

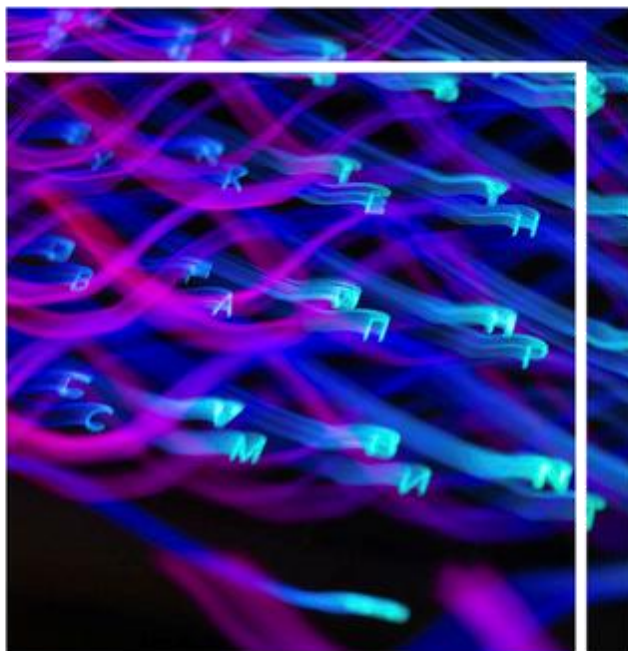
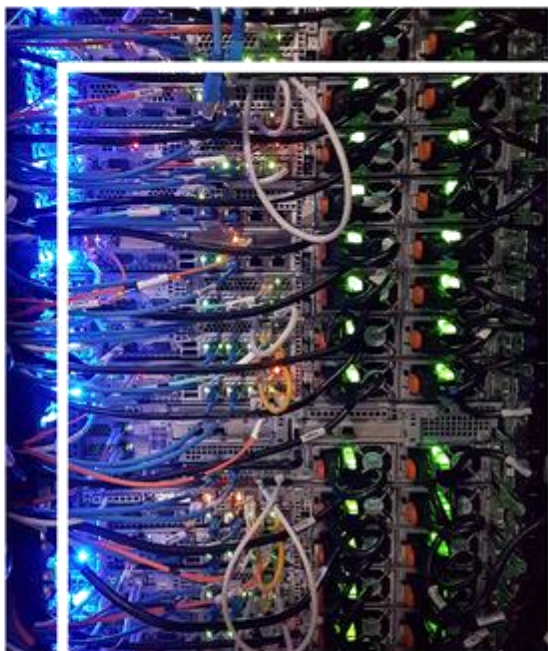


Thames Valley Park Data Centre

EIA Volume 2: Environmental Statement

Tyréns Hilson Moran | On Behalf of FH Trustees
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Author: R Gibbon

Checker: S Grimsley

Approver: T Reade

HM Project No: 38792

HM Office: Neo
9 Charlotte Street
Manchester
M1 4ET

T: +44 (0)161 876 2700

 hilsonmoran.com

 [@HilsonMoran](https://twitter.com/HilsonMoran)

 [hilson_moran](https://www.instagram.com/hilson_moran)

 [Tyréns Hilson Moran](https://www.linkedin.com/in/TyrénsHilsonMoran)

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1. Introduction

This Environmental Statement ('ES') has been prepared by Tyréns Hilson Moran and has been commissioned by BCS Consultancy Ltd, on behalf of FH Trustees¹ ('the Applicant') in support of an outline planning application for the proposed redevelopment of land at Microsoft Campus, Thames Valley Park, Reading, RG6 1WG ('the Site'), to provide a data centre campus together with associated infrastructure, access, landscaping and ancillary development.

The ES presents the findings of the Environmental Impact Assessment ('EIA') undertaken in accordance with the Town and Country Planning (EIA) Regulations 2017 (as amended)² ('2017 EIA Regulations').

1.1. The Environmental Statement

In line with the 2017 EIA Regulations the EIA has been reported in the form of an ES, which comprises three volumes:

- Volume 1 Non-Technical Summary;
- Volume 2 Environmental Statement; and,
- Volume 3 Technical Appendices.

This report comprises the ES, Volume 2, which presents the findings of the assessment of the environmental effects of the Proposed Development. The report provides information regarding the EIA process and approach to the assessment in Section 2, followed by a description of the existing site and surrounding area in Section 3 and the Proposed Development in Section 4. The planning policy associated with the Proposed Development is summarised in Section 5, followed by the environmental topic assessments in Sections 6 to 10. The final Sections, 11 and 12, provide a summary of the residual impacts from the development.

A summary of the environmental assessment is provided in the Non-Technical Summary, Volume 1, any supporting assessments and reports are provided in Volume 3, Technical Appendices.

The ES includes all of the information requirements set out in Schedule 4 of the 2017 EIA Regulations, with Appendix 1-1 in Volume 3 of the ES identifying the relevant information requirements and location of the information within the ES.

The ES is submitted as a standalone document to accompany and support the planning application for the Proposed Development. In addition to the ES, the planning application comprises a range of documents including the following:

- Design and Access Statement

¹ FH Trustees and FH Trustees 2 as trustees of the Mapeley Beta HL Unit Trust

² HMSO (2017), The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended).

- Planning Statement
- Statement of Community Involvement
- Preliminary Ecological Appraisal
- Great Crested Newt eDNA Surveys
- Biodiversity Net Gain Assessment
- Landscape and Visual Appraisal
- Economic Benefits Statement
- Desk Based Heritage Assessment
- Flood Risk Assessment & Drainage Strategy
- Arboricultural Impact Assessment
- Utilities Statement
- Phase II Site Investigation Report (Geotechnical & Contamination)
- External Lighting Strategy
- Energy Strategy Report
- BREEAM Pre-Assessment Report
- Transport Assessment & Travel Plan

1.2. Summary of the Development Proposals

The Proposed Development comprises the demolition of the existing buildings and redevelopment of the Site to provide a data centre and associated infrastructure. This includes fuel cells for energy generation, backup generators, ancillary office accommodation, electrical infrastructure and plant, drainage infrastructure, car parking, landscaping, internal access and maintenance roads and associated engineering works.

The planning application is submitted in outline, with all matters reserved except access. Outline planning permission is sought by reference Parameter Plans, which establish the parameters within which the detailed design may subsequently come forward.

An illustrative scheme accompanies the planning application and represents one way in which the Proposed Development could be delivered within the Development Parameters. The detailed description of the Proposed Development is provided in Section 4.

The Proposed Development is targeting a BREEAM 'Excellent' rating and would deliver a minimum 10% biodiversity net gain.

1.3. Environmental Assessment Team

Tyréns Hilson Moran has co-ordinated the completion of the EIA and production of the ES for the Proposed Development at Thames Valley Park, however this has involved input from a range of Technical Experts who have led the completion of topic specific assessments and drafting of the associated chapters.

The team involved in the completion of the EIA is identified in Table 1-2, with further detail on the topic leads provided in Appendix 1-2 in Volume 3 of the ES.

Table 1-1 Environmental Assessment Team and Topic Leads

Topic	Topic Lead	Company
EIA Co-ordination	Rose Gibbon	Tyréns Hilson Moran
Air Quality	Sian Grimsley	Tyréns Hilson Moran
Acoustics	Fatima Taha	Tyréns Hilson Moran
Climate Change and Resilience: Greenhouse Gas Assessment	Sian Grimsley	Tyréns Hilson Moran
Water Resources	Matt Lai	ARUP
Waste	Lucy Cooper	Tyréns Hilson Moran

1.4. Environmental Statement Availability

The ES, along with other planning submission documentation can be viewed online through Wokingham Borough Council's Planning Portal planning.wokingham.gov.uk or through the project website at www.tvpdc.co.uk.

A paper or electronic copy of the full ES can be obtained from:

Tyréns Hilson Moran, 4 Battle Bridge Lane, London, SE1 2HP.
Tel +44 (0)20 7940 8888

Reasonable copying and printing charges will be applied to a paper copy. An electronic copy (PDF version provided by electronic file transfer) is available free of charge.

All comments on the ES (and planning application) should be issued to Wokingham Borough Council.

1.5. Abbreviations

A full list of abbreviations has been provided as part of the Appendix 1-3.

2. Approach to Assessment

2.1. General Approach to EIA

EIA is a process used to identify, describe and assess the likely significant environmental effects of a proposed development. It ensures that the decision-maker has sufficient information on those effects and can take them into account when determining the planning application.

The EIA process also enables environmental considerations to inform the design of a development. This includes identifying opportunities to avoid or reduce adverse environmental effects and, where appropriate, deliver environmental enhancements. The findings of the EIA are reported within this ES.

2.2. Content of the Environmental Statement

The principal legislation governing EIA in England is the 2017 EIA Regulations.

In accordance with Regulation 4 of the 2017 EIA Regulations, the EIA considers the likely direct and indirect significant effects of the Proposed Development on the following environmental factors:

- Population and human health;
- Biodiversity;
- Land, soil, water, air and climate;
- Material assets, cultural heritage and landscape; and
- The interaction between these factors.

The content of the ES has been informed by Regulation 18 and Schedule 4 of the 2017 EIA Regulations. The ES includes the information reasonably required to assess the likely significant environmental effects of the Proposed Development, having regard to its nature and the environmental features likely to be affected.

Further guidance on the preparation of an ES is provided in the Planning Practice Guidance (PPG)³ produced by the Ministry of Housing, Communities and Local Government. The PPG advises that, while an ES should provide a full factual description of the development, it should focus on the main or significant environmental effects likely to arise. The ES should therefore be proportionate and no longer than is necessary to assess those effects.

Best-practice guidance for EIA is also provided by the Institute of Sustainability and Environmental Professionals (ISEP), formerly the Institute of Environmental Management and Assessment (IEMA)⁴. The IEMA guidance Environmental Impact Assessment Guide to: Delivering Quality Development emphasises the importance

³ Ministry of Housing, Communities and Local Government, Planning Practice Guidance: Environmental Impact Assessment.

⁴ Institute of Environmental Management and Assessment (2016), Environmental Impact Assessment Guide to: Delivering Quality Development, IEMA, Lincoln

of early interaction between the EIA and design processes, appropriate stakeholder engagement and the preparation of a clear and proportionate ES. These principles have informed the preparation of this ES.

The 2017 EIA Regulations require the ES to be prepared by competent experts. The environmental assessment team is identified in Table 1-2, with details of the relevant expertise and qualifications of the EIA co-ordinators and technical specialists provided in Appendix 1-2.

The structure of the ES and its accompanying volumes is described in **Section 1.1**. A schedule identifying where the information required by Schedule 4 of the 2017 EIA Regulations is provided within the ES is included in Appendix 1-1.

Where reasonable alternatives have been studied by the Applicant, the ES provides a description of those alternatives and the principal reasons for selecting the Proposed Development, including a comparison of their environmental effects. The alternatives considered are described within the Development Description section of this ES.

2.3. Scoping and Consultation

Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 provides that an applicant may request a formal Scoping Opinion from the relevant planning authority; obtaining a Scoping Opinion is not mandatory. No formal Scoping Opinion was requested or issued for the Proposed Development. Instead, the scope of the EIA has been informed by:

- Pre-application consultation with Wokingham Borough Council ('WBC') Council and other relevant consultees;
- The findings of the technical studies and surveys undertaken for the Proposed Development;
- The application of professional judgement;
- The characteristics of the Site and surrounding area; and
- Relevant legislation, policy and technical guidance.

This approach has enabled the EIA to focus on those matters with the potential to give rise to likely significant environmental effects. Matters scoped out of the EIA are, where relevant, addressed through the other technical documents submitted with the planning application.

Consultation relevant to individual environmental topics is described within the corresponding technical chapters. The environmental matters scoped into and out of the EIA are summarised in Table 2-1.

Table 2-1 Environmental Topics Scoped in and out of the EIA

Discipline	Topic (including key receptors where relevant)	Scoped In/Out	Justification
Air Quality	Construction dust emissions	In	Construction activities (e.g. demolition, earthworks and vehicle movements) can generate dust and particulate matter (PM ₁₀ and PM _{2.5}), which may cause temporary effects at nearby receptors. An assessment is therefore required in line with IAQM guidance to determine risk and mitigation.
	Construction traffic emissions	In	Emissions from construction vehicles (including HGVs and plant) may affect local air quality, particularly along access routes and near sensitive receptors. An assessment is therefore required to evaluate impacts and ensure compliance with air quality objectives.
	Operational traffic emissions	Out	Confirmed by the transport consultant there will be a reduction in operational trips compared to the existing use.
	Operational building emissions (fuel cells and generators)	In	The operation of fuel cells will result in point source emissions (e.g. NO _x) that could affect local air quality. As these emissions are continuous and may affect sensitive receptors, detailed dispersion modelling (using ADMS-6) is required to predict pollutant concentrations at existing and proposed receptor locations and to demonstrate compliance with air quality standards.
Noise & Vibration	Construction Noise	In	Construction activities associated with the Proposed Development could have the potential to generate temporary, significant noise impacts.
	Construction Vibration	In	Construction activities associated with the Proposed Development could have to have the potential to generate temporary, significant vibration impacts.
	Construction Traffic Noise	Out	Construction traffic routes are not expected to affect the residential noise sensitive receptors due to their location.
	Operational Traffic Noise	Out	Typically, a 10% increase in total traffic or 5% rise in HGV movements would result in only minor impacts, with significant impacts generally requiring a doubling of traffic volumes. Given this context, the operation of the Proposed Development is unlikely to generate significant noise impacts from traffic changes. Therefore, it

Discipline	Topic (including key receptors where relevant)	Scoped In/Out	Justification
			is proposed to scope out the assessment of operational traffic noise.
	Operational Noise	In	The installation of new mechanical and electrical plant associated with the Proposed Development, including cooling infrastructure, fuel cells, back-up generators and associated building-service plant, has the potential to generate permanent, significant noise impacts. Due to the outline nature of the application, final plant specifications and locations are not yet available. The assessment therefore establishes appropriate operational noise limits to inform the detailed design and ensure that significant effects at nearby noise-sensitive receptors are avoided.
Climate Change and Greenhouse Gas	Greenhouse Gas Assessment	In	Quantification of greenhouse gas emissions throughout the construction, operation and end-of-life stages of development. Required to inform the EIA and assess the significance of the Proposed Development's contribution to climate change.
	Climate Change Resilience Assessment	In	Assessment of the vulnerability and resilience of the Proposed Development to current and future climate change effects over its lifetime. Required to inform the EIA and demonstrate the Proposed Development's ability to adapt to projected climate conditions.
Water Resources	Detrimental impact on receiving water body/downstream network	In	Surface Water Drainage will contribute discharge to an existing Thames Water Utilities Limited (TWUL) network.
	Insufficient capacity in the foul network	In	Domestic and Industrial foul water will be produced by the Proposed Development. This will contribute discharge to an existing TWUL network.
	Detrimental impact on groundwater quality and increase flooding	In	A section of site encompasses a principal aquifer that may support water supply / river base flow on a strategic scale. Construction activities pose a hazard to site water quality. The Proposed Development has operational substances that will negatively impact the water quality if not contained appropriately.
	Increase in pluvial flooding	In	Proposed Development site consists predominantly of impermeable hardstanding and building roofs that have a high surface water runoff rate.

Discipline	Topic (including key receptors where relevant)	Scoped In/Out	Justification
	Increase in tidal and fluvial flooding	Out	The Proposed Development is in a Flood Zone 1 area and no flood defence infrastructure within the vicinity of the Site. Therefore, risk of tidal and fluvial flooding is low
	Increase in demand on the potable water network	Out	The Proposed Development will predominately use air based cooling. Any water based cooling elements will operate as sealed, closed-loop systems, with only limited water required for filling and occasional top ups. No discharges to watercourses are proposed. As such, the operational water use is anticipated to be negligible and unlikely to place a material demand on local potable water resources.
Waste	Waste generation and effects on waste management infrastructure during demolition	In	Demolition of the existing business park buildings and infrastructure will generate waste requiring reuse, recovery, recycling and disposal. Potential effects may arise from the demand placed on regional waste management infrastructure.
	Waste generation and effects on waste management infrastructure during construction	In	Construction of the proposed data centre, administration building, substation, fuel cell infrastructure and associated external works will generate construction wastes requiring management through licensed facilities. Potential effects may arise from the demand placed on regional waste management infrastructure.
	Excavated materials and earthworks	In	Site preparation, foundations and installation of underground services are expected to generate excavated materials requiring reuse on-site or management off-site. Potential effects relate to the recovery and disposal of surplus materials.
	Hazardous waste generation during demolition and construction	In	Potential exists for hazardous materials to be encountered during demolition and construction activities, including asbestos-containing materials, contaminated materials and other hazardous wastes requiring specialist management and disposal.
	Operational waste generation and management	Out	Operational waste generated by the proposed data centre would comprise relatively low quantities of general office, packaging and maintenance related waste during normal operation. Periodic replacement of IT equipment and server racks, anticipated approximately every three years, may generate larger quantities of waste electrical and electronic equipment (WEEE) and associated packaging. These materials would be managed in accordance with the waste

Discipline	Topic (including key receptors where relevant)	Scoped In/Out	Justification
			hierarchy, prioritising reuse, refurbishment, manufacturer take-back and recycling through appropriately licensed contractors. Subject to suitable storage, segregation and management arrangements, significant environmental effects are not anticipated.

The environmental topics scoped into the EIA are considered those most relevant to the nature, scale and operational characteristics of the Proposed Development. In particular, the operation of the data centre has the potential to give rise to environmental effects relating to air quality, noise and vibration, water resources, climate change, and waste, and these topics have therefore been assessed in detail within the EIA.

Other environmental topics have been subject to preliminary assessment through supporting technical studies and have been scoped out of the EIA on the basis that they are not anticipated to give rise to likely significant environmental effects.

- Ground Conditions and Contamination: The Phase 1 Site Investigation Report identified a very low to low risk of contamination, with no significant effects anticipated as a result of the Proposed Development.
- Ecology and Biodiversity: A Preliminary Ecological Appraisal and supporting protected species surveys have been undertaken to inform the design of the Proposed Development. The assessment confirms that the required Biodiversity Net Gain (BNG) targets can be achieved, and no likely significant ecological effects are anticipated.
- Transport and Access: The Proposed Development is anticipated to result in an overall reduction in traffic movements compared to the existing site use. Accordingly, no likely significant transport-related environmental are anticipated.

2.4. Environmental Impact Assessment Methodology

The EIA has been undertaken alongside the development of the design. The assessment process has involved establishing baseline conditions, identifying environmental constraints and opportunities, predicting and evaluating likely environmental effects, developing mitigation measures where required and assessing the residual effects following mitigation.

The assessments presented within this ES consider the demolition and construction of the Proposed Development and its subsequent operation. The

indicative demolition and construction programme used to inform the assessments is presented within the Development Description section.

Each technical chapter sets out the assessment methodology, study area, baseline conditions, relevant receptors, potential effects, mitigation measures and residual effects applicable to that topic.

2.5. Baseline Conditions

Baseline conditions have been established through a combination of desk based review, consultation, site surveys, technical investigations and publicly available datasets.

The baseline represents the environmental conditions against which the effects of the Proposed Development have been assessed. In accordance with Schedule 4 of the 2017 EIA Regulations, where sufficient information is available, the assessments also consider how the baseline could reasonably be expected to change in the future in the absence of the Proposed Development.

The baseline year, study area and information sources applicable to each environmental topic are identified within the corresponding technical chapter.

2.6. Identification of Effects

The environmental impacts of the Proposed Development, predicted from the demolition, construction and operational phases of the Proposed Development, will be assessed against the baseline conditions presented.

Decommissioning effects have been scoped out of the assessment as they are not considered likely to give rise to significant environmental effects beyond those already assessed for the construction phase. Decommissioning is anticipated to occur at the end of the operational life (typically around 25 years); however, the specific methods, programme and technologies cannot be defined with sufficient certainty at this stage. The operational lifespan has been assumed to be 60 years within some technical assessments (greenhouse gas, embodied carbon and operational energy) in accordance with RICs guidance and allows for a conservative assessment. However, the lifespan for this facility is more likely to be around 25 years. Any future decommissioning works would be comparable in nature to construction and demolition activities and would be subject to relevant legislation, best practice and standard mitigation measures in place at that time. On this basis, and in accordance with a proportionate approach to EIA, a detailed assessment of decommissioning is not considered necessary.

The characterisation of impacts will vary between technical chapters, according to respective best practice guidance. However, the following, where applicable, should be adhered to:

- Impacts should be quantified where possible, in terms that are readily understandable;
- Characteristics of an impact should be described, identifying the extent, magnitude, duration, frequency, reversibility, nature (direct or indirect), and probability of an impact;
- Changes over time should be considered, *i.e.*, where characteristics may change as a project develops/matures;
- Justification should be provided where judgements or estimates are made;
- Predictions should include a reasonable 'worst-case' approach;
- Qualitative terms referring to quantitative scales should be defined, *e.g.*, long-term/short-term, high/medium/low magnitude;
- Consideration should be given to the implications of reasonably foreseeable accidents or non-routine operations; and,
- Consideration of potential indirect effects.

2.7. Determining Significance

The evaluation of significance is often subjective, with best practice guidelines provided by ISEP identifying that *'there is often not a single, definitive, correct answer as to whether an impact is significant or not. Significance is influenced by the values of the individual, how the changes to the environment affect them and whether they have a stake in the project or not'*.

As a result, significance of environmental impacts will be determined through the application of professional judgement and relevant topic specific guidance where it is available. As a general rule, the nature of effects on sensitive receptors will be determined using the following:

- Extent;
- Magnitude;
- Duration;
- Frequency;
- Reversibility; and,
- Nature (direct or indirect).

However, it is important to provide consistency across each of the EIA chapters to ensure the impact assessment in one technical discipline is proportionate to that assessed within another. As a result, a general approach to assigning the level of sensitivity (Table 2-2), magnitude (Table 2-3) and significance (Table 2-4) is provided, which will be considered and referred to in each of the individual assessments or, where an alternative approach is recommended, terminology will be kept consistent with that identified. This adopts the same method outlined in ISEP's best practice guidance.

Table 2-2 Sensitivity Criteria

Sensitivity	Description
Very High	Receptors of high environmental value or rarity, that have little or no capacity for change without fundamentally altering its nature or character, or are of international value.
High	Receptors of high environmental value or rarity, that have a low capacity for change without fundamentally altering its nature or character, or are of national value.
Medium	Receptors of environmental value or rarity, that have a moderate capacity for change without fundamentally altering its nature or character, or are of County importance.
Low	Receptors of low environmental value or rarity, that are tolerant of change without fundamental alteration to its nature or character, or are of local or site value.
Negligible	Receptors of little or no environmental value or rarity, that are tolerant of change or resistant to it.

Table 2-3 Magnitude Criteria

Sensitivity	Description
High	Key elements or features of a receptor are lost or extensively altered from the baseline conditions such that there will be a fundamental shift from the baseline post-development.
Medium	One or more key elements or features of a receptor are lost or altered from the baseline conditions such that there will be a material change from the baseline post-development.
Low	Detectable changes to elements or features of a receptor occur from the baseline conditions but there is no material change from the baseline post-development with conditions remaining similar or with a slight change.
Negligible	Changes to elements or features of a receptor occur from the baseline conditions but are not clearly discernible resulting in no obvious change from the baseline post-development.

Table 2-4 Significance Criteria

	Nature of Receptor: Value, Scale and Sensitivity				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

The level of significance set out in Table 2-4 is defined as:

- Major effect: where the Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- Moderate effect: where the Proposed Scheme is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;
- Minor effect: where the Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and
- Negligible: where the Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

The level of significance will determine whether the implementation of mitigation measures, designed to eliminate significant effects or reduce their significant, are required with the focus given to major and moderate effects. The mitigation of effects will be achieved through design modification, implementation of specific working practices or proposing alternative methods or features for inclusion. Where proposed, the effectiveness will be considered and the residual effect if the measure was to be included determined.

2.8. Mitigation and Residual Effects

In accordance with the 2017 EIA Regulations, the ES identifies the measures proposed to avoid, prevent, reduce or, where possible, offset significant adverse environmental effects.

Measures incorporated into the design of the Proposed Development to avoid or reduce environmental effects are treated as embedded mitigation. These measures form part of the Proposed Development and have been taken into account when assessing likely effects.

Standard environmental controls and good-practice measures are also identified where relevant. These may include measures secured through planning conditions, a Construction Environmental Management Plan or other management plans and strategies.

Where the initial assessment identifies an adverse effect requiring further mitigation, additional measures are proposed. The likely effect remaining

following the implementation of all identified mitigation is referred to as the residual effect.

Each technical chapter identifies the mitigation relied upon and the mechanism through which it would be secured.

2.9. Consultation

A public consultation event was held on 7th July 2026 to inform the local community and key stakeholders about the Proposed Development and to invite questions and feedback.

Following the event, the questions and answers section of the project website was updated to respond to matters raised during the consultation. The project website has remained available as an open channel through which residents and other stakeholders can submit further questions and feedback to the project team. Information regarding the development proposals on the Application Site will continue be communicated to residents in the local area, along with elected representatives and community groups to keep people up-to-date with the intentions of the Proposed Development.

2.10. Cumulative Effects

Schedule 4 of the 2017 EIA Regulations requires the ES to consider the cumulation of effects with other existing and/or approved projects. The approach to the assessment has also been informed by European Commission guidance⁵ on indirect and cumulative effects and impact interactions.

The EIA considers the potential for cumulative effects arising from:

- Intra-project effects, comprising interactions between different environmental effects of the Proposed Development; and
- Inter-project effects, comprising the combined effects of the Proposed Development and other existing or reasonably foreseeable developments.

Intra-project effects may arise where a receptor is affected by more than one environmental effect from the Proposed Development. These interactions are considered within the relevant technical chapters and summarised in the cumulative effects section of the ES.

Inter-project effects may arise where the effects of the Proposed Development combine with those associated with other developments. The identification of other developments has considered:

- Developments under construction;
- Developments with planning permission that have not yet been completed;
- Applications awaiting determination; and

⁵ European Commission (1999), Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, Office for Official Publications of the European Communities, Luxembourg.

- Other reasonably foreseeable developments identified within adopted or emerging development plans, where sufficient information is available.

Existing developments that were complete and operational at the time the environmental baseline was established are generally treated as part of the baseline rather than assessed separately as cumulative developments.

An initial 5 km search area has been used to identify developments with the potential to interact with the Proposed Development. Where appropriate, individual technical assessments apply an alternative study area reflecting the nature and geographical extent of the effects under consideration.

The cumulative assessment is based on the information available at the agreed assessment cut-off date. The developments included within the assessment are shown on Figure 2-1 in Appendix 2-1 and listed in Table 2-5.

2.11. Cumulative Developments

A review has been undertaken of committed and reasonably foreseeable developments within the initial 5 km search area. The developments identified as having the potential to interact with the Proposed Development are presented in Table 2-5.

Table 2-5 Cumulative Developments Considered in the Environmental Statement

Planning Reference	Location	Status	Description
261324 PP/14897089	Veolia Depot Redevelopment, Old Forest Road, Wokingham	Awaiting Decision	Full application for the proposed demolition of existing structures and buildings, retention and recladding of the existing warehouse, reconfiguration of existing Depot to provide parking, external storage, fuel pump, washdown facilities and hot box, including erection of salt-barn, along with fencing, vehicle barrier, landscaping, access and associated works.
241855	400 Regus House, Thames Valley Park Drive, Wokingham, Earley, RG6 1PT	Prior Approval	Prior approval submission for change of use of the ground, 1st, 2nd and 3rd floors to 62no residential dwellings (use Class C3).
PL/19/2032	Station Hill North Reading RG1 1NB	Permitted; In Construction	Hybrid application comprising (i) application for Full Planning Permission for Phase 2 (Plot G and public realm) including demolition of existing structures, erection of an eighteen storey building containing office use and flexible retail,

Planning Reference	Location	Status	Description
			non-residential institution and assembly and leisure uses, Provision of podium deck, vehicular access and parking. New public open space and landscaping. Bridge link over Garrard St and; (ii) Application for Outline Planning Permission for Phase 3 (all Matters reserved) for four building Plots (A, B, C and D). Demolition of existing buildings and structures. Mixed-use redevelopment
PL/25/0616	Sovereign House, 57-59 Vastern Road, Reading	Approved - decision date 26/1/2026	Change of use from E(g)(i) offices to F1(g) Law Courts, including internal alterations, additional external lift, additional sub-station and landscaping works.
241900	Land South of Old Bath Road Sonning, RG4 6GQ	Approved - decision date 3/10/2025	Application to vary condition 2 of planning consent 220663 (as amended by permission 241899) for the proposed erection of 57 dwellings following demolition of the existing dwellings (Access, Layout, Scale and appearance to be considered).
251387	Sonning Golf Club Duffield Road, Woodley Wokingham, RG4 6GJ	Approved - decision date 5/11/2025	Application to vary condition 5,8,11,13 & 14 of planning consent 161529 for the proposed erection of 13 dwellings with associated highway works, public open space and landscaping.(Approval sought for Access).

3. Application Site and Surroundings

This chapter provides a description of the Site, referred to as Thames Valley Park Data Centre, as it currently stands and the wider context of the townscape in which it is located. The information presented within this chapter has been used in the identification of the baseline environment and determination of the potential area of influence of environmental effects associated with the Proposed Development.

The location of the Site is in Figure 3-1, included in Appendix 3-1 of Volume 3.

3.1. The Site

The Site is located within Thames Valley Park, within the administrative area of WBC. It extends to approximately 5.4 hectares and comprises previously developed land within an established business park.

The Site currently comprises three office buildings, formerly occupied by Microsoft, together with associated car parking, internal circulation routes, hardstanding, landscaping and ancillary infrastructure. Two of the buildings have been vacated and the remaining building is not fully occupied. Microsoft retains a lease on the remaining building but has confirmed that it intends to vacate the Site upon expiry of the lease in December 2027.

Vehicular access is currently provided from the internal Thames Valley Park highway network to the north of the Site.

