

A46 Newark Bypass

Scheme Number: TR010065

6.1 Environmental Statement
Chapter 10 Material Assets and Waste

APFP Regulation 5(2)(a)

Planning Act 2008

**Infrastructure Planning (Applications: Pre-
scribed Forms and Procedures) Regulations
2009**

February 2025

Volume 6

Infrastructure Planning

Planning Act 2008

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

The A46 Newark Bypass
Development Consent Order 202[#]

6.1 Environmental Statement Chapter 10 Material Assets and
Waste

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10 Material assets and waste

10.1 Introduction

- 10.1.1 This Chapter presents the information required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) to be provided in the Environmental Statement (ES) to enable the identification and assessment of likely significant effects on the use of primary, secondary, recycled, and manufactured materials, and the generation and management of waste.
- 10.1.2 The Scheme has the potential to cause both adverse and beneficial effects. This Chapter encompasses two sub-topics:
- Materials use, which is concerned principally with resource availability, and efficient use of materials within the Scheme.
 - Waste management, which is concerned with waste arising from the Scheme, and appropriate waste management of the waste streams arising from the Scheme. This includes managing waste higher up in the waste hierarchy and incorporating circular economy principles, whenever technically appropriate and economically feasible.
- 10.1.3 This assessment considers the construction phase effects and has been prepared in accordance with the Design Manual for Roads and Bridges (DMRB) LA110 for Material Assets and Waste.¹
- 10.1.4 This Chapter has been undertaken in compliance with the Planning Inspectorate's EIA Scoping Opinion [APP-198]. Appendix 4.1 (Scoping Opinion Schedule of Comments and Responses) of the ES Appendices [APP-125] contains further information on how each of the matters raised in the EIA Scoping Opinion have been addressed.
- 10.1.5 Chapter 2 (The Scheme) of this ES contains a detailed description of the Scheme. The drawings referenced in this Chapter can be found in the ES Figures [contained within Volume 6.2 of the ES], and the technical appendices referred to in this Chapter are presented in the ES Appendices [contained within Volume 6.3 of the ES].

10.2 Competent expert evidence

- 10.2.1 The competent expert is a Senior Waste and Resource Management Consultant, who is a Full and Chartered Member of the Chartered Institution of Wastes Management and has five years of experience in preparing material assets and waste chapters to support ESs. A

¹ Highways England (2019) Design Manual for Roads and Bridges, LA 110 – Materials assets and waste [online] available at: [LA 110 Material assets and waste-web](#) (Last accessed December 2023).

Chartered Institution of Wastes Management Full and Chartered Member and Senior Associate, of the Waste and Resource Management team, with over 20 years of experience in producing material assets and waste chapters has undertaken the technical approval of this Chapter.

10.3 Legislative and policy framework

- 10.3.1 The principal legislation and planning context for the assessment of the environmental effects of the Scheme on material assets and waste is presented below. The relevant legislation and policies listed below have been taken account of in the assessment.

European Legislation

- 10.3.2 The overarching European Directives that are applicable to the assessment of material assets use and waste generation are set out below. Whilst it is acknowledged that the UK has left the European Union (EU) it should be noted that existing legislation which transpose these Directives remains in force.

Waste Framework Directive (2008/98/EC)²

- 10.3.3 The Waste Framework Directive sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling and recovery. It defines when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products. The Waste Framework Directive lays down some basic waste management principles: it requires that waste is managed without endangering human health and harming the environment, and in particular, without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours, and without adversely affecting the countryside or places of special interest.
- 10.3.4 The Waste Framework Directive sets out a five-step waste hierarchy as to how waste should be managed which applies to anyone who produces or manages waste. The waste hierarchy requires that waste is dealt with in the following order of priority:
- Prevention
 - Preparing for reuse
 - Recycling
 - Other recovery (for example energy recovery)
 - Disposal, only as a last resort

² Waste Framework Directive (2008/98/EC) [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098> (Last accessed December 2023).

10.3.5 The following considerations must be taken into account:

- Environmental protection principles of precaution and sustainability
- Proximity principle for treatment and disposal of waste to be as close to its source as possible
- Technical feasibility and economic viability
- Protection of resources
- The overall environmental, human health, economic and social impacts

10.3.6 The Waste Framework Directive stipulates the requirement for Member States to reuse, recycle or recover a minimum of 70 percent of non-hazardous construction and demolition (C&D) waste by weight by 2020 and beyond.

10.3.7 The assessment in this Chapter has taken into account the waste hierarchy and the target for non-hazardous waste recovery, as well as considerations that are outlined in paragraph 10.3.5.

Landfill Directive (1999/31/EC)³

10.3.8 The Landfill Directive aims to prevent, or reduce as far as possible, negative effects on the environment from the landfilling of waste.

10.3.9 This assessment has considered disposal to landfill as the last option for waste management, prioritising the higher up options of the waste hierarchy.

Hazardous Waste Directive (91/689/EEC)⁴

10.3.10 This Directive lays down strict controls and requirements for controlling hazardous wastes. Hazardous waste is any waste with hazardous properties that may make it harmful to human health and the environment and is defined by the European Waste Catalogue.

10.3.11 This Directive has been considered in this Chapter in the event that hazardous waste arises from the Scheme's activities. In which case, the waste management will adhere to the controls and requirements of hazardous waste.

National legislation

The Environment Act 2021⁵

10.3.12 The Environment Act makes provision about plans and policies for improving the natural environment; for statements and reports about

³ Landfill Directive (1999/31/EC) [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31999L0031> (Last accessed December 2023).

⁴ Hazardous Waste Directive (91/689/EEC) [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01991L0689-20081212&from=EN> (Last accessed December 2023).

⁵ Her Majesty's Government (2021) The Environment Act 2021 [online]. Available at: [Environment Act 2021 \(legislation.gov.uk\)](https://legislation.gov.uk) (Last accessed December 2023).

environmental protection; for the Office for Environmental Protection; about waste and resource efficiency; about air quality; for the recall of products that fail to meet environmental standards; about water; about nature and biodiversity; for conservation covenants; about the regulation of chemicals; and for connected purposes. The Environment Act contains several provisions in Part 3 relating to waste which include:

- Producer responsibility obligations
- Producer responsibility for disposal cost
- Managing waste by separation of waste for domestic collection
- Managing hazardous waste
- Electronic waste tracking

10.3.13 Targets related to waste management as outlined in The Environment Act 2021 and implemented through the Environmental Targets (Residual Waste) (England) Regulations 2023/92 are unlikely to be applicable to the Scheme. The residual waste target is related to minimising waste generated per capita, and most of the construction and demolition waste types are excluded under paragraph 3 of Schedule 1 of the regulation, while recyclable C&D materials such as wood, glass, plastic and metals are included.

10.3.14 The long-term target related to waste refers to residual waste per capita being less than 287 kilograms per capita by the end of 2042. Mitigation plans in place for the Scheme will ensure that generation of residual waste is minimised throughout its construction period from 2025 to 2028. As operational waste has been scoped out, the residual waste is unlikely to be generated in 2042. The assessment has adhered to the plans and requirements of the Environment Act 2021, including separation of recyclable waste from residual waste, implementation of waste hierarchy and circular economy principles to manage waste as higher up in the waste hierarchy as technically and economically feasible, appropriate control and reporting of waste generated at the Scheme, and appropriate management of hazardous waste (if any arises).

The Environmental Protection Act 1990 (as amended)⁶

10.3.15 The Environmental Protection Act (EPA 1990) defines the fundamental structure and authority for waste management and control of emissions into the environment. It legislates for:

- The meaning of waste
- The requirements of the duty of care in respect of waste and transferral of waste to any person who imports, produces, carries, keeps, treats or disposes of waste

⁶ Her Majesty's Government (1990) Environmental Protection Act 1990 [online]. Available at: [Environmental Protection Act 1990 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/1990/61/contents/enacted) (Last accessed December 2023).

- A prohibition to any person on the unauthorised or harmful depositing, treatment, or disposal of waste on land
- Waste collection and waste disposal authorities and their roles

10.3.16 The assessment in this Chapter has considered the EPA 1990 definition of waste and the Act's requirements relating to the duty of care for the waste arising from the construction of the Scheme.

European Union (Withdrawal) Act 2018⁷

10.3.17 The European Union (Withdrawal) Act (the EU (Withdrawal) Act) introduces the concept of retained EU law. The EU (Withdrawal) Act ensures that the whole body of existing EU environmental law continues to have effect in UK law. Essentially any EU regulation or decision addressed to the UK in operation before the date of exit from EU will remain a part of the UK law. This includes the Landfill Directive and the Hazardous Waste Directive.

Waste (Circular Economy) (Amendment) Regulations 2020⁸

10.3.18 The Waste (Circular Economy) Regulations specify details on waste prevention programmes, waste management plans and the duties of waste producers and operators in relation to waste management and improved use of waste as a resource. English and Welsh law was updated on 1 October 2020 to include changes to the Waste Framework Directive (WFD) made in 2018. This was applied through the Waste (Circular Economy) (Amendment) Regulations 2020.

10.3.19 The assessment includes measures to minimise waste arisings and to manage the waste appropriately and efficiently, therefore, these Regulations are applicable to the Scheme.

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020⁹

10.3.20 These regulations were laid before Parliament on 16 December 2020 and are made in exercise of powers in section 8(1) of the European Union (Withdrawal) Act 2018 in order to ensure that the waste and environmental permitting regimes continue to operate effectively as of the 1 January 2021.

⁷ Her Majesty's Government (2018) European Union (Withdrawal) Act 2018 [online]. Available at: [European Union \(Withdrawal\) Act 2018 \(legislation.gov.uk\)](https://legislation.gov.uk/ukpga/2018/16/contents) (Last accessed December 2023).

⁸ Her Majesty's Government (2020) The Waste (Circular Economy) (Amendment) Regulations 2020 [online]. Available at: [Legislation.gov.uk](https://legislation.gov.uk/uksi/2020/1000/contents/made) (Last accessed December 2023).

⁹ Her Majesty's Government (2020) The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 [online]. Available at [The Waste and Environmental Permitting etc. \(Legislative Functions and Amendment etc.\) \(EU Exit\) Regulations 2020 \(legislation.gov.uk\)](https://legislation.gov.uk/uksi/2020/1000/contents/made) (Last accessed December 2023).

The Waste (England and Wales) Regulations (2011) as amended¹⁰

- 10.3.21 The Waste Regulations transpose the Waste Framework Directive in England and Wales. They make provision for waste prevention programmes and impose duties on an establishment which produces, collects, transports, recovers or disposes of waste, in relation to the improved use of waste as a resource, including the application of the waste hierarchy. Site Waste Management Plans (SWMPs) are no longer mandatory for projects commencing after 1 December 2013.¹¹ They are, however, recommended and the principles behind the regulations remain best practice.
- 10.3.22 An Outline Site Waste Management Plan (OSWMP) has been produced and is contained within Appendix B of the First Iteration Environmental Management Plan (EMP) **[REP4-010]** and would be developed into a full SWMP by the Principal Contractor prior to construction. This assessment together with the Outline SWMP takes into account the waste hierarchy. Waste management options would be as high up in the waste hierarchy as is technically and economically feasible.

The Hazardous Waste (England and Wales) Regulations (2005) as amended¹²

- 10.3.23 The Hazardous Waste Regulations provide for the control of hazardous wastes and their movements. A consignment note is required prior to the removal of any hazardous waste. Hazardous waste is waste that exhibits certain properties (for example, it is potentially flammable, toxic or carcinogenic) such that it is or may (at or above certain concentrations) be detrimental to human health or the environment.
- 10.3.24 These Regulations have been considered in this assessment in the event that hazardous waste arises from the Scheme's activities. In which case, the waste management would adhere to appropriate controls and requirements for hazardous waste management.

The Environmental Permitting (England and Wales) Regulations (2016), as amended¹³

- 10.3.25 The Environmental Permitting Regulations introduce a streamlined system of environmental permitting in England and Wales for certain installations, waste operations and mobile plants. It is an offence to operate a regulated facility except under and in accordance with an

¹⁰ Her Majesty's Government (2011) The Waste (England and Wales) Regulations 2011, No.988 [online]. Available at: <https://www.legislation.gov.uk/ukksi/2011/988/contents> (Last accessed December 2023).

¹¹ Department for Environment, Food and Rural Affairs (2008) non-statutory guidance for site waste management plans [online] Available at: <https://www.ihsti.com/CIS/document/267008> (Last accessed December 2023).

¹² Her Majesty's Government (2005) The Hazardous Waste (England and Wales) Regulations 2005, No. 894 [online]. Available at: <https://www.legislation.gov.uk/ukksi/2005/894/contents/made> (Last accessed December 2023).

¹³ Her Majesty's Government (2016) The Environmental Permitting (England and Wales) Regulations 2016 No. 1154 [online]. Available at: <https://www.legislation.gov.uk/ukksi/2016/1154/contents/made> (Last accessed December 2023).

environmental permit. Permits are required for certain activities involving the storage, treatment, use or disposal of waste. Waste would be managed in appropriate and permitted facilities, and the Scheme's activities would adhere to these Regulations, if required, for waste storage, use or disposal.

Waste Electrical and Electronic Equipment (England and Wales) Regulations, 2013¹⁴

10.3.26 The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 apply to all electrical and electronic equipment placed on the market in the UK covered by the scope of the regulations. There are 10 broad categories of WEEE currently outlined within the Regulations (see Schedules 1 and 2 of the Regulations). Relevant categories for the Scheme are:

- Lighting equipment, for example straight and compact fluorescent tubes and high intensity discharge lamps
- Electrical and electronic tools, for example drills, saws and electric lawnmowers
- Monitoring and control equipment, for example smoke detectors, thermostats, heating regulators

10.3.27 The Scheme is required to adhere to these Regulations in the event that WEEE arises from the Scheme construction activities.

Controlled Waste (England and Wales) Regulations 2012 (SI 2012/811)¹⁵

10.3.28 The Controlled Waste (England and Wales) Regulations 2012 (Controlled Waste Regulations) came into force in April 2012, replacing the Controlled Waste Regulations 1992. They define household, industrial and commercial waste for environmental permitting purposes. The Controlled Waste Regulations replaced Schedule 1 of the 1992 regulations with an updated schedule defining household waste, still by reference to its origin, but introducing some exceptions.

10.3.29 The Controlled Waste Regulations also specify that waste from construction or demolition works, including preparatory works, should be *"treated as household waste for the purposes of section 34(2) and (2A) of the EPA 1990 only (disapplication of section 34(1) and duty on the occupier of domestic property to transfer household waste only to an authorised person or for authorised transport purposes)"*.

¹⁴ Her Majesty's Government (2013) Waste Electrical and Electronic Equipment (WEEE) (England and Wales) Regulations, 2013 [online]. Available at: <https://www.legislation.gov.uk/ukSI/2013/3113/made> (Last accessed December 2023).

¹⁵ Her Majesty's Government (2012) Controlled Waste (England and Wales) Regulations 2012 [online]. Available at: www.legislation.gov.uk/ukSI/2012/811/contents/made (Last accessed December 2023).

10.3.30 These Regulations are applicable to the Scheme to ensure waste arising from works would be managed by permitted facilities and would be collected/transferred by permitted waste carriers.

National policy

National Policy Statement for National Networks, 2014¹⁶

- 10.3.31 The National Policy Statement for National Networks (NPSNN) sets out the policy which the Scheme should comply with. It is also the basis for informing a judgement on the impacts of a Scheme, for example whether the Scheme is consistent with the needs of the NPSNN. Compliance of the Scheme with the NPSNN is detailed within the NPSNN Accordance Tables [AS-090].
- 10.3.32 A draft NPSNN was published for consultation in March 2023. The consultation period ended in June 2023. The draft NPSNN may be subject to change following the consultation and once published in its designated form. Although this is currently in draft it may still be an important consideration for the Secretary of State when determining whether to consent the DCO for this Scheme, accordingly the Draft NPSNN Accordance Tables [APP-192] summarise compliance of the Scheme with the draft NPSNN.
- 10.3.33 The policies of relevance to material assets and waste within the NPSNN and detail on how they have been addressed in the assessment are provided below:
- Paragraph 5.39: States Government policy on hazardous and non-hazardous waste and its intention to protect human health and the environment by reducing waste production and using waste as a resource wherever possible. Where this is not possible, waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health.
 - Paragraph 5.40: Sustainable waste management should be implemented through using the waste hierarchy (see paragraph 10.3.4 above), focusing on preventing waste as a priority and using disposal methods as a last resort.
 - Paragraph 5.41: Processes should be in place to meet all relevant permit requirements to properly manage hazardous and non-hazardous waste arisings.
 - Paragraph 5.42: Arrangements should be made for managing any waste produced by a development with the aim of seeking to minimise the volume of waste produced and the volume of waste disposed of unless it can be demonstrated that the alternative is the best overall environmental outcome.

