPF makes it clear that the document does not contain specific policies for NSIPs and that applications in relation to NSIPs are to be determined in accordance with the decision-making framework set out in the Planning Act 2008 and relevant National Policy Statements, as well as any other matters that are considered both important and relevant. However, paragraph 5 clarifies that matters considered both important and relevant to NSIPs may include the NPPF.

11.4.9 While the NPPF does not contain specific materials or waste management policies, the framework does include references to both the prudent use of natural resources and waste management in Chapters 2 and 17 of the NPPF respectively. Of relevance to materials and waste, the NPPF states that, '*planning policies should*:

- *Provide for the extraction of mineral resources of local and national importance, but not identify new sites or extensions to existing sites for peat extraction*' (paragraph 210(a)).
- *So far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously (paragraph 210(b)).*
- *Safeguard mineral resources by defining Mineral Safeguarding Areas … and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked)*' (paragraph 210(c)).
- *Set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place*' (paragraph 210(d)).
- *Safeguard existing, planned and potential sites for: the bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material*' (paragraph 210(e)).

## Plans and strategies

11.4.10 In addition to national policy, the proposed scheme has also had regard to the additional national plans and strategies, as specified in Table 11.5.

**Table 11.5 Other national policy requirements for material assets and waste**

| Policy, plan, strategy or standard | Description |
|---|---|
| **National policy, plan, strategy or standard** | |
| Net Zero Strategy: Build Back Greener (BEIS, 2021c) | The Net Zero Strategy sets out the UKs approach to meeting UK carbon budgets, its 2030 Nationally Determined Contribution and net zero by 2050. Those policies for natural resources and waste that are applicable to this assessment include moving towards a circular economy, improving resource efficiency, and achieving near elimination of biodegradable waste to landfill. |
| Greening Government Commitments 2021 to 2025 (Defra, 2021a) | The Greening Government Commitments set out the actions UK government departments and their partner organisations will take to reduce their impacts on the environment in the period 2021 to 2025. The following sub-targets, pertaining to minimising waste and promoting resource efficiency, are applicable to this aspect:<br>• Reduce the amount of waste going to landfill to less than 5% of overall waste.<br>• Increase the proportion of waste which is recycled to at least 70% of overall waste.<br>These targets are aggregate central government targets for the Department of Transport and not bespoke minimum performance targets for its Arm's Length Bodies (e.g. National Highways). |
| Waste Prevention Programme for England: Towards a Resource Efficient Economy (Defra, 2021b) | Defra's Waste Prevention Programme for England sets out priorities for action to manage resources and waste in accordance with the waste hierarchy, which means preventing waste by, among other things, increasing reuse, repair and remanufacture of products. The Programme outlines the potential for, and benefits of, action on waste prevention, what industry is already doing and could do, as well as setting out actions for government. |
| Waste Management Plan for England (Defra, 2021c) | The Waste Management Plan for England aims to bring current waste management policies together under one national plan. Those policies of relevance to this assessment include ensuring by 2020 that at least 70% by weight of non-hazardous C&D waste, that is not naturally occurring material falling within the description of code 17 05 04 in the List of Wastes, is subjected to material recovery. This is C&D waste excluding hazardous waste and naturally occurring material falling within code 17 05 04. |
| Routemap for Zero Avoidable Waste in Construction (Green Construction Board, 2021) | The Routemap identifies actions across the construction industry and applies to new and existing buildings and structures. The overall target is for '*zero avoidable waste (ZAW) in the construction sector by 2050'*. There are a number of other targets included with the Routemap:<br>• By 2030 costs are reduced by 10% through designing out waste and material optimisation. |

| Policy, plan, strategy or standard | Description |
|---|---|
| | • By 2040 eliminate all but hazardous C&D waste entering landfill.<br>• By 2040 reduce soil to landfill by 75% based on a 2020 level and by 2050 this should be zero unless required for landfill operation purposes. |
| National Infrastructure Strategy (HM Treasury, 2020) | The National Infrastructure Strategy sets out plans to transform UK infrastructure in order to level up the country, strengthen the Union and achieve net zero carbon emissions by 2050. The Strategy states that the UK needs to go further in increasing its resource-use efficiency, to reduce the burden placed on the natural world through the supply of raw materials and absorbing waste. |
| A Green Future: Our 25 Year Plan to Improve the Environment (Defra, 2018a) | The 25 Year Plan sets out the Government's goals for improving the environment, within a generation, and leaving it in a better state than it was found. Key goals and targets include maximising the value and benefits from resources, doubling resource productivity by 2050; working towards the ambition of zero avoidable waste by 2050; and meeting all existing waste targets. |
| Our Waste, Our Resources: A Strategy for England (Defra, 2018b) | The resources and waste strategy sets out how resource use would be optimised by minimising waste, promoting resource efficiency and moving towards a circular economy in England. It gives a clear longer-term policy direction in line with the 25 Year Environment Plan. The strategy sets out a vision to achieve the UK's major goals: achieving zero avoidable plastic waste, doubling UK resource productivity, and reaching zero avoidable waste of all kinds by 2050. |
| Industrial Strategy: Building a Britain Fit for the Future (BEIS, 2017a) | The Industrial Strategy states that Britain is committed to moving towards a more circular economy, and is committed to raising productivity by using resources more efficiently. This strategy sets out the UK's aim for broader outcomes to be considered at the design stage of major projects and encouraging a cultural change – where consumers look at the whole life value of a product rather than focusing on the up-front cost. |
| The Clean Growth Strategy: Leading the Way to a Low Carbon Future (BEIS, 2017b) | The Clean Growth Strategy sets out the Government's proposals for decarbonising all sectors of the UK economy through the 2020s. Key policies and proposals include working towards the ambition for zero avoidable waste by 2050, maximising the value from resources, and minimising the negative environmental and carbon impacts associated with their extraction, use and disposal. |
| National Planning Policy for Waste (Department for Communities and Local Government, 2014) | The National Planning Policy for Waste sets out waste planning policies that all local planning authorities in England must follow when discharging their waste management responsibilities. Relevant policy aims include the following:<br>• Delivery of sustainable development and resource efficiency by driving waste management up the waste hierarchy.<br>• Ensuring that the likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities. |

| Policy, plan, strategy or standard | Description |
|---|---|
| | • Ensuring that handling of waste arising from the construction and operation of development maximises reuse and recovery opportunities and minimises offsite disposal.<br>• Securing the reuse, recovery or disposal of waste without endangering human health or the environment. |
| National and Regional Guidelines for Aggregates Provision in England 2005-2020 (Department for Communities and Local Government, 2009) | This document sets out guidelines for aggregates provision in England for the period 2005 to 2020, including assumptions on the proportional contribution of alternative sources of aggregate (secondary and recycled aggregates) to the overall provision. |
| **Applicant policy, plan, strategy or standard** | |
| Net Zero Highways: Our 2030 / 2040 / 2050 Plan (National Highways, 2021) | The net zero highways plan sets out National Highway's programme for a net zero future. Those actions of relevance to this assessment include: '*net zero for our maintenance and construction activities by 2040*'. The plan reports that National Highways will focus on the asphalt, cement and steel sectors. It will use a carbon management system to embed approaches that minimise emissions, including lean construction practices and the principles of the circular economy. It will also use digital technologies to increase the capacity of its existing network minimising new construction where practicable. |
| Sustainable Development Strategy (Highways England, 2017) | The Sustainable Development Strategy outlines National Highways (formerly Highways England) approach and priorities for sustainable development. Those ambitions of relevance include:<br>• Increasing knowledge of where National Highways goods and materials are sourced from and ensuring the responsible sourcing of resources to minimise the impacts that their production and handling can have on local, national and global human and social health and also on the environment and climate change.<br>• Reducing raw material consumption and waste generation; pushing towards a 'circular' approach to the management of resources, through minimising National Highways demand for primary resources extracted from the ground and maximising the reuse of the resources already in use on the network in as high a value function as possible.<br>• Working with its supply chain to find new ways to deliver a more resilient and adaptable network – seeking efficiency and value for money; and working to achieve security of supply: working with others to improve the stability and predictability of demand for high-sustainability performance products and services. Enabling suppliers to invest in innovative approaches and secure long-term partnerships with wider supply networks, their staff and wider communities. |

| Policy, plan, strategy or standard | Description |
|---|---|
| DMRB GG 103 Introduction and General Requirements for Sustainable Development and Design (Highways England, 2019a) | DMRB GG 103 introduction and general requirements for sustainable development and design specifies the principles, requirements and advice to be applied to all design lifecycle stages, from inception through to end of first life, including:<br>• Serve to support a sustainable economy<br>• Represent good 'whole life' value across the design life of road infrastructure<br>• Embrace innovation<br>• Use responsibly sourced materials that minimise adverse impacts on people and their environment<br>• Be resource efficient and reflect a circular approach to the use of materials |
| DMRB LA 110 Material Assets and Waste (Highways England, 2019b) | DMRB LA 110 Material Assets and Waste sets out the requirements for assessing and reporting the effects on material assets and waste from the delivery of motorway and all-purpose trunk road projects. The National Application Annexes to DMRB LA 110 specify regional and national aggregate recycled content targets and target for recovery of C&D waste for use with DMRB LA 110 in England. Those targets include:<br>• Any aggregates imported to site shall comprise reused, secondary or recycled content at levels in line with the East of England regional guideline for aggregates provision 2005-2020 target of 31% (by weight).<br>• At least 70% (by weight) of non-hazardous C&D waste ‘shall’ be subjected to material recovery/diverted from landfill (constitutes a requirement of National Highways).<br>• At least 90% (by weight) of non-hazardous C&D waste ‘should’ be subjected to material recovery/diverted from landfill and incineration (constitutes advice expressed as a recommendation by National Highways). |

## Local policy

11.4.11 In addition to the national policy set out in the NNNPS (Department for Transport, 2014), the proposed scheme has also had regard to relevant local plans and policy. A summary of the policy framework is provided in Appendix 1.1 of the Environmental Statement [TR010060/APP/6.3].

11.4.12 The key local policy relevant to this aspect are outlined in Table 11.6.

**Table 11.6 Local policy requirements for material assets and waste**

| Local authority | Local policy document/requirements | How this is addressed in the assessment |
|---|---|---|
| ECC | Essex Minerals Local Plan (ECC, 2014)[1]:<br><br>Policy S1 – Presumption in favour of sustainable development: The Mineral Planning Authority (MPA) will take a positive approach to minerals development[2] that reflects the presumption in favour of sustainable development contained in the NPPF.<br><br>Policy S2- Strategic priorities for minerals development: The strategic priorities for minerals development are focused primarily on meeting the mineral supply needs of Essex whilst achieving sustainable development.<br><br>Policy S4 – Reducing the use of mineral resources: all development proposals shall ensure that mineral waste is minimised and that minerals on development/redevelopment sites are reused and recycled. This is to reduce the need for primary minerals and the amount of waste to landfill.<br><br>Policy S5 – Creating a network of aggregate recycling facilities: proposals for new aggregate recycling facilities should be located on the main road network, and in the preferred locations specified in this policy (such as on major demolition and construction sites (on a temporary basis)).<br><br>Policy S6 – Provision for sand and gravel extraction: mineral extraction outside Preferred or Reserve Sites will be resisted by the MPA unless the applicant can demonstrate: (a) an overriding justification and/or overriding benefit, and, (b) the scale of the extraction is no more than that required of the proposal, and, (c) the proposal is environmentally suitable, sustainable, and consistent with the relevant policies set out in the Development Plan[3].<br><br>Policy S8 – Safeguarding mineral resources and mineral reserves: mineral resources of national and local importance shall be protected from surface development that would sterilise a significant economic resource or prejudice the effective working of a mineral reserve site[4]. | Mineral Resource Assessment and Mineral Infrastructure Assessment included in Appendix 11.1 and Appendix 11.2 of the Environmental Statement [TR010060/APP/6.3].<br><br>Measures detailed in Section 11.10 of this chapter, including:<br><br>• Producing an SPP<br>• Implementing an SWMP<br>• Obtaining and complying with all necessary permits, consents and licences |

| Local authority | Local policy document/requirements | How this is addressed in the assessment |
|---|---|---|
| | Policy S9 – Safeguarding mineral transhipment sites and secondary processing facilities: mineral facilities of strategic importance shall be safeguarded from development which would compromise their continued operation.<br><br>Policy S11 – Access and Transportation: Proposals for minerals development shall be permitted where it is demonstrated that the development would not have unacceptable impacts on the road network. Proposals for the transportation of minerals by rail and/or water will be encouraged subject to other policies in this Plan.<br><br>Policy S12 – Mineral Site Restoration and After-Use: Proposals for minerals development will be permitted provided that it can be demonstrated that the land is capable of being restored at the earliest opportunity to an acceptable environmental condition and beneficial after-uses, with positive benefits to the environment, biodiversity and/ or local communities. | |
| ECC | Essex and Southend-on-Sea Waste Local Plan (ECC and Southend-on-Sea Borough Council, 2017)<br><br>Policy 1 – Need for Waste Management Facilities[5]: In order to meet the future needs of the Plan area, waste development will be permitted to meet the shortfall in capacity of: Up to 1.95 million tonnes per annum by 2031/32 for the management of inert waste.<br><br>Policy 2 – Safeguarding Waste Management Sites and Infrastructure: waste management sites, water recycling centres and infrastructure shall be safeguarded from non-waste development.<br><br>Policy 6 – Open Waste Facilities on unallocated sites or outside Areas of Search: proposals for new open waste management facilities will be permitted where complying with the criteria laid out in this policy. This includes on C&D sites, where the inert waste materials are to be used on the construction project on that site; and on mineral sites where waste material is used in conjunction with restoration, or proposed waste operations are temporary and linked to the completion of the mineral operation. | Waste Infrastructure Assessment included in Appendix 11.3 of the Environmental Statement [TR010060/APP/6.3].<br><br>Measures detailed in Section 11.10 of this chapter, including:<br><br>• Obtaining and complying with all necessary permits, consents and licences |

| Local authority | Local policy document/requirements | How this is addressed in the assessment |
|---|---|---|
| | Policy 9 – Waste Disposal Facilities: Proposals for landfill facilities will be permitted where the policy criteria are met. In addition, preference will be given to proposals, inter alia, for the restoration of a preferred or reserve site in the Minerals Local Plan.<br><br>Policy 10 - Development Management Criteria: Proposals for waste management development will be permitted where it can be demonstrated that the development would not have an unacceptable impact on the matters specified in this policy.<br><br>Policy 12 - Transport and Access: Proposals for waste management development will be permitted where it is demonstrated that the development would not have an unacceptable impact on the road network. Proposals for the transportation of waste by rail and/or water will be encouraged subject to other policies in this Plan. | |
| North Essex Authorities | North Essex Authorities' Shared Strategic Section 1 Plan (Tendring District Council, Colchester Borough Council and Braintree District Council, 2021)<br><br>Policy SP 1 Presumption in Favour of Sustainable Development: When considering development proposals the Local Planning Authorities will take a positive approach that reflects the presumption in favour of sustainable development contained in the NPPF. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing Design for Resource Efficiency Principles<br>• Producing an SPP<br>• Implementing an SWMP |
| Braintree District Council | Braintree Publication Draft Local Plan (Braintree District Council, 2017)<br><br>Policy LPP 55 – Layout and Design of Development: the Council will seek a high standard of layout and design in all developments in the District and encourage innovative design where appropriate. Planning permission will be granted where the relevant following relevant criteria are met:<br>• Development proposals will incorporate measures for environmental sustainability throughout the construction, occupation and demolition of the development.<br>• Designs shall incorporate details of waste storage and collection arrangements, including provision for recycling. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing Design for Resource Efficiency Principles<br>• Producing an SPP<br>• Implementing an SWMP |

| Local authority | Local policy document/requirements | How this is addressed in the assessment |
|---|---|---|
| Braintree District Council | Braintree District Council Core Strategy (Braintree District Council, 2011)<br>Policy CS9 – Built and Historic Environment: the Council will promote and secure the highest possible standards of design and layout in all new development in order to incorporate the principles of sustainable design and construction, in accordance with recognised national standards securing the use of energy efficient design and materials and recycled materials. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing Design for Resource Efficiency Principles<br>• Producing an SPP |
| Chelmsford City Council | Chelmsford Local Plan 2013 – 2036 (Chelmsford City Council, 2020)<br>Strategic Policy S2 – Addressing Climate Change And Flood Risk: the Council, through its planning policies and proposals that shape future development, will seek to mitigate and adapt to climate change. In addressing the move to a lower carbon future for Chelmsford, the Council will encourage new development that inter alia promotes the efficient use of natural resources. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing Design for Resource Efficiency Principles<br>• Producing an SPP<br>• Implementing an SWMP |
| Colchester Borough Council | Colchester Borough Local Plan 2017 – 2033 Publication Draft (Colchester Borough Council, 2017)<br>Policy CC1 – Climate Change: Colchester Borough Council will continue to adopt strategies to mitigate and adapt to climate change. A low carbon future for Colchester will be achieved by inter alia minimising waste and improving reuse and recycling rates. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing Design for Resource Efficiency Principles<br>• Producing an SPP<br>• Implementing an SWMP |
| Colchester Borough Council | Colchester Core Strategy Adopted December 2008 (Selected policies revised July 2014) (Colchester Borough Council, 2014a)<br>Policy ER1 – Energy, Resources, Waste, Water and Recycling: the Council's commitment to carbon reduction includes the promotion of efficient use of resources, alongside waste minimisation and recycling. Sustainable construction techniques will also need to be employed in tandem with high quality design and materials to inter alia reduce waste and the use of natural resources, and include facilities and employ best practice technology to optimise the opportunities for recycling and minimising waste. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing Design for Resource Efficiency Principles<br>• Producing an SPP<br>• Implementing an SWMP |

| Local authority | Local policy document/requirements | How this is addressed in the assessment |
|---|---|---|
| Colchester Borough Council | Colchester Development Policies Adopted October 2010 (Selected policies revised July 2014) (Colchester Borough Council, 2014b)<br>Policy DP1 – Design and Amenity (Revised July 2014): all development must be designed to a high standard, avoid unacceptable impacts on amenity, and demonstrate social, economic and environmental sustainability. Development proposals must demonstrate that they, and any ancillary activities associated with them, will inter alia incorporate any necessary infrastructure and services including recycling and waste. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing an SWMP |
| Maldon District Council | Maldon District Approved Local Development Plan 2014-2029 (Maldon District Council, 2017)<br>Policy D2 – Climate Change & Environmental Impact of New Development: all development must minimise its impact on the environment by incorporating the following principles:<br>• Development should seek to maximise the use of building materials from sustainable sources and apply sustainable construction methods where appropriate.<br>• Development will contribute towards making more efficient use or reuse of existing resources and reducing the lifecycle impact of materials used in construction. The Council may require large scale development proposals to be supported by a Site Waste Management Plan. | Measures detailed in Section 11.10 of this chapter, including:<br>• Implementing Design for Resource Efficiency Principles<br>• Producing an SPP<br>• Implementing an SWMP |

Table notes:

[1] The Essex Minerals Local Plan provides planning policies for minerals development in Essex County until 2029. It sets a policy framework within which the best possible use of mineral resources, mainly sand and gravel, can be achieved. It also allocates sites for future mineral extraction and associated development. ECC is currently undertaking a review of its Minerals Local Plan to consider the continued appropriateness of each policy/supporting text. Until the review is complete, the current Minerals Local Plan remains the adopted plan.

[2] Mineral development typically also includes borrow pits. While borrow pit development is not a topic on which specific advice is given in the NPPF, it is a form of mineral development and the guidance contained in the NPPF relating to the need to deliver sustainable mineral development.

[3] Proposals for mineral extraction on 'non-Preferred Sites' may occur in relation to borrow pits and prior extraction to prevent mineral sterilisation. Such proposals will be considered on their own individual merits, and the MPA will pay particular regard to the justification/need that is cited by applicants when determining planning applications. The MPA must be satisfied that there are exceptional reasons for permitting such applications, after having considered all the relevant circumstances so as not to prejudice the overall strategy of the document. All proposals will be considered against policies in the Development Plan.

| Local authority | Local policy document/requirements | How this is addressed in the assessment |
|---|---|---|

[4] Non-mineral proposals that exceed the mineral specific thresholds set out in this policy shall be supported by a minerals resource assessment to establish the existence or otherwise of a mineral resource of economic importance. If, in the opinion of the local planning authority, surface development should be permitted, consideration shall be given to the prior extraction of existing minerals.

[5] Waste management facilities (including open waste facilities and waste disposal facilities) have been included due to the potential for the proposed scheme to import inert construction, demolition and excavation waste as backfill materials to Colemans Farm Quarry (see Section 11.6 of this chapter).

