

17.0 WASTE AND RESOURCES

Introduction

17.1 This Chapter has been prepared by Mott MacDonald and provides a description of the potential effects of the Proposed Development, on the material resources use for the construction phase and generation and management of waste for the construction and operational phase.

Legislation and Policy

17.2 National and local planning policy, legislation and guidance covering the environmental assessment of waste and resource management is set out in this section. These documents have been used to guide the technical assessment within this Chapter.

European Legislation

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

Waste Framework Directive (2008/98/EC)ⁱ

17.4 The Waste Framework Directive (WFD) sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling and recovery. It defines when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products. The WFD lays down some basic waste management principles: it requires that waste is managed without endangering human health and harming the environment.

17.5 The WFD sets out a five-step waste hierarchy as to how waste should be managed which applies to anyone who produces or manages waste. The waste hierarchy requires that waste is dealt with in the following order of priority:

- Prevention
- Preparing for reuse
- Recycling
- Other recovery (for example energy recovery)
- Disposal, only as a last resort

17.6 The following considerations must be taken into account:

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

17.7 The assessment in this Chapter has taken into account the waste hierarchy and the considerations that are outlined in paragraph 17.6.

Landfill Directive (1999/31/EC)ⁱⁱ

17.8 The Landfill Directive aims to prevent, or reduce as far as possible, negative effects on the environment from the landfilling of waste. This assessment has considered disposal to landfill as the last option for waste management, prioritising the higher up options of the waste hierarchy.

Hazardous Waste Directive (91/689/EEC)ⁱⁱⁱ

17.9 This Directive lays down strict controls and requirements for controlling hazardous wastes. Hazardous waste is any waste with hazardous properties that may make it harmful to human health and the environment and is defined by the European Waste Catalogue. In the event that hazardous waste arises from the Proposed Development's activities, the waste management will adhere to the controls and requirements of hazardous waste.

National legislation

The Environment Act 2021^{iv}

17.10 The Environment Act makes provision about plans and policies for improving the natural environment. The Environment Act contains several provisions in Part 3 relating to waste which include:

- Producer responsibility obligations
- Producer responsibility for disposal cost
- Managing hazardous waste
- Electronic waste tracking

17.11 The assessment has adhered to the plans and requirements of the Environment Act 2021, including separation of recyclable waste from residual waste, and appropriate management of hazardous waste (if any arises).

The Environmental Protection Act 1990 (as amended)⁵

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

- The meaning of waste.
- The requirements of the duty of care in respect of waste and transferral of waste to any person who imports, produces, carries, keeps, treats or disposes of waste.
- A prohibition to any person on the unauthorised or harmful depositing, treatment, or disposal of waste on land.
- Waste collection and waste disposal authorities and their roles.

17.13 The assessment in this Chapter has considered the EPA 1990 definition of waste and the Act's requirements relating to the duty of care for the waste arisings from the operation of the Proposed Development.

European Union (Withdrawal) Act 2018^v

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

Waste (Circular Economy) (Amendment) Regulations 2020^{vi}

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

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

17.17 The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020^{vii}. These regulations were laid before Parliament on 16 December 2020 and are made in exercise of powers in section 8(1) of the European Union (Withdrawal) Act 2018 in order to

ensure that the waste and environmental permitting regimes continue to operate effectively as of the 1 January 2021.

The Waste (England and Wales) Regulations (2011) as amended^{viii}

- 17.18 The Waste Regulations transpose the WFD in England and Wales. They make provision for waste prevention programmes and impose duties on an establishment which produces, collects, transports, recovers or disposes of waste, in relation to the improved use of waste as a resource, including the application of the waste hierarchy. Site Waste Management Plans (SWMPs) are no longer mandatory for projects commencing after 1 December 2013. They are, however, recommended and the principles behind the regulations remain best practice.
- 17.19 It was recommended in the Scoping Report that construction waste is scoped out with the help of a SWMP, that will be produced by the contractor. SWMP takes into account the waste hierarchy.

The Hazardous Waste (England and Wales) Regulations (2005) as amended^{ix}

- 17.20 The Hazardous Waste Regulations provide for the control of hazardous wastes and their movements. A consignment note is required prior to the removal of any hazardous waste. Hazardous waste is waste that exhibits certain properties (for example, it is potentially flammable, toxic or carcinogenic) such that it is or may (at or above certain concentrations) be detrimental to human health or the environment.
- 17.21 These Regulations have been considered in this assessment in the event that hazardous waste arises from the Proposed Development's operational activities.

The Environmental Permitting (England and Wales) Regulations (2016), as amended^x

- 17.22 The Environmental Permitting Regulations introduce a streamlined system of environmental permitting in England and Wales for certain installations, waste operations and mobile plants. It is an offence to operate a regulated facility except under and in accordance with an environmental permit. Permits are required for certain activities involving the storage, treatment, use or disposal of waste. Waste would be managed in appropriate and permitted facilities, and the Proposed Development's activities would adhere to these Regulations, if required, for waste storage, use or disposal.

Waste Electrical and Electronic Equipment (England and Wales) Regulations, 2013^{xi}

- 17.23 The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 apply to all electrical and electronic equipment placed on the market in the UK covered by the scope of the regulations. There

are 10 broad categories of WEEE currently outlined within the Regulations (see Schedules 1 and 2 of the Regulations). Relevant categories for the Proposed Development are:

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

17.24 The site is required to adhere to these Regulations in the event that WEEE arises from the Proposed Development's operational activities.

Controlled Waste (England and Wales) Regulations 2012 (SI 2012/811)^{xii}

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

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

17.27 These Regulations are applicable to the Proposed Development to ensure waste arising from operational phase would be managed by permitted facilities and would be collected/transferred by permitted waste carriers.

National policy

National Planning Policy Framework, 2023^{xiii}

17.28 The National Planning Policy Framework (NPPF) (December 2023) sets out the Government's planning policy framework for development and how these should be implemented but makes specific reference to the Government's policy for sustainable use of minerals and waste (paragraphs 4 and 20).

National Planning Policy for Waste 2014^{xiv}

17.29 The National Planning Policy for Waste sets out detailed waste planning policies and maintains the core principles of the 'plan led' approach with a continued focus of moving waste up the waste hierarchy. The document sets out detailed waste planning policies to facilitate a more sustainable and efficient approach to resource use and management. When determining planning applications for non-waste development, the policy requires that local planning authorities should, to the extent appropriate to their responsibilities, ensure that:

- The likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prevent the implementation of the waste hierarchy and/or the efficient operation of such facilities.
- New, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape.
- The handling of waste arising from the operation of developments maximises reuse/recovery opportunities and minimises off site disposal.

17.30 The Proposed Development includes measures to reuse, recycle and recover waste and, therefore, to minimise potential impacts on waste management facilities. Waste is anticipated to be managed as high up in the waste hierarchy as technically appropriate and economically feasible.

The Waste Management Plan for England, (2021)^{xv}

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

17.32 The assessment considers the waste hierarchy and plans to reuse and/or recover material within the Proposed Development, when technically appropriate and economically feasible.

The Waste prevention programme for England: Maximising Resources, Minimising waste^{xvi}

17.33 The policy encompasses three cross cutting themes:

- Designing out waste

- Systems and services
- Data and information including materials database, product passports.

17.34 Seven key sectors for actions, based on available data on the amount of waste arisings or known carbon emissions from production was selected and includes construction, textiles, furniture, electronics, vehicles, plastic and packaging and food.

17.35 The assessment considers reduction of waste from the three cross cutting themes for the construction and operational phase.

Our Waste, Our Resources: A Strategy for England (2018)^{xvii}

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

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

17.37 The strategy features the Government’s approach to sustainable production, consumer participation, recovering resources, and managing waste, waste crime, food waste, international leadership, research and innovation, and monitoring and evaluation of the strategy. The strategy will be delivered through policies, actions and commitments, and it will contribute to the delivery of the following strategic ambitions:

- Working towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025
- Eliminating food waste to landfill by 2030
- Zero avoidable plastic waste by 2042
- Doubling of resource productivity by 2050
- Zero avoidable waste by 2050

17.38 The assessment considers the targets set for managing waste and has plans to reuse and/or recover material within the Proposed Development.

A Green Future: Our 25-Year Plan to Improve the Environment (2018)^{xviii}

17.39 The Government’s 25-Year Environment Plan (25YEP) sets out Government action to help the natural world regain and retain good health. The proposals aim to tackle a number of growing problems including waste. It aims to champion sustainable development, lead in environmental science, innovate to achieve clean growth and increase resource efficiency to provide benefits to both our environment and economy. In doing so, the Government’s 25YEP has identified six key areas on which to focus action. The policy area relevant to the assessment of waste and material

resources is set out in Chapter 4 of the 25-Year Plan on increasing resource efficiency and reducing pollution and waste.

- 17.40 The assessment in this Chapter aims to minimise waste and reuse materials as much as possible, and disposal of waste to landfill would be considered as the last resort for waste management.

Environmental Improvement Plan 2023^{xix}

- 17.41 This sets out plans to achieve the 10 goals specified in the 25YEP. For goal five, to maximise our resources and minimise our waste, plans are in place to improve our use of resources. The assessment in this Chapter takes into account measures to ensure an efficient use of resources and to minimise waste arisings.

Net Zero Strategy: Build Back Greener 2021^{xx}

- 17.42 The strategy sets out a plan for the decarbonisation path to be net zero by 2050. It highlights the reduction of waste sent to landfill for disposal, particularly biodegradable waste, as well as the importance of an efficient and sustainable use of resources.
- 17.43 The assessment in this Chapter considers that green waste likely to arise from the operational phase of the Proposed Development would be sent for treatment to a waste management facility and not landfilled (for example through composting). The assessment considers that disposal of waste to landfill is the least preferred option for waste management.

The Clean Growth Strategy 2017^{xxi}

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

Local policy

- 17.46 The local planning framework comprises a number of documents that form the statutory development plans for the local planning authority area in which the Proposed Development is located. The relevant planning policies relating to resources and waste are summarised in **Table 17.1**. These policies have been considered in the assessment of likely significant effects for material resources and waste generation and management.

Oxfordshire Minerals and Waste Development Scheme^{xxii}

17.47 The Scheme sets out the decision and timetable to pursue a Minerals and Waste Plan, combining parts 1 and 2 into a new Minerals and Waste Local Plan. The new Plan, upon adoption, will supersede Oxfordshire Minerals and Waste Local Plan (OMWLP) Part 1: Core Strategy (2017). However, until this time the Core Strategy remains in place as part of the Development Plan for Oxfordshire. until it is replaced by the New Minerals and Waste Plan.

Table 17.1: Relevant local planning policies relating to resources and waste

Policy number and Title	Policy summary
Adopted Minerals and Waste	Core Strategy, September 2017 ^{xxii}
Policy M1: Recycled and secondary aggregate	So far as is practicable, aggregate mineral supply to meet demand in Oxfordshire should be from recycled and secondary aggregate materials in preference to primary aggregates, in order to minimise the need to work primary aggregates.
Policy M2: Provision for working aggregate minerals	Provides the provision of sharp sand and gravel, soft sand and crushed rock for the period of 2014-2031 inclusive.
Policy M3: Principal locations for working aggregate minerals	Provides information on the principal locations for aggregate minerals extraction in policy maps and helps to identify if the Proposed Development is within Mineral Safeguarding Sites.
Policy M4: Sites for working aggregate minerals	Provides information for working aggregate minerals.
Policy M8: Safeguarding mineral resources	Mineral resources in the Mineral Safeguarding Areas shown on the Policies Map are safeguarded for possible future use and has been considered for baseline study.
Policy M9: Safeguarding mineral infrastructure	Existing and permitted infrastructure that supports the supply of minerals in Oxfordshire is safeguarded against development that would unnecessarily prevent the operation of the infrastructure and has been considered for baseline study.
Policy W1: Oxfordshire waste to be managed	Policy states that provision will be made for waste management facilities to provide capacity that allows Oxfordshire to be net self-sufficient in the management of its principal waste streams – municipal solid waste, commercial and industrial waste, and construction, demolition and excavation waste – over the period to 2031. Information available for waste management capacity used for the assessment, includes recycling and composting at least 65% of household waste by 2020 and at least 70% by 2025 and 70% recycling for Commercial & Industrial (C&I) waste.
Policy W2: Oxfordshire waste management targets	Provision will be made for capacity to manage the principal waste streams in a way that provides for the maximum diversion of waste from landfill, in line with set targets that has been used for the assessment.
Policy W3: provision for waste management capacity and facilities.	Policy provides provision made for additional waste management capacity to manage non-hazardous element of the principal waste streams.
Policy W6: Landfill and other permanent deposit of waste to land	Policy provides information on provision for disposal of Oxfordshire’s non-hazardous, inert waste to an existing non-hazardous and inert landfill facility.
Oxfordshire’s Resource and Waste Strategy 2018-2023 ^{xxiii}	
The strategy aims to increase the amount of household waste recycling to 70% by 2030.	