¹⁶ Department for Transport (2014) National Policy Statement for National Networks [online]. Available at [National Policy Statement for National Networks \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/270441/national-policy-statement-for-national-networks.pdf) (Last accessed December 2023).

- Paragraph 5.43: Effective processes and waste management of non-hazardous and hazardous waste must be established to manage waste arising from the construction and operation of a proposed development, including ensuring waste is managed both on and off-site, assessing waste infrastructure for sufficient facilities and taking steps to reduce volumes of waste produced and waste sent to disposal facilities.
 - Paragraph 5.44: Where required, any requirements or planning obligations should be abided by in regard to implementing appropriate measures of the management of waste.
- 10.3.34 Paragraph 5.45: All waste sent to an external facility for recovery or disposal must be compliant with Environment Agency permitting requirements. The Scheme would manage the potential inert, non-hazardous and hazardous waste arisings appropriately and in compliance with national legislation. The Scheme would ensure effective waste management and would minimise any risk of damaging the environment or human health. Therefore, NPSNN policies will be considered throughout the waste generation and management assessment.

National Planning Policy Framework, 2023¹⁷

- 10.3.35 The National Planning Policy Framework (NPPF) (December 2023) sets out the Government's planning policy framework for the whole of England, including the Government's expectation for content and quality of planning applications and local plan policy. The overall strategic aims of the NPSNN and NPPF are consistent. The NPPF may be an important and relevant matter but does not form the basis for a decision on an NSIP.
- 10.3.36 The NPPF sets out policies for development and how these should be implemented but makes specific reference to the Government's policy for sustainable use of minerals and waste. Paragraphs 4, 8c) and 20b) are relevant to waste management whilst paragraphs 215 to 220 are relevant to minerals.
- 10.3.37 The NPPF includes relevant policies to material assets assessment, including the definition of Mineral Safeguarding Areas (MSA), the importance of the use of secondary and recycled materials and minerals, to maintain minerals landbanks and to minimise waste generation.

¹⁷ Department for Levelling Up, Housing & Communities (December 2023). National Planning Policy Framework [online] available at: [National Planning Policy Framework \(publishing.service.gov.uk\)](https://publishing.service.gov.uk) (last accessed March 2024).

National Planning Policy for Waste 2014¹⁸

- 10.3.38 The National Planning Policy for Waste sets out detailed waste planning policies and maintains the core principles of the ‘plan led’ approach with a continued focus of moving waste up the waste hierarchy.
- 10.3.39 The document sets out detailed waste planning policies to facilitate a more sustainable and efficient approach to resource use and management. When determining planning applications for non-waste development, the policy requires that local planning authorities should, to the extent appropriate to their responsibilities, ensure that:
- The likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prevent the implementation of the waste hierarchy and/or the efficient operation of such facilities.
 - New, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape.
 - The handling of waste arising from the operation of developments maximises reuse/recovery opportunities and minimises off-site disposal.
- 10.3.40 The Scheme includes measures to reuse and recover waste and, therefore, to minimise potential impacts on waste management facilities. Waste is anticipated to be managed as high up in the waste hierarchy as economically and technically feasible.

The Waste Management Plan for England, 2021¹⁹

- 10.3.41 The Department for Environment, Food & Rural Affairs (Defra) published the latest Waste Management Plan for England in January 2021, superseding the 2013 version.²⁰ The plan provides an overview of waste management in England. It outlines the waste hierarchy as a guide to sustainable waste management and sets out the Government’s ambition to work towards a more sustainable and efficient approach to resource use and management. Positive planning plays a pivotal role in delivering England’s waste ambitions through ensuring the reuse, recovery or disposal of waste is undertaken without endangering human health or harming the

¹⁸ Department for Communities and Local Government (2014), National Planning Policy for Waste. [online]. Available at: https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/364759/141015_National_Planning_Policy_for_Waste.pdf (Last accessed December 2023).

¹⁹ Department for Environment Food & Rural Affairs (2021) Waste Management Plan for England [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/101111/Waste_Management_Plan_for_England.pdf (Last accessed December 2023).

²⁰ Department for Environment Food & Rural Affairs (2013) Waste Management Plan for England. [online] Available at: https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/265810/pb14100-waste-management-plan-20131213.pdf (Last accessed December 2023).

environment and delivering sustainable development and resource efficiency through all Schemes.

- 10.3.42 The assessment considers the waste hierarchy and planification to reuse and/or recover material within the Scheme, when technically and economically feasible.

Waste Prevention Programme for England – 2023²¹

- 10.3.43 The key goals for the Waste Prevention Programme includes:

- Designing out waste
- System and services to include collection and take-back services, encouraging reuse, repair, leasing business and facilities
- Data and information including materials databases, product passport and voluntary corporate reporting

- 10.3.44 The assessment considers the circular economy principles to be incorporated into the Scheme, when technically and economically feasible.

Our Waste, Our Resources: A Strategy for England, 2018²²

- 10.3.45 The strategy complements and helps deliver the 25-Year Plan²⁵, the Clean Growth Strategy²³, and the Litter Strategy²⁴. It is guided by two overarching objectives, which have been taken into the account for this assessment:

- To maximise the value of resource use
- To minimise waste and its impact on the environment

- 10.3.46 The strategy features the Government's approach to sustainable production, consumer participation, recovering resources, and managing waste, waste crime, food waste, international leadership, research and innovation, and monitoring and evaluation of the strategy.

- 10.3.47 The strategy will be delivered through policies, actions and commitments, and it will contribute to the delivery of the following strategic ambitions:

- Working towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025
- Eliminating food waste to landfill by 2030

²¹ Department for Environment, Food & Rural Affairs (2023) Waste Prevention Programme for England – Maximising Resources Minimising Waste. [online] Available at: [The waste prevention programme for England: Maximising Resources, Minimising Waste - GOV.UK](#) (Last accessed January 2025).

²² Department for Environment Food and Rural Affairs (2019) Resources and waste strategy: at a glance [online]. Available at: [Resources and waste strategy: at a glance - GOV.UK \(www.gov.uk\)](#) (Last accessed December 2023).

²³ Her Majesty's Government (2017) The Clean Growth Strategy: Leading the way to a low carbon future [online]. Available at [Clean Growth Strategy - GOV.UK \(www.gov.uk\)](#) (Last accessed December 2023).

²⁴ Department for Environment Food and Rural Affairs (2017) Litter Strategy for England [online]. Available at [Litter Strategy for England - GOV.UK \(www.gov.uk\)](#) (Last accessed December 2023).

- Zero avoidable plastic waste by 2042
- Doubling of resource productivity by 2050
- Zero avoidable waste by 2050

A Green Future: Our 25-Year Plan to Improve the Environment²⁵

- 10.3.48 The Government's 25-Year Environment Plan sets out Government action to help the natural world regain and retain good health. The proposals aim to tackle a number of growing problems including waste. It aims to champion sustainable development, lead in environmental science, innovate to achieve clean growth and increase resource efficiency to provide benefits to both our environment and economy. In doing so, the 25-Year Environment Plan has identified six key areas on which to focus action. The policy area relevant to the assessment of waste and material assets is set out in Chapter 4 of the Plan on increasing resource efficiency and reducing pollution and waste.
- 10.3.49 A number of goals and targets are set out in the Plan. These include the aim of minimising waste, reusing materials as much as possible, and managing materials at the end of their life to minimise the impact on the environment. This is intended to be done by:
- Working towards the ambition of zero avoidable waste by 2050
 - Working to a target of eliminating avoidable plastic waste by the end of 2042
 - Meeting all existing waste targets – including those on landfill, reuse and recycling – and developing ambitious new future targets and milestones
 - Seeking to eliminate waste crime and illegal waste sites over the lifetime of the plan, prioritising those of highest risk. Delivering a substantial reduction in litter and littering behaviour
 - Substantially reducing and, where possible, preventing all kinds of marine plastic pollution – in particular material that came originally from land
- 10.3.50 The approach of the Scheme aims minimise waste and reuse materials as much as possible, and disposal of waste to landfill would be considered as the last resort for waste management.

Environmental Improvement Plan 2023²⁶

- 10.3.51 This sets out plans to achieve the 10 goals specified in the 25YEP. For goal five, to maximise our resources and minimise our waste, plans are in place to improve our use of resources.

²⁵ Her Majesty's Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment [online]. Available at: [25 Year Environment Plan - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/721412/25-Year-Environment-Plan.pdf) (Last accessed December 2023).

²⁶ Her Majesty's Government (2023) Environmental Improvement Plan 2023 [online]. Available at: [Environmental Improvement Plan 2023 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/121412/Environmental-Improvement-Plan-2023.pdf). (Last accessed December 2023).

- 10.3.52 The assessment in this Chapter takes into account measures to ensure an efficient use of resources and to minimise waste arisings.

Net Zero Strategy: Build Back Greener 2021²⁷

- 10.3.53 The strategy sets out a plan for the decarbonisation path to be net zero by 2050. It highlights the reduction of waste sent to landfill for disposal, particularly biodegradable waste, as well as the importance of an efficient and sustainable use of resources.
- 10.3.54 The assessment in this Chapter assumes that green waste likely to arise from the Scheme would be reused within the Scheme activities, where technically appropriate and economically feasible. Where it is not possible to reuse green waste arisings, these would be diverted from landfill (for example through composting). The assessment considers that disposal of waste to landfill is the least preferred option for waste management.

The Clean Growth Strategy 2017²³

- 10.3.55 The Clean Growth Strategy 2017 highlights the relevance to work towards the zero avoidable waste by 2050, maximising the value we extract from our resources, and minimising the negative environmental and carbon impacts associated with their extraction, use and disposal.
- 10.3.56 The assessment in this Chapter takes into account measures for an efficient use of materials aiming to minimise waste arisings from the Scheme's activities. Waste management would be as high up in the waste hierarchy as technically and economically feasible.

Local policy

- 10.3.57 The local planning framework comprises a number of documents that form the statutory development plans for the local planning authority area in which the Scheme is located. The relevant planning policies relating to resources and waste are summarised in Table 10-1. These policies have been considered in the assessment of likely significant effects for material assets and waste generation and management.

Table 10-1: Summary of current local policies

Policy number	Title	Policy summary
	Nottinghamshire and Nottingham Local Aggregates Assessment (containing 2022 sales data), published 2023 ²⁸	

²⁷ Her Majesty's Government (2021) Net Zero Strategy: Build Back Greener [online]. Available at [Net Zero Strategy: Build Back Greener - GOV.UK \(www.gov.uk\)](https://www.gov.uk/net-zero-strategy) (Last accessed December 2023).

²⁸ Nottinghamshire County Council (2023) Nottinghamshire and Nottingham Local Aggregates Assessment – containing 2022 sales data [online]. Available at: <https://www.nottinghamshire.gov.uk/media/hzhcwibd/december-2023-2022-data-nottinghamshire-and-nottingham.pdf> (Last accessed January 2025).

Policy number	Title	Policy summary
N/A	N/A	The Nottinghamshire and Nottingham Local Aggregates Assessment (LAA) is a document that is to be produced under the requirements set out in the NPPF and covers the geographical area of Nottinghamshire, including the Nottingham City unitary authority area. It monitors annual sales data for aggregate minerals between 2010 and 2022 as well as identifying other relevant local information to enable the Mineral Planning Authorities to plan for a steady and adequate supply of minerals.
Nottinghamshire Minerals Local Plan (adopted March 2021) ²⁹		
SP1	Mineral Provision	The priority is to make the best use of the county's finite mineral resources through supporting extensions to existing sites, where environmentally acceptable, encouraging the use of secondary and recycled aggregates as far as possible. All proposals for mineral development must demonstrate that they have prioritised the avoidance of adverse social, economic and environmental impacts of the proposed development.
SP7	Minerals Safeguarding, Consultation Areas and Associated Minerals Infrastructure	The Minerals Safeguarding Areas (MSA) identify the mineral resources which are worthy of safeguarding and the Minerals Consultation Area (MCA) identify the areas within Nottinghamshire where the District and Borough authorities are required to consult the Mineral Planning Authority (MPA) over non-minerals development. The NPPF encourages the prior extraction of minerals before alternative uses are permitted.
DM13	Incidental Mineral Extraction	Development Management Policy 13 includes Planning applications for the extraction of minerals as a necessary element of other development proposals on the same site will be supported where it can be demonstrated that the scale and duration of the mineral extraction does not result in adverse environmental impacts and that it brings environmental and other benefits to the development it is incidental to.
DM15	Borrow Pits	Development Management Policy 15 will support proposals for Borrow Pits that includes where they are adjacent to or close to the project/s they are intended to serve, are time limited to the life of the project and material is to be used only for the specified project, can be worked and reclaimed without any unacceptable environmental impacts.
MP1	Aggregate Provision	The National Planning Policy Framework requires MPAs to produce a Local Aggregates Assessment (LAA) on an annual basis. This assesses both the demand for and supply of aggregates based on the average of the last 10 and three year sales data. To meet identified levels of demand for aggregate mineral over the plan period (2018-2036) the following provision will be made: • 32.30 million tonnes of Sand and Gravel • 7.03 million tonnes of Sherwood Sandstone

²⁹ Nottinghamshire Country Council (2021) Nottinghamshire Minerals Local Plan 2021 [online]. Available at: <https://www.nottinghamshire.gov.uk/planning-and-environment/minerals-local-plan/adopted-minerals-local-plan> (Last accessed December 2023).

Policy number	Title	Policy summary
		0.09 million tonnes of crushed rock The county council will make provision for the maintenance of landbanks of at least seven years for sand and gravel, seven years for Sherwood Sandstone and 10 years for crushed rock, whilst maintaining a steady and adequate supply over the plan period.
MP2	Sand and Gravel Provision	An adequate supply of sand and gravel will be identified to meet expected demand over the plan period using the extraction of remaining reserves at 10 permitted quarries, extensions to five existing permitted quarries and a new sand and gravel quarry. As a result, Policy MP2, and the five extensions to existing quarries and one new quarry will provide a total of 11.8 million tonnes.
MP3	Sherwood Sandstone Provision	An adequate supply of Sherwood Sandstone will be identified to meet expected demand over the plan period from the extraction of remaining reserves at the following permitted quarries and extensions to two existing quarries which will provide a total of 2.43 million tonnes.
MP4	Crushed Rock (limestone) Provision	Based on the limestone requirements set out in the aggregate provision policy (MP1), the plan does not need to provide any further limestone as current permitted reserves are adequate to cover the plan period. The quarry has planning permission until 2035 at a planned output of 250,000tpa, however, actual output has been much lower and it has not been worked for a number of years.
MP5	Secondary and Recycled Aggregates	Development proposals which will increase the supply of secondary and/or recycled aggregates will be supported where it can be demonstrated that there are no significant environmental, transport or other unacceptable impacts. Although, there is considerable potential for using certain waste materials as secondary aggregates, large quantities either remain on site or end up in landfill. Making greater use of by-products and other waste materials will therefore also help to meet the Government's aim of reducing waste disposal to landfill. The Nottinghamshire and Nottingham Replacement Waste Local Plan sets out strategic policies to promote both temporary and permanent facilities for aggregates recycling facilities.
Nottinghamshire and Nottingham County Council Waste Core Strategy (Adopted 2013) ³⁰		
WSC1	Presumption in favour of sustainable development	When considering development proposals, a positive approach will be taken that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. Any adverse impacts of granting permission which would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole should be restricted.
WCS2	Waste awareness, prevention and reuse	All new development should be designed, constructed and implemented to minimise the creation of waste, maximise the use of recycled materials and assist the collection, separation, sorting, recycling and recovery of waste arising from the development. The underlying aim is to move waste

³⁰ Nottinghamshire County Council (2013) Waste Core Strategy 2020 [online]. Available at: [waste-core-strategy-1.pdf](https://www.nottinghamshire.gov.uk/waste-core-strategy-1.pdf) ([nottinghamshire.gov.uk](https://www.nottinghamshire.gov.uk)) (Last accessed December 2023).