Existing lighting principally comprises street lighting, façade-mounted lighting, lighting associated with the parking areas and bollard lighting along pedestrian routes. Areas of landscaping and open space within and around the Site are generally subject to lower levels of illumination.

The existing buildings, areas of hardstanding and associated infrastructure would be demolished to facilitate the Proposed Development.

3.2. Surrounding Area

The wider Thames Valley Park is characterised predominantly by office and commercial buildings with associated internal roads, car parking, landscaping and infrastructure.

To the north of the Site are further commercial premises, Thames Valley Park Nature Reserve and the River Thames corridor. Beyond the River Thames are further water bodies, including the Redgrave Pinsent Rowing Lake and Caversham Lake. These areas provide ecological, recreational, hydrological and landscape features within the wider area.

To the east, the surrounding area becomes more open and includes Sonning Meadows and agricultural land. These areas provide a transition between the developed business park and the wider countryside.

Immediately to the south of the Site is the railway corridor used by Elizabeth Line and National Rail services. Beyond the railway are residential properties along and around London Road (A4). The nearest residential receptors are approximately 113 m south of the Site boundary. Reading Substation is also located within the wider area to the south.

3.3. Environmental Context

The Environment Agency's ('EA') Flood Map for Planning identifies that the entire Site is located within Flood Zone 1 and therefore has a low probability of flooding from rivers or the sea (less than 0.1% annual probability). Areas of Flood Zone 2 and Flood Zone 3 are located approximately 100 m north and 250 m north-west of the Site, respectively.

The EA's Risk of Flooding from Surface Water mapping identifies localised areas within the Site at low, medium and high risk of surface water flooding, principally around the existing buildings within the central part of the Site. Flood risk, surface water drainage and the underlying water environment are considered further within the Water Resources assessment.

No statutory or non-statutory ecological designations are located within the Site. The ecological desk study identified a number of designated sites and habitats within the wider study area, including Local Nature Reserves, Sites of Special Scientific Interest, Local Wildlife Sites, ancient woodland and priority habitats. Ecological value within and around the Site is principally associated with the perimeter woodland, mature trees, hedgerows and other landscaped habitats, together with the River Thames corridor and Thames Valley Park Nature Reserve.

The Site is not located within a Conservation Area and there are no listed buildings within the Site. The closest identified listed buildings include:

- The Grade II listed London Road Bridge, located approximately 600 m east of the Site; and
- The Grade II listed barns at Holme Park Farm, located approximately 700 m north-east of the Site.

The closest Conservation Area is Sonning Conservation Area, located approximately 1.5 km north-east of the Site.

The Site is not located within or in proximity to an Air Quality Management Area ('AQMA').

The environmental receptors identified through the EIA process include nearby residential properties, existing commercial occupiers, ecological habitats, surface water and groundwater resources, users of local transport infrastructure and waste and utility infrastructure. Further detail on topic-specific baseline conditions, study areas and receptors is provided within the relevant technical chapters.

4. **Development Description**

The planning application seeks outline planning permission, with all matters reserved except access, for the following:

Outline planning application (all matters reserved except for Access) for demolition of existing buildings and the construction of a data centre (Use Class B8), fuel cells for energy generation, ancillary office space and associated plant, drainage, backup power generation, sub-station, car parking, landscaping, engineering works and formation of and alterations to access roads.

This section provides further detail on the need for the Proposed Development, its principal components and the anticipated programme for its delivery.

The plans and drawings defining the Proposed Development are included in Appendix 4-1.

4.1. **Need for Development**

The Site is located within Thames Valley Park, which is identified by WBC as a Core Employment Area in the emerging Wokingham Local Plan⁶. The Local Plan recognises the importance of such areas in supporting the borough's economic growth and future employment needs.

4.1.1. **Strategic Need for Additional Digital Infrastructure**

The UK Government has identified digital infrastructure as a fundamental driver of economic growth and national resilience, recently designating data centres as Critical National Infrastructure (CNI)⁷. This designation recognises the essential role data centres play in supporting the operation of modern society, placing them alongside other nationally important infrastructure sectors such as energy, water and transport.

Data centres provide the secure facilities required to house the servers, storage systems and networking equipment that underpin digital services relied upon by businesses, public services and individuals. They support a wide range of activities including cloud computing, online banking, healthcare systems, telecommunications, streaming services and emerging technologies such as artificial intelligence. As demand for these services continues to grow, there is a corresponding need for additional data centre capacity to ensure the UK's digital infrastructure remains resilient, secure and capable of supporting future economic development.

⁶ Wokingham Borough Council (2024). *Wokingham Borough Local Plan Update: Proposed Submission Plan (Regulation 19)* and accompanying *Employment Topic Paper*, September 2024

⁷ UK Parliament (2024), *Designation of UK Data Infrastructure as Critical National Infrastructure*, Written Statement HCWS89, 12 September 2024

The Proposed Development would contribute to meeting this growing demand by increasing the availability of strategically located digital infrastructure within the Thames Valley, one of the UK's most established technology clusters outside London. The proposal would strengthen the area's nationally significant digital ecosystem and support businesses already operating within the region, helping to maintain the Thames Valley's competitiveness as a centre for innovation and technology-led growth.

4.1.2. Economic Benefits

The Proposed Development would deliver substantial economic benefits at both the local and regional level. Construction of the facility is expected to support up to 245 jobs, while operation of the completed data centre would create an estimated 40–65 on site (gross, direct) jobs are expected to be created to maintain and operate the data centre. The full breakdown on employment is provided within the Economics Benefit Statement.

In addition, the development would represent an investment of more than £200 million during the construction phase, generating significant economic activity and supporting local supply chains. Once operational, the development would also generate business rates revenue that could contribute towards the funding of local services and infrastructure.

The proposal would further strengthen Wokingham's attractiveness as a business location, supporting sectors including technology, telecommunications, life sciences and healthcare. The presence of major international businesses within the area demonstrates the wider appeal of the Thames Valley Park as a location for investment, and the provision of additional digital infrastructure would help reinforce this position.

4.1.3. Justification of Change of Use

The proposed change of use is further justified by the prevailing conditions within the local office market, which indicate ongoing challenges for out-of-town business park accommodation.

Two of the three existing office buildings have already been vacated, while the remaining building is not fully occupied. Microsoft has confirmed that it does not intend to remain on the campus and will vacate the Site entirely upon expiry of its lease in December 2027. This existing and anticipated vacancy supports the need to consider an alternative use that can secure the long-term and effective use of the Site.

Available market evidence suggests elevated vacancy rates, negative net absorption and extended letting periods across the Reading fringe office market, reflecting reduced occupier demand, rising refurbishment and construction costs,

and limited rental growth prospects. In this context, the long-term re-occupation, refurbishment or redevelopment of large office buildings within established multi-ownership business parks has become increasingly challenging. These market constraints reduce the likelihood of the Site returning to a viable office use in the foreseeable future and support consideration of alternative uses that can deliver sustained economic activity, investment and more effective utilisation of the Site in accordance with wider planning and regeneration objectives.

4.2. Overview of Proposed Development

The Proposed Development comprises the redevelopment of the Site to provide a data centre and associated infrastructure.

The application is submitted in outline, with all matters reserved except access. Outline planning permission is sought by reference to Parameter Plans. These establish the parameters within which the detailed design may subsequently come forward. Future reserved matters applications would be required to comply with the approved Parameter Plans.

The principal components of the Proposed Development comprise:

- Data centre halls behind the office frontage comprising approximately 37,000m² of floorspace, excluding fuel cells and generators;
- A substation and compound
- An administrative/office at the front;
- Electrical equipment and generators;
- Double-stacked fuel cells at the east and west of the main building;
- Two access points to the Thames Valley Park estate road – one main access point at the north-west corner, and one emergency access point further east;
- Internal access roads circulating the main buildings, and maintenance access road;
- Removal of the traffic island along Microsoft Campus Drive;
- A security lodge at the main site entrance;
- A car parking area, positioned at the front of the office/admin building; and
- Landscaping and engineering works

The Design and Access Statement ('DAS') establishes the principal design approach for the Proposed Development.

An illustrative scheme also accompanies the outline planning application. It represents one way, but not the only way, in which the Proposed Development could come forward within the Development Parameters. The illustrative scheme does not form the principal basis of the environmental assessments.

The current illustrative scheme comprises:

- Data centre halls positioned behind the office frontage, providing approximately 37,000 m² of floorspace, excluding the fuel cells and generators;
- An administrative and office element at the front of the development;
- Associated electrical equipment and generators;
- Double-stacked fuel cells to the east and west of the main building;
- A main access from the Thames Valley Park estate road at the north-western corner of the Site;
- A separate emergency access further east;
- Internal access roads around the main buildings and a maintenance access road;
- A security lodge at the main Site entrance;
- Car parking positioned in front of the office and administrative building; and
- Landscaping and associated engineering works.

The Proposed Development is targeting a BREEAM 'Excellent' rating and would deliver a minimum 10% biodiversity net gain.

4.2.1. Energy Generation

The fuel-cell installation forms part of a phased energy solution intended to facilitate initial occupation and operation of the Proposed Development before permanent utility infrastructure is delivered. The Applicant is continuing to engage with utility providers regarding potential 33 kV and 132 kV grid-connection options.

The fuel cells are intended to provide the principal energy source until approximately 2037 or earlier should lower-carbon grid electricity become available where national infrastructure allows. Following implementation of a permanent grid connection, the operational strategy will be reviewed. The future role, retention, replacement or decommissioning of the fuel cells will be confirmed through the application process.

Backup generators will also be provided as part of the Proposed Development.

The assumptions used for the fuel cells and backup generators, including their technology, fuel type, number, capacity and operating profile, will be confirmed within the ES.

4.2.2. Transport and Access

Two vehicular access points are proposed from the Thames Valley Park Drive. The principal access will be located at the north-western corner of the Site, with a separate emergency access provided further east.

The illustrative scheme shows internal roads circulating the main buildings, together with a maintenance access road. It also shows a security lodge at the

principal entrance and car parking positioned in front of the office and administrative building. The proposals also include the removal of the traffic island along Microsoft Campus Drive.

4.2.3. Risk of Accidents and Disasters

The assessment of major accidents and disasters has been informed by the ISEP guidance *Major Accidents and Disasters in EIA: A Primer*⁸.

Major accidents and disasters are considered as a cross-cutting matter within the relevant technical chapters. The assessment considers both the potential for the Proposed Development to cause a major accident and its vulnerability to relevant natural or human-induced hazards.

The scenarios considered include, where relevant:

- A major accident during demolition or construction resulting in serious effects on people or the environment;
- Fire or explosion associated with the data centre, fuel cells, backup generators, substation or associated infrastructure;
- Loss of containment of fuel, oil or other potentially hazardous substances, resulting in pollution of land or the water environment;
- Flooding and extreme weather events; and
- Incidents associated with the adjacent railway or other relevant external hazards.

Relevant embedded measures include appropriate safety, containment and emergency-shutdown features within the energy infrastructure, preparation of a Fire Strategy and implementation of appropriate construction and operational emergency-response procedures.

Only measures confirmed as forming part of the Proposed Development or capable of being secured through an appropriate planning or regulatory mechanism have been relied upon as mitigation within the EIA.

4.2.4. Consideration of Alternatives

The Proposed Development was identified following consideration of a range of site-specific opportunities and constraints, together with relevant technical, environmental and planning factors. The Site was considered capable of accommodating the Proposed Development while enabling potential effects to be appropriately managed through the design process. As such, the Application Site was identified as a suitable and deliverable location for the Proposed Development.

⁸ Institute of Environmental Management and Assessment (2020), *Major Accidents and Disasters in EIA: A Primer*.

4.3. Programme

The Proposed Development would require the demolition of the existing buildings and structures, followed by construction and fit-out of the data centre and associated infrastructure.

A detailed indicative programme dated 7th August 2026 is included in Appendix 4-2. The programme remains preliminary and may be refined as the design, procurement and utility-connection arrangements progress.

An overview of the principal programme milestones relevant to the EIA is provided in Table 4-1.

Table 4-1. Indicative Development Programme

Activity	Indicative Start	Indicative Completion
Submission of outline planning application	September 2026	September 2026
Outline planning application determination	September 2026	March 2027
Design development	September 2026	December 2027
Demolition mobilisation	April 2027	April 2027
Demolition works	April 2027	October 2027
Main works mobilisation	February 2028	February 2028
Main works construction	February 2028	August 2031
Construction of the principal building shell	February 2028	February 2029
Phase 1 mechanical and electrical fit-out, providing approximately 32 MW	January 2029	March 2030
Fuel cells ready for service	—	March 2029
Long-lead electrical equipment	July 2035	July 2037
Completion of the 33 kV and 132 kV grid connections	—	January 2037
Phase 2 mechanical and electrical fit-out, providing approximately 40 MW	July 2037	April 2039

5. **Planning Policy**

This Section of the ES introduces the various planning documents that are relevant at a national, regional and local geographic scales, with each planning guidance establishing strategic and spatial policies against which the acceptability of the Proposed Development will be assessed by the Local Planning Authority (LPA).

Specific environmental policies, where relevant and applicable to the assessment, are addressed separately in each of the technical assessment chapters and their accompanying appendices, identifying the policy requirements and how these have been addressed in the EIA.

In addition to adopted plans, any emerging policies within draft plans, that are in consultation or subject to local examination, or guidance documents, such as Supplementary Planning Documents (SPDs), have been given due consideration as these comprise material considerations in the planning process.

A range of legal statutes and European Directives are relevant to the assessment and Proposed Development, most of which constrain activities or actions that can be undertaken on the Site or influence the design. Each technical assessment chapter identifies the relevant legal context of the Proposed Development for that environmental aspect and makes recommendations to ensure the requirements of the statutes are complied with. The legislative context of the EIA process is discussed in Section 2.2 of the ES.

5.1. **National Policy and Guidance**

The National Planning Policy Framework ('NPPF')⁹, published in August 2026, sets out the Government's planning policies for England and is a material consideration in the determination of planning applications.

The NPPF establishes economic, social and environmental objectives for achieving sustainable development and requires these objectives to be pursued in mutually supportive ways. It also establishes a presumption in favour of sustainable development.

Of relevance to the Proposed Development, the NPPF:

- Establishes a presumption in favour of sustainable development under Policy S3;
- Requires planning policies to recognise the specific locational and infrastructure requirements of data centres, associated generating capacity and electricity network infrastructure under Policy E1;

⁹ Ministry of Housing, Communities and Local Government (2026), National Planning Policy Framework, published 17 August 2026.

- States that substantial weight should be given to the economic benefits of commercial development that enables businesses to invest, expand or adapt under Policy E2;
- Recognises that the availability of electricity, water and wastewater infrastructure can make particular locations important for data centres and other large-scale users of power under Policy E2;
- Supports the effective reuse of previously developed and underutilised business land under Policies L1 and L2;
- Requires development to mitigate and adapt to climate change under Policies CC2 and CC3;
- Supports renewable and low-carbon energy and associated electricity network infrastructure under Policies W2 and W3; and
- Requires matters including design, transport, pollution, flood risk, biodiversity, landscape, heritage and public safety to be appropriately considered through the planning process.

These matters are considered, where relevant, within the technical assessments presented in this ES.

National planning policy relating specifically to waste is provided by the National Planning Policy for Waste ('NPPW')¹⁰, published in October 2014. The NPPW should be read alongside the NPPF and sets out the Government's detailed waste planning policies. Paragraph 8 addresses the determination of planning applications for non-waste development, including the need to ensure that new development makes appropriate provision for waste management and supports the reuse and recovery of materials.

The NPPF and NPPW are supported by the online PPG, which is updated periodically. The PPG provides further guidance on the implementation of national policy, including in relation to:

- Air quality;
- Climate change;
- Design;
- Environmental impact assessment;
- Flood risk and coastal change;
- The historic environment;
- Land affected by contamination;
- The natural environment;
- Noise;
- Renewable and low-carbon energy;
- Transport; and

¹⁰ Ministry of Housing, Communities and Local Government (2014), National Planning Policy for Waste.

- Waste.

The applicable PPG has informed the technical assessments presented in this ES.

Other national strategies and policy documents of potential relevance to the planning balance include the UK's Modern Industrial Strategy and Digital and Technologies Sector Plan, the AI Opportunities Action Plan, the Clean Power 2030 Action Plan, Powering Up Britain and the Government's designation of data infrastructure as Critical National Infrastructure. These documents are considered in further detail in the Planning Statement where relevant.

5.2. Local Policy

The adopted Development Plan relevant to the Proposed Development comprises:

- The Wokingham Borough Core Strategy, adopted on 29 January 2010;¹¹
- The Managing Development Delivery Local Plan, adopted on 21 February 2014;¹² and
- The Central and Eastern Berkshire Joint Minerals and Waste Plan, adopted by WBC on 19 January 2023¹³.

The Site is located within Thames Valley Park, an established employment area identified as a Core Employment Area in the adopted local planning policy framework.

Adopted policies of relevance to the Proposed Development and its environmental assessment include:

- Core Strategy Policy CP1 – Sustainable Development;
- Core Strategy Policy CP3 – General Principles for Development;
- Core Strategy Policy CP6 – Managing Travel Demand;
- Core Strategy Policy CP7 – Biodiversity;
- Core Strategy Policy CP15 – Employment Development;
- Managing Development Delivery Policy CC03 – Green Infrastructure, Trees and Landscaping;
- Policy CC04 – Sustainable Design and Construction;
- Policy CC05 – Renewable Energy and Decentralised Energy Networks;
- Policy CC06 – Noise;
- Policy CC09 – Development and Flood Risk from All Sources;
- Policy CC10 – Sustainable Drainage;
- Policy TB11 – Core Employment Areas;
- Policy TB20 – Service Arrangements and Deliveries;
- Policy TB21 – Landscape Character;

¹¹ Wokingham Borough Council (2010), Wokingham Borough Core Strategy.

¹² Wokingham Borough Council (2014), Managing Development Delivery Local Plan.

¹³ Central and Eastern Berkshire Authorities (2023), Central and Eastern Berkshire Joint Minerals and Waste Plan.

- Policy TB23 – Biodiversity and Development;
- Policy TB24 – Designated Heritage Assets; and
- Policy TB25 – Archaeology.

Relevant policies of the Central and Eastern Berkshire Joint Minerals and Waste Plan include those concerning the waste hierarchy, sustainable waste management, safeguarding mineral resources and infrastructure, and managing the environmental effects of minerals and waste development.

5.2.1. Emerging Local Plan

The Wokingham Borough Local Plan Update 2023–2040: Proposed Submission Plan was submitted to the Secretary of State for independent examination on 28 February 2025 and remains under examination at the time of preparing this ES¹⁴. Once adopted, the Local Plan Update will replace the Core Strategy and Managing Development Delivery Local Plan.

The emerging Local Plan is a material consideration. The weight afforded to its policies is dependent upon their stage of preparation, the extent of unresolved objections and their consistency with the NPPF.

Emerging policies of potential relevance include those relating to:

- Core Employment Areas;
- Digital infrastructure;
- Non-residential environmental standards;
- Energy-efficient design;
- Renewable and low-carbon energy;
- Circular-economy principles and embodied carbon;
- Transport and accessibility;
- Flood risk and sustainable drainage;
- Biodiversity and green infrastructure;
- Landscape and design;
- Air quality and noise; and
- Contaminated land, odour, fumes and dust.

Relevant adopted and emerging policies are considered in further detail in the Planning Statement. Policies directly informing the assessment of environmental effects are identified within the relevant technical chapters of this ES.

¹⁴ Wokingham Borough Council (2025), Wokingham Borough Local Plan Update 2023–2040: Proposed Submission Plan.

6. Air Quality

6.1. Introduction and Key Issues

This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development on Air Quality.

This Chapter describes the assessment methodology, the baseline conditions at the Application Site and surrounding area, a summary of the likely significant effects, the mitigation measures required to prevent, reduce or offset any significant negative effects, and the likely residual effects after these measures have been employed.

This Chapter (and its associated figures and appendices) should be read together with the introductory Chapters of this ES (Chapters 1-5), as well as Chapter 12: Summary of Residual Effects. This Chapter is accompanied by the following appendices:

- Appendix 6-1: Legislation, Policy and Guidance
- Appendix 6-2: Generator Specification
- Appendix 6-3: Meteorological Data
- Appendix 6-4: Traffic Data
- Appendix 6-5: Modelled Receptors and Background Concentrations
- Appendix 6-6: Model Verification
- Appendix 6-7: Modelled Construction Traffic Results
- Appendix 6-8: Modelled Operational Emissions Results
- Appendix 6-9: Figure Sheet

6.2. Experience

Vanessa Nguyen is an Environmental Consultant at Hilson Moran specialising air quality. She has over 1-year technical experience in delivering air quality assessments and ES Chapters in support of Environmental Impact Assessments. She has an MSc in Energy and Environment, is an associate member of the Institute of Environmental Sciences (IES) and the Institute of Air Quality Management (IAQM).

Sian Grimsley is a Senior Environmental Consultant at Hilson Moran specialising in air quality, greenhouse gas (GHG) and climate change. She has over 5 years of technical experience in delivering ES Chapters in support of Environmental Impact Assessments. She has an MSc in Atmospheric Science, is a full member of the IES and the IAQM.

The reviewer of this Chapter is Tom Reade. Tom Reade is a Studio Director at Hilson Moran. He has over 14 years of technical experience in delivering Air Quality ES Chapters in support of Environmental Impact Assessments. He has an

MSc in Atmospheric Science, is a full member of the IES and the IAQM. He is a Chartered Environmentalist.

6.3. Consultation

Table 6-1 provides an overview of any consultation that has been undertaken to inform the Proposed Development and EIA, including the consideration of likely significant effects and the methodology for assessment. Consultation has been carried out via email correspondence and through a pre-application meeting held on the 21st July.

Table 6-1 Summary of Consultation

Body/ Organisation	Contact	Date and Form of Consultation	Summary
WBC	Tahir Rafiq – Environmental Health Officer	21/05/26 Email consultation	Proposed methodology considered acceptable.
WBC	Tahir Rafiq – Environmental Health Officer	15/06/26 Email consultation	Proposed methodology for detailed fuel cell modelling was shared.
WBC	Andrew Chugg – Team Manager	21/07/26 Pre-App 3 Meeting	Considerations of the air quality assessment were shared with WBC.

6.3.1. Scope of Assessment

The assessment has been proportionately scoped to address environmental topics for which there is potential for likely significant effects, while demonstrating that other topics can be scoped out where appropriate. A summary is provided in Table 6-2 below.

Table 6-2 Air Quality Assessment Scope

Potential Effect	Scoped in/out	Justification
Construction Dust Emissions	In	Requirement for EIA Potential effect for nearby sensitive receptors
Construction traffic emissions	In	Requirement for EIA Potential effect for nearby sensitive receptors

Potential Effect	Scoped in/out	Justification
Operational traffic emissions	Out	Confirmed by the transport consultant there will be a reduction in operational trips compared to existing use (- 1802 AADT)
Operational building emissions (fuel cells)	In	Emissions released from the natural-gas fuel cells have the potential to impact nearby sensitive receptors (existing and proposed).
Operational building emissions (combustion plant)	In	Emissions released from the proposed back-up generators have the potential to impact nearby sensitive receptors (existing and proposed).

6.3.1.1. Effects Not Considered to be Significant

The following effects were not considered significant and are not considered further in this Chapter:

- Operational traffic emissions.

6.3.1.2. Effects Considered Likely to be Significant

Table 6-3 outlines the effects were considered likely to be significant and have been assessed and reported within this Chapter:

Table 6-3 *Effects considered likely to be Significant*

Likely Significant Effect	Receptors	Applicable Stage
Construction Dust Emissions	Existing	Construction
Construction Traffic Emissions	Existing	Construction
Operational building emissions (fuel cells)	Existing and Proposed	Operational
Operational building emissions (combustion plant)	Existing and Proposed	Operational

6.4. Legislation, Planning Policy & Guidance

The following legislation have informed the assessment reported within this Chapter and is detailed further in Appendix 6-1.

6.4.1. Legislation

A summary of the relevant air quality legislation is provided below.

- Air Quality Strategy for England, Scotland, Wales and Northern Ireland.¹⁵

¹⁵ Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007).

- The Air Quality (England) Regulations 2000 – Statutory Instrument No. 928.¹⁶
- The Air Quality (England) (Amendment) Regulations 2002 – Statutory Instrument No. 3043.¹⁷
- The Air Quality Standards (Amendment) Regulations 2016 – Statutory Instrument 2016 No. 1184.¹⁸
- The Environment Act 1995.¹⁹
- The Environment Act 2021.²⁰
- The Environmental Protection Act 1990.²¹
- World Health Organisation (WHO) Air Quality Guidelines.²²

6.4.2. Planning Policy

A summary of the relevant planning policy is provided below.

6.4.2.1. National

- National Planning Policy Framework (NPPF).²³
 - With regards to air quality, see Policy N1, DM3, CC2, P1, P3 and TR3.
- Defra Clean Air Strategy 2019.²⁴
- Reducing Emissions from Road Transport: Road to Zero Strategy.²⁵
- National Air Quality Plan.²⁶
- Defra Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations.²⁷

6.4.2.2. Local

- Wokingham Borough Core Strategy.²⁸
 - With regards to air quality, see Policy CP1 – Sustainable Development.
- Local Plan Update.²⁹
 - With regards to air quality, see Policy HC6: Air pollution and air quality.

¹⁶ The Air Quality (England) Regulations 2000 – Statutory Instrument No. 928.

¹⁷ The Air Quality (England) (Amendment) Regulations 2002 – Statutory Instrument No. 3043.

¹⁸ The Air Quality Standards (Amendment) Regulations 2016 – Statutory Instrument 2016 No. 1184.

¹⁹ The Environment Act 1995.

²⁰ The Environment Act 2021.

²¹ The Environmental Protection Act 1990.

²² World Health Organisation. WHO Global Air Quality Guidelines. 2021.

²³ Ministry of House Communities and Local Government (August 2026). National Planning Policy Framework.

²⁴ Defra (2019) Clean Air Strategy 2019, Defra.

²⁵ DfT (2018) The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy.

²⁶ Defra (2017) Air quality plan for nitrogen dioxide (NO₂) in the UK.

²⁷ Defra Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations.

²⁸ Wokingham Borough Council. Wokingham Borough Adopted Core Strategy Development Plan Document. (January 2010).

²⁹ Wokingham Borough Council. Wokingham Borough Local Plan Update 2023 – 2040: Proposed Submission Plan.

6.4.3. Guidance

A summary of the relevant technical guidance is provided below.

- National Planning Practice Guidance.³⁰
- Local Air Quality Management Review and Assessment Technical Guidance.³¹
- Land-Use Planning and Development Control: Planning for Air Quality.³²
- Guidance on the Assessment of Dust from Demolition and Construction.³³

6.5. Assessment Methodology

The scope of the assessment has been determined in the following way:

- Consultation with the Environmental Health Officer (EHO) at WBC to agree the scope of the assessment and the methodology to be applied;
- Review of the air quality data for the area surrounding the Application Site, including from WBC and Defra;
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality, and a review of the masterplan for the Proposed Development to establish the location of new sensitive receptors; and,
- Review of the traffic data provided by the project transport consultants (SK Transport).

The scope of the assessment includes considerations of the potential impacts on local air quality resulting from:

- Dust and particulate matter generated by on-site activities during the construction phase;
- Increases in pollutant concentrations as a result of exhaust emissions arising from construction traffic; and,
- Increases in pollutant concentrations as a result of exhaust emissions arising from the proposed fuel cells and back up emergency diesel generators.

6.5.1. Construction Dust Assessment

Assessment of the risk of impact associated with the generation of dust during the construction phase of the Proposed Development and determination of subsequent mitigation measures necessary has been undertaken following IAQM guidelines.

The assessment is based on a series of steps: screening the requirement for a detailed assessment; classification of the likely magnitude of dust emissions; characterisation of the area of influence and establishment of its sensitivity to dust; and establishment of the overall risk of impact. The risk of impact from dust

³⁰ Department for Levelling Up, Housing & Communities and Ministry of Housing Communities & Local Government (December 2024). National Planning Practice Guidance.

³¹ Local Air Quality Management Review & Assessment Technical Guidance (LAQM.TG22) (2022).

³² IAQM. Land-Use Planning and Development Control: Planning for Air Quality (v1.2) (2017).

³³ IAQM. Guidance on the Assessment of Dust from Demolition and Construction (v2.2) (2024).

emissions from the Proposed Development considers effects on human health, nuisance as a result of dust soiling and ecological receptors from four main activities: demolition; earthworks; construction; and track out. The potential for dust emissions from each activity should be considered, unless any of them are not relevant to the Proposed Development.

The guidelines identify appropriate screening criteria for the identification of potential receptors, based on a conservative approach and in consideration of the exponential decline in both airborne concentrations and the rate of deposition with distance. A detailed assessment of the impact of dust from construction sites will be required where:

- A 'human receptor' is located within 250m of the boundary of the Site or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance; or
- An 'ecological receptor' is located within 50m of the boundary of the Site or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance.

6.5.1.1. Establishing Risk

The magnitude of dust emissions for each activity is classified as small, medium or large depending upon the scale of the works proposed, materials involved and level of activity required. The IAQM guidelines provide examples of how the magnitude of emission can be defined, which are identified in Table 6-4. The Proposed Development is unlikely to satisfy all criteria within the examples, therefore professional judgement and site-specific information are used to identify appropriate emission magnitude.

