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London Luton Airport Expansion

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Volume 5 Environmental Statement and Related Documents

5.01 Chapter 19 Waste and Resources

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5.01 ENVIRONMENTAL STATEMENT CHAPTER 19: WASTE AND RESOURCES

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19 WASTE AND RESOURCES

19.1 Introduction

19.1.1 This chapter presents the assessment of likely significant effects of the Proposed Development on waste and resources.

19.1.2 Waste and resources comprise:

a. the generation and management of waste; and

b. the consumption of materials and products (from primary, recycled or secondary, and renewable sources).

19.1.3 Resources are defined as:

a. construction materials and products; and

b. assets associated with the management of waste or production of materials such as landfill capacity, safeguarded waste sites and mineral safeguard sites.

19.1.4 Waste is defined in the European Waste Framework Directive (2008/98/EC, Waste FD) (Ref. 19.1) as *"any substance or object which the holder discards or intends or is required to discard".*

19.1.5 The following effects of the Proposed Development have been assessed:

a. the availability of resources, specifically key construction materials during construction and operation; and

b. landfill void capacity during construction and operation.

19.1.6 Matters scoped in and out of this assessment on waste and resources and where waste and resources are covered by other chapters are listed in **Section 19.3**.

19.1.7 The remainder of this chapter consists of:

a. **Section 19.2** Legislation, policy and guidance relevant to the scope and methodology of the waste and resources assessment;

b. **Section 19.3** Scope of the assessment;

c. **Section 19.4** Stakeholder engagement undertaken to inform the assessment;

d. **Section 19.5** Methodology applied to the assessment;

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g. **Section 19.8** Embedded and good practice mitigation;

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l. **Section 19.13** Cumulative effects;
m. **Section 19.14** Monitoring; and
n. **Section 19.15** Assessment summary.

19.2 Legislation, Policy and Guidance

19.2.1 This section identifies the key legislation, policy and guidance relevant to the scope and methodology for the waste and resources assessment which have influenced the type of mitigation measures that have been embedded in the design of the Proposed Development and incorporated during construction and operation.

19.2.2 **Table 19.1** to **Table 19.4** provide a description of the relevant legislation, policy and guidance, and where each of these have been addressed in this Environmental Statement (ES).

Legislation

Table 19.1: Waste and resources legislation

Legislation	How and where addressed in ES
Waste FD (Ref. 19.1) Establishes the wider regulatory context for waste management across Europe. In addition to defining waste, it also introduces the concept of the waste hierarchy and establishes landfill diversion targets for member states. The requirements of the Waste FD are transposed into applicable national law through the Waste (England and Wales) Regulations 2011 (UK Statutory Instruments (SI) 2011/988) (Ref. 19.2) as amended and other national waste legislation and policies including but not limited to: a. The Environmental Permitting (England and Wales) Regulations 2016 (SI 2016/1154) (Ref. 19.3) as amended by Environmental Permitting (England and Wales) (Amendment) (EU Exit) Regulations 2018 (SI 2018/0000) (Ref.19.4)	The assessment of waste and resources has taken account of the waste hierarchy in the management of waste, and of the targets for recovery of non-hazardous construction and demolition waste. **Paragraphs 19.8.2-19.8.5** in **Section 19.8** outline how the waste hierarchy has been and will be applied to the Proposed Development. **Paragraph 19.8.5** outlines the targets that will be applied to the Proposed Development.
Waste (England and Wales) Regulations 2011 (as amended) (Ref. 19.2) Environmental Protection Act 1990 (as amended) (Ref. 19.5) The Waste (England and Wales) Regulations 2011 (as amended)	The assessment of waste and resources has taken account of the waste hierarchy in the management of waste, and of the targets for recovery of non-hazardous construction and demolition waste. **Paragraphs 19.8.2-19.8.5** in **Section 19.8** outline how the waste hierarchy has been and will be applied to the Proposed Development. **Paragraph 19.8.5** outlines

Legislation	How and where addressed in ES
transposes the requirements of the Waste FD in England and Wales and outlines duty in relation to the waste hierarchy. The waste hierarchy prioritises waste prevention, followed by preparing for reuse, recycling, recovery and finally disposal to the management of waste. The Regulations require businesses to apply the waste hierarchy when managing waste, and also require that measures are taken to ensure that, by the year 2020 and beyond, at least 70% by weight of non-hazardous construction and demolition waste is subjected to material recovery. The duty of care for waste management is set out under section 34 of the Environmental Protection Act 1990 and the Waste (England and Wales) Regulations 2011 (as amended). It requires anyone who produces, imports, keeps, stores, transports, treats or disposes of waste to take all reasonable steps to ensure that the waste is managed properly.	the construction targets that would be applied to the Proposed Development. The target for construction goes beyond legislative requirements: Achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste. Uncontaminated excavated soil and stones (European Waste Catalogue / List of Wastes code 17 05 04) are specifically excluded from this target. Recovery is deemed to include reuse, recycling and recovery (e.g. energy recovery). Details of the duty of care for waste management requirements for the contractor are set out in the Outline Site Waste Management Plan (OSWMP) provided as **Appendix 19.1** of this ES **[TR020001/APP/5.02]**. Details of waste and resources management requirements for the operator are set out in the Outline Operational Waste Management Plan (OOWMP) provided as **Appendix 19.2** of this ES **[TR020001/APP/5.02]**.
The Environmental Permitting (England and Wales) Regulations 2016 (Ref. 19.3) as amended by Environmental Permitting (England and Wales) (Amendment) (EU Exit) Regulations 2018 (Ref. 19.4) The Regulations require sites where waste is processed, treated or disposed of to hold a valid Environmental Permit issued by the Environment Agency (EA). The Regulations also include a schedule of activities that are exempt from the requirements of permitting. However, to comply with the Regulations, an exempt activity must generally be registered with the EA before commencing.	Details of the permits and exemption requirements for the contractor are set out in the OSWMP in **Appendix 19.1** of this ES **[TR020001/APP/5.02]** (high level requirements), the Outline Remediation Strategy (for former Eaton Green Landfill Site (**Appendix 17.5** in this ES **[TR020001/APP/5.02]**) (details of the remediation of the historic landfill) and **Chapter 17** Soils and Geology of this ES **[TR020001/APP/5.01]**.
Hazardous Waste (England and Wales) Regulations 2005 (as amended) (Ref.19.6)	Details of the hazardous waste management requirements for the contractor are set out in the OSWMP (**Appendix 19.1** in this ES

Legislation	How and where addressed in ES
These Regulations set out the regime for the control and tracking of the movement of hazardous waste for the purpose of transposing the requirements of the Hazardous Waste Directive (Directive 91/689/EC) (Ref. 19.7).	**[TR020001/APP/5.02]**). Requirements for the operator are set out in the OOWMP provided as **Appendix 19.2** of this ES **[TR020001/APP/5.02]**.
Environment Act 2021 (Ref. 19.8) The Act makes provision about targets, plans and policies for improving the natural environment; for statements and reports about 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 Act will deliver: a. An extension of producer responsibility to make producers pay for 100% of cost of disposal of products, starting with plastic packaging. b. A Deposit Return Scheme for single use drinks containers. c. Charges for single use plastics. d. Greater consistency in recycling collections in England. e. Electronic waste tracking to monitor waste movements and tackle fly-tipping. f. Further tackling of waste crime. g. The power to introduce new resource efficiency information (labelling on the recyclability and durability of products). h. The regulation of the shipment of hazardous waste. i. A ban or export restriction of waste to non-OECD countries.	For the purposes of this assessment municipal waste is considered to include Commercial and Industrial (C&I) and institutional waste from the activities associated with the operation of an airport (e.g. retail, aircraft and terminal cleansing etc.). Sufficient provision for waste management and the integration of waste management facilities is considered in **paragraph 19.8.4**. Primary mitigation measures include activities that would be undertaken during the design stage to minimise waste thus reducing the need for waste management and landfill disposal. These include design of adequate provision for internal and external waste storage to allow waste segregation during operation and setting of waste recycling targets (**paragraph 19.8.15**). Key sections, which are relevant to the Proposed Development in the Environment Act 2021 have been taken into account.

Policy

Table 19.2: Waste and resources policy

Policy	How and where addressed in ES
National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) (Ref. 19.9) The NPPF does not contain specific waste policies as these are detailed within the revised Waste Management Plan for England (2021) (Ref. 19.15) and the National Planning Policy for Waste (Ref.19.14), however the following overarching policies are relevant to waste and resources: a. The environmental objective set out at paragraph 8 of the NPPF is "*to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*." b. The environmental objective set out in paragraph 210 of the NPPF is to "*so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously*."	The approach to minimising waste for the Proposed Development is outlined in **paragraphs 19.8.2-19.8.8.** The recycled content target set for the construction of the Proposed Development takes into account the contribution that substitute or secondary and recycled materials make. This is outlined in **paragraph 19.8.5** (achieve a minimum of 25% recycled or secondary content in key construction materials (e.g. concrete and steel)).
National Policy Statement for National Networks – December 2014 (NPSNN) (Ref. 19.10) The NPSNN sets out the need for, and Government's policies to deliver development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England.	There are no elements of the Proposed Development on the national road or rail network that would be classified as a NSIP in their own right. However, the NPSNN remains an important and relevant consideration, particularly as works are proposed on the Strategic Road Network (SRN) at Junction 10 of the M1 as part of

Policy	How and where addressed in ES
It provides planning guidance for promoters of NSIPs on the road and rail networks. The provisions of the NPSNN relevant to environmental assessment broadly mirror those as outlined in the Airports National Policy Statement (ANPS).	the Proposed Development. Where the relevant polices of the NPSNN are consistent with the relevant policies of the ANPS, they have not been repeated here and accordingly the ANPS compliance **Table 19.3** provides the necessary policy response. The NPSNN policies of relevance that are not mirrored in the ANPS are as follows: a. Where necessary, the Secretary of State should use requirements or planning obligations to ensure that appropriate measures for waste management are applied (paragraph 5.44). b. Where the project will be subject to the Environment Agency's environmental permitting regime, waste management arrangements during operations will be covered by the permit and the considerations set out in NPSNN paragraphs 4.48 to 4.56 will apply (pollution control and other environmental protection regimes) (paragraph 5.45). Details of waste management requirements for the contractor are set out in the OSWMP provided as **Appendix 19.1** of this ES **[TR020001/APP/5.02]**. Such issues are outlined in other relevant chapters: a. Air quality (odour and dust from construction including landfill excavations and waste processing, **Chapter 7** Air Quality of this ES **[TR020001/APP/5.01]**); b. Traffic and transportation (removal of waste by road is included in the assessment of construction, **Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**); c. Noise and vibration (noise and vibration from earthworks and

Policy	How and where addressed in ES
	construction of the airport infrastructure including landfill excavations and waste processing, changes in on-site ground noise associated with the operational project, and changes in road traffic noise, including from the new road infrastructure, **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**); and d. Soils and geology (contamination issues, **Chapter 17** Soils and Geology of this ES **[TR020001/APP/5.01]**); and e. Water resources (construction and operational impacts e.g. potential impacts on groundwater, **Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]**).
The National Planning Policy Guidance (NPPG) for Minerals (Ref. 19.11) and Waste (Ref. 19.12) were published to provide more in-depth guidance to the NPPF. The NPPG aims to make planning guidance more accessible and ensures that the guidance is kept up to date.	The guidance provides further information in support of the implementation of waste planning policy and on the planning for mineral extraction in plan making and the application process. This information has been taken into consideration when reviewing local policy but is not directly used in the assessment.
Emerging Aviation Strategy (Department for Transport, 2018) (Ref. 19.13) The emerging Aviation Strategy (Aviation 2050, The Future of UK Aviation, A Consultation) was published for consultation in December 2018. Paragraphs 3.73 - 3.76 are concerned with “reducing waste” as part of the operation of the airport. The paragraphs include examples of good practice such as the incorporation of disposal points for liquids at security for passengers and biomass treatment plants to treat waste from aircraft.	These examples of good practice are listed and considered in **paragraph 19.8.14**.
National Planning Policy for Waste (Ministry of Housing, Communities and Local Government, 2014) (Ref. 19.14)	The likely impact of proposed, non-waste related development on existing waste management facilities is considered in **paragraph 19.3.17**. The Order Limits

Policy	How and where addressed in ES
The National Planning Policy for Waste sets out detailed waste planning policies to be applied in conjunction with the NPPF. It states: "*when determining planning applications for non-waste development, 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 prejudice 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;* • *The handling of waste arising from the construction and operation of development maximises reuse / recovery opportunities, and minimises off-site disposal".*	include a safeguarded waste site (the Luton Borough Council (LBC) Tidy Tip (formally called the Eaton Green Civic Amenity Site) as outlined in the Bedford Borough, Central Bedfordshire Council (CBC) and LBC's Minerals and Waste Local Plan: Strategic Sites and Policies adopted January 2014). However, no works to this site are proposed and it is anticipated that the Proposed Development will not conflict with or prejudice the site's waste management use, therefore this aspect is scoped out of the assessment. Sufficient provision for waste management and the integration of waste management facilities is considered in **paragraph 19.8.4**. Primary mitigation measures include activities that would be undertaken during the design stage to minimise waste thus reducing the need for waste management and landfill disposal. These include design of adequate provision for internal and external waste storage to allow waste segregation during operation and setting of waste recycling targets as per the ANPS. **Paragraphs 19.8.2-19.8.5** in **Section 19.8** outline how the waste hierarchy has been and will be applied to Proposed Development. **Paragraph 19.8.5** outlines the targets applied to the Proposed Development.
Waste Management Plan for England (Defra, 2013) (Ref. 19.15) Provides an overview of waste management in England and reiterates the requirement for all waste producers and waste management providers to implement the waste hierarchy. It also highlights the need for waste to be managed using the proximity principle and confirms England's commitment to recovering at least 70% by	**Paragraphs 19.8.2-19.8.5** in **Section 19.8** outline how the waste hierarchy has been and would be applied to Proposed Development. **Paragraph 19.8.15** outlines the construction targets that would be applied to the Proposed Development. The target set out for construction exceeds the minimum target set in Government policy: Achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste. Uncontaminated

Policy	How and where addressed in ES
weight of non-hazardous construction and demolition waste by 2020 (excluding soils and stones). Recovery is assumed in the context of this policy to include reuse, recycling and incineration with energy recovery.	excavated soil and stones (European Waste Catalogue / List of Wastes code 17 05 04) are specifically excluded from this target. Recovery is deemed to include reuse, recycling and recovery (e.g. energy recovery).
A Green Future: Our 25 Year Plan to Improve the Environment (Defra, 2018) (Ref. 19.16) Published in 2018, *"sets out goals for improving the environment within a generation and leaving it in a better state than we found it".* It details how the government will work with communities and businesses to do this. The following policies are relevant: a. Make sure that resources are used more efficiently and kept in use for longer to minimise waste and reduce its environmental impacts by promoting reuse, remanufacturing and recycling. b. Work towards eliminating all avoidable waste by 2050 and all avoidable plastic waste by end of 2042. c. Reducing food supply chain emissions and waste. d. Reducing litter and littering. e. Improving management of residual waste.	**Paragraphs 19.8.2-19.8.5** in **Section 19.8** outline how the waste hierarchy has been and would be applied to the Proposed Development.
Our Waste, Our Resources: A Strategy for England (Defra, 2018) (Ref. 19.17) The strategy published in 2018 will help the government to meet the commitments outlined in the 25 Year Plan and *"sets out how we will preserve our stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. At the same time we will minimise the damage caused to our natural environment by reducing and managing waste safely and carefully, and by tackling waste crime."* The strategy	For the purposes of this assessment, municipal waste is considered to include Commercial and Industrial (C&I) and institutional waste from the activities associated with the operation of an airport (e.g. retail, aircraft and terminal cleansing etc.). Sufficient provision for waste management and the integration of waste management facilities are considered in **paragraph 19.8.4**. Primary mitigation measures include activities that have been and would be undertaken during the design stage to minimise waste thus reducing the need for

Policy	How and where addressed in ES
combines actions to be taken now and commitments for the coming years. Key targets and milestones and targets, which could be relevant to the Proposed Development, include: a. Roll out of a deposit return scheme (subject to consultation) – 2023; b. Legislation for mandatory separate food waste collections (subject to consultation) – 2023; c. 75% recycling rate for packaging (subject to consultation) – 2023; d. 65% recycling rate for municipal solid waste – 2035; and e. Municipal waste to landfill 10% or less – 2035.	waste management and landfill disposal. These include design of adequate provision for internal and external waste storage to allow waste segregation during operation and setting of waste recycling targets (**paragraph 19.8.15**). Key targets and milestones and targets, which could be relevant to the Proposed Development in the Our Waste, Our Resources: A Strategy for England have been taken into account.
Luton Local Plan 2011-2031 (Ref. 19.18) Policy LLP37 encourages *"an overall reduction in the amount of waste generated, treated and disposed of to reduce the need for land for waste management. Proposals that are likely to generate significant volumes of waste through development or operational phases will be required to include a waste audit as part of the application"*.	An audit of the design has been undertaken to estimate resources required and waste to be generated from construction, the estimates are summarised in **Table 19.52**. An audit of operational waste data from the existing airport has been undertaken. This data has been used to extrapolate future waste generation (**Paragraph 19.9.42**).
CBC Local Plan 2015-2035, July 2021 (Ref. 19.19) This CBC Local Plan adopted in July 2021 replaces the North Core Strategy and Development Management Policies Document (2009) and the majority of the remaining policies within the South Bedfordshire Local Plan (2004), the Mid Bedfordshire Local Plan (2005) and the remaining saved policies of the Bedfordshire and Luton Minerals and Waste Local Plan (2005) so far as they affect Central Bedfordshire. Those residual site allocations in the north Site Allocations Document (2011) that are not already built	Sufficient provision for waste management and the integration of waste management facilities are considered in **paragraph 19.8.4**. Primary mitigation measures include activities that have been and would be undertaken during the design stage to minimise waste thus reducing the need for waste management and landfill disposal. These include design of adequate provision for internal and external waste storage to allow waste segregation during operation and setting of waste recycling targets as per the ANPS.

Policy	How and where addressed in ES
out will remain, in addition to the Minerals and Waste Local Plan – Strategic Sites and Policies (2014) which will sit alongside this Local Plan forming the Development Plan for Central Bedfordshire. Section 17.1.8 refers to sustainable design: *"All new developments should optimise the potential for sustainable design…The sorting and segregating of waste materials by occupiers is essential to the success of recycling and reuse schemes, and new developments should provide adequate and convenient storage space for the appropriate in-house storage of recyclables."*	
Bedford Borough Council (BBC), CBC and LBC's Minerals and Waste Local Plan: Strategic Sites and Policies adopted January 2014 (Ref. 19.20) The Bedford Borough, CBC and LBC's Minerals and Waste Local Plan: Strategic Sites and Policies adopted January 2014 sets out the strategic locations for mineral extraction and for waste management development in the Plan area together with strategic polices which will guide the ongoing supply of minerals and development of waste management facilities. Policy number *"M4. Protection of Mineral Resources / Mineral Consultation Areas. In the Mineral Consultation Areas, the MPA will make every effort to safeguard mineral resources which are, or may come to be, of economic importance, from unnecessary sterilisation by other types of development which would be a serious hindrance to their extraction. Where development is likely to result in the sterilisation of such resources, the MPA will encourage the prior extraction of the minerals where appropriate."*	The methodology used in the assessment is in accordance with the IEMA Guidance (Ref.19.28), which was published in 2020, i.e. post receipt of the Scoping Opinion. The IEMA Guidance (Ref.19.28) includes impacts on allocated/safeguarded mineral sites which were not included the methodology proposed in the Scoping Report (**Appendix 1.1** and **1.2** of this ES **[TR020001/APP/5.05]**). This methodology has been agreed with CBC, LBC and HCC. Impacts on allocated mineral sites are outlined in paragraph 19.3.17. The Order Limits do not include, and are not in the proximity of, any allocated mineral sites and hence this aspect is scoped out of the assessment. In the Scoping Opinion the Planning Inspectorate provided the following comment in relation to minerals (**Section 4.6** Geology and Soils **Appendix 1.3** of this ES **[TR020001/APP/5.05]**.) "*The Inspectorate agrees that an assessment of likely significant effects on geological or geomorphological features of scientific interest can be scoped out on the basis that there are none located within (or immediately adjacent to) the Proposed Development.*"

Policy	How and where addressed in ES
Waste Strategic Policy (WSP) 5 outlines that *"all new developments should include sufficient and appropriate waste storage and recovery facilities in their design and layout".* Policy number *"W5 Management of Waste at source: Waste Audits"* and policy number *"W6 Management of Waste at source: Provision of facilities with new development"* are saved waste polices from the Bedfordshire and Luton Minerals and Waste Local Plan (2005). Policy number *"W22 Safeguarding existing sites. Existing and proposed sites for waste management will be protected as far as practicable from development that may conflict with or prejudice their waste management use."*	Sufficient provision for waste management and the integration of waste management facilities are considered in **paragraph 19.8.4**. Primary mitigation measures include activities that have been and would be undertaken during the design stage to minimise waste thus reducing the need for waste management and landfill disposal. These include design of adequate provision for internal and external waste storage to allow waste segregation during operation and setting of waste recycling targets as per the ANPS. An audit of the design has been undertaken to estimate resources required and waste to be generated from construction, the estimates are summarised in **Table 19.52**. An audit of operational waste data from the existing airport has been undertaken. This data has been used to extrapolated future waste generation (**Paragraph 19.9.42**). The likely impact of proposed non-waste related development on existing waste management facilities is considered in **paragraph 19.3.17**. The Order Limits include a safeguarded waste site (the Tidy Tip as outlined in the Bedford Borough, CBC and LBC's Minerals and Waste Local Plan: Strategic Sites and Policies adopted January 2014). However, no works are proposed to this site and it is anticipated that the Proposed Development will not conflict with or prejudice the site's waste management use, therefore this aspect is scoped out of the assessment.
Hertfordshire County Council (HCC) Waste Development Framework Waste Core Strategy and Development Management Policies Development Plan Document 2011-2026 (Ref. 19.21)	The assessment of waste and resources has taken account of the waste hierarchy in the management of waste, and of the targets for recovery of non-hazardous construction and demolition waste. **Paragraphs 19.8.2-19.8.5** in **Section 19.8** outline how the waste hierarchy has been