Policy number	Title	Policy summary
		up the waste hierarchy and maximise recycling.
WCS3	Future waste management provision	The Waste Core Strategy aims to provide sufficient waste management capacity for its needs; to manage a broadly equivalent amount of waste to that produced within Nottinghamshire and Nottingham. Future waste management proposals should accord with the aim to achieve 70% recycling or composting of all waste by 2025.
WCS5	Disposal sites for hazardous, non-hazardous and inert waste	Where it is shown that additional non-hazardous or inert landfill capacity is necessary, priority will be given to sites within the main shortfall areas around Nottingham, and Mansfield/Ashfield. Development outside this area will be supported where it can be shown that there is no reasonable, closer, alternative. Proposals for hazardous waste will need to demonstrate that the geological circumstances are suitable and that there are no more suitable alternative locations in, or beyond, the plan area.
WCS8	Extensions to existing waste management facilities	The extension, or redevelopment or improvement of existing waste management facilities will be supported where this would increase capacity or improve existing waste management methods, and/or reduce existing environmental impacts
WCS10	Safeguarding waste management sites	The following sites will be safeguarded for waste management facilities: Existing permitted waste management facilities including potential extensions and sites which have a valid planning permission that has not yet been implemented. Sites allocated in the Site Allocations Document.

10.3.58 Nottinghamshire County Council and Nottingham City Council are working together to produce a new Waste Local Plan³¹ which will replace the previous adopted Waste Local Plan³² and the Waste Core Strategy.³⁰ A draft plan was published for stakeholder review between February to April 2022. A final version of this plan has been published and it is currently in an examination period. The new waste local plan is expected to be adopted by late spring/early summer 2025.

10.3.59 The policies in the draft Waste Local Plan aim to guide the future development and management of waste. The Plan reflects guidance and legislation that sets out waste policy at the international, and national level. There are two key principles that underpin waste planning which aim to promote the concept of waste as a resource to be used which are the Circular Economy and the Waste Hierarchy. Table 10-2 reflects the policies of relevance to the Scheme in the draft Waste Local Plan.

³¹ Nottinghamshire County Council (2022) Waste Local Plan [online]. Available at: [Waste Local Plan 2022 \(nottinghamshire.gov.uk\)](https://www.nottinghamshire.gov.uk) (Last accessed December 2023).

³² Nottinghamshire County Council (2002) Nottinghamshire and Nottingham Waste Local Plan [online]. Available at: [Adopted Waste Local Plan - Complete Document \(nottinghamshire.gov.uk\)](https://www.nottinghamshire.gov.uk) (Last accessed December 2023).

Table 10-2: Summary of the Nottinghamshire County Council draft Waste Local Plan (2022)³¹

Policy number	Title	Policy summary
SP1	Waste prevention and reuse	All new development should be designed, constructed, and operated to minimise the creation of waste, maximise the use of recycled materials, and assist with the collection, separation, sorting, recycling and recovery of waste arising from the development during its use.
SP2	Future Waste Management Provision	The policy aims to provide sufficient waste management capacity to meet identified needs and will support proposals for waste management facilities which help to move waste management up the waste hierarchy.
SP4	Residual Waste Management	Proposals for the recovery of inert waste to land will be permitted where it can be demonstrated that: This will provide a significant benefit or improvement which cannot practicably or reasonably be met in any other way. The waste cannot practicably and reasonably be reused, recycled or processed in any other way. The use of inert waste material replaces the need for non-waste materials. The development involves the minimum quantity of waste necessary to achieve the desired benefit or improvement. It will not prejudice the restoration of permitted mineral workings and landfill site.
SP8	Safeguarding Waste Management Sites	The policy will seek to avoid the loss of existing permitted waste management facilities, having regard to the long-term need for the facility and the wider benefits of any redevelopment proposal.

National Highways policy

10.3.60 The Sustainable Development Strategy³³ sets out National Highways' approach and priorities for sustainable development to their key stakeholders. Of the ambitions outlined in the Strategy, the following are of relevance to this material assets and waste assessment:

- To more actively manage carbon emissions: by examination and focus on business areas where efficiencies can be achieved through reducing fuel, energy and raw material consumption, and all waste generation.
- To increase knowledge of where our goods and materials are sourced from. Ensuring that responsibly sourced resources is essential, as their production and handling can have local, national and global

³³ National Highways (2017) Sustainable Development Strategy: Our Approach [online] available at: https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/605079/Sustainable_Development_Strategy_6.pdf (Last accessed December 2023).

- impacts – on human and social health and also on the environment and climate change.
- To push towards a ‘circular’ approach to our management of resources: minimising demand for primary resources extracted from the ground and maximise the reuse of the resources already in use on the network. Reutilising them in as high a value function as possible.

Other policy, standards and guidance

Construction Code of Practice for the Sustainable Use of Soils on Construction Sites³⁴

- 10.3.61 This code of practice provides relevant advice on the use of soil in construction projects.

Contaminated Land: Applications in Real Environments Definition of Waste: Development Industry Code of Practice³⁵

- 10.3.62 The Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste Code of Practice DoWCoP aims to encourage the sustainable remediation of contaminated land and groundwater throughout the UK, for effective social and economic use. This is achieved by increasing awareness and confidence in practical, sustainable remedial solutions.

Design Manual for Roads and Bridges LA 110¹

- 10.3.63 DMRB LA 110 sets out the requirements for initial considerations when assessing the environmental impacts and effects of material assets and waste generation for the construction and maintenance of motorways and roads. It promotes the reduction in overall impacts of material asset use and the efficient use of resources. It also promotes the prevention and/or reduction of impacts due to waste generation and management by adhering to the waste hierarchy principles.
- 10.3.64 In addition, DMRB LA 110 sets out the requirements for screening, scoping, the assessments, and the subsequent reporting and monitoring of material assets use and waste management.

10.4 Consultation

- 10.4.1 No consultation specific to material assets and waste has been undertaken to date. Scheme-wide consultation details are provided in

³⁴ Department for Environment, Food and Rural Affairs (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [online]. Available at: [Construction Code of Practice for the Sustainable Use of Soils on Construction Sites \(publishing.service.gov.uk\)](https://publishing.service.gov.uk) (Last accessed December 2023).

³⁵ Contaminated Land: Applications in Real Environments (2011) The Definition of Waste: Development Industry Code of Practice [online]. Available at: <https://claire.co.uk/component/phocadownload/category/8-initiatives?download=212:definition-of-waste-development-industry-code-of-practice> (Last accessed December 2023).

Section 4.7 of Chapter 4 (Environmental Assessment Methodology) of this ES.

- 10.4.2 Information has been provided by Nottinghamshire County Council through the statutory consultation that includes reference to minerals and waste.³⁶
- 10.4.3 In the EIA Scoping Opinion [APP-189], information has been requested by the Planning Inspectorate regarding the generation of liquid waste by the Scheme. This has been addressed in Section 10.11 of this Chapter.

10.5 Assessment methodology

- 10.5.1 The methodology is in line with the requirements set out in DMRB LA 110 Material Assets and Waste. The methodology is also in line with the following guidance and best practice for material assets and waste:
- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites³⁴
 - CL:AIRE Definition of Waste: Development Industry Code of Practice³⁵
- 10.5.2 The assessment considers the following:
- Types and quantities of materials required for the Scheme, where known
 - Details of the source or origin of materials, site won materials to replace virgin materials, materials from secondary or recycled sources, or virgin or non-renewable sources, if known
 - The type and volume of materials that would be recovered from off-site sources
 - Cut and fill balance
 - Details of on site storage and stockpiling arrangements
 - Forecast of non-hazardous, hazardous, and inert waste arisings
 - Surplus materials and waste falling under regulatory controls
 - Wastes that require storage on site prior to reuse, recycling and disposal
 - Wastes to be pre-treated on site for reuse within the Scheme
 - Wastes requiring treatment or disposal off-site
 - The impacts that would arise from the issues identified in relation to materials and waste
 - Identification of mitigation measures based on identified impacts
 - Conclusion based on nature and magnitude of impacts

³⁶ Nottinghamshire County Council (2022) A46 Newark Bypass – Statutory Consultation. Document reference TR010065/S42(1)(a)/Oct/2022.

- 10.5.3 The Environmental Scoping Report³⁷ highlighted the potential for significant effects on material assets and the generation of waste produced during the construction phase. Use of materials and generation of waste for the operational phase of the Scheme has been scoped out of further assessment as it is anticipated that there would be minimal requirement for material assets and minimal waste generation. This has been agreed to as part of the Scoping Opinion and has been detailed in Appendix 4.1 (Schedule of Scoping Opinion Comments and Responses) of the ES Appendices [APP-125]. As such, no operational stage assessment has been undertaken. Therefore, the assessment of effects on material assets and waste generation encompasses effects arising during the construction of the Scheme up until the point when the Scheme opens.

Significance criteria

- 10.5.4 The categories for significance are provided in Table 10-3 and Table 10-4 which define the significance category description and significance criteria. For these tables “Region” means the authority comprising the study area, in this case Nottinghamshire. “Primary materials” describes materials that are from a non-renewable source.

³⁷ National Highways (August, 2022) A46 Newark Bypass Environmental Scoping Report [online] available at: [TR010065-000002-A46N - Scoping Report.pdf \(planninginspectorate.gov.uk\)](https://www.planninginspectorate.gov.uk/tr010065-000002-A46N-Scoping-Report.pdf) (last accessed December 2023).

Table 10-3: Significance categories and descriptions for material assets and waste generation

Significance category	Description
Very Large	Material assets: No criteria: use criteria for large categories. Waste: >1% reduction or alteration in national capacity of landfill, construction of new (permanent) waste infrastructure is required to accommodate waste from a project.
Large	Material assets: Project achieves <70% overall material recovery/recycling (by weight) of non-hazardous Construction and Demolition Waste (CDW) to substitute use of primary materials. Aggregates required to be imported to site comprise <1% reused/recycled content. Projects sterilises ≥ 1 mineral safeguarding site and/or peat resource. Waste: Project achieves 1% reduction in the regional capacity of landfill as a result of accommodating waste from a project. >50% of project waste for disposal outside of the region.
Moderate	Material assets: Project achieves less than 70% overall material recovery/recycling (by weight) of non-hazardous CDW to substitute use of primary materials. Aggregates required to be imported to site comprise reused/recycled content below the relevant regional percentage target. Waste: >1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from a project. 1-50% of project waste for disposal outside of the region.
Slight	Material assets: Project achieves 70-99% overall material recovery/recycling (by weight) of non-hazardous CDW to substitute use of primary materials. Aggregates required to be imported to site comprise reused/recycled content in line with the relevant regional percentage target. Waste: ≤1% reduction or alteration in the regional capacity of landfill. 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.
Neutral	Material assets: Project achieves >99% overall material recovery/recycling (by weight) of non-hazardous CDW to substitute use of primary materials. Aggregates required to be imported to site comprise >99% reused/recycled content. Waste: No reduction or alteration in the capacity of waste infrastructure within the region.

Source: Design Manual for Roads and Bridges: LA 110 Material assets and waste (2019)¹

Table 10-4: Significance criteria for material assets and waste

Significance	Description
Significant (one or more criteria met)	Material assets: category description met for moderate or large effect. Waste: category description met for moderate, large or very large effect

Significance	Description
Not significant	Material assets: category description met for neutral or slight effect. Waste: category description met for neutral or slight effect.

Source: Design Manual for Roads and Bridges: LA 110 Material assets and waste (2019)¹

10.6 Assessment assumptions and limitations

- 10.6.1 The assessment has been based on the Scheme description and construction strategy presented in Chapter 2 (The Scheme) of the ES and has taken into account the lateral limits of deviation illustrated on the Works Plans [REP3-002] and vertical limits of deviation secured under Article 10 of the draft DCO [REP4-003] to establish a realistic worst case assessment scenario.
- 10.6.2 The assessment is based on desktop information and design information available for the Scheme. Field surveys were not required for the assessment of material assets and waste management, but information collected from Scheme-specific ground investigations have informed Scheme proposals.
- 10.6.3 The assessment does not consider the environmental effects associated with the off-site extraction of raw materials used for the off-site manufacture of products. These stages of the products or materials' lifecycles are outside of the scope of the assessment due to the range of unknown variables associated with the processes involved and are not considered to form part of the Scheme. In most cases, it can also be assumed that these processes would have already been subject to Environmental Impact Assessment (EIAs) in securing consents for the facilities' operation.
- 10.6.4 This assessment has not assessed the impact of material use and waste associated with the manufactured goods required by the Scheme as these would be subject to their own separate consenting and regulatory controls at the place of production.
- 10.6.5 Adverse environmental effects for material assets use and waste management have the potential to be generated through transportation of materials and waste to and from the Scheme, such as impacts on air quality, carbon emissions, and noise. The effects of these activities are considered in the relevant technical chapters including Chapter 5 (Air Quality), Chapter 11 (Noise and Vibration) and Chapter 14 (Climate) of this ES.
- 10.6.6 Adverse environmental effects of land contamination, such as impacts on groundwater and human health, have not been considered for this assessment as these have been considered in Chapter 9 (Geology and Soils) of this ES. In the event that contaminated land is identified through the ground investigation or during construction, this Chapter considers the management of this waste only.

- 10.6.7 Quantities for the Scheme at the time of the DCO submission have been used to forecast and assess the material assets required for the Scheme and the waste that may be generated by the Scheme. These Quantities for the Scheme are based on project information for the Scheme and professional judgement based on similar schemes. These are, therefore, appropriately robust and provide accurate estimations on the quantities of material assets likely to be used in the Scheme, and also provides an estimate on the quantity of waste that is likely to be generated. These forecasts are likely to be refined and subject to change as the Scheme design progresses. For that reason, the forecasts have been made on a reasonable worst-case scenario basis, informed by professional judgement.
- 10.6.8 The assessment has been undertaken on the basis that the Scheme aims to minimise the generation of waste and use materials efficiently. It is assumed that all excavated topsoil would be suitable for reuse on site or on projects locally. It is also assumed that, in the worst-case scenario, all waste identified for disposal would be sent to landfill.
- 10.6.9 Based on professional judgment and based on a worst-case scenario, it has been assumed that 10 percent of material assets brought to the site required for the construction of the Scheme may become waste due to damages, cut-off or surplus.
- 10.6.10 Information on the permitted capacity of waste management facilities has been used in the assessment, based on current publicly available data (at the time of DCO submission). However, it should be noted that the capacity information obtained from the Environment Agency for the sites and regions identified does not necessarily mean that the capacity detailed would be available for use by the Scheme.
- 10.6.11 It is noted that any future changes to this permitted capacity are uncertain, as there is potential for change to permitted capacities, opening of additional waste management facilities and closure of existing facilities. However, it is not currently possible to predict the timeframes for when these waste management facilities would be available/unavailable and, therefore, how many of these sites would be available to accommodate waste arising from the Scheme.
- 10.6.12 The procurement strategy for the materials required for the construction of the Scheme is unknown at this stage. For the purposes of this assessment, it is assumed that not all materials would be available to be sourced locally (within Nottinghamshire), and that the majority would be sourced nationally (within the UK). This will represent the (environmentally) worst-case scenario.
- 10.6.13 It is assumed that all aggregate material sourced either regionally or nationally would meet the regional target plan based on the UK Government's National and Regional guidelines for aggregates 2005-2020, for the recycled and secondary aggregate where technically appropriate and economically feasible.

- 10.6.14 It is assumed that all vegetation waste arising from general site clearance would be chipped on site or composted in a waste management facility.
- 10.6.15 Waste arising from packaging material, off-cuts from metals/plastics and site office has not been quantified. It is assumed that the majority of these wastes would be recycled and not landfilled.
- 10.6.16 It is assumed that all construction materials used for temporary construction works (such as for construction access roads and site office) would be reused and recycled after the construction of the Scheme and would not generate waste.
- 10.6.17 It is assumed that all waste arising from demolition works would be sent to C&D waste recycling facility and would not be landfilled.
- 10.6.18 It is assumed that excavated material outlined in the quantities of materials assets available at the time of DCO submission as 'to be disposed to an area of the Scheme' would be reused within the Scheme. Where it is not outlined to be disposed to an area of the Scheme, it is assumed to be disposed off-site.