Table 6-4 Dust Emissions Magnitude (Source: IAQM Guidance v2.2, updated January 2024)

Activity	Small	Medium	Large
Demolition	Total building volume < 12,000m ³ Construction material with low potential for dust release (e.g. metal cladding or timber) Demolition activities < 6m above ground level Demolition during wetter months	Total building volume 12,000 – 75,000m ³ Potentially dusty construction material Demolition activities 6-12m above ground level	Total building volume > 75,000m ³ Potentially dusty construction material (e.g. concrete) On-site crushing and screening Demolition activities > 12m above ground level
Earthworks	Total site area < 18,000m ² Soil type with large	Total site area 18,500 – 110,000 m ²	Total site area >110,000m ² Potentially dusty

Activity	Small	Medium	Large
	grain size (e.g. sand) < 5 heavy earth moving vehicles at any one time Formation of bunds <4m in height	Moderately dusty soil type (e.g. silt) 5-10 heavy earth moving vehicles active at any one time Formation of bunds 3-6m in height	soil type (e.g. clay) >10 heavy earth moving vehicles at any one time Formation of bunds >6m in height
Construction	Total building volume < 12,000m ³ Construction material with low potential for dust (e.g. metal cladding or timber)	Total building volume 12,000 – 75,000m ³ Potentially dusty construction material (e.g. concrete) On-site concrete batching	Total building volume > 75,000m ³ On-site concrete batching, sandblasting.
Trackout	< 20 HDV (>3.5t) outward movements* in any one day [#] Surface material with low potential for dust release Unpaved road length < 50m	20 – 50 HDV (>3.5t) outward movements* in any one day [#] Moderately dusty surface material (e.g. high clay content) Unpaved road length 50 – 100m	>50 HDV (>3.5t) outward movements* in any one day [#] Potentially dusty surface material (e.g. high clay content) Unpaved road length >100m
* A vehicle movement is a one-way journey, i.e. from A to B, and excludes the return journey. [#]HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.			

6.5.1.2. Identification of Receptors

Consideration is given to the likely sensitivity of the area to the impacts of dust, establishing a sensitivity of low, medium or high for dust soiling, human health and ecological receptors. The sensitivity of the area considers a number of factors, including the specific sensitivities of receptors in the area, the proximity and number of those receptors, local baseline conditions such as background conditions and site-specific factors.

The first step in identifying the sensitivity of the area is to establish the sensitivity of the receptor, based on the presence or level of activity associated with the area influenced by the Proposed Development. Professional judgement and site-specific information are used to assign an appropriate level of receptor sensitivity

using the principles outlined in Table 6-5. Following this, the sensitivity of the area can be established from Tables 6-6 to 6-8 based on the sensitivity of the receptor, number of receptors (in the case of human health and dust soiling) and the distance from source.

Table 6-5 Receptor Sensitivity Definitions (Source: IAQM Guidance, v2.2 updated January 2024)

Activity	Low	Medium	High
Dust Soiling	Enjoyment of amenity would not reasonably be expected; There is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; Transient exposure, where people or property is only expected to be present for limited periods of time as part of the normal pattern of use; Indicative examples including playing fields, farmland, footpaths, short-term car parks and roads.	Users would expect to enjoy a reasonable level of amenity, but not reasonably at same level as in their home; The appearance, aesthetics or value of property could be diminished by soiling; Indicative examples include parks and places of work.	Users can reasonably expect enjoyment of a high level of amenity; The appearance, aesthetics or value of property would be diminished by soiling, and continuous or regularly extended periods of presence expected during normal pattern of land use; Indicative examples include dwellings, museum and other culturally important collections, medium and long-term car parks and car showrooms.
Human Health	Locations where human exposure is transient; Indicative examples include public footpaths, playing fields, parks and shopping streets.	Locations where the people exposed are workers [#] , and exposure is over a time period relevant to the air quality objective for PM ₁₀ [*] ; Indicative examples include office and shop workers, but not those occupationally exposed to dust.	Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM ₁₀ [*] ; Indicative examples include residential properties, hospitals, schools and residential care homes.
Ecological	Locations with a location designation where the features may be affected by dust deposition, e.g.	Locations where there is a particularly important plant species, where its dust sensitivity is	Locations with an international or national designation and the designated features may be

Activity	Low	Medium	High
	Local Nature Reserve.	uncertain or unknown; Locations with a national designation where the features may be affected by dust deposition, e.g. Site of Special Scientific Interest.	affected by dust soiling, e.g. Special Area of Conservation with acid heathland; Location where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain.
*In the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day, following Defra guidance. #Workers are considered to be less sensitive than the general public as a whole because the most sensitive to the effects of air pollution, such as young children, are not normally workers.			

Table 6-6 Sensitivity of the Area to Dust Soiling Effect on People and Property
(Source: IAQM Guidance, v2.2 updated January 2024)

Receptor Sensitivity	Number of Receptors	Distance from Source			
		<20m	<50m	<100m	<250m
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 6-7 Sensitivity of the Area to Human Health Impacts (Source: IAQM Guidance, v2.2 updated January 2024)

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source			
			<20m	<50m	<100m	<250m
High	>32 µg/m ³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28 – 32 µg/m ³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24 - 28 µg/m ³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source			
			<20m	<50m	<100m	<250m
Medium	>32 µg/m ³	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28 – 32 µg/m ³	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24 - 28 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	Low	Low	Low	Low	Low

Table 6-8 Sensitivity of the Area to Ecological Impacts (Source: IAQM Guidance, v2.2 updated January 2024)

Receptor Sensitivity	Distance from Source	
	<20m	<50m
High	High	Medium
Medium	Medium	Low
Low	Low	Low

6.5.1.3. Establishing Significance

The risk of dust related impacts from the Proposed Development is established from the sensitivity of the area and the likely dust emission magnitude. The risk should be established, on the worst-case area sensitivity and in the absence of mitigation, for each of the construction related activities (demolition, earthworks, construction and track out) following the matrix in Table 6-9.

Table 6-9 Risk of Dust Impacts from Each Activity (Source: IAQM Guidance, v2.2 updated January 2024)

Sensitivity of Area	Activity	Dust Emission Magnitude		
		Large	Medium	Small
High	Demolition	High Risk	Medium Risk	Medium Risk
	Earthworks	High Risk	Medium Risk	Low Risk
	Construction	High Risk	Medium Risk	Low Risk
	Trackout	High Risk	Medium Risk	Low Risk
Medium	Demolition	High Risk	Medium Risk	Low Risk
	Earthworks	Medium Risk	Medium Risk	Low Risk
	Construction	Medium Risk	Medium Risk	Low Risk
	Trackout	Medium Risk	Medium Risk	Low Risk
Low	Demolition	Medium Risk	Low Risk	Negligible
	Earthworks	Low Risk	Low Risk	Negligible
	Construction	Low Risk	Low Risk	Negligible
	Trackout	Low Risk	Low Risk	Negligible

The IAQM guidelines identify a range of mitigation measures intended to reduce the emission and effects of dust from construction sites and identify their likely applicability to a development based on the level of impact risk attributed. Consideration is given to these in the development of mitigation measures, with the significance of the residual effect based on professional judgement.

6.5.2. Road Traffic Emissions

Road traffic is the main source of local pollution with respect to NO₂, PM₁₀ and PM_{2.5}.

Following consultation with the Transport Consultant (SK Transport), it is understood that the Proposed Development will result in a reduction in development-generated traffic, with 1,802 fewer vehicle movements per day compared to the existing business park use. Therefore, detailed dispersion modelling of operational traffic has been scoped out, and only construction vehicle movements have been modelled.

A summary of the traffic data provided for the construction traffic modelling is provided in Table 6-10 below and Figure 1 in Appendix 6-9.

Table 6-10 Daily Trip Generation (Annual Average Daily Traffic (AADT) Flows) - Construction

Road Link	Construction-Generated Road Traffic
A3290	321
A4 London Road West	289
A4 London Road East	289
Thames Valley Park Drive	449

To consider the impact on NO₂, PM₁₀ and PM_{2.5} concentrations at specified sensitive receptor locations a detailed assessment has been undertaken using the air dispersion model ADMS-Urban, Version 5.0.1 (release date February 2022). This model uses detailed road traffic information, surface roughness, and local meteorological information to predict the impact on pollutant concentrations at specific receptor locations. A summary of the air quality modelling parameters for road traffic is provided below in Table 6-11.

Table 6-11 ADMS Roads Modelling Parameters – Construction Traffic

Parameter	Local Area	Met. Measurement Site
Latitude (°)	51	51
Surface Roughness (m)	1	1
Monin-Obukhov Length (m)	30	30

The ADMS model uses meteorological data including wind speed and direction to determine how pollution is transported and diluted with distance from the source. For this assessment, meteorological data from 2024 (to align with the most recent ratified air quality monitoring dataset from WBC) for Heathrow has been utilised as this is considered representative of the Site.

6.5.2.1. Model Scenarios

For the model verification and the assessment of traffic generated by demolition/construction and operational activities, three scenarios have been modelled:

- 2024 Baseline (Model Verification);
- 2029 Interim Baseline (Peak Construction Year); and,
- 2029 Interim Baseline + Peak Construction Trips.

A full breakdown of the traffic modelled for each scenario is provided within Appendix 6-4.

Peak construction traffic has been added to the 2029 Interim Baseline for the purposes of the impact assessment. The construction of the Proposed Development is expected to commence in early 2028, with an anticipated completion year of 2030 for Phase 1 of proposals. By adding the peak construction trips to 2029 the worst-case scenario impacts of construction traffic emissions are captured when considering background concentrations.

The receptors modelled within this assessment are identified in Appendix 6-5.

6.5.2.2. Vehicle Emission Factors

Vehicle emission factors for input into ADMS-Urban have been calculated using Defra's Emissions Factors Toolkit (EFT), version 13.1 published in March 2025, available from the Defra website. The EFT allows for the calculation of emission factors arising from road traffic for all years between 2021 and 2050. For the predictions of future year emissions, the toolkit takes into account factors such as anticipated advances in vehicle technology and changes in fleet composition, such that vehicle emissions are assumed to reduce over time.

The EFT calculator has been used to calculate the emissions factors for NO_x, PM₁₀ and PM_{2.5}.

Emission factors for 2024 have been used for the baseline/model verification and 2029 for the construction scenarios.

6.5.2.3. Model Verification

The ADMS-Urban dispersion model has been validated by the software developer and is considered to be fit for purpose; however, local model validation, i.e. in the vicinity of the Proposed Development, has not been undertaken. Therefore, to

validate the model and to determine how well the model is performing at a local level, a comparison of the modelling results with local monitoring data has been undertaken. The verification process aims to minimise model uncertainty and error by adjusted the modelled results by a factor to offer greater confidence in the final results. This is undertaken in accordance with the methodology specified in Chapter 7, Section 4 of LAQM.TG22.

Details of the verification factor calculations have been presented in Appendix 6-6. An adjustment factor of 1.6 was obtained during the verification process, which indicated that the model was under-predicting. This factor was applied to the modelled road-NO_x outputs prior to conversion to annual mean NO₂ concentrations utilising the NO_x to NO₂ calculator (version 9.1, released August 2024) provided by Defra.

6.5.3. Point Source Emissions

As part of the energy strategy for the Proposed Development, the proposals include up to 49.9 MW of gas-powered fuel cells. The fuel cells will operate continuously as the Application Site's primary source of power, with additional electrical capacity secured from the grid.

The utilities consultant (Tyréns Hilson Moran) has confirmed that, following practical completion of Phase 1, the Application Site will be supplied with 49.9 MW of gas-generated power from the fuel cells and 0.9 MW of electricity from the grid. Following completion of Phase 2 in 2037/38, the Site will continue to be supplied with 49.9 MW of power from the fuel cells, together with a 33 kV grid connection (this information is contained with the supporting Utilities Statement, Reference: 38792-HML-XX-XX-RP-U-590001_P02_Uilities Statement Final). This will provide power to both the data centre and the onsite office and administrative facilities. The potential for a larger grid connection to supply the Site with additional electricity is currently being explored. This option would reduce reliance on the fuel cells and decrease the overall emissions associated with the Proposed Development.

The fuel cells will be installed on site in blocks of 10, forming an 'energy server'. The energy servers will be stacked to create four levels of fuel cells on either side of the data centre halls. Emissions from the fuel cells will be released via shared ducts located between the stacked energy servers, with exhaust gases discharged at a height of 16.5m.

Although the operation of the natural gas fuel-cells does not involve combustion, emissions are released because of the high-pressure compression systems inbuilt to the cells. Pollutants released from the fuel-cell exhaust include nitrogen oxides (NO_x), carbon monoxide (CO) and methane (CH₄). For the purpose of this assessment only NO_x's and CO associated with the fuel-cells have been

considered. Emissions CH₄ are not modelled within the ADMS dispersion tool, contributions of CH₄ have been captured in the GHG assessment.

With regards to back-up power to the site, the proposals include 36 diesel-fired generators, which will provide resilience for the entire Application Site (including the data centre and office building) in the event of a power outage, such as a fuel cell fault or disruption to the gas or electricity supply. The generators specification sheets provided by the manufacturer are provided in Appendix 6-2.

The back-up generators will be tested individually for one hour each month. They have been designed with sufficient onsite fuel storage to provide up to 72-hours of continuous back-up power.

Emissions associated with operation of the back-up generators comprises primarily of NO_x and particulate matter (PM). The generators have been designed to allow for the installation of selective catalytic reduction (SCR) units on each generator set, which are expected to significantly reduce NO_x emissions by approximately 85–95%.

To assess the potential impacts of emissions arising from operation of the fuel cells and generators, the ADMS-6 air dispersion model has been used. This model incorporates detailed information on emission sources, local building effects and meteorological conditions to predict pollutant concentrations at user-defined receptor locations.

A summary of the model parameters used in the assessment are detailed in Tables 6-12 and 6-13 below, and Figure 2 in Appendix 6-2.

Table 6-12 ADMS-6 Modelling Parameters – Fuel Cell Emissions

Parameter	Model Inputs
Duct Height (m)	16.5
Duct Area (m ²)	9
Release temperature (°C)	78.6
Release velocity (m/s)	7.34
NO _x emission rate (g/s)	0.0013
CO emission rate (g/s)	0.0665
Operating Schedule: Assumed cells will be running 24/7 365 days a year. Duct Area: Assumed as 9m ² for modelling purposes. The actual duct area will be 4m ² , which is too small to apply area source emissions within the ADMS software. Emission rates, release velocity and temperature: confirmed by the manufacturers at Bloom.	

Table 6-13 ADMS-6 Modelling Parameters – Back-Up Generators

Parameter	Model Inputs (per generator)
Stack Height (m)	23

Parameter	Model Inputs (per generator)
Stack diameter (m)	0.7
Release temperature (°C)	432
Release velocity (m/s)	4.37
NOx emission rate (g/s)	1.5627
PM emission rate (g/s)	0.002
Operating Schedule: 1-hour each month; sufficient fuel storage onsite for 72-hours of continuous power. Emission rates and temperature: provided by generator manufacturer Cummins.	

Meteorological data, such as wind speed and direction, is used by the model to determine pollutant transportation and levels of dilution by the wind. Meteorological data used in the model was obtained from the Met Office observing station at Heathrow 2024, see Appendix 6-3.

6.5.3.1. Modelled Buildings

Both nearby buildings and complex topography can have a significant effect on the dispersion characteristics of the plumes from the stacks being assessed. ADMS 6 has algorithms which attempt to take account of these impacts.

A summary of the building geometries input into the ADMS model are detailed in Table 6-14 and Figure 2 in Appendix 6-2.

Table 6-14 ADMS 6 - Building Geometries

Building ID	Height (m)	Length (m)	Width (m)	Angle
1	22.50	18.79	98.71	60.49
2	30.50	50.37	136.99	60.54
3	16.50	17.54	80.89	150.40
4	16.50	17.90	81.10	150.62
5	22.50	19.74	128.51	60.38
6	17.00	25.93	136.67	60.37

6.5.3.2. Model Scenarios

For the assessment, two scenarios were modelled, as follows:

- Future Baseline (aligns with Proposed Development opening year); and,
- Future Baseline + fuel cells + back-up generator testing (1-hour/month).

The following sensitivity analysis has also been undertaken:

- Future Baseline + maximum generator run time (assumes all generators operating for 72 hours at 100% load).

6.5.4. Selection of Background Concentrations

The background concentrations of those pollutants included within the Air Quality Standard (AQS) and used within the air quality assessment have been mapped at a grid resolution of 1 x 1 km for the whole of the UK and are available on Defra's website.

Estimated background concentrations are available for all years between 2021 and 2040, and the maps assume that background concentrations will reduce (i.e., improve) over time. This assumption is based upon improvements in emissions from various sources. In line with the findings (usually based on monitoring data) of local authorities, measured concentrations have not reduced as expected over time.

For the purposes of the assessment, background concentrations from 2028 (Proposed Development opening year) have been used in the baseline and verification scenario. The background concentrations and relevant receptors used in the assessment are presented in Appendix 6-5.

6.5.5. Reporting of the Environmental Effect and Significance Criteria

6.5.5.1. Significant Road Traffic Emissions

The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account the construction and operational stages. The following sections define the approach adopted within the assessment for the determination of sensitivity, magnitude of impact, the level of effect and significance.

The EPUK and IAQM provide guidance for establishing the significance of air quality impacts arising as a result of the Proposed Development. The magnitude of impact on individual receptors is dependent upon the long-term average pollutant concentrations at the receptor in the assessment year and the percentage change relative to the Air Quality Assessment Level (AQAL), as identified in Table 6-15.

Table 6-15 Impact Descriptors

Long Term Average Concentration at Receptor in Assessment Year	Percentage Change in Concentration to AQAL*			
	1	2 – 5	6 – 10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL	Slight	Moderate	Moderate	Substantial

Long Term Average Concentration at Receptor in Assessment Year	Percentage Change in Concentration to AQAL*			
	1	2 – 5	6 – 10	>10
103 – 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
* Where the % change is <0.5%, the change is described as 'Negligible' regardless of concentration.				

The guidelines do not, however, provide a set method for establishing the significance of impact. Whilst the establishment of the impact magnitude on individual receptors can be identified as negligible, slight, moderate or substantial, the significance of the overall effect is dependent on a number of factors. Therefore, professional judgement will be applied to determine the likely significance of effects, with the following factors considered:

- The existing and future air quality in the absence of the development, notably whether the Air Quality Objectives are likely to be met or the scale of exceedances in the long-term and short-term concentrations;
- The extent of current and future population exposure to the impacts, notably the number of properties and/or people present and the scale of impact (e.g., whether the majority of the local population is subject to substantial or slight magnitude impacts);
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts, such as establishing a worst-case scenario for sensitive receptors.

6.5.5.2. Significant Point Source Contributions

The point source contributions to annual mean NO_x and PM concentrations were predicted, along with the 99.79th percentile of hourly mean concentrations. The predicted NO_x contributions were then converted to NO₂ assuming 70% for long-term emissions and 35% for short-term emissions, as set out in a guidance note published by the Environment Agency.

The Environment Agency's Air Emissions risk assessment guidance sets out the levels at which process contributions (contributions to concentrations from energy centre emissions) can be screened out as being insignificant; Process Contributions ("PC") can be considered insignificant if:

- The long-term PC is <1% of the long-term environmental standard (for NO₂ and PM₁₀ <0.4µg/m³);
- The short-term PC is <10% of the short-term environmental standard (for NO₂ <20µg/m³).

Where the PC exceeds these thresholds and is potentially significant, it is necessary to compare the Predicted Environmental Concentration (“PEC”) against the relevant statutory and guideline air quality standards, by combining the PC with appropriate background data.

AQS Objective Compliance

The total concentrations (i.e. PEC) at each receptor were calculated as follows:

- Long term standards (NO₂; PM): $PEC = PC + \text{Baseline Concentration}$; and,
- Short term standards (NO₂; PM): $PEC_{\text{short term}} = PC_{\text{short term}} + (2 \times \text{Baseline}_{\text{long term}})$.

6.5.5.3. Determining Sensitivity of Receptors

The sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.

Defra provides guidance on locations where the air quality objectives should apply and Table 6-16 and professional judgement have been used to select receptors where likely significant exposure to pollutant concentrations may occur.

Table 6-16 Examples of where the Air Quality Objectives may or may not apply

Averaging Period	Objectives Should Apply	Objectives Should Generally Not Apply
Annual Mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other locations where public exposure is expected to be short term.
24-hour Mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other locations where public exposure is expected to be short term.
1-hour Mean	All locations where the annual mean and 24 -hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the	Kerbside sites where the public would not be expected to have regular access.

Averaging Period	Objectives Should Apply	Objectives Should Generally Not Apply
	public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expected to spend one hour or longer.	
15-minute Mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	-

6.5.5.4. Primary and Tertiary Mitigation

The following measures have been incorporated into the design of the Proposed Development to minimise air quality impacts during operation:

Provision for the installation of selective catalytic reduction (SCR) units and diesel particulate filters (DPF) on the proposed back-up generators to reduce emissions of nitrogen oxides (NOx) and particulates.

Design of the fuel cells and generators to discharge emissions at elevation, positioned away from access areas and other sensitive receptors, to promote effective dispersion of pollutants and minimise potential exposure.

A Framework Travel Plan, included with the Transport Assessment presented as a standalone document with the planning application, will also be implemented to encourage more sustainable modes of transport for residents and visitors to the Proposed Development.

6.5.6. Baseline

Table 6-17 summarises all studies and surveys undertaken to inform the assessment presented within this Chapter.

Table 6-17 Background studies undertaken

Item	Overview	Date of completion
Desk study	A desk study of the available data from WBC and Defra has been undertaken to inform the baseline conditions.	At the time of submission of this ES Chapter.

No further air quality monitoring surveys have been undertaken for this assessment.

6.5.7. Current Baseline

This section summarises the existing baseline air quality conditions at the Proposed Development.

6.5.7.1. Local Air Quality Monitoring

An Air Quality Management Area (AQMA) has been declared by WBC within Wokingham Town Centre for exceedances of annual mean nitrogen dioxide (NO₂). The Application Site lies outside of the influence of this AQMA and is unlikely to experience adverse effects with regards to air quality from operational traffic emissions.

6.5.7.2. Defra Background Concentration

The Defra background concentrations for NO₂, PM₁₀ and PM_{2.5} for the 1x1km grid squares (474500, 174500 and 475500, 174500) in which the Proposed Development is located are presented in Table 6-18 below.

Table 6-18 Defra Background Concentrations

X,Y	Pollutant	2024	2026	2029	2037
474500, 174500	NO ₂	11.6	11.2	10.4	9.3
	PM ₁₀	12.0	11.8	11.6	11.1
	PM _{2.5}	7.5	7.4	7.1	6.7
475500, 174500	NO ₂	10.0	9.5	8.7	7.4
	PM ₁₀	11.8	11.6	11.3	10.8
	PM _{2.5}	7.4	7.2	7.0	6.5
*Bold indicates an exceedance of the relevant AQS objective.					

Defra mapped background concentrations indicate that annual mean levels of NO₂, PM₁₀ and PM_{2.5} in the vicinity of the Site are well below the relevant Air Quality Strategy (AQS) objectives.

6.5.7.3. Local Monitoring Data

Monitoring undertaken in the vicinity of the Application Site, undertaken by WBC and Reading Borough Council (RBC), shows that annual mean NO₂ concentrations at automatic and diffusion tube monitoring locations are compliant with the AQS objective (40 µg/m³) at all monitoring locations (Table 6-19 and Table 6-20).

The hourly mean NO₂ objective is 200µg/m³, not to be exceeded more than 18 times per calendar year. Concentrations at CM2 were measured to exceed 200µg/m³ during 2023 and 2024, however these incidences remain well below the AQS of 18 (Table 6-21).

Table 6-19 WBC and RBC Continuous Monitoring Results – Annual Mean NO₂

Site ID	X, Y	Type	Annual Mean (µg/m ³)				
			2020*	2021*	2022	2023	2024
CM2	481348, 168603	R	22.3	24.2	27.1	30.6	28.0
RD4	473703, 173409	R	18	21	21	19	18
Reading AURN	473441, 173198	UB	15	20	22	13	11
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K = Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.							

Table 6-20 WBC and RBC Diffusion Tube Monitoring Results – Annual Mean NO₂

Site ID	X, Y	Type	Annual Mean (µg/m ³)				
			2020*	2021*	2022	2023	2024
WOK505	474444, 172062	R	31.0	29.2	28.9	27.3	22.6
RD009	474425, 172053	R	27.7	31.5	30.1	28.7	23.3
RD011	472513, 173281	R	27.9	35.2	23.7	31.7	30.8
RD016	472715, 173227	R	18.7	21.4	22.0	20.8	19.4
RD024	474729, 173432	R	-	-	20.0	26.4	25.7
RD025	472953, 171764	K	-	-	-	15.5	15.6
RD034	473233, 173244	K	21.1	24.1	22.6	22.6	20.2
RD043	472592, 173253	R	28.2	30.6	32.1	30.9	27.8
RD044	472706, 172047	R	-	-	-	22.8	22.7

Site ID	X, Y	Type	Annual Mean ($\mu\text{g}/\text{m}^3$)				
			2020*	2021*	2022	2023	2024
RD051	472742, 172024	R	-	-	-	18.1	21.1
RD064	473068, 173204	R	28.5	33.3	31.5	31.3	29.4
RD069	473202, 173157	R	-	-	-	-	26.4
RD070	473595, 173043	R	-	-	-	-	15.4
RD071	474880, 172850	K	-	-	-	-	18.7
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K = Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction related to COVID-19.							

Table 6-21 WBC and RBC Continuous Monitoring Results – 1-Hour Mean NO_2

Site ID	X, Y	Type	Exceedances of the 1 Hour Mean				
			2020*	2021*	2022	2023	2024
CM2	481348, 168603	R	0	0	0	1	6
RD4	473703, 173409	R	0	0	0	0	0
Reading AURN	473441, 173198	UB	0	0	0	0	0
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K = Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19. If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.							

No particulate matter (PM_{10} and $\text{PM}_{2.5}$) monitoring is undertaken by WBC; however, nearby RBC monitoring indicates that annual mean concentrations of both PM_{10} and $\text{PM}_{2.5}$ are well below the relevant AQS objectives ($40 \mu\text{g}/\text{m}^3$ and $20 \mu\text{g}/\text{m}^3$, respectively), as detailed in Table 6-22 and 6-23 below.

No exceedances of the 24-hour mean objective for PM₁₀ were observed at any monitoring locations (50 µg/m³, not to be exceeded more than 35 days per year) (Table 6-24).

Table 6-22 RBC Continuous Monitoring Results – Annual Mean PM₁₀

Site ID	X, Y	Type	Annual Mean (µg/m ³)				
			2020*	2021*	2022	2023	2024
RD4	473703, 173409	R	19	17	18	18	15
Reading AURN	473441, 173198	UB	15	15	16	12	10
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K – Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.							

Table 6-23 RBC Continuous Monitoring Results – Annual Mean PM_{2.5}

Site ID	X, Y	Type	Annual Mean (µg/m ³)				
			2020*	2021*	2022	2023	2024
Reading AURN	473441, 173198	UB	8	8	8	7	7
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K – Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.							

Table 6-24 RBC Continuous Monitoring Results – Daily Mean PM₁₀

Site ID	X, Y	Type	Exceedances of the 24-hour mean (days)				
			2020*	2021*	2022	2023	2024
RD4	473703, 173409	R	3	2	0	2	0
Reading AURN	473441, 173198	UB	0	1	0	0	0
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K – Kerbside, R = Roadside.							

Site ID	X, Y	Type	Exceedances of the 24-hour mean (days)				
			2020*	2021*	2022	2023	2024
*Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.							

6.5.8. Future Baseline

With or without the Proposed Development coming forward there is likely to be an improvement in local air quality conditions due to the potential reduction in tailpipe emissions from road traffic as cleaner and more efficient vehicle technologies become available. This might include the increased uptake of electric and hybrid vehicles (cars, vans, lorries, and buses), both of which have the potential to substantially decrease pollutant emissions and greater uptake of sustainable travel methods such as public transport, walking and cycling.

6.6. Impact Assessment

6.6.1. Assessment of Construction Dust

6.6.1.1. Dust Emission Magnitude

The likely magnitude of dust emissions from the Proposed Development for the four main activities have been assessed, as identified in Table 6-25.

Table 6-25 Predicted Magnitude of Dust Emissions from Proposed Development

Activity	Magnitude	Justification
Demolition	Large	It is understood that the proposals will involve the demolition of three existing 4-storey office buildings, two of which are vacant and stripped back to shell and core. These buildings are estimated to have a total building volume > 75,000 m ³ in line with IAQM screening values. With potentially dusty construction material (i.e. concrete) and demolition activities >12m above ground level. As such, the magnitude of demolition activities has been classified as Large.
Earthworks	Medium	The existing site area is estimated to be between 18,000m ² – 110,000m ² in line with IAQM screening values. Based on the size of the site, it is estimated that there will be 5 – 10 heavy earth-moving vehicles active at any one time, and formation of bunds 3m – 6m in height. As such, the magnitude of earthwork activities has been classified as Medium.
Construction	Large	The total building volume of the Proposed Development is conservatively estimated to be > 75,000m ³ . As such, the magnitude of construction activities has been

Activity	Magnitude	Justification
		classified as Large.
Trackout	Medium	The proposed haul roads are expected to be kept to a minimum (i.e., <50m) but are likely to be unpaved, therefore there is potential for dust releases. It is estimated that there would be 20 – 50 heavy duty vehicle (HDV) outward movements in any one day. As such, the magnitude of trackout activities has been classified as Medium.

6.6.1.2. Sensitivity of the Local Area

A wind rose for Heathrow, provided in Appendix 6-3, indicate that the prevailing wind direction is predominantly from the Southwest. Therefore, existing receptors that are located to the northeast are most likely to fall within the area of influence from dust emissions generated by the construction phase at the site.

The majority of dust generated by the construction stage is likely to be deposited in close proximity to the source (within 250m) – Appendix 6-9 indicates the construction zone of influence.

The majority of the existing buildings immediately surrounding the Site are related to the business park and are commercial in nature which are classified as medium sensitivity receptors. Further south of the Site, on the other side of the railway lines, there are areas of residential dwellings which are considered high sensitivity receptors. It is estimated that within 250m of the Site boundary there are >100 high sensitivity receptors to dust soiling effects.

There are no ecological receptors within 50m of the Application Site, or within 50m of the likely construction traffic route up to 250m from the Site boundary, and therefore consideration of these receptors has been scoped out.