Policy	How and where addressed in ES
The Hertfordshire Waste Development Framework Waste Core Strategy and Development Management Policies Development Plan Document 2011-2026 sets out HCC's policies for waste management. Policy 2 outlines how the authority will work with business and residents to reduce waste in line with the Waste FD. Policy 12 sets out requirements for sustainable construction and demolition practices, which include increased recycling and reductions in the use of primary materials. HCC is currently reviewing its Minerals and Waste Local Plan documents, through the preparation of a new Minerals and Waste Local Plan (the Plan). When adopted, the Plan will replace the following currently adopted Minerals and Waste Planning documents: a. Minerals Local Plan Review 2002-2016 (adopted March 2007); b. Mineral Consultation Areas in Hertfordshire Supplementary Planning Document (SPD) (adopted November 2007); c. Waste Core Strategy and Development Management Policies Development Plan Document (DPD) 2011-2026 (adopted November 2012); and d. Waste Site Allocations DPD 2011-2026 (adopted July 2014). The Hertfordshire Minerals and Waste Local Plan 2040 Draft Plan (Ref. 19.22) consultation took place in 2022.	and would be applied to Proposed Development. **Paragraph 19.8.5** outlines the targets that would be applied to the Proposed Development.
North Hertfordshire District Council (NHDC) Local Plan for 2011-2031, November 2022 (Ref. 19.23). NHDC's Local Plan 2011-2031, includes policies on sustainable design. Policy D1 Sustainable Design states that *"planning permission will be granted where development proposals… take all*	The assessment of waste and resources has taken account of the waste hierarchy in the management of waste, and of the targets for recovery of non-hazardous construction and demolition waste. **Paragraphs 19.8.2-19.8.5** in **Section 19.8** outline how the waste hierarchy has been and would be applied to Proposed Development. **Paragraph 19.8.5** outlines

Policy	How and where addressed in ES
reasonable opportunities, consistent with the nature and scale of the scheme, to, iii. reduce energy consumption and waste…". It encourages the efficient use of local or sustainably sourced new materials together with the reuse and recycling of materials to reduce the waste created in developments.	the targets that would be applied to the Proposed Development.
Dacorum Borough Council (DBC) Core Strategy 2006-2031 (Ref. 19.24). The DBC Core Strategy adopted on 25 September 2013 includes policies on Sustainable Design and Construction. Policy CS29 states that *"New development will comply with the highest standards of sustainable design and construction possible. The following principles should normally be satisfied:* *…..* *(c) Recycle and reduce construction waste which may otherwise go to landfill.* *…..* *(l) Provide on-site recycling facilities for waste."*	Primary mitigation measures include activities that have been and would be undertaken during the design stage to minimise waste thus reducing the need for waste management and landfill disposal. These include design of adequate provision for internal and external waste storage to allow waste segregation during operation and setting of waste recycling targets as per the ANPS. Sufficient provision for waste management and the integration of waste management facilities are considered in **paragraph 19.8.4**.

19.2.3 The Airports National Policy Statement (Ref. 19.25) (ANPS) does not have effect in relation to an application for development consent for an airport development not comprised of an application relating to the Heathrow Northwest Runway. Nevertheless, as set out within paragraph 1.41 of the ANPS, the Secretary of State considers that the contents of the ANPS will be both important and relevant considerations in the determination of such an application, particularly where it relates to London or the south east of England. In particular, the ANPS makes clear that, alongside the provision of a new Northwest Runway at Heathrow, the government supports other airports making best use of their existing runways as set out in Beyond the Horizon: Making best use of existing runways (MBU) (Ref. 19.26), which is the specific policy context for this application.

19.2.4 In addition, whilst the ANPS does not have effect in relation to the Proposed Development, it sets out a number of principles for environmental impact assessment and compliance and these will be an important and relevant consideration in the determination of the application for development consent. A summary of the relevant provisions for the waste and resources assessment and how these have been addressed in this ES is provided in **Table 19.3**.

Table 19.3: How relevant waste and resources requirements of ANPS are addressed in the ES

ANPS Section	How and where addressed in ES
Paragraph 5.137 states that the targets for preparation for reuse and recycling of municipal waste (50%), and for construction and demolition waste (70%) set out by the Waste FD should be considered 'minimum acceptable practice' for the construction and operation of any new airport infrastructure. Exceeding these targets if possible, by aiming for exemplar performance in resource efficiency and waste management is recommended, to align with the principles of the EU Action Plan for the Circular Economy (Ref. 19.27).	Mitigation including the setting of construction targets in line with the APNS is outlined in **Paragraphs 19.8.5** noting that the construction and demolition waste target set out in the Waste Framework Directive and Waste (England and Wales) Regulations 2011 (as amended) (Ref. 19.2) also includes recovery. **Paragraph 19.8.5** outlines the construction targets that would be applied to the Proposed Development. The target set out for construction exceeds the minimum target of 70%: Achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste. Uncontaminated excavated soil and stones (European Waste Catalogue / List of Wastes code 17 05 04) are specifically excluded from this target. Recovery is deemed to include reuse, recycling and recovery (e.g., energy recovery). A target for municipal waste in line with the ANPS is also included for construction (**Paragraph 19.8.5)** and operation (**Paragraph 19.8.17)**: Achieve at least 50% preparation for reuse, reuse and recycling of municipal waste (waste materials such as paper, metal, plastic and glass as far as these waste streams are similar to waste from households). Existing LLAOL operational targets and current performance are outlined in **Paragraph 19.8.16.**
Paragraph 5.141 sets out the approach to the management of waste. The applicant should set out the arrangements that are proposed for managing any waste produced in the application for development consent. The arrangements described should include information on the proposed waste recovery and disposal system for all waste	The assessment outlined in **Section 19.9** presents arrangements that are proposed for managing waste produced including information on the proposed waste recovery and disposal system for all waste generated by the Proposed Development.

ANPS Section	How and where addressed in ES
generated by the development. The applicant should seek to minimise the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental, social and economic outcome when considered over the whole lifetime of the project.	
Paragraph 5.143 is concerned with mitigation measures. The applicant should set out a comprehensive suite of mitigations to eliminate or significantly reduce the risk of adverse impacts associated with resource and waste management.	Embedded and good practice mitigation measures are described in **Section 19.8**. Mitigation measures for environmental impacts associated with the management of waste on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste are outlined in other relevant chapters: a. Air quality (odour and dust from construction including landfill excavations and waste processing, **Chapter 7** Air Quality of this ES **[TR020001/APP/5.01]**); b. Traffic and transportation (removal of waste by road is included in the assessment of construction, **Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**); c. Greenhouse gases (embedded carbon emissions in materials, transport of construction materials and transportation and disposal of waste, on-site construction activity, operation of the airport, buildings, assets and vehicles including waste treatment, **Chapter 12** Greenhouse Gases of this ES **[TR020001/APP/5.01]**); d. Noise and vibration (noise and vibration from earthworks and construction of the airport infrastructure including landfill excavations and waste processing, changes in on-site ground noise associated with the operational project, and changes in road traffic noise, including from the new road infrastructure, **Chapter 16** Noise

ANPS Section	How and where addressed in ES
	and Vibration of this ES **[TR020001/APP/5.01]**); and e. Soils and geology (contamination issues, **Chapter 17** Soils and Geology of this ES **[TR020001/APP/5.01]**); and Water resources (construction and operational impacts e.g. potential impacts on groundwater, **Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]**).
The Secretary of State will consider the extent to which the applicant has proposed an effective process that will be followed to ensure effective management of hazardous and non-hazardous waste arising from all stages of the lifetime of the development. The Secretary of State should be satisfied that the process set out provides assurance that: a. Waste produced will be properly managed, both onsite and offsite; b. The waste from the proposed development can be dealt with appropriately by the waste infrastructure which is, or is likely to be, available. Such waste arising should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arising in the area; and c. Adequate steps have been taken to ensure that all waste arising from the site is subject to the principles of the waste hierarchy and are dealt with at the highest possible level within the hierarchy.	Details of waste management requirements for the contractor are set out in the OSWMP provided as **Appendix 19.1** of this ES **[TR020001/APP/5.02]**. Details of waste and resources management requirements for the operator are set out in the OOWMP provided as **Appendix 19.2** of this ES **[TR020001/APP/5.02]**. The assessment of waste and resources as set out in **Section 19.9** includes an assessment of: a. effects that on-site generated materials e.g. soils, waste arisings have on the existing and future landfill void capacity, during construction; and b. effects that on-site generated waste arisings have on the existing and future landfill void capacity during operation. The assessment of waste and resources has taken account of the waste hierarchy in the management of waste, and of the targets for recovery of non-hazardous construction and demolition waste. **Paragraphs 19.8.2**-**19.8.5** in **Section 19.8** outline how the waste hierarchy has been and would be applied to Proposed Development. **Paragraph 19.8.5** outlines the targets that would be applied to the Proposed Development.

ANPS Section	How and where addressed in ES
Where necessary, the Secretary of State will require the applicant to develop a resource management plan to ensure that appropriate measures for sustainable resource and waste management are secured.	Details of waste and resources management requirements for the contractor are set out in the OSWMP provided as **Appendix 19.1** of this ES **[TR020001/APP/5.02]**. Details of waste and resources management requirements for the operator are set out in the OOWMP provided as **Appendix 19.2** of this ES **[TR020001/APP/5.02]**.

Guidance

Table 19.4: Waste and resources guidance

Guidance	How and where addressed in ES
Institute of Environmental Management and Assessment (IEMA) guide to: Materials and Waste in Environment Assessment, Guidance for a Proportionate Approach (referred to herein as the IEMA Guidance (Ref. 19.28). The document offers guidance and recommendations for EIA practitioners and stakeholders concerned with the impacts and effects of materials and waste on the environment. The guidance provides considerations for screening, scoping, consultation, assessment, and subsequent reporting and monitoring.	The assessment has been completed in accordance with the IEMA Guidance (relevant to a number of sections of this chapter including **Section 19.3** and **Section 19.5**).
The Definition of Waste: Development Industry Code of Practice, Contaminated Land: Applications in Real Environments (CL:AIRE) (CoP) (Ref. 19.29). The DoW CoP provides a process which enables the reuse of excavated materials on-site or their movement between sites. Use of the DoW CoP supports the sustainable and cost-effective development of land.	The reuse of excavated material (excluding material excavated from the historic landfill) i.e. soils and source segregated aggregate materials arising from demolition activities, such as crushed brick and concrete would be covered by a CL:AIRE DoW CoP Materials Management Plan (MMP). Details of the requirements for the contractor are set out in the Code of Construction Practice (CoCP) (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**).
Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (Ref. 19.30) and Designing Out Waste: A	A designing out waste workshop in accordance with the guide has been undertaken alongside discussions with the Proposed Development design team

Guidance	How and where addressed in ES
Design Team Guide for Buildings (Ref. 19.31). These guides outline the case for taking action to design out waste, provide a detailed explanation of the key principles that designers can use during the design process and how these principles can be applied to civil engineering and building projects to maximise opportunities to reduce construction waste and use materials more efficiently. They give examples of technical solutions and how, in practice, designers have helped achieve significant waste reductions.	throughout the design process. This is outlined in **paragraph 19.8.7.**

19.3 Scope of the Assessment

19.3.1 This section describes the scope of the Waste and Resources assessment, including how the assessment has responded to the Scoping Opinion. The temporal and spatial scope, the relevant receptors, and matters scoped in and out are identified. A description of engagement undertaken with relevant technical stakeholders to develop and agree this scope is provided in **Section 19.4**.

Scoping Opinion

19.3.2 The EIA Scoping Report set out the proposed scope and assessment methodologies to be employed in the EIA and is provided in **Appendix 1.1** and **1.2** of this ES **[TR020001/APP/5.05]**.

19.3.3 In response to the Scoping Report, a Scoping Opinion was received from the Planning Inspectorate on 9 May 2019 and is provided in **Appendix 1.3** of this ES **[TR020001/APP/5.05]**.

19.3.4 **Table 19.5** describes the main matters highlighted in the Scoping Opinion by the Planning Inspectorate, and how these have been addressed in this ES. Responses to all comments received during scoping are presented in **Appendix 1.4** of this ES **[TR020001/APP/5.02]**.

Table 19.5: Waste and resources Scoping Opinion comments highlighted by the Planning Inspectorate

Scoping Opinion ID	Scoping Opinion comment	How this is addressed
2.2.12	Table 13.6 of the Scoping Report outlines the material resources required for, and the waste to be generated by, the Proposed Development but does not provide any indication of likely quantities. This should be clearly set out in the ES. The nature and volume of materials should also be included in the description of the Proposed Development, including justification of any key assumptions made. It is also noted that the Scoping Report refers to five sites for the disposal of spoil; however, Figure 2.3 only shows four. This should be clarified in the ES and clearly	Estimated quantities of construction materials and waste are summarised in **Table 19.37** to **Table 19.39**. Estimated quantities of operational waste are summarised in **Table 19.54**: Estimated operational waste. All figures have been updated as appropriate for the ES. **Chapter 4** The Proposed Development of this ES **[TR020001/APP/5.01]** includes appropriate cross references to where information on waste and materials in provide in the ES, including **Appendix 4.1 [TR020001/APP/5.02]** and this chapter.

Scoping Opinion ID	Scoping Opinion comment	How this is addressed
	shown on accompanying figures.	
3.2.10	The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operational phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.	Estimated quantities of waste to be generated during construction and operation are presented in this ES and summarised in **Table 19.52** and **Table 19.54**. Other residues and emissions referred to are considered in relevant aspect assessments as summarised and cross referenced in **Chapter 4** of this ES **[TR020001/APP/5.01]**.
3.2.12	The Inspectorate notes that a draft CoCP is to be submitted as part of the DCO application, which will include draft plans such as the following: Construction Environmental Management Plan; Site Waste Management Plan; Construction Traffic Management Plan; Materials Management Plan; Soils Management Plan (SMP); Construction Noise Management Plan; Air Quality Management Plan; and Surface Water Management Plan. Where the ES relies upon mitigation measures which would be secured through management plans, it should be demonstrated (with clear cross referencing) where each measure is set out in the management plan.	This ES references the relevant sections of the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**), including those referring to the Site Waste Management Plan (SWMP) and MMP. The SWMP and MMP are contractor requirements, as outlined in the CoCP. An OSWMP is appended to the ES (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**). A Mitigation Route Map has been prepared summarising mitigation described in the ES and how it is secured, and is provided as part of the application for development consent **[TR020001/APP/5.09].**

Scoping Opinion ID	Scoping Opinion comment	How this is addressed
	Paragraph 17.8.2 of the Scoping Report also states the intention to submit a Landscape and Biodiversity Management Plan. The Applicant should provide draft copies of these documents appended to the ES and/or demonstrate how they will be secured.	
4.8.1	Waste arising from extraction, processing and manufacture of construction components and products - The Inspectorate agrees that this matter can be scoped out of the assessment. This is on the basis that such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured; however, the Inspectorate anticipates that the Applicant would implement sustainable procurement practices in the selection of sustainable sources.	Whilst these matters are scoped out, embedded and good practice mitigation measures including waste minimisation and sustainable procurement practices are described in **Section 19.8**. **Paragraphs 19.8.6 and 19.8.7** outline the targets that will be applied to the Proposed Development including (developing and implementing a sustainable procurement strategy throughout the supply chain).
4.8.2	Environmental impacts associated with the management of waste on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste - It is not apparent from the Scoping Report that these matters will be assessed in other aspect chapters. The Inspectorate accepts that these matters can be scoped out of the waste chapter of the ES on the basis that the	The assessment of likely significant effects associated with the management of waste on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste is assessed in other relevant ES aspect chapters: a. Air quality (odour and dust from construction including landfill excavations and waste processing, **Chapter 7** Air Quality of this ES **[TR020001/APP/5.01]**). b. Traffic and transportation (removal of waste by road is included in the assessment of construction, **Chapter**

Scoping Opinion ID	Scoping Opinion comment	How this is addressed
	assessment of likely significant effects associated with the management of waste will be assessed in other relevant aspect chapters. Clear cross-referencing between these relevant matters must be included in the ES to ensure a robust assessment has been undertaken.	**18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**). c. Greenhouse gases (embedded carbon emissions in materials, transport of construction materials and transportation and disposal of waste, on-site construction activity, operation of the airport, buildings, assets and vehicles including waste treatment, **Chapter 12** Greenhouse Gases of this ES **[TR020001/APP/5.01]**). d. Noise and vibration (noise and vibration from earthworks and construction of the airport infrastructure including landfill excavations and waste processing, changes in on-site ground noise associated with the operational project, and changes in road traffic noise, including from the new road infrastructure, **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**). e. Soils and geology (contamination issues, **Chapter 17** Soils and Geology of this ES **[TR020001/APP/5.01]**). f. Water resources (construction and operational impacts e.g. potential impacts on groundwater, **Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]**).
4.8.3	The Inspectorate notes that the overall Study Area for the Proposed Development has not yet been determined and it is the Applicant's intention to agree this with applicable consultation bodies. The Study Area should be clearly defined and justified in the ES with reference to the Zone of	The Study Areas are defined in **Table 19.6**, **Figure 19.1** and **Figure 19.2** of this ES **[TR020001/APP/5.03]** and have been agreed with applicable consultation bodies (LBC, CBC and HCC). The ZOI for waste and resources is the same as the non-hazardous waste Study Area (Bedfordshire, Buckinghamshire and Hertfordshire). More detail is provided in **Chapter 21** In-combination and Cumulative Effects of this ES **[TR020001/APP/5.01]**.

Scoping Opinion ID	Scoping Opinion comment	How this is addressed
	Influence (ZOI) for the Proposed Development.	
4.8.4	The Scoping Report states that the Study Area for the construction of the Proposed Development is the 'footprint of the Proposed Development, including temporary land requirements during construction'. The ES should clearly define this Study Area, accompanied by clear and appropriately labelled / referenced figure(s).	The Study Areas are defined in **Table 19.6**, **Figure 19.1** and **Figure 19.2** in this ES **[TR020001/APP/5.03]** and have been agreed with applicable consultation bodies (LBC, CBC and HCC).
4.8.5	The Applicant should seek to agree the baseline data to be used for landfill capacity with the relevant consultation bodies and ensure the use of the most up-to-date capacity data for the regions / counties assessed, taking account of any likely closures / capacity changes at the start of construction as future baseline.	Consultation with relevant consultation bodies (LBC, CBC and HCC) is described in **Section 19.4**. Baseline data is presented in **Section 19.7**. When new baseline data was available, this has been discussed and agreed with the LBC, CBC and HCC. There is no publicly available information on any potential changes to this permitted capacity by the time of construction of the Proposed Development or operation. A future baseline for landfill capacity has been developed in discussion with stakeholders (LBC, CBC and HCC) and using the Microsoft Excel 'Forecast' function and EA published landfill capacity trends for 2004 to 2021.
4.8.6	The Scoping Report provides a brief statement with respect to the amount of airport operational waste diverted from landfill in 2017, as stated to have been provided by LLAOL at footnote 282. The ES should expand on this statement and provide evidence to support statements made in respect to the baseline data used in the assessment.	Operational waste data for 2019 is presented in **Table 19.16** and **Table 19.18** and has been provided by the airport operator in the form of an annual waste report with associated recycling rates.

Scoping Opinion ID	Scoping Opinion comment	How this is addressed
4.8.7	The Scoping Report states that due to an absence of a specific methodology / guidance for assessing effects on waste and resources, it intends to use professional judgement, national and local policy, and recognised best practice. The ES should clearly explain the methodology applied to the assessment; where professional judgement has been applied this should be clearly stated.	The methodology applied is outlined in **Section 19.5**. The methodology is in accordance with the IEMA Guidance (Ref.19.28), which was published in 2020, i.e. post receipt of the Scoping Opinion. This methodology has been agreed with CBC, LBC and HCC. Where professional judgement has been applied, this is clearly stated in brackets in the text.
4.8.8	Table 13.6 makes no specific reference to the existing landfill site within the Proposed Development and the likely type of waste arisings the remediation of this area would generate. An assessment of the waste generated from this remediation should be included in the ES. Appropriate cross-references should be included between this aspect chapter and other relevant aspects, such as (but not limited to) Traffic and Transport, Soils and Geology, and Air Quality. The Applicant should seek to agree the proposed remediation strategy with relevant consultation bodies, including waste authorities and the EA, and ensure that consideration is given to the waste arisings being moved up the waste hierarchy.	The assessment of likely significant effects associated with the management of waste on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste is assessed in other relevant ES aspect chapters and cross referenced as appropriate. The likely types of waste arisings from the remediation of the existing landfill site are discussed in **paragraphs 19.9.35-19.9.36** and outlined in **Table 19.51**. An Outline Remediation Strategy (for former Eaton Green Landfill Site (**Appendix 17.5 [TR020001/APP/5.02]**) and details of consultation with the EA and other relevant consultation bodies is outlined in the **Chapter 17** Soils and Geology of this ES of this ES **[TR020001/APP/5.01]**. Embedded and good practice mitigation measures including waste arisings being moved up the waste hierarchy are outlined in **Section 19.8.**
4.8.9	It is not clear from this aspect chapter what future baseline will be considered for this	A future baseline for landfill capacity has been estimated in discussion with stakeholders (LBC, CBC and HCC) and

Scoping Opinion ID	Scoping Opinion comment	How this is addressed
	assessment, particularly for operational effects. The ES should make clear the baseline scenarios applied to the assessment.	using the Microsoft Excel Forecast function and is presented in **paragraphs 19.7.34-19.7.44.**

Spatial Scope

Study Area

19.3.5 Study Areas have been established in accordance with the IEMA Guidance (Ref.19.28). Study Areas cover both construction and operation and waste and resources as presented in **Table 19.6**. Receptors within this Study Area are described in **Section 19.7** of this chapter.