## Guidance

11.4.13 A number of statutory and good practice guidance documents are also relevant to this aspect, as outlined in Table 11.7.

**Table 11.7 Statutory and good practice guidance for material assets and waste**

| Guidance | Description |
|---|---|
| Net Zero: Making Essex Carbon Neutral (ECC, 2021b) | Essex's Net Zero plan sets out the plan to tackle climate change and the key steps needed for Essex to reach net zero by 2050. Specifically, for waste the document sets out a series of recommendations, the following of which are of relevance to this assessment:<br>• By 2025: systems are in place so all biodegradable waste in the county is put to beneficial use through composting, recycling or energy generation.<br>• By 2030: at least 70% of the waste the council collects is reused, recycled, or composted.<br>• By 2030: Essex should commit to send zero waste to landfill sites. |
| The Circular Economy and Net Zero Carbon, White Paper No. 4 (Major Infrastructure – Resource Optimisation Group (MI-ROG), 2020) | The MI-ROG white paper explores the different aspects of circular economy thinking. A core goal of circular economy principles is keeping assets, components, products and materials at their highest value for as long as possible. The underlying carbon reduction assumption is that using less material results in a lower carbon impact compared to using virgin materials. This paper explores the different aspects of circular economy thinking, presenting pathways and opportunities to delivering low-carbon or net zero emissions in the delivery of sustainable infrastructure assets. |
| Guidance on waste recovery plans and deposit for recovery permits (Environment Agency, 2021) | The Environment Agency guidance provides pre-application advice on how to apply for an environmental permit to permanently deposit waste on land as a recovery activity. Waste recovery on land, or deposit for recovery, is when waste materials are used instead of non-waste material to perform a function (e.g. quarry restoration): |

| Guidance | Description |
|---|---|
| | • Applicants should contact the Environment Agency for a pre-application discussion to find out what information to include and which permit to apply for.<br>• A waste recovery plan must be created and included with the deposit for recovery permit application. The plan must demonstrate that the waste recovery test would be met.<br>• If the plan cannot show that the proposed operation is waste recovery, applicants can apply for a waste disposal permit instead. |
| Technical Guidance WM3 on the Classification and Assessment of Waste (Environment Agency *et al*., 2021) | Technical Guidance WM3 provides guidance on waste classification. Appendix A of the guidance includes the waste classification codes, also referred to as the List of Waste or European Waste Catalogue codes for hazardous and non-hazardous waste. |
| Waste Duty of Care Code of Practice (Defra, 2018c) | The Code of Practice, issued under Section 34(7) of the Environmental Protection Act 1990, sets out practical guidance on how to meet waste duty of care requirements. This Code of Practice applies to anyone that imports, produces, carries, keeps, treats, disposes of or, as a dealer or broker, has control of certain waste in England or Wales. |
| Embedding circular economy principles into infrastructure operator procurement activities, White paper (MI-ROG, 2016) | The MI-ROG white paper discusses the risks and opportunities associated with changing infrastructure procurement policies in order to accelerate the circular economy in infrastructure. A key theme in the white paper is collaboration, recognising that mainstreaming circular economy principles will only be achieved through cross-sector collaboration. |
| BES 6001 Framework Standard for Responsible Sourcing (Building Research Establishment, 2014) | BES 6001 has been published to enable construction product manufacturers to ensure, and prove, that their products have been made with materials that have been responsibly sourced. The standard describes a framework for the organisational governance, supply chain management and environmental and social aspects that must be addressed in order to ensure the responsible sourcing of construction products. |
| Quality Protocol – Aggregates from Inert Waste: End of Waste Criteria for the Production of Aggregates from Inert Waste (Environment Agency, 2013) | The Quality Protocol sets out end of waste criteria for the production and use of aggregates from inert waste. The quality protocol identifies the point at which waste, having been fully recovered, may be regarded as a non-waste product that can be used in specified markets, without the need for waste management controls. |

| Guidance | Description |
|---|---|
| The Definition of Waste: Development Industry Code of Practice (Contaminated Land: Applications in Real Environments (CL:AIRE), 2011) | The CL:AIRE Code of Practice provides a process which enables the reuse of excavated materials onsite or their movement between sites. It can provide an alternative to Environmental Permits or Waste Exemptions. The Code of Practice enables the direct transfer and reuse of clean naturally occurring soil materials between sites; the conditions to support the establishment/ operation of fixed soil treatment facilities; and the reuse of both contaminated/uncontaminated materials on their site of origin and between sites. |
| Designing out Waste Guide for Civil Engineering (Waste and Resources Action Programme (WRAP), 2010) | WRAP's Designing out Waste Guide provides a detailed explanation of the key principles that designers can use during the design process and how these principles can be applied to civil engineering projects to maximise opportunities to reduce construction waste and use materials more efficiently. |
| GOV.UK Environmental Management Guidance: Waste (Environment Agency, no date) | GOV.UK's environmental management guidance series provides definitive guidance for waste on topics such as classifying waste; storing, treating, using, disposing and moving waste; waste permitting and licensing; battery, electrical, packaging and hazardous waste; and how to achieve end of waste status for certain waste derived materials. |

# 11.5 Assessment methodology

## Assessment scope

11.5.1 Table 11.8 summarises the scope of the material assets and waste aspect, which is based on the Scoping Opinion (Planning Inspectorate, 2021).

**Table 11.8 Scope of the material assets and waste aspect assessment**

| Matter | Scoped in – construction | Scoped in – operation |
|---|---|---|
| Material assets | ✓ | × |
| Waste | ✓ | × |

11.5.2 The Preliminary Environmental Information Report (Highways England, 2021) concluded that no likely significant effects would occur to safeguarded mineral and waste sites as a result of constructing the proposed scheme, applying the DMRB LA 110 significance criteria.

11.5.3 Notwithstanding, the potential impacts to these sites have also been separately considered outside the EIA process as part of the Mineral Resource Assessment, Mineral Infrastructure Assessment and Waste Infrastructure Assessment included in Appendix 11.1, Appendix 11.2 and Appendix 11.3 of the Environmental Statement [TR010060/APP/6.3].

11.5.4 These assessments have been prepared to accompany the Environmental Statement and DCO application at the request of ECC in line with its Local Planning Policy advice. These assessments have not been used in the assessment of likely significant effects in Section 11.11 of this chapter.

## General approach

11.5.5 The environmental assessment for this aspect focuses primarily on determining the likely significant effects of constructing the proposed scheme on the environment resulting from the consumption of material assets, and the production and disposal of waste.

11.5.6 The assessment has been prepared in accordance with DMRB LA 104 Environmental Assessment and Monitoring (Highways England, 2020a) and DMRB LA 110 Material Assets and Waste (Highways England, 2019b), which together form the published environmental assessment standard for the assessment, reporting and management of environmental effects associated with this aspect.

11.5.7 This assessment uses and builds on the information and data gathered as part of the ESR (Highways England, 2020c) and Preliminary Environmental Information Report (Highways England, 2021) and endeavours to collate additional information to qualify, and where feasible quantify, the material assets required, and waste likely to be generated in constructing the proposed scheme.

11.5.8 The Environmental Statement, for the purposes of this aspect, is a desk-based quantitative study that aims to identify the following assessment information for the anticipated construction phase (2024 to 2027):

- For material assets:
  - Types and quantities of material assets required to construct the proposed scheme.
  - Information on materials that contain secondary and recycled content.
  - Information on any known sustainability credentials of materials to be consumed.
  - The type and volume of materials that would be recovered from onsite or offsite sources for use on the proposed scheme.
  - The cut and fill balance.
  - The degree of sterilisation of mineral safeguarding sites.
  - Details of onsite storage and stockpiling arrangements, and any supporting logistical details.
- For waste management:
  - Types and quantities of waste generated during the construction of the proposed scheme.

- Amount of waste (by type and weight) that would be recovered and diverted from landfill either onsite or offsite (that is, for use on other projects).
- Types and quantities of waste arising from the proposed scheme (demolition, excavation arisings and remediation) requiring disposal to landfill.
- Details of onsite storage and segregation arrangements for waste and any supporting logistical arrangements.
- Potential for generation of hazardous waste (type and quantity).

11.5.9 There is limited information available at this stage regarding the precise material requirements and waste quantities associated with constructing the proposed scheme. These limitations are typical of an EIA for this aspect, and the information presented in this chapter is considered to represent an appropriate level of detail, in line with the available design information, to ensure that adequate information is available to inform the DCO determination in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended).

11.5.10 The following published statistics, benchmarks and key performance indicators have been used where required to populate the data gaps that exist in relation to the DMRB LA 110 requirements at this stage:

- UK Statistics on Waste ENV23 dataset (Defra, 2022)
- Net Waste Tool – dataset (Waste and Resources Action Programme (WRAP), 2008)
- Achieving Good Practice Waste Minimisation and Management – Guidance for Construction Clients, Design Teams and Contractors (WRAP, 2007)

11.5.11 These data sources have been used to undertake a quantitative assessment of the proposed scheme against the DMRB LA 110 significance criteria (Highways England, 2019b) (see significance category descriptions and significance criteria in Table 11.9 and Table 11.10). This framework has been used to assess the likely environmental effects of constructing the proposed scheme in relation to the following DMRB LA 110 descriptors of effects:

- For material assets:
  - Estimated percentage of non-hazardous C&D waste that would be recovered and diverted from landfill in either the first or second study areas (see Section 11.7 of this chapter for a definition of the study areas).
  - Estimated percentage of reused or recycled content that would be incorporated within imported aggregates and aggregate-containing materials.

- Estimated degree of potential minerals sterilisation, calculated on a worst case basis, by determining the degree of intersection between the following:
    - The proposed scheme's permanent acquisition of land boundary and sand and gravel MSA and brick clay MSA.
    - The 15m buffer (30m diameter) of the gas main diversion and sand and gravel MSA. There is no brick clay in the area of the gas main diversion.
    - All sterilisation calculations exclude any land that is already within the existing National Highways ownership boundary, and which has been assumed to have already been sterilised by the original A12.
    - These calculations also include land within the Order Limits where the sand and gravel resource has already been worked, or is intended to be worked at Colemans Farm Quarry; and which would therefore not be sterilised by the proposed scheme.

- For waste:
    - Estimated percentage reduction in regional landfill capacity that would occur as a result of managing C&D waste from the proposed scheme.
    - Estimated percentage of C&D waste that would require disposal to landfill outside of the second study area.

11.5.12 While Section 11.8 of this chapter provides a degree of sub-regional baseline assessment, at the request of ECC in their Scoping Opinion response (Planning Inspectorate, 2021), the assessment of likely significant effects provided in Section 11.11 of this chapter has been based on the East of England region as the primary receptor for this aspect.

11.5.13 Although a degree of ancillary sub-regional discussion has been included in Section 11.11 of this chapter, in response to ECC's statutory consultation feedback for this aspect, this does not form the central basis of the assessment of likely significant effects for this aspect in accordance with DMRB LA 110.

## Assessing the significance of effects

11.5.14 The general approach to assessing the significance of effects is set out in Chapter 5: Environmental assessment methodology, of the Environmental Statement [TR010060/APP/6.1], based on DMRB LA 104 Environmental Assessment and Monitoring (Highways England, 2020a).

11.5.15 The assessment of likely significant effects on material assets and waste has adopted the significance categories in Table 11.9. The significance of effects on material assets and waste has been reported in accordance with the significance criteria in Table 11.10. These significance category descriptions and criteria are replicated from Tables 3.13 and 3.14 in DMRB LA 110 (Highways England, 2019b).

11.5.16 Professional judgement has been used to determine which significant effect categories the proposed scheme is likely to fall within, with regards to the material assets and waste matters of this aspect, after an assessment of the effectiveness of those design and mitigation measures identified in Section 11.10 of this chapter.

**Table 11.9 DMRB LA 110 significance category descriptions**

| Significance category | Description[1] |
|---|---|
| Very large | Material assets:<br>1) no criteria: use criteria for large categories.<br>Waste:<br>1) >1% reduction or alteration in national capacity of landfill, as a result of accommodating waste from a project; or<br>2) construction of new (permanent) waste infrastructure is required to accommodate waste from a project. |
| Large | Material assets:<br>1) project achieves <70% overall material recovery/recycling (by weight) of non-hazardous C&D waste to substitute use of primary materials; and<br>2) aggregates required to be imported to site comprise <1% reused/ recycled content; and/or[2]<br>3) project sterilises ≥1 mineral safeguarding site and/or peat resource[3].<br>Waste:<br>1) >1% reduction in the regional capacity of landfill as a result of accommodating waste from a project; and<br>2) >50% of project waste for disposal outside of the region. |
| Moderate | Material assets:<br>1) project achieves <70% overall material recovery/recycling (by weight) of non-hazardous C&D waste to substitute use of primary materials; and<br>2) aggregates required to be imported to site comprise reused/recycled content below the relevant regional percentage target[4].<br>Waste:<br>1) >1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from a project; and<br>2) 1-50% of project waste for disposal outside of the region. |
| Slight | Material assets:<br>1) project achieves 70-99% overall material recovery/recycling (by weight) of non-hazardous C&D waste to substitute use of primary materials; and<br>2) aggregates required to be imported to site comprise reused/ recycled content in line with the relevant regional percentage target[4].<br>Waste:<br>1) ≤1% reduction or alteration in the regional capacity of landfill; and<br>2) waste infrastructure has sufficient capacity to accommodate waste from a project, without compromising integrity of the receiving infrastructure (design life or capacity) within the region. |

| Significance category | Description[1] |
|---|---|
| Neutral | Material assets:<br>1) project achieves >99% overall material recovery/recycling (by weight) of non-hazardous C&D waste to substitute use of primary materials; and<br>2) aggregates required to be imported to site comprise >99% reused/ recycled content.<br>Waste:<br>1) no reduction or alteration in the capacity of waste infrastructure within the region. |

[1] This table, reproduced from DMRB LA 110, uses very precise and deliberate language, specifically 'OR', 'AND' and 'AND/OR' after each descriptor of effect to denote which significance category should be applied. The descriptors for the material assets matter are generally summative (large, moderate, slight and neutral effects), and all descriptors need to be met in full in order to assign a relevant significance category (that is with the notable exception of a large effect which can be assigned when a project sterilises ≥1 mineral safeguarding site and/or peat resource). The descriptors of effect for the waste matter are either standalone (very large and neutral effects) or summative (large, moderate and slight effects).

[2] The published version of DMRB LA 110 includes 'AND' instead of 'AND/OR'. This has been changed to correct an editorial error in the standard that was confirmed in an email from a National Highways subject specialist (2020).

[3] Sterilisation is defined by DMRB LA 110 to mean '*substantially constrain / prevent existing and potential future use and extraction of materials*'. In the absence of further information, this has been interpreted to mean that the proposed scheme would need to substantially sterilise one or more allocated mineral safeguarding sites (in their entirety), placing their future use at risk or rendering them inaccessible for current or future use.

[4] The recycled aggregate target for the East of England region is 31%. This target is provided in DMRB LA 110 (Table E/1.2) and is taken from the National and Regional Guidelines for Aggregates Provision in England 2005-2020 (Department for Communities and Local Government, 2009). This target is assumed to exclude both site-won material and recycled demolition materials given that neither of these are imported to site.

**Table 11.10 DMRB LA 110 significance criteria**

| Significance | Description |
|---|---|
| Significant (one or more criteria met) | Material assets<br>1) category description met for moderate or large effect.<br>Waste<br>1) category description met for moderate, large or very large effect. |
| Not significant | Material assets<br>1) category description met for neutral or slight effect.<br>Waste<br>1) category description met for neutral or slight effect. |

11.5.17 With reference to DMRB LA 104 (paragraph 3.7) (Highways England, 2020a), effects of moderate significance can be considered to be material decision-making factors, large effects are likely to be material in the decision-making process and very large effects are material in the decision-making process. Effects at the slight level are not material in the decision-making process.

## 11.6 Assessment assumptions and limitations

11.6.1 While this section of the chapter provides a generalised list of assumptions and limitations that are applicable to the assessment of material assets and waste, additional section-specific assumptions and limitations have been identified throughout this chapter and have been retained with their corresponding sections for clarity.

11.6.2 The baseline data sources used in this assessment represent the most recently available stakeholder information. However, there is a general lag (in years) for materials, waste processing and landfill capacity data in the UK, and conditions may have changed since publication of these data.

11.6.3 Although checks are made by stakeholders for anomalies or errors in their data prior to publication, it cannot be guaranteed that these datasets are error free, or whether any commercial or confidentiality decisions have been taken by site operators that may have affected these data or restricted their publication.

11.6.4 This assessment has been undertaken on the basis of published minerals and waste information which includes data for the 2020 calendar year. These datasets are likely to have been influenced by reduced economic activity during the COVID-19 pandemic, with a corresponding reduction in aggregates sales and waste production.

11.6.5 The ancillary discussions, presented in Section 11.11 of this chapter, therefore present a worst case as they are based on comparing the influence of the proposed scheme, it terms of its comparative materials consumption and waste generation, against a reporting year which is likely to have witnessed a corresponding reduction in aggregates sales and waste production.

11.6.6 The quantities of material assets and waste predicted for the proposed scheme and used in this assessment comprise preliminary estimates consistent with the Bill of Quantities (BoQ) produced in October 2021. Given that the estimated material required, and waste generated, may change between this assessment and eventual construction, a 15% uplift has been applied to all material and waste quantities.

11.6.7 This uplift aims to account for additional material and waste quantities not accounted for in the current BoQ, and for any potential changes between the preliminary (specimen) design and construction of the proposed scheme. This uplift also covers those material and waste quantities associated with the utilities diversions, gas main diversion and other exclusions, and which are not accounted for in the current BoQ.

11.6.8 While the BoQ information utilised in this assessment provides a preliminary estimate of the key materials likely to be required during the construction of the proposed scheme, it does not quantify all materials use and waste generation. Therefore, the material and waste quantities presented in this assessment can

only be taken as approximate and indicative. The BoQ, which forms the basis of the material assets and waste forecasting, would be updated as the preliminary design is progressed to detailed design and construction.

11.6.9 Nevertheless, the assessment has been undertaken, wherever practicable, on a worst-case scenario basis. This has considered the reasonable worst case afforded by the proposed limits of deviation. While the proposed vertical limits of deviation may result in additional materials needing to be sourced from the borrow pits or additional excavation waste being transported offsite, such changes are unlikely to affect the predicted levels of likely significant effects reported in this assessment.

11.6.10 All material and waste quantities reported in Section 11.11 of this chapter have been reported in tonnes (t), having been converted from their original units by way of the conversion factors provided in the Highways England (2019c) Carbon Emissions Tool, in order to provide a consistent unit of measurement across the assessment. These quantities are reported as unrounded estimates, and should be viewed as approximate only, and do not confer the actual accuracy/precision of the estimates.

11.6.11 At this stage, specific opportunities for materials recycling, recovery, disposal or specification for the use of particular materials have not been prescribed because the design is at a preliminary stage. As the design for the proposed scheme advances through later stages of development consenting, procurement, construction and delivery, the opportunities for materials recycling and recovery would become more detailed. Therefore, at this stage, clear and deliverable mitigation has been identified in accordance with current guidance, good practice and legislation to help achieve future reduction of waste and maximisation of materials recovery.

11.6.12 Specific suppliers of construction materials and products have not been identified at this preliminary design stage owing to the rationale provide in Section 11.7 of this chapter. Similarly, the waste that is likely to be generated by the proposed scheme has not been allocated to individual waste management facilities given the limitations described in Section 11.7 of this chapter.

11.6.13 This subsequently results in additional limitations with regards to those elements of DMRB LA 110 (Highways England, 2019b) that require relatively precise information on materials provenance and waste management methods, such as recycled content and waste recovery rates. Nevertheless, these limitations have been offset through the use of those published statistics, benchmarks and key performance indicators identified in Section 11.5 of this chapter.

11.6.14 The indirect impacts of offsite materials extraction and production and waste management are assumed to have already been assessed (and where necessary, mitigated) under the Town and Country Planning and Environmental Permitting regimes for those sites and thus have not been assessed as part of the material assets and waste assessment for the proposed scheme. These stages of the materials and waste life cycles are also considered to be outside the scope of this assessment due to the range of unknown variables associated with these sites.

11.6.15 The Mineral Resource Assessment, Mineral Infrastructure Assessment and Waste Infrastructure Assessment, included in Appendix 11.1, Appendix 11.2 and Appendix 11.3 of the Environmental Statement [TR010060/APP/6.3], are consistent with the Order Limits issued for the proposed scheme on 9 January 2022. There has subsequently been a net reduction in Order Limits, and therefore the conclusions of these appendices should be considered to represent the worst case.