Guidance

- 17.48 The guidance provided in the following documents has been used to support the assessment:
- The Institute of Environmental Management and Assessment (IEMA) guide to Materials and Waste in Environmental Impact Assessment^{xxiv}. This provides guidance and recommendations for the impacts and effects of materials and waste on the environment. This document has been used to identify significance criteria and support professional judgement.
 - SWMPs – Guidance for Construction Contractors and Clients Voluntary Code of Practice^{xxv}.
 - Construction Code of Practice for Sustainable Use of Soils on Construction Sites^{xxvi}.
 - Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste : Development Industry Code of Practice (DoW CoP)^{xxvii}. The DoW CoP provides a clear, consistent and efficient 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. It can provide an alternative to Environmental Permits or Waste Exemptions and has been used for as part of the assessment process.
 - Union of European Football Associations (UEFA) Circular Economy Guidelines^{xxviii}. UEFA's Football Sustainability Strategy 2030 identifies policies and recycling targets for the generation and management of waste from European football. The 4R framework (Reduce, Reuse, Recycle, Recover) and recycling targets has been used to identify mitigation plans for the Proposed Development.

Assessment Methodology and Significance Criteria

- 17.49 The material resources required for the maintenance and operation of the Proposed Development would be infrequent and required in small quantities. Hence, the assessment of material resources for the operational phase has been scoped out.
- 17.50 The assessment methodology is in line with requirements set out in IEMA guidance for Materials and Waste in Environmental Impact Assessment.
- 17.51 The significance of an environmental effect is determined based on the magnitude of an impact and the sensitivity of the receptor affected by the impact of that magnitude. This section describes the criteria applied to characterise the magnitude of potential impacts and sensitivity of receptors. The terms used to define magnitude and sensitivity are based on IEMA's guidance.
- 17.52 The assessment criteria used to assess the potential effects on material resources use and generation and management of waste arising from the Proposed Development differs from the generic EIA methodology, set out in Chapter 2 and are described below. However, for ease of reference, the generic EIA terminology is included in brackets to allow comparisons to be made.

- 17.53 For waste generation, IEMA’s guidance offers two methods for assessing the magnitude of impact from the generation and disposal of waste:
- W1 – Void Capacity.
 - W2 – Landfill Diversion.
- 17.54 For this assessment, the W1 – Void Capacity method has been selected and presented in **Table 17.2** and **Table 17.3** for assessing the sensitivity and magnitude of impact from the generation and disposal of waste for the following reasons:
- It is a robust approach based on availability of industry data.
 - It is a detailed methodology.
 - This method is recommended for statutory EIAs.
- 17.55 For these tables “Region” means the authority comprising the second study area, in this case Oxfordshire and the South East region. “Primary materials” describes materials that are from a non-renewable source.

Sensitivity

- 17.56 The criteria for defining receptor sensitivity for the assessment of impacts to materials resources use and generation and management of waste are defined within **Table 17.2**.

Table 17.2: Criteria to determine sensitivity for material resources and waste generation

Sensitivity category	Description
Negligible	<p>Material resources for the key materials required for the construction and/or operation of a development:</p> <ul style="list-style-type: none"> • are forecast (through trend and analysis and other information) to be free from known issues regarding supply and stock; • are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials; and/or • sustainable features and benefit could include materials or products that comprise reuse, 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. <p>Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national):</p> <ul style="list-style-type: none"> • inert and non-hazardous landfill capacity void is expected to remain unchanged or is expected to increase through a committed change in capacity; and • hazardous landfill capacity void is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	<p>Material resources for the key materials required for the construction and/or operation of a development:</p> <ul style="list-style-type: none"> • are forecast (through trend and 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.

Sensitivity category	Description
	<p>Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national):</p> <ul style="list-style-type: none"> • inert and non-hazardous landfill capacity void is expected to reduce minimally by <1% as a result of waste forecast; and/or • hazardous landfill capacity void is expected to reduce minimally by <0.1% as a result of waste forecast.
Medium	<p>Material resources for the key materials required for the construction and/or operation of a development:</p> <ul style="list-style-type: none"> • are forecast (through trend and 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. <p>Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national):</p> <ul style="list-style-type: none"> • inert and non-hazardous landfill capacity void is expected to reduce noticeably by 1-5% as a result of waste forecast; and/or • hazardous landfill capacity void is expected to reduce noticeably by 0.1-0.5% as a result of waste forecast.
High	<p>Material resources for the key materials required for the construction and/or operation of a development:</p> <ul style="list-style-type: none"> • are forecast (through trend and analysis and other information) to suffer from some potential issues regarding supply and stock; and/or • comprise little or no sustainable features and benefits compared to industry-standard materials. <p>Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national):</p> <ul style="list-style-type: none"> • inert and non-hazardous landfill capacity void is expected to reduce considerably by 6-10% as a result of wastes forecast; and/or • hazardous landfill capacity void is expected to reduce considerably by 0.5 - 1% as a result of wastes forecast.
Very High (*High)	<p>Material resources for the key materials required for the construction and/or operation of a development:</p> <ul style="list-style-type: none"> • are known to be insufficient in terms of production, supply and/or stock; and/or • comprise no sustainable features and benefits compared to industry-standard materials. <p>Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national):</p> <ul style="list-style-type: none"> • inert and non-hazardous landfill capacity void is expected to reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand; and/or • hazardous landfill capacity void is expected to reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.

Source: *The Institute of Environmental Management and Assessment, 2020^{xxiv}*

Note: * includes the general EIA terminology as set out in Chapter 2, Table 2.3

Magnitude

17.57 The criteria for defining impact magnitude for material resources and waste generation for the assessment of impacts to materials use and generation and management of waste are defined within **Table 17.3**.

Table 17.3: Criteria to determine magnitude for material resources and waste generation

Magnitude	Description
No change (#Negligible)	<p>Material resources:</p> <ul style="list-style-type: none"> no materials required. <p>Waste generation:</p> <ul style="list-style-type: none"> based on void capacity: for inert, non-hazardous and hazardous waste, zero waste generation and disposal from the development.
Negligible	<p>Material resources:</p> <ul style="list-style-type: none"> no individual material type is equal to or greater than 1% by volume of the regional or where justified national baseline availability. <p>Waste generation:</p> <ul style="list-style-type: none"> based on void capacity, the development will reduce: <ul style="list-style-type: none"> regional or where justified national landfill void capacity baseline** for inert and non – hazardous by <1%; and/or national landfill void capacity baseline** for hazardous waste by <0.1%.
Minor (#Low)	<p>Material resources:</p> <ul style="list-style-type: none"> one or more materials is between 1-5% by volume of the regional or where justified national baseline availability; and/or the development has the potential to adversely and substantially* impact access to one or more allocated mineral site (in their entirety), placing their future use at risk. <p>Waste generation:</p> <ul style="list-style-type: none"> based on void capacity, the development will reduce: <ul style="list-style-type: none"> regional or where justified national landfill void capacity baseline** for inert and non-hazardous by 1- 5%; and/or national landfill void capacity baseline** for hazardous waste by <0.1-0.5%.
Moderate (#Medium)	<p>Material resources:</p> <ul style="list-style-type: none"> one or more materials is between 6-10% by volume of the regional or where justified national baseline availability; and/or the allocated mineral site is substantially* sterilised by the development rendering it inaccessible for future use. <p>Waste generation:</p> <ul style="list-style-type: none"> based on void capacity, the development will reduce: <ul style="list-style-type: none"> regional or where justified national landfill void capacity baseline** for inert and non-hazardous by 6-10%; and/or national landfill void capacity baseline** for hazardous waste by <0.5-1%.
Major (#High)	<p>Material resources:</p> <ul style="list-style-type: none"> one or more materials is >10% by volume of the regional or where justified, national baseline availability; and/or more than one allocated mineral site is substantially* sterilised by the development rendering it inaccessible for future use. <p>Waste generation:</p> <ul style="list-style-type: none"> based on void capacity, the development will reduce: <ul style="list-style-type: none"> regional or where justified national landfill void capacity baseline** for inert and non-hazardous by >10%; and/or national landfill void capacity baseline** for hazardous waste by >1%.

Source: *The Institute of Environmental Management and Assessment, 2020^{xxiv}*

**Justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed.*

*** forecast as the worst-case scenario, during a defined construction and/or operational phase.*

Note: # includes the general EIA terminology as set out in Chapter 2, Table 2.4

Significance

- 17.58 The significance of the effect is determined by assigning an impact magnitude and sensitivity to the receptor.
- 17.59 **Table 17.4** and **Table 17.5** set out the significance matrix used to determine significant effects for material resources and waste.
- 17.60 For the purpose of this assessment, any effects with a significance level of Minor or Neutral are considered to be **not significant**.

Table 17.4: Effect threshold used in EIA

		Magnitude of impact				
		No change (**Negligible)	Negligible	Minor (**Low)	Moderate (**Medium)	Major (**High)
Sensitivity (or value) of receptor	Very high (**High)	Neutral (**Negligible)	Minor* (**Negligible)	Moderate or large (**Moderate /Minor)	Large or very large (**Major or Moderate)	Very Large (**Major)
	High	Neutral (**Negligible)	Minor* (**Negligible)	Minor* or Moderate	Moderate or large (**Major /Moderate)	Large or very large (**Major)
	Medium	Neutral (**Negligible)	Minor* (**Negligible)	Minor*	Moderate	Moderate or large
	Low	Neutral (**Negligible)	Minor* (**Negligible)	Neutral or Minor* (**Minor/ Negligible)	Minor*	Minor* or Moderate
	Negligible	Neutral (**Negligible)	Minor* (**Negligible)	Neutral or Minor* (**Negligible)	Neutral or Minor* (**Negligible)	Minor* (**Negligible)

Source: The Institute of Environmental Management and Assessment, 2020^{xiv}

Note: *Modified based on professional judgement and project requirement.

**includes the general EIA terminology as set out in Chapter 2, Table 2.5

Table 17.5: Significance of effect

Effect	Materials	Waste
Neutral (**Negligible)	Not Significant	Not Significant
Minor*		
Moderate	Significant	Significant
Large (**Major)		
Very Large (**Major)		

Source: The Institute of Environmental Management and Assessment, 2020^{xiv}

Note: *Modified based on professional judgement and project requirement.

**includes the general EIA terminology as set out in Chapter 2.

Study area

- 17.61 In accordance with professional judgement and IEMA guidance for Materials and Waste in Environmental Impact Assessment, this assessment uses two geographically different study areas to examine the material resources use for construction phase and generation and management of waste for operational phase.
- 17.62 The first study area is based on the area of the construction works, and comprises the Proposed Development footprint and any areas required for temporary access, site compounds, working platforms and other enabling activities. The first study area is shown by the site boundary in **Figure 17.1** and indicates the area where the area within which construction materials will be consumed (used, reused and recycled) for the construction phase and waste will be generated for the construction and operational phase.
- 17.63 The second study area focuses on an area sufficient for the availability of materials required for construction and to help identify suitable waste infrastructure and landfill voids that could accept arisings or waste generated by the Proposed Development for the construction and operational phase.
- 17.64 For construction materials, the second study area will comprise the county of Oxfordshire and the South East of England region, within which the Proposed Development is located for procurement of material. The South East England region includes the counties of Buckinghamshire, East Sussex, Hampshire, the Isle of Wight, Kent, Oxfordshire, Berkshire, Surrey and West Sussex.
- 17.65 For waste management, the second study area is within the county of Oxfordshire and the South East of England region, within which the Proposed Development is located for suitable waste infrastructure including regional inert and non-hazardous landfill void capacity and national hazardous landfill void capacity.
- 17.66 The Proximity Principle implies that waste should be managed as near as possible to the place of origin, mainly because transporting waste could result in significant environmental impacts. The Proximity Principle has been used to identify suitable waste infrastructure within 10km of the Proposed Development and landfills with void capacities within 25km of the Proposed Development.