Table 19.6: Study Areas

Study areas	Spatial scope	Assessment section	Figure reference	Receptor
Proposed Development Study Area	The Order Limits, which include the Main Application Site, Off-site Car Parks and Off-site Highways Interventions. Includes temporary land requirements during construction: this includes temporary offices, compounds and storage areas.	Construction waste generation.	**Figure 2.1** Order Limits of this ES **[TR020001/APP/5.03].**	Not applicable.
		Operational waste generation.		Not applicable.
		Use of material resources.		Not applicable.
Expansive Study Area - Waste	a. Bedfordshire (including LBC and CBC) b. Buckinghamshire c. Hertfordshire As defined in the EA's 2021 Waste Summary Tables for England - Version 1. This represents the most likely area in which non-hazardous waste would be managed. Due to the lack of non-hazardous waste landfill capacity in the Greater London area, it is anticipated that waste from the Proposed Development is unlikely to be managed within this area.	Non-hazardous construction and operational waste management.	**Figure 19.1** Non-hazardous waste Expansive Study Area of this ES **[TR020001/APP/5.03].**	Capacity of waste management infrastructure and remaining landfill void.

Study areas	Spatial scope	Assessment section	Figure reference	Receptor
Expansive Study Area - Waste	a. South East region b. East of England region c. East Midlands region As defined in the EA's 2021 Waste Summary Tables for England - Version 1. This represents the most likely area in which hazardous waste would be managed.	Hazardous construction and operation waste management.	**Figure 19.2** Hazardous waste Expansive Study Area of this ES **[TR020001/APP/5.03].**	Capacity of waste management infrastructure and remaining landfill void.
Expansive Study Area – Construction Materials	National (UK or GB dependent on baseline information availability). Where baseline information is available regional data is also considered in the assessment.	Availability of key construction materials (aggregates, asphalt, concrete and steel).	Figure is not included since the Study Area is the whole of the UK.	National demand for key construction materials.

Zone of Influence

19.3.6 The ZOI for the cumulative assessment for waste and resources comprises the counties of Bedfordshire (including LBC and CBC), Buckinghamshire and Hertfordshire. This ZOI is the same as the non-hazardous waste Expansive Study Area outlined in **Figure 19.1** of this ES **[TR020001/APP/5.03]** and **Table 19.6**.

19.3.7 As part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that enough land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas.

19.3.8 Mineral Planning Authorities (MPAs) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

19.3.9 In preparing their waste management strategies, the WPAs already take into account waste generation at the regional and sub-regional scale, since these are the figures which are then used for determining the need for waste facilities.

19.3.10 The estimates of future landfill void capacity (which is used to evaluate the effects of the Proposed Development) already take into account the cumulative effects of waste generated by other developments, and hence a separate cumulative impact assessment is not required for waste. It is therefore not necessary or feasible for each development within the region to, in effect, duplicate the function of the WPA as part of the EIA process.

19.3.11 Furthermore, only limited waste and resources information is available for some of the other developments and these are deemed to be relatively small in scale e.g. residential development and will not require large quantities of construction materials or generate large quantities of construction waste and operational waste.

19.3.12 Where waste and resources information is available for projects, the quantities of waste are relatively small in the national or regional context. Larger projects e.g.:

a. Millbrook Power stated in Environmental Statement Non-Technical Summary dated October 2017 that (Ref. 19.32) "*It can be concluded that the Project will not result in any likely significant environmental effects with respect to waste*."

b. HS2 stated in Volume 3 Route-wide effects dated November 2013 (Ref.19.33) that "*The likely residual significant effects from construction will be: i. negligible in relation to inert waste landfill capacity; ii. moderate adverse in relation to non-hazardous waste landfill capacity; and iii. moderate adverse in relation to hazardous waste landfill capacity*."

c. HS2 stated "*the likely residual significant effects associated with operation of the Proposed Scheme will be negligible*."

d. HS2 stated "*the draw-down of non-hazardous waste landfill void space as a result of the Proposed Scheme will occur over a period of several*

years and is unlikely to drawdown projected capacity to an extent where there is an immediate, significant need for additional non-hazardous waste landfill capacity to be made available in these areas."

e. HS2 stated that hazardous surplus excavated material generated "*will be predominantly within the first two years of construction (i.e. 2017 and 2018)*."

f. Heathrow in the EIA Scoping Report dated May 2018 (Ref, 19.34) stated "*It is proposed that waste will not be the subject of a separate topic chapter in the EIA, as the effects of any waste related development will be addressed as part of the appropriate environmental topics and associated strategies*."

g. Heathrow in the Airport Expansion Consultation Document in the EIA Scoping Report dated May 2018 stated ([35]"*the preliminary assessment concludes that the Project is considered to have a significant negative effect on waste treatment and disposal capacity*". However, the Heathrow Preliminary Environmental Information Report is no longer available online.

19.3.13 The full cumulative effects assessment is provided in **Chapter 21** In-Combination and Cumulative Effects of this ES **[TR020001/APP/5.01]**.

Temporal Scope

19.3.14 The Proposed Development would be delivered incrementally; however, due the long timeframe for construction of the Proposed Development, three assessment phases are considered, within which construction and operation may take place simultaneously. The assessment Phases 1, 2a and 2b are described in **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

19.3.15 The waste and resources assessment considers the effects for each of the three assessment phases (Phase 1, Phase 2a, Phase 2b) and they are presented side by side in each table for each matter considered in the assessment e.g. operational waste.

Matters Scoped In

19.3.16 The matters that are scoped in are:

a. Waste generation during construction and operation.

b. Resource use during construction (key construction materials including concrete, steel, asphalt and aggregates only).

c. Resource use during operation (key bulk materials for airfield maintenance only).

Matters Scoped Out

19.3.17 The matters that are scoped out are:

a. Waste arising from extraction, processing and manufacture of construction components and products.

b. Impacts on allocated/safeguarded mineral sites. The Order Limits do not include, and are not in the proximity of, any allocated mineral sites and hence this aspect is scoped out of the assessment.

c. Impacts on allocated/safeguarded waste sites in the Order Limits. The Order Limits include a safeguarded waste site (the Tidy Tip as outlined in the Bedford Borough, CBC and LBC's Minerals and Waste Local Plan: Strategic Sites and Policies adopted January 2014 (Ref. 19.20). However, no works proposed would impact the site and it is anticipated that the Proposed Development would not conflict with or prejudice the site's waste management use, therefore this aspect is scoped out of the assessment.

Matters Considered in Other Topic Chapters

19.3.18 The matters considered in other topic chapters include:

a. Impacts on mineral safeguarding areas. These mineral extraction impacts are assessed in **Chapter 17** Soils and Geology of this ES **[TR020001/APP/5.01]**.

b. Impacts associated with resources such as water and energy; these are included in **Chapter 20** Water Resources and Flood Risk, and **Chapter 12** Greenhouse Gases of this ES **[TR020001/APP/5.01]** respectively.

c. Environmental impacts associated with the management of waste and resources are considered in other chapters:

   i. Air quality (odour and dust from construction including landfill excavations and waste processing, **Chapter 7** Air Quality of this ES **[TR020001/APP/5.01]**).
   ii. Traffic and transportation (removal of waste by road is included in the assessment of construction, **Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**).
   iii. Greenhouse gases (embedded carbon emissions in materials, transport of construction materials and transportation and disposal of waste, on-site construction activity, operation of the airport, buildings, assets and vehicles including waste treatment, **Chapter 12** Greenhouse Gases of this ES **[TR020001/APP/5.01]**).
   iv. Noise and vibration (noise and vibration from earthworks and construction of the airport infrastructure including landfill excavations and waste processing, changes in on-site ground noise associated with the operational project, and changes in road traffic noise, including from the new road infrastructure, **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**).
   v. Geology and soils (contamination issues, **Chapter 17** Geology and Soils of this ES **[TR020001/APP/5.01]**).
   vi. Water resources (construction and operational impacts e.g. potential impacts on groundwater, **Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]**).

19.4 Stakeholder Engagement and Consultation

19.4.1 Engagement in relation to waste and resources has been undertaken with a number of prescribed and non-prescribed stakeholders.

19.4.2 For waste and resources, a working group was formed comprising representatives from:

a. Luton Borough Council (LBC);
b. Central Bedfordshire Council (CBC);
c. Hertfordshire County Council (HCC);
d. Environment Agency (EA) (new member since July 2021); and
e. London Luton Airport Operations Ltd (LLAOL) (new member since June 2022, represented by Wood).

19.4.3 The group have met since January 2019 and on an ad-hoc basis when new and updated information is available to discuss.

19.4.4 The **Consultation Report** submitted as part of the application for development consent **[TR020001/APP/6.01]** and **[TR020001/APP/6.02]** contains a full account of the previous statutory consultation process and issues raised in feedback. Matters raised regarding the scope, method, mitigation or compensation being considered as part of the waste and resources assessment were then subject to further discussions directly with stakeholders during working group meetings. The main matters/themes raised during consultation considered relevant to the Waste and Resources assessment were:

a. current baseline;
b. future baseline;
c. assessment methodology;
d. non-landfill waste infrastructure are not considered sensitive receptors;
e. identification of receiving waste management facilities;
f. cumulative assessment;
g. legislation, policy and guidance updates;
h. inclusion of Host Authorities' scoping opinion comments;
i. inclusion of data sources;
j. baseline data updates;
k. waste disposal facilities that might receive material excavated from the historic landfill;
l. cross referencing;
m. regional and local baseline information on resources as assessment at a regional level; and
n. figure updates.

19.4.5 **Table 19.7** provides a summary of engagement with relevant stakeholders, undertaken to inform the EIA, and this ES including the date of meetings and a summary of discussions to resolve matters listed in **paragraph 19.4.4**.

Table 19.7: Stakeholder engagement relating to waste and resources

Meeting name and date	Attendees (organisation)	Summary of discussion
Pre statutory consultation		
Initial consultation, 18 January 2019	LBC, CBC and HCC	Introduction to Proposed Development and waste assessment, to gain feedback on the emerging scope and methodology, to gain insight into issues and opportunities for waste and establish an ongoing dialogue and support engagement during the consultation process.
Future baseline data consultation, 31 May 2019	CBC (incorporating input from LBC) and HCC	Discussion of future baseline data and assessment findings to date following receipt of EIA scoping opinion.
Post statutory consultation 2019		
Waste and Resources stakeholder update, 23 October 2020	LBC, CBC and HCC	New working group members introduced, information on scheme changes provided and discussion of the issues raised during previous meetings, at Scoping and during Statutory Consultation.
Waste and Resources stakeholder update to discuss future baseline, 7 December 2020	LBC, CBC and HCC	LBC, CBC and HCC comments on baseline data, e.g. EA, and local aggregate assessment and local plans taken in account. Approach for forecasting future landfill void capacity, discussed and agreed.
Waste and Resources stakeholder update, 27 July 2021	LBC, CBC and HCC	Information on scheme changes provided and discussion of appropriate timings for future meetings. Change in assessment methodology to IEMA Guidance (Ref.19.28) agreed by attendees at the meeting and via email.
Ground Conditions and Waste Working Group – Waste Sub-group – Preliminary Assessment 2 December 2021	LBC, CBC, HCC and EA	Preliminary results of the Waste and Resources assessment for the 2022 Preliminary Environmental Information Report (PEIR) shared and update on the waste infrastructure baseline provided (new EA data).
Post statutory consultation 2022		

Meeting name and date	Attendees (organisation)	Summary of discussion
Luton Rising: Waste Sub-group Technical Working Group Meeting 13 June 2022	LBC, CBC, HCC, EA and LLAOL	Feedback received from statutory consultation discussed.

19.5 Methodology

Overview

19.5.1 This section outlines the methodology employed for assessing the likely significant effects on waste management and resource use from the construction and operation of the Proposed Development.

19.5.2 The methodology proposed in the Scoping Report and presented in the 2019 PEIR was a bespoke methodology developed in the absence of any sector-specific guidance. In March 2020, IEMA published the IEMA Guide to Materials and Waste in Environmental Impact, Guidance for a Proportionate Approach (Ref. 19.28). The methodology employed in this assessment and the 2022 PEIR is now aligned to this new guidance. This is a departure from the 2019 Scoping Opinion, which has been agreed with LBC, CBC and HCC.

Data Sources

19.5.3 The following sources of information have been reviewed and have informed the assessment:

a. National policy and legislation (**Section 19.2**);
b. Local Authority documents including Local Plans and Local Aggregate Assessments;
c. Environment Agency data including the 2021 Waste Summary Tables for England – Version 1, Environmental Permitting Regulations – Waste Sites, 2021 Waste Data Interrogator (Ref.19.36);
d. LLAOL data including operation waste data obtained directly from LLAOL (Ref. 19.37) and LLAOL 2019 Sustainability Report (Ref. 19.38);
e. Make UK information on steel sales (Ref. 19.42);
f. Mineral Products Association (MPA) information on aggregates, asphalt and concrete sales (Ref. 19.43);
g. Department for Communities and Local Government (now called Department for Levelling Up, Housing and Communities) information on aggregates (Ref. 19.50);
h. Building Research Establishment (BRE) information on construction waste benchmarks (Ref. 19.53); and
i. WRAP information from the Net Waste Tool demolition benchmarks (Ref. 19.54) and waste volume to mass conversion factors (Ref. 19.55)

Sensitive Receptors

19.5.4 The sensitive receptors for this assessment are:

a. Landfill void capacity in the Expansive Study Areas (non-hazardous and hazardous landfill void capacity) – as defined in the IEMA Guidance (Ref. 19.28) (page 16) *"landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing*

and develop new facilities, This requires the depletion of natural and other resources which, in turn, adversely impacts the environment."

b. Resources, national consumption of key construction materials – as outlined in the IEMA Guidance (Ref. 19.2828) (page 16) *"materials are, in their own right, sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary material) long-term availability; this results in the depletion of natural resources and adversely impacts the environment."*

19.5.5 The IEMA Guidance (Ref. 19.28) (page 14) *"does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources."*

19.5.6 The four WPAs and MPAs), BBC, LBC, CBC and HCC have considered provision of minerals, waste recovery and landfill capacity in their respective areas. This consideration is outlined in the documents listed in **Table 19.2**.

Baseline Methodology

19.5.7 The baseline has been developed in accordance with the IEMA Guidance (Ref. 19.28) and discussed and agreed with LBC, CBC and HCC and consists of:

a. national and regional consumption for key construction materials;

b. landfill void capacity in the Expansive Study Areas (non-hazardous, inert and hazardous waste); and

c. historical and future trends in landfill void capacity.

19.5.8 A quantitative baseline for the assessment of Construction, Demolition and Excavation (CD&E) and operational waste generated during the construction and operation of the Proposed Development has been established using the most recently available published data from the EA, BBC, CBC and LBC's and other industry reports.

19.5.9 Operational waste data for 2019 (hazardous and non-hazardous) has been provided by the airport operator. This baseline has not been updated since 2020 and 2021 as these years are not representative of the airport operating at expected or consented capacity due to the COVID-19 pandemic.

19.5.10 Where required, future landfill void capacity and waste production data has been forecast in accordance with the IEMA Guidance (Ref.19.28) using statistical trend analysis. The Microsoft Excel 'Forecast' function has been used on historical landfill void capacity data from the EA 2021 Waste Summary Tables for England – Version 1 (Ref. 19.36). The function predicts future values by using linear regression.

19.5.11 The approach to defining future baseline is described in **Section 5.4** of **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**. The future baseline considered for waste and resources is described in **Section 19.7** of this chapter.

Assessment Methodology

19.5.12 The assessment focuses on the effects of the Proposed Development upon the availability of resources, specifically key construction materials during construction and operation, and landfill void capacity during construction and operation. It is not possible to allocate a sensitivity of other bulk materials used in operation due to the limited publicly available information on the UK demand for such materials. The sensitivity and magnitude of impacts on construction materials and landfill void capacity have been assessed through the following:

Resources

a. Establishing the baseline for national and regional consumption of key construction materials by weight.

b. Establishing the baseline local material capacity (where possible via desk-based research e.g. local aggregate assessments and local plans). Local information is provided for context. This data is not used in the quantitative assessment.

c. Assessing the sensitivity of materials as related to the availability and types of resources to be consumed by the Proposed Development.

d. Establishing the quantities of key construction materials required for the construction of the Proposed Development.

e. Establishing the quantities of key construction materials required for operation of the Proposed Development.

f. Comparing the total quantities of key construction materials with the most recent national and regional consumption (percentage approach).

Waste

a. Establishing the baseline landfill void capacity in the Expansive Study Areas.

b. Assessing the sensitivity of landfill void capacity.

c. Establishing a future baseline for landfill void capacity in the Expansive Study Areas.

d. Establishing the quantities of CD&E waste to be generated during the construction of the Proposed Development.

e. Forecasting the quantities of operational waste to be generated.

f. Comparing the total waste arising from the construction and operation of the Proposed Development against the landfill void capacity (quantitative percentage approach).

g. Establishing a baseline waste infrastructure capacity (inferred from inputs).

h. Comparing the total waste arising from the construction and operation of the Proposed Development against waste infrastructure inputs in the absence of capacity data (qualitative approach).

Sensitivity

19.5.13 The sensitivity of resources relates to the availability and type of resources to be consumed by the Proposed Development. The IEMA Guidance (page 30) criteria described within **Table 19.8** have been used to determine the sensitivity of materials.

Table 19.8: Resource receptor sensitivity

Effects	Criteria for materials receptor sensitivity
Negligible	On balance, the key materials required for the construction and operation of the Proposed Development are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*
Low	On balance, the key materials required for the construction and operation of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	On balance, the key materials required for the construction and operation of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or are available comprising some sustainable features and benefits compared to industry-standard materials.
High	On balance, the key materials required for the construction and operation of the Proposed Development are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or comprise little or no sustainable features and benefits compared to industry-standard materials.

Effects	Criteria for materials receptor sensitivity
Very High	On balance, the key materials required for the construction and operation of the Proposed Development are known to be insufficient in terms of production, supply and/or stock; and/or comprise no sustainable features and benefits compared to industry-standard materials.
* Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.	

19.5.14 The sensitivity of waste relates to availability of landfill void capacity in the absence of the Proposed Development. Landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste.

19.5.15 The IEMA Guidance (Ref.19.28) criteria (page 32) are described in **Table 19.9** and **Table 19.10** and have been used to determine the sensitivity of landfill void capacity.

Table 19.9: Inert and non-hazardous landfill void capacity sensitivity

Effects	Criteria for inert and non-hazardous landfill void capacity sensitivity
Negligible	Across construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is: a. expected to remain unchanged, or is expected to increase through a committed change in capacity.
Low	Across construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is: a. expected to reduce minimally by <1% as a result of wastes forecast.
Medium	Across construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is: a. expected to reduce noticeably by 1-5% as a result of wastes forecast.
High	Across construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is: a. expected to reduce considerably: by 6-10% as a result of wastes forecast.

Effects	Criteria for inert and non-hazardous landfill void capacity sensitivity
Very High	Across construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is: a. expected to reduce very considerably (by >10%); b. end during construction or operation; c. is already known to be unavailable; or d. would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 19.10: Hazardous landfill void capacity sensitivity

Effects	Criteria for Hazardous landfill void capacity sensitivity
Negligible	Across the construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is: a. expected to remain unchanged, or is expected to increase through a committed change in capacity.
Low	Across the construction and/or operation, the baseline/future baseline (i.e. without The Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is: a. expected to reduce minimally: by <0.1% as a result of wastes forecast.
Medium	Across the construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is: a. expected to reduce noticeably: by 0.1-0.5% as a result of wastes forecast.
High	Across the construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is: a. expected to reduce considerably: by 0.5-1% as a result of wastes forecast.
Very High	Across the construction and/or operation, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is: a. expected to reduce very considerably (by >1%); b. end during construction or operation: c. is already known to be unavailable; or d. would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude

19.5.16 The magnitude of impact describes the degree of variation from the baseline conditions as a result of the Proposed Development. For construction, the

magnitude of impact is considered at the end of each assessment phase (Phase 1, 2a and 2b).