10.7 Study area

- 10.7.1 The DMRB LA 110¹ standard defines two geographically different study areas to examine and assess the use of material assets (and resource use) and waste generation.
- 10.7.2 The first study area is based on the construction of the area within the Order Limits, which is shown in Figure 2.1 (Scheme Location Plan) of the ES Figures [AS-024], as this constitutes the area within which construction materials would be consumed (used, reused and recycled) and waste would be generated. A study area of 500 metres from the Order Limits is used to identify potential key sources of contaminated waste and potential constraints to Mineral Safeguarding Areas (MSA). This 500 metre study area is shown on Figure 10.1 (Material Assets and Waste Management First Study Area) of the ES Figures [REP2-008].
- 10.7.3 The second study area focuses on an area sufficient to identify the suitable waste infrastructure that could accept arisings or waste generated by the Scheme, and feasible sources and availability of construction materials typically required for the works. The second study area is shown in Figure 10.2 (Material Assets and Waste Management Second Study Area) of the ES Figures [AS-054].
 - Construction materials: For the purpose of this assessment the study area will focus primarily on Nottinghamshire County Council and

where required, the East Midlands region³⁸ within which the Scheme is located (shown on Figure 10.2 (Material Assets and Waste Management Second Study Area) of the ES Figures [AS-054].

- Waste generation and management: For the purpose of this assessment the study area focuses on an area sufficient to identify suitable waste infrastructure including landfills, considering the proximity principle and value for money. Where sufficient capacity is not available the search area has been extended accordingly, based on professional judgment, but kept within the boundaries of the East Midlands region. An initial search area of 10 kilometres from the Scheme's Order Limits has been assessed to support the proximity principle by highlighting appropriate waste management and disposal sites within a reasonable proximity to the Scheme. Only one permitted landfill with remaining capacity has been identified within 10 kilometres of the Scheme, consequently the range of the search area has been extended to 50 kilometres. The disposal facilities listed in Table 10-14 (within the 50 kilometres search area) are presented in ascending order showing the closest facilities to the Scheme first.

10.8 Baseline conditions

10.8.1 The baseline conditions for the use of material assets identifies:

- Regional and/or national availability of the main materials required for the construction of the Scheme, including for the site preparation and construction.
- MSA, peat resources and Allocated Minerals Sites within or adjacent to the Order Limits of the Scheme.

10.8.2 The baseline condition for waste generation and management identifies:

- The availability and capacity of regional and, where appropriate, national landfill capacity. Landfill void data has been collated for inert, non-hazardous and hazardous landfill types, where available.
- Historical and future trends in waste processing, recovery and/or landfill void capacity (especially where increases can be forecast or otherwise ascertained) to provide a useful insight as to the capability of these facilities, especially during the planned construction phase of a development.

10.8.3 Information available from local policies has been considered as part of the baseline study.

³⁸ East Midlands region as defined by the Environment Agency. For further information please refer to [Environment Agency area and region operational locations - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/organisations/environment-agency/about-us/our-areas-of-operation)

Materials resources use

10.8.4 Aggregates (sand, gravel and crushed rock) are the raw materials used to make construction products. There are three main sources of aggregate in the UK, these are as follows:

- Land-won (often referred to as natural or primary aggregates) – these are extracted directly from the ground in quarries or pits.
- Marine-dredged – these comprise of sand and gravel dredged from the sea floor.
- Secondary/recycled – secondary aggregates are a by-product from mineral operations or industrial processes, and recycled aggregates are materials produced by treatment of construction and demolition waste.

10.8.5 Information on the demand for key construction materials within the UK and within the East Midlands and Nottinghamshire sub-region has been used to provide the baseline for materials resources. This information has been determined through a desktop study using a number of readily available resources, in particular from the British Geological Society's Minerals UK, World Steel Association, and Nottinghamshire County Council.

10.8.6 An outline of the UK demand, in terms of sales, of minerals and mineral products by the year 2020 is provided in Table 10-5.

Table 10-5: UK demand of materials and minerals/mineral products in 2020 (unless otherwise stated)

Mineral/ mineral product	UK demand (2020, unless otherwise stated)
Primary aggregates, of which:	158.5 million tonnes
Crushed rock	107.8 million tonnes
Sand and gravel	50.7 million tonnes
Recycled and secondary aggregates, of which*	61.8 million tonnes
Recycled aggregates	55.2 million tonnes
Secondary aggregates	6.6 million tonnes
Cementitious products, of which:	
Cement clinker	6.9 million tonnes
Cement finished	8.0 million tonnes
Ready-mixed concrete	19.4 million tonnes
Concrete products (2018)*	32.0 million tonnes
Asphalt sales (2019)	27.4 million tonnes
Dimension stone	0.9 million tonnes
China Clay	0.6 million tonnes
Slag (2018)	2.5 million tonnes
Apparent steel use, finished steel products (2021)	10.8 million tonnes

Source: British Geological Society (2022)³⁹, Mineral Products Association (2022)⁴⁰, Mineral Products Association (2021)⁴¹, and World Steel Association (2022)⁴² Note: *Data for these minerals are for Great Britain only.

- 10.8.7 The Nottinghamshire and Nottingham Local Aggregates Assessment²⁸ and Nottinghamshire Minerals Local Plan²⁹ assess the demand for and supply of aggregates in the region of the Scheme. The Nottinghamshire and Nottingham Local Aggregate Assessment covers the geographical areas of Nottinghamshire, including the Nottingham City unitary authority area.
- 10.8.8 An outline of the aggregates sales and reserves is given in Table 10-6, which is the latest information. Aggregates extracted across the Nottinghamshire region include sand and gravel and Sherwood sandstone.
- 10.8.9 The stock of reserves with planning permission is known as the landbank. Government policy, including the NPPF,¹⁷ requires landbanks to be maintained for all primary aggregate minerals, with a required landbank of at least seven years.
- 10.8.10 The sand and gravel, and Sherwood sandstone landbanks are 15.2 and 25.41 years for Nottinghamshire, respectively. Therefore, the capacity within the region is sufficient to ensure the future provisions of sand and gravel supply at levels above the minimum requirements.
- 10.8.11 There is a permitted site to extract crushed rock within Nottinghamshire, however, it has been inactive since 2007. Therefore, Nottinghamshire rely on imports from other regions for crushed rocks. Limestone resources in Nottinghamshire and Nottingham are limited. The 2019 Aggregates Mineral Survey states that 1.19 million tonnes of crushed rock were imported into Nottinghamshire²⁸, whilst no mineral was exported. The survey also identified Derbyshire, Leicestershire, Telford and Wrekin, and Doncaster as the main sources of crushed rock²⁸.

Table 10-6: Aggregates sales and reserves for Nottinghamshire and Nottingham

Aggregate	2022 Sales (Mt)	Average 10-year sales (Mt)	Average 3-year sales (Mt)	LAA* Rate (Mtpa)	Permitted Reserves at 31 December 2022 (Mt)	Land-bank (years)
Sand and gravel	1.34	1.35	1.18	1.35	20.52	15.2
Sherwood Sandstone	0.18	0.31	0.17	0.31	7.98	25.41
Crushed rock	0.00	0.00	0.00	0.00	3.34	N/A

³⁹ British Geological Society (2024) United Kingdom Minerals Yearbook 2023 [online]. Available at: [UK Minerals Yearbook 2023 now available to download - British Geological Survey](#) (Last accessed January 2025).

⁴¹ Mineral Products Association (2023) Profile of the UK Mineral Products Industry 2023 Edition [online]. Available at: [Profile of the UK Mineral Products Industry 2023.pdf](#) (Last accessed January 2025).

⁴² World Steel Association (2021) Steel Statistical Yearbook 2022: online version (main indicators). [online] Available at: <https://worldsteel.org/steel-topics/statistics/steel-statistical-yearbook/> (Last accessed December 2023).

Aggregate	2022 Sales (Mt)	Average 10-year sales (Mt)	Average 3-year sales (Mt)	LAA* Rate (Mtpa)	Permitted Reserves at 31 December 2022 (Mt)	Land-bank (years)
(limestone)						

Source: Nottinghamshire and Nottingham Local Aggregates Assessment²⁸ and Nottinghamshire Minerals Local Plan²⁹

10.8.12 There are eight permitted sand and gravel quarries in Nottinghamshire, but two of them are inactive. Additionally, there are four Sherwood sandstone quarries. These quarries are outlined in Table 10-7.

Table 10-7: Permitted aggregate quarries in Nottinghamshire by 2022

Site name	Operator name	Facility type	Status	Permitted reserves (Mt)
Langford Lowfields	Tarmac	Sand and gravel	Active	3.37
Girton	Tarmac	Sand and gravel	Inactive	3.59
Besthorpe	Tarmac	Sand and gravel	Active	3.74
Sturton Le Steeple	Tarmac	Sand and gravel	Yet to be worked	7.99
East Leake	CEMEX	Sand and gravel	Active	1.08
Cromwell	CEMEX	Sand and gravel	Active	0.40
Scrooby	Rotherham Sand & Gravel (RGS)	Sand and gravel	Active	0.00
Misson Bawtry Road	Rowley	Sand and gravel	Active	0.35
Burntstump	Tarmac	Sherwood sandstone	Active	1.82
Bestwood 2	Tarmac	Sherwood sandstone	Active	2.21
Two Oaks Farm	Mansfield Sand Company	Sherwood sandstone	Active	3.44
Scrooby Top	RGS	Sherwood sandstone	Inactive	0.51

Source: Nottinghamshire and Nottingham Local Aggregates Assessment²⁸

10.8.13 The statutory consultation outlines the existence of an area that is potentially viable for extraction of sand and gravel materials. This area was considered as a potential allocated mineral site during the consultation period for the Mineral Local Plan; however, it was not taken forward to the adopted plan. The floodplain compensation area (FCA) near Kelham is located in close proximity to the above mentioned area, and therefore, this area is within the Order Limits.

10.8.14 Recycled aggregates are derived from reprocessing materials previously used in construction. Examples include recycled concrete

from C&D waste, power station ash and asphalt road planings. Secondary Aggregates are usually by-products of other industrial processes not previously used in construction.

- 10.8.15 Nottinghamshire Minerals Local Plan references Government policy, encouraging the use of secondary and recycled materials in construction in order to reduce the need for materials from traditional sources. The Mineral Local Plan also states that in order to conserve natural resources aggregates should be recycled where possible.²⁹
- 10.8.16 DMRB LA 110 sets the recycled aggregate target for the East Midland region (2005-2020) as 14 percent.¹ The percentage was calculated based on the figure of 784 million tonnes requirement for the East Midlands region set in the national and regional guidelines for aggregates provision in England (2005-2020) published from the Ministry of Housing, Communities and Local Government.⁴³
- 10.8.17 A total of 1,735,908 tonnes of C&D waste was generated in the Nottinghamshire region at permitted waste management facilities in 2021.⁴⁴ According to the Nottinghamshire and Nottingham Local Aggregates Assessment 2021,²⁸ there are 11 active sites with valid planning permission for aggregates recycling, which have maximum capacity of 1.7 million tonnes. An approximate of 0.42 million tonnes of inert waste suitable for recycled aggregates has passed through permitted recycling and transfer facilities in Nottinghamshire during the year 2020.²⁸ However, no sales data exists for specific types or recycled or secondary aggregates.
- 10.8.18 According to the Nottinghamshire Minerals Local Plan,²⁹ across the Nottinghamshire area there have been eight mineral resources identified with the purpose of safeguarding, which are:
- Sand and gravel
 - Sherwood sandstone
 - Alluvial sand and gravel
 - Limestone
 - Industrial dolomite
 - Brick clay
 - Gypsum
 - Surface coal
- 10.8.19 MSAs cover resources that are considered to be of current or future economic importance, they seek to prevent a mineral resource being needlessly sterilised by non-mineral developments.

⁴³ Ministry of Housing, Communities & Local Government (2009). National and regional guidelines for aggregates provisions in England 2005 – 2020 [online]. Available at: [The Empowerment Fund \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/214441/the-empowerment-fund.pdf) (Last accessed December 2023).

⁴⁴ Environment Agency (2023) Waste Data Interrogator 2021 – Waste received – Version 2 [online]. Available at [2021 Waste Data Interrogator - Wastes Received \(Excel\) - Version 2](#) (Last accessed December 2023).

- 10.8.20 The MSA and Associated Mineral Infrastructure map²⁹ outlines the MSA within Nottinghamshire. According to data and information provided by the Council,³⁶ there is one MSA within the 500 metre study area (Figure 10.1 (Material Assets and Waste Management First Study Area) of the ES Figures [REP2-008]. This MSA for sand and gravel lies adjacent to the Scheme. There are no peat resources in proximity to the Scheme.
- 10.8.21 The Scheme is not likely to represent a risk to the MSA and prior extraction from the MSA may not be appropriate. Taking into consideration the below points, the Scheme is anticipated to lie within the considerations and circumstances stated in paragraphs 3.84 and 3.87, which are part of policy SP7 of the Nottinghamshire Minerals Local Plan.²⁹
- Paragraph 3.84 of the Nottinghamshire Minerals Local Plan discusses the risk to future mineral extraction if new developments are located in open countryside. The Scheme is not a new development and it is not located in an open countryside area, as the works at the Scheme are related to the improvement and widening of a section of the existing A46 road. Additionally, the Order Limits of the Scheme is substantially smaller than the size of the MSA (refer to Figure 10.2 (Material Assets and Waste Management Second Study Area) of the ES Figures [REP2-008]. The total area for the sand and gravel MSA within Nottinghamshire is over 377 square kilometres, while the total area of the scheme within the MSA is approximately 1.8 square kilometres, which represents approximately 0.48 percent of the MSA area.
 - Paragraph 3.87 of the Nottinghamshire Minerals Local Plan considers that there may be circumstances where prior extraction of MSA may not be appropriate. It also indicates that it is expected that the development demonstrates that there is an overriding need for the non-mineral development which overweighs the need for the mineral development. Chapter 2 (The Scheme) of the ES and the Case for the Scheme [APP-190], describes the need for the Scheme, which includes:
 - The A46 forms part of the strategic Trans-Midlands Trade Corridor between the M5 in the south-west and the Humber Ports in the north-east.
 - The improvements to the A46 corridor are detailed within the Road Investment Strategy (RIS) 2 as a mechanism for underpinning the wider economic transformation of the country.
- 10.8.22 Key conclusions for use of material assets from the baseline are outlined below:
- The UK has a sufficient quantity of steel available for construction works.
 - Nottinghamshire has a sufficient supply of aggregates to support construction works within the region.

- There is one MSA for sand and gravel that lies within 500 metres of the Scheme, for which prior extraction may not be appropriate. However, there are no peat resources.

Waste generation and management

10.8.23 The most recent information available relating to current waste generation and operational waste facilities in Nottinghamshire and the East Midlands region has been gathered to provide the baseline for this assessment. Information on the current waste arisings, and the waste management facilities have been determined through a desktop study, using a number of readily available resources, in particular data from the Environment Agency and Defra.

Waste generation in the East Midlands region and England

10.8.24 The latest data from the Environment Agency⁴⁴ indicates England received over 236 million tonnes of waste in 2021, which was managed in 6,153 permitted waste facilities.⁴⁵ The waste facilities in the East Midlands region received over 19 million tonnes of waste in 2021, and the Nottinghamshire region received nearly 4.3 million tonnes of waste, as shown in Table 10-8.

Table 10-8: Waste breakdown by site type

Site Type	Nottinghamshire (tonnes)	East Midlands (tonnes)	England (tonnes)
Landfill	518,740	4,238,163	43,179,246
Transfer	766,674	4,588,886	45,111,106
Treatment (excluding metal recycling sector)	2,059,804	7,389,323	92,477,108
Metal Recovery	374,759	843,958	15,181,200
Incinerated	296,275	1,006,895	16,944,811
Use of Waste	0	0	194,781
Land Disposal	341,526	551,542	11,674,040
Total	4,363,327	19,028,852	236,702,048

Source: Environment Agency (2023).⁴⁴ Note: Mobile plant, processing, combustion, mining and storage of waste are included in the overall waste arisings figures.