The 2026 PM₁₀ concentration for the Application Site taken from the Defra background maps is 11.8 µg/m³, which is well below the annual mean AQS objective.

6.6.1.3. Receptor Sensitivity

The sensitivity of the area to each of the previously identified impact types associated with the Application Site are identified in Table 6-26.

Table 6-26 Sensitivity of Receptors of Dust Emissions Effects

Impact Type	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Low
Human Health	Low	Low	Low	Low
Ecological	N/A	N/A	N/A	N/A

6.6.1.4. Risk of Impact

To determine the risk of impacts prior to the implementation of mitigation the dust emission magnitude and the sensitivity of the area have been combined. Table 6-27 below summarises the potential risk of impacts during the construction phase.

Table 6-27 Potential Risk During the Construction Phase

Impact Type	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Low	Low	Low
Human Health	Medium	Low	Low	Low
Ecological	N/A	N/A	N/A	N/A

The risk of dust related impacts from the Proposed Development on existing receptors in the vicinity of the Application Site is Medium to Low without the implementation of mitigation.

The risk of dust related impacts on human health during the construction phase is Medium to Low without the implementation of mitigation.

The risk of ecological impacts has been scoped out as there are no ecologically sensitive sites in the vicinity of the Application Site.

6.6.2. Assessment of Construction Traffic Emissions

A detailed assessment of construction traffic emissions using ADMS-Urban has been undertaken to consider the impacts on pollutant concentrations of NO₂, PM₁₀ and PM_{2.5} at existing receptor locations during the construction phase. A summary of the results is provided below, with the full breakdown provided in Appendix 6-7.

6.6.2.1. Annual Mean NO₂

The objective for annual mean NO₂ is 40 µg/m³.

In both the '2029 Baseline' and '2029 Baseline + Construction Traffic' scenarios, annual mean NO₂ concentrations were below the annual AQS objective at all existing receptor locations.

The highest predicted concentration during the construction peak was 14.54 µg/m³ at receptor E1.

The greatest predicted change in annual mean NO₂ concentrations brought about by construction traffic at any existing receptor location was 0.07 µg/m³ at receptor E5. In accordance with EPUK and IAQM guidance, the impacts of construction traffic on annual mean NO₂ concentrations at all existing receptors is

considered Negligible. Consequently, the potential effect has been classified as Not Significant.

On this basis, mitigation to protect existing receptors from elevated annual mean NO₂ concentrations resulting from construction traffic is not required

6.6.2.2. Hourly Mean NO₂

The objective for hourly mean NO₂ concentrations is 200 µg/m³, not to be exceeded more than 18 times a year.

In both the '*2029 Baseline*' and '*2029 Baseline + Construction Traffic*' scenarios, hourly mean NO₂ concentrations were below the hourly AQS objective at all existing receptor locations.

The highest predicted concentration during the construction peak was 38.6 µg/m³ at existing receptor E1.

The greatest predicted change in hourly mean NO₂ concentrations brought about by construction traffic at any existing receptor location was 0.33 µg/m³ at receptor E5.

In accordance with EPUK and IAQM guidance, the impacts of construction traffic on hourly mean NO₂ concentrations at all existing receptors is considered Negligible. Consequently, the potential effect has been classified as Not Significant.

On this basis, mitigation to protect existing receptors from elevated hourly mean NO₂ concentrations resulting from construction traffic is not required

6.6.2.3. Annual Mean PM₁₀

The objective for annual mean PM₁₀ is 40 µg/m³.

In both the '*2029 Baseline*' and '*2029 Baseline + Construction Traffic*' scenarios, annual mean PM₁₀ concentrations were below the annual AQS objective at all existing receptor locations.

The highest predicted concentration during the construction peak was 14.3 µg/m³ at receptor E1.

The greatest predicted change in annual mean PM₁₀ concentrations brought about by construction traffic at any existing receptor location was 0.03 µg/m³ at receptor E5. In accordance with EPUK and IAQM guidance, the impacts of construction traffic on annual mean PM₁₀ concentrations at all existing receptors is considered Negligible. Consequently, the potential effect has been classified as Not Significant.

On this basis, mitigation to protect existing receptors from elevated annual mean PM₁₀ concentrations resulting from construction traffic is not required.

6.6.2.4. Daily Mean PM₁₀

The AQS objective for daily mean PM₁₀ concentrations is 50 µg/m³, not to be exceeded more than 35 days a year.

In both the '*2029 Baseline*' and '*2029 Baseline + Construction Traffic*' scenarios, daily mean PM₁₀ concentrations were below the daily AQS objective at all existing receptor locations.

The maximum number of days predicted to exceed the daily mean PM₁₀ objective is 1 day at existing receptors E5, E6, E7, E8 and E9.

There are no predicted changes in days of exceedance in both the '*2029 Baseline*' and '*2029 Baseline + Construction Traffic*' scenarios.

In accordance with EPUK and IAQM guidance, the impacts of construction traffic on daily mean PM₁₀ concentrations at all existing receptors is considered Negligible. Consequently, the potential effect has been classified as Not Significant.

On this basis, mitigation to protect existing receptors from elevated daily mean PM₁₀ concentrations resulting from construction traffic is not required.

6.6.2.5. Annual Mean PM_{2.5}

The AQS objective for annual mean PM_{2.5} concentrations is 20 µg/m³.

In both the '*2029 Baseline*' and '*2029 Baseline + Construction Traffic*' scenarios, annual mean PM_{2.5} concentrations were below the annual AQS objective at all existing receptor locations.

The highest predicted concentration during the construction peak was 8.6 µg/m³ at receptor E1.

The greatest predicted change in annual mean PM_{2.5} concentrations brought about by construction traffic was 0.02 µg/m³ at receptor E5. In accordance with EPUK and IAQM guidance, the impacts of construction traffic on annual mean PM_{2.5} concentrations at all existing receptors is considered Negligible.

Consequently, the potential effect has been classified as Not Significant.

On this basis, mitigation to protect existing receptors from elevated annual mean PM_{2.5} concentrations resulting from construction traffic is not required.

6.6.3. Assessment of Operational Emissions

A detailed assessment using ADMS-6 has been undertaken to evaluate the potential impacts of operational emissions on local air quality.

The assessment considers emissions released from the natural gas fuel-cells and the testing of the diesel-fired back-up generators. Full details of the operation

schedule and the modelled scenarios are provided in Section 6.5.3 and results in Appendix 6-8 .

The following sections do not present the results of the sensitivity test; however, the full results of this assessment are presented in Appendix 6-8.

Five years of data was modelled in ADMS-6 (2021-2025) to capture fluctuations in air pollutants associated with meteorological variability. The highest concentrations across the five-year assessment period are presented below.

6.6.3.1. Annual Mean NO₂

The objective for annual mean NO₂ concentrations is 40µg/m³.

Without the operation of the fuel-cells and testing of the back-up generators, baseline annual mean NO₂ concentrations at all modelled receptor locations are well below the AQS objective. The highest concentration was 14.54µg/m³ at modelled receptor E1 which is well below the relevant AQS objective.

With the operation of the fuel-cells and testing of the back-up generators, annual mean NO₂ concentrations at all existing receptor locations are well below the AQS objective. The highest concentration was 14.56 at modelled receptor E1 which remains well below the relevant AQS objective.

The greatest change (Process Contribution (PC)) attributable to the operation of the fuel-cells and back-up generator testing was 0.32µg/m³ at E12, which is less than 1% of the long-term environmental standard for NO₂ (i.e. <0.4µg/m³).

Annual mean NO₂ concentrations at all modelled proposed receptor locations were well below the relevant AQS objective. The highest annual mean NO₂ concentration was 11.35µg/m³ at location P7_3.

On this basis, the operation of the fuel-cells and testing of the back-up generators, the impact on annual mean NO₂ concentrations is negligible.

6.6.3.2. Hourly Mean NO₂

The objective for hourly mean NO₂ concentrations is 200µg/m³ to be exceeded no more than 18 times a year.

Without the operation of the fuel-cells and testing of the back-up generators, baseline hourly mean NO₂ concentrations at all modelled receptor locations are well below the AQS objective. The highest concentration was 38.58µg/m³ at modelled receptor E1 which is well below the relevant AQS objective.

With the operation of the fuel-cells and testing of the back-up generators, hourly mean NO₂ concentrations at all existing receptor locations are well below the AQS objective. The highest concentration is 86.34µg/m³ at modelled receptor E12 which remains below the relevant AQS objective.

There are several PCs attributable to the operation of the fuel-cells and back-up generator testing that exceed is 10% of the short-term environmental standard for NO₂ (i.e., >20µg/m³), including E6 (PC: 25.89µg/m³), E10 (PC: 32.03µg/m³), E12 (PC: 64.49µg/m³), E13 (PC: 35.53µg/m³), E14 (PC: 21.39µg/m³) and E15 (PC: 26.64µg/m³). Whilst the PC exceeds the threshold of 10% of the short-term environmental standard for NO₂ (i.e., >20µg/m³), the Predicted Environmental Concentrations (PEC) at each of these locations remain well below the relevant AQS objective for hourly mean NO₂ concentrations, as shown in Appendix 6-8.

Hourly mean NO₂ concentrations at all modelled proposed receptor locations were well below the relevant AQS objective. The highest annual mean NO₂ concentration was 105.12µg/m³ at location P9_2.

On this basis, the operation of the fuel-cells and testing of the back-up generators, the impact on hourly mean NO₂ concentrations is negligible.

6.6.3.3. Annual Mean PM₁₀

Contributions of PM₁₀ are associated with the operation of the back-up generators only. No PM₁₀ is released by the fuel-cells.

The objective for annual mean PM₁₀ concentrations is 40µg/m³.

Without the operation of the fuel-cells and testing of the back-up generators, baseline annual mean PM₁₀ concentrations at all modelled receptor locations are well below the AQS objective. The highest concentration was 14.3124µg/m³ at modelled receptor E1 which is well below the relevant AQS objective.

With the operation of the fuel-cells and testing of the back-up generators, annual mean PM₁₀ concentrations at all existing receptor locations are well below the AQS objective. The highest concentration was 14.3125µg/m³ at modelled receptor E1 which remains well below the relevant AQS objective.

The greatest change (Process Contribution (PC)) attributable to the operation of the fuel-cells and back-up generator testing was 0.0007µg/m³ at E12, which is less than 1% of the long-term environmental standard for PM₁₀ (i.e. <0.4µg/m³).

Annual mean PM₁₀ concentrations at all modelled proposed receptor locations were well below the relevant AQS objective. The highest annual mean NO₂ concentration was 11.35µg/m³ at location P7_3.

On this basis, the operation of the fuel-cells and testing of the back-up generators, the impact on annual mean NO₂ concentrations is negligible.

6.6.3.4. Daily Mean CO

Contributions of CO are associated with the operation of the fuel-cells only. No CO is emitted by the generators.

The objective for daily mean (8-hour mean) CO concentrations is 10mg/m³ (10,000 µg/m³).

With the operation of the fuel-cells, daily mean concentrations at all existing receptor locations are well below the AQS objective. The highest concentration was 0.292 µg/m³ at modelled receptor E15 which remains well below the relevant AQS objective.

The PC attributable to the operation of the fuel-cells, 0.181µg/m³ at E10.

Daily mean CO concentrations at all modelled proposed receptor locations were well below the relevant AQS objective. The highest annual mean CO concentration was 0.36 at location P7_3.

On this basis, the operation of the fuel-cells and testing of the back-up generators, the impact on annual mean CO concentrations is negligible.

6.6.3.5. Secondary Mitigation or Enhancement

Construction

The IAQM guidelines provide an indication of the mitigation measures that would be appropriate for inclusion within the Proposed Development, based on the level of risk and dust related impacts identified for each of the construction activities (Low to Medium). The relevant mitigation measures are included within Tables 6-28 to 6-29 below.

Table 6-28 Mitigation to be implemented during the construction phase (Source: IAQM Construction and Demolition Guidance, v2.2 updated January 2024)

Development Element	Mitigation Measure
Communication	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary. This may be the environment manager/engineer or the Site manager. Display the head or regional office contact information.
Planning	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the measures recommended in this table. The DMP may include monitoring of dust deposition, dust flux, real time PM₁₀ continuous monitoring and/or visual inspections.

Development Element	Mitigation Measure
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or emissions, either on- or off- site, and the action taken to resolve the situation in the logbook.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of the Site boundary, with cleaning provided if necessary. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Agree dust deposition, dust flux, or real time PM₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on site. Fully enclose site or specific operations where there is a high potential for dust production and the Site is active for an extensive period. Avoid site run-off of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. Cover, seed or fence stockpiles to prevent wind whipping.
Operating Vehicle/	Ensure all vehicles switch off engines when stationary – no idling vehicles.

Development Element	Mitigation Measure
Vehicle Movements	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Impose and signpost a maximum speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, <i>e.g.</i> suitable local exhaust ventilation systems. Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	Avoid bonfires and burning of waste materials.

Table 6-29 Activity specific mitigation measures to be implemented during the construction phase (Source: IAQM Construction and Demolition Guidance, v2.2 updated January 2024)

Development Element	Mitigation Measure
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. Avoid explosive blasting, using appropriate manual or mechanical alternatives.

Development Element	Mitigation Measure
	Bag and remove any biological debris or damp down such material before demolition.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Only remove the cover in small areas during work and not all at once.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site. This may require the sweeper being continuously in use. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable Record all inspections of haul routes and any subsequent action in a site log book. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable). Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Access gates to be located at least 10 m from receptors where possible.

The impacts of construction traffic on air quality (NO₂, PM₁₀ and PM_{2.5}) were determined as Negligible at all existing receptor locations and the effects are Not

Significant. On this basis, mitigation for these pollutants is not required. However, this does not deter from good site practice as set out in the IAQM guidance.

Operation

The impacts of building emissions associated with the operation of the fuel-cells and testing of the back-up generators on pollutant concentrations (NO₂, PM₁₀, CO) at all existing and proposed receptor locations is considered negligible. Consequently, the potential effect has been classified as Not Significant. On this basis, mitigation for these pollutants is not required.

6.6.3.6. Residual Effect & Significance

With the incorporation of IAQM best practise site measures, residual arising from dust and PM₁₀ generated by construction activities are considered Not Significant on all existing receptors.

No additional mitigation is proposed; in accordance with IAQM and EPUK guidance, the impacts arising from construction traffic and NRMM on local air quality (NO₂, PM₁₀ and PM_{2.5}) remain as set out within this ES Chapter, which are Negligible at all existing receptor locations. Consequently, the residual effects have been determined as Not Significant.

In accordance with IAQM and EPUK guidance, the impacts arising from operational building emissions on local air quality (NO₂, PM₁₀ and CO) remain as set out within Section this ES Chapter, which are Negligible at all existing and proposed receptor locations.

6.7. Limitations & Assumptions

Professional judgement has been used in the completion of the construction dust assessment for the Proposed Development.

It is assumed that the information provided by the transport consultants (SK Transport), MEP engineers (Hilson Moran) and fuel-cell provides (Bloom) is accurate.

Baseline traffic data for 2024 was used for model verification to align with the most recent annualised air quality monitoring data from WBC.

Construction is anticipated to commence in early 2028 and progress in two phases: 2028-2030 and 2035-2037. The impact assessment uses a 2029 interim baseline and a future baseline, assuming worst-case background concentrations. In reality, background concentrations are expected to improve over time.

The ADMS-Urban and ADMS 6 dispersion models have been used in this assessment to assess the existing and future baseline concentrations in the vicinity of the Site. The dispersion model relies on input data, such as traffic data and predicted emissions data, etc., which may have uncertainties associated with

them. The models simplify complex environments and does not always accurately reflect local micro-climatic conditions which may ultimately affect the predicted pollutant concentrations.

6.8. Interrelationship Effects

The assessment of air quality has considered the relationship with other environmental topics assessed within this Environmental Statement.

The generation of emissions associated with the Proposed Development has the potential to result in indirect environmental effects associated with vehicle movements, climate change, biodiversity, noise, land contamination, water resources, and waste and materials.

Table 6-30 Summary of Interrelationship Effects

Environmental Topic	Relationship with Air Quality Assessment
Biodiversity	Changes in air pollutant concentrations have the potential to affect sensitive habitats and ecological receptors through pollutant deposition and exposure. The air quality assessment therefore considers the potential for effects on designated sites and habitats where relevant.
GHG and Climate Change	Combustion processes and vehicle movements may generate both air pollutants and GHG emissions. Whilst assessed separately, both topics are linked through common emission sources and mitigation measures.
Noise and Vibration	Construction plant, machinery and traffic associated with the Proposed Development may generate both noise and air pollutant emissions. The relationship arises from common project activities and the implementation of shared mitigation measures.
Land Contamination and Ground Conditions	Construction activities involving earthworks, excavation and soil handling may generate dust emissions that can affect local air quality. Appropriate dust management measures also help minimise impacts on ground conditions.
Water Resources	Atmospheric deposition of pollutants and dust has the potential to affect surface water quality. Mitigation measures implemented to control dust and emissions therefore also contribute to protecting nearby water resources.
Waste and Materials	The transportation, handling and disposal of waste materials may generate dust and vehicle emissions that could affect local air quality. Waste minimisation and good site management practices can help reduce these emissions.

6.9. Cumulative Impacts Assessment

6.9.1. Construction Phase

The IAQM guidance suggests that cumulative construction impacts are only likely where sites are within 250m of each other. It is assumed that any cumulative schemes within this radius will also have measures in place to minimise their construction dust emissions. Work would also have to be taking place in areas of all sites that are close to a receptor in order for cumulative effects to occur.

With these measures in place, the cumulative effects of dust emissions from demolition and construction activities will be Not Significant.

6.9.2. Operational Phase

The operational phase assessment incorporates baseline traffic data, provided by the project transport consultant (SK Transport), which captures growth from cumulative schemes, and as such, have been accounted for the combined effect of traffic from both the Proposed Development and the aforementioned cumulative schemes, to assess a worst-case impact scenario.

As detailed in the Chapter, the impacts of operational building emissions are shown to be Negligible at all locations, and thus the cumulative effect will be Not Significant.

6.10. Summary and Conclusion

Table 6.31 provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter.

The table only provides a summary of the residual effects identified within the assessment and details of all primary, secondary and tertiary mitigation that has been taken into account is set out in detail within the Chapter.

Table 6-31 Summary of Likely Significant Impacts, Mitigation Measures and Residual Effects

Receptors	Likely Significant Impact	Mitigation Measures	Residual Effect
Construction Phase			
Construction Dust (generated by onsite construction activities)	Significant	Mitigation measure details are provided in Tables 6.28 and 6.29.	Not Significant
Road Traffic Emissions (NO ₂ , PM ₁₀ and PM _{2.5})	Not Significant	Mitigation measure details are provided in Tables 6.28 and 6.29.	Not Significant
Operational Phase			

Receptors	Likely Significant Impact	Mitigation Measures	Residual Effect
Building Emissions (NO ₂ , PM ₁₀ , CO)	Not Significant	Site specific mitigation not required.	Not Significant

7. Noise and Vibration

7.1. Introduction to Key Issues

This Chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development in relation to noise and vibration. The assessment considers the potential effects associated with both the construction and operational phases of the Proposed Development.

This Chapter describes the assessment methodology, the baseline conditions at the Application Site and surrounding area, a summary of the likely significant effects, the mitigation measures required to prevent, reduce or offset any significant negative effects, and the likely residual effects after these measures have been employed.

The key noise and vibration issues associated with the Proposed Development are:

- Temporary noise effects arising from demolition, excavation, earthworks and construction activities;
- Temporary vibration effects arising from construction activities;
- Operational noise associated with fixed mechanical and electrical plant serving the Proposed Development.

This Chapter (and its associated figures and appendices) should be read together with the introductory Chapters of this ES (Chapters 1 to 5), as well as Chapter 12: Summary. This Chapter is accompanied by the following appendices:

- Appendix 7-1: Legislation, Planning Policy and Guidance Review; and
- Appendix 7-2: Baseline Survey Information;
- Appendix 7-3: ABC Calculations

7.2. Experience

This Chapter has been prepared by Fatima Taha, Principal Acoustic Consultant at Tyréns Hilson Moran. Fatima has extensive experience in environmental acoustics, environmental impact assessment, planning, and building acoustics, having delivered noise and vibration assessments for a broad range of residential, commercial, infrastructure and mixed-use developments throughout the UK.

This Chapter has been reviewed by Jerry Rees, Head of Acoustics at Tyréns Hilson Moran. Jerry has extensive experience in environmental acoustics and environmental impact assessments and has led and reviewed numerous Environmental Statement chapters and planning-related noise and vibration assessments for major developments throughout the UK.

7.3. Consultation

Consultation was sought with WBC to inform the Proposed Development and the assessment methodology adopted within this Chapter.

Table 7-1 provides an overview of any consultation that has been undertaken to inform the Proposed Development and EIA, including the consideration of likely significant effects and the methodology for assessment. Consultation has been carried out via email correspondence and through a pre-application meeting held on the 21st of July 2026.

Table 7-1 Summary of Consultation

Body/ Organisation	Contact	Date and Form of Consultation	Summary
Wokingham Borough Council	Environmental Health	Attempted email consultation on 7th May 2026	Consultation was attempted regarding the assessment methodology and operational plant noise requirements. Based on a review of planning decisions within the Borough, operational plant noise limits have been developed and were proposed to Environmental Health at WBC. At the time of the preparation of this Chapter, formal confirmation of the criteria has not been received.
Tyréns Hilson Moran Environmental Team	EIA Team	June 2026, internal EIA scoping exercise	An informal scoping exercise was undertaken for the voluntary Environmental Impact Assessment. Construction noise, construction vibration and operational noise were scoped into the assessment. Construction traffic noise and operational traffic noise were scoped out.
Wokingham Borough Council	Environmental Health	Pre- application meeting	A pre-application meeting was held on 21st July 2026, however was not attended by an Environmental Health Officer specialising in noise pollution. Comments were made regarding potential noise impacts on ecological receptors by the WBC Ecology Officer however. Ecology comments were received regarding potential impacts on

Body/ Organisation	Contact	Date and Form of Consultation	Summary
			woodland habitats, birds and bats, and that these comments informed the consideration of ecological receptors within the operational noise assessment.

7.3.1. Scope of Assessment

The assessment has been proportionately scoped to address environmental topics for which there is potential for likely significant effects, while demonstrating that other topics can be scoped out where appropriate.

Table 7-2 Topic Specific Assessment Scope

Potential Effect	Scoped in/out	Justification
Construction Noise	In	Construction activities associated with the Proposed Development could have the potential to generate temporary, significant noise impacts.
Construction Vibration	In	Construction activities associated with the Proposed Development could have the potential to generate temporary, significant vibration impacts.
Construction Traffic Noise	Out	Construction traffic routes are not expected to affect residential noise-sensitive receptors due to their location.
Operational Traffic Noise	Out	The operation of the Proposed Development is unlikely to generate significant noise impacts from traffic changes and therefore operational traffic noise has been scoped out of the assessment.
Operational Noise	In	New mechanical and electrical plant associated with the Proposed Development has the potential to generate permanent, significant noise impacts. Due to the outline nature of the application, detailed assessments of plant equipment will not be undertaken, and operational noise limits have instead been established based on Local Authority requirements.

7.3.2. Effects Not Considered to be Significant

The following effects were not considered significant and are not considered further in this Chapter:

- Construction Traffic Noise;
- Operational Traffic Noise.

7.3.3. Effects Considered Likely to be Significant

Table 7-3 outlines the effects that were considered likely to be significant and have been assessed and reported within this Chapter:

Table 7-3 Effects considered likely to be Significant

Likely Significant Effect	Receptors	Applicable Stage
Disturbance from construction noise	Noise-sensitive receptors surrounding the Site	Construction
Disturbance from construction vibration	Vibration-sensitive receptors surrounding the Site	Construction
Disturbance from operational plant noise	Noise-sensitive receptors surrounding the Site	Operation

7.4. Legislation, Planning Policy & Guidance

The following legislation have informed the assessment reported within this Chapter and is detailed further in Appendix 7-1.

7.4.1. Legislation

- Environmental Protection Act 1990³⁴;
- Control of Pollution Act 1974³⁵; and
- Environmental Noise (England) Regulations 2006³⁶.

7.4.2. Planning Policy

The following planning policy has informed the assessment reported within this Chapter:

National Planning Policy

- National Planning Policy Framework (NPPF)³⁷; and

³⁴ Department for Environment, Food and Rural Affairs (1990) *Environmental Protection Act 1990*, HMSO.

³⁵ Her Majesty's Stationery Office (1974) *Control of Pollution Act 1974*, HMSO.

³⁶ Department for Environment, Food and Rural Affairs (2006) *Environmental Noise (England) Regulations 2006*, DEFRA.

³⁷ Department for Levelling Up, Housing and Communities (2026) *National Planning Policy Framework*, DLUHC.

- Noise Policy Statement for England (NPSE)³⁸.

Local Planning Policy

- Relevant policies within the Wokingham Borough Local Plan relating to environmental protection, residential amenity and noise management³⁹.

7.4.3. Guidance

The following guidance has informed the assessment reported within this Chapter:

- BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound⁴⁰;
- BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 1: Noise⁴¹;
- BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 2: Vibration⁴²;

7.5. Assessment Methodology

This section describes the methodology used to identify, predict and evaluate the likely significant effects of the Proposed Development in relation to noise and vibration. The assessment has been undertaken with reference to relevant legislation, planning policy and recognised industry guidance, and has considered both the construction and operational phases of the Proposed Development. The methodology includes the definition of the study area, identification of sensitive receptors, establishment of baseline conditions, assessment of potential effects, and evaluation of likely significance. The assessment has also taken account of embedded mitigation measures incorporated within the Proposed Development.

7.5.1. Define the Study Area

The assessment of construction noise, construction vibration and operational noise considers the Site and surrounding land uses that have the potential to experience effects arising from the Proposed Development. The study area has been defined with reference to the nature of the Proposed Development, the location of the nearest noise-sensitive receptors (NSRs), and the anticipated zone of influence associated with noise and vibration effects.

³⁸ Department for Environment, Food and Rural Affairs (2010) *Noise Policy Statement for England*, DEFRA.

³⁹ Wokingham Borough Council (Adopted Local Plan) *Relevant Environmental Protection and Amenity Policies*, WBC. (Update with exact policy references once confirmed by planning consultant.)

⁴⁰ British Standards Institution (2019) *BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound*, BSI.

⁴¹ British Standards Institution (2014) *BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 1: Noise*, BSI.

⁴² British Standards Institution (2014) *BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 2: Vibration*, BSI.

The principal receptors considered within the assessment comprise the nearest residential properties surrounding the Site. These receptors were identified during the baseline noise assessment and represent the locations most likely to be affected by construction and operational noise associated with the Proposed Development.

For the construction and operational noise assessments, the study area focuses on the nearest identified NSRs surrounding the Site, which are defined in the Identification of Receptors section of this Chapter.

The study area has been informed by the baseline environmental noise survey undertaken between 16 April and 21 April 2026, including long-term monitoring positions L1 and L2 located on the Site boundary.

The study area adopted for the Environmental Impact Assessment is considered appropriate to identify and assess the likely significant noise and vibration effects associated with the Proposed Development.

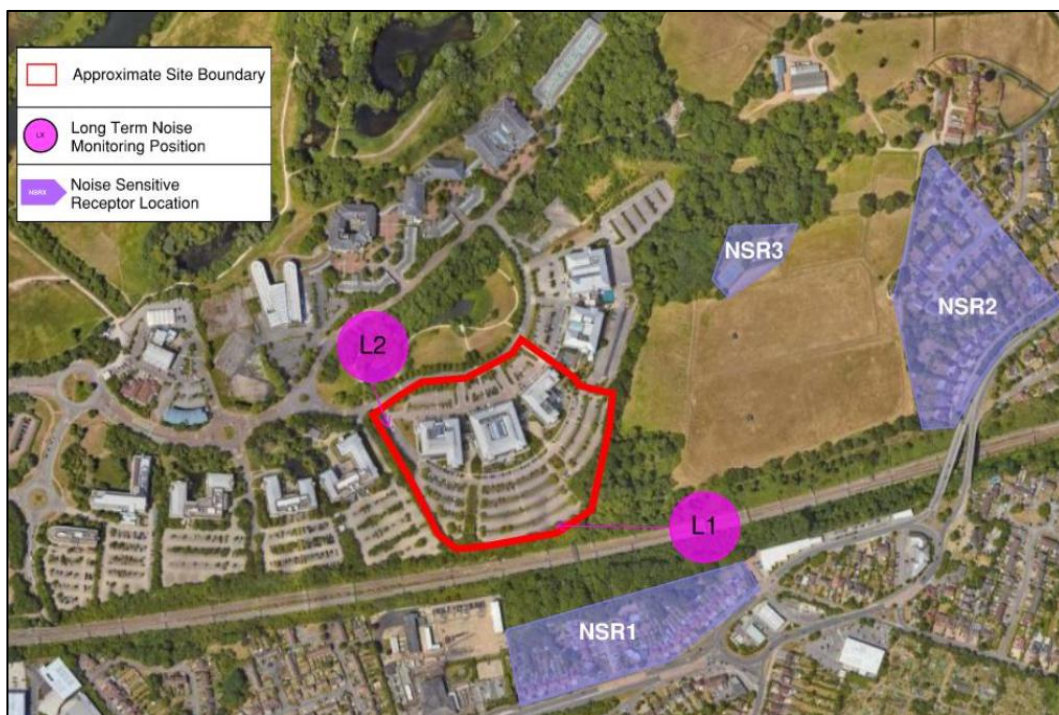


Figure 7-1 Noise Assessment Study Area

7.5.2. Data Sources

The assessment has been informed by a combination of baseline surveys, project information, technical guidance and professional judgement.

The principal data sources used within the assessment are as follows:

- Baseline environmental noise surveys undertaken between 16 April and 21 April 2026 to establish the existing noise environment surrounding the Site;

- Site observations undertaken during the baseline noise survey;
- Parameter plans and associated development information prepared by Twelve Architects, including ground floor, upper floor, roof level, building height and typical section drawings⁴³;
- Information provided by the project design team relating to the Proposed Development; and
- Relevant legislation, planning policy and technical guidance identified in Section 7.4.