19.5.17 For operation, the magnitude of impact is assessed at the end of assessment Phase 2b for the year 2043.

19.5.18 The methodology for assessing the magnitude of impact from resources comprises a percentage-based approach that determines the influence of construction materials use on the baseline national demand from the construction of the Proposed Development. The IEMA Guidance (Ref.19.28) (page 33-35) criteria used to assess the magnitude of impact for resources and waste are provided within **Table 19.11**, **Table 19.12** and **Table 19.14.**

Table 19.11: Resources – magnitude of impacts

	Criteria for resources magnitude of impacts
No change	The assessment is made by determining whether, through a development, the consumption of no materials is required.
Negligible	The assessment is made by determining whether, through a development, the consumption of no individual material type is equal to or greater than 1% by volume of the national* baseline availability.
Minor	The assessment is made by determining whether, through a development, the consumption of one or more materials is between 1-5% by volume of the national* baseline availability.
Moderate	The assessment is made by determining whether, through a development, the consumption of one or more materials is between 6-10% by volume of the national* baseline availability.
Major	The assessment is made by determining whether, through a development, the consumption of one or more materials is >10% by volume of the national* baseline availability.
*a national baseline is used in the absence of regional construction material consumption data.	

19.5.19 The methodology for assessing the magnitude of impact for waste comprises a percentage-based approach that determines the influence of waste generation from the construction and operation of the Proposed Development on the baseline landfill void capacity. The criteria used to assess the magnitude of impact for resources and waste are provided within **Table 19.12** and **Table 19.13**.

Table 19.12: Inert and non-hazardous waste – magnitude of impact

	Criteria for inert and non- hazardous waste magnitude of impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by <1%.
Minor	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by 1-5%.

	Criteria for inert and non- hazardous waste magnitude of impacts
Moderate	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by 6-10%.
Major	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by >10%.
* Bedfordshire, Hertfordshire and Buckinghamshire # forecast as the worst-case scenario, during defined construction and/or operation.	

Table 19.13: Hazardous waste – magnitude of impact

	Criteria for hazardous waste magnitude of impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by <0.1%.
Minor	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by <0.1-0.5%.
Moderate	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by <0.5-1%.
Major	Waste generated by the development will reduce Expansive Study Area* landfill void capacity baseline# by >1%.
* South East, East of England and East Midlands regions. # forecast as the worst-case scenario, during a defined construction and/or operational phase.	

Significance

19.5.20 **Table 19.14** describes the IEMA Guidance (Ref.19.28) (page 39) effect thresholds used in determining the significance of potential effects and **Table 19.15** shows the IEMA Guidance (Ref.19.28) (page 40) significance of the effects.

19.5.21 Where two effect thresholds are provided, professional judgement has been used to select the appropriate effect threshold.

Table 19.14: Effect thresholds

		Magnitude of impact				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity (or value) of receptor	Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate

		Magnitude of impact				
		No Change	Negligible	Minor	Moderate	Major
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Table 19.15: Significance of effect

Effect	Resources	Waste
Neutral	Not significant	Not significant
Slight		
Moderate	Significant	Significant
Large		
Very large		

19.6 Assumptions and Limitations

19.6.1 This section provides a description of the assumptions and limitations to the waste and resources assessment.

19.6.2 This assessment is based on the current Proposed Development design and as such, detailed information relating to the exact sources and types of construction materials is not yet available. The sources of construction materials would be decided post consent by the construction contractor. A high-level assessment of estimated key construction materials against national and regional availability is provided and is considered robust.

19.6.3 Information on the current permitted local and regional landfill capacity is provided. There is no publicly available collated information on any potential changes to this permitted capacity by the time of construction of the Proposed Development or operation during this period or beyond. However, a future baseline for landfill capacity has been developed in discussion with stakeholders (LBC, CBC and HCC) and using the Microsoft Excel 'Forecast' function. EA data from 2021 is used within the assessment.

Reasonable Worst Case

19.6.4 **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]** describes the general approach adopted to ensure that a reasonable worst case is assumed in this assessment including the use of parameters, accounting for uncertainty, and incorporating flexibility in design and demand forecasts.

19.6.5 Further relevant assumptions on worst case specific to this assessment include:

a. All waste generated by the construction and operation of the Proposed Development is sent for landfill disposal, although in practice a large proportion of waste is recycled or otherwise recovered. In the first instance, the quantitative assessment is completed on this basis that all waste is sent to landfill. If significant effects are predicted, then the assessment is repeated using a realistic waste recovery rate i.e. that a proportion of the waste will be recovered (reused, recycled or sent for energy recovery).

19.7 Baseline Conditions

19.7.1 This section provides a description of the existing conditions within the Proposed Development Study Area and Expansive Study Areas a described in **Table 19.6**.

Existing Conditions

Operational Resources

19.7.2 Assessing resources use during operation of the airport is not possible since:

a. The exact types and quantity of resource use associated with the operation of the existing airport is currently unknown, since the airport uses a wide variety of resources, in some cases hundreds of different products.

b. Data on resource usage is not readily available from the airport operator.

c. There is no publicly available information on the national availability of such resources, so it is not possible to set a national baseline or apply a value or sensitivity to that availability.

19.7.3 Resources are used on a day-to-day basis and periodically for maintenance activities e.g. airfield maintenance. Resource use from these maintenance activities during operation is expected to be generally the same in type to that generated by the existing airport; resources would be managed using the established procedures and facilities e.g. storage areas, that are used across the airport. Larger maintenance projects e.g. if resurfacing of the airfield was required, are likely to be covered by a project specific SWMP. Some data on resources required to maintain the airfield between 2026-2041 have been provided by the design team and are outlined in **paragraph 19.9.22**.

19.7.4 Therefore, for the reasons listed above, resource use during operation (excluding airfield maintenance) of the Proposed Development is not outlined in detail in the assessment as agreed with LBC, CBC and HCC.

Operational Waste

19.7.5 In 2019, the airport generated a total of 2,471 tonnes of non-hazardous operational C&I waste. 60% of airport operational waste was sent to recycling facilities, with the remaining 40% sent to an energy recovery facility (Ref. 19.37) (**Table 19.16**). No non-hazardous C&I waste was consigned directly to landfill. This represents 0.48% of Central Bedfordshire's 2013-2014 total C&I waste arisings (shown in **Table 19.19**). 2019 data is used in the assessment since 2020 and 2021 data was impacted by reduced passenger numbers due to COVID-19 travel restrictions.

Table 19.16: Operational non-hazardous waste (2019)

Waste type	Quantity (tonnes)	Waste management route
General waste	995	Recovery
Mixed recycling	795	Recycling

Waste type	Quantity (tonnes)	Waste management route
Food waste	273	Recycling
Cardboard	235	Recycling
Glass waste	140	Recycling
Wood	11.9	Recycling
Cooking oil	7.4	Recycling
Metal	6.2	Recycling
Confidential waste	4.9	Recycling
Tyres	3.0	Recycling
Alkali batteries	0.01	Recycling
Li-ion batteries	0.002	Recycling
Total waste	**2,471**	-
Total sent for recycling	**1,476**	-
Total sent for energy recovery	**995**	-
% sent for recycling	**60**	-
% sent for energy recovery	**40**	-

19.7.6 In 2019, the total non-hazardous waste generated was approximately 0.137 kg/pax (passenger) based on 18 million passengers per annum (mppa).

19.7.7 The LLAOL 2019 Sustainability Report (Ref. 19.38) outlines the quantities of waste and recycling rates for 2017-2019 (**Table 19.17**). The total includes both non-hazardous and hazardous waste.

Table 19.17: Operational waste as reported in the London Luton Airport 2019 Sustainability Report (Ref. 19.38)

Year	Recycled waste (tonnes)	Non-recycled waste (tonnes)	Total waste (tonnes)	Recycling rate (%)
2017	1,459	868	2,327	63
2018	1,430	809	2,239	64
2019	1,493	999	2,492	60

19.7.8 In 2019, approximately 21 tonnes of hazardous operational waste was generated as outlined in **Table 19.18**.

Table 19.18: Operational hazardous waste 2019

Waste type	Quantity (tonnes)	Waste management route
Waste Oil	7.3	Recycling
Waste Electrical and Electronic Equipment (WEEE)	4.4	Recycling

Waste type	Quantity (tonnes)	Waste management route
Absorbents Used to Soak up Oil	3.9	Incineration
Aerosol Cans	3.0	Recycling
Fridges	0.6	Recycling
Lead-acid Batteries	0.6	Recycling
Empty Paint Tins	0.6	Incineration
Oil Filters	0.5	Recycling
Control of Substances Hazardous to Health (COSHH) (Disposal (D15))	0.1	Incineration
COSHH (Recovery (R13))	0.1	Recovery
Paint / Thinners	0.1	Recycling
Parts Cleaner	0.1	Recycling
Ni-Cd Batteries	0.04	Recycling
Total hazardous waste	**21.3**	-

Waste Generation and Management in the Expansive Study Areas

Waste Generation

19.7.9 Non-hazardous CD&E and C&I waste arisings in the Expansive Study Area of Bedfordshire, Buckinghamshire and Hertfordshire are presented in **Table 19.19**, **Table 19.20**, **Table 19.21** and **Table 19.22**.

Table 19.19: Estimated waste arisings over the BBC, LBC and CBC plan period as outlined in the BBC, LBC and CBC Minerals and Waste Local Plan (Ref. 19.20).

Year	Estimated waste arisings (million tonnes)				
	C&DE	C&I	Municipal	London	Total
2013-2014	1.140	0.510	0.306	0.165	2.212
2028-2029	1.323	0.544	0.371	0.031	2.269

19.7.10 BBC, LBC and CBC acknowledge that (page 23, paragraph 5.9) "*the volumes of arisings of hazardous wastes in the Plan area are low, and no facilities for their management exist within the Plan area. It is anticipated that the transfer of these wastes to nationally significant disposal facilities outside of the Plan area, will continue.*"

Table 19.20: Estimated waste arisings over the Buckinghamshire plan period as outlined in the Buckinghamshire Minerals and Waste Local Plan (Ref. 19.39)

Year	Buckinghamshire waste arisings (million tonnes)				
	CD&E	C&I	Hazardous	Municipal	Total
2016	1.132	0.554	0.013	0.266	1.965
2021	1.132	0.582	0.014	0.279	2.008
2026	1.132	0.612	0.015	0.292	2.051
2031	1.132	0.643	0.016	0.306	2.097
2036	1.132	0.676	0.016	0.319	2.144

Table 19.21: Estimated waste arisings over the Hertfordshire plan period as outlined in the Waste Core Strategy and Development Management Policies Development Plan Document (Ref. 19.21)

Year	Hertfordshire waste arisings (million tonnes)			
	CD&E	C&I	Municipal	Total
2016	No estimate provided	0.564	1.059	No total provided
2021		0.556	1.066	
2026		0.546	1.062	

Table 19.22: Estimated waste arisings for the non-hazardous Study Area

Year	Estimated waste arisings (million tonnes)		
	Bedfordshire (BBC, LBC and CBC) total	Buckinghamshire total	Hertfordshire C&I and Municipal only, no CD&E estimate is provided, no total is provided
2013-2014	2.122		
2016		1.965	1.623
2021		2.008	1.066
2026		2.051	2.164
2028-2029	2.269		
2031		2.097	
2036		2.144	

Landfill Inputs and Capacity

19.7.11 **Table 19.23** and **Table 19.24** present EA figures for landfill inputs (waste received at the landfill) and remaining void capacity for the non-hazardous waste Expansive Study Area (Bedfordshire, Buckinghamshire and Hertfordshire) and the hazardous waste Study Area (South East, East of England regions and East Midlands) for 2021.

19.7.12 Merchant landfills are operated for commercial purposes accepting waste from construction projects and operating businesses. Merchant landfills are therefore considered to form the baseline. In contrast, restricted landfills are sites that deal with their own produced waste (i.e. not operating for commercial purposes) and therefore additional capacity is excluded from the baseline. Stable Non-Reactive Hazardous Waste (SNRHW) cells are cells designed specifically for waste such as asbestos.

Table 19.23: Landfill capacity in Bedfordshire, Buckinghamshire and Hertfordshire for 2021 (Ref. 19.36)

Landfill Type	Sub-Region			
	Bedfordshire	Buckinghamshire	Hertfordshire	Total
	Void capacity ('000s m^3)			
Non-hazardous with SNRHW cell	-	10,344	-	10,344
Non-hazardous	-	14,119	-	14,119
Total non-hazardous	-	24,463	-	24,463
Inert	658	535	7,807	9,000

Table 19.24: Landfill inputs in Bedfordshire, Buckinghamshire and Hertfordshire for 2021(Ref. 19.36)

Landfill Type	Sub-Region			
	Bedfordshire	Buckinghamshire	Hertfordshire	Total
	Inputs ('000s tonnes)			
Non-hazardous with SNRHW cell	-	1,703	-	1,416
Non-hazardous	221	702	450	2,249
Total non-hazardous	221	2,405	450	3,665
Inert	629	722	1,174	2,253

19.7.13 Buckinghamshire's Minerals and Waste Local Plan (MWLP) estimates indicate that there will be sufficient landfill capacity, noting this is based on indicative capacity requirements over the plan period (up to 2036) identified in the MWLP and does not include new capacity required as a result of NSIPs.

19.7.14 The BBC, LBC and CBC Minerals and Waste Plan notes that as of 2014, there was no landfill capacity for non-hazardous wastes within their jurisdictions and the scope for landfilling wastes is very limited, due to the geology and poor availability of suitable mineral working voids.

Other Waste Management Facilities

19.7.15 The exact waste management facilities to be used would be decided post consent by the construction contractor, however, high-level information on local capacity is provided for context.

19.7.16 The capacity of waste management facilities is publicly available (e.g. Environmental Permitting Regulations – Waste Sites (Ref. 19.40)), however the permitted capacity is not necessarily representative of the actual operational capacity of the infrastructure. Therefore, data is collated for the non-hazardous waste Study Area from the EA's Waste Data Interrogator 2021 – Waste Received (Excel) – Version 1 (Ref. 19.41) and presented in **Table 19.25**. Inputs are not totalled, since the double counting of waste in the Waste Data Interrogator cannot be discounted. Double counting results from the same waste making multiple movements through multiple facilities, e.g. transfer station to treatment facility with residues going to an energy from waste facility.

Table 19.25: Summary of waste infrastructure inputs in the non-hazardous waste Study Area (sites accepting hazardous waste and landfills included for completeness)

Facility type	Bedfordshire	Buckinghamshire	Hertfordshire
Anaerobic Digestion	26,380	48,386	122,674
Animal By-products Incinerator	34,413		
Biological Treatment	124,081	163,614	202,578
Civic Amenity Site	40,208	92,145	133,121
Car Breaker	201	162,074	7,888
Chemical Treatment	6,155	5,487	1,576,117
Clinical Waste Transfer		16	184,345
Co-Incinerator (Hazardous)			36,752
Composting	54,341	13,865	114,610
Deposit of waste to land (recovery)	2,020	289,509	5,549
Energy from Waste Incinerator	27,672		
Hazardous Waste Transfer	18,642		68,597
Hazardous Waste Transfer / Treatment		42,548	145,728
Inert Landfill	628,947	722,223	1,173,573
Inert Waste Transfer			22,845
Inert Waste Transfer / Treatment	38,613	170,442	47,274

Facility type	Bedfordshire	Buckinghamshire	Hertfordshire
Material Recycling Facility	112,806	95,927	129,675
Metal Recycling	141,847	20,078	101,942
Municipal Waste Incinerator	169,165	421,494	
Non-hazardous (SNRHW) Landfill		1,703,465	
Non-hazardous Waste Transfer / Treatment	30,422	174,061	92,900
Non-hazardous Landfill	220,622	702,246	449,600
Non-hazardous Waste Transfer	254,286	469,801	310,494
Physical Treatment	91,359	268,822	225,850
Recovery of Waste		57,706	408,109
Vehicle depollution facility	10	1,077	6,288
WEEE Treatment Facility	960		787

19.7.17 Since some of the construction waste generated by the Proposed Development would be hazardous wastes (e.g. excavated material from the historic landfill as outlined in **Table 19.51,** oils from construction vehicles, WEEE, treated timber, adhesives, paints, solvents, batteries etc.) and due to the specialised nature of hazardous waste management, hazardous waste management facility information is provided for context.

19.7.18 Data is collated for the hazardous waste Study Area from the EA's Waste Data Interrogator 2021– Waste Received (Excel) – Version 1 (Ref. 19.41) and presented in **Table 19.26,** for hazardous waste incinerators and **Table 19.27** for waste operation with hazardous waste inputs. Inputs are not totalled, since the double counting of waste in the Waste Data Interrogator cannot be discounted. Double counting results from the same waste making multiple movements through multiple facilities, e.g. transfer station to treatment facility with residues to going to an energy from waste facility.

19.7.19 The following incinerator types are not included:

a. animal by-products;
b. clinical waste;
c. pet crematoriums;
d. sewage sludge incinerators; and
e. gas engines.

19.7.20 The following site types have not been included, since only those site types likely to be used (in terms of both waste type and quantity) during the construction and operation of the Proposed Development are the primary focus of this assessment:

a. landfills (considered elsewhere in the baseline);
b. combustion and incinerators (considered in **Table 19.26)**;

c. transfer stations;
d. storage facilities;
e. clinical waste transfer/treatment; and
f. WEEE treatment facilities.

19.7.21 Sites receiving less than 250 tonnes of hazardous waste in 2021 have not been included since hazardous waste generated by the excavated material from the historic landfill is potentially in excess of this and these facilities are relatively small.

19.7.22 Sites over 60 miles straight line distance are not included.

Table 19.26: Hazardous waste incinerators

Operator	Site name and permit number	Site postcode	Sub region	Direct line distance from Proposed Development (miles)	Tonnes of hazardous waste received in 2021
Tradebe Fawley Limited	Fawley HT Incinerator EPR/FP3935KL	SO45 3NX,	Hampshire	84	30,287
Wastecare Ltd	East Kent Waste Recovery Facility	CT13 9ND,	Kent	84	4,615

Table 19.27: Waste operations with hazardous waste inputs in 2021

Operator	Site name and permit number	Site postcode	Sub region	Direct line distance from Proposed Development (miles)	Site type	Tonnes of hazardous waste received in 2021
Veolia ES (UK) Limited	Redbournbury Treatment Plant - EPR/BW3281IA	AL3 6RP	Hertfordshire	7	Hazardous Waste (Haz Waste) Transfer / Treatment	23,156
Recycling Lives Limited	Wallace Way Metal Recycling Facility EPR/WP3539RL	SG4 0SE	Hertfordshire	7	Recovery of Waste	16,362
Severn Trent Green Power (North London) Limited	North London Anaerobic Digestion Facility EPR/MP3934QN	AL4 0PG	Hertfordshire	12	Anaerobic Digestion	9,196
Veolia ES (UK) Limited	Stewartby Waste Management Facility EPR/QP3237SC	MK43 9LY	Bedfordshire	15	Chemical Treatment	4,941
Alpheus Environmental Limited	Cotton Valley Waste Treatment Centre EPR/PP3434ML	MK15 9PA	Buckinghamshire	19	Haz Waste Transfer / Treatment	4,845
Severn Trent Green Power (West London) Limited	West London AD Facility	KT16 0EF	Surrey	35	Animal and Food Waste	344
Page	New Duston Oil & Solvent Reclamation Works - EPR/XP3237MZ	NN5 6NL	Northamptonshire	36	Physical-Chemical Treatment	15,087
S T & N J Page	Duston Oils	NN5 6NL	Northamptonshire	36	Physical-Chemical Treatment	645

Operator	Site name and permit number	Site postcode	Sub region	Direct line distance from Proposed Development (miles)	Site type	Tonnes of hazardous waste received in 2021
Malary Limited	Cottenham Oil Treatment Plant	CB24 8PS	Cambridgeshire	36	Physical-Chemical Treatment	26,690
F M Conway Limited	Gully Waste Recycling Facility - EPR/BX2213IV	DA1 3QY	Kent	38	Physical-Chemical Treatment	5,053
Sims Environmental & Recycling Services Ltd	Burrows Farm Transfer Station - EPR/WP3831JT	RM14 3TL	Essex	40	Haz Waste Transfer / Treatment	24,730
Mick George Limited	Rushton Waste Transfer Station EPR/CP3995SN	NN14 1RS	Northamptonshire	42	Composting	1,781
Alpheus Environmental Limited	Basildon Waste Treatment Centre - EPR/EP3838MK	SS13 1DB	Essex	43	Physical Treatment	4,066
Oxfordshire County Council	Drayton Depot EPR/RP3338DS	OX14 4EZ	Oxfordshire	43	Haz Waste Transfer / Treatment	2,206
Mick George Limited	Mepal Soil and Waste Treatment Centre EPR/EP3492SP	CB6 2AY	Cambridgeshire	44	Biological Treatment	76,483
Controlled Reclamation (Oxford) Limited	Dix Pit Aggregate Processing Facility - EPR/VP3730EQ	OX29 5BB	Oxfordshire	46	Haz Waste Transfer / Treatment	1,253
Adler & Allan Ltd	Standlake Waste Oil Storage Facility EPR/YP3231TT	OX29 7PL	Oxfordshire	47	Haz Waste Transfer / Treatment	1,651
Slicker Recycling Ltd	Kingsnorth Oil TP EPR/QP3138AA	ME3 9ND	Kent	52	Physical-Chemical Treatment	13,861

Operator	Site name and permit number	Site postcode	Sub region	Direct line distance from Proposed Development (miles)	Site type	Tonnes of hazardous waste received in 2021
London Mining Associates Limited	Aylesford Metals Recycling Facility EPR/DB3104KP	ME20 7FG	Kent	53	Physical-Chemical Treatment	12,750
Cleansing Service Group Ltd	CSG Aylesford Treatment Plant EPR/UP3033UX/V007	ME20 7NA	Kent	54	Physical-Chemical Treatment	19,145
Gallagher Aggregates Limited	Hermitage Quarry Waste Treatment Facility - EPR/LP3134YU	ME16 9NT	Kent	55	Haz Waste Transfer / Treatment	302
Hensel Recycling (UK) Ltd	HRUK Slinfold Site - EPR/EP3439DW	RH13 0SH	West Sussex	56	Physical-Chemical Treatment	784
OCO Technology Limited	Brandon Aggregate Manufacturing Facility - EPR/JP3332FK	IP27 0AX	Suffolk	58	Physical-Chemical Treatment	34,396
Sweeep Kuusakoski Limited	Sweeep Kuusakoski Ltd - EPR/GP3498HL	ME102QB	Kent	60	Material Recycling Facility	35,945

Resources

19.7.23 The exact sources of construction materials would be decided post consent by the construction contractor. United Kingdom (steel) (Great Britain for minerals and mineral products), and regional data has been used to establish a quantitative national baseline of the consumption for resources (key construction materials including steel, aggregates, asphalt and concrete). Local information is also provided for context, but this data is not used in the quantitative assessment.