11.6.16 Brice Aggregates Limited have submitted a planning application to ECC (planning reference ESS/98/21/BTE) which allows the quarry to change the phasing, accelerate extraction and allow import of inert material to backfill the quarry to pre-quarrying ground levels ahead of the proposed scheme works. This application is currently under determination, and it has been developed in cooperation with the A12 team in order to enable the construction of the new junction 22 (Colemans interchange) and Rivenhall End bypass in a timely manner should the DCO be granted.

11.6.17 It has therefore been assumed that those voids left by quarrying activities at Colemans Farm Quarry, that sit within the footprint of the Order Limits, would be backfilled by the quarry operators within the constraints governed by their planning application. However, given the criticality of backfilling the voids for the proposed scheme to be constructed, and the dependence on the quarry operator having their planning applications approved, the draft DCO [TR010060/APP/3.1] allows for the Applicant to infill the voids themselves. This chapter of the Environmental Statement has therefore assessed the use and consumption of these backfill materials, as a worst case[2].

11.6.18 The quantity of inert material required for the backfill would be sought through a combination of imported inert materials which would arrive via the A12, and materials extracted from the proposed scheme borrow pit(s) which would be transported via a combination of haul roads and the A12. An additional 950,000m$^3$ of fill material has therefore been accounted for in this chapter of the Environmental Statement in the event that the quarry operators have not completed these works ahead of construction in this area.

11.6.19 In this event, the intention would be to import 650,000m$^3$ of inert material from off-site, and source 300,000m$^3$ of non-granular fill material from borrow pit J[3]. It should be noted that this approach would not increase the area required for the borrow pit, because the supply would come from the overburden material that would have been replaced in the borrow pit on completion. This would therefore have a bearing on the finished landscaping of the borrow pit. This has been assessed with the wider Environmental Statement [TR010060/APP/6.1]

[2] Brice Aggregates Limited have also submitted a planning application (planning reference ESS/36/21/BTE) for the proposed western extension to the current site using existing approved facilities. For the purpose of this chapter of the Environmental Statement, it is assumed that this planning application is approved, as this represents the worst case scenario in terms of the consumption of materials assets required to backfill the quarry voids.

[3] The locations of the four borrow pits, which have been included within the Order Limits, are shown on Figure 2.3 [TR010060/APP/6.2] and described in Chapter 2: The proposed scheme, of the Environmental Statement [TR010060/APP/6.1], and the Borrow Pits Report [TR010060/APP/7.8].

11.6.20 It is unlikely that importing primary materials would be economically or environmentally viable as general fill for quarry backfilling because of the cost and carbon impact of doing. It is therefore expected that these materials would consist of inert construction, demolition and excavation waste sourced from residential developments and/or other large scale infrastructure projects in the region.

11.6.21 It is assumed that this material would be utilised on the proposed scheme through either the CL:AIRE (2011) Definition of Waste: Development Industry Code of Practice (which authorises the direct transfer of naturally occurring soil and mineral materials[4] from one development site to another as a non-waste), or through a Bespoke Waste Recovery Permit (which authorises the permanent deposit of a range of inert wastes[5]).

## 11.7 Study area

11.7.1 In accordance with DMRB LA 110 (Highways England, 2019b), the assessment of material assets and waste has used two geographically different study areas to examine the use of material assets and the production and disposal of waste:

- The first study area (proposed scheme) – based on the construction footprint or boundary of the proposed works which is defined by the Order Limits as shown on Figure 11.1 [TR010060/APP/6.2]. Within these areas, material assets would be consumed, minerals could be sterilised and waste would be generated.

- The second study area (East of England region) – which extends to the availability of material assets required to construct the main elements of the proposed scheme, and capacity of waste management infrastructure and remaining landfill void space that is likely to be suitable to accept the majority of waste generated by the proposed scheme. These include the following:

  - The East of England Regional Aggregates Working Party area[6] and Thames and East Coast dredging areas, which are likely to be the first source of primary, secondary and recycled aggregates used to construct the proposed scheme.

  - The former East of England Planning Region, which is likely to be where the waste management infrastructure used to manage the majority of waste generated by the proposed scheme is located. This

[4] Naturally occurring soil and mineral materials includes: soil, both top soil and sub-soil; parent materials; clays, silts, sands and gravels; underlying geology; and made ground consisting of the previous materials only. For example, this excludes the direct transfer of aggregate material arising from demolition.

[5] Permitted wastes are limited to mainly inert wastes as defined in these standard rules, with some limited uses for selected non-inert wastes (e.g. topsoil, peat, soil from cleaning and washing beet and road planings).

[6] The East of England Regional Aggregates Working Party area comprises the former East Anglia MPAs (Norfolk, Suffolk, Cambridgeshire and Peterborough) and MPAs from the former East of England region (Essex, Southend-on-Sea, Thurrock, Hertfordshire, Central Bedfordshire, Bedford Borough, and Luton).

includes the Bedfordshire, Cambridgeshire, Greater Essex[7], Hertfordshire, Norfolk and Suffolk sub-regions.

11.7.2 In accordance with DMRB LA 110, professional judgement, with consideration for a balance of the proximity principle and value for money principle, has been applied in establishing the second study area.

11.7.3 Setting the study area at the regional level takes account of the need for the inter-regional movement of materials and waste within England, and echoes the broader approach to minerals and waste planning and management that has traditionally been undertaken on a regional and county-level basis.

11.7.4 This reflects the fact that minerals and waste planning authorities have a statutory duty to plan for an appropriate amount of minerals and waste capacity to be available over a defined period, and take account of minerals and waste that are transferred across minerals and waste planning authority boundaries.

11.7.5 Furthermore, this approach was considered appropriate given the proximity of the proposed scheme to other sub-regions in the East of England, London and the South East; and recognising that cross-boundary movements of material assets and waste are likely to occur, while endeavouring to adopt the proximity principle where practicable. The information provided in this assessment would assist the mineral and waste planning authority with discharging this duty.

11.7.6 Reference to Whole Life Carbon Assessment for the Built Environment (Royal Institution of Chartered Surveyors, 2017) suggests that, in the absence of project-specific information, the following indicative transport distances can be used when estimating the radius, as the crow flies, of imported material assets and exported wastes:

- Material assets:
  - Locally extracted or manufactured materials (such as soil, aggregates, asphalt, concrete): 50km.
  - Nationally manufactured materials (such as steel, plastics, timber): 300km.
- Waste management:
  - Reuse, recycling or recovery of inert and non-hazardous waste: 50km.
  - Landfill or incineration of inert and non-hazardous waste: 50km.

11.7.7 These distances would suggest that the proposed scheme is likely to have access to material suppliers and waste management facilities in the East of England (Greater Essex, Hertfordshire, Cambridgeshire and Suffolk), Greater London and the South East of England (Kent).

[7] Greater Essex comprises ECC, Southend-on-Sea Borough Council and Thurrock Council areas.

11.7.8 This assumption is validated by the 2020 Waste Data Interrogator (Environment Agency, 2022a), which confirms that a notable proportion (~20%) of the C&D waste originating in the Greater Essex was managed at facilities outside of the sub-region in 2020.

11.7.9 While commentary has been provided in this chapter to reflect the radius within which materials are likely to be imported and wastes disposed of, the proposed scheme would not be bound by these distances when procuring materials and managing wastes.

11.7.10 It would be up to the Principal Contractor to source materials and manage waste during the construction of the proposed scheme, and typically they would look to use local (sub-regional) material sources and waste infrastructure wherever feasible to reduce the environmental impact and cost of transport, and support the economic wellbeing of local communities.

11.7.11 Procurement rules mean that it is not possible to prescribe specific material suppliers and waste management facilities to be used during construction of the proposed scheme, and these rules prevent setting a precedent that would potentially tie the Principal Contractor to exclusive arrangements with specific material suppliers and waste management facilities.

11.7.12 The ability to use materials suppliers and waste management infrastructure from a wide range of locations would also allow existing material resources and waste management capacity to be used effectively and efficiently, without resulting in local overcapacity to the detriment of the local economy.

## 11.8 Baseline conditions

11.8.1 A desk-based assessment has been undertaken to describe the current and likely future state (in the absence of the proposed scheme) of the following where practicable:

- For the first study area:
  - Types and quantity of material use and waste associated with operation of the existing A12 where available
  - Information on availability of key site-won construction materials likely to be required for the proposed scheme
- For the second study area:
  - Information on availability of key imported construction materials likely to be required for the proposed scheme
  - Regional (or other relevant geographic scale) presence and capacity of waste infrastructure facilities likely to be used by the proposed scheme
  - Regional (or other relevant geographic scale) presence and capacity of landfill facilities likely to be used by the proposed scheme
  - Location of mineral sites and peat resources in relation to the proposed scheme extents

## Baseline sources

11.8.2 Baseline data has been collected at the regional (East of England), sub-regional (Greater Essex) and local (Order Limits) level. The baseline assessment has been prepared with reference to the latest minerals and waste information published by the East of England Aggregates Working Party (EEAWP), ECC minerals and waste planning authority, the Crown Estate, Defra and the Environment Agency.

11.8.3 No account of future climate change has been considered in the baseline conditions, as this is unlikely to affect the material assets or waste matters baseline within the timescales of constructing the proposed scheme (2024 to 2027). Please refer to Chapter 15: Climate, of the Environmental Statement [TR010060/APP/6.1], for potential impacts resulting from climate change during construction and operation of the proposed scheme.

## Baseline information

### Material assets

11.8.4 DMRB LA 110 (Highways England, 2019b) defines material assets as '*materials and products (from primary, recycled or secondary, and renewable sources), the use of materials offering sustainability benefits, and the use of excavated and other arisings that fall within the scope of waste exemption criteria'*.

11.8.5 Primary, secondary and recycled aggregates have been chosen to act as a proxy indicator of regional and sub-regional material assets given that large quantities of aggregates are typically required for all-purpose trunk road projects. This was also considered appropriate due to the prominence given to aggregates in the DMRB LA 110 assessment criteria.

11.8.6 This is also supported by the Highways England Sustainable Development Strategy and Action Plan (Highways England, 2017), which confirms that its key ambition covering manufactured capital is to push towards a 'circular' approach to the management of its resources; minimise its demand for primary resources extracted from the ground; and maximise the reuse of the resources already in use on the network.

#### *Aggregates consumption associated with the existing A12*

11.8.7 The operational maintenance of this section of the existing A12 trunk road is likely to consume both unbound aggregates (used as sub-base and drainage applications) and bound aggregates (used in ready-mixed concrete, asphalt and pre-cast concrete products).

11.8.8 At the time of writing, there were no precise figures available regarding the baseline quantities of operational and maintenance aggregates consumption generated across the first study area. Based on recent experience on other road schemes, this information is unlikely to be available at sufficient granularity to be useful in reporting the baseline conditions in the first study area.

### *Primary mineral reserves and sales*

11.8.9 The principal materials used in road construction are primary aggregates, including sand, gravel and crushed rock. Primary aggregates are produced from naturally occurring mineral deposits and used for the first time, as defined by the British Geological Survey (2019) in its Mineral Planning Factsheet: Construction Aggregates.

11.8.10 Aggregates are normally defined as being hard, granular materials which are suitable for use on their own or with the addition of cement, lime or bituminous binders. However, a proportion of aggregates sales are for construction fill or other uses where soft and non-granular material may be acceptable or specified.

11.8.11 The Aggregate Minerals Survey for England and Wales 2019 (MHCLG, 2021b) reports that concreting aggregate is the largest end use for both land-won and marine-dredged sand and gravel, accounting for 55% of land-won and 79% of marine-dredged sales for aggregate use respectively in 2019. The other main products were other screened and graded gravels, sand suitable for use in mortar, and sand and gravel for construction fill.

11.8.12 The MHCLG (2021b) confirms that crushed rock has a much wider range of uses than sand and gravel, including as a source of both coarse and fine concrete aggregate (14%), other screened and graded aggregates (28%) and for other construction uses, including fill (18%). However, its main use is in road construction (37%), both unbound, primarily for the foundations of roads, and bound with either bitumen or cement in the upper layers.

11.8.13 The NPPF (MHCLG, 2021a) advises MPAs to maintain a landbank of at least 10 years for crushed rock and a landbank of at least seven years for sand and gravel. This is used to determine whether there is a shortage or surplus of supply in a given minerals planning area.

11.8.14 The Annual Report 2020 (EEAWP, 2021) provides sales and reserves data for the 2019 and 2020 calendar years. This data is summarised in Table 11.11 for the East of England region and Greater Essex sub-region. From this table, it can be inferred that the East of England region demonstrates landbanks for sand and gravel and crushed rock in excess of the advised NPPF thresholds as of the end of 2020, based on rolling average 10-year sales.

**Table 11.11 Land-won aggregate sales, reserves and landbanks in the East of England and Greater Essex, 2020**

| Mineral | Average sales 2018-2020 (million tonnes) (Mt) | Remaining reserves (at 31/12/20) (Mt) | Landbank based on rolling average 10-year sales (years) |
|---|---|---|---|
| **East of England region** | | | |
| Sand and gravel | 11.20 | 117.2 | 10.8 |
| Crushed rock* | 0.16 | 5.01 | 15.4 |

| Mineral | Average sales 2018-2020 (million tonnes) (Mt) | Remaining reserves (at 31/12/20) (Mt) | Landbank based on rolling average 10-year sales (years) |
|---|---|---|---|
| **Greater Essex sub-region** | | | |
| Sand and gravel | 3.20 | 33.60 | 10.4 |
| Crushed rock | N/A | N/A | N/A |

*Sales for Cambridgeshire, Peterborough and Norfolk only. These have been aggregated for confidentiality reasons given the small number of operators, and comprise limestone from Cambridgeshire and Peterborough and carstone from Norfolk.

*EEAWP (2021) confirms that the crushed rock resource in the East of England region is limited and not of sufficiently high quality for it to be economic to transport any significant distance and is therefore not a truly regional resource.

11.8.15 The Greater Essex Local Aggregate Assessment 2021 (Covering the Calendar Year of 2020) (hereafter referred to as the LAA 2021) (ECC, 2021a) confirms that sub-regional permitted reserves were 33.59Mt in December 2020. The apportionment landbank stood at 7.55 years at the end of 2020, while the 10-year sales average landbank stands at 10.30 years. Therefore, the landbank is above the seven-year requirement set out in the NPPF. In addition, as of the time of its publication (December 2021), the LAA 2021 reports that there were four pending permissions across Greater Essex, which would permit the working of 9.5Mt of sand and gravel which, if granted and/or all legal agreements are signed, would further increase the landbank.

11.8.16 The LAA 2021 reports that the 10-year (2011 to 2020) average sales figure (3.26Mt) and the three-year (2018 to 2020) average sales (3.23Mt) for sand and gravel are both below the apportioned tonnage of 4.45Mt per annum (Mtpa) provision made in the adopted Essex Minerals Local Plan (ECC, 2014)[8]. There have been no years where the actual sales have exceeded the annualised plan provision (apportionment). The last three years of sales show a decrease from 3.56Mt in 2018 to 2.96Mt in 2020. However, the LAA 2021 suggests that some of this decrease could be attributed to the lower than expected survey response rate due to staff being on furlough as a result of the COVID-19 pandemic.

11.8.17 Reference to the LAA 2021 confirms that there are no hard-rock quarries in Greater Essex, and that Greater Essex is heavily reliant on hard rock importation (1.58Mt imported in 2020), used for roadstone, railway ballast, concrete aggregate, armourstone, other screened and graded aggregate, or for constructional fill. The LAA 2021 reports a pattern of long-distance supply, with Greater Essex exporting its sand and gravel, while importing hard rock by rail from areas including the East Midlands and South West of England. According to the most recent East Midlands (2021) and South West (2021) Aggregates

[8] The Greater Essex land-won sand and gravel provision figure of 4.45mtpa is divided as follows: 4.31mtpa to Essex, and 0.14mtpa to Thurrock. Southend-on-Sea is unable to make a contribution to the Greater Essex mineral supply because of its tightly defined and built-up administrative area and lack of mineral resource.

Working Party Annual Monitoring Reports, these regions have an excess of crushed rock reserves (45.00 years and 38.80 years respectively based on average three-year sales of 27.80Mtpa and 24.32Mtpa respectively).

11.8.18 The East of England is also served by the Thames and East Coast dredging regions. In addition to the land-won aggregates, the Marine Aggregates Capability and Portfolio 2021 (The Crown Estate, 2021) reports that there were an additional 30.78Mt and 48.95Mt of primary marine aggregate reserves respectively within the Thames and East Coast dredging regions as of 31 March 2021. The LAA 2021 reports that a total of 4.23Mt of aggregate material were dredged from the seabed in 2020 in these regions. This contributed to the supply of sand and gravel in the region.

11.8.19 The LAA 2021 reports that this was a decrease of 0.12Mt compared to the 4.35Mt removed in 2019. Licences have been granted that permit the dredging of a total of 10.93Mtpa from these regions. At this rate, current estimates provided in the LAA 2021 suggest there are 26 years of primary marine aggregate production permitted in the Thames Estuary and 12 years within the East Coast region.

***Regional secondary and recycled aggregates production capacity***

11.8.20 The Annual Report 2020 (EEAWP, 2021) confirms that data on secondary and recycled aggregate production and use in the East of England is variable and incomplete. Notwithstanding this, the 2020 Waste Data Interrogator (Environment Agency, 2022a) confirms that approximately 11.8Mt of inert C&D mineral waste was received at waste management facilities in the East of England region in 2019, with 4.6Mt of this received at facilities in the Greater Essex sub-region.

11.8.21 The EEAWP (2021) confirms that there were 47 permitted aggregate recycling sites active in the East of England in 2020. Reference to the LAA 2020 (ECC, 2020[9]) suggests that there is a well-established network of C&D waste recycling and recovery facilities in Greater Essex, with a combined operational capacity of approximately 2.1Mtpa in 2009. Some of these sites are transient in nature, so there would be a reduction in recycling capacity as temporary permissions expire, unless further permissions are granted.

11.8.22 The LAA 2020 reports that, during 2019, two permissions were granted that would increase the inert recovery capacity in Greater Essex to approximately 2.3Mtpa if these facilities were developed. The LAA 2020 reports that it is not known whether secondary aggregates are produced in any significant quantity in Greater Essex. However, it suggests that a lack of heavy industry in the county would imply that there will be little produced.

11.8.23 The UK Statistics on Waste (Defra, 2022) reports that approximately 98% of mineral waste from C&D activities are currently subject to waste recovery in England. The ‘mineral wastes’ category includes wastes such as bricks, stone

[9] A revised methodology to enable a more accurate recording of C&D waste data is being devised as part of the Essex Minerals Local Plan review, which links to a national/regional project to standardise aggregate recycling data. The LAA 2020 has therefore been referenced instead of the LAA 2021, given that the latter is known to be an under representation of actual recycled aggregate production capacity in the sub-region.

and road planings that are converted into usable aggregates. This further indicates there is likely to be a good potential supply of recycled aggregates available within the East of England region and Greater Essex sub-region to support the construction of the proposed scheme.

***Mineral extraction, processing and transhipment sites***

11.8.24 The Annual Report 2020 (EEAWP, 2021) confirms that there were 130 aggregate extraction sites, 171 aggregate recycling sites and 42 wharfs and aggregate rail depots in the East of England in 2020.

11.8.25 Reference to the LAA 2021 (ECC, 2021a) shows that there were 37 sand and gravel quarries in Greater Essex, 24 of which were active at the end of 2020. Of the 13 inactive sand and gravel quarries, four are considered as long-term 'dormant' and nine are permitted, but not actively extracting, as of the end of 2020.

11.8.26 At the end of 2020, the LAA 2021 reports that there was at least 3.60Mtpa potential sand and gravel production capacity at these sites. In addition, at the end of 2020, the potential for extraction at a further four sites was pending determination or legal agreements. A single site also ceased mineral extraction and closed in 2020.

11.8.27 There are no hard-rock quarries in Greater Essex as reported in Table 11.11. One quarry produces sand and gravel as well as silica sand. Greater Essex also has two brick clay quarries and a single chalk quarry.

11.8.28 Furthermore, the LAA 2021 confirms that there were 46 mineral processing facilities, three wharves and six rail transhipment facilities operational at the end of 2020.

***Mineral safeguarding sites***

11.8.29 The DMRB LA 110 (Highways England, 2019b) defines mineral sites as '*Operational sites or sites identified within strategic planning documents for the extraction of minerals*'. No definition is provided for mineral safeguarding sites in DMRB LA 110. Mineral sites are therefore assumed to equate to mineral safeguarding sites for the purpose of assessment.