Construction and demolition waste

10.8.25 With respect to C&D waste in 2021, the Environment Agency recorded that 7,136,606 tonnes of inert C&D waste were received at permitted facilities in the East Midlands region, of which 1,735,908 tonnes were received in Nottinghamshire. Additionally, in 2021 in the East Midlands region a total of 1,326,104 tonnes of C&D waste were

⁴⁵ Environment Agency (2023) Environmental Permitting Regulations – Waste Operations [online]. Available at [Environmental Permitting Regulations – Waste Operations \(data.gov.uk\)](https://www.gov.uk/government/publications/environmental-permitting-regulations-waste-operations) (Last accessed December 2023).

removed, of which 273,733 tonnes were removed from Nottinghamshire.⁴⁶

10.8.26 According to the Environment Agency (2021),⁴⁴ there was no use of waste material including in construction, reclamation nor to manufacture timber within the East Midlands region. However, in the East Midlands region 540,919 tonnes of C&D waste were deposited to land for recovery, of which 341,546 tonnes were deposited within Nottinghamshire.

10.8.27 The baseline target for recovery of C&D waste is 70 percent by weight, as set out in the EU Waste Framework Directive 2008/98/EC and the European Union (Withdrawal) Act 2018 (paragraph 10.3.17). According to Defra,⁴⁷ the recovery rate of non-hazardous C&D waste in 2020 for England was 93.2 percent.

Hazardous waste

10.8.28 The quantities of hazardous waste received and deposited from permitted waste facilities in 2021 for England and the East Midlands region are given in Table 10-9.

Table 10-9: Hazardous C&D and asbestos waste received and deposited in 2021

Hazardous waste	Nottinghamshire (tonnes)	East Midlands (tonnes)	England (tonnes)
Received	13,372	133,597	1,205,852
Deposited	762	180,978	1,247,663

Source: Environment Agency (2023)⁴⁸. Note: The data is a summary of the registered hazardous waste movements. The same waste may have been moved between multiple facilities and each separate movement is recorded.

10.8.29 To identify potential sources of contamination, an initial review of permitted and historical landfills site that are within 500 metres from the Scheme was undertaken using the Environment Agency's 'Historical Landfill sites' web map⁴⁹ and 'Permitted Waste Sites – Authorised Landfill Site Boundaries' web maps.⁵⁰

10.8.30 There are two permitted landfill sites within 500 metres of the Order Limits of the Scheme and one historical landfill, as shown in Table 10-

⁴⁶ Environment Agency (2023) Waste Data Indicator 2021 – Waste removed Version 3 [online]. Available at [2021 Waste Data Interrogator - Wastes Removed \(Excel\) - Version 3](#) (Last accessed December 2023).

⁴⁷ Defra (2022) UK statistics on waste [online]. Available at: [UK statistics on waste - GOV.UK \(www.gov.uk\)](#) (Last accessed December 2023).

⁴⁸ Environment Agency (2023) Waste summary tables for England 2021 – Version 3 [online]. Available at [2021 Waste Summary Tables for England – Version 3 \(data.gov.uk\)](#) (Last accessed December 2023).

⁴⁹ Environment Agency (2023) Historic Landfill Sites [online]. Available at: <https://data.gov.uk/dataset/17edf94f-6de3-4034-b66b-004ebd0dd010/historic-landfill-sites> (Last accessed December 2023).

⁵⁰ Environment Agency (2023) Permitted Waste Sites - Authorised Landfill Site Boundaries [online] Available at: <https://data.gov.uk/dataset/ad695596-d71d-4cbb-8e32-99108371c0ee/permitted-waste-sites-authorised-landfill-site-boundaries> (Last accessed December 2023).

10 and shown on Figure 10.1 (Material Assets and Waste Management First Study Area) of the ES Figures [REP2-008]. Potential sources of contamination that are greater than 500 metres away from the Scheme have not been considered, as these are considered unlikely to affect the Scheme.

- 10.8.31 Figure 10.1 shows that the existing A46 road is located over an edge of one permitted landfill site area (British Sugar Plc, Easting 479070, Northing 355420). The work that will be undertaken in proximity to this area (refer to Figure 2.3 (Environmental Masterplan) of the ES Figures [AS-026]) includes landscaping works for retaining existing vegetation and proposed areas to have species rich grassland, and linear belts of shrubs and trees. Therefore, the use of land is likely to be compatible with the existing use.

Table 10-10: Permitted and historical landfill sites within 500 metres of the Scheme

Site name	Operator	Status	Treatment facility type	Easting	Northing	Distance from Scheme
Muskham Road	British Sugar Corporation	Historic	The landfill is recorded as having accepted inert and industrial waste	479400	355100	215 metres
Newark Sugar Factory	British Sugar Plc	Active	A7: Industrial Waste Landfill (Factory curtilage)	479070	355420	Adjacent to the boundary of the Scheme
Newark Sugar Factory	British Sugar Plc	Closure	A7: Industrial Waste Landfill (Factory curtilage)	479600	355200	305 metres

Source: Environment Agency (2023)^{49,50}

10.8.32 In addition, an initial Ground Investigation has identified an area where contaminated soil may arise; further information is contained within Chapter 9 (Geology and Soils) of this ES.

Waste management facilities

10.8.33 The Environment Agency reported that at the end of 2021, 595 sites accepted waste in the East Midlands region, and 862 sites had environmental permits to accept waste. There were 121 active sites receiving waste in the Nottinghamshire sub-region in 2021. Waste should be treated in compliance with the waste hierarchy, eliminating waste as a priority and recycling and recovering unavoidable waste as a next step, with waste disposal methods such as landfill only used as a last resort.

10.8.34 According to the Environment Agency,⁵¹ there are currently 61 permitted landfills in the East Midlands region, with 40 landfills having remaining capacity at the end 2021 (see Table 10-11). The landfills with remaining capacity in this region are classified as follows: 19 inert landfills, 16 non-hazardous landfills, one hazardous merchant landfill, three non-hazardous landfills with at least one Stable Non-Reactive Hazardous Waste (SNRHW), and one hazardous restricted landfill. In addition, there are currently 11 permitted landfills in the Nottinghamshire sub-region with eight landfills having remaining capacity at the end of 2021. The sub-region has four inert landfills and four non-hazardous landfills.

Table 10-11: Landfill capacity at the end of 2021

Landfill type	Nottinghamshire sub-region (m ³)	East Midlands (m ³)	England (m ³)
Hazardous Merchant	-	800,000	12,527,082
Hazardous Restricted	-	7,550	2,105,291
Non-Hazardous with SNRHW* cell	-	15,883,882	54,175,505
Non-Hazardous	4,297,774	17,570,365	160,203,489
Non-Hazardous Restricted	-	-	-
Inert	4,627,510	21,574,131	130,706,025
Total	8,925,284	55,835,928	359,717,391

Source: Environment Agency (2023)⁵¹

10.8.35 The remaining landfill capacity in Nottinghamshire at the end of 2021 was 4,297,774 cubic meters for non-hazardous landfills, and 4,627,510 cubic meters for inert landfills. Details of landfills with remaining capacity in Nottinghamshire are listed in Table 10-12.

⁵¹ Environment Agency (2023) Remaining landfill capacity 2021 – Version 2 [online]. Available at: [Remaining Landfill Capacity - data.gov.uk](https://data.gov.uk/dataset/remaining-landfill-capacity) (Last accessed December 2023).

Table 10-12: Permitted landfill with remaining capacity at the end of 2021 in Nottinghamshire

Facility name	Operator name	Local Authority	Site Type	Remaining capacity at the end of 2021 (m ³)
Serlby Landfill	Serlby Quarry Ltd	Bassetlaw	L05 – Inert Landfill	1,350,000
Harrycroft Quarry Landfill Site	Tarmac Aggregates Ltd	Bassetlaw	L05 – Inert Landfill	688,653
Borrow Pits Landfill*	British Sugar Plc	Newark & Sherwood	L05 – Inert Landfill	383,603
Vale Road Quarry	Midland Landfill Ltd	Mansfield	L05 – Inert Landfill	1,875,518
Daneshill Landfill Site	FCC Recycling (UK) Ltd	Bassetlaw	L04 - Non-Hazardous	753,378
Cottam Ash Disposal Site*	EDF Energy (West Burton Power) Ltd	Bassetlaw	L04 - Non-Hazardous	1,559,955
Ratcliffe on Soar Power Station*	Uniper UK Ltd	Rushcliffe	L04 - Non-Hazardous	760,387
Bole Ings Ash Disposal Site*	EDF Energy (West Burton Power) Ltd	Bassetlaw	L04 - Non-Hazardous	1,553,790

Source: Environment Agency (2023)⁵¹ Note: Landfills marked with an asterisk (*) have been confirmed by NCC as not suitable to receive waste generated from the Scheme

10.8.36 A search on the Environment Agency's public register⁵² was undertaken for all permitted waste facilities within 10 kilometres of the Scheme, measured from postcodes NG23 5RS and NG24 2NY. The postcode locations were selected since they are located at opposite ends of the Order Limits of the Scheme. The search in the public register showed that there are 36 waste management facilities to the west of the Scheme (postcode NG23 5RS), 11 of which are able to treat or transfer C&D waste (Table 10-13). In addition, there are 25 waste management facilities to the east of the Scheme (postcode NG24 1GB), 13 of which are able to treat or transfer C&D waste (Table 10-13).

⁵² Environment Agency (2023) Public Registers Online [online]. Available at: [Public Registers Online \(data.gov.uk\)](https://publicregistersonline.data.gov.uk) (Last accessed December 2023).

Table 10-13: Permitted waste management facilities within 10 kilometres of the Scheme

Site name	Treatment facility type	Distance from NG24 2NY (km)	Distance from NG23 5RS (km)
Newark Waste Transfer Station (TS) – Veolia ES Nottinghamshire	S0805 No5: 75kte Household, commercial and industrial (HCI) Waste Transfer Station + asbestos.	1.6	6.5
Conica Ltd	A15: Material Recycling Treatment Facility.	2.4	6.5
Eurotech Waste Treatment Ltd	Disposal of non-hazardous waste involving physico-chemical treatment. Temporary storage of hazardous waste. Disposal or recovery of hazardous waste involving physico-chemical treatment.	2.6	5.8
Briggs Metal Ltd	A20: Metal Recycling Facility	3.6	4.4
Quarry Farm – Nubeau Holdings Ltd	S0803 No3: 75kte HCI Waste Transfer Station + treatment.	5.9	6.8
Ivan Hall Newark Mini Skips	S1504 No4: 75kte HCI Waste Transfer Station.	6.1	6.8
Regional Waste Recycling (commercial) Ltd	A11: HCI Waste Transfer Station.	6.1	7.9
Cromwell Quarry	A25: Deposit of waste to land as a recovery operation.	6.2	8.4
Cromwell Quarry	S0803 No3: 75kte HCI Waste Transfer Station + treatment.	6.2	8.5
Laffy's	S0906 No6: Inert and excavation waste Transfer Station with treatment.	7.0	>10
Swinderby Quarry	SR2010 No12: Treatment of waste to produce soil <75,000 tpy	7.9	>10
Ansons Farm	SR2011 No4: Treatment of waste wood <75,000 tpy A22: Composting facility	9.1	>10
Hobleys Yard	SR2010 No12: Treatment of waste to produce soil <75,000 tpy	9.4	>10
Coneygre Farm - Hoveringham	A25: Deposit of waste to land as a recovery operation.	>10	8.7
Coneygre Farm	A16: Physical treatment facility.	>10	8.7

Source: Environment Agency (2023)⁵²

10.8.37 Reuse, recycling and recovery of wastes would be prioritised within the Scheme, following the local policies on sustainable development. However, if these options are not available or feasible the following alternative is to adopt the proximity principle. Landfill locations within a 50 kilometres radius of the Scheme were measured from a central location within the Scheme. There is one appropriate permitted landfill within 10 kilometers of the Scheme and an additional 18 landfills with remaining capacity that lie within a 50 kilometre radius of the Scheme (Table 10-14). The distances to landfills were measured from a central point along the Scheme, from postcode NG24 1HN. Waste

management infrastructure and landfills are included as part of the second study area for this assessment, and Figure 10.2 (Material Assets and Waste Management Second Study Area) of the ES Figures [AS-054] outlines these waste management facilities.

- 10.8.38 The change in volume of the remaining capacity of the landfills in 2021 given in (Table 10-14) has been checked against the remaining landfill capacity that was available for 2020, along with the permit status of the landfills where publicly available to indicate if the landfills is likely to be available to accept waste. Not all landfills would necessarily be available for use by the Scheme, however some landfills would have the potential to accept waste from the Scheme. The volumes of waste generated by the Scheme would be assessed against the capacities of the relevant waste infrastructure to identify if there is sufficient capacity available.

Table 10-14: Permitted landfill sites with remaining capacity for C&D waste at the end of 2021, located within 50 kilometres of the Scheme

Landfill facility name	Operator name	Landfill type	Remaining capacity at the end of 2021 (m ³)	Distance from the Scheme (km)
Borrow Pits Landfill*	British Sugar Plc	L05 - Inert Landfill	383,603	1
Leadenham Landfill	Lincwaste Ltd	L04 - Non-Hazardous	1,400,000	15
Whisby Landfill	Lincwaste Ltd	L04 - Non-Hazardous	2,500,000	23
North Hykeham Landfill Site	Lincwaste Ltd	L04 - Non-Hazardous	285,000	23
Harmston Quarry Inert Landfill Site	Harmston Waste Management Ltd	L05 - Inert Landfill	75,000	23
Colsterworth Landfill Site	Lincwaste Ltd	L04 - Non-Hazardous	3,533,000	26
Vale Road Quarry	Midland Landfill Ltd	L05 - Inert Landfill	1,875,518	29
Brooksby Quarry	Tarmac Trading Ltd	L05 - Inert Landfill	168,164	30
Welby Tip	Saint-Gobain Construction Products UK Ltd	L04 - Non-Hazardous	12,670	30
Daneshill Landfill Site	FCC Recycling (UK) Ltd	L04 - Non-Hazardous	753,378	33
Cottam Ash Lagoons*	EDF Energy (West Burton Power) Ltd	L04 - Non-Hazardous	1,559,955	33

Landfill facility name	Operator name	Landfill type	Remaining capacity at the end of 2021 (m³)	Distance from the Scheme (km)
Bole Ings Ash Disposal Site*	EDF Energy (West Burton Power) Ltd	L04 - Non-Hazardous	1,553,790	33
Ratcliffe on Soar Power Station*	Uniper UK Ltd	L04 - Non-Hazardous	760,387	33
Harrycroft Quarry Landfill	Tarmac Aggregates Ltd	L05 - Inert Landfill	688,653	42
Lockington Quarry Landfill Site	Tarmac Aggregates Ltd	L05 - Inert Landfill	60,215	45
Erin Landfill	Viridor Ltd	L02 – Non-Hazardous Landfill with SNRHW cell	5,153,605	45
Gainsborough Landfill	Lincwaste Ltd	L04 - Non-Hazardous	114,035	45
Serlby Landfill	Serlby Quarry Ltd	L05 - Inert Landfill	1,350,000	47
Boston Landfill Site	Lincwaste Ltd	L04 - Non-Hazardous	268,516	50

Source: Environment Agency (2023)^{51,52} Note: Landfills marked with an asterisk (*) have been confirmed by NCC as not suitable to receive waste generated from the Scheme.

10.8.39 Not all landfills outlined in Table 10-12 and Table 10-14 may be suitable for accepting waste generated by the Scheme, but it demonstrates that sufficient landfills are within the surrounding areas of the Scheme.

10.8.40 In addition to permitted C&D waste management sites, inert material is also managed on sites that have an Environment Agency Environmental Permit exemption. These exempt sites generally comprise land restoration activities such as restoring mineral voids, engineering/landscaping Schemes and for agricultural improvements on farmland. These sites are an important part of the provision of the capacity for managing inert materials. Although small tonnages of waste from other waste streams (such as biodegradable waste) may be managed at locations with an exemption, the largest tonnage of exempt activities is likely to involve C&D material.

10.8.41 There are 298 waste exempt sites listed by the Environment Agency within 10 kilometres of the western side of the Scheme (from postcode NG23 5RS), of which 106 are U1 exempt sites (sites allowed to use suitable waste material in construction, in place of virgin materials). In addition, there are 284 waste exempt sites within 10 kilometres of the eastern side of the Scheme (from postcode NG24 1GB), of which 110 are U1 exempt sites. These U1 exempt sites are used to manage waste produced on site only as one-off events, therefore, these are often short-lived, and should be identified upon commencement of construction.