National Construction Resources

19.7.24 **Table 19.28** summarises national consumption in 2018 for steel, aggregates, asphalt and concrete (the most recent year for which data is available), which are the key construction materials expected to be used during the construction of the Proposed Development.

Table 19.28: National consumption and demand for key construction materials

Material	National consumption (million tonnes, year)	Baseline data year	Data description
Steel	17	2018	UK total consumption (Ref. 19.42)
Aggregates of which:	*251*	2018	Minerals and mineral products sales in Great Britain (Ref. 19.43)
Crushed rock	117.3		
Sand and gravel - land won	48.9		
Sand and gravel - marine	13.7		
Recycled and secondary	71		
Asphalt	25.4		
Concrete of which:	*86.2*		
Ready-Mixed Concrete	54.2		
Concrete products	32		

Regional Construction Resources

19.7.25 Regional data is presented in **Table 19.29**. Construction material sales by region are provided for the regions surrounding the Proposed Development (South East, London, East of England and East Midlands). Regional information on steel is not available. It is assumed that the majority of key construction materials would be sourced regionally, taking into account the proximity principle and value for money.

Table 19.29: Construction material sales by region for the regions surrounding the Proposed Development, 2019 (Ref.19.43)

Construction material	South East sales	London sales	East of England sales	East Midlands sales	Total sales in the regions surrounding the Proposed Development
Crushed rock (million tonnes)	None	None	None	26.5	26.5
Sand and gravel (million tonnes)	16.1	None	13.7	6.1	35.9
Ready-mixed concrete (million tonnes, converted from m^3 using a density of 2.4 t/m^3)	5.8	7.4	3.6	3.4	20.16
Asphalt (million tonnes)	1.9	2.7	2.5	2.8	9.9

Local Construction Resources

19.7.26 Local construction resources including sand and gravel, recycled and secondary aggregates, concrete and asphalt have been summarised in **Table 19.30 to Table 19.33** for Buckinghamshire (Bucks), Bedfordshire (Beds) and Hertfordshire (Herts). Information has been collected via desk-based research e.g. local aggregate assessments and local plans. Local information is provided for context. This data is not used in the quantitative assessment.

Table 19.30 Sand and gravel capacity

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
Springfield Farm Ltd	Springfield Farm	Broad Lane, Beaconsfield, HP9 1XD	Bucks	23	1,004,444* and 2,000,000 (extension)	*Capacity was estimated based on 9.04 Mt of reserved / allocated sand and gravel available (until 2036) at nine sites in the Buckinghamshire Minerals and waste Local Plan (Ref. 19.39). Buckinghamshire County Council Local Aggregate Assessment 2019 (Ref. 19.44)
Summerleaze Ltd	New Denham Quarry	New Denham Quarry Denham, Uxbridge, UB9 4HE	Bucks	23	1,004,444* 2,790,000 (extensions)	Capacity value includes proposed extensions (Ref. 19.39, Ref. 19.44.)
	Denham Park Farm	Denham Green	Bucks	23	1,004,444*	(Ref. 19.39, Ref. 19.44).
Brett Aggregates Ltd.	George Green Quarry	George Green Quarry, Uxbridge Road, George Green, Slough, SL2 5NH	Bucks	26	1,004,444*	(Ref. 19.39, Ref. 19.44).
Tarmac	All Souls Farm Quarry (Wexham)	Wexham, Buckinghamshire	Bucks	26	1,004,444*	(Ref. 19.39, Ref. 19.44).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
Harleyford Aggregates Ltd.	Harleyford Marina	Henley Rd, Marlow, SL7 2DX	Bucks	29	1,004,444*	Quarry is not mentioned in the Local Aggregate Assessment 2019 (Ref. 19.39).
Summerleaze Ltd.	Berry Hill Farm	Taplow, Maidenhead, SL6 0EH	Bucks	28	1,004,444*	Quarry is not mentioned in the Local Aggregate Assessment 2019 (Ref. 19.39).
Brett Aggregates Ltd.	Park Lodge Quarry	Pinewood Road, Iver Heath SL0 0NE	Bucks	24	1,004,444*	Quarry is not mentioned in the Local Aggregate Assessment 2019 (Ref. 19.39).
Summerleaze Ltd.	East Burnham Quarry	Burnham Pit, Beechwood Nurseries, Farnham Lane, Slough, SL23SD	Bucks	26	1,004,444*	(Ref. 19.39, Ref. 19.44).
CEMEX	North Park, Richings Park	North Park, Richings Park, Buckinghamshire, SL0 9DJ	Bucks	27	3,000,000	(Ref. 19.39, Ref. 19.44).
CEMEX	Slade Farm (North and South)	Hedgerley Lane, Hedgerley, Slough, Buckinghamshire, SL2 3XD	Bucks	23	1,300,000	Capacity value is for both north and south sites (Ref. 19.39, Ref. 19.44).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
	Hydelane Farm	Foscott, Buckinghamshire, England, MK18 5EX	Bucks	26	1,000,000	(Ref. 19.39, Ref. 19.44).
Breedon Group	Willington Lock	Grange Way, Bedford MK44 3QN	Beds	18	1,090,000	Central Bedfordshire, Bedford Borough and Luton Borough Councils Materials and Waste Local Plan: Strategic Sites and Policies (Ref. 19.20). Central Bedfordshire, Bedford Borough and Luton Borough Council's Mineral and Waste Monitoring Report published 2022 (Ref. 19.45). Local Aggregate Assessment 2021 (covering the calendar year 2020) (Ref. 19.46).
Lafarge Tarmac	Blunham / Roxton	Blunham / Roxton	Beds	20	2,950,000 - 3,550,000	Unpermitted reserves as of 2020 (no planning permission) (Ref.19.20, Ref.19.45 and Ref.19.46).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
Breedon Group	Black Cat	Black Cat Roundabout, Chawston, Bedford MK44 3B	Beds	21	0	Planning permission lapsed in 2020 (Ref.19.20, Ref.19.45 and Ref.19.46).
Lafarge Tarmac	Broom South Quarry	Broom South, Broom, Biggleswade, SG18 9JH	Beds	14	4,000,000	Includes northern extension of quarry which was granted planning permission during 2020. New reserves from the extension area only (Ref.19.20, Ref.19.45 and Ref.19.46).
TARMAC	The Briggens Estate (Olives Farm)	Stanstead Road, Ware, SG12 8PT	Herts	19	9,000,000	Workable reserves. Information taken from Policy 2 of the Hertfordshire Minerals and Waste Local Plan 2040 (Draft Plan) (Ref.19.22) and Hertfordshire Local Aggregate Assessment 2021 (Covering the calendar year of 2020) (Ref.19.47).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
Brett Aggregates	Hatfield Aerodrome	Land at former Hatfield Aerodrome, Hatfield Road, Hatfield	Herts	10	0 (8,000,000)	Reserve only. Planning permission refused (Ref 19.22, Ref.19.47).
CEMEX	Hatfield Quarry - Furze Field	Oaklands Lane, Smallford, St Albans, AL4 0HT	Herts	9	450,000	Obtained planning permission in October 2018. The site is to be worked as an extension to the existing Hatfield Quarry. Extraction has not yet commenced (as of the end of 2020) (Ref. 19.22, Ref. 19.47).
CEMEX	Hatfield Quarry – Land Adjoining Coopers Green Lane	Oaklands Lane, Smallford, St. Albans, AL4 0HT	Herts	9	3,520,000	(Ref. 19.22, Ref. 19.47).
Breedon Group	Willowhill Farm	Unknown, not provided in references or on Breedon Group website.	Beds	-	740,000	Unpermitted reserves as of 2020 (no planning permission) (Ref.19.20, Ref.19.45, Ref.19.46).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
Breedon Group	Bridge Farm	Unknown, not provided in references or on Breedon Group website.	Beds	-	544,000 – 1,004,000	Unpermitted reserves as of 2020 (no planning permission) (Ref.19.20, Ref.19.45, Ref.19.46).
Hanson	Rickneys Quarry	Wadesmill Road, Hertford, SG12 0GB	Herts	13	1,240,000	Eastern extension to the mothballed site at Rickneys Quarry. Applicant did not commence development of the site within the planning permission expired. Application remains undetermined (at the end of 2020) (Ref.19.47).
Hanson	Bengeo Quarry - Land at Ware Park	Between Sacombe Road and Wadesmill Road, SG12 0GB	Herts	13	0 (2,600,000)	Reserve only. Planning permission refused (Ref.19.47).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
TARMAC	Tyttenhanger Quarry (Coursers Road)	Coursers Road, London Colney, St Albans, AL4 0PG	Herts	10	No information provided in references.	Currently being worked as an extension to Tyttenhanger Quarry. The application for an eastern extension of the existing quarry (south of Coursers Road) was permitted on 23 February 2011. Information taken from Section 3 of the Hertfordshire Local Aggregate Assessment 2020 (Ref.19.22, Ref.19.47).
TARMAC	Tyttenhanger (Colney Heath)	St Albans, AL4 0RZ	Herts	10	No information provided in references.	Extraction and site permission to 2032 (Ref.19.47).
Tarmac	Panshanger Park	Thieves Lane, Hertford SG14 2WN	Herts	13	No information provided in references.	Infill of landfill commenced 2019 - restoration to be completed within 10 years of this date (Ref. 19.47).

Table 19.31: Recycled and secondary aggregates capacity

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
FCC Environment	Greatmoor Energy from Waste (EfW) Facility	Greatmoor Road, Woodham, Aylesbury, HP18 0QE	Bucks	26	75,000 per annum	It is expected that 25% of the waste input will be exported as secondary aggregate (Ref. 19.39).
No information provided.	Thorney Mill	Thorney Mill Road, Richings Park, Iver, UB7 7EZ	Bucks	27	No information provided in references.	(Ref. 19.39).
No information provided.	Westhorpe Farm	Woodham, Buckinghamshire, HP18 0QD	Bucks	26	No information provided in references.	(Ref. 19.39).
No information provided.	Spade Oak	Address not provided.	Bucks	26	No information provided in references.	(Ref. 19.39).
Veolia Environmental Services PLC	Wapseys Wood Landfill	Oxford Road, Gerrards Cross, Buckinghamshire, SL9 8TE	Bucks	22	No information provided in references.	(Ref. 19.39).
Brett Aggregates Limited	Park Lodge	Park Lodge, Pinewood Road, Iver SL0 0NE	Bucks	24	No information provided in references.	(Ref. 19.39).
No information provided in references.	Airfield Industrial Estates	Cheddington Lane, Long Marston, HP23 4QR	Bucks	13	No information provided in references.	(Ref. 19.39).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
No information provided in references.	Home Farm	Home Farm, Bourton Road, Buckinghamshire, MK18 7DP	Bucks	27	No information provided in references.	(Ref. 19.39).
Clear Up Skips Recycling	Clear Up Skips Recycling	Binders Industrial Estate, High Wycombe, HP15 6LJ	Bucks	21	No information provided in references.	(Ref. 19.39).
Wycombe Skip Hire & Demolition	Wycombe Skip Hire & Demolition	Facility Unit 53, Binders Id Est, Cryers Hill Road, High Wycombe, Buckinghamshire, HP15 6LJ	Bucks	21	No information provided in references.	(Ref. 19.39).
Cappagh	Cappagh	Bison Industrial Estate, Thorney Lane, Iver, SL0 9HE	Bucks	26	No information provided in references.	(Ref. 19.39).
Ground Waste Recycling Ltd	Burrowfields Waste Solutions	50-52 Burrowfield, Welwyn Garden City, AL7 4SR	Herts	9	No information provided in references.	Permanent status. Hertfordshire Local Aggregate Assessment 2020 (Ref. 19.47).
BP Mitchell Ltd	Birchall Lane	Birchall Lane, Cole Green, Welwyn Garden City, SG14 2NR	Herts	11	No information provided in references.	Permanent status (Ref. 19.47).
Envirowaste (Inc) Ltd /	Land adjacent to B197	Land adjacent to B197, North of Graveley (Graveley	Herts	8	No information provided in references.	Permanent status (Ref. 19.47).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
Stevenage Skips		used for distance calculation)				
Peter Brothers Ltd	Burnside, Hatfield	Hertford Road, Hatfield, Herts AL9 5AB	Herts	10	No information provided in references.	Permanent status (Ref. 19.47).
Tarmac Ltd	Harper Lane (Rail Loop)	Harper Lane, Radlett, WD7 7HX	Herts	13	No information provided in references.	Permanent status (Ref. 19.47).
Aggregate Industries UK Ltd	Skinners Yard, Hertford	Lower Hatfield Road, Hertford SG13 8LE	Herts	13	No information provided in references.	Certificate of Lawful Use (CLEUD) (Ref. 19.47).
Acorn Transport & Plant Hire Ltd	Blunham Recycling Facility	Land north of Bartford Road, Blunham	Beds	19	75,000 p.a	Central Bedfordshire, Bedford Borough and Luton Borough Councils' Local Aggregate Assessment 2021 (covering the calendar year 2020) (Ref. 19.46).
Thomas Bros Excavations (Luton) Ltd	Cainhoe Quarry	Cainhoe Quarry, Shefford, Beds, SG17 5PJ	Beds	10	210,000 p.a	(Ref. 19.46).
Winton Haulade Ltd	Land adjacent to Ampthill Road (A507)	A507, Beadlow	Beds	10	75,000 p.a	(Ref. 19.46).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
Mini One Plant Hire ltd	Heron's Farm	Mancroft Road, Aley Green, Luton, LU1 4DR	Luton	4	1,000 p.a	(Ref. 19.46).
SC Bradshaw Haulage	Old Sand Pit / Quarry	Old Main Rd, Haynes West End, Bedford MK45 3QS	Beds	12	7,500 p.a	(Ref. 19.46).
Cawleys Waste Management	1 Covent Garden Close	1 Covent Garden Cl, Luton, LU4 8QB	Luton	3	5,000 p.a	Permit states 143,000 tonnes p.a however 5,000 tonnes p.a based on the Waste Data Interrogator (WDI) 2020 (Ref. 19.46).
Wykes Engineering	Goosey Lodge Industrial Estate	Wymington, Rushden, NN10 9LU	Beds	28	35,000 p.a	Permit states 105,000 tonnes p.a however 35,000 tonnes p.a based on separate planning permission for inert waste (Ref. 19.46).
C Jackson & Sons	North End Farm	Stagsden, Bedford, MK43 8TU	Beds	24	10,000 p.a	(Ref. 19.46).
DB Standing & Sons	Fox Corner	35 Woburn Road, Heath and Reach, Leighton Buzzard, LU7 OAR	Beds	13	7,000 p.a	(Ref. 19.46).
Holywell Haulage	Chiltern Green Road	Chiltern Green Road, East Hyde, Luton, LU2 9PW	Luton	2	50,000 p.a	Permit allows up to 100,000 tonnes p.a but estimate 50,000 tonnes p.a. (Ref. 19.46).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
Paul Riches Skips	Unit 1 Kempston Court	Manor Rd, Kempston Hardwick, Bedford MK43 9NT	Beds	15	75,000 p.a	(Ref. 19.46).
FD O'Dell and Sons Ltd.	Cow Close	Cow Close, Biggleswade SG18 9JT	Beds	14	8,000 p.a	Permit limit of 49,000 tonnes p.a of which aggregates estimated to comprise 8,000 tonnes p.a. (Ref. 19.46).
Three Shires Waste Recycling Ltd	Unit 2, 250 Toddington Road	250 Toddington Rd, Luton LU4 9DZ	Luton	5	14,000 p.a	No limit on permit. Estimate based on WDI 2020 (Ref. 19.46).
ABSS Skips (Budget Skips)	Compound A Unit 4, Cauldwell Walk	Compound A, Cauldwell Walk Ind Est, Bedford, Bedfordshire, MK42 9DT	Beds	18	1,000 p.a	Thought to be under 10,000 tonnes p.a which secondary aggregates are estimated to be 1,000 tonnes p.a (Ref. 19.46).
M O'Brien Plant Hire	Unit 16 Harmill Industrial Estate	Unit 16 Harmill Ind Estate, Grovebury Road, Leighton Buzzard, Bedfordshire, LU7 4FF	Beds	13	75,000 p.a	(Ref. 19.46).
Wilstead Skips	Four Winds Industrial Estate	Bedford Road, Haynes West End, Bedford MK45 3QT	Beds	12	1,000 p.a	No restriction in planning permissions (Ref. 19.46).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
Biffa	Blackburn Road	Blackburn Road, Townsend Industrial Estate, Houghton Regis, LU5 5DD	Luton	9	1,000 p.a	Permit 202,800 tonnes p.a. of which secondary aggregate recycling is estimated to be 1,000 tonnes p.a. (Ref. 19.46).
Barton Skips	Unit G Faldo Road	Faldo Road, Barton Industrial Estate, Barton-le-Clay, MK45 4RP	Beds	7	15,000 p.a	Permit 75,000 tonnes p.a of which secondary aggregate are estimated to be 15,000 tonnes p.a based on the WDI 2020 (Ref. 19.46).

Table 19.32: Asphalt capacity

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
Tarmac	Harper Lane (Rail Loop)	Harper Lane, Radlett, WD7 7HX	Herts	13	No information provided.	Operator website.
Aggregate Industries	Asphalt Hertford	Water Hole Quarry, Lower Hatfield Rd, Hertford SG13 8LE	Herts	13	No information provided.	Operator website.

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments
Tarmac	The Old Brickworks (two sites)	Wilstead Road, Elstow, Bedford, MK42 9YU	Beds	16	No information provided in reference.	Central Bedfordshire, Bedford Borough and Luton Borough Councils Materials and Waste Local Plan: Strategic Sites associated Policies Map: Location Plan Key (Ref. 19.48).
Lafarge	30-31 Cosgrove Way	30-31 Cosgrove Way, Luton LU1 1XL	Luton	4	No information provided in references.	(Ref. 19.48).
Spade Oak	Spade Oak	Spade Oak Construction, Town Lane, High Wycombe, HP10 0PD	Bucks	26	300,000 p.a (asphalt and aggregate)	Operator website.

Table 19.33: Concrete capacity

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
Tarmac	Tyttenhanger	St Albans, AL4 0RZ	Herts	10	No information provided in reference.	Operator website.
London Concrete Ltd. (Aggregate Industries)	Orphanage Road Goods Yard	Orphanage Road Sidings, Off Reeds Crescent, Watford, Hertfordshire, WD24 4PH	Herts	15	No information provided in reference.	Operator website.
Breedon	Thorney Mill	Thorney Mill Lane, Iver, SL0 9AL	Bucks	27	No information provided in reference.	Operator website.
Breedon	Milton Keynes Concrete Plant	Chesney Wold, Bleak Hall, Milton Keynes MK6 1LS	Bucks	19	No information provided in reference.	Operator website.
Hanson	Sandy Road	Sandy Road, Cople Turn, Cople, Bedford, MK44 3PX	Beds	18	No information provided in reference.	(Ref. 19.48).
Breedon Group	Bedford Road, Willington Quarry	Off Bedford Rd, Willington, Bedford, MK44 3PG	Beds	18	No information provided in reference.	(Ref. 19.48).

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
CEMEX	St Neots Concrete Plant	Great North Road, Wyboston Lakes, Wyboston, Bedfordshire, MK44 3AL	Beds	23	No information provided in references.	(Ref. 19.48) and operator website.
CEMEX	Grovebury Road	Grovebury Rd, Leighton Buzzard, LU7 4TB	Luton	13	No information provided in references.	(Ref. 19.48) and operator website.
CEMEX	Letchworth Plant	Hitchin Rd, Arlesey, SG15 6RS	Beds	13	No information provided in references.	(Ref. 19.48) and operator website.
Weber Ltd.	Enterprise Way	Dickens House, Enterprise Way, Flitwick, Bedford, MK45 5BY	Beds	13	No information provided in reference.	(Ref. 19.48).
No information provided in reference.	Sunderland Road	Sunderland Road, Sandy, SG19 1QT	Beds	10	No information provided in reference.	(Ref. 19.48).
CEMEX	Selbourne Road	Selbourne Rd, Luton, LU4 8LS	Luton	10	No information provided in references.	(Ref. 19.48) and operator website.
Hanson	Cosgrove Way	Cosgrove Way, Bedfordshire, Luton, LU1 1XL	Luton	18	No information provided in references.	(Ref. 19.48) and operator website.