11.8.30 The MSAs are areas designated by an MPA which cover known deposits of minerals which are desired to be safeguarded from unnecessary sterilisation by non-mineral development, while not creating a presumption that the resources defined in the MSA would be worked.

11.8.31 The Essex Minerals Local Plan (ECC, 2014) confirms that MSAs are designated in Essex for mineral deposits of sand and gravel, silica sand, chalk, brickearth and brick clay considered to be of national and local importance, as defined on the Essex Minerals Local Plan Policies Map (ECC, no date).

11.8.32 The Minerals and Waste Authority Monitoring Report 2017 to 2018 (ECC, 2018b) estimates that during 2017/18, 30.5ha of commercial sand and gravel deposits were sterilised by non-mineral development; and that cumulatively between 1 April 2014 and 31 March 2018, 153.9ha had been sterilised. No data

is provided for brick clay which is limited in Essex to the MSA located at Marks Tey[10].

11.8.33 A significant proportion of the first study area lies within an MSA for sand and gravel. Part of the eastern study area also falls within an MSA for brick clay. The first study area also passes through a number of Mineral Consultation Areas (MCAs) for mineral extraction and infrastructure sites.

11.8.34 The MCAs are designated within and up to an area of 250m from existing and allocated mineral extraction and infrastructure sites, and act as a trigger for where a district or borough council should consult the MPA for any proposals for non-minerals development. Minerals infrastructure and designations within 250m of the first study area are identified in Table 11.12 and Figure 11.1 [TR010060/APP/6.2].

11.8.35 Policy S8 of the Essex Minerals Local Plan (ECC, 2014) seeks to ensure that mineral resources of national and local importance are not directly sterilised by non-minerals surface development, and that development does not prejudice the effective working of permitted mineral reserves, preferred or reserve site allocations within the Essex Minerals Local Plan.

11.8.36 With regards to MCAs, Policy S8 of the plan also seeks to ensure that existing and allocated mineral sites and infrastructure are protected from potentially sensitive or inappropriate neighbouring developments that may prejudice their continuing efficient operation (such as by being impacted through noise, dust, odour, traffic, visual or light).

**Table 11.12 Mineral safeguarding sites within 250m of the first study area**

| Site type | Site name | Planning application no. |
|---|---|---|
| MSAs | Sand and gravel | N/A |
| | Brick clay | N/A |
| Essex Minerals Local Plan (ECC, 2014) Allocations or Safeguarded Sites | Bulls Lodge Quarry Coated Stone Plant | p. 196 of Essex Minerals Local Plan |
| | Land at Colemans Farm (allocated for extraction, now existing) | A46, p. 170 of Essex Minerals Local Plan |
| | Marks Tey Rail Siding (existing) | F3, p. 180 of Essex Minerals Local Plan |
| Minerals infrastructure | Bulls Lodge Quarry Coated Stone Plant | ESS/01/11/CHL |
| | Bulls Lodge | ESS/37/15/CHL, pending determination |
| | Bulls Lodge | ESS/36/13/CHL, pending determination |

[10] As reported in Chapter 10: Geology and soils [TR010060/APP/6.1], Marks Tey Brickpit is also a Site of Special Scientific Interest designated for its geological importance.

| Site type | Site name | Planning application no. |
|---|---|---|
| | Colemans Farm | ESS/98/21/BTE, pending determination |
| | Colemans Farm | ESS/10/18/BTE |
| | Colemans Farm | ESS/35/17/BTE |
| | Colemans Farm | ESS/11/20/BTE |
| | Marks Tey | ESS/26/08/COL |
| The information in this table was provided by ECC in their Scoping Opinion (Planning Inspectorate, 2021) response, and is considered correct as of March 2021. Notwithstanding, no additional sites or planning applications were identified by ECC in its statutory consultation response for this aspect in August 2021. | | |

***Peat resources***

11.8.37 The DMRB LA 110 (Highways England, 2019b) defines peat resources as '*existing or potential peat extraction sites*'.

11.8.38 The Essex Minerals Local Plan (ECC, 2014) confirms that there are no such sites recorded within the study area, and the Minerals Information Online tool (British Geological Survey, no date) confirms that there are no superficial peat deposits within 250m of the proposed scheme extents.

11.8.39 Peat resources have therefore been scoped out of the assessment in accordance with the Scoping Opinion (Planning Inspectorate, 2021).

**Waste management**

***Waste generation associated with the existing A12***

11.8.40 The operational maintenance of this section of the existing A12 trunk road is likely to generate a wide range of C&D wastes including, but not limited to, asphalt planings, soft estate vegetative arisings, road sweepings, gully arisings, oil separator waste, animal by-products and litter.

11.8.41 At the time of writing, there were no precise figures available regarding the baseline quantities of operational and maintenance waste generated across the first study area. Based on recent experience on other road schemes, this information is unlikely to be available at sufficient granularity to be useful in reporting the baseline conditions in the first study area.

***National and regional C&D waste generation and management baseline***

11.8.42 The UK Statistics on Waste (Defra, 2022) reports that the construction sector is the largest contributing sector to the total waste generation in the UK. This sector generated 119.4Mt of construction, demolition and excavation waste in 2018 (the most recent year available).

11.8.43 Defra (2022) confirms that the construction sector in England generated a total of 53.6Mt of non-hazardous C&D waste in 2020 (the most recent year available[11]), 93.2% of which was recovered. The C&D figure excludes excavation waste and dredging spoils that are out of scope for the UK C&D waste statistics.

11.8.44 The annual recovery rate for C&D waste in England has remained above 92% since 2010, which is well above the Waste (England and Wales) Regulations 2011 target of 70%. This excludes hazardous waste and excavation and dredging waste which are outside the scope of this target.

11.8.45 The 2020 Waste Data Interrogator (Environment Agency, 2022a) confirms that approximately 12.3Mt of C&D waste was received at waste facilities in the East of England region in 2020, with 4.8Mt of this received at waste facilities in the Greater Essex sub-region.

11.8.46 The Environment Agency (2022a) also confirms that approximately 9.1Mt of merchant waste from all sources was landfilled in the East of England region in 2020 (54% of this to inert landfill and 46% to non-hazardous landfill), with 3.3Mt of this in the Greater Essex sub-region (45% of this to inert landfill and 55% to non-hazardous landfill).

11.8.47 Specifically, the Environment Agency (2022a) records that 3.2Mt (65% inert waste and 35% non-hazardous waste) and 1.2Mt (29% inert waste and 71% non-hazardous waste), of the total waste disposed of to landfill from all sources in the East of England region and Greater Essex sub-region respectively in 2020, was C&D waste.

***Waste treatment, recycling and recovery baseline***

11.8.48 The availability of waste management infrastructure, to accept waste likely to be generated during the construction of the proposed scheme, has been ascertained through a review of the 2020 Waste Data Interrogator (Environment Agency, 2022a).

11.8.49 While annual capacity data is published by the Environment Agency for both landfill and incineration facilities at the national, regional and sub-regional level, no annual capacity data is published by the Environment Agency for waste transfer, treatment or metal recycling sites. Only annual inputs are published for these facilities.

11.8.50 The total annual permitted throughput or capacity reported by the Environment Agency (2022a) for the East of England region and Greater Essex sub-region are detailed in Table 11.13.

[11] C&D waste generation was approximately 9Mt less in 2020 that in 2019 due to the COVID-19 pandemic.

**Table 11.13 Total permitted throughput or capacity of transfer, treatment, metal recycling and incineration in the East of England and Greater Essex, 2020**

| Site type | East of England region (000s t) | Greater Essex sub-region (000s t) |
|---|---|---|
| **Transfer (annual throughput)** | | |
| Hazardous waste transfer stations | 997 | 361 |
| Household, industrial, commercial waste transfer stations | 2,740 | 1,112 |
| Non-biodegradable waste transfer stations | 308 | 288 |
| **Treatment and metal recycling (annual throughput)** | | |
| Material recovery | 1,473 | 509 |
| Physical treatment | 3,978 | 1,121 |
| Physico-chemical treatment | 934 | 144 |
| Chemical treatment | 1,606 | 1 |
| Composting | 791 | 99 |
| Biological treatment | 1,906 | 706 |
| Metal recycling | 1,801 | 1,210 |
| **Incineration (annual capacity)** | | |
| Co-incineration of hazardous waste | - | - |
| Co-incineration of non-hazardous waste | - | - |
| Hazardous waste incineration | - | - |
| Municipal and/or industrial & commercial incineration | 467 | - |
| Biomass or waste wood incineration | 490 | 490 |

11.8.51 The 2020 Waste Data Interrogator (Environment Agency, 2022a) reports that, as of 2020, there were 973 permitted transfer, treatment, metal recovery, incineration and use of waste sites located in the East of England region.

11.8.52 The Minerals and Waste Authority Monitoring Report 2016 to 2017 (ECC, 2020) records that, as of 31 March 2017, there were 329 waste management facilities (including waste transfer facilities) located in the Greater Essex sub-region.

11.8.53 This data indicates that there are likely to be sufficient opportunities for C&D waste arisings to be transferred, treated, recycled or recovered as appropriate within the second study area.

### *Inert, non-hazardous and hazardous landfill capacity baseline*

11.8.54 For wastes which cannot be reused, recycled or recovered, disposal to landfill would be required. The 2020 Waste Data Interrogator (Environment Agency, 2022a) details the total remaining merchant landfill capacity in the East of England region and Greater Essex sub-region in 2020. This is presented in Table 11.14.

**Table 11.14 Total landfill capacity available in the East of England and Greater Essex, 2020**

| Site type | East of England region (000s t[1]) | Greater Essex sub-region (000s t[1]) |
|---|---|---|
| Hazardous merchant landfill[2] | - | - |
| Non-hazardous landfill with stable non-reactive hazardous waste (SNRHW) cell[3] | 4,354 | - |
| Non-hazardous landfill | 17,008 | 7,448 |
| Inert landfill | 37,470 | 9,744 |
| **Total** | **58,832** | **17,192** |

[1] Landfill capacity is provided in $m^3$ by the 2020 Waste Data Interrogator (Environment Agency, 2022a). This has been converted to a tonnage figure through the use of the following density convention factors: 1.5t/$m^3$ for inert landfill and 0.83t/$m^3$ for non-hazardous landfill.

[2] Merchant landfills accept waste from all users, as opposed to restricted landfills that accept wastes from a restricted set of sources/producers, commonly the site operator.

[3] Some non-hazardous sites can accept some SNRHW into a dedicated cell, but this is usually a small part of the overall capacity of the site.

11.8.55 The 2020 Remaining Landfill Capacity (Environment Agency, 2022b) reports that at the end of 2020 there were 55 permitted operational landfills in the East of England region with remaining capacity (comprising 33 inert landfills, 19 non-hazardous landfills and three non-hazardous landfills with SNRHW cell).

11.8.56 The vast majority of these sites (82%) are located in the sub-regions of Greater Essex, Cambridgeshire, Hertfordshire and Suffolk, which Section 11.7 of this chapter suggests the proposed scheme is likely to have access to.

11.8.57 Reference to Environment Agency (2022) confirms that there were 17 operational landfills with remaining capacity located in the Greater Essex sub-region (comprising 11 inert landfills and six non-hazardous landfills) at the end of 2020.

11.8.58 While the East of England region and Greater Essex sub-region both have available inert landfill and non-hazardous landfill capacity, there is currently no merchant hazardous waste landfill capacity available in the region and no non-hazardous landfill with SNRHW cell capacity in the sub-region.

11.8.59 The management of hazardous waste generated in the region would therefore typically take place at either specialist recycling or recovery facilities located in the second study area, or at facilities designed to meet a national or regional need located outside the second study area.

11.8.60 No information is publicly available at the regional level on when the permitted landfills are scheduled to cease infilling operations. This information is not provided in the Environment Agency's Public Registers, Waste Data Interrogator or Remaining Landfill Capacity datasets. No direct consultation has been undertaken with landfill operators to populate this information.

11.8.61 Notwithstanding this, the Minerals and Waste Authority Monitoring Report 2017 to 2018 (ECC, 2018b) does provide some information in terms of when those sub-regional landfills, identified in 2020 Remaining Landfill Capacity (Environment Agency, 2022b), are estimated to cease infilling operations in Greater Essex. This information is provided in Table 11.15 where available.

**Table 11.15 Operational landfills in Greater Essex, 2020**

| Facility name | Approximate distance from the first study area (km) | Site type | Capacity at the end of 2020 (t) | Estimated end date |
|---|---|---|---|---|
| East Tilbury Quarry Landfill | 45 | Inert | 465,000 | Unknown |
| Widdington Pit Inert landfill | 45 | Inert | 199,837 | 30/09/2023 |
| Sandon Quarry Southern Void | 15 | Inert | 107,751 | Unknown |
| Royal Oak Quarry | 15 | Inert | 81 | 16/02/2027 |
| Linford Landfill | 45 | Inert | 70,223 | Unknown |
| Rainbow Shaw Quarry | 40 | Inert | 47,997 | Unknown |
| Highwood Quarry Inert Landfill | 40 | Inert | 820,609 | 25/03/2027 |
| Brightlingsea Inert Landfill | 50 | Inert | 476,775 | 31/01/2026 |
| Asheldham Quarry | 35 | Inert | 807,838 | Unknown |
| Stanway Quarry Landfill | 20 | Inert | 2,950,000 | Unknown |
| Dollymans Farm | 35 | Inert | 550,000 | Unknown |
| SRC Martells Quarry | 35 | Non-hazardous | 600,000 | 30/06/2032 |
| Tilbury Ash Disposal Site | 50 | Non-hazardous | 1,777,494 | Unknown |
| Elsenham Landfill | 45 | Non-hazardous | 1,333,000 | 10/05/2029 |

| Facility name | Approximate distance from the first study area (km) | Site type | Capacity at the end of 2020 (t) | Estimated end date |
|---|---|---|---|---|
| Bellhouse Landfill Site | 25 | Non-hazardous | 3,718,786 | 31/03/2022 |
| Ockendon Area II & III Landfill | 50 | Non-hazardous | 3,220,931 | Unknown |
| Martells Quarry Landfill | 35 | Non-hazardous | 100,000 | 30/06/2032 |

11.8.62 Those landfill strategic site allocations, yet to be brought forward by the Essex and Southend-on-Sea Waste Local Plan (ECC and Southend-on-Sea Borough Council, 2017), have been identified in Table 11.16.

11.8.63 These strategic sites have been allocated to meet the identified shortfalls in landfill capacity over the plan period (2017 to 2032) in order to deliver the objective of net self-sufficiency in the plan area.

11.8.64 No current equivalent information was available at the time of the assessment for the Thurrock Council area. While an assessment of sites for minerals and waste in Thurrock was published in December 2009, all work on the Thurrock Council Minerals and Waste Local Plan has been suspended indefinitely.

11.8.65 Any additional capacity associated with these strategic landfill allocations has not been used in the statistical forecast of future landfill capacity provided in Table 11.18, given that these sites have yet to begin operation.

**Table 11.16 Landfill strategic sites allocations in Essex and Southend-on-Sea, 2017**

| Site name | Location | Allocation | Capacity (t) | Life |
|---|---|---|---|---|
| Blackley Quarry | Chelmsford | Inert landfill | 2,100,000 | 20–25 years |
| Little Bullocks and Crumps Farm Great and Little Canfield | Uttlesford | Inert landfill<br>Hazardous landfill | 630,000<br>67,500 | 12 years<br>15 years |
| Fingringhoe Quarry | Colchester | Inert landfill | 900,000 | 10 years |
| Newport Quarry | Uttlesford | Inert landfill | 450,000 | Up to 20 years |
| Sandon | Chelmsford | Inert landfill | 1,500,000 | Up to 5 years |
| Slough Farm | Tendring | Inert landfill | 1,500,000 | 19 years |
| Sunnymead, Elmstead & Heath Farms | Tendring | Inert landfill | 2,700,000 | 17 years |

### *Safeguarded waste management infrastructure*

11.8.66 The first study area passes through a number of Waste Consultation Areas (WCAs) as identified in Table 11.17. While the point-source locations of these waste infrastructure sites are mapped on Figure 11.1 [TR010060/APP/6.2], it has not been possible to map the WCAs given the absence of GIS data.

11.8.67 Policy 2 of the Essex and Southend-on-Sea Waste Local Plan (ECC and Southend-on-Sea Borough Council, 2017) seeks to ensure that existing and allocated waste sites and infrastructure are protected from potentially sensitive or inappropriate neighbouring developments that may prejudice their continuing efficient operation. This policy defines WCAs as extending up to 250m from the boundary of the existing or allocated waste infrastructure, and up to 400m from existing or allocated water recycling centres.

**Table 11.17 Waste infrastructure and designations within the first study area**

| Site type | Site name | Planning application number |
|---|---|---|
| Waste management infrastructure | Boreham Recycling Centre | ESS/24/10/CHL/SO |
| | Bulls Lodge Inert Recycling | ESS/44/17/CHL |
| | Drovers Recycling Centre | ESS/42/11/CHL |
| | Winsford Way Waste Transfer Station | ESS/65/12/CHL |
| | Witham Recycling Centre | ESS/44/15/BTE |
| | Witham Water Recycling Centre | ESX/22/93/BTE |
| The information in this table was provided by ECC in their Scoping Opinion (Planning Inspectorate, 2021) response, and is considered correct as of March 2021. Notwithstanding, no additional sites or planning applications were identified by ECC in its statutory consultation response for this aspect in August 2021. | | |

## Future baseline

### Future minerals availability and minerals safeguarding sites baseline

11.8.68 For the purpose of this assessment, it has been assumed that the size of the primary aggregate landbanks, marine aggregate reserves and the supply market for secondary and recycled aggregate would remain largely the same for the construction period (2024 to 2027) as for the baseline year (2020), as mandated by relevant national planning policy.

11.8.69 It has also been assumed that the size and location of minerals infrastructure and designations, located within 250m of the first study area, would remain unchanged from the baseline year. Reference to the Essex Minerals Local Plan Review Consultation (ECC, 2021c) confirms that there are no newly proposed sites within the amended Minerals Local Plan.

11.8.70 The ECC (2021c) reports that that sites that are currently allocated as 'Preferred Sites' have already been demonstrated as being appropriate for extraction through an Examination in Public held in 2013. They continue to be considered appropriate unless there are demonstrable issues with their delivery.

**Future waste treatment, recycling and recovery capacity baseline**

11.8.71 Waste treatment, recycling and recovery infrastructure facilities are considered to be a beneficiary of incoming materials through driving the management of the waste hierarchy, and by creating conditions that facilitate a circular approach to the management of materials (see Plate 11.1).

**Plate 11.1 Waste hierarchy**


11.8.72 These facilities are therefore not considered to be sensitive receptors for the purposes of assessment in the same way as landfill sites, given that they are part of a recovery system that could reduce the environmental effects associated with waste generation, management and disposal. These facilities are also different to landfills, in that landfills are a finite resource.

11.8.73 Waste treatment, recycling and recovery facilities are typically characterised by large annual throughputs; consequently, large step changes in capacity (as single facilities are commissioned) have an exaggerated impact on the historical trend. Waste treatment, recycling and recovery infrastructure capacity cannot therefore be realistically projected forward to the construction phase of the proposed scheme.

11.8.74 While the future capacity of material recycling and recovery facilities is not quantified in this assessment, the presence and capacity of these facilities has been accounted for as per DMRB LA 110 requirements. The impact of constructing the proposed scheme on these facilities has also been considered in the ancillary discussion provided in Section 11.11 of this chapter.

11.8.75 Professional experience has shown that waste markets are flexible and adapt to changing markets within a region; and that historical trends show that waste treatment, recycling and recovery is added or removed, not least to cope with changes in waste generation. It is expected that, while the actual waste facilities available may change over the course of constructing the proposed scheme, the overall capacity is likely to remain similar as the market responds.

11.8.76 The future waste treatment and recovery infrastructure capacity for use in the assessment has therefore been based on the most recent available Environment Agency annual capacity and input data for 2020. This suggests that there is likely to be adequate opportunity for wastes arising during the construction of the proposed scheme to be treated, recycled or otherwise recovered via appropriate means within the second study area.

**Future inert, non-hazardous and hazardous landfill capacity baseline**

11.8.77 Projected future inert and non-hazardous landfill void capacity has been forecast, using statistical trend analysis, in Table 11.18 and illustrated in Plate 11.2 and Plate 11.3 for the East of England region and Greater Essex sub-region respectively during the anticipated construction phase (2024 to 2027).