10.8.42 Key conclusions from the generation and management of waste baseline study indicate that:

- There are numerous waste management facilities available within the Nottinghamshire region.
- There is sufficient remaining landfill capacity within the Nottinghamshire region to accept inert and non-hazardous waste.
- There are permitted hazardous landfill sites in the East Midlands region to accept hazardous waste.

10.9 Potential impacts

10.9.1 The following potential impacts from the Scheme have been identified for both the construction and operational stages. The construction phase considers site preparation, demolition and construction of the Scheme.

Material assets use

- 10.9.2 Material assets required for the construction phase of the Scheme include raw materials such as aggregate and minerals from primary, secondary and recycled sources, and manufactured construction products. Manufactured construction products include materials required for the construction of road surface, pre-cast elements for the construction of structures such as bridges, gantries and signage, barriers, lighting, and fencing.
- 10.9.3 Road Schemes generally require large quantities of both primary raw materials and manufactured construction products. Many material assets may originate off-site, purchased as construction products. However, some materials may arise on site, for example excavated soils and sub-strata.
- 10.9.4 It is not anticipated that materials would be required for demolition activities and vegetation removal and, even if any were, the quantities of both primary raw materials and manufactured products required would be negligible compared to those required for the construction phase. Therefore, it is anticipated that there would not be any impacts to material asset use relating to the demolition activities.
- 10.9.5 In addition to demolition works, the site preparation works are anticipated to be related to site vegetation clearance and excavation activities within the Order Limits.
- 10.9.6 Site remediation work is not anticipated. Although a specific area is suspected to be contaminated, it has been confirmed that this area would be left undisturbed, as detailed in Section 9.10 of Chapter 9 (Geology and Soils) of this ES.
- 10.9.7 The receptors likely to be subjected to impacts as a result of the use of material assets include quarries and other sources of minerals, and

other finite raw material resources. The potential impacts associated with the use of material assets include:

- The availability of material assets and the subsequent impact on the demand for materials due to the consumption of raw resources. Materials would need to be imported to the site as it is assumed that the Scheme is unlikely to recover/reuse all the site won materials.
 - The depletion of non-renewable resources. The majority of materials needed on the Scheme comprise primary material as the Scheme is unlikely to be able to source all requirement materials from recycled/secondary materials.
- 10.9.8 Use of recycled and/or secondary material assets would be considered for new structures that form part of the Scheme, where feasible. Excavated material is expected to be reused on-site.
- 10.9.9 As indicated in the baseline study, sand and gravel have high reserves and landbank within Nottinghamshire (paragraph 10.8.10 and Table 10-6), which have been confirmed by Nottinghamshire County Council. The size of this MSA is significantly greater than the size of the Scheme. The total area of the Scheme within the MSA represents approximately 0.48 percent of the MSA area (paragraph 10.8.21). Based on the DMRB LA110 guidance¹, the Scheme will not sterilise an area greater than 1 percent of the MSA for sand and gravel (Table 10-3). Additionally, the Scheme is not likely to represent a risk to the MSA, as outlined in paragraph 10.8.22. Therefore, the Scheme is considered unlikely to have an impact on sterilisation of MSAs.
- 10.9.10 There are no other mineral and/or peat resources within 500 metres of the Scheme.
- 10.9.11 Prior extraction from this MSA may not be appropriate, as detailed in paragraph 10.8.21. Additionally, mitigation measures outlined in section 10.10 include the cut and fill balance, where the material extracted from the Scheme would be reused on the Scheme. These materials will also be managed in accordance with an Outline Materials Management Plan, within the First Iteration EMP [REP4-010]. These mitigation measures aim to ensure that all viable material extracted within the Order Limits will be reused in the Scheme, where technically appropriate and economically feasible.

Generation and management of waste

- 10.9.12 When considering the generation and management of waste, it is important to define when, under current legislation and understanding, a material is considered to be a waste. The EU Waste Framework Directive 2008/98/EC defines waste as “*any substance or object which the holder discards or intends or is required to discard*”. This definition continues to be applicable to the UK following the European Union (Withdrawal) Act (paragraph 10.3.17).

- 10.9.13 Waste is likely to be generated mainly from the site preparation works, which may result in the following waste arisings (although the list is not exhaustive):
- Green waste from vegetation clearance.
 - Inert waste from demolition and site preparation works.
 - Excavated materials (natural and made ground) which may be contaminated (and potentially classified as hazardous) or unsuitable for reuse without treatment.
 - Unsorted non-hazardous materials, such as timber, tarmac, signage, removal of existing footpaths.
 - Surplus materials from the site preparations, excavations, and construction.
 - Damaged stocks or cut-offs.
 - Debris and rubbish lying on the ground.
- 10.9.14 There are two permitted and one historical landfill sites within 500 metres from the Order Limits (paragraph 10.8.30 and Table 10-10). Therefore, there is a potential risk that some excavated material near these areas may be contaminated and hazardous.
- 10.9.15 An initial Ground Investigation has identified an area where contaminated soil may arise. This has been discussed in Chapter 9 (Geology and Soils) of this ES. It is not anticipated that excavation in this area would be to a depth where the contaminated land is exposed, and as such no impacts associated with hazardous waste are anticipated.
- 10.9.16 Waste from construction activities is likely to be generated from surplus site won materials (from excavations of natural and made ground), and materials brought to site which are not used for their original purpose.
- 10.9.17 The receptors likely to be subject to impacts as a result of waste generation and waste management are landfills and other waste management infrastructure. The potential impacts relating to the generation and management of waste on these receptors, without mitigation measures, are likely to be:
- Temporary occupation of waste management infrastructure capacity (from treatment of waste)
 - Temporary occupation of land for the storage of waste awaiting transfer off-site
 - Permanent reduction in landfill capacity (from disposal of waste)
- 10.9.18 The generation and management of waste that cannot be reused on site would require transport to off-site waste management facilities. The impacts of this activity during construction have been assessed within Chapter 5 (Air Quality) of this ES.

10.10 Design, mitigation and enhancement measures

Design measures

- 10.10.1 The Scheme has been designed, as far as reasonably practicable, to minimise effects on material assets and waste. Embedded mitigation for the Scheme is reported in Chapter 2 (The Scheme) of this ES.
- 10.10.2 Embedded mitigation measures incorporated in the Scheme design include features to ensure resource efficiency such as lowering land within the FCA to reduce material sent to landfill and retrofitting existing structures.

Mitigation measures

- 10.10.3 Mitigation measures of relevance during construction are included within the First Iteration Environmental Management Plan (EMP) [REP4-010] which would be developed into a Second Iteration EMP for implementation during construction of the Scheme. A Site Waste Management Plan, Materials Management Plan and Soil Management Plan would also be prepared in full as part of the Second Iteration EMP prior to construction commencing. Details on the First and Second Iteration EMPs, including how mitigation is secured within the draft DCO [REP4-003], is provided within Section 4.3 of Chapter 4 (Environmental Assessment Methodology) of this ES. Those mitigation measures of relevance to material assets and waste include the following:
- Materials would be delivered on a just-in-time basis to avoid damage or contamination that would lead to waste generation.
 - All suitable excavated material would be reused in the construction of the Scheme and in landscaping features along the A46, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site.
 - Where site won material is not available or suitable for reuse, secondary or recycled materials would be procured where available.
 - Temporary stockpiling of fill materials prior to incorporation in the Scheme would be avoided where possible, to ensure double handling and damage is minimised and, therefore, avoiding waste. However, where required, materials would be stockpiled in accordance with best practice and managed appropriately to limit the likelihood of damage or contamination.
 - Locally sourced materials and suppliers, ideally within 10 kilometres, would be identified and used, where possible. Additionally, borrow pits within the Order Limits have been identified (as shown in the General Arrangement Plans [AS-007]) and would be used, where possible, to minimise the import of materials to the Scheme. These borrow pits are

located to the east and to the west of Farndon roundabout, and to the west of Brownhills Junction.

- Precast elements would be used, where technically feasible, to ensure efficient use of materials and avoid generation of waste arisings from cut-offs.

10.10.4 The waste hierarchy and circular economy principles would be implemented throughout the construction phase to minimise disposal and maximise reuse and recycling of waste arisings. Opportunities for reuse and recycling of waste include (but are not limited to):

- Reusing excavated soils that includes stored topsoil on site in the landscaping features of the A46 or in FCA. Excavated materials would also be considered to create flood bund when possible. Surplus soils would be offered to projects in close proximity to the Scheme for reuse on land, whenever possible.
- Chipping green waste on site for use in the landscaping for the Scheme.
- Composting of green waste.
- Recycling inert materials by crushing, blending and subsequent reuse, as an aggregate.
- Reusing waste on other nearby Schemes, which includes reuse of C&D waste from bitumen road surfaces, existing footway, highway kerb stone, concrete, mortar, drainage pipes, rock, steel, asphalt.
- Reusing waste for uses with clear benefits to the environment, for example in the remodelling of agricultural land or in the restoration of nearby quarries or other excavation sites.
- Providing on site facilities to separate out waste to enable the recovery of material through recycling.
- Where waste must be taken to a recycling or disposal site, the Principal Contractor would ensure that the site has the appropriate permits. In addition, the suitable facility would be located as close to the works as possible to minimise the impacts of transportation, in particular the release of carbon emissions. The Principal Contractor would identify the closest and relevant treatment and disposal sites.

10.10.5 A non-exhaustive list of waste management facilities sites within 10 kilometres of opposite ends of the Order Limits of the Scheme are provided in Table 10-13. The ability for waste arisings to be deposited at these sites would be dependent on the conditions imposed on the sites by the relevant licence or permit. There may be other facilities in the vicinity of the Scheme that may be used.

10.10.6 An OSWMP has been produced and is contained within Appendix B of the First Iteration EMP **[REP4-010]** and would be developed into a full SWMP by the Principal Contractor prior to construction. The SWMP would ensure that waste is managed in accordance with the waste hierarchy and other relevant legislative requirements and would detail information on the waste carriers and waste management facilities that would be used.

- 10.10.7 An Outline Materials Management Plan (OMMP) is contained in Appendix B of the First Iteration EMP **[REP4-010]**. This has been produced to identify ways to reuse site won or excavated materials within the construction of the Scheme provided it meets the requirements of the CL:AIRE Code of Practice (CoP).³⁶ Refer to Chapter 9 (Geology and Soils) of this ES for further information. The OMMP would be developed into a full MMP by the appointed contractor.
- 10.10.8 Additionally, an Outline Soil Management Plan (OSMP) contained in Appendix B of the First Iteration EMP **[REP4-010]** has also been produced which sets out how soils are to be managed in accordance with Defra's Code of Practice (CoP). This would ensure that the quality of soil resources, won from the site, are maintained during construction so that they remain suitable for reuse, do not become contaminated and ultimately do not become waste. Refer to Chapter 9 (Geology and Soils) of this ES for further information. This OSMP would be developed into a full SMP by the Contractor prior to construction.
- 10.10.9 All contaminated waste (including soil) would be identified for proper management and transfer/disposal to an adequate waste management facility.
- 10.10.10 Material and waste audits would be undertaken throughout the construction phase to ensure that reuse and recycling targets are met on site and to ensure that there is no surplus of materials. The First Iteration EMP and its appendices **[REP4-010]** include measures to monitor the materials and waste. For example, the OSWMP (Appendix B of the First Iteration EMP **[REP4-010]**) includes measures to ensure waste monitoring during the construction phase, that includes types and quantities of waste generated.
- 10.10.11 The amount of waste that would arise during the construction of the Scheme would be subject to change as the construction progresses. In addition, it is expected that the mitigation measures described in Section 10.10 of this Chapter would be implemented to ensure that the waste generated would be adequately managed. Therefore, this assessment has been undertaken on a reasonable worst-case scenario basis, informed by experience on similar projects.
- 10.10.12 Best practice would be to minimise the generation of waste as much as possible in accordance with the waste hierarchy principles. The use of a First Iteration EMP, MMP and a SWMP would seek to implement the waste hierarchy and circular economy principles. Therefore, wherever technically appropriate and economically feasible, adequate mitigation measures would be applied to the Scheme, and therefore, the potential effects would be minimised.

Enhancement measures

- 10.10.13 During the preliminary design stage, the potential for reducing waste has been included in workshops aimed at incorporating sustainability features within the design, including a Design for Resource Efficiency (D4RE) workshop. This D4RE workshop identified opportunities to prevent, reduce, reuse or recycle waste materials and to improve resource efficiency early on in the design. The potential for further waste reduction and resource efficiencies needs to be taken forward during the detailed design stage by the design team, as an enhancement opportunity to incorporate any additional resource efficient opportunities into the detailed design of the Scheme.
- 10.10.14 Excavation works near potential MSAs would give consideration to the potential use of the minerals extracted, if any where technically appropriate and economically viable, rather than considering the material as waste. This would be considered particularly in works near the FCA in Kelham, where the Nottinghamshire Council has identified an area potentially viable for extraction of sand and gravel. Site won materials, including sand and gravel, would be reused within the Scheme, and if required further opportunities would be explored.
- 10.10.15 However, these enhancement measures have not been taken into account when determining significance of effects because they are over and above what is required to mitigate the adverse effects of the Scheme.

10.11 Assessment of likely significant effects

- 10.11.1 This section provides details on the effects for material assets use, and waste generation and management from the Scheme during the construction phase, having taken into consideration the mitigation measures described in Section 10.10 of this Chapter.

Material assets use

- 10.11.2 As stated in paragraph 10.9.4, it is not anticipated that there would be any significant effects relating to material assets use for the site preparation activities.
- 10.11.3 Demolition works that would be undertaken as part of the Scheme are mainly related to partial demolition of existing structures, in order to accommodate the construction of new structures required for the Scheme. Details of the demolition work are outlined in Table 10-19.
- 10.11.4 For the assessment of material assets requirements, the following information (where available) was used to estimate the percentage of site won material used on site and the percentage of recycled and/or secondary material used for the Scheme:

- The types and quantities of materials required to construct the Scheme.
- Any information on materials that contain secondary/recycled content.
- Any information on any known sustainability credentials of materials to be consumed.
- The type and volume of materials that would be recovered from off-site sources for use on the Scheme.
- The estimated cut and fill balance.
- The details of on-site storage and stockpiling arrangements, and any support logistical details.

10.11.5 The quantities of material assets available at the time of DCO submission, as stated in paragraph 10.6.7, have been used to estimate the quantities of material assets required for the construction of the Scheme, which have been summarised in Table 10-15. As it has been stated in paragraphs 10.6.3 and 10.6.4, materials used to produce finished products (such as pipelines, cables, signage, and communication systems) have not been included in this assessment.