Consultation

- 17.67 During the scoping exercise CDC liaised with a range of consultees. Responses relevant to the management of waste and resources have been considered within the baseline section of this Chapter.

Baseline Conditions

17.68 IEMA's guidance for Materials and Waste in Environmental Impact Assessment has been used to establish the baseline conditions for material resource use and generation and management of waste. The baseline conditions are based on the demand for key construction materials and the national and local generation of waste, within Oxfordshire and the South East England region.

17.69 The baseline conditions for the use of material resources identifies:

- Regional and/or national availability of the main materials required for the construction of the Proposed Development, including for the site preparation and construction.
- Mineral Safeguarding Area (MSA), peat resources and Allocated Minerals Sites within or adjacent to the Proposed Development

17.70 The baseline conditions for waste identify the following:

- The availability and capacity of regional and (where appropriate) national landfill facilities. Landfill void data has been collated for both inert and non-inert (non-hazardous and hazardous) landfill types, where available.
- Historical and future trends in waste processing, recovery and/or landfill void capacity (especially where increases can be forecast or otherwise ascertained) to provide a useful insight as to the capability of these facilities.
- Future baseline information for waste generation up to 2031 and regional waste infrastructure capacity that will be required.

17.71 The information in this Chapter is determined through a desk-based study, using a range of online resources.

Use of material resources

17.72 Information on the demand for key construction materials within the UK and within South East England has been used to provide the baseline for material resources. This information has been determined from data from the British Geological Society (BGS), World Steel Association, and Oxfordshire County Council (OCC).

17.73 UK's production of minerals and mineral products in 2021 is given in **Table 17.6**, the production of minerals within England in 2021 and available mineral workings is shown in **Table 17.7**.

Table 17.6: UK's production of minerals, mineral products and steel, 2021.

Mineral/ mineral product	UK's production (2021)
Aggregates, of which:	279.8 million tonnes
• Crushed rock	148.2 million tonnes
• Sand and gravel – land won	47.7 million tonnes

Mineral/ mineral product	UK's production (2021)
• Sand and gravel - marine	14.3 million tonnes
• Recycled and secondary aggregates ^(a)	69.9 million tonnes
Cementitious, of which	11.2 million tonnes
• Cement	9.0 million tonnes
• Other cementitious material (Fly ash, GGBS)	2.1
Ready-mixed concrete ^(b)	52.7 million tonnes
Concrete products	24.8 million tonnes
Asphalt	24.8 million tonnes
Granite	28.3 million tonnes
Dimension stones ^(a,c)	1.0 million tonnes
Apparent steel use (2021)	10.8 million tonnes

Source: British Geological Society (2022)^{xxix}, Mineral Products Association (2023)^{xxx} and World Steel Association (2022)^{xxxi}
Note: (a) GB only; (b) Converted using 2.38 tonnes per cubic metre of ready-mixed concrete. (c) Latest data available is for 2014.

Table 17.7: Production of minerals in 2021

Mineral	UK production in tonnes	Number of mineral workings in England	Number of mineral workings in South East England
Igneous rock	125.9 million*	34	0
Limestone and dolomite		230	11
Sandstone		157	6
Sand and gravel	64.6 million	267	41

Source: British Geological Society (2023)^{xxxix}

Note: *Includes marine-dredged landings at foreign ports

17.74 The Oxfordshire Local Aggregate Assessment 2022 and South East England Aggregate Working Party Annual Report 2022 assess the demand for and supply of aggregates in the study area of the Site. The South East England Aggregate Working Party Annual Report provides data for 13 mineral planning authorities, including OCC.

17.75 Aggregate sales and reserves in Oxfordshire and the South East region in 2022 are outlined in **Table 17.8** and **Table 17.9** respectively.

Table 17.8: The 10-year and 3-year total land-won aggregate sales average (to 2022) for Oxfordshire

Aggregate	10-year average aggregate sales (Mtpa)	3-year average aggregate sales (Mtpa)	Annual sales, 2022 (Mt)	Existing permitted reserves at end of 2022 (Mt)	Landbank at end of 2022 (years)
Soft sand	0.23	0.234	0.229	3.517	14.47
Sharp sand and gravel	0.791	0.986	0.972	9.607	9.74
Crushed rock	0.914	1.162	1.146	6.193	6.78
Recycled and	0.42	0.409	0.416	N/A	N/A

Aggregate	10-year average aggregate sales (Mtpa)	3-year average aggregate sales (Mtpa)	Annual sales, 2022 (Mt)	Existing permitted reserves at end of 2022 (Mt)	Landbank at end of 2022 (years)
secondary aggregates					

Source: Oxfordshire County Council^{xxxii}

Table 17.9: The 10-year and 3-year total land-won aggregate sales average (in 2022) for South East England

Aggregate	10-year average aggregate sales (Mtpa)	3-year average aggregate sales (Mtpa)	Annual sales, 2022 (Mt)	Existing permitted reserves at end of 2022 (Mt)	Landbank at end of 2022 (years)
Land won sand and gravel	5.959	5.989	5.529	52.290	8
Crushed rock	2.043	2.482	confidential	21.647	11
Marine dredged aggregates	6.452	6.978	6.319	N/A	N/A
Total primary aggregates	14.290	15.448	14.236	N/A	N/A
Secondary aggregates	0.388*	0.543	0.423	N/A	N/A
Recycled aggregates	4.416*	3.708	3.998	N/A	N/A

Source: South East England Aggregate Working Party^{xxxiii}

17.76 The landbank in Oxfordshire at the end of 2022 stood at 9.74 years for sand and gravel, and 6.78 years for crushed rock. The landbank figure for sand and gravel provide sufficient supplies of seven years, as required by the NPPF. However, the landbank figure for crushed rock does not satisfy the recommended level of 10 years. Therefore, any crushed rock required for the Proposed Development may need to be sourced from the wider South East England region where there is sufficient supply.

17.77 The Site is not underlain by peat resources^{xxxiv} and is not located in an MSA^{xxxv}. Kidlington rail depot (Hanson's) is a Mineral Infrastructure which is safeguarded by policy M9 of the Oxfordshire Minerals and Waste Local Plan Part 1 – Core Strategy (OMWCS) and lies in close proximity of the Proposed Development.

Generation and management of waste

17.78 The most recent information available, relating to waste generation and operational waste management infrastructure in Oxfordshire and the South East England region, has been gathered to provide the baseline for this assessment. Information on the current waste arisings, and the waste management infrastructure have been determined through a desktop study, using a number of readily available resources, in particular data from the Environment Agency, DEFRA and OCC.

17.79 The latest data from the Environment Agency indicated that England produced over 222 million tonnes of waste in 2022, which was accepted by 5,853 permitted waste facilities. The permitted waste facilities in the South East England region received 36.5 million tonnes of waste in 2022, and those in Oxfordshire received approximately 4.6 million tonnes (as shown in **Table 17.10**).

Table 17.10: Waste received in England by the site type in tonnes (2022)

Site type	Oxfordshire	South East England	England
Landfill	1,891,773	9,415,314	40,100,023
Transfer	217,622	6,205,684	43,074,495
Treatment (excluding metal recycling)	1,764,227	11,940,644	96,137,746
Metal recovery	41,664	904,752	15,341,227
Incineration	371,457	3,547,574	16,825,400
Use of waste	0	0	90,287
Land disposal	343,063	2,533,859	11,062,495
Total	4,629,845	36,565,547	233,533,998

Source: Environment Agency^{xxxvi}

Note: Mobile plant, processing, combustion and storage of waste are included in the overall waste breakdown

17.80 The Environment Agency's Waste Data Interrogator (WDI) recorded that 16,895,107 tonnes of inert construction and demolition (C&D) waste were received in permitted waste facilities in the South East England region in 2022, with 2,165,510 tonnes received in Oxfordshire. The WDI^{xxxvii} states that 2,031,045 tonnes of inert construction and demolition (C&D) waste were removed from permitted waste facilities in the South East England region with 150,547 tonnes removed from Oxfordshire. A total of 86,800,969 tonnes of non-hazardous C&D waste was received in permitted waste facilities in England in 2022, of which 15,823,707 tonnes were removed.

17.81 The baseline target for recovery of C&D waste is 70 percent by weight, as set out in the EU Waste Framework Directive 2008/98/EC and the European Union (Withdrawal) Act 2018. According to DEFRA, the recovery rate of non-hazardous C&D waste in 2020 was 92.6% and 93.2% in the UK and England respectively.^{xxxviii}

17.82 In terms of organic waste treatment, a total of 106,987 tonnes of waste was received for treatment for composting in Oxfordshire in 2022, of which 106,719 (99.7%) was municipal waste. Also, 111,344 tonnes of waste was received for treatment through anaerobic digestion, of which 72,195 tonnes (64.8%) was municipal waste.

17.83 Of the 313,635 tonnes of waste received at material recycling facilities in Oxfordshire in 2022, a total of 127,905 tonnes were municipal wastes. This included 10,772 tonnes of paper and cardboard, 1,922 tonnes of glass and 108,040 tonnes of mixed municipal waste.

- 17.84 Regarding hazardous waste, 46,237 tonnes of hazardous waste were received in Oxfordshire, of which 7,656 tonnes were specified as C&D waste. 3,027 tonnes of hazardous waste C&D waste were removed from Oxfordshire in 2022.
- 17.85 To identify potential sources of contamination, an initial review of permitted and historic landfill sites that are near the Proposed Development was undertaken using the Environment Agency’s ‘Historic Landfill Sites’ web map^{xxxix} and ‘Permitted Waste Sites - Authorised Landfill Site Boundaries’ web map^{xl}.
- 17.86 There is one historic landfill within 500m of the Proposed Development, known as Peartree Railway Cutting, located approximately 300m south of the Site, as shown in **Figure 17.1**. The landfill closed in 1973 and accepted inert, industrial, commercial and household wastes. There are no permitted landfill sites within 500m of the Proposed Development.
- 17.87 Potential sources of contamination that are greater than 500m away from the Proposed Development have not been considered, as these are unlikely to affect the Site.
- 17.88 The Environment Agency reported that in 2022, 816 sites in South East England had environmental permits to accept waste. **Table 17.11** outlines the remaining landfill capacity within Oxfordshire, South East England, and England at the end of 2022.

Table 17.11: Landfill capacity in Oxfordshire, South East England and England at the end of 2022 (cubic meters)

Landfill type	Oxfordshire	South East England	England
Hazardous Merchant	-	91,524	7,921,608
Hazardous Restricted	-	173,335	708383
Non-Hazardous with SNRHW* cell	-	10,799,344	51,122,422
Non-Hazardous	2,347,399	17,582,210	151,481,585
Inert	2,604,501	20,357,575	129125,357
Total	4,951,900	49,003,988	359,717,391

Source: Environment Agency (2023)^{xli}

Note: *SNRHW: Stable Non-Reactive Hazardous Waste

- 17.89 The remaining capacity for Oxfordshire at the end of 2022 for inert landfill was 2,604,501m³. At the end of 2022, the county had seven permitted inert landfills and two non-hazardous landfills with remaining capacity, that are outlined in **Table 17.12** and **Table 17.13**. The distance from the Proposed Development, measured from postcode OX5 1UP, is also stated in the tables. The lists indicates that there are sufficient landfills to accept inert and non-hazardous waste from the Proposed Development within the Oxfordshire region.

Table 17.12: Oxfordshire permitted sites for inert landfill at the end of 2022 (cubic meters)

Facility Name	Local Authority	Remaining capacity	Distance from Proposed Development, Km
Woodeaton Quarry	South Oxfordshire	112,613	3.7
Shipton Quarry	South Oxfordshire	1,029,700	5.4
Restoration Landform	West Oxfordshire	167,406	8.4
Upwood Quarry	Vale of White Horse	262,735	13
Hatford quarry	Vale of White Horse	250,000	23.9
Shellingford Quarry Landfill	Vale of White Horse	680,000	24.3
Ewelme No 2 Landf-II - Inert Area	South Oxfordshire	102,047	25.2

Source: Environment Agency (2023)^{xli}

Table 17.13: Oxfordshire permitted sites for non-hazardous landfill at the end of 2022 (cubic meters)

Facility Name	Local Authority	Remaining capacity	Distance from Proposed Development, Km
Dix Pit Landfill Site	West Oxfordshire	231,568	11.5
Finmere Quarry Landfill	Cherwell	90,000	26

Source: Environment Agency (2023)^{xli}

17.90 The regions that have capacity to accommodate hazardous waste are listed in **Table 17.14**. There are two hazardous landfills in South East of England that can accept hazardous waste.