11.8.78 The assessed categories include both merchant inert (inert landfill only) and merchant non-hazardous (non-hazardous landfill sites and non-hazardous landfill sites with an SNRHW cell) landfill sites, but exclude restricted user sites which are permitted only to accept waste from the operators of these sites.

11.8.79 The predicted changes in landfill capacity are derived from the existing Environment Agency time-based data, for remaining landfill capacity at the end of each calendar year, for the years for which consistent data is available from the Environment Agency (that is, 2005 to 2020[12]).

11.8.80 This data has been projected forward to 2027 (target opening year), using the Microsoft Excel 'Forecast' function[13], to provide an estimate of the remaining landfill capacity that may be available during the construction phase.

11.8.81 This forecast takes accounts of trends in the addition and subtraction of landfill capacity between 2005 and 2020, and the values reported in Table 11.18 represent the mean capacity forecasts, for the years 2021 to 2027, based on the lower and upper bound limits of the estimates at a 95% confidence interval.

[12] Reference to historic Environment Agency data confirms the following average annual capacity change in landfill capacity between 2005 and 2020: East of England: inert landfill (+18.57%) and non-hazardous landfill (-5.22%); and Greater Essex: inert landfill (+39.48%) and non-hazardous landfill (-1.62%).

[13] The exponential smoothing forecasting in Microsoft Excel is based on the AAA version (additive error, additive trend and additive seasonality) of the Exponential Triple Smoothing (ETS) algorithm, which uses advanced machine learning to smooth out minor deviations in past data trends by detecting seasonality patterns and confidence intervals in non-linear data. It should be noted that forecasting cannot definitively predict future landfill capacity, only probable capacity.

## Table 11.18 Forecast future baseline inert and non-hazardous landfill capacity in the East of England and Greater Essex, 2021 to 2027

| Timeline | Historic baseline and future forecast landfill capacity (000s t) | | | |
|---|---|---|---|---|
| | East of England (inert) | East of England (non-hazardous) | Greater Essex (inert) | Greater Essex (non-hazardous) |
| 2005 | 8,313 | 49,067 | 714 | 11,675 |
| 2006 | 14,932 | 49,735 | 2,210 | 13,270 |
| 2007 | 16,319 | 46,738 | 2,484 | 12,827 |
| 2008 | 15,514 | 52,998 | 2,793 | 20,749 |
| 2009 | 12,306 | 48,862 | 2,238 | 19,546 |
| 2010 | 10,733 | 45,443 | 1,772 | 17,154 |
| 2011 | 11,506 | 42,053 | 1,719 | 16,242 |
| 2012 | 9,723 | 39,974 | 1,296 | 15,631 |
| 2013 | 24,161 | 37,859 | 818 | 14,455 |
| 2014 | 27,347 | 33,071 | 1,721 | 13,311 |
| 2015 | 29,232 | 31,724 | 4,410 | 11,930 |
| 2016 | 53,928 | 29,173 | 6,728 | 10,549 |
| 2017 | 27,689 | 26,313 | 5,654 | 9,443 |
| 2018 | 30,513 | 25,566 | 4,787 | 9,837 |
| 2019 | 32,882 | 22,638 | 3,151 | 8,015 |
| 2020* | 37,470* | 21,362 | 9,744* | 7,448 |
| 2021 | 39,243 | 19,003 | 10,101 | 6,930 |
| 2022 | 41,274 | 16,838 | 10,458 | 6,397 |
| 2023 | 43,305 | 14,673 | 10,816 | 5,863 |
| **2024** | **45,336** | **12,508** | **11,173** | **5,330** |
| **2025** | **47,367** | **10,343** | **11,530** | **4,797** |
| **2026** | **49,398** | **8,178** | **11,887** | **4,264** |
| **2027** | **51,429** | **6,013** | **12,245** | **3,730** |

| Timeline | Historic baseline and future forecast landfill capacity (000s t) | | | |
|---|---|---|---|---|
| | East of England (inert) | East of England (non-hazardous) | Greater Essex (inert) | Greater Essex (non-hazardous) |
| **Average estimated capacity during the four-year anticipated construction period (Q1 2024 start-on-site to Q4 2027 full proposed scheme open to traffic) (000s tpa)** | **48,383** | **9,260** | **11,709** | **4,530** |

* The increase in remaining inert landfill capacity, between the end of 2019 and at the end of 2020, is the result of two new landfill sites (Stanway Quarry Landfill and Dollymans Farm Landfill) coming online in the Greater Essex sub-region in 2020. These sites represent an additional 3,500,000t of capacity. Furthermore, seven existing landfills in the East of England region reported capacity increases totalling 1,220,160t between 2019 and 2020. Four of these capacity increases were recorded at sites in the Greater Essex sub-region with total increases of 970,842t.

**Plate 11.2 Forecast future inert landfill capacity in East of England region and Greater Essex sub-region (2021–2027) (000s t)**

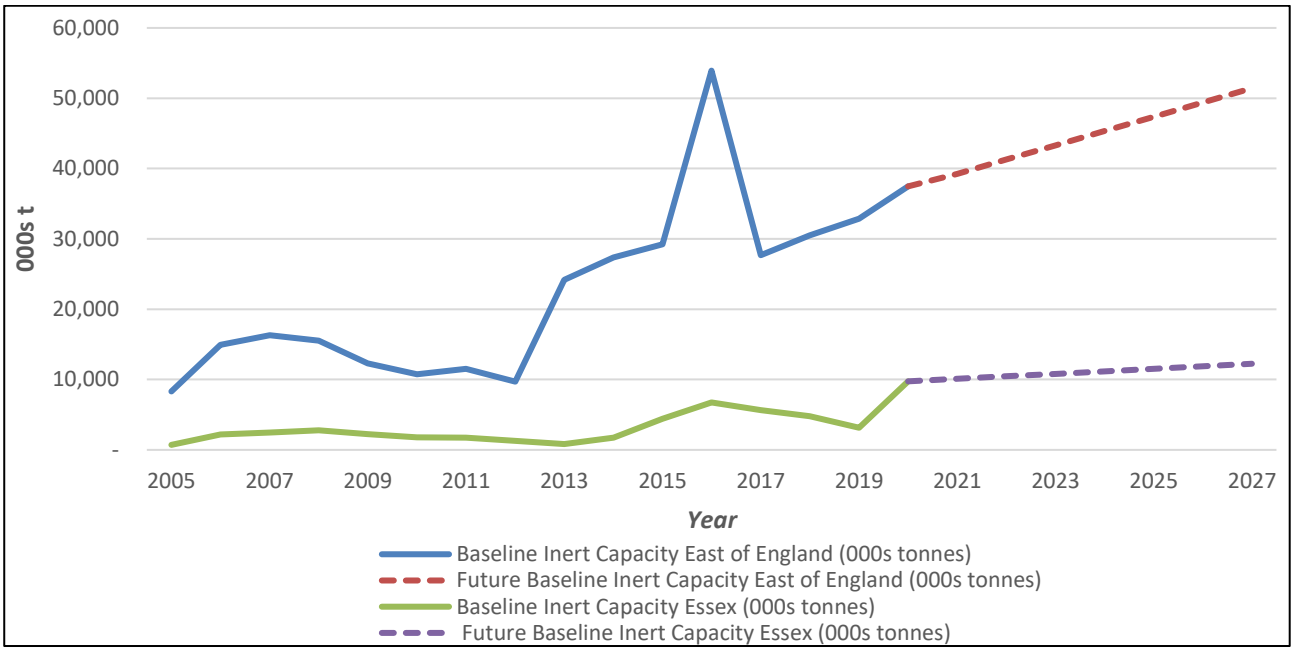
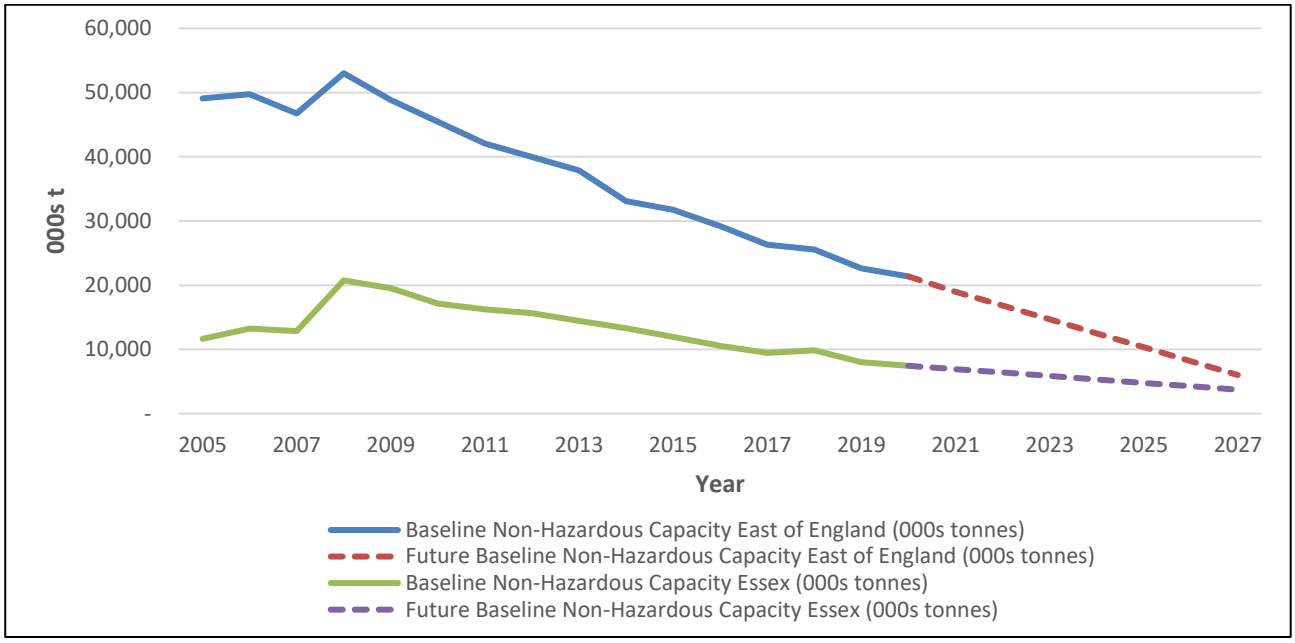


**Plate 11.3 Forecast future non-hazardous landfill capacity in East of England region and Greater Essex sub-region (2021–2027) (000s t)**




11.8.82 Although there is generally a reducing trend for landfill disposal in England, the forecast estimates suggest that there is likely to be sufficient inert and non-hazardous landfill capacity available in the East of England region and Greater Essex sub-region, to support the construction of the proposed scheme, based on the predicted average annual capacity between 2024 and 2027. However, there is unlikely to be any hazardous landfill capacity in the region as is currently the case and which the assessment is predicated on.

11.8.83 This means that any inert, non-hazardous and SNRHW waste that is destined for landfill would most likely find available capacity in the second study area. Waste planning authorities have a statutory responsibility to make provision for sufficient landfill capacity; future local plans should include provision for landfill sites or to identify other suitable placement locations to enable continued capacity to be available as landfill void space is occupied.

11.8.84 It is also of note that, even where wastes are deposited in land, some may, subject to their properties, be used within landfill cover or other engineering uses rather than subject to and accounted as disposal. Any landfills that have ceased infilling, at the time of construction, and are no longer accepting waste may also still require inert and non-hazardous materials for capping and restoration purposes, and therefore may be amenable to accepting any suitable surplus materials arising from construction.

11.8.85 Inert and non-hazardous material is also likely to be required for quarry infilling and other restoration purposes. For example, reference to the Waste Data Interrogator (Environment Agency, 2022a) confirms that an additional 1.7Mt and 0.8Mt were deposited in landfill for the purposes of waste recovery in the East of England region and Greater Essex sub-region respectively in 2020. This activity covers the deposit of waste in land for benefit and recovery purposes, whereas landfilling is the deposit in land for the purposes of final disposal.

11.8.86 Notwithstanding this, it is envisaged that the vast majority of waste arising from constructing the proposed scheme would be reused, recycled or otherwise recovered in accordance with legislative, policy and economic drivers. This assumption is validated by the available UK Statistics on Waste (Defra, 2022) with 93.2% of non-hazardous C&D waste currently being diverted from landfill in England. A high degree of waste recovery would also be required in order to demonstrate the proposed scheme's contribution to achieving the following mandatory and advisory targets in DMRB LA 110 (Highways England, 2019b):

- At least 70% (by weight) of non-hazardous C&D waste 'shall' be subjected to material recovery or diverted from landfill (constitutes a requirement of National Highways).
- At least 90% (by weight) of non-hazardous C&D waste 'should' be subjected to material recovery or diverted from landfill (constitutes advice expressed as a recommendation by National Highways).

11.8.87 Materials would either be recovered within the Order Limits or within the wider East of England region to offset the use of primary construction materials and support a circular economy. These targets exclude naturally occurring soil and stone material falling within code 17 05 04 in the Hazardous Waste (Miscellaneous Amendments) Regulations 2015 (as amended).

**Future waste safeguarding sites baseline**

11.8.88 For the purpose of this assessment, it has been assumed that the size and location of waste infrastructure and designations located within 250m of the first study area would remain unchanged from the baseline year (2020).

## Value and sensitivity of receptors

11.8.89 The baseline environment comprises receptors which have been defined geographically, based on the likely impacts and effects, associated with the use and consumption of material assets and the production and management of waste, as set out in paragraphs 3.9 and 3.10 of DMRB LA 110 (Highways England, 2019b).

11.8.90 While these receptors and a summary of their baseline conditions are provided in Table 11.19, it should be noted that the DMRB LA 110 significance criteria precludes the need to assign a sensitivity rating to the identified receptors for the purposes of assessment (see Section 11.5 of this chapter).

11.8.91 The sensitivity of all receptors within the baseline is intrinsically considered within the significance category descriptions provided in DMRB LA 110, and as such, the methodology for this aspect is not based on the method of combining the sensitivity of the receptor and the magnitude of impact to determine the significance of effect as detailed in Chapter 5: Environmental assessment methodology, of the Environmental Statement [TR010060/APP/6.1].

**Table 11.19 Summary of the baseline conditions for material assets and waste**

| Sensitivity | Description | Summary of baseline conditions |
|---|---|---|
| N/A – not required for assessment | Primary, secondary and recycled aggregate resources | Primary aggregates are, in their own right, considered as sensitive receptors. Notwithstanding this, there is likely to be a sufficient supply of both primary and recycled aggregates within the second study area to construct the proposed scheme. There is no information covering secondary aggregates. |
| N/A – not required for assessment | Mineral safeguarding sites | A significant proportion of the first study area is located within an MSA for sand and gravel, and part of the eastern extents of the proposed scheme also falls within an MSA for brick clay. The first study area also intersects with a number of MCAs for existing and allocated mineral sites and infrastructure. |
| N/A – not required for assessment | Material recycling or recovery facilities | There is likely to be significant opportunity for the reuse, recycling or recovery of appropriate wastes generated during the construction of the proposed scheme. This assessment does not consider these non-landfill facilities to be receptors as they are viewed to be part of a system that could reduce the impacts associated with the disposal of waste. |
| N/A – not required for assessment | Inert, non-hazardous and hazardous landfill capacity | There is likely to be available inert and non-hazardous landfill capacity within the second study area to accommodate the majority of wastes arising from the construction of the proposed scheme, and there are unlikely to be any specific constraints with regards to disposing of inert, non-hazardous and SNRHW streams. However, any hazardous waste requiring disposal to landfill is likely to require disposal outside of the East of England due to the absence of current permitted merchant capacity. |
| N/A – not required for assessment | Waste safeguarding sites | The first study area intersects with a number of WCAs for existing and allocated waste sites and infrastructure. Waste safeguarding sites are not considered within the DMRB LA 110 significance criteria. |

11.8.92 The DMRB LA 110 recommends that sensitive receptors (designated sites identified in other environmental aspects) should also be considered in order to reduce the effects from material assets and waste (such as, for example, those resulting from onsite storage or treatment activities).

11.8.93 In addition to the generalised receptors identified in Table 11.19 for this aspect, further environmental receptors and designated sites are considered in the other aspect chapters in the Environmental Statement.

# 11.9 Potential impacts

## Construction

### Consumption of material assets

11.9.1 Constructing the proposed scheme would require the use of substantial quantities of material assets which impacts upon their immediate, and in the case of primary aggregates, long-term availability, resulting in temporary or permanent adverse impacts on the environment through the depletion of natural resources. Material assets include both primary materials, such as mineral aggregates, and manufactured construction products such as asphalt and concrete.

11.9.2 Some of these materials would originate offsite, purchased as primary construction products, but some would arise onsite, particularly from the use of borrow pits, but also excavated soils, crushed concrete or recycled asphalt planings, or recycled materials brought in from offsite, possibly from other projects or industries. Table 2.11 in Chapter 2: The proposed scheme, of the Environmental Statement [TR010060/APP/6.1], provides a summary of types of construction materials and products to be consumed on the proposed scheme that are likely to hold certification to a recognised responsible sourcing standard.

11.9.3 The proposed scheme is anticipated to require a large quantity of both primary materials and manufactured construction products during earthworks and main construction as quantified in Section 11.11 of this chapter. These materials are likely to include, but are not limited to:

- earthworks materials including topsoil, general fill and landscaping fill
- aggregates for capping, sub-base, site compound hardstanding, drainage filter media and concrete
- asphalt base, binder and surface courses, including aggregates and bitumen
- concrete for use in structures, retaining walls, culverts, headwalls, piles, foundations, fenceposts, kerbs, chambers and catch pits
- iron and steel for use in structures, reinforcement, safety barriers, fencing, utilities diversions, manhole covers and cabinets
- plastics for use in drainage pipes, chambers, gully pots and interceptors, traffic signs, cables, ducting, road markings and geotextiles
- timber for use in fencing and for structural formwork and falsework

11.9.4 The largest quantity of materials to be used in construction of the proposed scheme would be earthworks materials, aggregates for road foundations, asphalt aggregates, and drainage and duct aggregates. It is assumed at this stage that all these materials, except for the site-won material from borrow pits/

earthworks, would be imported to site as they are unlikely to be available in the borrow pits or earthworks excavations across the proposed scheme.

11.9.5 Notwithstanding, depending on the quality of the granular material, processing and treatment may be used to gain concrete and drainage aggregates from borrow pit J for use on the proposed scheme. The locations of the four borrow pits, which have been included within the Order Limits, are shown on Figure 2.3 [TR010060/APP/6.2] and described in Chapter 2: The proposed scheme, of the Environmental Statement [TR010060/APP/6.1], and the Borrow Pits Report [TR010060/APP/7.8].

**Sterilisation of mineral safeguarding sites**

11.9.6 Constructing the proposed scheme would require land to be acquired and used within the Order Limits which is outside of the existing highway boundary for both temporary (such as borrow pits, haul roads, site compounds and laydown areas) and permanent (such as new highways, junctions, access roads, structures, embankments, drainage) construction purposes.

11.9.7 Any new land that is to be permanently acquired and used by the proposed scheme, inside the MSAs for sand and gravel and brick clay, could therefore result in partial sterilisation of the safeguarded mineral resource by constraining or preventing existing and potential future use and extraction of those resources.

11.9.8 The Order Limits also intersect with a number of MCAs around existing, allocated and safeguarded mineral sites (including Bulls Lodge, Colemans Farm, Marks Tey Brickworks and Marks Tey Rail Sidings), and could also result in impacts to the safeguarded infrastructure and allocations through either direct loss of capacity or by constraining the operation of these facilities.

**Generation and disposal of waste to landfill**

11.9.9 Constructing the proposed scheme would generate substantial quantities of surplus materials and waste, leading to potential impacts on the available waste management infrastructure through permanently occupying landfill capacity.

11.9.10 Landfill is a finite resource, and the successive disposal of waste generally results in a continued need to expand existing, and develop new, landfill facilities. This loss of resources to landfill generally requires the extraction or production of new material assets which, in turn, accelerates the depletion of natural resources, resulting in temporary or permanent adverse impacts on the natural environment.

11.9.11 The use of sub-regional landfill capacity could also displace (or push out) waste that would otherwise be landfilled in Essex, thus impacting upon the waste planning authority's proximity and net self-sufficiency principles which are viewed as a key performance indicator and driver for waste planning at the sub-regional level.

11.9.12 A range of waste types, including inert, non-hazardous and small quantities of hazardous wastes, would be generated during the construction of the proposed scheme. The majority of wastes produced would be C&D waste, a large proportion of which could be suitable for reuse, recycling or recovery on or

offsite, although a proportion could require disposal to landfill. Smaller quantities of municipal waste (household-like waste) would also be generated by construction workers and site welfare activities.