Operator	Site Name	Site Address	Sub Region	Direction line distance from Proposed Development (miles)	Capacity (tonnes)	Comments and Information Reference
Breedon Aggregates	Luton Concrete Plant	Leagrave Road, Luton, LU3 1RJ	Luton	3	No information provided in reference.	Operator website.
No information provided in reference.	Kingsway, Luton	Kingsway, Luton	Luton	3	No information provided in reference.	(Ref. 19.48).

Targets for Recycled Content

19.7.27 A target is set in the Luton Rising Sustainability Strategy (Ref.19.49) for recycled content:

a. *"Achieve a minimum of 25% recycled or secondary content in key construction materials (e.g. concrete and steel)."*

19.7.28 This target is included as mitigation in **Paragraph 19.8.5** and the target is set in the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**) and OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**).

19.7.29 Baseline targets for alternative aggregates (comprising both secondary aggregates, which are by-products from industrial and mining operations, and recycled aggregates, which are produced from construction waste also known as recycled content) can be derived from the data set out in the National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 (Ref. 19.50).

19.7.30 The regions surrounding the Proposed Development are summarised in **Table 19.34** below. The total aggregate provision is the sum of all aggregates, the recycled content is a proportion of the total provision that is recycled and secondary material. This table provides an indication of aggregate availability since MPAs consider these guidelines at a local level.

Table 19.34: National and regional guidelines for aggregates provision

Region	Guidelines for land-won production		Assumptions			Total aggregate provision (million tonnes)	Alternative materials (recycled content) target derived from the guidelines
	Land-won sand and gravel	Land-won crushed rock	Marine sand and gravel	Alterative materials (secondary and recycled aggregates)	Net imports to England		
South East	195	25	121	130	31	502	26%
London	18	0	71	95	12	197	48%
East of England	236	8	14	117	7	382	31%
East Midlands	174	500	0	110	0	784	14%
England	1028	1492	259	993	136	3,908	25%

Future Baseline

19.7.31 In the absence of the Proposed Development, there is likely to be a change to the future baseline conditions as a result of other factors and developments in proximity to the airport. These are the conditions that will prevail 'Without development' in place. The 'Without development' scenario is used, where appropriate, as a comparator for the assessed case, to show the effect of the Proposed Development against an appropriate reference point. The approach to defining future baseline and the developments identified for consideration are described in **Section 5.4** of **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

Future Consumption Baseline for Resources

19.7.32 Information on national and regional consumption of resource (key construction materials is provided in **Table 19.28** and **Table 19.29**). There is no publicly available information on any potential long-term changes to this national or regional demand by the time of construction of the Proposed Development or operation, so it is not possible to set a future baseline for resources. Therefore, future consumption is assumed to be the same as the current baseline as outlined in **Table 19.28** and **Table 19.29**.

19.7.33 Construction material demand, such as ready-mixed concrete, is closely aligned to both the quantity of construction taking place and the general economy, therefore it is deemed inappropriate to forecast future demand as the demand is unlikely to be linear. The assessment considers the influence of material consumption during construction and operation on the current baseline.

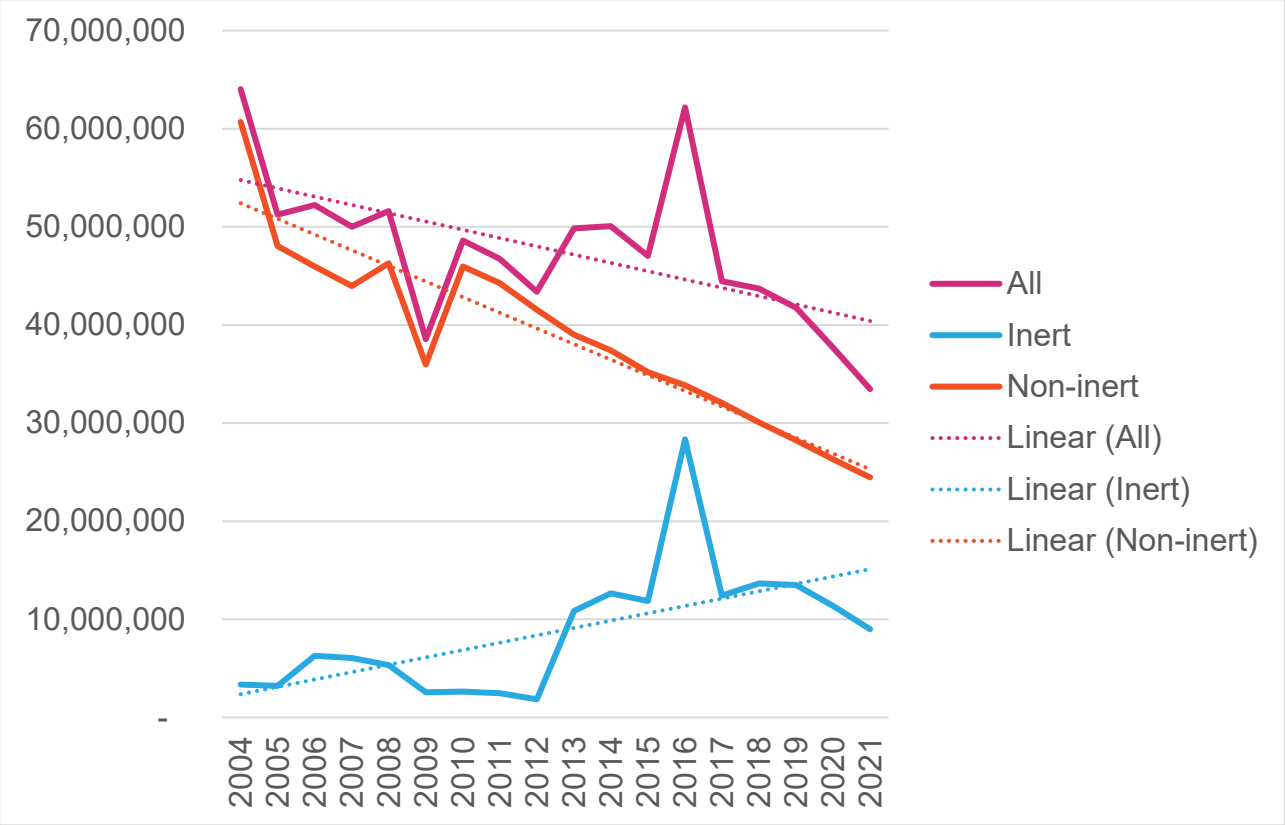
Future Landfill Void Capacity

19.7.34 Information on the currently permitted landfill void capacity is provided in **Table 19.23**. There is no publicly available information on any potential changes to this permitted capacity by the time of construction of the Proposed Development or operation. A future baseline for landfill capacity has been developed in discussion with stakeholders (LBC, CBC and HCC) and using the Microsoft Excel 'Forecast' function.

19.7.35 The EA published landfill capacity trends for 2004 to 2021 in in the 2021 Waste Summary Tables for England – Version 2 (Ref. 19.41). Data for 2004 to 2021 has been plotted as shown in **Inset 19.1**. The data represents the non-hazardous landfill capacity in the Expansive Study Area of Buckinghamshire, Bedfordshire and Hertfordshire.

19.7.36 The 'Non-inert' category includes non-hazardous landfill sites, non-hazardous landfill sites with a SNRHW cell, and merchant hazardous landfill sites. The restricted user category has been excluded as it is assumed that this capacity would not be available to the Proposed Development.

Inset 19.1: Landfill void capacity trends 2004 to 2021



19.7.37 Between 2004 and 2012, inert landfill void capacity dropped from 3.3 million m^3 to 1.8 million m^3. In 2013, the landfill void capacity increased to 10.8 million m^3 and increased steadily to 13.7 million m^3 in 2018. In 2019, 2020 and 2021 there was a slight reduction in landfill void capacity to 9 million m^3. The 2016 landfill void capacity increase to 28.3 million m^3 is deemed to be an outlier.

19.7.38 Due the cyclic nature of inert landfill void capacity, it is not considered appropriate to use the Microsoft Excel 'Forecast' function, as the forecast results in a large increase in landfill void capacity up to 2043 and the trend since 2013 has shown a general increase in capacity. It is considered unlikely that inert landfill capacity would continue to increase (based on the data from 2013 onwards), but equally unlikely that it would be allowed to decline to zero.

19.7.39 As there is no realistic basis for forecasting the future baseline, a future inert landfill void capacity of 10.8 million m^3 (based on 2013 capacity when capacity started to increase) is used in the assessment. This is slightly more than the current landfill capacity (2021) of 9 million m^3.

19.7.40 Between 2004 and 2021, non-inert (which includes hazardous merchant) landfill void capacity dropped from 60.7 million m^3 to 24.5 million m^3. In 2010, the landfill void capacity increased by 28%. Since 2010, non-inert landfill void capacity has reduced by between 4% and 6% each year.

19.7.41 Using the current rate of decline of void capacity and forecasting 20 years into the future would lead to the inevitable conclusion that there would be no void space remaining by 2043. However, this is not a credible scenario: if there is

still a need for landfill, then the WPA would need to consent new void capacity to replace that which has been used up. The apparent absence of landfill capacity in 20 years' time is merely a reflection of the fact that landfill operators and planning authorities do not typically develop or permit capacity to cover such a long period of time.

19.7.42 In order to allow for consistency in assessing impacts occurring in the different assessment phases, it is therefore assumed for assessment purposes and based on professional judgement that the future baseline landfill void capacity reduces from the capacity forecast for 2027 (15.3 million m^3) to a nominal 10 million m^3 in 2039, and is maintained at this level up to 2043. This approach has been discussed and agreed with LBC, CBC and HCC. This is less than half of the current landfill capacity (2021) of 24.5 million m^3.

19.7.43 Hazardous landfill void capacity data is available for 2013-2021. Only merchant landfills have been considered to be available to the Proposed Development. In 2013, hazardous landfill void capacity was approximately 0.7 million m^3, this reduced to 0.5 million m^3 in 2014. Additional capacity was provided in 2015 for 1.7 million m^3. For the following two years, the capacity reduced and in 2018 and 2019 the capacity increased. Capacity decreased again in 2020 to 1.1 million m^3 and to 0.9 million in 2021.

19.7.44 Due the cyclic nature of hazardous waste landfill void capacity, it is again not considered appropriate to use the Microsoft Excel 'Forecast' function, as the forecast results in a large increase in landfill void capacity up to 2043 as the trend for 2018 and 2019 has shown an increase in capacity. Therefore, the 2021 hazardous waste landfill capacity of 0.9 million m^3 is used in the assessment.

Receptor Sensitivity

Material Receptor Sensitivity

19.7.45 Material receptor sensitivity is determined as Medium. On balance, the key materials required for the construction and operation of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock and are available comprising some sustainable features and benefits compared to industry-stand materials (e.g. recycled content). Material receptor sensitivity has been changed from low to medium since the 2022 PEIR in discussion with stakeholders with knowledge of material shortages on other large other infrastructure projects within the area (LBC, CBC and HCC).

19.7.46 Potential recycled content for the main construction materials are outlined in **Table 19.35**. These "good practice" rates are derived from WRAP's Designing Out Waste Tool for Civil Engineering (Ref. 19.30).

Table 19.35: Potential recycled content

Material type	Potential recycled content (% by weight)
Concrete	16

Material type	Potential recycled content (% by weight)
Asphalt	25
Aggregates	50
Steel reinforcement	100
Structural steel	60

Waste Receptor Sensitivity

19.7.47 Taking into account the future landfill void capacity set out in **paragraphs 19.7.34-19.7.44**, across construction and operation the baseline/future baseline (without the Proposed Development) of non-hazardous landfill void capacity in the Expansive Study Area is expected to:

a. reduce very considerably (by >10%), between 2004 and 2021 non-inert (which includes hazardous merchant) landfill void capacity dropped from 60.7 million m^3 to 24.5 million m^3, a >10% reduction;

b. end during construction and operation;

c. is already known to be unavailable; or

d. would require new capacity or infrastructure to be put in place to meet forecast demand.

19.7.48 Taking into account the future landfill void capacity set out in **paragraphs 19.7.34-19.7.44**, across construction and operation the baseline/future baseline (without the Proposed Development) of hazardous landfill void capacity in the Expansive Study Area is expected to:

a. reduce very considerably (by >1%), between 2019-2-21 there has been a 31% reduction in landfill capacity;

b. end during construction and operation;

c. is already known to be unavailable; or

d. would require new capacity or infrastructure to be put in place to meet forecast demand.

19.7.49 Since in all cases there is predicted to be a very considerable reduction in void capacity between the current and future baseline, the receptor sensitivity is determined to be Very High.

19.8 Embedded and Good Practice Mitigation Measures

19.8.1 This section describes the embedded and good practice mitigation for waste and resources that has been incorporated into the Proposed Development's design or assumed to be in place before undertaking the assessment. A definition of these classifications of mitigation and how they are considered in the EIA is provided in **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

Embedded

Design

19.8.2 The Proposed Development has been designed, as far as possible, to avoid effects related to waste and resources through option identification, appraisal, selection and refinement.

19.8.3 The design of the Proposed Development and the planned approach to its construction have been developed with an overarching principle of achieving efficiencies in waste and resources where possible, for example by designing-out waste generation where possible and diverting waste from landfill through on-site and off-site recycling and recovery.

19.8.4 Mitigation measures have been integrated (embedded) into the design for the purpose of minimising effects related to waste and resources. These general measures comprise the following, which focus on designing out waste and implementing the waste hierarchy:

a. Designing the development in a manner that facilitates the reuse of acceptable material arisings, for example those associated with earthworks cuttings and other excavations.
b. The inclusion of land within the Order Limits for the temporary on-site storage of soils, excavated materials and other materials.
c. The appropriate sizing of construction compounds to enable the segregation and storage of waste, and to facilitate off-site recovery.
d. The retention of existing infrastructure within the development design where feasible, to minimise the need for the demolition of components and infrastructure and the associated generation of waste material.
e. Design of adequate provision for internal and external waste storage to allow waste segregation during operation.

Construction

19.8.5 Mitigation measures have been integrated (embedded) into the Proposed Development for the purpose of minimising effects related to waste and resources during construction. These general measures comprise the following, which focus on implementing the waste hierarchy through the reuse and recycling of site-won materials on-site where possible to minimise the need to import construction materials to site, and to reduce the quantity of waste to be exported off-site:

a. Achieving an earthworks balance (cut and fill material) within the design of the development, where possible, to minimise the need to import and export material.
b. The reuse of excavated materials and the recycling of demolition and construction materials within the development, where practicable.
c. Importing alternative (recycled and secondary) aggregate and other materials during construction, where practicable.
d. Produce a MMP (a requirement set out in the CoCP included as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).
e. Produce a SWMP (as a requirement set out in the CoCP, included as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). The SWMP will be based on the OSWMP (included as **Appendix 19.1** of this ES **[TR020001/APP/5.02]**).
f. Setting of recycled content targets. The following target is set in the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**) and OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**):
    i. Achieve a minimum of 25% recycled or secondary content in key construction materials (e.g. concrete and steel).
g. Setting of waste recovery and recycling targets as per the ANPS. The following targets are set in the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**) and OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**):
    i. Achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste. Uncontaminated excavated soil and stones (European Waste Catalogue/List of Wastes code 17 05 04) are specifically excluded from this target. Recovery is deemed to include reuse, recycling and recovery (e.g. energy recovery).
    ii. Achieve at least 50% preparation for reuse, reuse and recycling of municipal waste (waste materials such as paper, metal, plastic and glass as far as these waste streams are similar to waste from households).

Operational

19.8.6 Mitigation measures have been integrated (embedded) into the Proposed Development for the purpose of minimising effects related to waste and resources during operation. These general measures comprise the following, which focus on implementing the waste hierarchy through reuse and recycling:

a. Produce an OWMP in accordance with the OOWMP, provided as **Appendix 19.2** of this ES **[TR020001/APP/5.02]** and secured by a Requirement of the draft DCO **[TR020001/APP/2.01]**.
b. Setting of waste recycling target as per the ANPS. The following target is set in the OOWMP (**Appendix 19.2** of this ES **[TR020001/APP/5.02]**):

i. Achieve at least 50% preparation for reuse, reuse and recycling of municipal waste (waste materials such as paper, metal, plastic and glass as far as these waste streams are similar to waste from households).

Good Practice

Design

19.8.7 A designing out waste workshop was completed on 4 June 2019 and opportunities have been discussed further with the design team throughout the design process at follow up discussions. The following WRAP designing out waste principles have been explored:

a. design for reuse and recovery;
b. design for off-site construction;
c. design for material optimisation;
d. design for waste efficient procurement; and
e. design for deconstruction and flexibility.

19.8.8 The Proposed Development design team have to date identified a number of designing out waste opportunities, which have been prioritised, investigated and implemented where appropriate. The designing out waste opportunities to be investigated further during subsequent design stages and construction are summarised as follows:

a. recycling of demolition waste on-site;
b. recycling and use on-site of existing landfill material;
c. balancing the cut (excavation) and fill (material placement) (earthworks excluding landfill material);
d. clearing vegetation in winter;
e. using materials with recycled content;
f. off-site manufacture of design elements;
g. working platform (temporary geotechnical structure, consisting of compacted granular fill, installed to allow construction plant and vehicles to travel and/or operate on-site) incorporated into final structure; and
h. setting waste targets in line with the ANPS.

Construction

19.8.9 Good practice mitigation, in the form of specific guidance on managing waste in accordance with the relevant regulations are outlined in the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**) and OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**).

19.8.10 Implementation and development of the contractor's SWMP based on the OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**) is a requirement on the contractor under the DCO.

19.8.11 With the availability of further ground investigation data during the design development stage and post consent, further opportunities to reuse materials beneficially both within the Proposed Development and on other nearby projects would be explored. This would typically involve the use of the CL:AIRE DoW CoP (Ref. 19.29) to reclassify waste as a resource and move material between construction sites using a defined process and methodology. Reuse of non-landfill material on-site i.e. soils and demolition waste would be covered by a MMP. The implementation and development of the MMP is a requirement set out in the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**).

19.8.12 The CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**) and OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**) also require contractors to adopt good practice in sustainable procurement and construction waste management, which would reduce the quantity of waste generated and increase the use of materials with recycled content. The following approaches would be implemented, in order to minimise the quantities of waste requiring disposal and increase the use of materials with recycled content:

a. Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme wherever feasible.
b. Implementation of a ‘just-in-time’ material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste wherever feasible.
c. Attention to material quantity requirements to avoid over-ordering and generation of waste materials.
d. Reuse of materials on-site wherever feasible.
e. Recycling of waste on-site wherever feasible, e.g. recycling of demolition material.
f. Segregation of waste at source.
g. Reuse and recycling of materials off-site where reuse on-site is not feasible (e.g. through use of off-site waste management infrastructure and resale for direct reuse or reprocessing).
h. Setting construction and demolition waste recovery targets.
i. Establishment of a project specific recycled content target e.g. for aggregates.
j. Contractual requirements for contractors to procure and use recycled and more sustainable materials.
k. Contractor to prepare a sustainable procurement strategy to include waste and resources aims and objectives.

19.8.13 More information is set out in the Luton Rising Sustainability Strategy (Ref.19.49) and this has been considered during the design and provides context to the Applicant’s strategy in relation to construction waste and resources.

Operation

19.8.14 The emerging Aviation Strategy Aviation 2050. The Future of UK Aviation, A Consultation (Ref. 19.51) provides a number of good practice examples for reducing waste in airports which will be adopted as appropriate by the Proposed Development:

a. Water fountains enabling customers to refill their own water containers.
b. Liquid disposal point located before security search areas, encouraging passengers to dispose of liquids and take their empty bottles through security and refill at airside water refill stations.
c. Removing single use plastic.
d. Substituting disposable items with those made from recycled plastic, biodegradable or compostable options.
e. Coffee cup recycling.
f. More environmentally friendly liquid and gel bags used at security screening.
g. Working with customers, employees, and suppliers to raise awareness of the issues of single use plastics.

19.8.15 Operational information, including a roadmap for resources and waste which includes targets, is set out in the Luton Rising Sustainability Strategy (Ref 19.49) and this has been considered during the design and provides context to Luton Rising's strategy in relation to waste and resources.

19.8.16 LLAOL have set a target to recycle at least 70% of their waste by 2022. It was reported in the LLAOL 2021 Sustainability Report (Ref. 19.52) that the airport has maintained a recycling rate of over 60% most years since 2017 (2020 being the exception) but in 2021 had not yet achieved their target recycling rate of 70% (note that LLAOL's 2022 Sustainability Report has not yet been published to confirm whether this target has now been achieved). The recycling rate in 2020 was 49%, the recycling rate in 2021 was 62%.

19.8.17 An operational target as per the ANPS is set in the DCO as outlined in **Paragraph 19.8.6** and the OOWMP (included as **Appendix 19.2** of this ES **[TR020001/APP/5.02]**)

19.9 Assessment

19.9.1 This section presents the results of the assessment of likely significant effects with the embedded and good practice mitigation measures, described in the previous section, in place.

19.9.2 A summary of the assessment of effects is provided in **Section 19.15**. Significant effects are discussed in further detail in this section.