Table 17.14: Regions with remaining capacities for hazardous waste at the end of 2022 (cubic meters)

Region	Site Type	Number of sites with remaining capacities	Remaining capacities
East Midlands	Hazardous Merchant	1	657,200
North East	Hazardous Merchant	2	2,243,238
North West	Hazardous Merchant	4	3,273,659
South East	Hazardous Merchant	1	91,524
	Hazardous Restricted	1	173,335
South West	Hazardous Merchant	2	1,179,836
West Midlands	Hazardous Restricted	2	535,048
Yorkshire & Humber	Hazardous Merchant	1	476,151
Total	Hazardous Merchant	11	7,921,608
	Hazardous Restricted	2	708,383

Source: Environment Agency (2023)^{xli}

17.91 A search on the Environment Agency's public register was undertaken for all permitted waste facilities within 10km of the Proposed Development, measured from postcode OX5 1UP, and information is given in **Table 17.15**. The search found four permitted sites for recycling and recovery of C&D waste, within 10km of the Proposed Development, suitable for the construction phase, and six sites suitable for treatment/transfer of wastes likely to be generated in the operational phase.

There is one Anaerobic Digestion facility for treatment of organic waste and three inert landfills within 10km of the Proposed Development.

Table 17.15: Oxfordshire permitted sites for non-hazardous landfill at the end of 2022 (cubic meters)

Site name	Treatment facility type	Distance from OX5 1UP
M & M Waste Recycling Transfer Station	S0803 No 3: 75kte HCl Waste TS + treatment	2.5
Cresswell Field, Worton Farm	SR2010 No12: Treatment of waste to produce soil <75,000 tpy	2.7
Cassington AD Facility - EPR/TP3231KR	A29: Landfill Gas Engine (<3 mW)	2.7
Worton Park	S0809 No 9: Asbestos Waste Transfer Station	2.9
Woodeaton Quarry	L05: Inert LF	3.7
Shipton Quarry	L05: Inert LF	5.4
Shipton Quarry	A16: Physical Treatment Facility	5.5
Aggregates Recycling Facility	A16: Physical Treatment Facility	6.7
Amity Insulation Services	A9: Special Waste Transfer Station	7.5
Cuckwood Farm	SR2010 No12: Treatment of waste to produce soil <75,000 tpy	7.9
Restoration Landform	L05: Inert LF	8.4
Cowley Marsh Depot	A14: Transfer Station taking Non-Biodegradable Wastes	8.7
Horspath Road Depot	A9: Special Waste Transfer Station	9.7

Source: Environment Agency (2023)^{xliii}

17.92 Reuse, recycling and recovery of wastes will be prioritised within the Proposed Development, following the local policies on sustainable development. However, if these options are not available or feasible the following alternative is to adopt the proximity principle. There are three inert permitted landfill within 10Km of the Proposed Development (**Table 17.12**) and an additional four inert and two non-hazardous landfills with remaining capacity that lie within a 25Km radius of the Proposed Development (**Table 17.12** and **Table 17.13**).

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

17.94 There are 338 waste exempt sites^{xliiii} listed by the Environmental Agency within 10km of the Proposed Development, of which 177 are 'use of waste in construction' (U1) exempt sites. These U1 exempt sites utilise waste for the purpose of construction, such as buildings or engineering work, and are often short-lived, and therefore should be identified upon commencement of construction.

17.95 Not all treatment facilities may be suitable for the waste generated by the Proposed Development during construction and operational phases, but it demonstrates that sufficient treatment facilities are available for the waste that will be generated by the Site. Reuse, recycling and recovery of wastes will be prioritised. However, if these options are not available or feasible, the alternative is to adopt the Proximity Principle. The Proposed Development will be assessed against the capacities of the relevant waste infrastructure to identify if there is sufficient capacity available.

Future baseline for waste

17.96 Forecast of waste produced by Oxfordshire is given in OMWLP Core Strategy – adopted plan^{xxii}. The forecasts of waste produced in Oxfordshire are likely to change over time, as circumstances affecting the amount of waste produced change and new information becomes available. These forecasts will be kept under review and updated as necessary in the Oxfordshire Minerals and Waste Annual Monitoring Reports.

17.97 Oxfordshire estimates that a minimum of 1.033mtpa of Construction Demolition and Excavation waste will require management in Oxfordshire throughout the plan period to 2031.

17.98 The estimated non-hazardous waste management capacity required for 2016-2031 is given in **Table 17.16**.

Table 17.16: Estimated waste management capacities required in Oxfordshire

Projected capacities required	MSW	C&I	CDE (non-inert proportion)	Total (tpa)
2026				
Composting/ food waste treatment	126,000	28,700	10,300	165,000
Non-hazardous waste recycling	126,000	372,500	134,400	632,900
Non-hazardous waste residual	90,000	143,300	51,700	285,000
2031				
Composting/ food waste treatment	131,600	29,100	10,300	171,000
Non-hazardous waste recycling	131,600	378,600	134,400	644,600
Non-hazardous waste residual	94,000	145,600	51,700	291,300

Source: Oxfordshire Minerals and Waste Local Plan (OMWLP) Part 1: Core Strategy^{xxii}

17.99 OMWLP Core Strategy – adopted plan states that existing waste management facilities will provide much of the waste management capacity required, as identified in **Table 17.16**.

17.100 **Table 17.17** shows the capacity available, this reduces through the plan period as the capacity provided by facilities with time-limited planning permissions is deducted in accordance with the end dates of their planning permissions.

Table 17.17: Oxfordshire – capacity available to manage waste at existing facilities until 2031.

Type of waste management	2026	2031
Non-hazardous waste recycling	429,900	317,800
Composting/ food waste treatment	214,600	214,600
Non-hazardous waste residual	300,000	300,000

Source: Oxfordshire Minerals and Waste Local Plan (OMWLP) Part 1: Core Strategy^{xxii}

17.101 Based on available information, there is sufficient capacity available for waste treatment within Oxfordshire and policies are in place to increase provision for waste management capacities and facilities.

Assumptions and limitations

17.102 The assessment is based on desktop information and design information available for the Proposed Development at the time of writing. Field surveys were not required for the assessment of material resources and waste management. Baseline information and potential impacts identified are based on publicly available information.

17.103 This assessment has not considered the environmental effects associated with the off site extraction of raw materials used for the off site manufacture of products. These stages of the products' or materials' lifecycles are outside of the scope of the assessment due to the range of unknown variables associated with the processes involved and are not considered to form part of the Proposed Development. In most cases, it can also be assumed that these processes would have already been subject to EIA in securing consents for the facilities' operation.

17.104 This assessment has not assessed the impact of material resources use and waste associated with the manufactured goods required by the Proposed Development as these will be subject to their own separate consenting and regulatory controls at the place of production.

17.105 The assessment has been undertaken on the basis that the Proposed Development aims to use material resources efficiently and minimise the generation of waste.

17.106 The procurement strategy for the materials required for the construction of the Proposed Development is unknown at this stage. For the purposes of this assessment, it is assumed that not all materials will be available to be sourced locally (within Oxfordshire), and that the majority will be sourced nationally (within the UK). This will represent the (environmentally) worst-case scenario.

- 17.107 It is assumed that all aggregate material sourced either regionally or nationally will meet the regional target plan based on the UK Government's National and Regional guidelines for aggregates 2005-2020, for the recycled and secondary aggregate where technically appropriate and economically feasible.
- 17.108 Adverse environmental effects for material resources use and waste management have the potential to be generated through transportation of materials and waste to and from the Proposed Development, such as impacts on the air quality, carbon emissions, and noise. The effects of these activities are considered in the relevant technical chapters including Chapter 12 Air Quality, Chapter 11 Noise and Vibration and Chapter 16 Climate Change.
- 17.109 Information available for quantities of material resources used for construction for the Proposed Development at the time of the EIA submission have been used to forecast and assess the material resources required and the waste that is likely to be generated for the Proposed Development. Design information available for the Proposed Development has been used to forecast the operational waste likely to be generated. These forecasts are likely to be refined and subject to change as the Proposed Development's design progresses. For that reason, the forecasts have been made on a reasonable worst-case scenario basis, informed by professional judgement.
- 17.110 It is assumed that all vegetation waste arising from construction and operational phase will be chipped on site or composted in a waste management facility.
- 17.111 For the construction and operational phase, waste arising from packaging material, off-cuts from metals/plastics and site office has not been quantified but is assumed to be recycled and not landfilled.
- 17.112 Based on professional judgment and a worst-case scenario, it has been assumed that 10 percent of material resources brought to the site required for the construction of the Proposed Development may become waste due to damages, off-cuts or surplus to requirements.
- 17.113 It is assumed that all construction materials used for temporary construction works (such as for construction access roads and site office) will be reused and recycled after the construction of the Proposed Development and will not generate waste.
- 17.114 Information on permitted capacity of waste management facilities has been used in the assessment, based on current publicly available data (at the time of writing). However, it should be noted that the capacity information obtained from the Environment Agency for the sites and regions identified does not necessarily mean that the capacity detailed would be available to use by the Proposed Development.

- 17.115 It is noted that any future changes to this permitted capacity are uncertain, as there is potential for change to permitted capacities, opening of additional waste management facilities and closure of existing facilities. However, it is not currently possible to predict the timeframes for when, or if, these waste management facilities will be available/unavailable and, therefore, how many of these sites would be available to accommodate waste arisings from the Proposed Development.
- 17.116 The assessment assumes that there will not be any demolition works.
- 17.117 The assessment assumes that all materials required for construction will be sourced within the South East of England and UK.
- 17.118 The assessment assumes that use of recycled and/or secondary material resources is likely to be considered for new structures that form part of the Proposed Development, where feasible.
- 17.119 The assessment assumes that the recycling rate of the waste generated by the Proposed Development will be 75% in line with Policy W1: Oxfordshire waste to be managed (**Table 17.1**).
- 17.120 The assessment assumes that procurement of materials will be based on a Resource Management Plan that outlines the procurement requirements for reused, recycled and locally sourced materials and will be aligned with Building Research Establishment Environmental Assessment Method (BREEAM) guidance as stated in Sustainability Statement.

Consultation summary

- 17.121 The scoping opinion from Cherwell District Council (CDC) agreed that waste should be scoped into the ES and considered that waste generation and management as part of the construction process be scoped into EIA due to uncertainty regarding the quantities of waste anticipated and limited design information for assessment. Scoping opinion received from CDC and various stakeholders, did not include any objection to the scoping out of material resources for operational phase. Based on the opinion from CDC, the generation and management of construction waste has now been scoped into the EIA. Comments were provided for Kidlington rail depot (Hanson's) as part of OCC's response as it was a mineral infrastructure safeguarded by policy M9 of the Oxfordshire Minerals and Waste Local Plan.
- 17.122 Oxfordshire County Council requested that the EIA have regard to the Kidlington rail depot, further detail has been provided in paragraph 17.133.
- 17.123 Friends of Stratfield Brake (FoSB) requested further information with regards to the presence and management of potentially contaminated waste that may arise from excavation activity. Paragraphs

17.85, 17.86, 17.87, 17.161, 17.165, 17.166 provide information regarding the potential presence and management of contaminated waste should it arise.

Potential Effects

Construction

Use of material resources

17.124 The following potential impacts from the Proposed Development have been identified for construction phase. The construction phase considers site preparation and construction of the 16,000 seat capacity stadium.

17.125 Key elements of the Proposed Development include:

- 16,000 capacity stadium (Use Class F2) with associated flexible commercial and community facilities for conferences, exhibitions, education and other events (including club shop, public restaurant, bar, health and wellbeing facility/clinic, and gym) (Use Class E/Sui Generis),
- 180-bed hotel (Use Class C1)
- External concourse/fan-zone
- Car and cycle parking, and associated access,
- Highways, utilities, public realm, landscaping and other supporting infrastructure.