11.9.13 The proposed scheme is anticipated to result in substantial quantities of surplus materials and wastes during earthworks, demolition of highways assets and third party buildings, and main construction as quantified in Section 11.11 of this chapter. These waste streams are likely to include, but are not limited to:

- vegetation, trees, scrub and invasive plants (non-hazardous)
- surplus topsoil and unacceptable earthworks materials (inert, non-hazardous or hazardous)
- asphalt road planings (non-hazardous or hazardous (if containing coal tar))
- concrete, masonry, tiles, bricks and ceramics (inert)
- insulation, gypsum (non-hazardous or hazardous)
- furniture, floor coverings, vinyl tiles, carpet (non-hazardous)
- signage, signal posts, lighting columns, steel safety barriers and other street furniture (non-hazardous)
- ferrous and non-ferrous metal waste (non-hazardous)
- treated and untreated wood waste (non-hazardous or hazardous)
- plastic waste (non-hazardous)
- mixed C&D waste (non-hazardous or hazardous)
- mixed packaging (non-hazardous)
- canteen, office, ad hoc waste (non-hazardous)
- asbestos-containing materials (hazardous)
- hydraulic oils (hazardous)
- waste electrical and electronic equipment (WEEE), lamps, bulbs, etc. (hazardous or non-hazardous)
- miscellaneous waste associated with the maintenance of plant and machinery or chemicals required as part of the construction processes (hazardous)
- residual pipeline products/scale, pipe cleaning swabs (hazardous)

11.9.14 The largest quantities of surplus materials and waste are anticipated to be unsuitable earthworks materials, asphalt planings from removal of existing pavement and wastage associated with aggregates use. It is assumed at this stage that the majority of the surplus earthworks materials would be used in

onsite landscape areas and for borrow pit restoration works, and that aggregate crushing and grading would be used to recycle or recover demolition and pavement arisings into the main construction works where practicable.

### Impacts to safeguarded waste management sites

11.9.15 The Order Limits also intersect with a number of WCAs around existing, allocated and safeguarded waste sites (Boreham Recycling Centre, Bulls Lodge Inert Recycling, Drovers Recycling Centre, Winsford Way Waste Transfer Station, Witham Recycling Centre and Witham Water Recycling Centre), and could therefore result in impacts to the safeguarded infrastructure and allocations through either direct loss of capacity or by constraining the operation of these facilities.

11.9.16 As reported in Section 11.5 of this chapter, any impacts to WCAs for allocated and safeguarded waste sites have been separately assessed as part of the Waste Infrastructure Assessment that accompany the Environmental Statement and DCO application (see Appendix 11.3 of the Environmental Statement [TR010060/APP/6.3]).

## Operation

11.9.17 DMRB LA 110 (Highways England, 2019b) specifies that the assessment shall report on the first year of operational activities (opening year). It has been assumed that no significant maintenance activities would occur during the first year of operational activities on a newly constructed highway asset (target opening year 2027), and so there is not likely to be significant materials consumption or waste generation. It has also been assumed that any sterilisation impacts to mineral safeguarding sites would have been mitigated as far as practicable during the design and construction of the proposed scheme.

11.9.18 Operational impacts have therefore been scoped out of the assessment on the basis that no likely significant effects would be realised. Although the opening year is a time period not necessarily confined to operational effects, any construction phase effects overlapping within this period are captured within the construction phase assessment. This was agreed with by both the Planning Inspectorate and ECC in the Scoping Opinion (Planning Inspectorate, 2021).

11.9.19 While EN-1 (Department of Energy and Climate Change, 2011a) requires an assessment of the impact of the waste arising from energy developments on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation, it has been assumed that no significant materials consumption or waste generation is likely to be realised during this period. It has also been assumed that any sterilisation impacts to mineral safeguarding sites would have been mitigated as far as practicable during the design and construction of the gas main diversion. Operational impacts have therefore been scoped out of the assessment on the basis that no likely significant effects would be realised.

11.9.20 Notwithstanding this, the design process would inherently seek to reduce the consumption of material assets, unnecessary sterilisation of mineral sites, and the generation of waste throughout the life cycle of the proposed scheme. Design choices and the choice of materials would make a significant

contribution to reducing the environmental impacts associated with material assets and waste during operation, by influencing the required method and frequency of maintenance, and facilitating opportunities to recover and regenerate materials and products at the end of first life.

11.9.21 It is also assumed that the assessment of any environmental impacts and effects associated with material assets and waste during any large-scale future maintenance, renewal or improvement works beyond the opening year would be undertaken by National Highways East of England Asset Delivery Contractor(s) (or equivalent) in accordance with the requirements of DMRB LA 110 (or any future environmental assessment guidance specified by National Highways). It also assumes that the gas main operating company would be responsible for undertaking any future environmental assessment associated with maintaining the diverted gas main beyond the first five years of operation.

11.9.22 It is highly unlikely that the proposed scheme would be demolished as the improvements would have become an integral part of the strategic and local road networks. In the unlikely event of the proposed scheme needing to be demolished, this would conform to the statutory process in place at that time, including any requirements for EIA as appropriate.

11.9.23 Demolition of the proposed scheme has therefore not been considered further in this assessment. The notable exception to this is the inclusion of a standard mitigation measure that requires the implementation of Design for Resource Efficiency Principles to identify how materials can be designed to be more easily adapted over an asset's lifetime and how de-constructability and de-mountability of elements can be increased at end of life (see Section 11.10 of this chapter).

## 11.10 Design, mitigation and enhancement measures

11.10.1 This section of the chapter identifies established and reliable design, mitigation and enhancement measures considering relevant legislation, policy and good practice. These measures would be implemented during the design and construction of the proposed scheme.

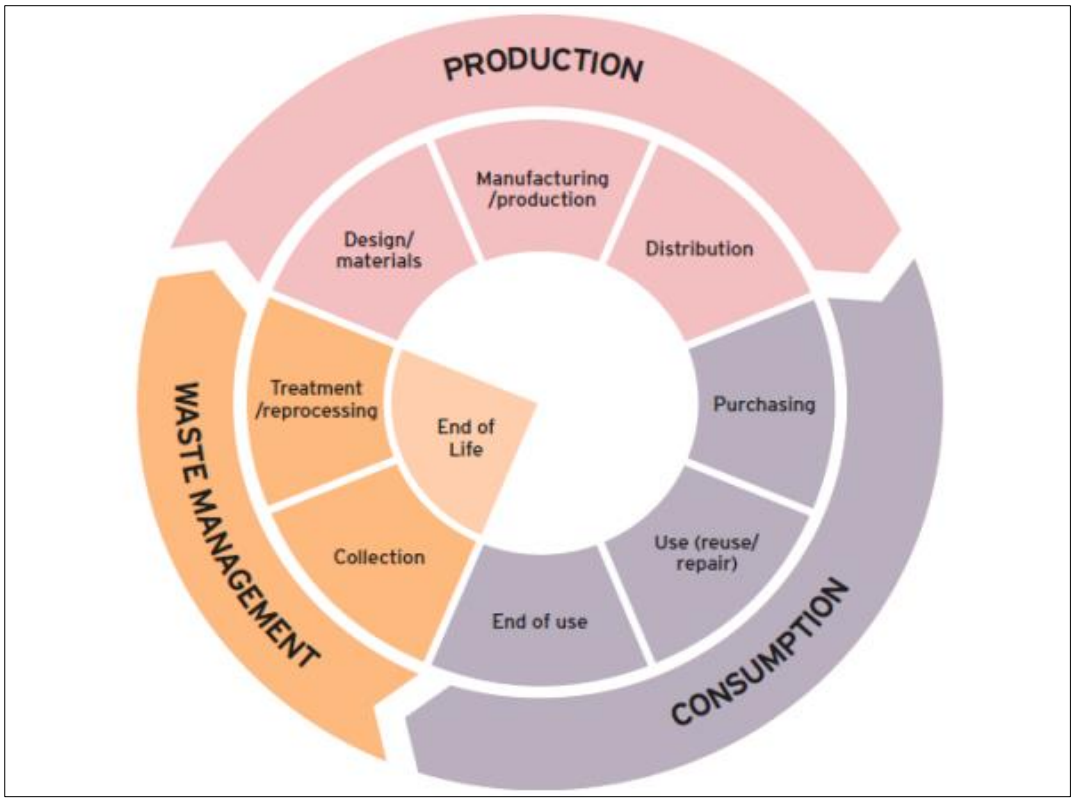
11.10.2 Measures would be implemented to reduce the potential impacts associated with the consumption of material assets, sterilisation of mineral safeguarding sites and the production and disposal of waste during the construction of the proposed scheme. There is significant synergy between material assets and waste, thus there is overlap between the mitigation measures.

11.10.3 Minimising the use of new/virgin materials and maximising the use of reused, recycled and responsibly sourced materials in the proposed scheme, and diverting materials from landfill would reduce the attendant indirect environmental impacts and effects associated with materials production (as discussed in Section 11.6 of this chapter), thereby supporting a circular economy.

11.10.4 A circular economy is an alternative to a traditional linear economy (of make, use, dispose) in which resources are kept in use for as long as possible; where maximum value is extracted from these resources while in use; and where assets, components, products and materials are recovered and regenerated at

end of life as products and materials that maintain rather than degrade resource value (see Plate 11.4). The underlying assumption is that using less material results in lower attendant environmental impacts compared to virgin materials.

**Plate 11.4 A simplified depiction of the circular economy (Defra, 2018b)**




11.10.5 Where practicable, the design of the proposed scheme would work towards the ambition of zero avoidable waste in construction. This means preventing waste being generated at every stage of the proposed scheme's life cycle, from the manufacture of materials and products, the design, specification, procurement and assembly of infrastructure through to deconstruction.

11.10.6 The primary objective for zero avoidable waste should be at the top of the waste hierarchy (see Plate 11.1) on prevention, that is measures taken before a substance, material or product has become waste, that use less material in design or reduce:

- the quantity of waste, including through the reuse of products or the extension of the life span of products
- the adverse impacts of the generated waste on the environment and human health
- the content of harmful substances in materials and products

11.10.7 As such, the aim is not to focus on lower value recycling and other recovery, and in any case, the majority of C&D waste is already being 'recovered' in some form (93.2% in England). If waste cannot be prevented, then the secondary objective is for waste to be kept at its highest level within the waste hierarchy, in

line with the Resources and Waste Strategy (Defra, 2018b) and the Waste (England and Wales) Regulations 2011 (as amended), which, in descending order of preference, is:

- preparing for reuse (repairing or remanufacturing)
- closed-loop recycling (using waste as a feedstock in the same process)
- open-loop recycling (using waste as a feedstock for a different purpose)

11.10.8 If waste can be managed in this way, then it is 'avoidable' as it has a further use and is not being disposed of to landfill or as energy recovery. It is recognised that some waste produced may be unavoidable and is considered unsuitable for further use (such as certain hazardous wastes). However, all other waste is avoidable waste, in that it can either be prevented, reused or recycled.

## Embedded (design) mitigation

11.10.9 The environment team has worked in close collaboration with the infrastructure design team to avoid or reduce environmental impacts through the proposed scheme design. This is referred to as embedded (or design) mitigation.

11.10.10 Chapter 3: Assessment of alternatives, of the Environmental Statement [TR010060/APP/6.1], details the design alternatives that have been considered, including the environmental factors which have influenced the decision making.

11.10.11 Those design changes that are relevant to material assets and waste include consideration of the following:

- Optimising the cut-fill balance to reduce material requirements and waste
- The location and extent of carriageway widening
- The alignment of the new offline carriageway

11.10.12 Key examples of the design refinements undertaken at the options selection and preliminary design stages include, but are not limited to, the following:

- Junction 19 (Boreham interchange): making greater use of existing infrastructure at junction 19 to reduce the footprint of the proposed scheme.
- Junction 19 to junction 20a (Hatfield Peverel South interchange): descoping verge and central reserve works between junction 19 and junction 20a. The carriageway is already three lanes in this section.
- Hatfield Peverel noise mitigation: removing the noise barrier from the design, and a surface with better noise-reducing properties was added instead, which eliminates the need for additional materials.
- Maldon Road junction with The Street: discounting an alternative design that would have resulted in loss of trees and demolition of properties.
- Junction 21 (Witham South interchange): avoiding the need for demolition of existing properties in Hatfield Peverel, thereby preventing waste.

- Junction 22 (Colemans interchange): revising the mainline alignment to reduce the impact on Colemans Farm Quarry, and modifying the vertical alignment to reduce earthworks and fill material requirements.
- Junction 22: agreeing a number of measures with the Colemans Farm Quarry operator to mitigate any impacts to the consented quarry operations caused by the construction of the proposed scheme (see Section 11.11 of this chapter).
- Junction 23 (Kelvedon South interchange): removal of the new junction 23 from the scope of the proposed scheme, with the existing A12 between junctions 22 and 23 being retained as a local access road.
- Junction 24 (Kelvedon North interchange): relocating the new junction 24 to Inworth Road which improves the earthworks cut and fill balance at this location.
- Prested Hall access: using part of the existing A12 northbound carriageway to provide the new access road, and reducing the number of new structures over the proposed A12 mainline from two to one.
- Junction 25 (Marks Tey interchange): maximising the use of existing infrastructure at junction 25 to facilitate improvements for walkers, cyclists and horse riders.
- River Ter Bridge: retaining the bridge width, as opposed to physically widening the bridge.
- Borrow pits: use of borrow pits to source bulk earthworks materials instead of importing material.
- Use of low noise pavement: use of low noise pavement, which allowed the removal of noise barriers in certain locations eliminating the need for substantial additional civil works to accommodate such structures.
- Re use of existing pavement: pavement has been designed to utilise existing pavement as much as practicable, based on the pavement assessments, to eliminate as far as practicable full reconstruction of existing pavement.

11.10.13 The proposed scheme design is ongoing and would continue to be influenced, as the preliminary design is progressed to detailed design, by environmental factors to avoid or reduce the effects from the consumption of materials assets and disposal of waste where practicable.

## Standard mitigation

11.10.14 Standard mitigation would occur as a matter of course due to legislative and policy requirements or standard sector practices. These measures would typically be implemented across the proposed scheme to avoid or reduce potential environmental effects.

11.10.15 Standard mitigation to be implemented for this aspect would include the following:

- Implementing Design for Resource Efficiency Principles in a systematic manner to suit the scale of the proposed scheme, to identify, prioritise and select appropriate opportunities to improve project resource efficiency and design out waste. Most opportunities to design for resource efficiency are embodied by the following five key principles:
  - Design for reuse and recovery: identifying, securing and using materials that already exist onsite, or can be sourced from other projects.
  - Design for resource optimisation: simplifying layout and form to reduce material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content.
  - Design for offsite construction: maximising the use of pre-fabricated structures and components, encouraging a process of assembly rather than construction.
  - Design for resource-efficient procurement: identifying and specifying materials that can be acquired responsibly, in accordance with a recognised industry standard.
  - Design for the future: identify how materials can be designed to be more easily adapted over an asset lifetime and how de-constructability and de-mountability of elements can be maximised at end of first life.

  Evidence of material resource efficiencies and waste reductions would be demonstrated in a number of ways, for example value engineering registers, design meeting records, designing out waste workshops, site waste management plans, specifications, drawings or site photographs.
- Developing and implementing a Sustainable Procurement Plan (SPP). The SPP would set out a clear framework to increase the procurement and use of sustainably and responsibly sourced construction materials and products with proven sustainability credentials that reduce adverse impacts on people and the environment during the construction of the proposed scheme. The plan would specify the following:
  - Use of key material elements (asphalt, concrete, aggregate, steel, aluminium and plastics) responsibly sourced from suppliers with industry recognised responsible sourcing certification for that material (such as certification to BES 6001 (Building Research Establishment, 2014), or membership of a sector-specific scheme that complies with BS 8902 (British Standards Institution, 2009)).
  - Use of timber and wood-derived products that are sustainably sourced from independently verifiable legal and sustainable sources certified by Central Point of Expertise on Timber approved scheme such as Forestry Stewardship Council or Programme for the Endorsement of Forest Certificate. Other certification schemes are available.

- Use of locally soured and recycled materials, where available and permitted by the Specification for Highway Works, and where practicable and cost-effective to do so. This could include materials that already exist onsite, can be recovered from demolition activities, removal of existing pavement, or can be sourced from other projects and suppliers.
- Use of imported aggregates that comprise reused, secondary or recycled content at levels in line with the East of England regional guideline for aggregates provision 2005-2020 target of 31% where available for those applications and where it is technically and economically feasible to substitute these alternatives to primary aggregates. Where primary aggregate materials are mandated within DMRB, they are excluded from the target. This target excludes site-won material and recycled demolition materials.
- Use of minimal quantities of hazardous materials or high volatile organic compound applied coatings that could harm human health or the environment; and that might cause problems for future reuse, recycling and recovery at end of first life.

The SPP would also set out the policies that would be employed by the appointed Principal Contractor and its subcontractors to evaluate and specify the responsible sourcing of construction materials and products, and the procedures that are to be put in place to check and verify that the SPP is being implemented and adhered to during construction. This would include setting out any measurement criteria, methodology and performance indicators to assess progress and demonstrate success; and how the chain of custody of materials would be audited and evidenced during procurement.

- Implementing an SWMP, in a manner to suit the requirements of the proposed scheme, to plan, implement, monitor and review waste minimisation and management throughout the construction phase of the proposed scheme. The SWMP is a live document, updated at varying points during the design and construction phase. It would be used to forecast waste arisings and enable practical decisions to be taken at the detailed design and construction stage regarding waste prevention and the segregation of materials onsite for reuse, recycling, recovery or disposal, as well as for the layout of site waste management storage and treatment facilities. The SWMP would:
  - be prepared using either the good practice resources developed by WRAP or the appointed Principal Contractor's own SWMP tools and resources
  - include targets or key performance indicators for waste recovery in line with prevailing Government and National Highways targets
  - document the methods to be used to measure and record the quantity of waste generated during construction

- be accompanied by appropriate communication between the Client, Designer and Principal Contractor as well as subcontractors and other members of the supply chain

- Complying with waste 'duty of care' requirements during the construction of the proposed scheme. Taking all reasonable steps to ensure that surplus materials and waste are stored, treated, transferred, consigned, transported, reused, recovered or disposed of safely without endangering human health or harming the environment. This includes ensuring that:
  - all waste has been managed in accordance with the waste hierarchy, as a priority order, to achieve the best overall environmental outcome
  - all reasonable steps have been taken to ensure that waste does not cause pollution or harm to human health
  - all inert, non-hazardous and hazardous waste materials have been segregated, and care is taken to prevent contamination during storage
  - all waste is transported by Registered Waste Carrier
  - all waste transfer notes and consignment notes are completed and retained
  - all waste has been taken to licensed, permitted or exempt facilities
  - all transfers to disposal sites have been checked to ensure that they are licensed or permitted to accept the waste material

- To reduce any attendant effects from storing and processing material assets and waste, ensuring that construction site compounds and onsite storage, stockpiling and processing areas are designed to reduce impacts to those designated environmental sites and sensitive environmental receptors identified in other aspect chapters of the Environmental Statement.

- Obtaining and complying with all necessary waste carrier registrations, environmental permits, planning permissions, mobile plant deployments or waste exemptions in relation to the storage, sorting, treatment, use, disposal and transportation of waste during the construction of the proposed scheme; and preparing any necessary documentation required of statutory and industry-regulated codes of practice or end of waste quality protocols for converting waste into non-waste products (such as The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) and End of Waste Criteria for the Production of Aggregates from Inert Waste (Environment Agency, 2013)).

- Ensuring that waste is stored, treated, reused, recycled, recovered or disposed of as close as practicable to the point of origin during the construction of the proposed scheme, with consideration of the proximity principle, self-sufficiency principle and value for money principle, provided there are no unacceptable adverse impacts on people, the environment or

local amenities. Locally permitted transfer, reuse, recycling, other recovery and disposal sites would be used during construction, where sufficient capacity is available, to reduce the environmental impact and cost of waste transport and to support the economic wellbeing of local communities.

- Investigating the potential of importing certain bulk construction materials by rail, using the rail head terminals located at either end of the proposed scheme in Chelmsford and Marks Tey, where it is environmentally and economically feasible to do so. These terminals are operated by national manufactures and suppliers of construction materials, including aggregates, asphalt, cementitious materials and concrete. While any material imported via these terminals would typically be limited to the aforementioned materials (owing to the nature of the operating businesses), the opportunity of using these terminals to import inert construction, demolition and excavation waste as backfill materials to Colemans Farm Quarry should also be explored in the event that the quarry operators cannot perform this work themselves.