The baseline noise surveys were used to characterise the existing acoustic environment and to identify representative background sound levels at the nearest noise-sensitive receptors. These data have informed both the assessment of construction noise and vibration effects and the establishment of operational plant noise criteria for the Proposed Development.

The assessment has also been informed by professional judgement and experience gained from comparable data centre, commercial and infrastructure developments, particularly where detailed construction methodologies and operational plant specifications are not currently available due to the outline nature of the Proposed Development.

7.5.3. Identification of Receptors

The assessment considers existing receptors that have the potential to be affected by noise and vibration arising from the construction and operation of the Proposed Development. Receptors have been identified through a review of the Site setting, baseline survey information and surrounding land uses. The assessment focuses on receptors that are considered sensitive to changes in environmental noise and vibration, and which are located within the defined study area.

The nearest identified NSRs comprise residential properties located to the south and east of the Site. These receptors were identified during the baseline noise assessment and are considered to represent the locations most likely to experience effects associated with the Proposed Development.

The principal receptors considered within the assessment are:

- NSR 1: residential dwellings facing London Road, located approximately 118 m to the south of the Site;
- NSR 2: residential dwellings located within Sonning Meadows and South Drive, approximately 350 m to the east of the Site; and
- NSR 3: a residential property located on a private road, approximately 200 m to the east of the Site.

Residential receptors are considered to be highly sensitive to changes in noise and vibration due to the potential for effects on residential amenity during both daytime and night-time periods. Consequently, the assessment has focused on the nearest residential receptors as the worst-case assessment locations.

The identified receptors are considered representative of the surrounding residential communities and, due to their proximity to the Site, are expected to experience the greatest potential exposure to construction and operational noise arising from the Proposed Development.

In addition to residential noise-sensitive receptors, ecological receptors have been identified within the vicinity of the Site, including adjacent woodland habitat and the Local Wildlife Site located to the north and east of the Proposed Development. These areas have the potential to support bird and bat species and are therefore recognised as potentially sensitive ecological receptors in relation to anthropogenic noise. However, unlike residential receptors, there are currently no recognised UK planning standards, EIA methodologies or accepted quantitative significance criteria available for assessing operational noise effects on ecological receptors. Consequently, ecological receptors are identified qualitatively within the assessment, with consideration given to embedded mitigation measures and future detailed design controls.

7.5.4. Assessment Process

The assessment process has been undertaken with reference to the relevant legislation, planning policy and guidance identified in Section 7.4. The assessment considers the potential effects associated with both the construction and operational phases of the Proposed Development and has been informed by baseline survey information, Site-specific circumstances and professional judgement.

7.5.4.1. Construction Phase

Construction Noise

The potential effects associated with construction noise have been assessed with reference to BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise.

A BS 5228 ABC assessment has been undertaken using representative construction phases and plant assumptions derived from the outline construction programme. Detailed calculations are provided in Appendix 7-4. The assessment has been undertaken at NSR1, representing the nearest noise-sensitive receptor. NSR2 and NSR3 are located further from the Site and would therefore be expected to experience lower construction noise levels.

The assessment considers the nature, duration and proximity of construction activities to surrounding receptors, together with the implementation of standard Best Practicable Means (BPM) and embedded mitigation measures typically employed through a Construction Environmental Management Plan (CEMP).

Based on the guidance provided in BS 5228-1+2, the criterion considered in this ES chapter for the onset of potentially significant construction noise effects at SRs is set in line with the ABC thresholds which enable definition of a magnitude of effect. A semantic scale adopted for the description of construction noise effects is presented in Table 7-4 based on the degree to which the predicted Site noise level at the SR in question exceeds the threshold value.

Table 7-4 Criteria for the Assessment of Construction Noise Effects

Magnitude of Effect	Level of Construction Noise Above Threshold Value, dB(A)	Definition
Negligible	≤ 2.9	The effect is not of concern.
Small Adverse	3.0 to 4.9	The effect is not desirable but of limited concern.
Medium Adverse	5.0 to 9.9	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration.
Large Adverse	≥ 10.0	The effect gives rise to serious concern and it should be considered unacceptable.

Construction Vibration

The potential effects associated with construction vibration have been assessed with reference to BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration

The assessment has considered the likely construction activities, separation distances and locations of nearby receptors. Consideration has been given to activities with the potential to generate perceptible vibration, including demolition, excavation, compaction and associated construction activities.

Based on the guidance provided in BS 5228-2 and BS 6472-1, Table 7-5 presents the descriptors of magnitude of vibration impact and the scale of resultant effects for vibration on human receptors. Significant negative impacts are considered to occur when construction vibration levels increase above the specified Major Adverse effect threshold (depending on the nature of the activity, its duration and the number of receptors likely to be affected).

Table 7-5 Criteria for the Assessment of Construction Vibration Effects

Magnitude of Effect	Level of Vibration, mm/s	Definition
Negligible	≤0.9	The effect is not of concern.
Small Adverse	1.0 to 3.0	The effect is not desirable but of limited concern.
Medium Adverse	3.0 to 5.0	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration.
Large Adverse	5.0 to 10.0	The effect gives rise to serious concern, and it should be considered unacceptable.

7.5.4.2. Operational Phase

Operational noise has been assessed with reference to BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound.

The Proposed Development comprises a data centre campus incorporating cooling infrastructure, generators, fuel cells, electrical infrastructure and associated building services plant. However, detailed plant schedules, acoustic specifications and final equipment locations are not currently available due to the outline nature of the Proposed Development.

Consequently, it is not possible to undertake a detailed quantitative assessment of operational plant noise at this stage. Instead, the assessment establishes operational noise limits based on the measured baseline noise environment and the requirements typically applied by WBC. These limits will inform the future detailed design, selection and specification of fixed plant associated with the Proposed Development, and would be expected to be required by Condition.

When assessing the likely effects from operational activity noise on NSRs, the criteria presented in Table 7-6 **Error! Reference source not found.** have been used for the BS 4142 rating level assessment. The criteria are based on the adverse impact criteria, as provided in BS 4142.

Table 7-6 Criteria for the Assessment of Operational Activity Noise

Magnitude of Effect	Difference between operational activity rating noise level and background levels (dB)	Definition
Negligible	≤-5	The effect is not of concern.

Small Adverse	-4.9 to 4.9	The effect is not desirable but of limited concern.
Medium Adverse	5.0 to 9.9	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration. BS 4142 states that a difference of around +5 dB is likely to be an indication of adverse impact, depending on the context.
Large Adverse	≥ 10.0	The effect gives rise to serious concern and it should be considered unacceptable. BS 4142 states that a difference of around +10 dB or more is likely to be an indication of significant adverse impact, depending on the context.

Ecological Receptors

The potential for anthropogenic noise to influence ecological receptors is recognised within published literature, including potential effects relating to communication, habitat use and foraging behaviour in some bird and bat species. However, there are currently no recognised UK planning standards, British Standards, EIA methodologies or accepted threshold criteria that define acceptable operational noise levels for ecological receptors or provide a basis for determining significance in the planning process. Accordingly, a quantitative operational noise assessment for ecological receptors cannot be undertaken.

The assessment therefore adopts a qualitative approach which:

- identifies nearby ecological receptors and habitats;
- acknowledges the potential for anthropogenic noise to influence wildlife behaviour;
- considers embedded mitigation measures including habitat buffers, stand-off distances and acoustically controlled plant design;
- establishes operational noise limits for future plant design; and
- commits to detailed acoustic assessment during subsequent design stages once plant specifications become available.

This approach is considered proportionate to the outline nature of the application and consistent with the level of information currently available.

7.5.5. Reporting of the Environmental Effect and Significance Criteria

The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account the construction and operational stages. The following sections define the approach adopted within the assessment

for the determination of sensitivity, magnitude of change, the level of effect and significance.

7.5.5.1. Determining Sensitivity of Receptor

The sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.

Residential receptors are considered to be of high sensitivity due to the potential for noise and vibration to affect residential amenity during both daytime and night-time periods. Commercial and office uses are generally considered to be of medium sensitivity, whilst industrial and employment uses are considered to be of low sensitivity.

7.5.5.2. Determining the Magnitude of Change

The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of large, medium, small or negligible.

For construction noise and vibration, the assessment has considered the anticipated nature of the works, their duration and proximity to sensitive receptors, together with the implementation of standard BPM measures.

For operational noise, the assessment has considered the potential for fixed plant associated with the Proposed Development to affect nearby receptors. Given the outline nature of the Proposed Development, the assessment is based upon compliance with operational noise limits established considering potential impact on NSRs rather than detailed plant-specific predictions.

The magnitude of effect has been classified as:

- **Large:** Substantial change from existing conditions with potential for significant adverse effects.
- **Medium:** Noticeable change from existing conditions that may result in an adverse effect.
- **Small:** Minor change from existing conditions with limited potential for adverse effects.
- **Negligible:** Imperceptible or barely perceptible change from existing conditions.

7.5.5.3. Determining the Level of Effect

The level of effect has been informed by the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and Table 7-6 has been a tool which has assisted with this process.

Whilst Table 7-7 provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'.

Table 7-7 Significance Matrix

		Sensitivity (or Value/Importance)			
		High	Medium	Low	Negligible
Magnitude of change / impact	Large	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

The following terms have been used to define the level of the effects identified and these can be 'beneficial' or 'adverse':

- Major effect: where the Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- Moderate effect: where the Proposed Scheme is likely to cause an effect resulting in a noticeable change from baseline conditions which may affect amenity but is generally considered tolerable within the context of the surrounding environment;
- Minor effect: where the Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and
- Negligible: where the Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

7.5.5.4. Determining Significance

For each residual effect, a statement has been made as to whether the level of effect is 'Significant' or 'Not Significant'. This determination has been based on professional judgement and / or relevant guidance/legislation where applicable.

Significance has only been concluded for residual effects (i.e., following the identification of secondary mitigation).

7.5.6. Primary and Tertiary Mitigation

A number of mitigation measures have been embedded within the Proposed Development and have been taken into account within the assessment. These measures are considered to reduce the potential for adverse noise and vibration effects during both the construction and operational phases.

7.5.6.1. Construction Stage

The following primary and tertiary mitigation which has been evaluated as part of the construction stage assessment is outlined below:

- A CEMP will be prepared and implemented by the appointed contractor.
- Construction activities will be undertaken in accordance with BPM as defined by the Control of Pollution Act 1974.
- Construction plant and equipment will be appropriately maintained and operated to minimise noise and vibration emissions.
- Plant and equipment will be switched off when not in use where practicable.
- Deliveries and construction activities will be managed to minimise disturbance to nearby receptors.
- Temporary acoustic screening, hoarding or barriers will be employed where required.
- A community liaison and complaints procedure will be implemented throughout the construction period.
- Noise and vibration monitoring will be undertaken where necessary to verify the effectiveness of mitigation measures.

7.5.6.2. Operational Stage

The following primary and tertiary mitigation which has been evaluated as part of the operational stage assessment is outlined below:

- Operational fixed plant associated with the Proposed Development will be designed to achieve the established operational noise limits.
- Low-noise plant and equipment will be selected wherever practicable.
- Plant will be located and orientated to minimise noise propagation towards nearby noise-sensitive receptors.
- Acoustic screening, enclosures, louvres and barriers will be incorporated where necessary.

- Duct attenuators and low-frequency noise control measures will be incorporated where required.
- Mechanical and electrical plant will incorporate anti-vibration mounts and isolation measures.
- Roof-mounted plant will incorporate parapets and/or acoustic screening where required to achieve the adopted design criteria.

7.6. Baseline

The current and future baseline conditions relating to noise and vibration are described in this section. The baseline has been established through a review of Site-specific surveys, technical assessments and development information, and provides the basis against which the potential effects of the Proposed Development have been assessed.

Table 7-8 summarises all studies / surveys / analysis / evaluations undertaken to inform the assessment presented within this Chapter.

Table 7-8 Background studies / surveys / evaluations / analysis

Study / survey / analysis / evaluation	Overview	Date of completion
Environmental Noise Survey	Baseline noise survey undertaken at representative locations surrounding the Site to establish existing background sound levels and prevailing acoustic conditions.	16-21 April 2026
Site Visits and Observations	Site inspections undertaken in conjunction with the baseline survey to identify prevailing noise sources, surrounding land uses and representative receptor locations.	April 2026
Parameter Plans and Typical Sections	Review of development layout, building heights, roof plant locations and associated infrastructure to inform the assessment.	April- June 2026

7.6.1. Current Baseline

The current baseline conditions have been established through a review of the surrounding land uses, Site observations and environmental noise surveys undertaken between 16th April and 21st April 2026. The baseline assessment provides an understanding of the existing acoustic environment against which the potential effects of the Proposed Development have been assessed.

7.6.1.1. Site Context

The Site is located within Thames Valley Park, Reading, and is currently occupied by office buildings and associated infrastructure. The surrounding area comprises a mixture of commercial development, transport infrastructure and residential receptors located primarily to the south and east of the Site.

7.6.1.2. Existing Noise Environment

Noise levels within the vicinity of the Site are influenced by a combination of road traffic, commercial activities and local environmental sources. The dominant noise source at the nearest residential receptors is road traffic, particularly from London Road and the surrounding highway network.

During the baseline survey, sound levels were observed to vary between daytime and night-time periods. Night-time background sound levels were generally lower, reflecting reduced traffic activity and a quieter acoustic environment.

7.6.1.3. Baseline Noise Survey

A baseline environmental noise survey was undertaken between 16 April and 21 April 2026. Long-term unattended noise monitoring was undertaken at two locations:

- **L1:** Southern Site boundary, representative of NSR 1.
- **L2:** North-western Site boundary, representative of NSR 2 and NSR 3 (due to similar distance from railway line).

The survey results were used to establish representative daytime and night-time background sound levels for the assessment of operational plant noise and to characterise existing acoustic conditions surrounding the Site.

Details of the survey methodology, monitoring locations, equipment, calibration procedures and survey results are provided in Appendix 7-3.

The measured daytime ambient noise levels of 66 dB L_{Aeq} at Location L1 and 55 dB L_{Aeq} at Location L2 have been used to inform the BS 5228 ABC construction noise assessment.

7.6.2. Future Baseline

In the absence of the Proposed Development, the future baseline noise environment is expected to remain broadly consistent with the current baseline conditions. The surrounding acoustic environment would continue to be influenced principally by road traffic on the local highway network and existing commercial activities within Thames Valley Park.

Whilst changes in traffic flow, background activity levels and surrounding development may occur over time, no changes have been identified that would be expected to materially alter the existing noise climate within the study area in

the foreseeable future. Consequently, the future baseline is anticipated to remain comparable to the conditions identified through the baseline noise survey.

The existing residential receptors identified within this Chapter are expected to remain in place and continue to represent the principal NSRs for the assessment.

In the absence of the Proposed Development, the operational plant noise sources associated with the data centre campus would not be present. As such, no change to the existing noise environment attributable to the Site would occur.

7.7. Impact Assessment

This section presents an assessment of the likely significant effects of the Proposed Development on noise and vibration during both the construction and operational phases. The assessment has been undertaken using the methodology described in Section 7.5 and considers the identified noise-sensitive receptors within the study area. Mitigation measures incorporated into the assessment are described in Section 7.5.6 and have been taken into account when determining the level of residual effect and significance.

7.7.1. Construction Phase

7.7.1.1. Construction Noise

The sensitivity of the identified NSRs is considered to be high. A BS 5228-1 ABC assessment has been undertaken for representative construction phases comprising demolition works, excavation and substructure works, building construction and external works. The assessment (Appendix 7-4) indicates that worst-case construction noise levels would remain below the relevant ABC threshold values at the nearest identified noise-sensitive receptor (NSR1), located approximately 118 m from the Site. Accordingly, the magnitude of change is considered negligible.

Construction noise levels would vary throughout the programme depending on the activities being undertaken and would be temporary in nature. However, due to the distance between the Site and the nearest residential receptors, together with the implementation of the primary and tertiary mitigation measures identified in Section 7.5.6, significant construction noise effects are not anticipated.

Consequently, there is likely to be a direct, temporary, short-term Negligible Adverse effect, which is considered Not Significant.

7.7.1.2. Secondary Mitigation or Enhancement

No secondary mitigation or enhancement measures have been identified.

The assessment has been undertaken assuming implementation of the primary and tertiary mitigation measures identified in Section 7.5.6, including the CEMP and adoption of BPM.

7.7.1.3. Residual Effect

In the absence of secondary mitigation the residual effects for construction noise is that same as that reported in the pre-mitigation scenario.

7.7.1.4. Significance

This effect of construction noise is considered to be Not Significant.

7.7.1.5. Construction Vibration

Construction vibration has been assessed with reference to BS 5228-2:2009+A1:2014. Vibration propagation calculations have been undertaken and are presented in Appendix 7-5. The calculations demonstrate that predicted vibration levels at the nearest residential receptor are below the adopted negligible effect threshold. Vibration levels would vary throughout the construction programme depending on the activities being undertaken and would be temporary in nature. However, due to the distance between the Site and the nearest residential receptors, significant vibration effects are not anticipated.

The nearest noise-sensitive receptors comprise residential properties located to the south and east of the Site. Due to the distance between the Site and the nearest residential receptors, together with the implementation of the primary and tertiary mitigation measures identified in Section 7.5.6, significant construction vibration effects are not anticipated. The effect is therefore considered to be Negligible Adverse (Not Significant).

7.7.1.6. Secondary Mitigation or Enhancement

No secondary mitigation or enhancement measures have been identified.

The assessment has been undertaken assuming implementation of the primary and tertiary mitigation measures identified in Section 7.5.6, including the CEMP and adoption of BPM.

7.7.1.7. Residual Effect

In the absence of secondary mitigation the residual effects for construction vibration are the same as that reported in the pre-mitigation scenario.

7.7.1.8. Significance

This effect of construction vibration is considered to be Not Significant.

7.7.2. Operational Phase

7.7.2.1. Operational Plant Noise

At this stage in the design, specific details of the type, number and configuration of building services plant are not known and therefore it is not possible to accurately predict plant noise emission levels.

Without acoustic design controls, moderate or major adverse effects could occur, if appropriate design steps are not taken when designing and procuring the building services plant. The assessment assumes implementation of the primary and tertiary mitigation measures identified in Section 7.5.6, including the selection of low-noise plant, incorporation of acoustic screening and attenuation where required to achieve the adopted operational noise limits.

Consequently, suitable limits to which plant and internal operational noise should adhere have been set based on surveyed background noise levels ($L_{A90,T}$) and the plant noise criteria understood to be required by WBC. The adopted limits are defined in Table 7-9 and are 5 dB below representative minimum measured background sound levels and are therefore consistent with a BS4142 negligible impact objective.

Table 7-9 Operational External Plant Noise Limits

Receptor Location	Representative Measurement Location	Time period	Typical Minimum Measured Background Level L_{A90}	Noise Emission Limit, Rating Level dB $L_{A,T}$ ¹
NSR 1	L1	Daytime (07:00-23:00)	39	34
		Night-time (23:00-07:00)	36	31
NSR 2	L2	Daytime (07:00-23:00)	38	33
		Night-time (23:00-07:00)	37	32
NSR 3	L2	Daytime (07:00-23:00)	38	33
		Night-time (23:00-07:00)	37	32

Notes: ¹Noise from services shall be rated in accordance with BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

These limits apply to the cumulative noise from the overall Proposed Development; the limits would apply to all operational external plant noise that may operate during any period.

Noise from emergency systems design should be limited to 10 dB above typical minimum measured background level without compromising the performance of the systems' primary function (smoke purge, emergency power, etc.). Noise control measures that are likely to degrade the performance of the associated life-safety services should be avoided in the interest of safety. Noise impact during regular, but short-lived testing periods can be effectively managed through careful scheduling to avoid sensitive periods of the day (e.g. early morning, evenings), and days when ambient noise levels are expected to be typically lower (weekends, bank holidays etc.).

Provided measures are implemented to achieve the set noise limits, negligible operational noise effects are anticipated at NSRs. The effect is therefore considered to be Negligible Adverse (Not Significant).

7.7.2.2. Ecological Receptors

Adjacent woodland habitat and the Local Wildlife Site have been identified as ecological receptors. Whilst scientific literature indicates that some species may exhibit behavioural responses to anthropogenic noise, there are currently no accepted operational noise thresholds or significance criteria that would enable a quantitative assessment of effects on birds or bats within the EIA process. In addition, detailed plant specifications, sound power data and operating regimes are not yet available due to the outline nature of the application.

The Proposed Development incorporates embedded mitigation through the retention of habitat buffers and the requirement for future plant and equipment to comply with operational noise limits established through this assessment. Detailed plant design, acoustic mitigation and operational noise predictions will be undertaken during subsequent design stages when sufficient information becomes available. On this basis, no significant operational noise effect on ecological receptors has been identified at the current outline stage.

7.7.2.3. Secondary Mitigation or Enhancement

No secondary mitigation or enhancement measures have been identified.

The assessment has been undertaken assuming implementation of the primary and tertiary mitigation measures identified in Section 7.5.6, including compliance with the operational noise limits established for the Proposed Development and incorporation of suitable acoustic mitigation during the detailed design stage.

7.7.2.4. Residual Effect

In the absence of secondary mitigation, the residual effects for operational plant noise are the same as that reported in the pre-mitigation scenario.

7.7.2.5. Significance

This effect of operational plant noise is considered to be Not Significant.

7.8. Limitations & Assumptions of Assessment

To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- The Proposed Development is currently at outline stage and detailed construction methodologies, contractor information, construction plant schedules and final phasing arrangements are not available. Construction noise and vibration assessments have therefore been based on representative construction phases and plant assumptions derived from BS 5228 guidance and the outline construction programme.
- Construction noise and vibration has been assessed using the BS 5228 ABC method and representative plant schedules. Construction vibration has been assessed using representative vibration source levels and distance attenuation calculations for representative construction activities.
- The assessment has been undertaken at NSR1, representing the nearest identified noise-sensitive receptor. As NSR2 and NSR3 are located further from the Site, they are expected to experience lower construction noise levels than those predicted for NSR1.
- Detailed operational plant schedules, acoustic specifications, sound power data and final equipment locations are not currently available due to the outline nature of the Proposed Development. Consequently, a detailed BS 4142 assessment has not been undertaken. Instead, operational noise limits have been established to inform future detailed design and plant selection.

7.9. Interrelationship Effects

The potential for interrelationship effects has been considered as part of the assessment.

During the construction phase, noise and vibration effects may interact with human health and amenity. However, construction noise and vibration effects have been assessed as Negligible Adverse (Not Significant) and, with the implementation of the mitigation measures identified in Section 7.5.6, no significant interrelationship effects are anticipated.

During the operational phase, noise and vibration may interact with human health and amenity. However, the operational assessment has concluded that residual

noise and vibration effects would be Negligible Adverse (Not Significant). Therefore, no significant interrelationship effects are anticipated.

7.10. Cumulative Impacts Assessment

The potential cumulative effects of the Proposed Development have been considered in relation to the cumulative developments identified in Table 2-5 of Chapter 2: Approach to Assessment. The identified developments comprise a mixture of residential, commercial and mixed-use developments located within the wider study area, including the Station Hill redevelopment, the Veolia Depot Redevelopment, residential developments at Sonning and other developments within the Reading and Wokingham area.

7.11. Construction Phase

Construction activities associated with the Proposed Development have the potential to overlap with construction activities associated with the cumulative developments identified in Table 2-5. This could give rise to temporary cumulative noise and vibration effects at nearby receptors.

Construction activities associated with the Proposed Development would be temporary in nature and subject to the primary and tertiary mitigation measures identified in Section 7.5.6, including implementation of a CEMP and adoption of BPM.

The BS 5228 assessment indicates that construction noise levels would remain below the applicable ABC threshold values at the nearest identified receptor and vibration calculations indicate that vibration levels would remain below the adopted negligible effect threshold. In addition, the identified cumulative developments are spatially separated from the Site and would be subject to their own construction management controls.

Significant cumulative construction noise and vibration effects are therefore not anticipated.

The cumulative construction effect is considered to be Negligible Adverse (Not Significant).

7.12. Operational Phase

Operational noise associated with the Proposed Development will be controlled through compliance with the operational noise limits established within this assessment and the incorporation of appropriate acoustic mitigation measures during detailed design.

The cumulative developments identified in Table 2-5 comprise a mixture of residential, commercial and mixed-use developments. Any operational plant associated with these developments would similarly be expected to comply with relevant planning controls, environmental legislation and adopted noise standards.

On this basis, significant cumulative operational noise or vibration effects are not anticipated.

The cumulative operational effect is considered to be Negligible Adverse (Not Significant).

7.13. Summary and Conclusion

Table 7-10 provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter.

The table only provides a summary of the residual effects identified within the assessment and details of all primary, secondary and tertiary mitigation that has been taken into account is set out in detail within the Chapter.

Table 7-10 Summary of Receptors, Likely Significant Impacts, Mitigation Measures and Residual Effects

Receptors	Likely Significant Impact	Mitigation Measures	Residual Effect
Construction Phase			
Residential receptors (NSR1, NSR2 and NSR3)	Construction Noise	CEMP; BPM; plant maintenance; delivery management; temporary acoustic screening where required; stakeholder liaison and complaints procedure.	BS 5228 ABC assessment indicates construction noise levels remain below the applicable ABC threshold values at the nearest receptor. Negligible Adverse (Not Significant).
(NSR1, NSR2 and NSR3)	Construction Vibration	CEMP; BPM; management of vibration-generating activities; stakeholder liaison.	Vibration calculations indicate predicted vibration levels remain below the adopted negligible effect threshold at the nearest receptor. Negligible Adverse (Not Significant)
Operational Phase			

Residential receptors (NSR1, NSR2 and NSR3)	Operational Noise	Operational plant noise limits; low-noise plant selection; acoustic screening; enclosures; attenuators; anti-vibration mounts; rooftop screening where required.	Compliance with the operational noise limits during detailed design. Negligible Adverse (Not Significant).
Adjacent woodland habitat and Local Wildlife Site (ecological receptors)	Operational Noise	Habitat buffers and stand-off distances; operational plant noise limits; low-noise plant selection; acoustic screening and attenuation where required; detailed acoustic design at reserved matters stage	No accepted ecological noise criteria exist for quantitative assessment. Operational noise controls and subsequent detailed design assessment are proposed. Significant effects have not been identified at outline stage (Not Significant).

8. Climate Change and Greenhouse Gas

8.1. Introduction and Key Issues

This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development on Climate Change.

This Chapter describes the assessment methodology, the baseline conditions at the Application Site and surrounding area, a summary of the likely significant effects, the mitigation measures required to prevent, reduce or offset any significant negative effects, and the likely residual effects after these measures have been employed.

This Chapter (and its associated figures and appendices) should be read together with the introductory Chapters of this ES (Chapters 1-5), as well as Chapter 12: Summary of Residual Effects. This Chapter is accompanied by the following appendices:

- Appendix 8-1: Policy, Legislation and Guidance;
- Appendix 8-2: Assessment Boundaries; and,
- Appendix 8-3: Embodied Carbon Assessment.

8.2. Experience

Sian Grimsley is a Senior Environmental Consultant at Tyréns Hilson Moran specialising in air quality, greenhouse gas (GHG) and climate change. She has over 5 years of technical experience in delivering ES Chapters. She has an MSc in Atmospheric Science, is an associate member of the IES and the IAQM.

The reviewer of this Chapter is Andy Hart. Andy is an Associate Director at Tyréns Hilson Moran, a Chartered Engineer (CEng) with over 16 years technical experience and a full member of the Engineering Council (EC).

8.3. Consultation

Table 8-1 provides an overview of any consultation that has been undertaken to inform the Proposed Development and EIA, including the consideration of likely significant effects and the methodology for assessment. Consultation through a pre-application meeting held on 21st July, 2026, which ran through the sustainability strategy for the Proposed Development

Table 8-1 *Summary of Consultation*

Body/ Organisation	Contact	Date and Form of Consultation	Summary
WBC	Andrew Chugg – Team Manager	21/07/2026	The sustainability strategy proposals were shared with WBC – these included considerations

Body/ Organisation	Contact	Date and Form of Consultation	Summary
		Pre-App Meeting 3 Virtual	of operational emissions and material carbon.
WBC: Wokingham Borough Council			

8.3.1. Scope of Assessment

The assessment has been proportionately scoped to address environmental topics for which there is potential for likely significant effects, while demonstrating that other topics can be scoped out where appropriate.

Table 8-2 Topic Specific Assessment Scope

Potential Effect	Scoped in/out	Justification
Greenhouse Gas Assessment: Assessing the potential effect of the Proposed Development on climate change.	In	Requirement for EIA.
Climate Change Resilience Assessment: Assessing the resilience of the Proposed Development to future climate change.	In	Requirement for EIA.

8.3.1.1. Effects Considered Likely to be Significant

Table 8-3 outlines the effects that are considered to be significant and have been assessed and reported within this Chapter.

Table 8-3 Effects considered likely to be Significant

Likely Significant Effect	Applicable Stage	Receptors
Embodied Carbon associated with the Product Stages (A1-A3)	Construction	Global Atmosphere
Embodied Carbon associated with Construction (A4-A5)		
Construction Traffic Emissions		
Construction Water Consumption		
Embodied Carbon associated Repair, Maintenance and Refurbishment (B1-B5)	Operational	

Likely Significant Effect	Applicable Stage	Receptors
Operational Energy Emissions (B6)		
Operational Water Consumption (B7)		
Embodied Carbon associated with the End-of-Life Stages C1-C4)	End of Life	

8.4. Legislation, Planning Policy & Guidance

The following legislation have informed the assessment reported within this Chapter and is detailed further in Appendix 8-1.