Table 10-15: Summary of estimated material assets requirements for the Scheme

Scheme activity	Material assets required	Estimated quantity	Base of product
Vegetation clearance	No material assets would be required for vegetation clearance	N/A	N/A
Demolition works	No material assets would be required for demolition works	N/A	N/A
Construction works	Approved water stop	179m	Other, non-hazardous
	Asphaltic plug joint	6no	Other, non-hazardous
	Steel bar reinforcement, all nominal sizes	2,840t	Steel
	Bridge bearings	98no	Steel
	Bituflex	203m ²	Other, non-hazardous
	Cast-in-place piles, various diameters	3,400m	Aggregate-based
	Footways and paved areas	103m ³	Aggregate-based
	Class 6G material	11m ³	Aggregate-based
	Pipes, different diameters (drain pipe, uPVC pipe, P/E	768m	Plastic
	Perforated pipe	257m	Plastic
	Concrete grade C22.5/20	230m ³	Aggregate-based
	Cement bound granular mixture	44,288m ³	Aggregate-based
	Stainless steel dowel, various diameters	177no	Steel
	Class C uPVC size C3	169m	Plastic
	Narrow filter drain	9,306m	Plastic

Scheme activity	Material assets required	Estimated quantity	Base of product
	Expansion joint	6no	Other, non-hazardous
	Fabric reinforcement A393 (steel)	685m ²	Steel
	C32/40 unreinforced concrete	1,471m ³	Aggregate based
	Formwork class F1 to F4	9,996m ²	Timber
	Geotextile impermeable membrane	2,106m ²	Other, non-hazardous
	In-situ concrete reference grade C40/50	11,961m ³	Aggregate based
	In-situ concrete ST	460m ³	Aggregate based
	Joint filler board	258m ²	Other, non-hazardous
	Fabrication of subsidiary steelwork	2t	Steel
	Metal long rolled Tee galvanised	2no	Steel
	Solid concrete blocks	28m	Aggregate based
	Patterned profile formwork P4, P8	4,727m ²	Other, non-hazardous
	Pedestrian parapet	72m	Steel
	Structural pot bearings (free, fixed and guided)	98no	Steel
	Permanent erection of superstructure	297t	Steel
	Permanent GRP formwork	1,630m ²	Steel
	Permeable backing in rear face drainage	1,608m ²	Aggregate based
	Permeable layer for solid concrete blocks	28m ²	Aggregate based
	Plated girders	297	Steel
	Polyethylene tape	457m	Other, non-hazardous
	Polysulphide joint sealant	569m	Other, non-hazardous
	Porous concrete blocks	3,253m ²	Aggregate based
	Precast concrete beams	39no	Precast concrete
	Precast concrete combined drainage and kerbs	253m	Precast concrete
	Precast concrete kerbs	1,688m	Precast concrete
	Precast concrete edgings	8,506m	Precast concrete
	Precast concrete pipe	108m	Precast concrete
	Precast concrete pretensioned prestressed	28no	Precast concrete
	Precast concrete box	16no	Precast concrete
	Precast concrete double box	49no	Precast concrete
	Protection of steelwork against corrosion, Type 2	2,871m ²	Other, non-hazardous
	Rail fencing with timber	200m	Timber

Scheme activity	Material assets required	Estimated quantity	Base of product
	posts		
	Steel bearing piles, various sizes	10,412m	Steel
	Steel sheet piles	3,091m ²	Steel
	Cable	5,321m	Other, non-hazardous
	Surface drainage gutter	248m	Plastic
	Surface drainage tube	95m	Plastic
	Surface impregnation to plain/patterned surfaces with anti-graffiti paint	230m ²	Paint
	Two-way duct	5,321m	Other, non-hazardous
	uPVC duct	456m	Plastic
	Service duct, uPVC sleeve size	14m	Plastic
	Vehicle parapet, various heights	1,580m	Steel
	Bridge deck spray for waterproofing for structures	4,170m ²	Other, non-hazardous
	Mastic asphalt for waterproofing for structures	1,478m ²	Other, non-hazardous
	Bitumen for waterproofing (two coats) for structures	11,986m ²	Other, non-hazardous
	Nitocote ET 550 for waterproofing for structures	445m ²	Other, non-hazardous
	Retaining walls (anticipated total length)	1,935m	Aggregate based
	Concrete safety barrier containment	7,542m	Precast concrete
	Safety barrier containment	15,425m	Steel
	Type 1 unbound mixture	3,953m ³	Aggregate based
	AC32 dense base	17,033m ³	Aggregate based
	Binder course, AC20 and SMA10 bin 40/60	11,961m ³	Aggregate based
	Surface course	9,905m ³	Aggregate based
	AC6DSF 100/150	145m ³	Aggregate based
	Dense binder 40/60	399m ³	Aggregate based
	Tack coat	35,614m ²	Other, non-hazardous
	Concrete drainage channel systems	9,121m	Aggregate based
	Milling pavement	1,603m ³	Aggregate based
	Erosion control matting	24,412m ²	Other, non-hazardous
	Geosynthetic clay liner	24,412m ²	Other, non-hazardous
	Geotextile jute membrane	15,436m ²	Other, non-hazardous
	Geotextile separator	243,524m ²	Other, non-hazardous
	Lining intercepting ditches	28,005m ²	Other, non-hazardous

Scheme activity	Material assets required	Estimated quantity	Base of product
	Connection to existing system lateral displacement	4no	Steel
	Terminal section lateral displacement	29no	Steel
	Transition from containment	3no	Steel
	Paint for line in white thermoplastic	55,946m	Paint
	Bi-directional reflecting road stud	4,384no	Other, non-hazardous

Source: Quantities of materials assets available at the time of DCO submission

10.11.6 Table 10-16 summarises the aggregate and aggregate based materials that are required in the construction of the Scheme.

Table 10-16: Anticipated volumes of aggregate based material assets to be used in the Scheme

Material	Volume (m ³)
Class 6G material	11
Concrete related materials	14,122
Cement bound granular mixture	44,288
Type 1 unbound mixture	3,953
Base materials (such as dense base, surface course, binder course, etc.)	39,433
Footways and paved areas	1,706
Total aggregate based material	103,513

Source: Table 10-15

10.11.7 The majority of raw materials required for the Scheme are aggregate, aggregate based products, and steel (Table 10-15). The recycle content of this material that could be used in the Scheme is unknown at this stage, but it is expected to meet the regional target plan for the recycled and secondary aggregate (see paragraph 10.11.14). Best practice would be to use materials with a high proportion of sustainable features and benefits compared to industry-standard materials where it is technically appropriate and economically feasible to do so.

10.11.8 Aggregate materials are available in the Nottinghamshire region; sand and gravel and Sherwood sandstones landbanks are considerably above the minimum landbanks set out by NPPF, which is of seven years (Table 10-6). Sufficient steel is available within the UK (Table 10-5).

10.11.9 For the construction of the Scheme, the implementation of the measures outlined in Section 10.10 aims to ensure the efficient use of material assets on site. The recycled content of the material that could be used in the Scheme is unknown at this stage but would be as high as possible, where technically appropriate and economically feasible.

10.11.10 Table 10-17 provides indicative figures for the earthwork volumes that is expected to be required by the Scheme. It is expected that approximately 251,940 cubic metres of excavated material would arise from the Scheme, and a total of 1,040,289 cubic metres of material would be required for fill activities, which is likely to be imported to the site.

Table 10-17: Estimate cut and fill volume balance at the Scheme

Earthwork activity	Cut (m ³)	Fill (m ³)	Additional notes
Excavation of acceptable material class 5A (likely to be topsoil)	122,154	-	
Excavation of acceptable material excluding class 5A	106,021	-	
Excavation of unacceptable material in Class U1A	10,685	-	
Extra over excavation for excavation in hard material	10,685	-	
Deposition of acceptable material within the Scheme	-	100,977	Likely to be reused
Imported acceptable material Class 1	-	416,145	
Imported acceptable material Class 6C	-	177,972	Borrow pits may be used to import up to 70% of acceptable material Class 6C and 6I/6J
Imported acceptable material Class 6I/6J	-	158,718	
Imported acceptable material Class 6F1/6F2	-	28,176	Likely to be recycled material
Imported acceptable material Class 6N/6P	-	45,822	
Imported acceptable material for granular bedding	-	240	
Surplus topsoil to be designated for landscaped areas	-	70,300	Likely to be reused
Topsoiling to surfaces	-	35,511	Likely to be reused
Trench for cable/duct	2,395	-	
Disposal of acceptable material excluding class 5A, to be used within the Scheme	-	15,727	Likely to be reused
Total	251,940	1,049,588	
Total imported material	827,070		
Total fill material from reuse/recycled sources	250,690 (of which 222,515 m ³ is reuse of material)		
Total fill material potentially from borrow pits*	235,685		

Source: Available quantities for the Scheme at the time of DCO submission

10.11.11 It is not anticipated that all site won material would be reused on the Scheme, due to the potential poor quality of the material and its

unsuitability for use as structural fill. Therefore, it is likely that material required for the construction of the Scheme, including backfilling of structures, would be imported to the Scheme. A worst-case scenario implies fill material and other construction material would need importing to the Scheme and all excavated material would be landfilled. Nonetheless, topsoil is anticipated to be taken to FCAs, and excavated material would be used to create flood bunds, where possible. Additionally, surplus of excavated materials would potentially be suitable to be reused in earth bunds, the landscaping for the Scheme (such as creating shallow margins to enable vegetation to be established), or used to backfill the excavated borrow pits. Any slop-based material recovered from the cut material would be reused in the non-structural fill, and, any soil-based material would be reused on-site, when possible.

- 10.11.12 Therefore, from the 251,940 cubic meters of excavated material anticipated to arise from the Scheme, approximately 222,515 cubic metres are anticipated to be reused within the Scheme (Table 10-17). This indicates that approximately 88% of the excavated materials would be reused within the Scheme.
- 10.11.13 Borrow pits may be used to minimise the imports of acceptable material Class 6C and Class 6I/6J. In this sense, material from borrow pits are estimated to represent up to 70 percent of the required quantities for each material. Therefore, it is estimated that approximately 124,580 cubic meters of acceptable Class 6C material and 111,103 cubic meters of acceptable 6I/6J material may come from borrow pits, for a total of 235,683 cubic meters (Table 10-17).
- 10.11.14 The volume of the imported material required for fill would depend greatly on the characteristics of the existing ground and the technical requirements for the construction of the Scheme. The total fill material required by the Scheme is 1,049,588 cubic meters, of which 222,515 cubic meters of site won material, 28,176 cubic meters of recycled aggregates (Table 10-17) and 235,685 cubic meters from borrow pits (Table 10-17) will be reused on the Scheme. This equates to approximately 46 percent of fill materials required for the Scheme. Premade and precast elements (such as steel structures, ducts, signs, etc) would also require importing to the Scheme.
- 10.11.15 It is anticipated that there would be a direct and permanent effect on the availability of material assets and in the depletion of non-renewable resources, due to the use of material assets during the construction phase. The estimated quantities of materials assets required by the Scheme are listed in Table 10-15; and Table 10-16 outlines the approximate volumes of aggregate based materials likely to be used in the construction of the Scheme.
- 10.11.16 As stated in paragraph 10.8.11, Nottinghamshire does not have crushed rock resources of its own, and so some materials (such as Class 6G and Type 1 unbound mixture) are likely to be imported from other regions. Based on the total availability of aggregate in

Nottinghamshire, which is of 31.84 million tonnes (Table 10-6), the Scheme is likely to use approximately 3.5 percent of the available total aggregate reserve.

10.11.17 Table 10-18 provides a detailed assessment of the effects on material assets use.

Table 10-18: Assessment of material assets use in the construction phase of the Scheme

Scheme activity	Potential impact associated with material use	Description of effects	Mitigation measures	Significance of effect (with mitigation)
Vegetation clearance	None	It is not expected that there would be any substantial use of material assets for vegetation clearance.	N/A	Neutral
Demolition	None	It is not expected that there would be any substantial use of material assets for demolition activities.	N/A	Neutral
Construction	Materials would need to be imported to the site as it is assumed that the Scheme is unlikely to recover/reuse all the site won materials.	The implementation of design and mitigation measures, as outlined in section 10.10, would ensure the efficient use of material assets on site. All required fill material for the earthworks cannot be provided from site won material due to the potential poor quality of the material and its unsuitability for use as structural fill. The OSWMP would seek to manage waste up in the waste hierarchy and to monitor the waste management. It is anticipated that the Scheme would achieve more than 80% of overall material recovery/recycling of non-hazardous C&D waste, considering the reuse of excavated material across the Scheme (paragraph 10.11.2 and Table 10-17 This is classed as a Slight Adverse effect based on Table 10-3. Effects would be direct, permanent and adverse, but not significant.	Site won material would be considered where technically appropriate and economically feasible. Topsoil is anticipated to be reused FCAs, excavated material would be used to create flood bund; surplus from excavation materials would be suitable to be reused in the landscaping for the Scheme and material recovered from the excavation material would be suitable to be reused in the non-structural fill (paragraph 10.11.11).	Slight Adverse
	The majority of materials needed on the Scheme comprise primary material as the Scheme is unlikely to be able to source all	The baseline study (section 10.8) has indicated adequate supply of aggregates within Nottinghamshire, and the use of the available sand and gravel by the Scheme is anticipated to be less than approximately 3.5%. With the implementation of the design and mitigation measures outlined in section 10.10, it is anticipated that at least 46% of fill materials would	All suitable excavated material would be reused in the construction of the Scheme and in landscaping features along the A46, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site.	Slight Adverse

Scheme activity	Potential impact associated with material use	Description of effects	Mitigation measures	Significance of effect (with mitigation)
	requirement materials from recycled/secondary materials.	consist of reused or recycled materials, and from borrow pits (Table 10-17). This is above the 14% for the regional target adopted for aggregates provision in England. ⁴³ This is classed as a Slight Adverse effect based on Table 10-3. Effects would be direct, permanent and adverse, but not significant.	Where site won material is not available or suitable for reuse, secondary or recycled materials would be procured where available.	
	Sterilisation of MSA or peat resources.	Data and information in the baseline study (Section 10.8) has indicated that there is one MSA for sand and gravel within the study area; and there are no peat resources (paragraph 10.8.20). However, paragraph 10.8.21 outlines reasons of why prior extraction may not be appropriate. The Scheme only covers approximately 0.48% of the total MSA area in Nottinghamshire (paragraph 10.9.9) and includes the area stated in paragraph 10.8.13, and will not sterilise an area greater than 1% of the MSA. Therefore, the Scheme development is unlikely to represent a risk to the MSA (Table 10-3). There are no other MSA and/or peat resources in proximity to the Scheme.	N/A	Neutral

Source: Based on information provided in Table 10-3 and Table 10-4, and professional judgement

Generation and management of waste

- 10.11.18 As a worst-case scenario is assumed during the site preparation and construction phase of the Scheme, where all waste is sent to landfill, and the reduction of landfill void capacity in the East Midlands region is anticipated.
- 10.11.19 An estimate of quantities of waste likely to be generated is based on the quantities of materials assets available at the time of DCO submission, for material assets use and volume of soil to be excavated and used for on site filling activities.
- 10.11.20 Demolition of minor structures would be required as part of the structure modifications for the Scheme. Two commercial buildings would be completely demolished and road planing would be removed. Table 10-19 provides an outline of the types of demolition activities anticipated to be carried out as part of the Scheme, in addition with the initial estimation of waste arising from the demolition works.

Table 10-19: Anticipated demolition activities within the Scheme

Structure	Minor demolition of structure	Initial waste arising estimations (m ³)	Type of waste
Windmill viaduct	South wingwall trim	Steel: 0.17	Non-hazardous
		Concrete: 5.96	Inert
Farm access	Parapet	Steel: 0.04	Non-hazardous
		Concrete: 0.00	Inert
	Edge beam	Steel: 0.04	Non-hazardous
		Concrete: 1.63	Inert
	Wingwall trim	Steel: 0.09	Non-hazardous
		Concrete: 3.21	Inert
Nottingham to Lincoln Railway Line West	SW foundation	Steel: 0.64	Non-hazardous
		Concrete: 23.13	Inert
	NW foundation	Steel: 0.19	Non-hazardous
		Concrete: 6.58	Inert
	SW wingwall	Steel: 1.27	Non-hazardous
		Concrete: 45.83	Inert
	NW wingwall	Steel: 0.38	Non-hazardous
		Concrete: 13.75	Inert
Nottingham to Lincoln Railway Line East	Parapet	Steel: 0.76	Non-hazardous
		Concrete: 27.50	Inert
	M8 precast beams x 2	Steel: 0.51	Non-hazardous
		Concrete: 16.67	Inert
	Wingwalls	Steel: 0.51	Non-hazardous
		Concrete: 18.33	Inert
Nether Lock	Retaining wall north of railway span	Steel: 2.29	Non-hazardous
		Concrete: 82.50	Inert
Sewage work	Foundations	Steel: 0.25	Non-hazardous
		Concrete: 9.17	Inert
	Wingwalls	Steel: 0.19	Non-hazardous
		Concrete: 6.88	Inert
Other minor structures	Lighting, signage, VRS, etc.	Steel: 64	Non-hazardous
		Concrete: 288	Inert
Businesses and	Demolition of the old salt	Timber: 15	Non-hazardous

Structure	Minor demolition of structure	Initial waste arising estimations (m ³)	Type of waste
properties	barn to the south-west quadrant of the existing Cattle Market Roundabout.*	Metal: 1.53	Non-hazardous
		Concrete: 175	Inert
	Demolition of the Mint Leaf restaurant located within the Friendly Farmer Junction adjacent to the Esso service area.*	Brick and blocks: 25	Non-hazardous
		Mixed waste: 27	Non-hazardous
		Concrete: 33	Inert
		Asphalt: 100	Non-hazardous
Road planings	Across the Scheme	Asphalt: 2375	Non-hazardous
Approximate total non-hazardous waste arisings (m ³)		2,656	
Approximate total inert waste arisings (m ³)		758	

Source: Quantities of materials assets available at the time of DCO submission. Note: *These would be completely demolished

10.11.21 Based on the quantities of materials assets available at the time of DCO submission for the Scheme, waste arisings from construction activities have not been quantified yet. However, based on professional judgement, a worst-case scenario would assume that 10 percent of materials assets required for the Scheme and brought to the site would become waste due to damages, cut-offs or surplus. Table 10-20 outlines the potential losses of aggregate based materials in the event of a worst-case scenario.