11.10.16 Standard mitigation is included in the Register of Environmental Actions and Commitments (REAC), which is within the first iteration of the EMP [TR010060/APP/6.5] which forms part of the DCO submission (refer to Chapter 5: Environmental assessment methodology, of the Environmental Statement [TR010060/APP/6.1]). The second iteration of the EMP would subsequently be produced for the construction phase and the third iteration of the EMP developed at the end of the construction phase for handover to the applicant.

## Additional mitigation

11.10.17 Additional mitigation would occur in the form of specific or bespoke mitigation to avoid or reduce effects on material assets and waste. This includes any locally specific measures to be implemented to reduce likely significant adverse environmental effects.

11.10.18 Additional mitigation to be implemented for this aspect includes the following:

- While the Mineral Resource Assessment (see Appendix 11.1 of the Environmental Statement [TR010060/APP/6.3]) has demonstrated that prior extraction of the sand and gravel resource would not be economically viable in the context of constructing the proposed scheme, any sand and gravel (a safeguarded mineral resource) that are incidentally extracted during site preparation should be processed and reused on site where practicable, and disposed of as a last resort.

- Undertaking a pre-demolition assessment of all highway structures and assets and third-party buildings to be removed or demolished as part of the proposed scheme. This assessment would be undertaken prior to demolition and used to determine the quantities of demolition assets, elements, components, products and materials; and to make recommendations for their reuse (on and/or offsite), recycling, other recovery or final disposal. This assessment would also support the SWMP and SPP by identifying the types and quantities of each waste to be

produced during demolition and any opportunities to use these site-won materials to offset the use of primary materials.

11.10.19 Additional mitigation is included in the REAC, which is within the first iteration of the EMP [TR010060/APP/6.5]. The second iteration of the EMP would subsequently be produced for the construction phase and the third iteration of the EMP developed at the end of the construction phase for handover to the applicant.

### Enhancement

11.10.20 No enhancement measures have been identified at this stage. Enhancement measures would be explored throughout the design and construction of the proposed scheme as an intrinsic part of developing the SPP and SWMP. Examples of enhancement opportunities for this aspect could include, but would not be limited to, the following:

- Where reasonably practicable, seek to use surplus recycled or recovered materials in community projects, such as utilising recycled mulch from tree felling on adjacent community facilities.
- Where reasonably practicable, recycling suitable material for use in constructing the noise and landscape bunding within the Order Limits.

11.10.21 Potential enhancement measures have not influenced to conclusions on likely significant effects.

## 11.11 Assessment of likely significant effects

11.11.1 This section sets out the key findings of the material assets and waste assessment after the application of those design and mitigation measures specified in Section 11.10 of this chapter.

11.11.2 The assessment has focused on the construction phase (anticipated from 2024 to 2027) which is the stage considered to have the potential for significant impacts to occur on material assets and waste.

11.11.3 Operational effects have been scoped out of this assessment as per the rationale provided in Section 11.9 of this chapter. This is in line with the proposed scheme Scoping Opinion (Planning Inspectorate, 2021).

### Material assets

#### Consumption of material assets

11.11.4 Indicative estimated quantities of the major materials required to construct the proposed scheme, including a 15% contingency to cover any unknown items, are provided in Table 11.20.

11.11.5 Material assets consumption has been estimated through a review of BoQ information provided by the Principal Contractor. To evaluate the potential recycled aggregate content of construction materials against the significance category descriptors detailed in Table 11.9, indicative levels of recycled content have been established in Table 11.20.

11.11.6 These benchmarks have been selected through the application of professional judgement to the material-specific 'good practice' reused and recycled content levels provided in WRAP's (2008) Net Waste Tool dataset. Given the age of this data, good practice benchmarks, as opposed to standard or best practice benchmarks, have been selected in order to provide a reasonable and realistic worst case assessment scenario in line with following benchmark definitions:

- 'Standard practice' benchmarks reflect the baseline performance of the construction industry, at the time of publication, based on achieving minimum standards and legal requirements.
- 'Good practice' benchmarks reflect going beyond standard practice to realise 'quick win' – benefits that are easy to achieve on a majority of projects without a fundamental change in working practice and were at least cost neutral at the time of publication.
- 'Best practice' benchmarks reflect the leading approach undertaken in the industry at the time of publication, but may bear a cost premium or require a significant change in working practice on some projects.

11.11.7 The use of good practice benchmarks aligns with the implementation of those mitigation measures/targets identified in Section 11.10 of this chapter. These measures would be implemented to reduce the use of new/virgin materials and increase the use of reused, recycled and responsibly sourced materials in the proposed scheme.

**Table 11.20 Summary of estimated material assets consumption (2024 to 2027)**

| Material assets | Approximate quantity (t) | Indicative reused and recycled content (%) | Estimated reused and recycled content (t) | Estimated primary content (t) |
|---|---|---|---|---|
| **Temporary works** | | | | |
| Site-won earthworks material | 256,942 | 100 | 256,942 | 0 |
| Imported aggregates*[2] | 568,230 | 50 | 284,115 | 284,115 |
| Imported asphalt*[2] | 156,421 | 46 | 71,954 | 84,467 |
| Imported concrete*[1] | 3,671 | 22 | 808 | 2,864 |
| Imported steel | 3,081 | 60 | 1,849 | 1,232 |
| Imported plastics | 24 | 10 | 2 | 22 |
| Imported timber/wood | 42 | 20 | 8 | 33 |
| **Permanent works** | | | | |
| Site-won earthworks material | 6,736,074 | 100 | 6,736,074 | 0 |
| Imported general fill*[2] | 3,236 | 50 | 1,618 | 1,618 |

| Material assets | Approximate quantity (t) | Indicative reused and recycled content (%) | Estimated reused and recycled content (t) | Estimated primary content (t) |
|---|---|---|---|---|
| Imported inert waste*[2] | 1,495,000 | 100 | 1,495,000 | 0 |
| Imported aggregates*[2] | 1,663,036 | 50 | 831,518 | 831,518 |
| Imported asphalt*[2] | 381,051 | 46 | 175,284 | 205,768 |
| Imported concrete*[1] | 738,641 | 22 | 162,501 | 576,140 |
| Imported bricks | 172 | 10 | 17 | 155 |
| Imported steel | 18,865 | 60 | 11,319 | 7,546 |
| Imported aluminium | 0.3 | 73 | 0.3 | 0.1 |
| Imported plastics | 1,671 | 10 | 167 | 1,504 |
| Imported geotextiles | 1,374 | 10 | 137 | 1,237 |
| Imported timber/wood | 13,128 | 20 | 2,626 | 10,502 |
| **Total (t) of all construction materials** | **12,040,660** | **N/A** | **10,031,939** | **2,008,722** |
| **Total (t) of all construction materials containing aggregates** | **5,009,287** | **N/A** | **3,022,797** | **1,986,490** |
| **Total (t) of all construction materials containing sand and gravel** | **742,313** | **N/A** | **163,309** | **579,004** |
| **Total (t) of all construction materials containing crushed rock** | **4,266,974** | **N/A** | **2,859,488** | **1,407,486** |

* Denotes aggregate materials or aggregate-containing materials. The further addition of [1] or [2] has been used to denote whether sand and gravel or crushed rock is likely to be the constituent aggregate source based on a review of aggregate end uses in British Geological Survey (2019) and MHCLG (2021b).

11.11.8 The choice of whether to use primary or secondary or recycled aggregates, or a combination of both, would ultimately be made by the Principal Contractor after considering a combination of factors, such as sources, specification, production, cost, carbon and transport of available materials.

11.11.9 By implementing good practice during construction, the proposed scheme could incorporate approximately 60% recycled aggregate content (by weight) (equating to approximately 3,022,797t). This excludes site-won earthworks materials which are not considered an imported aggregate for the purposes of the DMRB LA 110 assessment criteria.

11.11.10 While it is currently unknown what percentage of reused or recycled content will be included in imported aggregate materials, some degree of secondary/ recycled aggregate is anticipated given that this is standard practice in construction. The WRAP's (2009) Construction Procurement Guidance reports that recycled content as a percentage of the total material cost for infrastructure projects was in the region of 25–49% when applying cost-neutral good practice.

11.11.11 In the absence of a precise figure, it is therefore anticipated that the proposed scheme would incorporate reused and recycled aggregate at levels in line with, and not less than, the East of England regional percentage target of 31% in DMRB LA 110 (Highways England, 2019b). Reference to the Mineral Products Association's (2021) Profile of the UK Mineral Products Industry 2020 Edition also confirms that in 2020 the share of recycled and secondary aggregate materials as a proportion of total Great Britain aggregates sales was approximately 30%.

11.11.12 On this basis, it is considered that the proposed scheme would achieve levels of reused or recycled content in imported aggregates in line with the East of England regional percentage target of 31%. As reused and recycled content in imported aggregates is unlikely to be less than 31%, this would constitute a slight adverse, not significant effect according to DMRB LA 110 significance category descriptions and significance criteria (see Tables 11.9 and 11.10 respectively).

**Sterilisation of mineral safeguarding sites**

11.11.13 Any new permanent sterilisation is considered to be substantial by area in the context of the sand and gravel MSA and brick clay MSA in which the proposed scheme would be constructed (approximately 411ha and 2ha respectively). Of the 411ha of potentially impacted sand and gravel, the gas main diversion is likely to account for approximately 7ha of sterilisation. The brick clay MSA would not be impacted by the gas main diversion.

11.11.14 Should prior extraction of the mineral resources not be viable ahead of constructing the proposed scheme, this would represent a marginal loss (approximately 0.3% and 0.8% respectively) of the total safeguarded sand and gravel MSA (130,387ha) and brick clay MSA (197ha) in the county of Essex. However, MSAs are not considered to be mineral safeguarding sites, as per the definition provided in DMRB LA 110 (Highways England, 2019b), as the NPPF (MHCLG, 2021a) makes it clear that there is no presumption that resources defined in MSAs would be worked.

11.11.15 While the Order Limits intersect a number of MCAs (consultation buffer zones) around existing, allocated and safeguarded mineral sites, the proposed scheme would only intersect with the actual site boundaries of Bulls Lodge Quarry and Colemans Farm Quarry. The likely environmental effects on these sites are discussed below.

11.11.16 One of the haul roads for the proposed scheme would temporarily intersect the safeguarded site access for the operational mineral and waste infrastructure sites at Bulls Lodge Quarry. Given the minor and temporary nature of the proposed scheme at this location, it is considered unlikely that it would result in impacts to the safeguarded quarry infrastructure and allocations.

11.11.17 The new junction 22 (Colemans interchange) is proposed on land that is currently used for mineral extraction known as Colemans Farm Quarry. Brice Aggregates Limited has submitted a planning application to ECC (planning reference ESS/98/21/BTE). Part of that application is the Consultation Leaflet regarding Planning Applications at Colemans Farm Quarry (Brice Aggregates Limited, 2021), which confirms that the following embedded mitigation measures, relevant to this aspect of the Environmental Statement, would be put in place through varying quarry planning applications or within the DCO application, to mitigate any significant effects to the consented quarry operations caused by the construction of the proposed scheme:

- Establishing a new primary access into the quarry site from the realigned proposed scheme and/or its attendant connector roads into the site; and relocating the plant site and ancillary facilities currently in operation.
- Ensuring that the current void space within the Order Limits is restored, through the importation of inert waste, to enable the realignment and construction of the proposed scheme to proceed in a timely manner.
- Extracting any remaining minerals that are not sterilised by existing development within the Order Limits to ensure that these are not needlessly sterilised. Such an approach is consistent with national and local policy guidance.

11.11.18 The importation of inert waste materials is required, instead of using indigenous materials, to ensure that the parts of the quarry site within the Order Limits are restored to formation level in an accelerated timescale to facilitate the construction of the proposed scheme. For the remainder of the site outside the Order Limits, it should be noted that imported inert waste materials would also be required to offset the deficit in restoration material created as a direct result of the proposed scheme, which limits the quarry operator's ability to over dig the base of the site to win materials for use in site restoration.

11.11.19 Following this, quarrying is proposed to resume in the areas of the approved quarry site unaffected by the proposed scheme throughout the remaining consented life of the quarry operations through to 2034. Given the embedded mitigation measures at this location, it is considered unlikely that the proposed scheme would result in significant effects to the safeguarded quarry infrastructure and allocations as per the DMRB LA 110 significance criteria[14]. However, it should be noted that some of the above measures are subject to planning applications submitted by the quarry operator that are yet to be approved by ECC.

[14] Sterilisation is defined by DMRB LA 110 (Highways England, 2019b) to mean '*substantially constrain / prevent existing and potential future use and extraction of materials*'. In the absence of further information, this has been interpreted to mean that the proposed scheme would need to substantially sterilise one or more allocated mineral safeguarding sites (in their entirety), placing their future use at risk or rendering them inaccessible for current or future use, in order to realise likely significant effects.

11.11.20 Given the nature of the proposed scheme, it is also considered unlikely that the safeguarded minerals infrastructure and allocations would be indirectly (proximally) sterilised by the proposed scheme or vice versa (through noise, dust, odour, traffic, visual or light) that would prejudice the efficient operation of these sites in line with their extant planning permissions. Proximal sterilisation is more commonly associated with more sensitive land uses such as residential developments that could limit the operation of these sites.

11.11.21 Notwithstanding the above, any sterilisation impacts to MSAs (for sand and gravel, and brick clay) and MCAs for allocated and safeguarded mineral sites have been separately assessed as part of a Mineral Resource Assessment and Mineral Infrastructure Assessment, which have been prepared to accompany the Environmental Statement and DCO application in accordance with ECC requirements (see Appendix 11.1 and Appendix 11.2 of the Environmental Statement [TR010060/APP/6.3]).

11.11.22 The Mineral Resource Assessment has been prepared to establish the existence, or otherwise, of a mineral resource capable of having economic importance. The assessment has been used to establish the viability of the prior extraction of minerals such that the resource is not sterilised where this can be avoided. The Mineral Infrastructure Assessment has been produced to consider whether the proposed scheme would prejudice the continuing efficient operation of existing and allocated minerals infrastructure sites.

## Waste

### Generation and disposal of waste to landfill

11.11.23 The indicative quantities of C&D waste likely to be generated during the construction of the proposed scheme, including a 15% contingency to cover any unknown items, are estimated in Table 11.21.

11.11.24 Construction of the proposed scheme would also generate waste streams from offices, welfare facilities, material packaging, construction plant maintenance and miscellaneous hazardous wastes. The quantities are anticipated to be small compared to the main C&D waste streams summarised in Table 11.21, and have not been included given the limited quantities and difficulty in forecasting. It has also not been possible to quantify waste arisings from site tree and vegetation clearance works. Notwithstanding this, the vast majority of vegetative waste would be diverted from landfill given the UK's legislative targets requiring the progressive reduction in biodegradable waste being sent to landfill.

11.11.25 Waste arisings have been estimated through a number of methods, including reference to actual BoQ information provided by the Principal Contractor; and application of material-specific wastage rates, at good practice levels provided in WRAP's (2008) Net Waste Tool dataset, to the quantities reported in Table 11.20. For the purposes of assessment, all materials imported for temporary construction purposes are assumed to be discharged as waste after use. Wastage rates have not been applied to site-won earthworks materials given the availability of estimated earthworks waste quantities.

11.11.26 To evaluate potential recovery rates of the main C&D waste streams, against the significance category descriptors detailed in Table 11.9, indicative waste recovery rates have been established in Table 11.21 to determine the potential for waste to be diverted from landfill. These benchmarks have been selected through the application of professional judgement to the material-specific 'good practice' performance benchmarks provided in WRAP's (2007) Achieving Good Practice Waste Minimisation and Management guidance.

11.11.27 Given the age of this data, good practice benchmarks, as opposed to standard or best practice benchmarks, have been selected in order to provide a reasonable and realistic worst case assessment scenario in line with the benchmark definitions provided in Section 11.11 – Material assets, above. No good practice rate is specified for hazardous waste in WRAP (2007), so the standard rate has been used instead. The use of good practice benchmarks aligns with the implementation of those mitigation measures/targets identified in Section 11.10 of this chapter. These measures would be implemented to increase the quantity of waste reused, recycled or recovered on or offsite in accordance with the waste hierarchy, thereby reducing offsite disposal to landfill.

11.11.28 These benchmarks reflect the total percentage of a given material that is likely to be diverted from landfill on or offsite at good practice levels. While some degree of professional judgement has been used in assigning recovery rates to each material, a validatory review of the UK Statistics on Waste (Defra, 2022) and industry good practice landfill diversion rates from other infrastructure projects in the UK would suggest that these rates are likely to be achievable on the proposed scheme. If anything, these benchmarks are likely to provide a conservative estimate of proposed scheme performance, and it is likely that higher levels of waste recovery would be realised during the construction. This is especially the case for hazardous excavation and bituminous wastes.

11.11.29 Where surplus excavation materials that are geotechnically unsuitable for use as engineering fill are to be reused within the Order Limits, the recovery rate has been based on the actual earthworks design where all of the material is forecast to be suitable for use in onsite landscape areas and borrow pit restoration works. It was not considered appropriate to apply benchmarks to this reuse scenario when estimated earthworks waste quantities are available. However, benchmarks have been applied in instances where surplus excavation materials are classified as requiring offsite management.

**Table 11.21 Estimated C&D waste generation, recovery and disposal (2024 to 2027)**

| Waste stream | Indicative waste classification | Material quantity (t) | Good practice wastage rate (%) | Wastage (t) | Waste recovery rate (%) | Disposal to landfill (t) |
|---|---|---|---|---|---|---|
| **Demolition and excavation waste from temporary works (actual wastage)** | | | | | | |
| Excavation materials | Non-hazardous | 48,875 | N/A – actuals | 48,875 | 95 | 2,444 |
| Bituminous mixtures | Non-hazardous | 2,170 | N/A – actuals | 2,170 | 95 | 109 |
| Mixed metals | Non-hazardous | 1 | N/A – actuals | 1 | 100 | 0 |
| **Construction waste from temporary works (estimated wastage)** | | | | | | |
| Imported aggregates | Inert | 568,230 | 5 | 596,642 | 95 | 29,832 |
| Imported asphalt | Non-hazardous | 156,421 | 5 | 164,242 | 95 | 8,212 |
| Imported concrete | Inert | 3,671 | 2.5 | 3,763 | 95 | 188 |
| Imported steel | Non-hazardous | 3,081 | 2.5 | 3,158 | 100 | 0 |
| Imported plastics | Non-hazardous | 24 | 2 | 25 | 80 | 5 |
| Imported timber/ wood | Non-hazardous | 42 | 2.5 | 43 | 90 | 4 |
| **Demolition and excavation waste from permanent works (actual wastage)** | | | | | | |
| Excavated materials | Inert | 1,150,000 | N/A – actuals | N/A – non-waste | N/A – actuals | 0 |
| Excavated materials | Non-hazardous | 690,000 | N/A – actuals | N/A – non-waste | N/A – actuals | 0 |
| Excavated materials | Non-hazardous | 381,101 | N/A – actuals | 381,101 | 95 | 19,055 |
| Excavated materials | Hazardous | 39,100 | N/A – actuals | 39,100 | 50 | 19,550 |
| Bituminous mixtures | Non-hazardous | 15,682 | N/A – actuals | 15,682 | 95 | 784 |

| Waste stream | Indicative waste classification | Material quantity (t) | Good practice wastage rate (%) | Wastage (t) | Waste recovery rate (%) | Disposal to landfill (t) |
|---|---|---|---|---|---|---|
| Bituminous mixtures | Hazardous | 2,362 | N/A – actuals | 2,362 | 50 | 1,181 |
| Concrete, brick, tiles, ceramics | Inert | 24,237 | N/A – actuals | 24,237 | 95 | 1,212 |
| Mixed metals | Non-hazardous | 2,887 | N/A – actuals | 2,887 | 100 | 0 |
| Plastic | Non-hazardous | 30 | N/A – actuals | 30 | 80 | 6 |
| Wood/ timber | Non-hazardous | 414 | N/A – actuals | 414 | 90 | 41 |
| WEEE | Hazardous | 0.4 | N/A – actuals | 0.4 | 70 | 0.1 |
| Mixed C&D waste | Non-hazardous | 7,732 | N/A – actuals | 7,732 | 95 | 387 |
| **Construction waste from permanent works (estimated wastage)** | | | | | | |
| Imported general soil/topsoil | Inert | 3,236 | 5 | 162 | 95 | 8 |
| Imported inert waste | Inert | 1,495,000 | 5 | 74,750 | 95 | 3,738 |
| Imported aggregates | Inert | 1,663,036 | 5 | 83,152 | 95 | 4,158 |
| Imported general asphalt | Non-hazardous | 381,051 | 5 | 19,053 | 95 | 953 |
| Imported concrete | Inert | 738,641 | 2.5 | 18,466 | 95 | 923 |
| Imported bricks | Inert | 172 | 10 | 17 | 95 | 1 |
| Imported steel | Non-hazardous | 18,865 | 2.5 | 472 | 100 | 0 |
| Imported aluminium | Non-hazardous | 0.3 | 0 | 0 | 100 | 0 |

| Waste stream | Indicative waste classification | Material quantity (t) | Good practice wastage rate (%) | Wastage (t) | Waste recovery rate (%) | Disposal to landfill (t) |
|---|---|---|---|---|---|---|
| Imported plastics | Non-hazardous | 1,671 | 2 | 33 | 80 | 7 |
| Imported geotextiles | Non-hazardous | 1,374 | 2 | 27 | 80 | 5 |
| Imported timber/ wood | Non-hazardous | 13,128 | 2.5 | 328 | 90 | 33 |
| **Total (t) C&D wastes** | | **7,412,235** | **N/A** | **1,488,924** | **N/A** | **92,835** |
| **Total (t) inert C&D wastes** | | **5,646,223** | **N/A** | **801,189** | **N/A** | **40,059** |
| **Total (t) non-hazardous C&D wastes** | | **1,724,550** | **N/A** | **646,273** | **N/A** | **32,044** |
| **Total (t) hazardous C&D wastes** | | **41,462** | **N/A** | **41,462** | **N/A** | **20,731** |

11.11.30 The choice of how to manage surplus materials and waste would ultimately be made by the Principal Contractor in accordance with the waste hierarchy as a priority order. The Principal Contractor may depart from the priority order so as to achieve the best overall environmental outcome (e.g. for asbestos).