17.126 Construction of a stadium, and 180 bed hotel for visitors generally require large quantities of both primary raw materials and manufactured construction products. Many material resources may originate off site, purchased as construction products. However, some materials may arise on site, for example excavated soils and sub-strata.

17.127 The Proposed Development is on a greenfield site with no existing built development, so no demolition works and thus no material resources will be required for demolition activity.

17.128 It is not anticipated that material resources will be required for vegetation removal and, even if any were, the quantities of both primary raw materials and manufactured products required will be negligible compared to those required for the construction phase. Therefore, it is anticipated that there will not be any impacts to material resources use relating to the vegetation removal activities.

17.129 Excavation activities will be required within the site boundary of the Proposed Development and includes site remediation activities.

17.130 The receptors likely to be subjected to impacts as a result of the use of material resources include quarries and other sources of minerals, and other finite raw material resources. The sensitivity associated with the use of material resources include:

- The availability of material resources and the subsequent impact on the demand for materials due to the consumption of raw resources. Materials will need to be imported to the site, as it is assumed that the Proposed Development is unlikely to recover/reuse all the site won materials.
- The depletion of non-renewable resources. The majority of materials needed on the Proposed Development comprise primary material, as the Proposed Development is unlikely to be able to source all requirement materials from recycled/secondary materials.

17.131 Referring to the baseline information, it is anticipated that the UK will have a sufficient quantity of steel available for construction works. Additionally, it is likely that Oxfordshire and South East England will have a sufficient supply of aggregates to support construction works within the region.

17.132 As the site is not underlain by peat resources and is not located in a MSA, so the Proposed Development will not sterilise any peat resources or MSA.

17.133 The Proposed Development is near to the Kidlington rail depot, safeguarded for the importation of aggregate into Oxfordshire. The construction and operation of the Proposed Development are not anticipated to adversely affect the operation of the Kidlington rail depot.

17.134 For the assessment of material resources requirements, the following information (where available) was used to estimate the percentage of site won material potentially available for use on site and the percentage of recycled and/or secondary material available for use for the Proposed Development:

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

17.135 As the design of the Proposed Development progresses, use of recycled and/or secondary material resources is likely to be considered for new structures that form part of the Proposed Development, where feasible. Excavated material is expected to be reused on site, where possible.

17.136 The material resources required for the Proposed Development are stated in **Table 17.18** and summarised in **Table 17.19** and has been used for EIA assessment. As it has been stated in paragraphs 17.103 and 17.104, materials used to produce finished products such as composite slabs, timber frames, doors , windows, glazing, precast concrete terrace units, pipelines, cables,

signage, windows, insulated cladding panels, ventilation equipment, communication systems etc. have not been included in this assessment.

Table 17.18: Material resources required for construction of Proposed Development

Description	Unit	Quantity	Information
Substructure, specialist foundation			
• Ground beams	m3	926	
• Pile caps	m3	4,419	
• Piling	m3	8,040	
Lowest floor construction, GF slab concrete	m3	4,202	315.5 tonnes (reinforcement at 75 kg/m3)
Super structure			
Upper floor, composite slab, 120m deep	m3	1,548	
Precast concrete terrace	m2	8,700	
Roof structure, 200m depth	m3	1,108	
Stairs	nos	6	concrete and steel
Ramps	nos	35	concrete and steel
External wall, steel	tonnes	150	
Hotel wall area			
Reconstituted stone	m ²	10	
Anodised bronze fins	nr	17	
Double glazed windows	m ²	481	
Frameless curtain walls	m ²	19	
Hotel External Wall on Inside (facing pitch) (North)	m ²	615	
Assumed glazing due to CGIs	m ²	557	
Hotel External Wall on Inside (facing pitch) (West) (L3)	m ²	394	
Assumed glazing due to CGIs	m ²	296	
Stadium Wall Area			
Reconstituted Stone	m ²	1,616	
Metal Cladding	m ²	1,137	
Polycarbonate Rodeca	m ²	2,855	
Double Glazed Window	m ²	273	
Frameless Curtain Wall	m ²	1,526	
Stadium External Wall on Inside (facing pitch)	m ²	96	
Steel	tonnes	4,089	
Glulam	m3	1,723	

Source: Source: Oxford United FC RIBA 2 Cost update, version 2.0430 June 2023.^{xliv}

Table 17.19: Summary of material resources required for construction activities of Proposed Development

	Materials	Unit	Quantities	Procurement source, base of products if known and notes
Vegetation removal	No material resources will be required for vegetation clearance		N/A	N/A
Demolition works	None required			No demolition works anticipated.
Construction works	Glulam (glue laminated timber)	m ³	1,723	100% of Timber and timber-based products for construction process and within the fabric of any construction

	Materials	Unit	Quantities	Procurement source, base of products if known and notes
				materials to be covered by third party and likely to be certified by independent forest certification schemes.
	Steel	tonnes	4,239	
	Concrete	m ³	16,041	

Source: Oxford United FC RIBA 2 Cost update, version 2.0430 June 2023^{xliv}

- 17.137 Manufactured products like insulation, waterproof surface finish, ladders, chutes, slides, balustrade, external and internal doors and windows/glazings, roller shutters, paint etc would be required and has not been reported as these will be subject to their own separate consenting and regulatory controls at the place of production and thus not assessed.
- 17.138 The majority of raw material resources required for the Proposed Development are concrete, (aggregate based products) steel and glulam (**Table 17.19**) and would require to be imported to the site. The recycled content of this material is unknown at this stage. However, it is expected to meet the requirements for use of recycled and secondary aggregate as stated in OMWLP, policy M1 (**Table 17.1**) where technically appropriate and economically feasible. Best practice would be to use material resources with a high proportion of sustainable features and benefits compared to industry-standard materials, where it is technically appropriate and economically feasible to do so.
- 17.139 Aggregate materials are available in the Oxfordshire region without any known issues regarding supply and stock. Sand and gravel landbanks are above the minimum landbanks set out by the NPPF, which is seven years (**Table 17.9**). Sufficient steel is available within the UK (**Table 17.6**).
- 17.140 For crushed rock, the landbank figure for crushed rock is 6.78 years, below the recommended level of 10 years, as set out by NPPF. However, as the wider South East England region has sufficient supply, it is possible to be procured within the region.
- 17.141 As given in the Materials and Waste plan^{xliv}, all materials required for construction will be procured from a sustainable source and will not adversely impact the environment.
- 17.142 16,000m³ of concrete will be required for the Proposed Development. Using the concrete density^{xlvi} of 2,400kg/m³, this equates to 38,500 tonnes of cement required, which is calculated to be 0.15% of the concrete supply available within the UK.
- 17.143 Concrete is made up of sand (which is a fine aggregate), ballast (which is a coarse aggregate), cement (can be referred to as a binder) and water (which is an additive). It is assumed that the maximum quantity of aggregate and aggregate based material that will be required for the Proposed Development is equivalent to mass of concrete required. Using the aggregate density^{xlvii} of 1,750kg/m³, this equates to 28,070 tonnes of aggregate and calculated to be 2.3% of the aggregate

supply available within Oxfordshire and 0.5% of aggregate supply available within South East England.

- 17.144 The use of steel bars will be 0.04% of the apparent steel use in UK in 2021. Steel required for the prefabricated items such as steelwork structures, pipes etc. have already been subject to relevant assessments for securing consents for the facilities' operation and not considered as part of this assessment.
- 17.145 The Proposed Development will undergo general site strip to a working level. Based on the Strategy 1 Model output for cut/fill volume, it is expected that 100% of the 55,000m³, initial cut volume will be retained and reused on site. The initial cut and fill exercise undertaken at the RIBA 2 stage indicates that 17,000m³ of topsoil will be used in landscape areas and 38,000m³ of weathered clay will be re-engineered to level the site. These figures will be further revised and refined for the current design, to take into account testing results and considerations for engineering properties etc. Where surplus excavated material is identified, opportunities for reuse on or off site will be investigated and managed accordingly through the development of Sustainability Statement by the contractor, and a MMP, prior to commencement of works on the site.

Mitigation measures for material resources use

- 17.146 The project design will utilise all site won excavated materials as part of its design and embedded mitigation measure, where feasible.
- 17.147 Good mitigation plans that will be incorporated with the Construction Environmental Management Plan, include:
- Materials will be delivered on a just-in-time basis to avoid damage or contamination that would lead to waste generation.
 - All suitable excavated material would be reused in the construction of the Proposed Development and in landscaping features along the stadium, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site.
 - Where site won material is not available or suitable for reuse, secondary or recycled materials would be procured, where available.
 - Locally sourced materials and suppliers, ideally within 10Km, would be identified and used, where possible.
 - Precast elements would be used, where technically feasible, to ensure efficient use of materials and avoid generation of waste arising from off cuts.
 - The waste hierarchy and circular economy principles would be implemented throughout the construction phase to maximise reuse and recycling of material.

- An outline Materials Management Plan is likely to be produced to identify ways to reuse site won or excavated materials within the construction of the Proposed Development provided it meets the requirements of the CL:AIRE: DoW CoP.

17.148 The Oxford United Football Club – New Stadium Development Sustainability Statement^{xlviii} has been developed to provide guidance on how sustainability initiatives might be implemented on the stadium. The Sustainability Statement has been designed to support the delivery of OUFC’s sustainability vision at the project level drawing on a range of standards and examples of best and leading practice including:

- Designing Out Waste workshops will be conducted with the aim of identifying key material use and waste management that may be adopted by the project through the design and construction phases.
- Waste minimisation by ‘designing out’ from the project and limiting waste arising during the construction phase. This involves promoting the use of recycled materials, re-using on site where possible, and disposing of any waste in the most sustainable manner.

17.149 A Resource Management Plan (RMP) will be produced to outline the procurement requirements for reused, recycled and locally sourced materials.

17.150 Reuse and direct recycling of materials: The proportion of suitable refurbishment waste either directly re-used on-site or off-site or are sent back to the manufacturer for closed loop recycling exceeds 75%.

17.151 Specific targets have been set at both building and development level for responsible sourcing in line with industry best practice. Any timber and timber-based products specified meet the 'Legal' and 'Sustainable' definition as per the UK Government's Timber Procurement Policy (TPP) and have been sourced from within the EU. Where this is not possible, and wood has to be sourced from outside the EU, only suppliers with a robust Responsible Purchasing Policy have been considered. Their risk mitigation strategy includes one of the following:

- Scientific testing to confirm species and harvest origins
- Field-based supply chain assessment & audits
- Stakeholder consultation

17.152 A circular economy workshop with the design team will ensure consideration of resource efficiency, use of renewable materials and waste minimisation in design. Opportunities for implementing Circular Economy include:

- Recycling and/or reuse of existing materials and equipment.
- Managing materials and waste demands with the wider site.
- Engaging with the local community on material resourcing.
- Prioritising local suppliers.

- Donating existing or excess material to local groups/organisations.
- Engaging with take-back schemes.
- Standardisation of materials.
- Regular review and monitoring with delivery teams to manage recycling opportunities.

17.153 Implementation of the Oxford United FC, New Stadium development vision master plan^{xlix} where UN's Sustainable Development Goals is a focal point in procurement, construction, development and operation.

Assessment of likely significance

17.154 This section describes the significance of effects for material resources use from the construction phase, having taken into account the mitigation measures described in paragraphs 17.146 and 17.147.

17.155 Based on the Strategy 1 Model output for cut/fill volume, the Proposed Development will utilise 100% of site won materials.

17.156 Baseline study indicated that aggregate resources are available in the South East of England without any known issues. Adequate cement (9mT), concrete (24.8mT) and steel resource (10.8mT) are available within the UK.

17.157 As stated in paragraphs 17.139 and 17.140, aggregate material and crushed rocks are available within South East England without any known issues. Adequate cement, concrete and steel are also available within UK (**Table 17.6**). Paragraphs 17.142 to 17.144 provides the % requirement of aggregate based material, concrete and steel.

17.158 Based on **Table 17.2** and **Table 17.3**, the sensitivity of the receptor is Low and magnitude is Negligible. The effect is determined as **Minor** or **Negligible** and, therefore, **not significant**.