8.4.1. Legislation

A summary of the relevant legislation is provided below:

- Climate Change Act (2008) and 2050 Target Amendment (Order 2019)⁴⁴;
- Climate Change and Sustainability Energy Act (2006)⁴⁵;
- Energy Act (2013)⁴⁶;
- Environment Act (1995, 2021)⁴⁷.
- EIA Directive (2014/52/EU)⁴⁸;
- Town and Country Planning Regulations Environmental Impact Assessment (EIA) Regulations (2017)⁴⁹; and,
- Infrastructure Planning (EIA) Regulations (2017)⁵⁰.

8.4.2. Planning Policy

8.4.2.1. National

A summary of the relevant national planning policy is provided below:

- National Planning Policy Framework⁵¹;
- The National Adaptation Programme and Third Strategy for Climate Adaptation⁵²;
- The Clean Growth Strategy⁵³; and,

⁴⁴ Climate Change Act 2008 (2050 Target Amendment) Order 2019.

⁴⁵ Change and Sustainable Energy Act 2006.

⁴⁶ Energy Act 2013.

⁴⁷ Environment Act 1995; 2021.

⁴⁸ EIA Directive (2014/52/EU).

⁴⁹ Town and Country Planning (EIA) Regulations (2017).

⁵⁰ Infrastructure Planning (EIA) Regulations (2017).

⁵¹ Ministry of Housing, Communities and Local Government (2024, Updated 2025). National Planning Policy Framework.

⁵² Department for Environment, Food and Rural Affairs (2018). The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting.

⁵³ HM Government (2017). Clean Growth Strategy.

- The Carbon Plan: Delivering Low Carbon Future⁵⁴.

8.4.2.2. Regional and Local

- Wokingham Borough Adopted Core Strategy Development Plan⁵⁵.

8.4.3. Guidance

A summary of the relevant technical guidance is provided below:

- IESP: Assessing Greenhouse Gas Emissions and Evaluating their Significance, with Supplementary Guidance (2026)⁵⁶;
- ISEP: Environmental Impact Assessment Guide to: Climate Change Resilience and Adaption (2020)⁵⁷;
- RICS: Whole life carbon assessment for the built environment version 1 (2017)⁵⁸;
- RICS: Whole life carbon assessment for the built environment version 2 (2023)⁵⁹;
- LETI: Embodied Carbon Primer (2020)⁶⁰;
- LETI: Embodied Carbon Benchmarks (2022)⁶¹; and,
- UKGBC: Net Zero Whole Life Carbon - Consultation Slides & Embodied Carbon Benchmarks (consultation)⁶².

8.5. Assessment Methodology

8.5.1. Greenhouse Gas Assessment

The assessment methodology presented in this chapter draws upon the Institute of Sustainability and Environmental Professionals (ISEP) guidance on ‘Assessing Greenhouse Gas Emissions and Evaluating their significance’. This document provides guidance on how to assess the impact of climate change, within the context of EIA, emphasising the need for proportionality in the context of nation, sector and local Greenhouse Gas (GHG) emissions. It sets out advice to the key components necessary to deliver a robust, appropriate and consistent assessment.

⁵⁴ HM Government (2011). The Carbon Plan: Delivering our Low Carbon Future.

⁵⁵ Wokingham Borough Council. Wokingham Borough Adopted Core Strategy Development Plan Document. (January 2010).

⁵⁶ Institute of Environmental and Sustainability Professionals Assessment (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance.

⁵⁷ Institute of Environmental and Sustainability Professionals Assessment (2020) Climate Change Resilience and Adaptations.

⁵⁸ RICS, 2017. Whole life carbon assessment for the built environment. Professional Statement, 1st ed. Royal Institution of Chartered Surveyors.

⁵⁹ RICS, 2023. Whole life carbon assessment for the built environment. Professional Statement, 2nd ed. Royal Institution of Chartered Surveyors.

⁶⁰ LETI: Embodied Carbon Primer.

⁶¹ LETI: Embodied Carbon Benchmarks (2022).

⁶² UKGBC: Net Zero Whole Life Carbon — Consultation Slides & Embodied Carbon Benchmarks (consultation).

The following six steps outline the framework that has been followed within this assessment of GHG emissions:

- 1) Define the scope and boundaries of the GHG assessment;
- 2) Develop the baseline;
- 3) Determine the emissions calculation methodologies;
- 4) Data collection;
- 5) Calculate and determine the GHG emissions inventory; and,
- 6) Consider mitigation opportunities and assessment of residual effects.

GHG emissions associated with the construction, operation and decommissioning of the Proposed Development are quantified and assessed within this chapter. GHG is assessed using a whole-life approach (i.e. from cradle to grave), including GHG emissions (direct and indirect) and embodied carbon associated with the Proposed Development, to develop a GHG footprint for the Proposed Development.

8.5.1.1. Assessment Scope and Boundaries

The scope of this assessment reflects the whole-life-carbon (WLC) approach throughout the construction and operation of the Proposed Development. Appendix 8-2 presents the modular approach of the life-cycle stages that are used to set the boundaries of this GHG assessment presented in Table 8-4.

Table 8-4 GHG Assessment Boundaries

Development Phase		
Construction	Product Stage (A1-A3)	Emissions released through the extraction and processing of raw materials, manufacturing of products and the transportation of materials to the manufacturing sites (lifecycle stages A1-A3).
	Construction Stage (A4-A5)	Emissions from transporting construction materials, components and equipment to the Site. As well as from on-site construction activities, including any fuel/gas combusting processes and the development of the new structure and supporting infrastructure.
	Construction Traffic	Emissions arising from daily vehicle movements from site personal for the duration of the construction phase.
	Construction Water Consumption	Emissions associated with the construction of the fuel cells and data centre. Upon installation of the

Development Phase		
		fuel cells and IT equipment, water is added to the closed-loop cooling systems.
Operational	Use, Maintenance, Repair and Refurbishment (B1-B5)	Emissions associated with the maintenance and repair of any onsite systems the replacement of any materials. Emissions arising from waste generation onsite (e.g., general waste and mixed recycling).
	Operational Energy (B6)	Emissions associated with the energy consumption of the Proposed Development, i.e., gas fuel cells and electricity. The energy strategy for the office/admin building will be via electricity off the grid and all-electric air source heat pumps. The data centre will be powered by a combination of natural gas fuel cells and electricity.
	Operational Water Use (B7)	Emissions associated with consumption of water by the office and admin building, i.e., water supply and treatment.
	Operational Traffic	Emissions associated with all modes of transport generated by the Proposed Development. Including trips associated with the office building, and maintenance workers for the datacentre.
End of Life	End of Life Stage (C1-C4)	Emissions arising from the deconstruction and demolition of the Proposed Development at the end of its operational lifetime. Including the transportation of materials to waste processing facilities, waste processing (reuse, recovering or recycling) and disposal.

8.5.1.2. Methods of Assessment

The metric for assessing climate change impacts of GHG emissions in this assessment is Global Warming Potential ('GWP'), expressed as tonnes of carbon dioxide equivalent ('tCO_{2e}') in total or per annum. This accounts for six key GHGs: carbon dioxide ('CO₂'), methane ('CH₄'), nitrous oxide ('N₂O'), hydrofluorocarbons ('HFCs'), perfluorocarbons ('PFCs'), and sulphur hexafluoride ('SF₆').

The calculation for determining GHG emissions is based upon the multiplication of relevant emission factors with the activity producing GHG emissions, with the units used to report GHG emissions as tonnes of CO₂ equivalent (tCO_{2e}), for example:

$$\text{Electricity consumed (kWh)} \times \text{electricity emission factor (tCO}_2\text{e per kWh)} = \text{total tCO}_2\text{e}$$

Embodied Carbon calculations have been undertaken using industry benchmarks for embodied carbon and operational carbon (London Energy Transformation Initiative (LETI) and UK Green Building Council (UKGBC) net zero carbon) as well as the industry recognised and approved tool for assessing environmental impacts over a project lifecycle: etoolLCD. This tool aligns with international standards ISO 14044 'Environmental management – Life Cycle Assessment – Requirements and Guidelines' and EN 15978 'Sustainability of Construction works – Assessment of Environmental Performance of Buildings – Calculation Methods'.

Embodied carbon calculations were performed using the latest carbon database available in eToolLCD, the United Kingdom LCI – V20 – Life Cycle Strategies.

The quantification of annual emissions for the assessment is carried out to allow comparison of the Proposed Development's GHG emissions to regional and national annual emissions and targets.

8.5.1.3. Determining Significance of Receptors

GHG emissions arising from the construction and operation of the Proposed Development are considered the key impacts, with the principal receptor being the 'global atmosphere'. The consequence of GHG emissions associated with the Proposed Development is that atmospheric GHG emissions are pushed closer towards their environmental limit, triggering subsequent detrimental effects on the global climate system.

In line with the ISEP (2022) guidance, the sensitivity of the receptor (i.e. the global atmosphere) in relation to GHG emissions is always considered to be 'high', based on the following conclusions:

- Value of the resource: the atmosphere and its role in regulating the global climate is of high ecological, social and economic value and underpins life on the planet, therefore is of global critical value;
- Vulnerability: it is recognised by the Paris Agreement (2015) that the GHG concentrations in the atmosphere are already approaching their environmental limit and the effects of climate change are already evident; and
- Reversibility of the effect: climate change is considered irreversible, with a delayed effect in any actions or technologies employed to reduce concentrations of GHG emissions already in the atmosphere.

8.5.1.4. Determining Level of Effect

In accordance with ISEP guidance (2022) the nature of the effect (i.e. beneficial, or adverse) is determined by whether the GHG emissions contribute positively or negatively to the achievement of climate-related targets and objectives. An effect is generally considered beneficial if it leads to a reduction in GHG emissions or

supports climate change mitigation efforts. Conversely, an effect is considered adverse if it results in an increase in GHG emissions or hinders efforts to mitigate climate change. The following terms have been used to define the level of the effects identified locally and nationally, on a Borough or the UK level, respectively:

- Major effect: where the Proposed Development is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- Moderate effect: where the Proposed Development is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability; or, a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;
- Minor effect: where the Proposed Development is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Development is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and,
- Negligible: where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

The level of effect has been informed by the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and Table 8-5 has been a tool which has assisted with this process.

Whilst Table 8-5 provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'.

Table 8-5 Determining Level of Effect in EIA

		Sensitivity			
		High	Medium	Low	Negligible
Magnitude of change / impact	Large	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

As recommended by ISEP guidance (2022), the magnitude of effect has been considered in relation to the context of where the Proposed Development is located. The GHG emissions generated during the construction, operational and end-of-life stages of the Proposed Development have been considered in the context of CO₂e emissions for Wokingham, Berkshire and the wider UK carbon budgets.

The incremental GHG emissions have been assessed in relation to Wokingham and Berkshire annual emissions (2024, latest available dataset) and the UK's seventh carbon budget. This will place the GHG emissions impact into context and demonstrate its magnitude and level of contribution.

To determine the magnitude of effect of GHG emissions, the criteria detailed in Tables 8-6, 8-7 and 8-9 has been used.

Table 8-6 Magnitude of Effect against Wokingham's annual GHG Emissions

Magnitude of Change (Effect)	Criteria
Major Adverse (Large)	Emissions for Proposed Development above 1% of annual Wokingham emissions (688.1 ktCO ₂ e).
Moderate Adverse (Medium)	Emissions for Proposed Development above 0.1% of annual Wokingham emissions (688.1 ktCO ₂ e).
Minor Adverse (Small)	Emissions for Proposed Development below 0.1% of annual Wokingham emissions (688.1 ktCO ₂ e).
Negligible	Emissions for Proposed Development below 0.01% of annual Wokingham emissions (688.1 ktCO ₂ e).

Table 8-7 Magnitude of Effect against regional annual GHG Emissions

Magnitude of Change (Effect)	Criteria
Major Adverse (Large)	Emissions for Proposed Development above 1% of annual Southeast England emissions (39,149.6.3 ktCO ₂ e).
Moderate Adverse (Medium)	Emissions for Proposed Development above 0.1% of annual Southeast England emissions (39,149.6.3 ktCO ₂ e).
Minor Adverse (Small)	Emissions for Proposed Development below 0.1% of annual Southeast England emissions (39,149.6.3 ktCO ₂ e).
Negligible	Emissions for Proposed Development below 0.01% of annual Southeast England emissions (39,149.6.3 ktCO ₂ e).

Table 8-8 Magnitude of Effect against UK's GHG carbon budget

Magnitude of Change (Effect)	Criteria
Major Adverse (Large)	Emissions for Proposed Development above 1% of the UK's Carbon Budget (535 MtCO ₂ e).
Moderate Adverse (Medium)	Emissions for Proposed Development above 0.1% of the UK's Carbon Budget (535 MtCO ₂ e).
Minor Adverse (Small)	Emissions for Proposed Development below 0.1% of the UK's Carbon Budget (535 MtCO ₂ e).
Negligible	Emissions for Proposed Development below 0.01% of the UK's Carbon Budget (535 MtCO ₂ e).

8.5.1.5. Determining Significance

As recommended by ISEP guidance on 'Assessing Greenhouse Gas Emissions and Evaluating their Significance', the assessment will take a highly precautionary approach where any net increase in GHG emissions is treated as having a likely significant effect.

The guidance sets out in EIA context relative significance descriptors to assist GHG assessments (Beneficial, Negligible, Minor Adverse, Moderate Adverse, Major Adverse), Major or Moderate Adverse and any Beneficial effects are considered Significant. Minor adverse and Negligible effects are considered to be Not Significant.

The levels of significance are not solely based on the Proposed Development's GHG emissions alone, but on the Proposed Developments contribution towards limiting global warming to 1.5°C and the transition towards net-zero.

8.5.1.6. Data Sources

Product Stage

Design drawings and the list of equipment provided by the Applicant were analysed and used as the foundation for deriving the quantities of materials required on the Site. Where specific data and information related to certain materials was not provided, generic data from approved LCA tools such as etoolLCD were used to calculate the embodied carbon emission within the product stage. The Embodied Carbon Assessment is presented in Appendix 8.3, which presents the full breakdown of material inputs.

Construction

GHGs associated with the construction of the Proposed Development include those embedded in the materials used during construction. As well as emissions generated from on-site construction activities including fuel and gas combusting processes and emissions from construction vehicles.

Carbon arising from the energy consumption by on-site machinery during construction was estimated using either (1) LETI benchmarks or (2) eToolLCD default carbon rates and the closest available datasets (3) Manual calculations following RICS guidance for estimating site impacts using Cut and fill estimates, and Gov.uk GHG emissions factors.

Transport

Operational and construction vehicle movements and average distances travelled were provided by the project Transport Consultant (SK Transport). Traffic emissions were calculated using the most current Department for Energy Security and Net Zero (DESNZ) factors provided in Tables 8-9, 8-10 and 8-11.

RICS Professional Statement ('PS') on 'Whole life carbon assessment for the built environment' was used to gather data for the globally manufactured elements.

Table 8-9 Vehicle Movements and Emission Factors – Proposed Development Construction Traffic

Daily Trips		Average Distance Travelled (km/day)	2025 DESNZ Emission Factor	
Mode	Arrivals + Departures			
HGVs*	16	40	0.49944	Rigid HGV (>3.5 - 7.5 tonnes)
LGVs**	433	40	0.25612	Vans - Average (up to 3.5 tonnes), fuel unknown
*Heavy goods vehicles				
**Light goods vehicles				

Table 8-10 Vehicle Movements and Emission Factors – Proposed Development Operational Traffic

Daily Trips			Average Daily Distance Travelled (km)	2025 DESNZ Emission Factor	
Mode	Arrivals	Departures			
Total Vehicles*	77	78	2195	0.16591	Average car - fuel unknown

Daily Trips			Average Daily Distance Travelled (km)	2025 DESNZ Emission Factor	
Mode	Arrivals	Departures			
Cycle Trips	1	2	17	0	-
PSVs**	1	1	12	0.02649	Average local bus
OGVs***	3	3	158	0.49944	Rigid HGV (>3.5 - 7.5 tonnes)
LGVs****	13	13	0	0.25612	Vans - Average (up to 3.5 tonnes), fuel unknown
Motorcycles	1	1	33	0.02956	Motorbike - Average
Service Vehicles	16	16	819	0.25612	Vans - Average (up to 3.5 tonnes), fuel unknown
* Includes cars, van driver and passenger trips ** Public service vehicles *** Ordinary goods vehicles **** Light goods vehicles					

Maintenance, Repair and Refurbishment

Over the lifetime of the Proposed Development, emissions arising from the maintenance, repair and refurbishment of the Proposed Development (B1-B6) were calculated over a lifespan of 60 years, in line with ISEP and RICS guidance.

Appropriate allowances for future material maintenance and repair have been made in accordance with the default rates included in the selected etoolLCD database.

Operational Energy

The operational energy emissions for the office and admin building, and the data centre, were calculated for the proposed gas fuel-cell capacity and grid connection scenarios, using Treasury's Green Book emissions factor projections for both electricity and natural gas.

The Energy Strategy (Ref: 38532-HML-XX-XX-RP-V-800001_P01_Energy Strategy Report, dated 25th September 2026) presents the full methodology for how operational energy emissions were calculated.

Operational Water

There will be no operational water consumption associated with the data centre or fuel cells. Water will be required during the installation of the cooling systems associated with the fuel cells and IT equipment (construction phase). Top-ups of these sealed systems may be required over the operational lifetime of the Proposed Development; however, these are expected to be minimal.

Water usage associated with the fuel cells, is attributed to the construction phase only. Energy servers will be commissioned and energised in groups of 10, requiring 0.25 l/min per energy server and 2.5 l/min (peak) during installation. Following commissioning, water is then regenerated and recycled within the sealed system.

The cooling systems serving the data centre comprise of a mix of air-air cooled chillers, and air-water cooled chillers. The air-water chillers will require water for initial filling on day one (approximately 800 m³ across the Site). Thereafter, they will not require a continuous water supply and will operate as sealed, closed-loop systems. Therefore, no water consumption has been attributed to the operation of the data centre; water demand is limited to the initial filling required during the construction phase.

Operational water emissions associated with water supply and wastewater treatment for the office/administration building were calculated by applying the occupancy density of the building, the relevant benchmark set out in CIBSE Guide G (Office – All Buildings: 55 litres/person/day), and the applicable DESNZ emission factors. The emission factors used are presented in Table 8-11.

Table 8-11 Emission Factors – Water Supply and Treatment

2025 DESNZ Factors (cubic metres)	
Water Supply	0.1913
Water Treatment	0.17088

End of Life

Emissions associated with end-of-life stage have been included to ensure a robust whole-life cycle assessment in accordance with ISEP guidance. An operational lifespan of 60 years has therefore been assumed, as per the principles outlined in BS EN 15978.

The ‘end-of-life’ stage accounts from carbon emissions arising from the deconstruction of the Proposed Development and the processing and disposal of materials (C1-C4).

GHG Emissions associated with building decommissioning of the Proposed Development have been obtained from the embodied carbon calculation using

etoolLCD database, where assumptions have been made, they are aligned with the guidance of section 3.5.4 of RICS Professional Standard: Whole Life Carbon Assessment for the Built Environment, 1st Edition.

8.5.2. Climate Change Resilience Assessment

The Proposed Development's Climate Change Resilience ('CCR') during its operation has also been assessed as part of this ES Chapter. The approach to assessing the potential impact of climate change on the Proposed Development has been undertaken in line with ISEP guidance 'Climate Change Resilience and Adaptation', which presents a framework for the consideration of climate change resilience and adaptation within the EIA process.

The ISEP guidance indicates key steps within the assessment of CCR:

- 7) Pre-EIA Stage: Embedding building climate resilience and adaptation into the project design;
- 8) Scoping climate change adaptation into the EIA;
- 9) Defining the future (climate) baseline;
- 10) Identifying and determining sensitivity of receptors (Vulnerability);
- 11) Reviewing and determining magnitude of the effects;
- 12) Determination of significance;
- 13) Developing additional adaptation and mitigation measures; and
- 14) Post-EIA Stage: Monitoring and Adaptive Management.

The ISEP guidance recommends considering and assessing the 'in-combination' climate impacts as well as the possibility of new significant effects arising throughout the Proposed Developments lifetime. The assessment should assess whether additional effects of future climate impacts will alter the sensitivity or magnitude of the effects, and consequently the significance of effects.

The CCR assessment examines how climate change may pose risk to the Proposed Development in relation to other environmental disciplines with potential significant effects:

- Air Quality;
- Ecology & Biodiversity; and,
- Drainage & Flood Risk.

For each topic listed above, the CCR assessment will aim to:

- Identify and determine sensitivity of receptors;
- Review and determine the magnitude of effect;
- Determine the significance of effect; and,
- Identify appropriate mitigation (adaptation) measures.

The CCR assessment considers whether the effect on receptors by potential impacts of the Proposed Development under the current condition (without climate change) are likely to be different under an alternative future climate baseline. A key aspect of the assessment (for each of the technical topics considered) has been to identify the likely effect of those receptors considered more vulnerable to changes in climate, having taken into account the resilience and adaptive measures proposed for the scheme in order to mitigate the risk presented by climate change.

Due to uncertainty in both the future climate projections and the effect of future climate conditions of receptors, the assessment is qualitative and based on objective professional judgement, unless where there is published, accepted quantifiable methods available. Adaption and resilience measures are also outlined.

8.5.2.1. Determining Significance of Receptors

The CCR aims to identify potential receptors to the effects of future climate change. Potential receptors relevant to the location, nature and scale of the Proposed Development will be identified. These receptor groups may include:

- Buildings and infrastructure (including equipment and building operations);
- Human health receptors (e.g., construction workers and site users);
- Environmental receptors (e.g., habitats and species); and,
- Climatic systems (i.e., the atmosphere).

The sensitivity of the receptors or receiving environment refers to how strongly it responds to change, as well as its ability to adapt to and recover from that change once impacted. In ascribing the sensitivity of receptors in relation to potential climate change effects, the following factors must also be considered:

- Susceptibility of the receptor (e.g., ability to be affected by a change) (opposite of resilience); and,
- Vulnerability of the receptor (e.g., potential exposure to a change).

The susceptibility of a receptor can be determined using the following scale:

- High susceptibility: receptor has no ability to withstand/not be substantially altered by the projected changes to the existing/prevaling climatic factors (e.g., lose much of its original function and form).
- Moderate susceptibility: receptor has some limited ability to withstand/no be altered by the projected changes to the existing/prevaling climatic conditions (e.g., retain elements of its original function and form).
- Low susceptibility: receptor has the ability to withstand/not be altered much by the projected changes to the existing/prevaling climatic factors (e.g., retain much of its original function and form).

The vulnerability of a receptor can be defined using the following scale:

- High vulnerability: receptor is directly dependent on existing/prevaling climatic factors and reliant on these specific existing climate conditions continuing in future or only able to tolerate a very limited variation in climate conditions.
- Moderate vulnerability: receptor is dependent on some climatic factors but able to tolerate a range of conditions.
- Low vulnerability: climatic factors have little influence on the receptors.

There isn't a set matrix for determining receptor sensitivity. Professional judgement is used considering the combination of susceptibility and vulnerability in accordance with ISEP guidance. The greater the susceptibility and vulnerability of a receptor, the higher the sensitivity of the receptor.

8.5.2.2. Determining Level of Effect

A combination of susceptibility and vulnerability in addition to value/importance of the receptor should be used to reach a reasoned conclusion on sensitivity.

The magnitude is the degree of change from the determined baseline conditions which drives from the construction, operation and decommissioning of a development. A combination of probability and consequence should be used to reach a reasoned conclusion on the magnitude of effect. Professional judgement should be applied to assign magnitude.

8.5.2.3. Determining Significance

Once the sensitivity and magnitude have been determined, these should be combined to reach an overall judgement on the significance of the likely environmental effect. As there is no legislative definition of 'significance', the conclusion of whether an effect is significant/the level of significance is down professional judgement of the sustainability consultant evaluating, in conjunction with the EIA Coordinator. An explanation of the outcomes of the assessment should be clearly set out.

The matrix provided with ISEP guidance used to inform the likelihood, magnitude and significance outcomes of the CCR assessment are set out in Table 8-13 and Table 8-14, below. The below matrix has been used with professional judgement to inform the assessment of CCR.

Table 8-12 Likelihood Categories (Source: ISEP Guidance: EIA Guide to: Climate Change Resilience & Adaptation, 2020)

Likelihood Category	Description (probability and frequency of occurrence)
Very high	The event occurs multiple times during the lifetime of the project (60 years), e.g. approximately annually, typically 60 events.

Likelihood Category	Description (probability and frequency of occurrence)
High	The event occurs several times during the lifetime of the project (60 years), e.g. approximately once every five years, typically 12 events.
Medium	The event occurs limited times during the lifetime of the project (60 years), e.g. approximately once every 15 years, typically 4 events.
Low	The event occurs during the lifetime of the project (60 years), e.g. once in 60 years.
Very low	The event may occur once during the lifetime of the project (60 years).

Table 8-13 Consequence Categories (Source: ISEP Guidance: EIA Guide to: Climate Change Resilience & Adaptation, 2020)

Consequence of Impact	Description
Very large adverse	National-level (or greater) disruption to strategic route(s) lasting more than 1 week.
Large adverse	National-level disruption to strategic route(s) lasting more than 1 day but less than 1 week OR Regional level disruption to strategic route(s) lasting more than 1 week.
Moderate adverse	Regional level disruption to strategic route(s) lasting more than 1 day but less than 1 week.
Minor adverse	Regional level disruption to strategic route(s) lasting less than 1 day.
Negligible	Disruption to an isolated section of a strategic route lasting less than 1 day.

Table 8-14 Significance Matrix (Source: ISEP Guidance: EIA Guide to: Climate Change Resilience & Adaptation, 2020)

Measure of Likelihood						
Measure of Consequence		Very Low	Low	Medium	High	Very High
	Negligible	NS	NS	NS	NS	NS
	Minor	NS	NS	NS	S	S
	Moderate	NS	NS	S	S	S
	Large	NS	S	S	S	S
	Very Large	NS	S	S	S	S
Notes: NS = Not Significant, S = Significant						

8.5.2.4. Primary and Tertiary Mitigation

Embedded mitigation measures, set out below will be incorporated throughout the construction and operational phases of the Proposed Development to minimise environmental impacts.

Construction Stage

To reduce emissions during the construction of the Proposed Development a number of measures have been considered for incorporation into the design:

- Selecting materials with low embodied impact, focusing on key elements of the Proposed Development that typically have higher carbon impacts;
- Committing to resourcing construction materials through local supply chains;
- Where possible utilise cut and fill civil engineering techniques, to minimise emissions generated by transporting materials throughout the construction phase; and,
- Select materials with long life and require little maintenance.

A Waste ES Chapter has been prepared which details how materials and waste will be managed to minimise potential GHG emissions, including:

- The amount of excavated material held on site will be minimised;
- Waste during the construction process will be minimised, through waste reduction, material efficiency and waste tracking;
- Waste arising from the construction of the Proposed Development will be managed in accordance with local and national policy and guidance. It shall be managed in accordance with the waste hierarchy; and
- The Proposed Development should adhere to sustainable waste management principles with the objective of reducing and recycling materials either on or off site as far as practicable.

Operational Stage

To reduce emissions during the operation of the Proposed Development a number of embedded mitigation and sustainable design measures have been considered. These are presented in the Sustainability Statement – presented as a standalone document with the planning application and summarised below.

- Passive design seeks to maximise the use of natural sources of heating, cooling and ventilation to maintain thermal comfort levels within the building. Where feasible external features will be included to provide a degree of shading from the sun. It is intended that the building will have the potential to be naturally ventilated via openable windows and vents.
- Fabric efficiency concerns the thermal properties associated with the building fabric and construction. Building fabric will incorporate low U-Values to reduce heat losses; a high level of air tightness is also proposed to control air filtration and further reducing heating demand; and, building fabric will be constructed to avoid thermal bridging and heat loss.
- System efficiency where fans are employed, the specific fan power for these systems will be efficient and target a low power consumption rate.
- Metering: the major energy uses shall be monitored via separate “smart” energy meters with time and temperature zone control.
- Lighting: internal lighting design is intended to be highly efficient and in excess of Building Regulation requirements. It is intended that lighting efficiency shall be in excess of 110 lumens/circuit Watt and predominantly LEDs.
- Ventilation / cooling systems: where practical mechanical ventilation heat recovery will be incorporated into the design help maintain thermal comfort levels. There is potential for the apartments to be naturally ventilated/ purge ventilated via openable windows.

A Framework Travel Plan, produced by SK Transport (project transport consultants), will also be implemented to encourage more sustainable modes of transport for residents and visitors to the Proposed Development.

8.6. Baseline

For the purpose of this assessment a baseline is defined against which the impact of a new project can be compared against. As described within the ISEP guidance, the baseline for the assessment should either be determined based on available data or alternatively to be zero, where data is not available or where no physical development or activity is taking place. The assessment should determine the baseline GHG emissions based on the current existing projects (i.e. energy consumption of building scheduled for deconstruction for a complete redevelopment) and infrastructure (i.e. current operational and use emissions of a road due to be upgraded) within the Site.

8.6.1. Current Baseline

The Site is located at Thames Valley Park, Thames Valley Park Drive, Reading, under the jurisdiction of WBC. The Site currently comprises three office buildings formerly occupied by Microsoft. The surrounding context comprises commercial offices to the north, east and west, and the great western railway line to the south with the River Thames and Caversham Lakes situated further north.

Based on the existing uses on the Site (the existing development) the current baseline GHG emissions associated with operation have been calculated where data is available and an annual carbon footprint for the existing development has been presented.

Baseline emissions associated with the construction phase have been assumed as zero. Baseline emissions associated with repairs, maintenance and refurbishment have also been assumed as zero.

8.6.1.1. Energy Usage

Baseline annual energy usage (Operational Energy (B6)) for the existing development has been calculated using the existing Gross Internal Areas (GIA) and the CIBSE Guide F, as summarised in Table 8-16. Emissions were then calculated using emission factors obtained from current DESNZ data.