Construction Effects

19.9.3 The potential impacts of the Proposed Development with regards to waste and resources include:

a. reduction in resources required for construction available in the relevant markets (key construction materials e.g. concrete, asphalt, steel, aggregates);

b. effects that on-site generated materials e.g. soils, waste arisings have on the existing and future landfill void capacity, during construction; and

c. effects that on-site generated waste arisings have on the existing and future landfill void capacity during operation.

19.9.4 **Table 19.36** summarises the types of resources that would be used and wastes that may be generated during construction and operation.

Table 19.36: Types of resources that would be used and wastes that may be generated during construction and operation.

Project Activity	Material resources required for the project	Waste arisings from the project
Site remediation / preparation / earthworks	a. Fill material for construction purposes. b. Primary and secondary/recycled aggregates for ground stabilisation. c. Stripped topsoil and subsoil.	a. Surplus excavated materials (earthworks) – inert. b. Surplus excavated material (former landfill) – Non-hazardous and hazardous. c. Stripped topsoil and subsoil - non-hazardous. d. Contaminated soils - hazardous. e. Site clearance, green waste arisings – non-hazardous.
Demolition	a. Materials are not required for demolition works.	a. Waste arisings from the demolition of any existing buildings, car

Project Activity	Material resources required for the project	Waste arisings from the project
		parks or structures – non-hazardous. b. Waste arisings from the demolition of any existing buildings, car parks or structures – hazardous.
Site construction	Construction materials including: a. concrete; b. asphalt and bituminous material; c. bricks; d. plasterboard; e. cement bound granular material; f. plastics; g. tiles and ceramics; h. floor coverings; i. well graded granular material; j. precast concrete kerb; k. timber; l. plywood; m. cementitious grout; n. reinforcing steel; o. reinforcing fabric; p. geotextile; q. geo-composite drainage system; and r. pipe bedding aggregate.	a. Packaging from materials delivered to site – non-hazardous. b. Excess and broken / damaged construction materials – non-hazardous. c. Waste oils from construction vehicles – hazardous. d. Construction worker wastes (excluding sewage) – non-hazardous.
Operation	a. Resources required during operation and routine maintenance of the airport.	a. Waste arisings during operation and routine maintenance of the airport – hazardous and non-hazardous.

Resources

Construction Effects

19.9.5 **Table 19.37**, **Table 19.38** and **Table 19.39** outline the estimated main types and quantities of materials resources to be used during the construction of the

Proposed Development, wastage and potential recycled content by assessment phase.

Table 19.37: Estimated main types and quantities of materials resources, wastage and potential recycled content – assessment Phase 1

Material Category	Material density	Quantity to be used in construction		Wastage rate	Wastage		Potential recycled content (% by weight)	Potential recycled content (tonnes)
	(tonnes/m^3)	m^3	tonnes	%	m^3	tonnes		
Concrete	2.4	46,373	111,295	5	2,319	5,565	16	17,807
Asphalt	2.4	57,505	138,013	2.5	1,438	3,450	25	34,503
Steel - Structural	7.85	-	301	0	-	-	60	181
Steel - Rebar	7.85	-	123	2	-	2	100	123
Aggregate	1.9	33,708	64,046	5	1,685	3,202	50	32,023
Earthworks material (granular) - imported	1.9	43,000	81,700	5	2,150	4,085	50	40,850
							Total recycled content all materials (tonnes)	125,486
Total		180,586	395,476				%	32

Table 19.38: Estimated main types and quantities of materials resources, wastage and potential recycled content – assessment Phase 2a

Material Category	Material density	Quantity to be used in construction		Wastage rate	Wastage		Potential recycled content (% by weight)	Potential recycled content (tonnes)
	(tonnes/m^3)	m^3	tonnes	%	m^3	tonnes		
Concrete	2.4	393,509	944,421	5	19,675	47,221	16	151,107
Asphalt	2.4	104,866	251,678	2.5	2,622	6,292	25	62,919
Steel - Structural	7.85	1,139	8,941	0	-	-	60	5,365
Steel - Rebar	7.85	789	6,197	2	16	124	100	6,197
Aggregate	1.9	461,384	876,629	5	23,069	43,831	50	438,315
Earthworks material - imported	1.9	289,000	549,100	5	14,450	27,455	50	274,550
Total		1,250,687	2,636,968				Total recycled content all materials (tonnes)	938,453
							%	36

Table 19.39: Estimated main types and quantities of materials resources, wastage and potential recycled content – assessment Phase 2b

Material Category	Material density	Quantity to be used in construction		Wastage rate	Wastage		Potential recycled content (% by weight)	Potential recycled content (tonnes)
	(tonnes/m^3)	m^3	tonnes	%	m^3	tonnes		
Concrete	2.4	85,882	206,117	5	4,294	10,306	16	32,979
Asphalt	2.4	63,126	151,502	2.5	1,578	3,788	25	37,876
Steel - Structural	7.85	584	4,585	0	46	-	60	2,751
Steel - Rebar	7.85	296	2,324	2	6	46	100	2,324
Aggregate	1.9	137,087	260,465	5	6,854	13,023	50	130,233
Earthworks material - imported	1.9	211,000	400,900	5	10,550	20,045	50	200,450
Total		497,975	1,025,894				Total recycled content all materials (tonnes)	406,612
							%	40

19.9.6 The estimated key construction material quantities for each assessment phase have been compared against the national annual consumption baseline in **Table 19.40**.

Table 19.40: Estimated construction material and percentage of national consumption by assessment phase

Material type	National consumption (million tonnes)	Assessment Phase 1 (tonnes)	%	Assessment Phase 2a (tonnes)	%	Assessment Phase 2b (tonnes)	%
Concrete	86.2	111,295	0.13	944,421	1.10	206,117	0.24
Asphalt	25.4	138,013	0.54	251,678	0.99	151,503	0.60
Steel (structural and rebar)	17	424	0.002	15,138	0.09	6,909	0.04
Aggregate and earthworks material (imported material only)	251	145,745	0.06	1,425,730	0.57	661,365	0.26

19.9.7 For construction assessment Phase 1 and 2b, no individual construction material type is equal to or greater than 1% by weight of the national baseline consumption.

19.9.8 For construction assessment Phase 2a, concrete is equal to or greater than 1% (1.1%) of the national baseline, and asphalt is just below 1% (0.99%). This is deemed to be a conservative assessment, since total construction material use would not be within a single year. For example, construction covers multiple years, therefore spreading out the impact on national consumption further. Phase 2a is anticipated to be constructed over three years.

19.9.9 The estimated key construction material quantities for each year have been compared against the national annual consumption baseline in **Table 19.41**. Each assessment phase has been divided equally by the number of years within each assessment phase.

Table 19.41 Estimated construction material and percentage of national consumption by year

Material type	National annual consumption (million tonnes)	Assessment Phase 1 (2025-2027 2.5 years) (tonnes)	% of national consumption	Assessment Phase 2a (2033-2036 3 years) (tonnes)	% of national consumption	Assessment Phase 2b (2037-2041 4 years) (tonnes)	% of national consumption
Concrete	86.2	44,518	0.05	314,807	0.37	51,529	0.06
Asphalt	25.4	55,205	0.22	83,893	0.33	37,876	0.15
Steel - Structural and rebar	17	170	0.001	5,046	0.03	1,727	0.01
Aggregate and earthworks material - imported	251	58,298	0.02	475,243	0.19	165,341	0.07

19.9.10 For all construction years, no individual construction material type is equal to or greater than 1% by weight of the national baseline consumption.

19.9.11 Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Medium, the overall effect is **Neutral**, which is **not significant**, based on the anticipation that individual construction material type would be well below 1% by weight of the national baseline consumption.

19.9.12 The estimated key construction material quantities for each assessment phase have been compared against the regional consumption baseline in **Table 19.40**.

Table 19.42: Estimated construction material and percentage of regional consumption by assessment phase

Material type	Regional consumption (million tonnes)	Assessment Phase 1 (tonnes)	%	Assessment Phase 2a (tonnes)	%	Assessment Phase 2b (tonnes)	%
Concrete	48.4	111,295	0.23	944,421	1.95	206,117	0.43
Asphalt	9.9	138,013	1.39	251,678	2.54	151,503	1.53
Steel - Structural and rebar	Not applicable, considered at national scale only	-	-	-	-	-	-
Aggregate and earthworks material - imported	62.4	145,745	0.23	1,425,730	2.28	661,365	1.06

19.9.13 For construction assessment Phase 1, concrete and aggregates and earthworks material are equal to or less than 1% by weight of the regional baseline consumption. Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Medium, the overall effect is **Neutral**, which is **not significant**, based on the anticipation that individual construction material type would be well below 1% by weight of the regional baseline consumption.

19.9.14 For construction assessment Phase 1, asphalt is 1-5% by weight of the regional consumption. Therefore, the magnitude of impact is Minor. Receptor sensitivity is Medium, the overall effect is **Slight**, which is **not significant**.

19.9.15 For construction assessment Phase 2a, concrete, asphalt and aggregates and earthworks material is 1-5% by weight of the regional consumption. Therefore, the magnitude of impact is Minor. Receptor sensitivity is Medium, the overall effect is **Slight**, which is **not significant**.

19.9.16 For construction assessment Phase 2b, concrete is equal to or less than 1% by weight of the regional baseline consumption. Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Medium, the overall effect for concrete is **Neutral** which is **not significant**, based on the anticipation that individual construction material type would be well below 1% by weight of the regional baseline consumption.

19.9.17 For construction assessment Phase 2b, asphalt, aggregates and earthworks material are 1-5% by weight of the regional consumption. Therefore, the magnitude of impact is Minor. Receptor sensitivity is Medium, the overall effect is **Slight,** which is **not significant**.

19.9.18 Assessment based on phase is a conservative assessment since the total construction material use would not be within a single year. Construction covers multiple years, therefore spreading out the impact on regional consumption further.

19.9.19 The estimated key construction material quantities for each year have been compared against the regional consumption baseline in **Table 19.43**. Each assessment phase has been divided equally by the number of years within each assessment phase.

Table 19.43 Estimated construction material and percentage of regional consumption by year

Material type	Regional consumption (million tonnes)	Assessment Phase 1 (2025-2027 2.5 years) (tonnes)	% of regional consumption	Assessment Phase 2a (2033-2036 3 years) (tonnes)	% of regional consumption	Assessment Phase 2b (2037-2040 4 years) (tonnes)	% of regional consumption
Concrete	48.4	44,518	0.09	314,807	0.65	51,529	0.11
Asphalt	9.9	55,205	0.56	83,893	0.85	37,876	0.38
Steel - Structural and rebar	Not applicable, considered at national scale only	-	-	-	-	-	-
Aggregate and earthworks material - imported	62.4	58,298	0.09	475,243	0.76	165,341	0.26

19.9.20 For all construction years, no individual construction material type is equal to or greater than 1% by weight of the national baseline consumption.

19.9.21 Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Medium, the overall effect is **Neutral**, which is **not significant**, based on the anticipation that individual construction material type would be well below 1% by weight of the regional baseline consumption.

Operational Effects

19.9.22 Information on the quantities and types of the resources required for operation of the airport are currently limited to airfield maintenance (quantities required between 2029 and 2041, the assessment period) (**Table 19.44**). The material estimates take into account minor overlays of asphalt (also known as resurfacing), repairs and major maintenance.

Table 19.44: Estimated construction material for maintenance (2029-2041) and percentage of national annual consumption

Material type	National annual consumption (million tonnes)	Regional annual consumption (million tonnes)	Maintenance (quantities required between 2029-2041) (tonnes)	% national consumption	% regional consumption
Concrete	86.2	48.4	3,763	0.004	0.01
Asphalt	25.4	9.9	103,360	0.407	1.04
Steel (structural and rebar)	17	Not applicable	Not required for maintenance		
Aggregate and earthworks material (imported material only)	251	62.4			

19.9.23 Concrete required for maintenance of the airfield is less than 1% by volume of the national or regional baseline consumption. Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Medium, the overall effect is **Neutral**, which is **not significant**, based on the anticipation that individual construction material type would be well below 1% by weight of the regional baseline consumption.

19.9.24 Asphalt required for maintenance of the airfield is less than 1% by volume of the national baseline consumption and 1-5% by volume of the regional baseline consumption. Therefore, the magnitude of impact is Minor. Receptor sensitivity is Medium, the overall effect is **Slight**, which is **not significant**.

Waste

Construction Effects – Construction Waste

19.9.25 Construction waste has been estimated in two ways, firstly for infrastructure components such as roads, taxiways, hardstanding and roads (by volume of material) as summarised in **Table 19.45**, and secondly for buildings as summarised in **Table** 19.47.

Table 19.45: Construction waste – wastage from construction materials

	Assessment Phase 1		Assessment Phase 2a		Assessment Phase 2b	
	m^3	tonnes	m^3	tonnes	m^3	tonnes
Concrete	2,319	5,565	19,675	47,221	4,294	10,306
Asphalt	1,438	3,450	2,622	6,292	1,578	3,788
Steel - Structural	-	-	-	-	-	-
Steel - Rebar	-	2	16	124	6	46
Aggregate	1,685	3,202	23,069	43,831	6,854	13,023
Earthworks material - imported	2,150	4,085	14,450	27,455	10,550	20,045
Total	7,592	16,302	59,816	124,800	23,277	47,162

19.9.26 Building construction waste is estimated using BRE SmartWaste benchmarks (Ref. 19.53) (average waste arising in m^3 per 100 m^2) and the Gross External Area (GEA) of each building in m^2. Where GEA is not available, sub-zone area (site area) is used as worst case. The benchmarks used are presented in **Table 19.46** and the construction waste estimate for buildings is presented in **Table 19.47.**

Table 19.46 Average waste arisings benchmarks

Project Type	Average waste arising m^3/100 m^2
Residential	18.9
Public Buildings	24.2
Leisure	16.3

Project Type	Average waste arising m^3/100 m^2
Industrial Buildings	13.2
Healthcare	18.5
Education	21.3
Commercial Other	15.3
Commercial Offices	16.8
Commercial Retail	19.4

Table 19.47: Construction waste – building construction

	Assessment Phase 1		Assessment Phase 2a		Assessment Phase 2b	
	m^3	tonnes	m^3	tonnes	m^3	tonnes
Total building construction waste	1,494	478	18,664	5,973	12,004	3,841

19.9.27 The precise composition and volume of this waste is dependent on several factors and will be further informed at detailed design and by the appointed Principal Contractor, based on their experience of similar developments.

Construction Effects – Demolition Waste

19.9.28 Demolition waste consists of waste from the clearance of car parks, earth bunds, airside roads and buildings. The Bristol Britannia fuselage in the fire training area is not included in the demolition waste estimate since it is not possible to accurately estimate demolition waste as the fuselage is not a building. The fuselage is constructed of aluminium which is readily recyclable. It is anticipated that this material would be reused in the proposed new fire training ground or recovered and would not impact landfill void capacity. Corrugated bonded cement sheeting and asbestos products have been noted in one building listed for demolition.

19.9.29 Demolition waste from buildings has been estimated based on building volume in m^3 (width, depth and height) and the demolition waste benchmarks outlined in **Table 19.48**. The benchmarks are those that were used in the WRAP's Demolition Quantities Estimator which sat within the Net Waste Tool (Ref. 19.54). The Net Waste Tool is no longer available online.

Table 19.48: Building demolition waste benchmarks

Building type	Demolition waste arisings (tonne per $m^{3)}$
Masonry	0.543
Steel frame	0.47
Timber	0.386

19.9.30 Waste in tonnes was converted to m^3 using the WRAP Waste Volume to Mass Conversion Factors (Ref. 19.55). The demolition waste estimate is presented in **Table 19.49**. Asphalt, concrete, aggregate and brick from site clearance are all

inert. Since the composition of demolition waste is currently unknown 75% of the building demolition waste is estimated to be inert waste e.g. concrete, brick, asphalt. The remainder is estimated to be non-hazardous. All steel is categorised as non-hazardous waste. Some hazardous waste would be generated during demolition, but it is not possible to quantify at this time.

Table 19.49: Site clearance and demolition waste estimate

Material	Waste type	Assessment Phase 1		Assessment Phase 2a		Assessment Phase 2b	
		m^3	tonnes	m^3	tonnes	m^3	tonnes
Site clearance waste							
Asphalt	Inert	60,710	145,704	102,352	245,645	65,385	156,924
Concrete and asphalt mix	Inert	11,630	27,912	24,717	59,321	6,431	15,433
Aggregate (granular type)	Inert	13,929	26,465	0	0	0	0
Steel	Non-hazardous	0	0	1,556	654	0	0
Brick	Inert	0	0	208	137	0	0
Building demolition waste	75% inert, 25 % non-hazardous	1,552	497	92,126	29,480	170,997	54,719
Total		**87,821**	**200,578**	**220,959**	**335,237**	**242,812**	**227,076**
Total inert		**87,433**	**200,454**	**196,372**	**327,213**	**200,063**	**213,396**
Total non-hazardous		**388**	**124**	**24,588**	**8,024**	**42,749**	**13,680**

Construction Effects – Vegetation Clearance

19.9.31 The quantity of waste estimated to arise from vegetation clearance (**Table 19.50**) is based on the number of hectares expected to be cleared, the vegetation type (heavily wooded, medium wood or open field) and a benchmark for m^3 and tonnes of waste per hectare. All trees to be cleared are assumed as a worst case to be heavily wooded. Areas allocated for topsoil removal are represented by the open field vegetation type. The benchmarks are:

a. Heavily wooded – 429m^3 per ha, 300 tonnes per ha;
b. Medium wooded – 250m^3 per ha, 175 tonnes per ha; and
c. Open field – 9m^3 per ha, 6 tonnes per ha.

Table 19.50: Vegetation clearance waste arisings

Vegetation Type	m^3 of waste per ha	tonnes of waste per ha	Assessment Phase 1	Waste		Assessment Phase 2a	Waste		Assessment Phase 2b	Waste	
			ha	m^3	tonnes	ha	m^3	tonnes	ha	m^3	tonnes
Heavily wooded	429	300	1.8	771	539	5.2	2,230	1,559	1.2	509	356
Medium wooded	250	175	0	-	-	0	-	-	0	-	-
Open field	9	6	39.7	357	238	12.9	116	78	33.6	302	201
Total waste				1,128	777		2,346	1,637		811	558

19.9.32 During vegetation clearance (excluding invasive species), it is estimated that 4,286m^3 (2,972 tonnes) of material would be generated. It is anticipated that all of this waste would be composted on or off-site with a 100% recovery rate and therefore would not impact landfill void capacity.

19.9.33 Japanese Knotweed (non-native invasive species) has been identified in areas within the Order Limits as outlined in **Chapter 8** Biodiversity of this ES **[TR020001/APP/5.01]**. Where possible, works in these areas would be avoided. Any material generated would be managed in accordance with EA guidance: Stop invasive non-native plants from spreading (Ref. 19.56), Prevent Japanese knotweed from spreading (Ref. 19.57) and Treatment and disposal of invasive non-native plants: Regulatory Position Statement (RPS)178 (Ref. 19.58). Options for management include, but are not limited to, treatment or burial on-site, therefore, it is anticipated that this material would be managed on-site and would not impact landfill void capacity. Control of invasive and non-native species is outlined in the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**).

Construction Effects – Excavated Material

19.9.34 Overall, in all three assessment phases it is estimated that 2,769,000m^3 of non-hazardous material (excluding the material excavated during the landfill works) would be excavated, and it is anticipated that all of this material would be reused on-site and incorporated into the landform, thus achieving a cut and fill balance. Therefore, it is anticipated that this material would be managed on-site and would not impact landfill void capacity.

19.9.35 Overall, in all three assessment phases it is estimated that 387,000m^3 of material would be excavated during the landfill works, of this 347,000m^3 would be reused or recycled on-site and incorporated into the landform. Therefore, it is anticipated that the majority of this material would be managed on-site and would not impact landfill void capacity.

19.9.36 **Table 19.51** presents the quantities of waste to be taken off-site for recycling or recovery (40,000m^3). The majority of waste would be diverted from landfill, with the remaining hazardous waste to be sent to hazardous waste landfill or to an energy from waste facility. For the purpose of this assessment, the waste management route assessed is landfill as a worst-case scenario. As the assessment of impact is based on the effects on landfill void capacity, only that waste which would potentially be sent to hazardous waste landfill is assessed.

Table 19.51: Material to be excavated from the landfill and taken off-site

	Waste management route	Assessment Phase 1 (m^3)	Assessment Phase 2a (m^3)	Assessment Phase 2b (m^3)
Total excavated material to	To be confirmed by the lead contractor	3,000	34,000	3,000

	Waste management route	Assessment Phase 1 (m^3)	Assessment Phase 2a (m^3)	Assessment Phase 2b (m^3)
be taken off-site				
Total hazardous waste	To be confirmed by the lead contractor	1,500	17,000	1,500
Hazardous - asbestos (25% of hazardous waste)	Non-hazardous landfill (SNRHW cell)	375	4,250	375
Hazardous - soil (60% of hazardous waste)	Soil treatment	900	10,200	900
Hazardous - other (15% of hazardous waste)	Hazardous waste landfill or incineration	225	2,550	225
Non-hazardous	To be confirmed by the lead contractor	1,500	17,000	1,500

Construction Effects – Summary

19.9.37 All estimated waste from construction is summarised in **Table 19.52**. Vegetation clearance is not summarised here as it assumed that waste would not impact on landfill void capacity (100% recovery rate). The total estimated construction waste is compared against the landfill void capacity in **Table 19.53**.