Generation and management of waste

17.159 For the assessment of waste generation and its management, the following information was used where available:

- The volume or weight of waste that will be recovered and diverted from landfill, either on-site or off-site. Where information does not exist and it is not possible to assess compositions, it is assumed that all waste is disposed off to landfill in order to ensure a worst-case assessment is applied.
- Details of on-site storage and segregation arrangements for waste, and any supporting logistical information.

- Any physical, chemical or other processing requirements that should be deployed to ensure waste is managed to retain utility and value.
- The type and volume of waste to be discarded to landfill.

17.160 Waste generation during the construction phase may result in adverse environmental effects on the identified receptors, the temporary increased use of waste management facilities and permanent reduction to landfill void capacity. Potential effects on the receptors include:

- Direct effects on waste infrastructure, through temporary space occupation of space waste (for transfer, storage, or treatment).
- Direct effect as a result of permanent reduction of regional inert and non-hazardous landfill void capacity.
- Direct effect as a result of permanent reduction of national hazardous landfill void capacity.

17.161 Waste is likely to be generated from two main sources during construction: site-won materials from excavations of natural and made ground and materials brought to site which are not used for their original purpose. In this regard, waste arisings are likely to be:

- Excavated materials (natural and made ground) which may be contaminated or unsuitable for reuse without treatment.
- A Ground Investigation will be undertaken in advance of any construction works on the Site. The Ground Investigation will determine the presence of any contaminated materials on the Site.
- Inert waste from excavation activities.
- Green waste from vegetation clearance, likely to come from the Proposed Development as the site is a greenfield site.
- Unsorted non-hazardous materials, such as timber.
- Surplus materials from site preparation, excavations, and construction.
- Waste from temporary construction of compounds, vegetation protection.
- Debris and litter lying on the ground; and
- Damaged stock or off-cuts.

17.162 Quantities of waste from materials brought to site that are not used for their original purpose, for example, damaged items, off-cuts and surplus materials, is unknown at this stage. As a worst-case scenario, it is assumed that 10% of the construction materials brought to the site will become waste due to damages, cut-offs or surplus to requirements. An estimation of the waste arisings for the construction phase is based on the material resources required for construction activities of Proposed Development (**Table 17.19**) and outlined in **Table 17.20**.

Table 17.20: Summary of waste generation from construction activities of Proposed Development

Construction activity	Waste arising	Approximate quantity	Additional information
Vegetation removal	Trees, shrubs	Unknown	All vegetation removed to be composted and not landfilled.
Excavation	None as cut and fill requirement has been balanced.	Unknown	Materials Management Plan is likely to identify ways to reuse site won or excavated materials within the construction of the Proposed Development.
Demolition	None		
Construction materials	Steel, concrete, intumescent paint etc from construction site, damaged stock or cut-offs, surplus materials, office related waste	Steel: 425 tonnes, concrete: 1604m ³ Glulam 170m ³	As a worst-case scenario, it is assumed that 10% of materials resources brought to the site would become waste. However, materials are likely to be reused or recycled where feasible.
Construction site compound	Municipal solid waste	Unknown	All waste will be recycled and not landfilled.

- 17.163 A worst-case scenario is assumed where all waste identified for disposal is destined to be landfilled. However, the Proposed Development will aim to minimise the waste generation as much as possible, by implementing the principles of waste hierarchy and a SWMP, which will be produced prior to the construction works by the contractor. Therefore, where technically appropriate and economically feasible, appropriate mitigation measures will be applied and, thus, the potential effects could be reduced.
- 17.164 If it is assumed that all concrete waste generated from the construction of the stadium and hotel is inert waste and is landfilled, it will reduce the Oxfordshire inert landfill void capacity by 0.05% and that of South East England inert landfill void capacity by 0.007% (**Table 17.11**).
- 17.165 If Ground Investigations indicate that excavation is required in contaminated land, then the contaminated, excavated material will be managed in accordance with the SWMP. Baseline study indicates that there is sufficient hazardous landfill void space available in South East of England (**Table 17.14**).
- 17.166 There is a historic landfill site within 500m of the site boundary. This landfill site is outside of the Proposed Development Site and there are no excavation works envisioned to be undertaken more than 150m from the Site boundary; therefore, it is not expected that any contaminated waste would arise from this landfill.
- 17.167 Hazardous waste has not been quantified, and it is assumed that all hazardous waste (such as paint) generated from the construction of the stadium and hotel is landfilled. The baseline study indicates that there is sufficient hazardous landfill void space available in South East of England (**Table 17.14**) to accommodate it from the Proposed Development.

17.168 Non-hazardous waste has not been identified at the time of drafting this report. The baseline study indicates that there is sufficient non-hazardous landfill void space available in South East of England (**Table 17.14**).

Mitigation measures for generation and management of waste

17.169 Good industry practice and application of mitigation measures that includes MMP and SWMP, secured through planning conditions will ensure that the volume of construction and excavation waste generated and require management by the regional waste handling facilities is unlikely to be significant.

17.170 The route map for zero avoidable waste in construction and/or the Zero Waste hierarchy will be applied (redesign, reduce, reuse, recycle/compost, material recovery, residuals management, unacceptable).

17.171 An RMP will provide specific targets, which will be monitored as part of the implementation that includes plans for

- Resource efficiency, where the amount of construction waste per 100m² is between less than 2.1m³ / 0.4 tonnes.
- Diversion from landfill:
 - Non-demolition: 85% volume or 90% tonnage
 - Demolition: 85% volume or 95% tonnage
 - Excavation: 95% by volume or tonnage

17.172 Mitigation measures stated in paragraphs 17.147 to 17.150 will also help to minimise the generation of waste.

Assessment of likely significance

17.150 This section describes the significance of effects for generation and management of waste from the construction phase, having taken into account the mitigation measures described in paragraphs 17.169 to 17.172.

17.173 The baseline study indicated that Oxfordshire has sufficient waste treatment infrastructure for the treatment of waste arisings from the Proposed Development. Oxfordshire has sufficient capacity to treat C&D waste arisings associated with the construction phase of the Proposed Development. Vegetation waste from site clearance in the construction phase should be treated in a composting or anaerobic facility.

17.174 Paragraphs 17.164 to 17.168 provides the % landfill void space that will be filled if waste from the construction phase of the Proposed Development is landfilled.

17.175 Based on **Table 17.2** and **Table 17.3**, the sensitivity on the receptor is Low and magnitude is Negligible. The effect is, therefore, determined as **Negligible** and therefore **not significant**.

Operation

Use of material resources

17.176 For the operational phase, maintenance works of the key elements of the Proposed Development, stated in paragraph 17.125 (ie larger building maintenance activities) would be infrequent and associated material volumes required will be in small quantities. Small quantities of materials, when compared to the material resources required for the construction phase may be required for the regular operation of the Proposed Development.

17.177 The assessment for environmental effects for material resources during the operational phase was, therefore, scoped out.

Generation and management of waste

17.178 The Proposed Development is a new development, built in a greenfield site with no existing waste management contract. During the operational phase, large volumes of commercial waste is likely to be generated from both regular operation and maintenance of the Proposed Development.

17.179 Waste generated from maintenance works includes:

- Grass clippings from the pitch maintenance works of the football stadium
- Vegetation clearance from the maintenance works of the landscaped areas.
- Materials brought to the Proposed Development that are not used for their intended purposes.
- Surplus materials such as concrete, paints and oils (some of which may be hazardous or require additional requirements for safe and compliant handling).

17.180 Waste likely to be generated from the operational phase of the Proposed Development includes:

- Grass cuttings from sport pitch maintenance
- Municipal solid /commercial waste and dry recyclables from the stadium use from both match and non-match event days
- Litter and debris
- Municipal solid waste from the hotel
- Waste from hospitality activities including:

- Discarded food waste and beverages
- Packaging and single use containers
- Glass bottles and containers
- Paper and cardboard
- Metal cans and tins
- Sanitary waste arising from toilets.
- Waste from retail facilities including packaging

17.181 The receptors likely to be impacted as a result of waste generation and management are landfills and other waste management infrastructure. The generation and management of waste as a result of the operation of the Proposed Development may adversely impact the environment, including:

- Direct effects on waste infrastructure, through temporary occupation of capacity of waste treatment facility (for treatment of waste) and temporary occupation of land for the storage of waste awaiting transfer off site
- Direct effect as a result of permanent reduction of regional inert and non-hazardous landfill void capacity from disposal of waste.
- Direct effect as a result of permanent reduction of national hazardous landfill void capacity from disposal of waste.

17.182 The baseline study indicates that the region has sufficient waste treatment infrastructure for the treatment of waste arisings generated by the Proposed Development. Oxfordshire has sufficient capacity to treat C&D waste arisings associated with the operational phase of the Proposed Development. Food waste and grass clippings generated from the operational phase can be treated in a composting or anaerobic facility.

17.183 It is also expected that the region will have sufficient treatment capacity for operational wastes, provided the waste hierarchy is followed and landfilling of wastes is avoided where possible.

17.184 The Proposed Development is a newbuild development, so baseline information regarding the type and volume of waste that is likely to be generated from its operational phase is unavailable. Estimation of waste generated from the operation of the Proposed Development is based on publicly available information.

17.185 The generation and management of waste that cannot be reused on site will require transport to off site waste management facilities. The impacts of this activity during construction have been assessed within Chapter 12 Air quality of the ES.

17.186 UEFA^{xxviii} estimates that for events of up to 25,000 spectators there may be as much as 20 tonnes of waste based of a rate of 0.8kg of waste per spectator. For a 16,000 seat capacity stadium, the volume of waste generated per event day is likely to be 12.8 tonnes.

- 17.187 The stadium operation is based on 41 football matches and two full stadium sporting events, which for the purposes of assessment have been combined to assume 43 football matches per annum, generating approximately 550 tonnes per annum of waste.
- 17.188 Expected waste volumes generated by the adjoining 180 bed hotel are currently unknown. British Standard 5906^l provides a guidance, for a weekly waste arising of 250 litre per bed. So, the total waste arising from the hotel is likely to be 2,340m³ per annum. With a density conversion^{li} factor of 0.3473 for non-composted fraction of municipal and similar waste, the likely waste arising for the hotel is 800 tonnes per annum.
- 17.189 Approximately 2,320m² commercial space of Class Use E/Sui generis is planned for the Proposed Development, of which 2,040m² is for usage for club shop, ticket office, sports bar, gym, health, wellbeing and clinic facility and 280m² space for restaurant. British standard guidance provided, for a weekly waste arising from department store (10 litre per sales area) has been used to estimate the likely waste arising and is likely to be 1210m³ per annum. With a density conversion factor of 0.3473 for non-composted fraction of municipal and similar waste, the likely waste arising for the commercial space is 420 tonnes per annum.
- 17.190 The stadium anticipates hosting 578 events per year. Indicative number of events per year and average number of attendees is given in **Table 17.21**. British Standard 5906^l provides a guidance, for an office waste arising of 50 litre per employee and it has been used to estimate the total waste arising from such events. With a density conversion factor of 0.3473 for non-composted fraction of municipal and similar waste to the estimated the waste arising from such events is 1,155 tonnes per annum (**Table 17.21**).

Table 17.21: Summary of waste generated from events organised in stadium

Event	Average Number of attendees	Indicative number per year	Waste, tpa
Box events	10	308	54
Medium events	30	117	61
Large events	150	85	221
Very large events	700	59	717
Christmas events	650	9	102
Total		578	1,155

- 17.191 The total quantity of waste that is likely to be generated from the operation of the Proposed Development is approximately 2,925 tonnes per annum. Future baseline study indicate that there is sufficient capacities in existing waste management facilities to manage the waste that is likely to arise from the operational phase of the Proposed Development.

17.192 However, as a worst-case scenario, if it is assumed that all waste generated by the stadium and hotel is non-hazardous waste and is landfilled, it will reduce the Oxfordshire non-hazardous landfill void capacity by 0.12% and that of South East England non-hazardous landfill void capacity by 0.017% (**Table 17.11**).

Mitigation measures for generation and management of waste

17.193 The sustainability statement for OUFC states that the stadium will operate with zero plastic, with minimal waste and packaging. This is in line with UEFA's Football Sustainability Strategy 2030 to achieve zero plastic waste (to landfill) in the food and beverage sector at Champions League finals by 2026.