11.11.31 By implementing 'good practice' during construction, the proposed scheme could generate approximately 1,488,924t (or 372,231tpa) of C&D waste (54%, 43% and 3% of this likely to be classified as inert, non-hazardous and hazardous waste respectively), with approximately 1,396,089t (or 94%) of total C&D waste considered to be recoverable and therefore diverted from landfill.

11.11.32 This approach is consistent with the waste hierarchy and the objectives of minimising waste generation and maximising material reuse, recycling and recovery. It has been estimated that the proposed scheme therefore could achieve a total waste recovery rate of approximately 95% for non-hazardous C&D waste (against the mandatory DMRB LA 110 target of ensuring that 70% of non-hazardous C&D waste is diverted from landfill)[15].

11.11.33 The drawdown of inert and non-hazardous waste landfill void space as a result of constructing the proposed scheme would occur over a period of four years (2024 to 2027). It is estimated that 40,059t (10,015tpa) and 32,044t (8,011tpa) of inert and non-hazardous waste could require disposal at inert and non-hazardous landfills respectively within the study area between 2024 and 2027.

[15] Non-hazardous C&D waste includes waste classified as both inert and non-hazardous waste.

11.11.34 This would be equivalent to a less than 1% reduction in inert and non-hazardous waste landfill capacity void space in both the East of England region and Greater Essex sub-region according to the amount of average annual inert and non-hazardous landfill capacity projected to be available in the region (48,382,627tpa and 9,260,314tpa) and sub-region (11,708,717tpa and 4,530,303tpa) between 2024 and 2027. This could result in the following drawdown to future inert and non-hazardous landfill capacity:

- East of England region: 0.08% and 0.35% respectively
- Greater Essex sub-region: 0.34% and 0.71% respectively

11.11.35 On this basis, it is considered that there would likely be sufficient landfill capacity available in the region and sub-region to accept the forecast quantity of inert and non-hazardous waste for offsite disposal to landfill. As a greater than 1% reduction or alteration in regional inert and non-hazardous landfill capacity is unlikely to occur, this would constitute a slight adverse, not significant effect according to DMRB LA 110 significance category descriptions and significance criteria (see Tables 11.9 and 11.10 respectively).

11.11.36 As reported in Section 11.8 of this chapter, there is currently no hazardous waste landfill capacity within the East of England region nor is there likely to be any by the time the proposed scheme begins construction. It has therefore been estimated that the proposed scheme could dispose of 20,731t (5,183tpa) of hazardous waste to landfills outside of the study area. This is equivalent to approximately 22% (by weight) of the total C&D waste that is estimated to require disposal to landfill during the construction of the proposed scheme.

11.11.37 The DMRB LA 110 (Highways England, 2019b) specifies the disposal of 1-50% of project waste outside of the region as one of the significance category descriptions necessary for assigning a moderate adverse significant effect. However, DMRB LA 110 confirms that a project would also need to result in a greater than 1% reduction or alteration in landfill capacity within the study area for this to be realised. This is not the case for the proposed scheme, and therefore likely significant effects have not been assigned for the waste matter.

11.11.38 The management of any residual quantities of hazardous waste generated by the proposed scheme would therefore take place at hazardous waste landfill facilities that are designed to meet a national or regional need located outside the second study area. While it is likely that the levels of waste recovery would significantly exceed the 50% reported in WRAP (2007), it is uncertain as to whether the proposed scheme could achieve levels of waste recovery (~99%) that would be necessary to reduce the quantity of waste for disposal outside of the region to less than 1%.

**Impacts to safeguarded waste infrastructure and allocations**

11.11.39 While the Order Limits intersects a number of WCAs (consultation buffer zones) around existing, allocated and safeguarded waste sites, the construction of the proposed scheme would neither temporarily nor permanently intersect with the actual boundaries of any of these sites.

11.11.40 Given the locations of the safeguarded waste infrastructure sites (that is, within industrial estates and industrial parks) and the nature of the proposed scheme, it is considered unlikely that the safeguarded waste management infrastructure and allocations would be indirectly (proximally) sterilised by the proposed scheme or vice versa (through noise, dust, odour, traffic, visual or light) that would prejudice the efficient operation of these sites in line with their extant planning permissions. Proximal sterilisation is more commonly associated with more sensitive land uses such as residential developments that could limit the operation of these sites.

11.11.41 Notwithstanding this, any impacts to WCAs for allocated and safeguarded waste sites have been separately assessed as part of the Waste Infrastructure Assessment, which has been prepared to accompany the Environmental Statement and DCO application in accordance with ECC requirements (see Appendix 11.3 of the Environmental Statement [TR010060/APP/6.3]). The Waste Infrastructure Assessment has been prepared to consider whether the presence of the proposed scheme would prejudice the continuing efficient operation of existing and allocated waste infrastructure sites.

## Ancillary discussion

11.11.42 As discussed in Section 11.6 of this chapter, this sub-section provides a degree of regional and sub-regional ancillary discussion in response to ECC's Scoping Opinion (Planning Inspectorate, 2021) and statutory consultation feedback for this aspect.

11.11.43 However, as agreed with ECC during both the Scoping Opinion and statutory consultation responses, this does not form the central basis of the assessment of likely significant effects for this aspect, which has been undertaken in accordance with the DMRB LA 110 assessment standard.

### Material assets

11.11.44 The proposed scheme is likely to require 1,986,490t (or 496,622tpa) of primary aggregate materials, of which 29% and 71% is estimated to be sand and gravel, and crushed rock, respectively.

11.11.45 Average sales data provided by EEAWP (2021) and ECC (2021a) confirms that the East of England region and Greater Essex sub-region sold 11.20Mtpa and 3.23Mtpa of sand and gravel between 2018-2020 respectively.

11.11.46 The proposed scheme is therefore likely to have a small impact on regional and sub-regional sales of sand and gravel materials, with any corresponding uplift in sales likely to be approximately 1% and 4% per annum (144,751tpa) respectively across the four-year construction programme.

11.11.47 The MHCLG's (2021b) Aggregate Minerals Survey for England and Wales 2019 confirms that approximately 8.85Mt of crushed rock aggregates were imported into the East of England region in 2019. There are no hard-rock quarries in the Greater Essex sub-region, and it is therefore reliant on hard rock importation, with ECC (2020) reporting 1.58Mt imported in 2019.

11.11.48 Given the pattern of long-distance supply reported in Section 11.8 of this chapter, with Greater Essex exporting its sand and gravel while importing crushed rock, it is therefore assumed that the majority of crushed rock used on the proposed scheme would need to be imported from outside of the study area from areas including the East Midlands and South West of England.

11.11.49 A review of the East Midlands (2021) and South West (2021) Aggregates Working Party Annual Monitoring Reports confirms average three-year baseline sales of 27.80Mtpa and 24.32Mtpa respectively for these regions. The proposed scheme is therefore likely to have a small impact on regional sales of crushed rock materials, in these source regions, with the total corresponding uplift in sales likely to be approximately 1% per annum (351,872tpa) across the construction programme.

11.11.50 This ancillary discussion would suggest that the proposed scheme is likely to result in a negligible uplift to regional and sub-regional sales of primary aggregate materials. It is therefore considered unlikely that the construction of the proposed scheme would, in insolation, create a scenario where there is a significant increase in annual baseline sales of primary aggregate materials beyond 'business as usual'.

**Waste**

11.11.51 For comparative purposes, the proposed scheme's estimated annual C&D waste arisings would be equivalent to approximately 3% and 8% respectively of the total C&D waste recorded by the Environment Agency (2022a) as having been received at all waste management facilities in the East of England region (12.3Mt) and Greater Essex sub-region (4.8Mt) in 2020.

11.11.52 The 349,022tpa of total C&D waste estimated to be diverted from landfill would be equivalent to 4% and 11% respectively of the total C&D waste whose fate was recorded by the Environment Agency (2022a) as treatment, recovery, incineration, long term storage or other fates in the East of England region (8.2Mt) and Greater Essex sub-region (3.3Mt) in 2020.

11.11.53 The 10,015tpa and 8,011tpa of residual inert and non-hazardous C&D waste would be equivalent to 0.2% and 0.7% respectively of the total inert waste recorded by Environment Agency (2022a) as having being disposed of at landfill in the East of England region (5.0Mt) and Greater Essex sub-region (1.5Mt) in 2020; and equivalent to 0.2% and 0.4% respectively of the total non-hazardous waste recorded as having been disposed of at landfill in the East of England region (4.2Mt) and Greater Essex sub-region (1.8Mt) in 2020.

11.11.54 Specifically, this would be equivalent to 0.5% and 2.3% respectively of the total inert C&D waste recorded by Environment Agency (2022a) as having been disposed of at landfill in the East of England region (2.1Mt) and Greater Essex sub-region (0.4Mt) in 2020; and equivalent to 0.7% and 0.9% respectively of the total non-hazardous C&D waste recorded as having been disposed of at landfill in the East of England region (1.2Mt) and Greater Essex sub-region (0.8Mt) in 2020.

11.11.55 This ancillary discussion would indicate that the proposed scheme is likely to have a negligible bearing on regional and sub-regional waste recovery and disposal facilities. It is therefore considered unlikely that the construction of the proposed scheme would, in insolation, create a scenario where there is a significant increase in annual quantities of C&D waste managed at regional and sub-regional recovery and disposal sites that goes beyond 'business as usual'.

## Predicted residual effects

11.11.56 The likely significance of each residual effect is assessed in Table 11.22 after consideration of the proposed design and mitigation measures, in line with the methodology described in Section 11.5 of this chapter. All effects have been assessed as being **not significant** based on the application of the DMRB LA 110 significance criteria.

11.11.57 Where effects have been identified, these would be reduced where practicable by implementing the mitigation measures outlined in Section 11.10 of this chapter and by ensuring that the construction of the proposed scheme responds to the national regulatory or policy standards and local policy requirements relevant to this aspect as reported in Section 11.4 of this chapter.

11.11.58 Material resource efficiency would be implemented throughout the detailed design and construction of the proposed scheme. This would include implementing resource-efficient construction principles, adopting responsible sourcing practices, avoiding unnecessary sterilisation of mineral resources, managing waste in accordance with the waste hierarchy, preparing an SWMP and complying with all relevant legislation, policies and statutory guidance for materials and waste.

11.11.59 Site-won C&D materials arising from the construction of the proposed scheme would be reused, recycled and recovered on or offsite in accordance with the waste hierarchy (as described in Section 11.8 of this chapter), which would reduce the need for offsite disposal to landfill, and where practicable, construction materials would be responsibly sourced from local sources of supply with consideration for secondary and recycled content.

11.11.60 Given the nature of the DMRB LA 110 significance criteria, all residual effects are likely to be the same both pre- and post-mitigation. The baseline conditions reported in Section 11.8 of this chapter would suggest that a high degree of waste recovery, recycled aggregate content and landfill diversion is endemic throughout the UK construction sector, and that this is likely to occur irrespective of the statutory EIA process. Notwithstanding this, the assignment of appropriate mitigation measures ensures that the reported significance of effects would be achieved.

11.11.61 While the application of the measures provided in Section 11.10 of this chapter could reduce the impacts from the consumption of material assets and the production and disposal of waste to a certain but unspecified degree, it is unlikely that the proposed scheme would be able to deliver increased resource efficiency at levels necessary to meet the significance category descriptors for a neutral effect for the material assets and waste matters of this aspect.

**Table 11.22 Summary of likely effects after mitigation**

| Matter | Significant effect threshold | Description of potential effects from the proposed scheme | Mitigation measures | Mitigation mechanism | Resulting residual significance of effect category |
|---|---|---|---|---|---|
| **Material assets** | (1) Project achieves less than 70% overall material recovery or recycling (by weight) of non-hazardous C&D waste to substitute use of primary materials within the first or second study areas; and<br><br>(2) Aggregates imported to site comprise reused or recycled content below percentage target of 31%; and/or<br><br>(3) Project sterilises ≥1 mineral safeguarding site or peat resources. | The proposed scheme could divert an estimated 1,375,358t of non-hazardous C&D waste from landfill, which represents a waste recovery rate of 95%. The proposed scheme would adopt the DMRB LA 110 target of ensuring that at least 90% (by weight) of non-hazardous C&D waste be recovered or diverted from landfill. Materials would either be recovered within the Order Limits or within the wider East of England region to offset the use of primary construction materials and support a circular economy.<br><br>The proposed scheme could incorporate an estimated 3,022,797t of recycled aggregate (this excludes site-won earthworks materials which are not considered an imported aggregate for the purposes of the DMRB LA 110 assessment criteria), which equates to approximately 60% recycled aggregate content by weight. This data supports the assumption that reused or recycled aggregate content use on the proposed scheme is likely to be at least in line with the East of England regional percentage target of 31%.<br><br>The proposed scheme is unlikely to substantially constrain or prevent existing and potential future use and extraction of materials at one or more mineral safeguarding sites (operational sites or sites identified within strategic planning documents for the extraction of minerals). There are no peat resources (existing or potential peat extraction sites) within the proposed scheme extents. | • Implementing Design for Resource Efficient Construction Principles<br>• Producing an SPP<br>• Implementing an SWMP<br>• Reusing any incidentally extracted sand and gravel resources<br>• Undertaking pre-demolition assessments | • DCO requirements<br>• REAC, within the first iteration of the EMP [TR010060/APP/6.5]<br>• First iteration of the EMP (design stage) [TR010060/APP/6.5]<br>• Second iteration of the EMP (construction stage)<br>• Third iteration of the EMP (end of construction stage) | (1) The proposed scheme is likely to achieve 70–99% overall material recovery or recycling (by weight) of non-hazardous C&D waste to substitute use of primary materials in the first or second study areas.<br><br>(2) The aggregates imported to site would likely comprise reused or recycled content in line with the relevant regional percentage target of 31% where available.<br><br>(3) The proposed scheme is unlikely to substantially sterilise one or more mineral safeguarding sites, placing their future use at risk or rendering them inaccessible for current or future use.<br><br>Likely significance of effect: **Slight adverse – not significant** |
| **Waste** | (1) Project leads to a greater than 1% reduction or alteration in regional landfill capacity; and<br><br>(2) 1–50% of project waste requiring disposal outside of the region. | The proposed scheme could dispose of an estimated 40,059t and 32,044t respectively of inert and non-hazardous C&D waste at inert and non-hazardous landfills within the study area between 2024 and 2027 based on the application of good practice waste recovery benchmarks. This would be equivalent to a less than 1% reduction in inert and non-hazardous waste landfill capacity void space in the East of England region according to the amount of average annual inert (48,382,627tpa) and non-hazardous (9,260,314tpa) landfill capacity projected to be available in the region.<br><br>The proposed scheme could dispose of an estimated 20,731t of hazardous C&D waste to landfills outside the East of England region. This is equivalent to approximately 23% (by weight) of the total C&D waste that is estimated to require disposal to landfill in constructing the proposed scheme. Notwithstanding, this criterion would only be relevant in the assigning of likely significant effects if the proposed scheme were also to result in a greater than 1% reduction or alteration in landfill capacity within the study area. Based on the linked waste criterion above, this is unlikely to be realised. | • Implementing Design for Resource Efficient Construction Principles<br>• Producing an SPP<br>• Implementing an SWMP<br>• Complying with waste duty of care requirements<br>• Obtaining and complying with all waste authorisation<br>• Ensuring that waste is managed with consideration of the proximity principle, self-sufficiency principle and value for money principle<br>• Reusing any incidentally extracted sand and gravel resources<br>• Undertaking pre-demolition assessments | • DCO requirements<br>• REAC, within the first iteration of the EMP [TR010060/APP/6.5]<br>• First iteration of the EMP (design stage) [TR010060/APP/6.5]<br>• Second iteration of the EMP (construction stage)<br>• Third iteration of the EMP (end of construction stage) | (1) The proposed scheme would lead to a less than 1% reduction or alteration in regional landfill capacity.<br><br>(2) The proposed scheme would dispose of <1% of scheme waste outside of the region.<br><br>Likely significance of effect: **Slight adverse – not significant** |

## 11.12 Monitoring

11.12.1 As reported in Section 11.11 of this chapter, all environmental effects have been assessed as being not significant after consideration of the proposed design and mitigation measures, in line with the methodology described in Section 11.5 of this chapter.

11.12.2 The design and mitigation measures to be implemented in constructing the proposed scheme, identified in Section 11.10 of this chapter, would be secured, delivered and maintained through contractual responsibilities between National Highways and its Principal Contractor.

11.12.3 These measures have been captured in the first iteration of the EMP and REAC [TR010060/APP/6.5] that has been prepared for the proposed scheme in accordance with the requirements of DMRB LA 120 Environmental Management Plans (Highways England, 2020b).

11.12.4 The DMRB LA 120 provides a framework to manage the environmental effects of projects to demonstrate compliance with environmental legislation, by providing a plan for the delivery of projects' design, mitigation, enhancement and monitoring commitments.

11.12.5 While all residual environmental effects have been assessed as being not significant, these commitments would be nonetheless implemented, measured and monitored, during construction of the proposed scheme, using a variety of standard sector practices including, for example:

- *For material assets*: the SPP, including materials procurement register, invoices, certification records and as-built records
- *For waste generation and disposal*: the SWMP, including site weighbridge records where required, waste transfer notes (for non-hazardous waste) and waste consignment notes (for hazardous waste)

11.12.6 The Principal Contractor would undertake regular audits and inspections of material procurement and waste management activities to ensure compliance with the requirements of this aspect, statutory controls and other proposed scheme policies and procedures relevant to material assets and wastes.

11.12.7 Specifically, the Principal Contractor would identify, measure and record the types, quantities and provenance of all materials used in constructing the proposed scheme in a materials procurement register (or equivalent).

11.12.8 Conversely, the Principal Contractor would also identify, measure and record the types, quantities and fate of all waste generated during construction in the SWMP, including all relevant statutory waste duty of care information.

11.12.9 In accordance with DMRB LA 104 (Highways England, 2020a) and DMRB LA 110 (Highways England, 2019b), the results of this monitoring would be used to update the second and third iterations of the EMP during the construction and handover stage.

## 11.13 Summary

11.13.1 The assessment has concluded that the impacts on material assets and waste of constructing the proposed scheme are likely to remain at a slight adverse effect level after the application of standard and additional mitigation measures outlined in Section 11.10 of this chapter. Based on the DMRB LA 110 significance criteria, this would result in **not-significant effects**, that is effects that are not material in the decision-making process.

11.13.2 Overall, the design and assessment of the proposed scheme has had regard to, and is compliant with, the NNNPS, EN-1 and EN-4 objectives for this aspect. Subject to appropriate mitigation measures to promote and increase resource efficiency during the construction of the proposed scheme, it is assessed that the proposed scheme adheres to the NNNPS, EN-1 and EN-4 requirements relevant to material assets and waste as reported in Section 11.4 of this chapter.

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