Table 8-15 Baseline Conditions – Operational Energy

CIBSE Guide F Benchmark (Kwh/m ² /year)		Usage (kwh/year)	2026 DESNZ Factor (kg tCO ₂ e)		Total tCO ₂ e/year
Electricity	226	5,167,987.20	0.14395	Electricity	743.93
Gas	178	4,070,361.60	0.20199	Natural gas	822.17

8.6.1.2. Water Usage

Baseline emissions associated with the supply and treatment of water (Operational Water (B7)) for the existing development have been calculated using the GIA's for the existing development and the CIBSE Guide G, as summarised in Table 8-16. Emissions were then calculated using emission factors obtained from current DESNZ data.

Table 8-16 Baseline Conditions – Operational Water

CIBSE Guide G Benchmark (l/person/day)		Usage (m ³ /year)	2026 DESNZ Factor (kg tCO ₂ e)		Total tCO ₂ e/year
Water	55	45,905.90	0.1913	Supply	8.78
			0.17088	Treatment	7.84

8.6.1.3. Transport

Vehicle movements associated with the existing development were provided by the project transport consultants (SK Transport). Average distances travelled were calculated using statistics taken from the National Travel Survey 2025. Transport emissions were then calculated using emission factors obtained from current BEIS data for each mode of transport, as set out in Table 8-17 below.

Table 8-17 Vehicle Movements and Emission Factors – Existing Development Operational Traffic

Daily Trips			Average Daily Distance Travelled (km)	2025 DESNZ Emission Factor	
Mode	Arrivals	Departures			
Total Vehicles*	906	1131	28715	0.16591	Average car - fuel unknown
Cycle Trips	53	57	513	0	-
PSVs**	8	8	147	0.02649	Average local bus
OGVs***	12	11	572	0.49944	Rigid HGV (>3.5 - 7.5 tonnes)
Pedestrians	163	161	1195	0	-
Public Transport Users	206	204	23898	0.00897	National Rail
				0.00749	Light Rail and Tram
*Includes cars, van driver and passenger trips.					
**Public service vehicles.					
***Ordinary goods vehicles.					

A summary of all estimated baseline GHG emissions is provided in Table 8-18 below.

Table 8-18 Summary of GHG Baseline emissions

Development Phase		Baseline Emissions (tCO ₂ e/year)	Rationale
Construction	Embodied Carbon – Product and Construction Stages (A1-A5)	0.00	Baseline for construction and demolition is zero.

Development Phase		Baseline Emissions (tCO2e/year)	Rationale
	Construction Traffic	0.00	Baseline for construction and demolition is zero.
Operational	Embodied Carbon – Repair, Maintenance and Refurbishment (B1-B5)	0.00	Conservative assumption. Some materials will be reused and repurposed; however, this figure is not available at this stage and therefore baseline emissions assumed as zero.
	Energy (B6)	1,566	Calculated using existing GIAs, CIBSE Guide F and carbon factors for gas and electricity.
	Water (B7)	17	Calculated using usage existing GIAs, CIBSE Guide G and carbon factors carbon factors for the supply and treatment of water.
	Operational Traffic	1,378	Calculated using vehicle movements provided by SK Transport, average distances travelled and BEIS carbon factors.
End of Life	Embodied Carbon – End of Life (C1-C4)	0.00	Baseline for end-of-life is zero.

8.6.2. Future Baseline

8.6.2.1. Greenhouse Gas

The future baseline assumes that the Proposed Development is not constructed, and therefore the conditions will remain the same as the current baseline.

Some improvements would be anticipated attributed to improvements in GHG emissions, driven by improvements in grid carbon intensity, adoption of cleaner technologies, and the transition to a lower-emission vehicle fleet.

8.6.2.2. Climate Resilience

In line with the ISEP guidance, a baseline has been established and a future climate scenario has been developed using the future climate projections

published by the Met Office (UK Climate Projections (UKCP18)). The results include projections for several variables including annual mean temperatures, annual changes in summer and winter precipitation. Data is provided for different time periods, from 1961 until 2100, under different scenarios with different probability levels within each scenario. In alignment with guidance, a high emissions scenario is used (RCP8.5) for the 2080 future baseline year, considered most relevant to the Proposed Development. The projected change to the range of climatic conditions has adopted the 50% probability level, which is a central estimate adopted given the level of uncertainty associated with predicting the modelled scenarios.

The variations in temperature and precipitation for Southeast England area, where the Site is located, can be seen in the table below. The 'UKCP18 Factsheet: Derived Projections' (August 2022) was used to inform the table and CCR assessment, as it provided an accessible and clear summary and is presented in Table 8-19 below.

Table 8-19 UK Climate Projections for Southeast England following the RCP8.5 Scenario

Variable	Project Change in Trend		
	10 th Percentile	50 th Percentile	90 th Percentile
Temperature (°C)			
Mean Annual Temperature	↑	↑	↑
Mean Summer Temperature	↑	↑	↑
Mean Winter Temperature	↑	↑	↑
Precipitation (%)			
Mean Summer Precipitation	↓	↓	↑ ↓
Mean Winter Precipitation	↑ ↓ ↑ ↓	↑	↑

Temperature

Overall UKCP18 derived projects in the UK for 2°C of global mean warming include:

- The largest warming in the UK will be in the Southeast where summer temperatures may increase another 3 to 4°C relative to present day (1981-2000);
- Median warming will be at least 1 to 2°C throughout the year across the whole of the UK;
- Winter cool days will warm by 1 to 1.5°C across the country, whilst temperatures on warmer winter days increase by less than 1°C; and,
- In summer both hot and cool days warm by 1 to 1.5°C across Scotland and 1.5 to 2°C across England.

For overall UK 4°C of global warming, the changes in pattern include:

- All seasons warm, but summers warmer than winters;
- Summer temperatures rise by another 4 to 5°C in the South of England and 3 to 4°C elsewhere in the country;
- Hot summer days warm by 4.5 to 5°C compared to present day (1981-2000), across much of Southern England, possibly exceeding 5°C in some locations;
- Cooler summer days warm by 4 to 4.5°C across England and up to 5°C in the Southeast. Increases reduce toward to north to under 3°C in the far Northwest of Scotland”
- Cool winter days warm by 2.5 to 3°C across the country; and,
- Warm winter days warm by 2.5 to 3°C in England but by 2 to 2.5°C in Wales and Scotland.

Precipitation

Overall UKCP18 derived projects in the UK for 2oC of global mean warming include:

- Changes are uncertain, but suggest slightly wetter winters and drier summers, with summer drying more in the South; and,
- Dry days in summer have 30% less precipitation in parts of the Southwest.

For overall UK 4oC of global warming, the changes in pattern include:

- Median winter precipitation increases by up to 20% across most of the country;
- Median summer precipitation decreases most in the south with median reductions of up to 20 to 30% across much of the England and Wales;
- Dry summer days decrease in precipitation by up to 50% in summer across much of Southern Wales and England. This drying reducing toward the north to under 20% in Northern Scotland; and,
- The wettest summer days dry by up to 40% on parts of the south coast. This decreases toward zero in the North.

8.7. Impact Assessment

8.7.1. Greenhouse Gas Assessment

The total emissions associated with the construction, operation and decommissioning of the Proposed Development are presented below and compared against local, regional and UK wide carbon budgets.

The GHG assessment has been undertaken based on the approved design and power phasing strategy at the time of submission. The proposed power phasing strategy reflects the availability of energy supply to site, which as resulting effect on the GHG emissions associated with the construction and operation of the Site. *In Phase 1 (2028-2038) this comprises, 49MW nominal capacity (42.5 MW effective capacity) fuel cells and 1.8 MW grid supply energise a partial build out, in Phase 2 60 MW grid connection has been secured which result in the retention of the fuel cells and additional electrical capacity.*

It is acknowledged that the option of a larger 110 MW grid connection, which would allow the removal fuel cells, and the Proposed Development to fully transition to the electrical grid, is being explored. Whilst the GHG calculations have not incorporated this design, this option is discussed in Section 8.7.2.

8.7.1.1. During Construction

Table 8-20 presents a summary of the overall emissions associated with the construction of the Proposed Development compared to local, regional and UK wide carbon budgets.

Table 8-20 Summary of Proposed Development Carbon Footprint – Construction Phase

	Embodied Carbon - Upfront	Traffic Emissions	Water (Fuel Cells and DC Cooling)	Total Construction
Total Proposed Development Emissions (tCO ₂ e)	103,643	6,025	0.17420	109,667
Baseline Emissions (tCO ₂ e/year)	0	0	0	0
Construction Emissions (tCO ₂ e/year)	20,729	1,205	0.03484	21,933
Net Emissions (tCO ₂ e/year)	20,729	1,205	0.03484	21,933
WBC - Annual GHG Emissions (tCO ₂ e)	688,076			

	Embodied Carbon - Upfront	Traffic Emissions	Water (Fuel Cells and DC Cooling)	Total Construction
Proposed Development as % of WBC Emissions	3.0125%	0.1751%	<0.0000%	3.1877%
Southeast - Annual GHG Emissions (tCO ₂ e)	39,149,562			
Proposed Development as % of Southeast	0.0529%	0.0031%	<0.0000%	0.0560%
UK Carbon Budget (tCO ₂ e)	535,000,000			
Proposed Development as % of UK CB	0.00387%	0.00023%	<0.0000%	0.00410%
*Significant effects indicated in bold. WBC (Wokingham Borough Council). CB (Carbon Budget).				

Embodied Carbon – Upfront Stages

The assessment of upfront embodied carbon, i.e., the product (A1-A3) and construction (A4-A5) stages, determined total emissions to be 103,643 tCO₂e. With annual emissions accounting for 3.01% local emissions, 0.05% of regional emissions and 0.003% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, upfront embodied carbon emissions are considered to have a Major Adverse (Significant) effect on local emissions, Minor Adverse (Not Significant) effect on regional emissions, and a Negligible (Not Significant) effect on the UK's carbon budget.

Construction Traffic

The assessment of traffic associated with the construction of the Proposed Development determined total emissions to be 6,025 tCO₂e. With annual emissions accounting for 0.17% local emissions, 0.003% of regional emissions and 0.00023% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, construction traffic emissions are considered to have a Moderate Adverse (Significant) effect on local emissions, and Negligible (Not Significant) effects on regional emissions on the UK's carbon budget.

Water Usage

The assessment of emissions associated with supply of water through during the construction of the Proposed Development determined total emissions to be 0.17 tCO₂e. With annual emissions accounting for 0.00001% of local emissions, and <0.00000% of regional emissions and the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, construction water emissions are considered to have a Negligible (Not Significant) effect on local emissions, regional emissions and the UK's carbon budget.

Construction Phase

The total emissions associated with the construction of the Proposed Development were determined to be 109,667tCO₂e. With annual emissions accounting for 3.18% of local emissions, 0.056% of regional emissions and 0.004% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, total construction emissions are considered to have a Major Adverse (Significant) effect on local emissions, a Minor Adverse (Not Significant) effect on regional emissions and a Negligible (Not Significant) effect the UK's carbon budget.

8.7.1.2. During Operation

Table 8-21 presents a summary of the overall emissions associated with the operation of the Proposed Development compared to local, regional and UK wide carbon budgets.

Table 8-21 Summary of Proposed Development Carbon Footprint – Operational Phase

	Embodied Carbon – In-Use	Energy	Water	Generators	Traffic	Total Operational
Total Proposed Development Emissions (tCO ₂ e)	987,522	8,376,459	518	62,103	9,928	9,436,530
Baseline Emissions (tCO ₂ e/year)	0	1,566	17	0	1,378	2,961
Operational Emissions (tCO ₂ e/year)	16,459	139,608	8.63	1,035	165.46	157,275
Net Emissions (tCO ₂ e/year)	16,459	138,042	-8	1,035	-1,213	154,315

	Embodied Carbon – In-Use	Energy	Water	Generators	Traffic	Total Operational
WBC - Annual GHG Emissions (tCO ₂ e)	688,076					
Proposed Development as % of WBC Emissions	2.3920%	20.062%	0.0012 %	0.1504%	0.176 %	22.243%
Southeast - Annual GHG Emissions (tCO ₂ e)	39,149,562					
Proposed Development as % of Southeast Emissions	0.0420%	0.3526%	<0.000 0%	0.0026%	0.0031 %	0.39%
UK Carbon Budget (tCO ₂ e)	535,000,000					
Proposed Development as % of UK CB	0.00308%	0.02580 %	<0.000 0%	0.0002%	0.0002 %	0.029%
*Significant effects indicated in bold. WBC (Wokingham Borough Council). CB (Carbon Budget).						

Embodied Carbon – In-Use Stages

The assessment of embodied carbon associated with the operation of the Proposed Development, i.e., the repair, replacement and refurbishment of materials, determined total emissions to be 987,522 tCO₂e. With annual emissions accounting for 2.39% local emissions, 0.04% of regional emissions and 0.003% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, in-use embodied carbon emissions are considered to have a Major Adverse (Significant) effect on local emissions, Minor Adverse (Not Significant) effect on regional emissions and a Negligible (Not Significant) effect on the UK's carbon budget.

Operational Energy

The assessment of operational energy emissions of the Proposed Development determined total emissions to be 8,376,459 tCO₂e. With annual emissions

accounting for 20.06% local emissions, 0.35% of regional emissions and 0.02% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, operational energy emissions are considered to have a Major Adverse (Significant) effect on local emissions, Moderate Adverse (Not Significant) effect on regional emissions and a Minor Adverse (Not Significant) effect on the UK's carbon budget.

Water Usage

The assessment of emissions associated with supply and treatment of water through during the operation of the Proposed Development determined total emissions to be 518 tCO₂e. With annual emissions accounting for 0.0012% local emissions and <0.0000% of regional emissions and the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, operational water emissions are considered to have a Negligible (Not Significant) effect on local emissions, regional emissions and the UK's carbon budget.

Back-Up Generators

The assessment of emissions associated with the testing of the diesel-fired back-up generators, determined total emissions to be 62,103tCO₂e. With annual emissions accounting for 0.15% local emissions, 0.0026% of regional emissions and 0.0002% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, back-up generator emissions are considered to have a Moderate Adverse (Significant) effect on local emissions, and Negligible (Not Significant) effects on regional emissions on the UK's carbon budget.

Operational Traffic

The assessment of traffic associated with the operation of the Proposed Development determined total emissions to be 9,928 tCO₂e. With annual emissions accounting for 0.18% local emissions, 0.003% of regional emissions and 0.0002% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, construction traffic emissions are considered to have a Moderate Adverse (Significant) effect on local emissions, and Negligible (Not Significant) effects on regional emissions on the UK's carbon budget.

Total Operation

The total emissions associated with the operation of the Proposed Development were determined to be 9,436,530tCO₂e. With annual emissions accounting for

22.42% of local emissions, 0.39% of regional emissions and 0.028% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, total construction emissions are considered to have a Major Adverse (Significant) effect on local emissions, a Moderate Adverse (Significant) effect on regional emissions and a Negligible (Not Significant) effect the UK's carbon budget.

8.7.1.3. During Decommissioning (End of Life)

Table 8-22 presents a summary of the overall emissions associated with the decommissioning of the Proposed Development compared to local, regional and UK wide carbon budgets.

Table 8-22 Summary of Proposed Development Carbon Footprint – End-of-Life Phase

	Embodied Carbon – In-Use
Total Proposed Development Emissions (tCO ₂ e)	9,226
Baseline Emissions (tCO ₂ e/year)	0
EOL Emissions (tCO ₂ e/year)	154
Net Emissions (tCO ₂ e/year)	154
WBC - Annual GHG Emissions (tCO ₂ e)	688,076
Proposed Development as % of WBC Emissions	0.02235%
Southeast - Annual GHG Emissions (tCO ₂ e)	39,149,562
Proposed Development as % of Southeast Emissions	0.00039%
UK Carbon Budget (tCO ₂ e)	535,000,000
Proposed Development as % of UK CB	0.00003%
*Significant effects indicated in bold. EoL (End of Life). CB (Carbon Budget).	

Embodied Carbon – End-of-Life Stages

The assessment of embodied carbon associated with the decommissioning of the Proposed Development, *i.e.*, the end-of-life stages, determined total emissions to be 9,226 tCO₂e. With annual emissions accounting for 0.022% local emissions, 0.0004% of regional emissions and 0.00003% of the UK's latest carbon budget.

Based on the criteria set out in Tables 8-6, 8-7 and 8-8, and the high sensitivity of the global atmosphere, end-of-life embodied carbon emissions are considered to have a Minor Adverse (Not Significant) effect on local emissions, and Negligible (Not Significant) effects on regional emissions on the UK's carbon budget.

8.7.1.4. Summary

Significant effects have been identified throughout the construction and operational phases of the Proposed Development.

These effects are largely associated with embodied carbon emissions, including upfront emissions associated with IT equipment and fuel cells, as well as the replacement and maintenance of these systems throughout the Proposed Development's lifecycle.

Operational energy emissions are the most significant contributor to the project's carbon footprint. The operational energy emissions were calculated based on the approved power phasing at the time of submission, *i.e.*, Phase 1 (2028-2038) this comprises, 49MW nominal capacity (42.5 MW effective capacity) fuel cells and 1.8 MW grid supply energise a partial build out, in Phase 2 60 MW grid connection has been secured which result in the retention of the fuel cells and additional electrical capacity. However, there is potential for these emissions to be significantly reduced should an the alternative 110 MW grid connection move forward, allowing for the Proposed Development to fully transition to the electrical grid.

Whilst significant effects have been identified, the associated emissions have been contextualised against local and regional annual emissions. As GHG emissions have a cumulative effect and contribute to global climate change irrespective of their source location, the significance of the Proposed Development must also be considered within a broader context.

Data centres are a global asset and a recognised area of growth worldwide. Therefore, the emissions generated by the Proposed Development should also be considered in the context of wider sector emissions.

8.7.2. Carbon Offsetting Options

The utilisation of the fuel cells forms part of a phased energy strategy designed to facilitate the initial occupation and operation of the facility prior to the delivery of permanent utility infrastructure. The Applicant continues to engage with utility providers regarding both 60MW and 110MW grid connection options.

The fuel cells are intended to operate as the primary energy source until 2037, or earlier should lower-carbon grid electricity supplies become available through future enhancements to the national electricity infrastructure. The operational strategy will be reviewed following the implementation of a permanent grid

connection, and details regarding the future role, retention, replacement or decommissioning of the fuel cells will be confirmed through the relevant application process.

Consideration has also been given to sleeving of biomethane into the gas network to reduce emissions associated with grid-supplied natural gas, which has a higher carbon intensity. Under this approach, biomethane is injected into the gas distribution network, displacing an equivalent quantity of fossil natural gas that would otherwise be supplied to the grid.

The carbon emissions associated with the unsecured 132 kV grid connection option and the use of biomethane have been calculated to assess the potential reduction in GHG emissions that could be achieved should these alternative energy scenarios become viable in the future.

110 MW grid connection, with grid-supplied natural gas

Under this scenario, the fuel cells would be decommissioned during Phase 2 once the additional grid capacity has been secured, with the Proposed Development subsequently powered entirely by electricity imported from the grid. This would result in a reduction in operational GHG emissions compared with Design Option 1, due to increased reliance on grid electricity and subsequent reduction in gas consumption.

Overall, a total reduction of **6,725,036 tCO₂e** over the assessment period would be achieved, equivalent to an average saving of **112,084 tCO₂e per year** compared with the proposed power phasing, due to the increased use of grid electricity and reduced gas consumption.

60 MW grid connection, with biomethane sleeving

Under this scenario, the natural-gas fuel cells would be retained throughout Phase 1 and 2, and the Proposed Development would continue to be powered through a combination of fuel cells and grid electricity. The use of sleeving biomethane into the gas network would reduce carbon emissions associated with gas consumption, and, consequently, the overall operational carbon footprint of the Proposed Development.

Overall, a total reduction of **6,463,484 tCO₂e** over the assessment period would be achieved, equivalent to an average saving of **98,325 tCO₂e per year** compared with the proposed power phasing

110 MW grid connection, with biomethane sleeving

Under this scenario, the fuel cells would be decommissioned during Phase 2 and the Proposed Development would be powered entirely by electricity imported from the grid. In combination with sleeving of biomethane, this option would

further reduce emissions associated with the Proposed Development's energy supply.

Overall, a total reduction of **6,725,036 tCO₂e** over the assessment period would be achieved, equivalent to an average saving of **112,084 tCO₂e per year** compared with the proposed power phasing.

Regional Heat Network Connection

The use of waste heat generated by the data centre, and construction of local and regional heat networks, has also been considered. Heat networks reduce demand for heat generated by natural gas boilers in buildings throughout Wokingham and Reading, resulting in associated carbon savings.

The potential offset carbon emissions associated with construction of heat networks for the Thames Valley Park (Micro Heat Network) and Reading (Macro Heat Network), have been estimated and are presented in the Energy Strategy (REF: 38532-HML-XX-XX-RP-V-790001_P01_Energy Strategy Report). Emissions for offsetting the use of gas boilers and low carbon boilers has been calculated. A summary is presented in Table 8-23 below.

Table 8-23 Lifecycle heat network emission reduction calculations

Scenario	Emission reduction – Gas-fired counterfactual (tCO ₂ e)	Emission reduction – Low-carbon counterfactual (tCO ₂ e)
Micro Heat Network	55,529	-
Macro Heat Network - Preferred	559,062	74,066
Macros Heat Network - Extended	888,458	117,706

8.7.3. Climate Change Resilience Assessment

A Climate Change Resilience (CCR) assessment has been undertaken for the Proposed Development, considering the key climate hazards and potential impacts on sensitive receptors. The sensitive receptors considered within the CCR assessment are identified in Table 8.24 below.

The assessment has been undertaken using information available other Technical ES Chapters and planning reports, ISEP guidance and using professional judgement. The matrix for determining likelihood, magnitude and significance used to inform this assessment are taken from ISEP guidance, included within Section 8.5.2.1 of this Chapter.

The findings of the CCR assessment are presented in Table 8.24.

Climate Effect / Event	Receptor	Potential Impact	Adaptation Design Measures / Embedded Mitigation	Likelihood of Effect	Magnitude of Risk (Measure of Consequence)	Significance
UKCP 8.5 Projection: Rising Temperatures						
Increase in mean temperatures (annual and seasonal) Heatwave events	Buildings & Infrastructure	- Increased cooling demand and energy consumption across server halls and ancillary buildings. - Reduced efficiency of cooling infrastructure (HVAC systems, chillers and dry coolers) resulting from elevated ambient temperatures. - Increased risk of server overheating and service interruption where cooling systems become overstretched during extreme heat events. - Accelerated deterioration and reduced lifespan of mechanical and electrical equipment due to prolonged exposure to elevated temperatures. - Increased strain on electrical infrastructure, grid connections, transformers, UPS systems and backup generators due to higher cooling loads. - Increased water demand where water-dependent cooling systems are employed. - Increased operational costs associated with cooling and energy consumption. - Potential disruption of maintenance activities, equipment deliveries and construction activities during heatwave conditions.	- Thermal comfort has been assessed using present and future weather scenarios to inform the building design and ensure resilience to projected increases in summer temperatures (Ref: Energy Strategy; Sustainability Statement). - A resilient energy strategy comprising a secured grid connection, onsite fuel cells and backup generators is proposed to maintain operational resilience during periods of increased cooling demand and electricity consumption associated with elevated temperatures (Design & Access Statement; Energy Strategy; Sustainability Statement). - The location and arrangement of fuel cells and rooftop cooling plant have been refined through the design process to minimise heat interaction between infrastructure components and maintain operational performance during warmer conditions (Design and Access Statement). - Waste heat recovery opportunities have been explored within the energy strategy, including the feasibility of local and regional heat networks. Which would reduce the reliance on gas-powered boilers. - Existing mature trees, woodland and landscaped areas will be retained and enhanced around the Site through the proposed Green Ring landscape strategy, providing cooling benefits and improving resilience to elevated temperatures (Design & Access Statement; Landscape Strategy; Ecological Impact Assessment).	- Increase in mean temperatures (annual and seasonal) - Low to Medium - Heatwave event - Medium to High	- Increase in mean temperatures (annual and seasonal) - Negligible to Minor - Heatwave event - Negligible to Minor	- Increase in mean temperatures (annual and seasonal) - Not Significant - Heatwave event - Significant
	Human Health	Heat stress, fatigue and dehydration affecting operational staff, contractors and construction workers during periods of elevated temperatures.	Thermal comfort has been assessed using present and future weather scenarios to ensure acceptable internal environmental conditions are maintained	Increase in mean temperatures (annual and	Increase in mean temperatures (annual and	Increase in mean temperatures (annual and

Climate Effect / Event	Receptor	Potential Impact	Adaptation Design Measures / Embedded Mitigation	Likelihood of Effect	Magnitude of Risk (Measure of Consequence)	Significance
		•Reduced worker productivity, wellbeing and concentration during prolonged hot weather. •Increased health and safety risks associated with outdoor maintenance activities and construction works. •Poor working conditions within external plant compounds and rooftop equipment areas during extreme heat events. •Disruption to travel and commuting due to overheating of transport infrastructure and reduced comfort when walking, cycling or using public transport. •Increased reliance on cooling systems to maintain safe indoor working environments. •Potential business disruption and emergency response requirements where heat affects critical systems or site operations.	under future climate scenarios (Energy Strategy; Sustainability Statement). •The Proposed Development has been designed to comply with relevant thermal comfort criteria under future climate scenarios, reducing potential overheating effects within occupied areas (Energy Strategy; Sustainability Statement). •Existing and enhanced landscape features, including retained mature trees and woodland areas, will be maintained across the Site, supporting a more resilient outdoor environment during elevated temperatures (Design & Access Statement; Landscape Strategy; Ecological Impact Assessment). •A resilient energy strategy comprising a secured grid connection, onsite fuel cells and backup generators will help maintain building operation and internal environmental conditions during periods of increased electricity demand (Design and Access Statement; Energy Strategy; Sustainability Statement).	seasonal) - Low to Medium • Heatwave event - Medium to High	seasonal) - Minor to Moderate •Heatwave event - Minor to Moderate"	seasonal) - Significant • Heatwave event - Significant "
	Ecology & Environment	•Gradual increases in mean temperatures may alter baseline conditions for existing and proposed habitats, placing thermal and water stress on vegetation, particularly during extended warm periods. •Heatwave events may result in habitat stress and biodiversity loss and increase susceptibility of habitats to pests and disease. •Soil cracking, subsidence and ground instability as a result of moisture loss, potentially resulting in a loss or degradation of habitat quality. •Changes in species behaviour, breeding patterns and food availability as a result of rising annual and seasonal mean temperatures.	•Existing perimeter woodland, mature trees and hedgerows will be retained and enhanced to maintain habitat connectivity and ecological resilience during future periods of elevated temperatures (Design & Access Statement; Landscape Strategy; Ecological Impact Assessment). •The Proposed Development has been designed to retain and strengthen ecological connections with the wider Thames Corridor green infrastructure network (Design & Access Statement; Landscape Strategy; Ecological Impact Assessment). •The scheme will deliver a minimum 10% Biodiversity Net Gain, improving the resilience of habitats and ecological networks to future climate	•Increase in mean temperatures (annual and seasonal) - Low to Medium •Heatwave event - Medium to High	•Increase in mean temperatures (annual and seasonal) - Negligible to Minor •Heatwave event - Negligible to Minor	• Increase in mean temperatures (annual and seasonal) - Not Significant • Heatwave event - Significant

Climate Effect / Event	Receptor	Potential Impact	Adaptation Design Measures / Embedded Mitigation	Likelihood of Effect	Magnitude of Risk (Measure of Consequence)	Significance
		- Increased evapotranspiration during heatwave periods may reduce soil moisture availability, affecting the establishment and long-term resilience of newly planted landscaping and green infrastructure. - Warmer conditions may reduce the effectiveness of some SuDS and green infrastructure features during extended dry periods.	change pressures (Ecological Impact Assessment; Energy Strategy; Sustainability Statement). The layout has been refined to avoid Root Protection Areas associated with TPO protected trees, supporting the long-term retention of established ecological features (Design & Access Statement; Arboricultural Assessment).			
UKCP 8.5 Projection: Wetter Winters (Increased Precipitation %)						
Extreme rainfall events	Buildings & Infrastructure	Flooding of data centre buildings, utility compounds and below-ground infrastructure.	A Sustainable Drainage Strategy will be incorporated into the Proposed Development to manage surface water runoff and improve resilience to more intense rainfall events (Flood Risk Assessment & Drainage Strategy; Energy Strategy; Sustainability Statement).	Extreme rainfall events – Very Low to Low	Extreme rainfall events - Negligible to Minor	Extreme rainfall events - Not Significant
Fluvial flooding		Water ingress affecting server halls, electrical rooms and critical plant areas.	Sustainable Drainage Systems (SuDS) will be incorporated throughout the Site to manage runoff and reduce flood risk associated with future climate change (Flood Risk Assessment and Drainage Strategy; Energy Strategy; Sustainability Statement).	Fluvial Flooding – Very Low to Low	Fluvial flooding - Negligible to Minor	Fluvial flooding - Not Significant
Surface water flooding		Damage to power distribution systems, substations and backup power infrastructure.	A two stage attenuation tank is proposed to control runoff rates to greenfield conditions and provide stormwater attenuation capacity during extreme rainfall events (Flood Risk Assessment and Drainage Strategy).	Surface water flooding – Very Low to Low	Surface water flooding - Negligible to Minor	Surface water flooding - Not Significant.
Groundwater Flood Risk		Disruption to telecommunications and digital connectivity.	Restricted site access preventing maintenance activities, fuel deliveries and emergency response.	Groundwater Flood Risk – Very Low to Low	Groundwater Flood Risk – Negligible to Minor	Groundwater Flood Risk – Not Significant.
Sewer Flood Risk		- Corrosion, material degradation and increased maintenance requirements associated with prolonged exposure to moisture. - Temporary interruption of critical digital services.	- Opportunities for greywater and rainwater reuse will be explored as part of the wider water management strategy (Flood Risk Assessment and Drainage Strategy). - The Green Ring landscape strategy will retain and enhance substantial peripheral landscape areas around the Site, providing additional opportunities for water retention and climate resilience (Design	Sewer flooding – Very Low to Low	Sewer flooding – Negligible to Minor	Sewer flooding – Not Significant

Climate Effect / Event	Receptor	Potential Impact	Adaptation Design Measures / Embedded Mitigation	Likelihood of Effect	Magnitude of Risk (Measure of Consequence)	Significance
			& Access Statement; Landscape Strategy; Ecological Impact Assessment).			
	Human Health	• Health and safety risks to staff, contractors, visitors and delivery personnel during extreme rainfall and flooding events. • Restricted access to and from the Site due to flooding of local roads, public transport disruption and hazardous travel conditions. • Increased risk of slips, trips and falls associated with standing water, waterlogged ground conditions and adverse weather. • Exposure to contaminated floodwaters and associated health risks during flood events. • Delays to maintenance activities, emergency response and evacuation procedures. • Disruption to workforce travel, attendance and day to day operations. • Stress and disruption associated with temporary interruption to site operations and critical services.	• Surface water strategy designed to prevent flooding of operational areas, site access routes and critical infrastructure during extreme rainfall events (Flood Risk Assessment & Drainage Strategy; Design & Access Statement). • Drainage network designed such that flooding does not occur to buildings or critical utility infrastructure during the 1 in 100 year plus 40% climate change event (Flood Risk Assessment & Drainage Strategy). • Safe access and egress maintained through site wide drainage and flood management measures (Flood Risk Assessment & Drainage Strategy; Design & Access Statement).	• Extreme rainfall events – Very Low to Low • Fluvial Flooding – Very Low to Low • Surface water flooding – Very Low to Low • Groundwater Flood Risk – Very Low to Low • Sewer flooding – Very Low to Low	• Extreme rainfall events - Negligible to Minor • Fluvial flooding - Negligible to Minor • Surface water flooding - Negligible to Minor • Groundwater Flood Risk – Negligible to Minor • Sewer flooding – Negligible to Minor	• Extreme rainfall events - Not Significant • Fluvial flooding - Not Significant • Surface water flooding - Not Significant. • Groundwater Flood Risk – Not Significant. • Sewer flooding – Not Significant
	Ecology & Environment	• Soil erosion and top soil run off as a result of flash flooding/surface water flooding resulting in a loss of habitat and carbon release. • Loss of habitat due to waterlogging. • Pollution of habitats and water features due to contaminants during surface water flooding events • physical damage to planted areas, SuDS features and green infrastructure resulting from floodwaters.	• SuDS measures will be incorporated to better manage runoff and reduce flood risk associated with climate change (Flood Risk Assessment & Drainage Strategy; Energy Strategy; Sustainability Statement). • Existing and enhanced landscape areas will be retained across the Site to support surface water management and ecological resilience (Design & Access Statement; Landscape Strategy). • Retention and enhancement of woodland, trees and hedgerows will support habitat resilience during future increases in rainfall intensity (Design	• Extreme rainfall events – Very Low to Low • Fluvial Flooding – Very Low to Low • Surface water flooding – Very Low to Low • Groundwater Flood Risk – Very Low to Low	• Extreme rainfall events - Negligible to Minor • Fluvial flooding - Negligible to Minor • Surface water flooding - Negligible to Minor • Groundwater Flood Risk – Negligible to Minor	• Extreme rainfall events - Not Significant • Fluvial flooding - Not Significant • Surface water flooding - Not Significant. • Groundwater Flood Risk – Not Significant.