17.194 Good mitigation plans will be incorporated that includes a Sustainability Statement, prepared and implemented to embed circular economy principles into operations specifically aimed to:

- Reuse and direct recycling of materials: The proportion of suitable refurbishment waste either directly re-used on-site or are sent back to manufacturer for closed loop recycling exceeds 75%.
- Apply zero waste hierarchy.
- Design adequate external storage space for bins and recycling.
- Provide sufficient waste storage options to enable staff, visitors and residents to separate and recycle their waste (external & internal storage).
- Implement a monitoring strategy to establish a baseline for operational waste.

17.195 An Operational Waste Management Strategy (OWMS) will be produced by the club which will provide an estimate of the anticipated waste generation from the Proposed Development during operation. The OWMS will provide guidance on how to allow waste to be disposed, stored and managed in a sustainable manner.

17.196 The recycling target of the waste generated by the Proposed Development will be 75%.

17.197 Mitigation measures for the management of construction waste, stated in paragraphs 17.170 to 17.172, are also applicable for the management of waste generated during the operational phase.

17.198 Good practices for recycling of waste generated will be incorporated that includes:

- Composting of green waste.
- Source segregation of dry recyclables.
- Treatment of food waste by anaerobic digestion process or by composting

- 17.199 Sufficient waste storage options will be provided to enable staff, visitors, residents to separate and recycle their waste (external & internal storage).
- 17.200 The Proposed Development will have a waste management contract with a waste management service provider to help manage all waste generated from its site, prior to its being operational.

Assessment of likely significant effects

- 17.201 Paragraphs 17.179 and 17.180 provides information regarding the most probable sources for waste to be generated. Potential receptors would be landfills and waste management infrastructures.
- 17.202 The amount of waste that will arise during the operational phase of the Proposed Development will be subject to change as it is expected the implementation of the mitigation measures described in Paragraphs 17.193 to 17.200 will ensure an adequate waste management as possible.
- 17.203 Based on the probable source for generation of waste, volume of inert and hazardous waste, that is likely to be generated is low, when compared to non-hazardous waste generated and hence not assessed.
- 17.204 A worst-case scenario assumes that during the operation of the Proposed Development, all waste is sent to landfill. It is estimated that 2,925m³ of non-hazardous waste will be landfilled causing a reduction of 0.017% of the non-hazardous landfill void capacity in the South East England region.
- 17.205 Based on **Table 17.2** and **Table 17.3**, the sensitivity on the receptor is Low and magnitude is Negligible. The environmental effect is, determined as **adverse Negligible** and, therefore, **not significant**.

Mitigation Measures and Residual Effects

Mitigation

- 17.206 Additional mitigation measures beyond measures inherent (designed in) to the Proposed Development and best practice are not required.

Residual effects

- 17.207 There are **no residual significant effects**.

Cumulative Effects

17.208 During the construction phase that includes site remediation activities, 20 schemes have the potential to result in cumulative effects with the Proposed Development. The location of these construction works, their application numbers and a brief description of the development are given in **Table 17.22**.

Table 17.22: Summary of potential scheme's cumulative effects from material use and waste generation

Site address	Application reference	Project description	Likely effect
OS Parcel 4347 East of Pipal Cottage Oxford Road Kidlington	23/01233/OUT	Demolition of existing building and erection of 800 dwellings, two primary schools, local convenience centre, café , restaurant etc.	Materials for construction will be required and waste will be generated from the construction and operational phase.
North Oxford Golf Club, Land west of Oxford Road Cherwell District Council	N/A	Allocated for residential development	Materials for construction will be required and waste will be generated from the construction and operational phase.
Frieze Farm, Kidlington	N/A	N/A, Reserved for a potential golf course, unless demonstrated it is not required.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Land at Bicester Road, Kidlington Cherwell District Council	Cherwell 22/00747/OUT	Outline planning application for 370 residential units, public open spaces, sport pitches and pavilion.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Land North of 66 and adjacent Water Eaton Lane Gosford Cherwell District Council	Cherwell District Council 22/03883/F	Development of 96 dwellings open space, landscaping and infrastructure.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Stratfield Farm, 374 Oxford Road, Kidlington, OX5 1DL	Cherwell 22/01611/OUT	Outline planning application for up to 118 no dwellings.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Former Piggery and Land North of Woodstock Road, Yarnton Cherwell District Council	Cherwell 23/03307/OUT	Up to 300 residential units	Materials for construction will be required and waste will be generated from the construction and operational phase.
Begbroke Science Park Begbroke Hill Begbroke Kidlington OX5 1PF Cherwell District Council	23/02098/OUT	Residential-led mixed use development comprising: Up to 215,000 square metres gross external area of residential floorspace (or c.1,800 homes) and supporting infrastructures	Materials for construction will be required and waste will be generated from the construction and operational phase.

OS Parcel 3673, Adjoining and West Of 161 Rutten Lane, Yarnton	Cherwell 21/03522/OUT	Erection of up to 540 dwellings, up to 9000 sqm of elderly care residential units, community hub, community space etc.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Northern Gateway, Oxford City Council	Oxford City Council 18/02065/OUTFUL	Outline planning application for 87,300 sqm of employment space, 550 sqm of community space, 2500 sqm of class usage A1, A2, A3, A4 and A5 space, 480 residential units etc.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Land south west of St Frideswide Farm, Banbury Road, Oxford OX2 BEH	Oxford City Council 21/01449/FUL	Residential development of 125 units	Materials for construction will be required and waste will be generated from the construction and operational phase.
Oxford University Press Sports Ground	N/A	Residential development for 130 units and public open space at Oxford University Press Sports Grounds.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Hill view farm, Mill Lane, Marston, Oxford OX3 0QG	Oxford City Council 20/03034/FUL	Demolition of existing buildings and construction of 159 dwellings, associated roads and infrastructure, drainage and landscaping	Materials for construction will be required and waste will be generated from the construction and operational phase.
Land to the west of Mill Lane, Marston, Oxford OX3 0QA	Oxford City Council 21/0127/FUL	Erection of 80 residential dwellings (use class C3) formed of 13 one-bedroom apartments and 28 two-, 35 three- and 4 four-bedroom houses with associated public open space, access and landscaping	Materials for construction will be required and waste will be generated from the construction and operational phase.
Marston Paddock, Butts Lane, Oxford OX3, 0QN	Oxford City Council 21/0580/FUL	Full planning permission for the erection of 40 residential dwellings (Class C3), access arrangements and public open space, landscaping, associated infrastructure and works including pedestrian and cycle routes	Materials for construction will be required and waste will be generated from the construction and operational phase.
Land north of Bayswater Brook near Barton South Oxfordshire District Council	P22/S4618/O	Residential development for up to 1,450 new dwellings and associated infrastructures.	Materials for construction will be required and waste will be generated from the construction and operational phase.

Oxford Technology Park Buildings 8-11 Cherwell District Council	23/00915/F	Planning Application for Development within Use Classes E(g) (i), and/or (ii), and/or (iii), and/or B2 and/or B8 and associated works including access and parking (relating to proposed Buildings 8, 9, 10 and 11) (total of a total of 16,909 sqm)	Materials for construction will be required and waste will be generated from the construction and operational phase.
New Science Park, Land West of the Junction with The Boulevard, Oxford Airport Langford Lane, Kidlington	Cherwell District Council 23/00517/F	Redevelopment of the site to include the demolition of existing buildings and development of new accommodation across five buildings for employment uses (Class E(g)(ii) and (iii)) plus ancillary amenity building, outdoor amenity space.	Materials for construction will be required and waste will be generated from the construction and operational phase.
Land North of Manor Farm, Noke Cherwell District Council	Cherwell District Council 22/01682	Development of a ground mounted solar farm incorporating the installation of solar PV panels, associated infrastructure and access,	Materials for construction will be required and waste will be generated from the construction phase.
Land West of Cuckoo lane and adjacent to the A40, Eynsham, West Oxfordshire District Council Oxfordshire County Council	Oxfordshire County Council reference R3.0057/19	Construction of a park & ride car park providing 850 car parking spaces, cycle spaces, motorcycle spaces, electric vehicle charging points, bus shelters, landscaping, external lighting, public open space, toilets, seating, fencing, habitat creation, drainage features, new access from Cuckoo Lane, new roundabout with access onto A40, an eastbound bus lane approximately 6.5km in length from the park & ride site to the A40 bridge over the Dukes Cut canal, two sections of westbound bus lane (each approximately 500m in length), new shared use footway/cycleway, widening of Cassington New Bridge, junction improvements, new crossings, new	Materials for construction will be required and waste will be generated from the construction and operational phase.

		footbridge alongside Cassington Halt Bridge, and associated works	
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17.209 The construction of these 20 schemes could potentially be concurrent with the construction phase of the Proposed Development, and due to their proximity to the site, may cause construction cumulative impacts.

17.210 It could be assumed that some of these schemes will have been constructed prior to start of the Proposed Development in Q3, 2024. However, due to the unknown proposed dates for these schemes to commence they remain a consideration in this assessment.

17.211 The sensitive receptors which could potentially experience cumulative effects as a result of the use of material resources include quarries and other sources of minerals, and other finite raw material resources. The potential cumulative impacts these receptors may experience include:

- Depletion of non-renewable resources
- Impact on the national or local demand for materials
- Sterilisation of larger areas of land from future mineral extraction either above or below ground.

17.212 For the generation and management of waste from the Proposed Development, the sensitive receptors, which could potentially experience cumulative effects as a result of waste generation and management are landfills and other waste management infrastructure. The potential cumulative impacts these receptors may experience include:

- Utilisation and depletion of the remaining local landfill capacity; and
- Occupation of available waste management infrastructure capacity.

17.213 There is the potential that most of the short-listed schemes, in **Table 17.22**, could have an adverse impact on the capacity of receiving waste management facilities within the two study areas. It is anticipated that these schemes would require materials during construction phase and generate waste during both construction and operational phases that would require treatment and/or disposal at third party waste management facilities. There would also be a requirement for materials (potentially in large volumes), particularly during the construction of each of the schemes unrelated to the Proposed Development.

17.214 The materials anticipated to be used, or waste anticipated to be generated by these short-listed schemes, or the timescales, over which materials required and waste would be generated, are not known at this time. Thus, it has not been possible to assess the cumulative effects due to the lack of materials and waste arisings information and assumptions has been made based on professional judgement. It is recognised that the cumulative effects are likely to be greater than the individual

effects, although good practice would seek to reuse material on the development sites, where possible, to reduce waste arisings as far as practicable.

- 17.215 Mitigation measures will be implemented as part of the construction of the Proposed Development. The schemes, listed in **Table 17.22**, themselves will also be subject to the NPPF and will require mitigation and control measures to be adopted during their construction through management plans to reduce impacts to the environment, including dust generation and potential mobilisation of contaminants. The detailed design for the Proposed Development will also take into consideration any impacts and recommended mitigation measures associated with material resource use and waste generation during construction.
- 17.216 Based on a worst case scenario, material resource use for the construction phase, if it is assumed that all these short-listed schemes are constructed at the same time as the Proposed Development, then construction materials (aggregate, aggregate based materials, steel etc.) will be required at the same time and construction waste will be generated from sources listed in paragraph 17.161.
- 17.217 The baseline information indicates that there is sufficient construction material available within the region, so sensitivity on the receptor is Low. It is assumed that the cumulative requirement for regional construction material all these schemes is higher than 1% but less than 5%, causing magnitude to be Minor or Low. The cumulative effect for use of material resources for construction phase is, determined as **Negligible** and, therefore, **not significant**.
- 17.218 The baseline study indicated that Oxfordshire has sufficient waste treatment infrastructure for the treatment of waste arisings from the Proposed Development, so the sensitivity on the receptor is Low. For the construction and operational phase, it is assumed that all schemes will generate waste that requires to be landfilled. The regional landfill capacity in the South East of England for hazardous waste is 264,859m³, over 17.5million m³ for non-hazardous waste and over 20 million m³ for inert waste. Based on professional judgement, it is unlikely that landfilling of all waste from these short-listed schemes will reduce the regional inert and non-hazardous landfill capacities by more than 1% and that of hazardous waste by 0.1%. So, effect of magnitude for the receptor is Low. The cumulative effect for the generation of waste for construction and operational phase is, determined as **Negligible** and, therefore, **not significant**.
- 17.219 Material resources required for the operational phase was scoped out for the assessment and hence not assessed for cumulative effects.