10.11.22 The volume of surplus topsoil not utilised in landscaping activities is considered to give arise to potential waste material.

Table 10-20: Summary for potential losses of aggregate based and excavated materials during construction

Scheme activity	Material	Quantity (m ³)	Waste type
Earthworks	Deposition of acceptable material within the Scheme	10,098	Inert waste
	Imported acceptable material Class 1	41,615	Inert waste
	Imported acceptable material Class 6C	17,797	Inert waste
	Imported acceptable material Class 6I/6J	15,872	Inert waste
	Imported acceptable material Class 6F1/6F2	2,818	Inert waste
	Imported acceptable material Class 6N/6P	4,582	Inert waste
	Imported acceptable material for granular bedding	24	Inert waste
	Surplus of topsoil material	16,343	Non-hazardous waste
Construction	Class 6G material	1.1	Inert waste
	Concrete related materials	1,412	Inert waste
	Cement bound	4,429	Inert waste

Scheme activity	Material	Quantity (m³)	Waste type
	granular mixture		
	Type 1 unbound mixture	395	Inert waste
	Base materials (such as dense base, surface course, binder course, etc.)	3,943	Inert waste
	Footways and paved areas	171	Inert waste
Total	Inert waste	103,157	
	Non-hazardous waste	16,343	

Source: Table 10-16 and Table 10-17

10.11.23 Table 10-21 presents the main waste streams that are likely to be generated during the construction phase of the Scheme.

Table 10-21: Summary of estimated waste arisings from the Scheme during construction phase

Scheme activity	Waste arising	Estimated quantity	Additional information
Site clearance and preparation	Green waste	Approximate area of vegetation clearance is 1.35km ² , which an approximate 1,550 tonnes of green waste anticipated to be generated	Vegetation to be removed is not yet quantified, but it is anticipated that an approximate area of 1.35km ² would require vegetation removal. It is assumed that green waste would be cleared and chipped on site, or sent off-site for composting.
	General clearance	Approximate area to be cleared is 2.28km ²	Waste arisings from general clearance are not yet quantified, but it is anticipated that an approximate area of 2.28km ² would require general clearance. Waste would be removed and sent off-site for recovery, recycling, or disposal. Disposal would be considered as a last option, following the waste hierarchy.
	Excavated materials	29,425m ³	All suitable excavated soil to be reused on site for backfilling and landscaping works, where feasible. See Table 10-17 for further details of excavated material.
Demolition works	Inert and non-hazardous waste	Inert waste: 758m ³ Non-hazardous waste: 2,656m ³	Initial waste arisings from demolition activities have been estimated and presented in Table 10-19. There would be several minor demolitions, two premises/businesses would be completed demolished, and road planing would be removed as part of the Scheme. Waste arisings from demolition activities would be sorted and sent off-site to C&D recycling facilities, when possible and would not be deposited to a landfill.
Construction	Waste from materials brought to site that are not used for their original purpose, for example damaged items, cut-offs and surplus materials	Not yet quantified	Quantities of waste arising from construction are unknown. A worst-case scenario, where losses of material assets are likely to be 10% of construction materials due to damages, cut-offs or surplus. Table 10-20 outlines the potential losses for aggregate-based materials.

Source: Quantities of materials assets available at the time of DCO submission

- 10.11.24 Based on the available information for quantities of material assets for DCO submission, the Scheme is unlikely to generate large quantities of liquid waste. Any waste (liquid and solid) that may be generated from the activities undertaken at the temporary construction compounds would be sent to a waste treatment facility and therefore would be diverted from landfill. This would be monitored through the OSWMP contained within Appendix B of the First Iteration EMP **[REP4-010]** .
- 10.11.25 A worst-case scenario would be if all non-hazardous material identified for disposal in landfill (refer to Table 10-17 and Table 10-20). If this scenario is assumed, then anticipated non-hazardous waste arisings would be approximately:
- 29,425 cubic meters of non-hazardous excavated material
 - 2,656 cubic meters of non-hazardous material from demolition works
 - 16,343 cubic meters of non-hazardous waste from potential losses during construction works.
- 10.11.26 The East Midlands landfill void capacity for non-hazardous waste, is approximately 33 million cubic metres (Table 10-11). However, as stated in Table 10-12, NCC has confirmed that there are non-hazardous landfill sites which will not be suitable to receive waste from the Scheme. Therefore, the available regional non-hazardous landfill void for the Scheme would be of approximately 29 million cubic meters. The disposal of the non-hazardous waste arisings from the Scheme, in a worst-case scenario, would be approximately 48,500 cubic metres. This would reduce the regional landfill void capacity for non-hazardous waste by approximately 0.16 percent.
- 10.11.27 Inert waste arisings would be mainly from demolition works and waste derived from construction material. For a worst-case scenario, it is assumed that some demolition material would generate inert waste and would require disposal to landfill. As a worst-case scenario, inert waste arisings from construction activities are estimated to be approximately:
- 760 cubic meters from demolition works
 - 103,157 cubic meters from aggregate based materials from the construction works
- 10.11.28 The East Midlands inert landfill void capacity is approximately 21.5 million cubic meters (Table 10-11). However, as stated in Table 10-12 NCC has confirmed of one inert landfill that will not be suitable to receive waste from the Scheme. Therefore, the regional inert landfill void capacity for the Scheme would be of approximately 21.2 million cubic meters. The disposal of inert waste arisings from the Scheme, in a worst-case scenario, would be of approximately 103,900 cubic metre. This represents 0.49 percent of the regional inert landfill void capacity.

- 10.11.29 The volume of hazardous waste that may be generated by the Scheme is currently unknown. A Ground Investigation survey helped to establish the potential for excavated materials to be classified as hazardous, particularly on the areas located near historical and permitted landfills. An initial Ground Investigation identified one potential area to contain contaminated material. Site testing has confirmed contamination of this area, however, material in this area would be left undisturbed and in-situ; further details are contained in Chapter 9 (Geology and Soils) of this ES. Therefore, contaminated excavated material is not anticipated to arise from the Scheme.
- 10.11.30 If hazardous material arises during construction, the SWMP procedures for handling and storing of this waste would be followed to ensure cross-contamination does not occur. Appendix 9.2 (Contaminated Land Risk Assessment) of the ES Appendices [APP-164 - APP-169] should be referred to for further information.
- 10.11.31 Two permitted landfills and one historical landfill are located within 500 metres of the Order Limits (paragraph 10.8.30) of the Scheme. A worst-case scenario is assumed where all excavated material from the surrounding areas of these landfills are hazardous, equating to approximately 2,824 cubic meters of hazardous waste that would require disposal to the hazardous landfill. The East Midlands landfill void capacity for hazardous waste is approximately 807,550 cubic metres (Table 10-11). Therefore, considering a worst-case scenario, the hazardous waste arisings would occupy approximately 0.35 percent of the regional landfill void capacity.
- 10.11.32 Table 10-22 provides a detailed assessment of the effects from waste generation and management from the Scheme.

Table 10-22: Assessment of generation and management of waste during the construction phase of the Scheme

Scheme activity	Potential impact associated with waste generation	Description of effects	Mitigation measures	Significance of effect (with mitigation)
Vegetation clearance	None	Vegetation to be removed from the Scheme is assumed to be chipped and reused for landscaping along the Scheme. As a worst-case scenario, vegetation removed would be sent off-site to recover, for composting. Therefore, it would be diverted from landfill.	Chipping green waste on site for use in the landscaping for the Scheme. Composting of green waste.	Neutral
Site preparation (including excavation and demolition works)	Production of inert waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	Initial estimates of inert waste arisings from the demolition works have been quantified, which is approximately 756m ³ . A worst-case scenario where all inert waste from demolition works is sent to landfill for disposal, would cause less than 1% reduction of the regional inert landfill void capacity (paragraph 10.11.28). Therefore, there is sufficient capacity to accommodate inert waste arisings from the Scheme without compromising the integrity of the receiving infrastructure within the region, if disposal to landfill is required. Effects would be direct and adverse, but not significant (Table 10-3 and Table 10-4).	The Scheme would aim to implement the waste hierarchy principles, and the implementation of measures outlined in Section 10.10 and would look to reuse and reduce waste. Measures to implement circular economy and waste hierarchy principles are detailed in the First Iteration EMP [REP4-010] and include: • Providing on site facilities to separate out waste • Recycling inert materials • Reusing inert waste materials on the Scheme or on other nearby Schemes • Diverting waste from landfill by identifying appropriate and permitted waste management facilities to recycle or recover waste inert waste.	Slight Adverse
	Production of non-hazardous waste resulting in the	Non-hazardous waste would arise mainly from the excavation works. A worst-case scenario assumes that all non-hazardous waste is sent	The Scheme would aim to implement the waste hierarchy principles, and the implementation	Slight Adverse

Scheme activity	Potential impact associated with waste generation	Description of effects	Mitigation measures	Significance of effect (with mitigation)
	temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	to landfill for disposal; therefore, in a worst-case scenario approximately 29,500m ³ of excavated material would be disposed to landfill, and additionally 2,656m ³ to arise from demolition works. A worst-case scenario anticipates that non-hazardous waste arising across the Scheme represents approximately 0.11% of the regional landfill void capacity. However, the Scheme would aim to implement the waste hierarchy principles, and the implementation of measures outlined in Section 10.10 would likely reduce the effects through the reuse and recycling of waste. Effects would be direct and adverse, but not significant (Table 10-3 and Table 10-4).	of measures outlined in Section 10.10 and would look to reuse and reduce waste. Measures to implement circular economy and waste hierarchy principles are detailed in the First Iteration EMP [REP4-010] and include: • Providing on site facilities to separate out waste • Reusing excavated materials within the Scheme or on other nearby Schemes • Diverting waste from landfill by identifying appropriate and permitted waste management facilities to recycle or recover non-hazardous waste	
	Production of hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	Hazardous waste arisings from the Scheme are not yet quantified. A worst-case scenario would be that all excavated materials in the close proximity to the surrounding areas of the permitted and historical landfills is classed as hazardous. For the worst-case scenario, approximately 2,824m ³ of material would be classed as hazardous, which represents approximately 0.35% of the regional landfill capacity. Effects would be direct and adverse, but not significant (Table 10-3 and Table 10-4).	A full SWMP would be prepared to ensure that waste is managed in accordance with the waste hierarchy and other relevant legislative requirements. In the event that hazardous waste arises, the SWMP procedures for handling and storing of this waste, would be followed to ensure cross-contamination does not occur. The full SWMP would be developed based on the principles and mitigation detailed within the OSWMP (Appendix B of the First Iteration EMP [REP4-010]).	Slight Adverse

Scheme activity	Potential impact associated with waste generation	Description of effects	Mitigation measures	Significance of effect (with mitigation)
Construction	Production of inert, non-hazardous, and hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	Waste arisings from the construction of the Scheme would be subject to change as the construction progresses. Although waste arisings from the construction phase are not yet estimated, it is not expected that high quantities of waste would arise. Examples of waste that may arise are: • Inert waste: damaged stock, cut-offs, surplus materials. • Non-hazardous waste: packaging, damaged stock, surplus materials, office-related waste, general debris, excavated material. • Hazardous waste: contaminated materials or packaging. A worst-case scenario, where aggregate based materials would have 10% of losses, estimates approximately 103,157m³ of inert waste from aggregate based materials (Table 10-20), and 16,500m³ of non-hazardous waste arisings (Table 10-20). This scenario estimations represent less than 1% of the regional landfill void capacity for both non-hazardous and inert waste. The implementation of mitigation measures outlined in Section 10.10 would likely reduce the effects through the reuse and recycling of waste. Effects would be direct and adverse, but not significant (Table 10-3 and Table 10-4).	Waste arisings from the construction phase are expected to be managed up in the waste hierarchy and, therefore, diverted from landfill. The implementation of measures outlined in Section 10.10 and would look to reuse and reduce waste. Measures to implement circular economy and waste hierarchy principles are detailed in the First Iteration EMP [REP4-010] and include: • Incorporating resource efficiency and circular economy principles into the design of the Scheme • Delivering Materials on a just-in-time basis • Using pre-cast elements, where technically feasible • Implementing waste hierarchy principles, for example by: • Providing on site facilities to separate out waste • Recycling inert materials • Reusing inert waste materials on the Scheme or on other nearby Schemes • Diverting waste from landfill by identifying appropriate and permitted waste management facilities to	Slight Adverse

Scheme activity	Potential impact associated with waste generation	Description of effects	Mitigation measures	Significance of effect (with mitigation)
			recycle or recover inert and non-hazardous waste.	

Source: Based on information provided in Table 10-3 and Table 10-4, and professional judgement

10.12 Monitoring

- 10.12.1 There are no significant effects anticipated for material assets use and waste management and generation as a result of the Scheme.
- 10.12.2 In accordance with Requirement 3 of the draft DCO **[REP4-003]** a Second Iteration EMP will secure the monitoring requirements and procedures to reduce or eliminate impacts on the environment during construction of the Scheme, as summarised below.
- 10.12.3 Material and waste arisings would be monitored throughout the construction phase as detailed in the OSWMP and OMMP. The OSWMP and OMMP would be developed into a full SWMP and MMP as part of the Second Iteration EMP. Undertaking monitoring audits on a regular basis would give an indication of where continual improvements to waste management and minimisation can be made throughout the construction phase. The SWMP would be used to measure and monitor the types and quantities of waste taken off-site, to ensure that the waste hierarchy is being implemented where practicable. Environmental management and compliance will also be monitored through measures outlined within the First Iteration EMP and its appendices, including the OSWMP.
- 10.12.4 The OSWMP ensures that all waste leaving the site will be recorded and monitored by the contractor. Through the OSWMP it can be recorded the quantities of waste arising from the Scheme, with a description of the waste, its origin, and the waste contractors' details for transport and treatment/disposal facilities where waste is taken.

10.13 Conclusions

- 10.13.1 It is anticipated that a large quantity of materials would be required for the construction of the Scheme, particularly aggregate, aggregate based materials and steel-related materials. There is sufficient availability for sand and gravel and Sherwood sandstones within Nottinghamshire, and sufficient availability of steel within the UK.
- 10.13.2 The design and mitigation measures outlined would ensure the efficient use of material assets on site, the reuse of material is made a priority and recycled or secondary material is used wherever technically appropriate and economically feasible. This would be in line to achieve the regional percentage target specified for aggregates provision in England.⁴³
- 10.13.3 Sterilisation of MSA and/or peat resources is not anticipated by the Scheme.
- 10.13.4 Following the implementation of the design and mitigation measures, as outlined within the assessment, a Slight Adverse effect is expected

for the use of primary material and the significance of effect for material assets use is Not significant.

- 10.13.5 It is anticipated for the Scheme to generate waste during the construction stage, including the site clearance, demolition and construction works. The key environmental effect resulting from the generation and management of waste is the impact on reduction or alteration in the regional capacity of waste infrastructure. The design and mitigation measures outlined would ensure the implementation of circular economy and the waste hierarchy principles, aimed to minimise the generation of waste in the first place.
- 10.13.6 A worst-case scenario is anticipated where inert waste from aggregate based materials would generate the largest quantities of waste within the Scheme. In a worst-case scenario, non-hazardous waste arisings are anticipated to be less than 0.12 percent of the regional non-hazardous landfill void capacity. Inert waste from demolition works is not yet quantified, but as demolition works comprise mainly partial demolition of structures, it is not anticipated to be of large quantities of inert waste. Potential arising of hazardous waste is not yet quantified and worst-case scenario does not anticipate hazardous waste arisings to be greater than the 0.35 percent of the regional hazardous landfill void capacity.
- 10.13.7 Following the implementation of the design and mitigation measures, as outlined within the assessment, it is concluded that there are negligible effects associated with vegetation clearance and construction works. A Slight Adverse effect is anticipated for site preparation works, which includes excavation and demolition works. Therefore, the significance of effect for waste management and generation is Not significant.

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