Table 19.52: Construction, demolition and excavation waste summary

Construction, demolition and excavation waste	Waste type	Assessment Phase 1		Assessment Phase 2a		Assessment Phase 2b	
		m^3	tonnes	m^3	tonnes	m^3	tonnes
Construction waste – material wastage	Inert	7,592	16,302	59,816	124,800	23,277	47,162
Construction waste – material wastage	Non-hazardous	-	2	16	124	6	46
Construction waste – buildings	Inert	747	239	9,332	2,986	6,002	1,921
Construction waste – buildings	Non-hazardous	747	239	9,332	2,986	6,002	1,921
Demolition waste	Inert	87,433	200,454	196,372	327,213	200,063	213,396
Demolition waste	Non-hazardous	388	124	24,588	8,024	42,749	13,680
Excavated waste (historic landfill excavation only)	Non-hazardous	1,500	Excavated materials quantified in m^3 only.	17,000	Excavated materials quantified in m^3 only.	1,500	Excavated materials quantified in m^3 only.
Hazardous waste (destined for landfill only)	Hazardous	225	Excavated materials quantified in m^3 only.	2,550	Excavated materials quantified in m^3 only.	225	Excavated materials quantified in m^3 only.
Total inert		**97,771**	**216,995**	**265,520**	**454,999**	**229,342**	**262,479**
Total non-hazardous		**2,635**	**366**	**50,936**	**11,134**	**50,257**	**15,647**

Construction, demolition and excavation waste	Waste type	Assessment Phase 1		Assessment Phase 2a		Assessment Phase 2b	
		m^3	tonnes	m^3	tonnes	m^3	tonnes
Total hazardous		**225**		**2,550**		**225**	

Table 19.53: Estimated construction waste compared against landfill void capacity

	Capacity (million m^3)	Assessment Phase 1 (m^3)	%	Capacity (million tonnes m^3)	Assessment Phase 2a (m^3)	%	Capacity (million m^3)	Assessment Phase 2b (m^3)	%
Inert construction waste	10.8	97,771	0.9	10.8	265,520	2.45	10.8	229,342	2.1
Non-hazardous construction waste (noting the capacity is categorised as non-inert which includes hazardous waste capacity)	15.8	2,635	0.02	10	50,936	0.5	10	50,257	0.5
Hazardous construction waste	0.9	225	0.03	0.9	2,550	0.28	0.9	225	0.03

19.9.38 For inert waste, in a worst-case scenario where all waste goes to landfill, the effects in each assessment phase would be:

a. Assessment Phase 1, waste generated by the Proposed Development would reduce landfill void capacity in the non-hazardous waste Expansive Study Area by <1% (0.9). Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight,** which is **not significant**.

b. Assessment Phase 2a, waste generated by the Proposed Development would reduce landfill void capacity in the non-hazardous waste Expansive Study Area by 1-5% (2.5%). Therefore, the magnitude of impact is Minor. Receptor sensitivity is Very High. The overall effect is Moderate and is selected from a choice of Moderate or Large in the IEMA Guidance (Ref.19.28). Moderate is selected because the anticipated landfill capacity reduction would be well below 5%. When a non-hazardous construction waste recovery rate of 70% is applied waste generated would reduce the landfill void capacity by 0.7%. Therefore, the magnitude of impact is reduced to Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

c. Assessment Phase 2b, waste generated by the Proposed Development would reduce landfill void capacity in the non-hazardous waste Expansive Study Area by 1-5% % (2.1%). Therefore, the magnitude of impact is Minor. Receptor sensitivity is Very High. The overall effect is Moderate and is selected from a choice of Moderate or Large in the IEMA Guidance (Ref.19.28). Moderate is selected because the anticipated landfill capacity reduction would be well below 5%. When a non-hazardous construction waste recovery rate of 70% is applied waste generated would reduce the landfill void capacity by 0.6%. Therefore, the magnitude of impact is reduced to Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

19.9.39 For non-hazardous waste, in a worst-case scenario where all waste goes to landfill, the effects in each assessment phase would be:

a. Assessment Phase 1, waste generated by the Proposed Development would reduce landfill void capacity in the non-hazardous waste Expansive Study Area by <1% (0.02%). Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

b. Assessment Phase 2a, waste generated by the Proposed Development would reduce landfill void capacity in the non-hazardous waste Expansive Study Area by <1% (0.5). Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

c. Assessment Phase 2b, waste generated by the Proposed Development would reduce landfill void capacity in the non-hazardous waste Expansive Study Area by <1% (0.5). Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

19.9.40 For hazardous waste in a worst-case scenario where all waste goes to landfill, the effects in each assessment phase would be:

a. Assessment Phase 1, waste generated by the Proposed Development will reduce landfill void capacity in the hazardous waste Expansive Study Area by <0.1% (0.03%). Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

b. Assessment Phase 2a, waste generated by the Proposed Development would reduce landfill void capacity in the hazardous waste Expansive Study Area by 0.1-0.5% (0.28%). Therefore, the magnitude of impact is Minor. Receptor sensitivity is Very High, the overall effect is **Moderate**, which is **significant**, based on the anticipation landfill capacity reduction would be well below 0.5%. When hazardous waste recovery rate of 50% is applied waste generated would reduce the landfill void capacity by 0.14%. Therefore, the magnitude of impact remains as Minor. Receptor sensitivity is Very High, the overall effect is still **Moderate**, which is **significant**. While a conservative approach has been taken in this assessment, which assumes the Study Area comprises the three surrounding regions, the IEMA Guidance (Ref.19.28) suggests that the hazardous waste Study Area is set at a national level (England). This is due the specialist nature of hazardous waste and the limited availability of hazardous waste management facilities in certain regions of England. A Study Area limited to particular regions could represent an 'un-reasonable' worst case assessment on how hazardous waste is managed by the Proposed Development. Therefore, if national (England) hazardous landfill void capacity (12.1 million m^3) at the end of 2021 is considered, waste generated (without recovery) would reduce the landfill void capacity by <0.1% (0.02%). Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

c. Assessment Phase 2b, waste generated by the Proposed Development would reduce landfill void capacity in the hazardous waste Expansive Study Area by <0.1% (0.03%). Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

Operational Effects

19.9.41 As identified in the current airport operational 2019 baseline (**Table 19.17** and **Table 19.18**), all non-hazardous operational waste is sent for recycling or energy recovery with no non-hazardous operational waste consigned directly to landfill. It is assumed that the current landfill diversion rate (100%) will be maintained. Non-hazardous operational waste is expected to increase in proportion to passenger numbers. In 2019, the airport generated a total of 2,471 tonnes of non-hazardous operational waste.

19.9.42 It is estimated that non-hazardous operational waste would increase to 4,731 tonnes by the year 2043 (**Table 19.54**). Waste quantity and type is proportional

to passenger numbers, assuming the terminal capacities are achieved, and they are achieved at the start of each year.

Table 19.54: Estimated operational waste

Year predicted passenger capacity reached	Total capacity (mppa)	Estimated non-hazardous operational waste (tonnes)	Estimated hazardous operational waste (tonnes)	Non-hazardous operational waste kg/pax	Estimated non-hazardous operational waste (m^3)	Landfill void capacity (million m^3)	% landfill void capacity
2019 (baseline year)	18 (Ref. 19.59) (actual)	2,471 (actual)	21 (actual)	0.137	n/a	n/a	n/a
2027 (Assessment Phase 1)	21.5	2,951	25	0.137	14,055	15.3	0.09
2039 (Assessment Phase 2a)	27	3,707	32	0.137	17,650	10	0.18
2043 (Assessment Phase 2b)	32	4,393	37	0.137	20,919	10	0.21
Tonnes converted to m^3 using WRAP Waste Volume to Mass Conversion Factors (mixed municipal waste 0.21 tonnes/m^3)							

19.9.43 Given the current 100% landfill diversion rate for non-hazardous operational waste, it is considered that operation of the Proposed Development would result in no impact on landfill void capacity. However, a worst-case scenario where all non-hazardous waste is sent to landfill is used in the assessment. This would be 0.09% (assessment Phase 1), 0.18% (assessment Phase 2a) and 0.21% (assessment Phase 2b) of the baseline non-hazardous waste landfill void capacity of 15.3 million m^3 (assessment Phase 1) and 10 million m^3 (assessment Phase 2a and 2b). Therefore, operational waste generated by the Proposed Development would reduce landfill void capacity in the non-hazardous waste Expansive Study Area by <1%. The magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

19.9.44 Hazardous operational waste is expected to increase in proportion to passenger numbers. In 2019, the airport generated a total of approximately 21 tonnes of hazardous operational waste. It is estimated that hazardous operational waste will increase to 37 tonnes by the year 2043 (assuming the terminal capacities are achieved, and they are achieved at the start of each year).

19.9.45 Based on the estimated future hazardous waste arisings at the airport and potential for recycling and recovery of some of these waste types e.g. aerosols and batteries, it is considered waste generated by the Proposed Development would reduce landfill void capacity in the hazardous waste Expansive Study Area by <0.1%. In a worst-case scenario where all hazardous waste is sent to landfill, this would be 0.011% (assessment Phase 1) 0.014% (assessment Phase 2a) and 0.016% (assessment Phase 2b) of the baseline hazardous waste landfill void capacity of 1.1 million m^3. Therefore, the magnitude of impact is Negligible. Receptor sensitivity is Very High, the overall effect is **Slight**, which is **not significant**.

Sensitivity Analysis

19.9.46 There are certain known scenarios or risks that may occur that could influence the conclusions of the core assessment. These scenarios and the general approach to considering them in this assessment are described in **Section 5.4** of **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

19.9.47 **Table 19.55** provides a qualitative assessment of any likely changes to the conclusions of the assessment reported in this chapter, in the event that that scenario or risk is realised.

Table 19.55: Qualitative sensitivity analysis

Sensitivity scenario	Potential impact and change	Likely effect
1. 19 mppa Application	No change, baseline capacity of 18 mppa is not used in the assessment.	No change.
2. Faster growth	Future operational waste is based on passenger numbers, higher passenger throughput occurring earlier would bring forward the point	No change or slight decrease but remain **slight** and **not significant**.

Sensitivity scenario	Potential impact and change	Likely effect
	at which the maximum operational waste is generated. Operational waste generated is compared against landfill void capacity in the assessment, which is assumed to decrease up to 2039 before remaining at the same level up to 2043. If the point of maximum waste generation is brought forward, then the operational waste generated would be compared against a greater than or equal landfill void capacity. This would result in an equal or decreased impact on landfill void capacity.	
3. Slower growth	Future operational waste is based on passenger numbers, higher passenger throughput occurring later would push back the point at which the maximum operational waste is generated. Operational waste generated is compared against landfill void capacity in the assessment, which is assumed to decrease up to 2039 before remaining at the same level up to 2043. If the point of maximum waste generation is pushed back, then the operational waste generated would be compared against an equal landfill void capacity assuming landfill void capacity continuing to remain at the same level beyond 2043. This would result in an equal impact on landfill void capacity. The overall effect would remain **slight** and **not significant**.	No change, remains **slight** and **not significant**.
4. Next generation aircraft	Not relevant to the waste and resources assessment.	No change
5. J10 without National Highways Smart Motorway upgrade (hard	Not relevant to the waste and resources assessment.	No change

Sensitivity scenario	Potential impact and change	Likely effect
shoulder running scheme)		
6. Changes to airspace	Not relevant to the waste and resources assessment.	No change

19.10 Additional Mitigation

19.10.1 No additional mitigation has been proposed with respect to operational effects as a result of there being no likely significant effects.

19.10.2 For construction a significant effect has been identified in assessment Phase 2a for hazardous waste, based on a conservative approach which assumes the Study Area comprises the three surrounding regions only. In this case, the effect would be **Moderate**, which is **significant**. However, the IEMA Guidance (Ref.19.28) suggests that the hazardous waste Study Area is set at a national level (England). The overall effect is in this case is **Slight**, which is **not significant**. Therefore, no additional mitigation has been proposed with respect to construction.

19.11 Residual Effects

19.11.1 As no additional mitigation has been proposed with respect to construction or operational effects, the effects would be as reported in **Section 19.9**.

19.12 In-combination Climate Change Impacts (ICCI)

19.12.1 The waste and resources assessment receptors are waste management infrastructure (specifically landfill capacity) and national material resources demand. It is considered that impacts arising from an increase in demand and climate change on the operation of waste management infrastructure and manufacturing of material resources have been taken into account as part of the planning and permitting process for such facilities. Therefore, the ICCI are not considered further in this assessment.

19.13 Cumulative Effects

19.13.1 Since the quantities of construction materials required and the quantity of waste generated by the Proposed Development will result in no likely significant effects, and the timescales for some of the other large project waste generation do not align, there are not expected to be any cumulative waste and resources impacts as a result of the Proposed Development, together with the identified other developments in the surrounding area.

19.14 Monitoring

19.14.1 The OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**) sets out monitoring to be undertaken during the construction stage to ensure that the mitigation measures embedded in the design and those considered essential to mitigate the effects of construction activities are appropriately implemented. Reporting and auditing includes:

a. The lead contractor shall record details of the proposed waste carrier for each waste stream in the registration table, with Waste Carriers Licence details appended to the SWMP. An example table for demonstrating waste carrier registration is available in Annex A of the OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**).

b. The lead contractor shall maintain a record of all materials that come on to site. The quantity of reused, recycled and secondary aggregate shall be recorded, alongside details of the supplier, the producing facility and records that demonstrate that the material meets all relevant technical and regulatory requirements. An example table for recording materials imported to site is available in Annex B - Construction materials imported to site of the OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**). This will allow the monitoring of the target to achieve a minimum of 25% recycled or secondary content in key construction materials (e.g. concrete and steel).

c. The lead contractor shall maintain a record of all wastes that are removed from the site and their management route. Each waste management contractor shall provide details of the types and quantities of waste removed from the site, the receiving waste management facility and the associated recycling, recovery and disposal rates for each waste stream. An example table for recording waste management is available in Annex C of the OSWMP (**Appendix 19.1** of this ES **[TR020001/APP/5.02]**). This will allow the monitoring of adherence to the target to achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste. Uncontaminated excavated soil and stones (European Waste Catalogue/List of Wastes code 17 05 04) are specifically excluded from this target. Recovery is deemed to include reuse, recycling and recovery (e.g. energy recovery).

19.14.2 The reuse of non-landfill excavated material i.e. soils and demolition waste would be covered by a CL:AIRE DoW CoP MMP. The Contractor's MMP would set out monitoring requirements to be undertaken during material excavation and reuse.

19.14.3 The OOWMP (**Appendix 19.2** of this ES **[TR020001/APP/5.02]**) sets out monitoring to be undertaken during the operational stage to ensure that the mitigation measures embedded in the design and those considered essential to mitigate the effects of operational activities are appropriately implemented. Reporting and auditing includes:

a. The operator shall maintain a record of all wastes that are removed from the site and their management route. Each waste management contractor shall provide details of the types and quantities of waste removed from the site, the receiving waste management facility and the associated reuse and recycling rates for each waste stream. An example table for recording waste management is available in Annex A of the OOWMP (**Appendix 19.2** of this ES **[TR020001/APP/5.02]**). This will allow the monitoring of adherence to the target to achieve at least at least 50% preparation for reuse, reuse and recycling of municipal waste (waste materials such as paper, metal, plastic and glass as far as these waste streams are similar to waste from households).

19.15 Assessment Summary

19.15.1 **Table 19.56** provides a summary of the identified impacts, mitigation and likely effects of the Proposed Development on waste and resources.

Table 19.56: Waste and resources assessment summary

Impact	Embedded / good practice mitigation	Magnitude	Receptor sensitivity	Description of effect and significance	Additional mitigation	Residual effect
Construction - resources						
Assessment Phase 1	As described in **Section 19.8**.	Negligible	Medium	Decrease in the availability of construction material resources **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2a		Negligible	Medium	Decrease in the availability of construction material resources **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2b		Negligible	Medium	Decrease in the availability of construction material resources **Slight, not significant**	None required	**Slight, not significant**
Construction – non-hazardous waste						
Assessment Phase 1	As described in **Section 19.8**.	Negligible	Very High	Decrease in non-hazardous and inert landfill void capacity	None required	**Slight, not significant**

Impact	Embedded / good practice mitigation	Magnitude	Receptor sensitivity	Description of effect and significance	Additional mitigation	Residual effect
				Slight, not significant		
Assessment Phase 2a		Negligible	Very High	Decrease in non-hazardous and inert landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2b		Negligible	Very High	Decrease in non-hazardous and inert landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Construction – hazardous waste						
Assessment Phase 1	As described in **Section 19.8**.	Negligible	Very high	Decrease in hazardous landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2a		Negligible	Very high	Decrease in hazardous landfill void capacity **Moderate, significant,** when considering Three	None required	**Moderate, significant** when considering Three Counties

Impact	Embedded / good practice mitigation	Magnitude	Receptor sensitivity	Description of effect and significance	Additional mitigation	Residual effect
				Counties Expansive Study Area. **Slight, not significant** when national hazardous landfill void capacity considered.		Expansive Study Area. **Slight, not significant** when national hazardous landfill void capacity considered.
Assessment Phase 2b		Negligible	Very High	Decrease in hazardous landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Operation - resources						
Assessment Phase 1	As described in **Section 19.8**.	Negligible	Medium	Decrease in the availability of operational material resources **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2a		Negligible	Medium	Decrease in the availability of	None required	**Slight, not significant**

Impact	Embedded / good practice mitigation	Magnitude	Receptor sensitivity	Description of effect and significance	Additional mitigation	Residual effect
				operational material resources **Slight, not significant**		
Assessment Phase 2b		Negligible	Medium	Decrease in the availability of operational material resources **Slight, not significant**	None required	**Slight, not significant**
Operation – non-hazardous waste						
Assessment Phase 1	As described in **Section 19.8**.	Negligible	Very High	Decrease in non-hazardous and inert landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2a		Negligible	Very High	Decrease in non-hazardous and inert landfill void capacity **Slight, not significant**	None required	**Slight, not significant**

Impact	Embedded / good practice mitigation	Magnitude	Receptor sensitivity	Description of effect and significance	Additional mitigation	Residual effect
Assessment Phase 2b		Negligible	Very High	Decrease in non-hazardous and inert landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Operation – hazardous waste						
Assessment Phase 1	As described in **Section 19.8**.	Negligible	Very High	Decrease in hazardous landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2a		Negligible	Very High	Decrease in hazardous landfill void capacity **Slight, not significant**	None required	**Slight, not significant**
Assessment Phase 2b		Negligible	Very High	Decrease in hazardous landfill void capacity **Slight, not significant**	None required	**Slight, not significant**

COMPETENT EXPERTS

Topic	Role	Company	Qualifications / competencies / experience of author
Waste and resources	Author	AECOM	BSc Environmental Science MSc Environmental Management 14 years' experience Chartered Member of the Chartered Institution of Wastes Management (MCIWM) Chartered Resource and Waste Manager (CRWM) Chartered Environmentalist (CEnv) Individual Member International Solid Waste Association (ISWA) and International Waste Manager
Waste and resources	Technical Reviewer	AECOM	BSc Environmental Science MSc (Eng) Sustainable Waste Management 17 years' experience Chartered Member of the Chartered Institution of Wastes Management (MCIWM)
Waste and resources	Technical Reviewer	AECOM	BSc Chemistry 20+ year's experience Chartered Chemist (CChem) Member of the Royal Society of Chemistry (MRSC)

GLOSSARY AND ABBREVIATIONS

Term	Definition
ANPS	Airports National Policy Statement
BBC	Bedford Borough Council
BRE	Building Research Establishment
C&I	Commercial and Industrial
CBC	Central Bedfordshire Council
CD&E	Construction, Demolition and Excavation
CL:AIRE	Contaminated Land: Applications in Real Environments
CoCP	Code of Construction Practice
COSHH	Control of Substances Hazardous to Health
DCO	Development Consent Order
DoW CoP	Definition of Waste Code of Practice
DPD	Development Plan Document
EA	Environment Agency
EC	European Commission
EfW	Energy from Waste
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
GEA	Gross External Area
HCC	Hertfordshire County Council
ICCI	In-combination Climate Change Impact
IEMA	Institute of Environmental Management and Assessment
LBC	Luton Borough Council
LLAOL	London Luton Airport Operations Limited
LLP	Luton Local Plan
MMP	Materials Management Plan
mmpa	million passengers per annum
MPA	Mineral Planning Authority
MWLP	Minerals and Waste Local Plan
NHDC	North Hertfordshire District Council
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
NPPW	National Planning Policy for Waste
NPSNN	National Policy Statement for National Networks
NSIP	Nationally Significant Infrastructure Project
OOWMP	Outline Operational Waste Management Plan
OSWMP	Outline Site Waste Management Plan

Term	Definition
PEIR	Preliminary Environmental Information Report
PPG	Planning Policy Guidance
RPS	Regulatory Position Statement
SMP	Soils Management Plan
SNRHW	Stable Non-Reactive Hazardous Waste
SPD	Supplementary Planning Document
SRN	Strategic Road Network
SWMP	Site Waste Management Plan
Waste FD	Waste Framework Directive
WEEE	Waste Electrical and Electronic Equipment
WPA	Waste Planning Authority
WRAP	Waste and Resources Action Programme
WSP	Waste Strategy Policy
V&G	Vincent and Gorbing
ZOI	Zone of Influence

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