Conclusions

Construction

17.220 For the construction phase, the environmental effect was assessed for the use of material resources and the generation and management of waste. Sand and gravel, crushed rocks and steel are the primary materials that are required for construction works and waste is likely to arise from the construction phase. The baseline study indicated that, the South East of England had sufficient quantities of sand and gravel and crushed rocks, and UK had sufficient supply for steel. The Proposed Development is likely to procure materials from responsible sources and in a sustainable manner, wherever technically appropriate and economically feasible. Baseline study also indicated that there are sufficient waste management facilities within the region. Following the implementation of the design and mitigation measures, as outlined within the assessment, an adverse Negligible effect is expected for the use of material resources and the generation and management of waste. The significance of environmental effect for the use of material resources and the generation and management of waste is considered not significant. The cumulative effect for use of material resources, and the generation and management of waste for the construction phase is, determined as **Negligible** and, therefore, **not significant**.

Operation

17.221 For the operational phase, the environmental effect was assessed for generation and management of waste. The baseline study indicated that, the current waste management infrastructure in Oxfordshire will be able to manage the potential waste anticipated to be generated during the operational phase. An OWMS will be prepared, by the contractor, during RIBA 3 stage, to identify the waste streams and storage provisions required during the operation of the Proposed Development. Best practice including the implementation of Circular Economy principles and introducing a recycling target for food and beverages, in line with UEFA's policies, will help to reduce the waste generated by the operational phase of the Proposed Development. Following the implementation of the design and mitigation measures, as outlined within the assessment, the environmental effect for waste generated for the operational phase is, adverse, Negligible and, therefore, not significant. The cumulative effect for the generation of waste for the operational phase is, determined as **Negligible** and, therefore, **not significant**.

17.222 There are **no residual effects** for material resources and waste.

Table 17.23: Summary of Residual Effects Table

Effect/ Receptor	Sensitivity	Magnitude	Nature/ Level of Effect	Mitigation	Residual Effect
Construction Phase					
Quarries and other sources of minerals, and other finite raw material resources.	Low	Negligible	Permanent, direct, Not Significant	Enhanced mitigation not required.	Negligible, Not significant
Landfills and other waste management infrastructure	Low	Negligible	Permanent direct, Not Significant	Enhanced mitigation not required.	Negligible, Not significant
Operational Phase					
The landfills and other waste management infrastructure	Low	Negligible	Permanent direct, Not Significant	Enhanced mitigation not required.	Negligible, Not significant
Cumulative Effects					
Quarries and other sources of minerals, and other finite raw material resources.	Low	Low	Permanent, direct, Not Significant	Enhanced mitigation not required.	Negligible, Not significant
The landfills and other waste management infrastructure	Low	Low	Permanent, direct Not Significant	Enhanced mitigation not required.	Negligible, Not significant

References

- ⁱ European Union Directive. (2008) Waste Framework Directive (2008/98/EC) [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098>.
- ⁱⁱ European Union Council Directive (1999). Landfill Directive (1999/31/EC) [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A1999L0031>.
- ⁱⁱⁱ European Union Council Directive (1991). Hazardous Waste Directive (91/689/EEC) [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01991L0689-20081212&from=EN>.
- ^{iv} Her Majesty's Government (2021) The Environment Act 2021 [online]. Available at: [Environment Act 2021 \(legislation.gov.uk\)](https://www.legislation.gov.uk).
- ^v Her Majesty's Government (2018) European Union (Withdrawal) Act 2018 [online]. Available at: [European Union \(Withdrawal\) Act 2018 \(legislation.gov.uk\)](https://www.legislation.gov.uk).
- ^{vi} Her Majesty's Government (2020) The Waste (Circular Economy) (Amendment) Regulations 2020 [online]. Available at: [Legislation.gov.uk](https://www.legislation.gov.uk)
- ^{vii} Her Majesty's Government (2020) The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 [online]. Available at [The Waste and Environmental Permitting etc. \(Legislative Functions and Amendment etc.\) \(EU Exit\) Regulations 2020 \(legislation.gov.uk\)](https://www.legislation.gov.uk)
- ^{viii} Her Majesty's Government (2011) The Waste (England and Wales) Regulations 2011, No.988 [online]. Available at: <https://www.legislation.gov.uk/ukxi/2011/988/contents>
- ^{ix} Her Majesty's Government (2005) The Hazardous Waste (England and Wales) Regulations 2005, No. 894 [online]. Available at: <https://www.legislation.gov.uk/ukxi/2005/894/contents/made>
- ^x Her Majesty's Government (2016) The Environmental Permitting (England and Wales) Regulations 2016 No. 1154 [online]. Available at: <https://www.legislation.gov.uk/ukxi/2016/1154/contents/made>
- ^{xi} Her Majesty's Government (2013) Waste Electrical and Electronic Equipment (WEEE) (England and Wales) Regulations, 2013 [online]. Available at: <https://www.legislation.gov.uk/ukxi/2013/3113/made>
- ^{xii} Her Majesty's Government (2012) Controlled Waste (England and Wales) Regulations 2012 [online]. Available at: www.legislation.gov.uk/ukxi/2012/811/contents/made
- ^{xiii} Ministry of Housing, Communities & Local Government (2023) National Policy Planning Framework [online]. Available at: [National Policy Planning Framework \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk)
- ^{xiv} Department for Communities and Local Government (2014), National Planning Policy for Waste. [online]. Available at: https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/364759/141015_National_Planning_Policy_for_Waste.pdf
- ^{xv} Department for Environment Food & Rural Affairs (2021) Waste Management Plan for England [online]. Available at: [Waste Management Plan for England \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk)
- ^{xvi} Department for Environment, Food & Rural Affairs (2023). The waste prevention programme for England: Maximising Resources, Minimising Waste [online]. Available at: [The waste prevention programme for England: Maximising Resources, Minimising Waste - GOV.UK \(www.gov.uk\)](https://www.gov.uk)
- ^{xvii} Department for Environment Food and Rural Affairs (2019) Resources and waste strategy: at a glance [online]. Available at: [Resources and waste strategy: at a glance - GOV.UK \(www.gov.uk\)](https://www.gov.uk)
- ^{xviii} Her Majesty's Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment [online]. Available at: [25 Year Environment Plan - GOV.UK \(www.gov.uk\)](https://www.gov.uk)
- ^{xix} Her Majesty's Government (2023) Environmental Improvement Plan 2023 [online]. Available at: [Environmental Improvement Plan 2023 - GOV.UK \(www.gov.uk\)](https://www.gov.uk).
- ^{xx} Her Majesty's Government (2021) Net Zero Strategy: Build Back Greener [online]. Available at [Net Zero Strategy: Build Back Greener - GOV.UK \(www.gov.uk\)](https://www.gov.uk).
- ^{xxi} Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy (2018). Clean Growth Strategy [online]. Available at: [Clean Growth Strategy - GOV.UK \(www.gov.uk\)](https://www.gov.uk).
- ^{xxii} Oxfordshire Minerals and Waste Local Plan (2017). Part 1-Core Strategy [online]. Available at: [AdoptedMineralsWasteCoreStrategySept2017.pdf \(oxfordshire.gov.uk\)](https://www.oxfordshire.gov.uk)
- ^{xxiii} Oxfordshire's Resources and Waste Strategy 2018-2023. [online]. Available at: [CA JUN1819R10 Annex Oxfordshires Resources and Waste Strategy 2018-2023 final web ready.pdf](https://www.oxfordshire.gov.uk).
- ^{xxiv} Materials and Waste in Environmental Impact Assessment - March 2020. [online]. Available at: [IEMA - Materials and Waste in Environmental Impact Assessment - March 2020](https://www.oxfordshire.gov.uk).
- ^{xxv} Department of Trade and Industry (2004). Site Waste Management Plans - Guidance for Construction Contractors and Clients [online] available at: <https://www.bathnes.gov.uk/sites/default/files/sitewastemanagement.pdf>.
- ^{xxvi} Department for Environment, Food & Rural Affairs (2009). Code of practice for the sustainable use of soils on construction sites. [online] available at: <https://www.bathnes.gov.uk/sites/default/files/sitewastemanagement.pdf>.
- ^{xxvii} Definition of Waste: Code of Practice: [online]. Available at: [DoW:CoP \(clare.co.uk\)](https://www.clare.co.uk)

-
- xxxviii UEFA Circular Economy Guidelines (2022) [online]. Available at: [uefa_circular_economy_guidelines_f_b_07092022_rgb_20220907111725.pdf](#).
- xxxix British Geological Society (2023). United Kingdom Minerals Yearbook 2022. [online] Available at: [OR23001.pdf \(nerc.ac.uk\)](#).
- xxx Mineral Products Association (2022) Profile of the UK Mineral products Industry 2023 Edition [online]. Available at: [Profile_of_the_UK_Mineral_Products_Industry_2023.pdf \(mineralproducts.org\)](#)
- xxxix World Steel Association (2023), 2021 World Steel in Figures. [online] available at: <https://worldsteel.org/steel-topics/statistics/world-steel-in-figures-2022/>
- xxxii Oxfordshire Local aggregate Assessment (2023) [online]. Available at: [LAA Annex 2.pdf \(oxfordshire.gov.uk\)](#)
- xxxiii South East England Aggregates Working Party (SEEAWP) (2022) Annual Report 2022 [online]. Available at: [SEEAWP-annual-report-2022.pdf \(hants.gov.uk\)](#).
- xxxiv Natural England (2023) Peaty Soils Location Map [online]. Available at: [Magic Map Application \(defra.gov.uk\)](#)
- xxxv Oxfordshire County Council (2017). Minerals and Waste Local Plan Policies Map South [online]. Available at: [Oxfordshire Minerals & Waste South 2](#).
- xxxvi Environment Agency (2023) Waste Data Interrogator – Wastes Received (Excel) V1 [online]. Available at: [2022 Waste Data Interrogator - data.gov.uk](#) .
- xxxvii Environment Agency (2023) Waste Data Interrogator – Wastes Removed (Excel) V1 [online] <https://environment.data.gov.uk/datafiles/1551bcb6e2764ad09bad390a482691d4>
- xxxviii Department for Environment Food and Rural Affairs (2023) UK statistics on waste [online]. Available at: [UK statistics on waste - GOV.UK \(www.gov.uk\)](#).
- xxxix Department for Environment Food and Rural Affairs (2023). [online]. Available at: [Historic Landfill Sites - data.gov.uk](#).
- xl Department for Environment Food and Rural Affairs (2023). [online]. Available at: [Permitted Waste Sites - Authorised Landfill Site Boundaries - data.gov.uk](#).
- xli Environment Agency (2023) 2022 Remaining Landfill Capacity – Version 1 [online]. Available at: [Remaining Landfill Capacity - data.gov.uk](#)
- xlii Environment Agency (2023) Waste Operations [online]. Available at: [Public Registers Online \(data.gov.uk\)](#).
- xliiii Environment Agency (2023) [online]. Available at: [Waste Exemptions \(data.gov.uk\)](#)
- xliiv RIDGE (2023) Oxford United FC RIBA 2 Cost Update version 2.04 (June 2023) [pdf].
- xliv RIDGE Materials and Waste Plan, Oxford United Football Club – New Stadium Development (2023) [pdf].
- xlvi Wikipedia (2023), Properties of Concrete [online]. Available at: [Properties of concrete - Wikipedia](#)
- xlvii Civil Engineering (2023) [online]. Available at: [Density of Aggregate - Bulk and Relative Density - Civil Engineering \(civiltoday.com\)](#)
- xlviii RIDGE Oxford United Football Club – New Stadium Development Sustainability Statement. [online]. Available at: [151123 Oxford United FC Sustainability Statement.pdf](#)
- xlix Oxford United FC (2023) New Stadium Development Project Vision – May 2023. Available at: [PowerPoint Presentation \(oufcstadium.co.uk\)](#).
- ^l British Standard BS 5906:2005 (2005). Waste management in buildings- Code of practice [online]. Available at: [untitled \(rbkc.gov.uk\)](#).
- ^{li} Density conversion factor for waste [online]. Available at: [uk-conversion-factors-for-waste.xlsx \(live.com\)](#).