Climate Effect / Event	Receptor	Potential Impact	Adaptation Design Measures / Embedded Mitigation	Likelihood of Effect	Magnitude of Risk (Measure of Consequence)	Significance
			& Access Statement; Landscape Strategy; Ecological Impact Assessment). •Additional native woodland planting is proposed along the eastern and western site boundaries to strengthen ecological resilience (Design & Access Statement; Landscape Strategy). •Redundant hardstanding areas will be replaced with planting and habitat creation wherever practicable (Design & Access Statement; Landscape Strategy; Ecological Impact Assessment). •Biodiversity enhancement measures associated with the delivery of a minimum 10% Biodiversity Net Gain will improve the resilience of ecological receptors (Ecological Impact Assessment; Energy Strategy; Sustainability Statement; Landscape Strategy).	• Sewer flooding – Very Low to Low	•Sewer flooding – Negligible to Minor	•Sewer flooding – Not Significant
UKCP 8.5 Projection: Dryer Summers (Reduced Precipitation %)						
Drought Event	Buildings & Infrastructure	•Reduced availability of water resources for cooling systems during prolonged drought conditions. •Reduced efficiency of water-dependent cooling infrastructure resulting in increased energy demand. •Increased operational costs associated with water procurement and cooling requirements. •Potential cooling system performance constraints during periods of severe water stress. •Increased pressure on local water resources and utility infrastructure. •Ground shrinkage and settlement affecting buried utilities, drainage assets and hardstanding areas.	•Greywater recycling is proposed for WC flushing, reducing reliance on potable water supplies during operation (Energy Strategy; Sustainability Statement). •Opportunities for greywater and rainwater reuse for irrigation will be explored during future design stages (Energy Strategy; Sustainability Statement; Flood Risk Assessment & Drainage Strategy). •Leak detection and flow shut-off measures will be incorporated to minimise water losses and improve water efficiency (Energy Strategy; Sustainability Statement). •Water efficiency measures will reduce demand on water infrastructure and improve resilience to future water resource constraints (Energy Strategy; Sustainability Statement).	• Drought events - Medium to High	• Drought events - Negligible to Minor	• Drought events - Significant

Climate Effect / Event	Receptor	Potential Impact	Adaptation Design Measures / Embedded Mitigation	Likelihood of Effect	Magnitude of Risk (Measure of Consequence)	Significance
		•Reduced performance of SuDs features during extended dry periods.	•Landscape proposals incorporate retained and enhanced planting areas around the Site perimeter to support long-term resilience during hotter and drier conditions (Design & Access Statement; Landscape Strategy; Ecological Impact Assessment).			
	Human Health	• Increased heat stress, fatigue and dehydration affecting operational staff, contractors and construction workers during prolonged periods of hot weather. •Reduced worker comfort, wellbeing and productivity during elevated temperatures. •Increased reliance on cooling systems to maintain suitable working environments. •Stress and inconvenience associated with drought restrictions and reduced water availability. •Potential disruption to maintenance operations during extreme heat events. "	• Increased heat stress, fatigue and dehydration affecting operational staff, contractors and construction workers during prolonged periods of hot weather. •Reduced worker comfort, wellbeing and productivity during elevated temperatures. •Increased reliance on cooling systems to maintain suitable working environments. •Stress and inconvenience associated with drought restrictions and reduced water availability. •Potential disruption to maintenance operations during extreme heat events.	• Drought events - Medium to High	• Drought events - Minor to Moderate	• Drought events - Significant
	Ecology & Environment	• Low soil moisture content leading to stress on habitats, trees and vegetation, potentially resulting in loss of habitat quality. •Increased risk of vegetation dieback and reduced resilience of newly planted landscaping during prolonged dry periods. •Reduced water availability within SuDS features and water dependent habitats, affecting their ecological functions. •Changes in species composition and behaviour as a result of prolonged drought conditions.	•Reduced potable water consumption through greywater recycling will lessen pressure on water resources during prolonged dry periods (Energy Strategy; Sustainability Statement). •Opportunities for rainwater and greywater reuse will support more sustainable long term water management (Energy Strategy; Sustainability Statement; Flood Risk Assessment & Drainage Strategy). •Retained and enhanced landscape areas will contribute to maintaining ecological resilience during drought conditions (Design & Access	• Drought events - Medium to High	• Drought events - Negligible to Minor	• Drought events - Significant

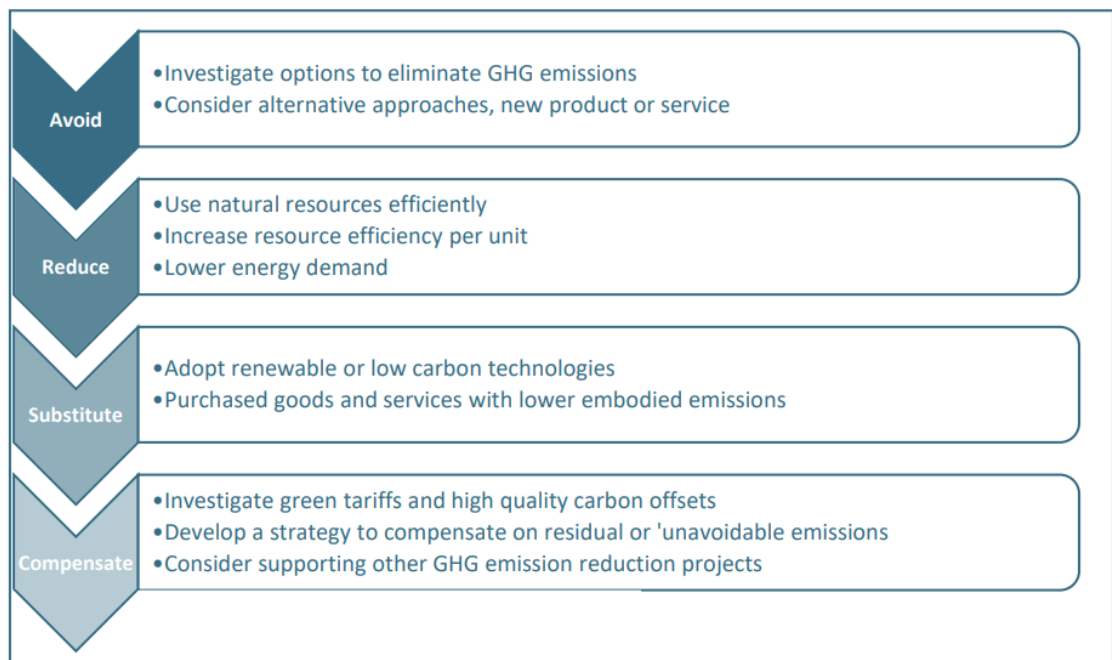
Climate Effect / Event	Receptor	Potential Impact	Adaptation Design Measures / Embedded Mitigation	Likelihood of Effect	Magnitude of Risk (Measure of Consequence)	Significance
			Statement; Landscape Strategy; Ecological Impact Assessment). •The Green Ring landscape framework incorporates retained woodland, new woodland planting and habitat enhancements to improve ecological resilience during prolonged dry periods (Design & Access Statement; Landscape Strategy; Ecological Impact Assessment).			

8.7.3.1. Secondary Mitigation or Enhancement

Greenhouse Gas

It is important to consider measures to reduce GHG emissions as a means to mitigate climate change. The emissions estimated for the Proposed Development may be deemed to be relatively low in relation to the local, regional and UK carbon budgets; however, the sensitivity of the receptor (i.e. the global climate) is considered high, resulting in some Significant Adverse potential effects. This section sets out steps in which the Proposed Development intends to minimise and/or avoid GHG emissions.

It is possible to reduce emissions by following the GHG Management Hierarchal approach (adapted by ISEP) illustrated in Figure 8.1.



The mitigation measures below will be taken into account by the Applicant in order to reduce emissions related to the Proposed Development. These have been split across construction and operational phases.

Construction

In addition to the measures embedded into the design of the Proposed Development, several additional mitigation measures to reduce direct emissions during the construction phase are recommended, these include:

- Use low emission or electric/ hybrid/Stage V compliant plant and equipment;
- Enforce strict no idling policies and optimise plant duty cycles;
- Use cleaner fuels (e.g., sustainably sourced HVO) where appropriate;

- Maintain plant regularly to ensure efficient operation and minimise emissions;
- Minimise generator use; prioritise grid connections and hybrid/battery units;
- Plan efficient site layout and logistics to reduce vehicle movements;
- Provide operator training on efficient machinery use and fuel saving behaviours; and
- Monitor and report fuel use.

Operational

No additional mitigation measures are proposed during the operation of the Proposed Development beyond those identified as primary measures within this Chapter.

Climate Resilience

Construction

No mitigation measures are required.

Operational

The CCR assessment identified some potential significant effects during the operational lifetime of the Proposed Development. Significant effects identified include Heatwave and Drought events.

In addition to the primary measures outlined in Section 8.5.2.4, the following mitigation measures are recommended where feasible to strengthen the resilience of the Proposed Development to heatwave and drought events:

Water efficiency and drought resilience

- Sustainable landscape management: Use native, drought-tolerant plant species throughout the landscape design.

Resilience for infrastructure and operations

- Thermally resilient building materials: Incorporate measures such as high-albedo roofs and reflective coatings.
- Machinery and process resilience: Ensure that critical equipment is rated for higher temperature ranges and protect sensitive electronics using active cooling systems or shading.

Monitoring and emergency response

- Extreme-event response plan: Include procedures for staff safety, equipment shutdowns, welfare measures, and prioritisation of water use during shortages.
- Early warning systems: Integrate Met Office National Severe Weather Warnings into operational decision-making.

8.7.3.2. Residual Effect

Greenhouse Gas

Construction

A summary of the residual effects associated with the operation of the Proposed Development are include below.

- Major Adverse (Significant) (Upfront Embodied Carbon) and Moderate Adverse (Significant) (Construction Traffic) effects on local emissions; and,
- All other construction effects, and effects on regional emissions and the UK's carbon budget, are considered Minor Adverse or Negligible (Not Significant).

Operational

A summary of the residual effects associated with the operation of the Proposed Development are included below.

- Major Adverse (Significant) (In-Use Embodied Carbon; Operational Energy) and Moderate Adverse (Significant) (Generators; Operational Traffic) effects on local emissions.
- Moderate Adverse (Significant) (Operational Energy) effect on regional emissions.
- All other operational effects, and effects on the UK's carbon budget, are considered Minor Adverse or Negligible (Not Significant).

Decommissioning

All effects during the end-of-life stage, on local and regional emissions, and the UK's carbon budget are considered Minor Adverse or Negligible (Not Significant).

Climate Resilience

The assessment of CCR identified some potential significant effects during the operational lifetime of the Proposed Development. Significant effects identified include Heatwave and Drought events on all receptor types (Buildings & Infrastructure, Human Health and Ecology).

Recommendations to further reduce the effects identified throughout the CCR assessment are set out in above in Secondary Mitigation and Enhancements. These measures have not been considered within the assessment of residual effects to present a conservative and robust assessment approach.

8.8. Limitations & Assumptions of Assessment

The limitations and assumptions made within this assessment are presented below.

8.8.1. GHG Assessment

- The metric for assessing climate change impacts of GHG emissions within this assessment is Global Warming Potential (GWP), expressed as tonnes of carbon dioxide equivalent (tCO₂e) in total or per annum. This accounts for six key GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).
- The assessment is based on information available at this stage of development. The use of industry benchmarks and preliminary modelling results have supported the development of the assessment. As the design of the Proposed Development develops and the level of detail increases, the GHG associated with the assessed elements may change.
- The assumed lifespan of the Proposed Development is 60-years in accordance with ISEP guidance and the principles outlined in BS EN 15978. This considers the repairing and replacement of equipment onsite as set out in Section 8.5.1.6.
- The GHG assessment has been undertaken based on the approved design at the time of submission, i.e., the approved 60 MW connection with grid supplied with gas (Option 1). The feasibility of the alternative design options considered within this assessment are still being determined, therefore, these options are presented for comparative assessment purposes only.
- The operational energy assessment assumes that all plant and equipment operate continuously at peak load (100% utilisation). In practice, operational loads are expected to vary over time and be subject to load diversification. This assumption is therefore considered conservative and is likely to result in an overestimation of operational energy demand and associated GHG emissions.
- The operational energy assessment assumes that all plant and equipment will be fully built out on day one, in reality the construction will be phased. This assumption is therefore considered conservative and is likely to result in an overestimation of operational energy demand and associated GHG emissions.
- The operational energy assessment incorporates diversification factors to allow for varying reliability of the fuel cells (5%) and electricity from the grid (25%).
- It is important to note that the electricity emission (carbon) factors change on an annual basis, with factors lowering year on year as the grid transitions to cleaner methods of generating energy. This has been considered when calculating the operational carbon of the Proposed Development.
- The emissions associated with the testing of the back-up diesel-fired generators has been included. A testing regime of 1-hour a month per unit has been assumed as confirmed by the project MEP consultant (Tyréns Hilson Moran).
- The technology associated with the systems and processes on site is rapidly changing in performance and embodied carbon content, therefore quantifying

embodied emissions at this stage associated with the fuel cells and IT equipment is an estimate that will continue to evolve.

- Vehicle movements were provided by the project transport consultant (SK Transport). Average distances travelled for operational modes of travel were calculated using statistics from the National Travel Survey 2025. Average distances travelled for construction vehicles were assumed based on site locale.
- The assessment presents total carbon emissions generated throughout the construction, operation and end-of-life phases of the Proposed Development (over a 60-year period). The annual carbon footprint of each stage has been contextualised against local (Wokingham) and regional (Reading) emissions, and the UK's 7th Carbon Budget. Annual emissions from 2024 have been used in the comparison of local and regional emissions as this is the most recent dataset (released in June 2026).
- The emissions from the construction stage have been annualised using the duration of the construction programme (5 years, inclusive of Phase 1 and Phase 2). The emissions from the operational and end-of-life stages have been annualised using the operational lifetime (60 years).
- The assessment is based on information available at this stage of development. The use of industry benchmarks and preliminary modelling results have supported the development of the assessment. As the design of the Proposed Development develops and the level of detail increases, the GHG associated with the assessed elements may change.

8.8.2. Climate Change Resilience

- The UK Climate projections have been used with the CCR assessment in line with UKCP18 modelling, which assumes different Representative Concentration Pathways ('RCP'). This CCR follows the RCP 8.5 which is the highest-impact scenario and therefore takes a worst-case approach. It is important to note that because the assessment is based on projections and modelling, fluctuations are expected and therefore uncertainties are inherently present within the modelling and CCR assessment.
- The assessment takes a long-term view approach and therefore, the receptor types considered within the assessment may be more broadly defined, as opposed to other ES Chapters that are more specific in the receptors identified.
- The mitigation measures proposed within this CCR assessment are provided as advisory and as non-committing recommendations. It is not stipulated by policy the requirement for a Climate Change Adaptation Plan nor the requirement for monitoring the Proposed Development's resilience over time. Therefore, the advised mitigation measurements are not mandatory but should be considered for best practice and long-term resilience.
- The assumptions made within the Embodied Carbon Assessment are included within Appendix 8-3.

8.9. Interrelationship Effects

The assessment of GHG has considered the relationship with other environmental topics assessed within this Environmental Statement.

The generation of GHG emissions has the potential to result in indirect environmental effects associated with climate change, including impacts on air quality, biodiversity, water resources, land use and soil function.

Table 8-24 Summary of Interrelationship Effects

Environmental Topic	Relationship with GHG Assessment
Biodiversity	Climate change resulting from GHG emissions has the potential to affect habitats, species distributions and ecosystem resilience. Measures to reduce GHG emissions may therefore contribute to limiting indirect effects on biodiversity.
Air Quality	The sources of GHG emissions, such as construction plant, vehicles and operational energy use, may also generate air pollutants. Whilst assessed separately, both topics are intrinsically linked through common emission sources and mitigation measures.
Noise and Vibration	Construction plant, equipment and vehicle movements that generate noise and vibration also consume fuel and contribute to GHG emissions. The relationship is therefore associated with common project activities and energy use.
Land Contamination and Ground Conditions	Earthworks, excavation, remediation activities and the transport of materials require energy and can generate GHG emissions. Efficient use of materials and minimisation of earthworks can reduce both carbon emissions and impacts on ground conditions.
Water Resources	Climate change associated with GHG emissions may influence rainfall patterns, drought frequency and flood risk, potentially affecting water resources. Measures that reduce GHG emissions may contribute to reducing long-term climate-related pressures on the water environment.
Waste and Materials	The production, transportation and disposal of materials are associated with embodied carbon and GHG emissions. Waste reduction, reuse and recycling can minimise resource consumption and reduce life-cycle GHG emissions associated with the Proposed Development.

vehicle movements, emissions, noise, vibration and the handling of potentially contaminated materials. These effects are not assessed within this Chapter, as

they are considered within the relevant technical chapters of the Environmental Statement and other standalone reports.

8.10. Cumulative Impacts Assessment

A GHG assessment has been undertaken to assess the potential for GHG from the construction, operational and end-of-life stages of the Proposed Development. GHGs are gases in the atmosphere which have the potential to increase air temperatures and contribute towards climate change. It is important to note that all GHG emissions have the potential to result in a cumulative effect in the atmosphere over long periods of time.

All GHG emissions are described as significant in accordance with the relevant guidance for the assessment of GHGs as part of the EIA process. This does not mean that the contribution of GHG emissions from the Proposed Development alone will equate to a likely significant effect; for the majority of development projects, the individual contribution to total GHG emissions (relative to a national and global scale) will be minimal.

Therefore, it is important to acknowledge that GHG impacts are considered to be exclusively cumulative impacts because no single project makes a significant contribution to global climate change. The assessment of significance is based on whether a project's GHG emissions cumulatively represent a considerable contribution to the global atmosphere.

8.11. Summary and Conclusion

Table 8-24 provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter.

The table only provides a summary of the residual effects identified within the assessment and details of all primary, secondary and tertiary mitigation that has been taken into account is set out in detail within the Chapter.

Table 8-25 Summary of Receptors, Likely Significant Impacts, Mitigation Measures and Residual Effects – GHG Assessment

Receptors	Likely Significant Impact	Additional Mitigation Measures	Residual Effect
Construction Phase			
Global Atmosphere	Upfront Embodied Carbon	-	Major Adverse (S) (Local CB); Minor Adverse (NS) (Regional CB); Negligible (NS) (UK CB)

Receptors	Likely Significant Impact	Additional Mitigation Measures	Residual Effect
	Traffic Emissions	Implement measures to reduce direct emissions.	Moderate Adverse (S) (Local CB); Negligible (NS) (Regional & UK CB)
	Water Usage	-	Negligible (NS) (Local, Regional & UK CB)
Operational Phase			
Global Atmosphere	In-Use Embodied Carbon	-	Major Adverse (S) (Local CB); Minor Adverse (NS) (Regional CB); Negligible (NS) (UK CB)
	Operational Energy	-	Major Adverse (S) (Local CB); Moderate Adverse (S) (Regional CB); Minor Adverse (NS) (UK CB)
	Water Usage	-	Negligible (NS) (Local, Regional & UK CB)
	Back-up Generators	-	Moderate Adverse (S) (Local CB); Negligible (NS) (Regional & UK CB)
	Traffic Emissions	-	Moderate Adverse (S) (Local CB); Negligible (NS) (Regional & UK CB)
Decommissioning Phase			
Global Atmosphere	End-of-Life Embodied Carbon	-	Minor Adverse (NS) (Local CB); Negligible (NS) (Regional & UK CB)

The assessment of CCR identified some potential significant effects during the operational lifetime of the Proposed Development. Significant effects included heatwave and drought events. Additional mitigation measures to strengthen the resilience of the Proposed Development to heatwave and drought events are recommended.

Table 8-26 Summary of Receptors, Likely Significant Impacts, Mitigation Measures and Residual Effects – CRC Assessment

Receptor	Likely Significant Impact	Additional Mitigation and Monitoring	Residual Effects
Buildings & Infrastructure	Increase in Mean Temperature	-	Not Significant
	Heatwave	-	Significant (Adverse)
	Extreme Rainfall	-	Not Significant
	Fluvial Flooding	-	Not Significant
	Surface Water Flooding	-	Not Significant
	Drought	-	Significant (Adverse)
Human Health	Increase in Mean Temperature	-	Not Significant
	Heatwave	-	Significant (Adverse)
	Extreme Rainfall	-	Not Significant
	Fluvial Flooding	-	Not Significant
	Surface Water Flooding	-	Not Significant
	Drought	-	Significant (Adverse)
Ecology & Natural Environment	Increase in Mean Temperature	-	Not Significant
	Heatwave	-	Significant (Adverse)
	Extreme Rainfall	-	Not Significant
	Fluvial Flooding	-	Not Significant
	Surface Water Flooding	-	Not Significant
	Drought	-	Significant (Adverse)

9. Water Resources

9.1. Introduction and Key Issues

This chapter reports the outcome of the assessment of effects arising from the Proposed Development on Water Resources.

This Chapter describes the assessment methodology, the baseline conditions at the Application Site and surrounding area, a summary of the likely significant effects, the mitigation measures required to prevent, reduce or offset any significant negative impacts, and the likely residual impacts after these measures have been employed.

This Chapter (and its associated figures and appendices) should be read together with the introductory Chapters of this ES (Chapters 1-5), as well as Chapter 12: Summary of Residual Effects. This Chapter is accompanied by the following appendices:

- Appendix 9.1 – Planning Policy, guidance and industry standards
- Appendix 9.2 – Flood Risk Assessment and Drainage Strategy report

9.2. Experience

Matt Lai is a Civil Engineer at Arup. He has over 4 years of technical experience within the Civil Engineering industry, specialising in the design of drainage systems and data centre infrastructure. He has a MEng in Civil Engineering and is a Graduate Member of the Institute of Civil Engineers (GMICE).

The reviewer of this Chapter is Edie Hatter, a Senior Civil Engineer at Arup with 8 years of experience in flood risk, drainage and water management. Edie is a Chartered Water and Environmental Manager (C.WEM) and a member of the Chartered Institution of Water and Environmental Management (CIWEM). Edie has led and contributed to the preparation of Flood Risk Assessments, Drainage Strategies and associated technical studies for a range of major infrastructure and development projects across the UK. Edie has delivered six Environmental Impact Assessments and has significant experience in assessing flood risk, surface water drainage, climate change resilience and water environment effects to support planning and consenting applications.

Consultation

Table 9-1 provides an overview of consultation that has been undertaken to inform the Proposed Development and EIA, including the consideration of likely significant effects and the methodology for assessment. Consultation has been carried out via email correspondence.

Table 9-1 Summary of Consultation

Body/Organisation	Contact	Date and Form of Consultation	Summary
Thames Water	Long Tran (Adoptions Engineer)	Pre-development application process	Consultation ongoing with Thames Water to agree discharge rates to the existing sewer network

9.2.1. Scope of Assessment

The assessment has been proportionately scoped to address environmental topics for which there is potential for likely significant effects, while demonstrating that other topics can be scoped out where appropriate.

Table 9-2 Topic Specific Assessment Scope

Potential Effect	Scoped in/out	Justification
Detrimental impact on receiving water body/downstream network	In	Surface Water Drainage will contribute discharge to an existing Thames Water Utilities Limited (TWUL) network.
Insufficient capacity in the foul network	In	Domestic and Industrial foul water will be produced by the Proposed Development. This will contribute discharge to an existing TWUL network.
Detrimental impact on groundwater quality and increase flooding	In	A section of site encompasses a principal aquifer that may support water supply / river base flow on a strategic scale. Construction activities pose a hazard to site water quality. The Proposed Development has operational substances that will negatively impact the water quality if not contained appropriately.
Increase in pluvial flooding	In	Proposed Development site consists predominantly of impermeable hardstanding and building roofs that have a high surface water runoff rate.
Increase in tidal and fluvial flooding	Out	The Proposed Development is in a Flood Zone 1 area and no flood defence infrastructure within the vicinity of the Site. Therefore, risk of tidal and fluvial flooding is low

Potential Effect	Scoped in/out	Justification
Increase in demand on the potable water network	Out	The Proposed Development will predominately use air based cooling. Any water based cooling elements will operate as sealed, closed-loop systems, with only limited water required for filling and occasional top ups. No discharges to watercourses are proposed. As such, the operational water use is anticipated to be negligible and unlikely to place a material demand on local potable water resources.
Increase in demand on the potable water network from building users	Out	The worker population for the operation of the data centre will be significantly lower than the worker population. Therefore, Proposed Development potable water demand will be lower than existing buildings. Existing potable water connection from Thames Water to be retained.

9.2.1.1. Effects Not Considered to be Significant

The following effects were not considered significant and are not considered further in this Chapter:

- Potable Water
- Fluvial and Tidal flooding
- Building water demands

9.2.1.2. Effects Considered Likely to be Significant

Table 9-3 outlines the effects were considered likely to be significant and have been assessed and reported within this Chapter:

Table 9-3 *Effects considered likely to be Significant*

Likely Significant Effect	Receptors	Applicable Stage
Detrimental impact on receiving water body/downstream network	TWUL network	Construction and Operation
Insufficient capacity in the foul network	TWUL network	Construction and Operation
Detrimental impact on groundwater quality and increase flooding	Upper and lower aquifers	Construction and Operation

Likely Significant Effect	Receptors	Applicable Stage
Increase in pluvial flooding	Existing local population and infrastructure affected by a change in flood risk	Construction
	Proposed Development and its occupants	Operation

9.3. Legislation, Planning Policy & Guidance

9.3.1. Legislation

The following legislation have informed the assessment reported within this Chapter:

- Water Framework Directive⁶³
- Water Resources Act (1991)⁶⁴

9.3.2. Planning Policy

The following planning policies have informed the assessment reported within this Chapter:

- National Planning Policy Framework (NPPF)⁶⁵
- Planning Practice Guidance (PPG)⁶⁶
- Wokingham Borough Core Strategy⁶⁷
- WBC Development Plan: Adopted Managing Development Delivery Plan⁶⁸
- WBC Strategic Flood Risk Assessment (SFRA)⁶⁹

9.3.3. Guidance

It is considered best practice to follow adoptable standards for drainage systems, where appropriate. The following sources are considered to form the body of industry best practice:

- BS EN 752:2017 Drain and sewer systems outside buildings – Sewer system management⁷⁰.

⁶³Water Framework Directive (2017/407 and 2000/60/EC)

⁶⁴Water Resources Act (1991)

⁶⁵Ministry of Housing, Communities and Local Government. NPPF (August 2026).

⁶⁶Ministry of Housing, Communities and Local Government. Planning Practice Guidance (September 2026).

⁶⁷Wokingham Borough Core Strategy (Adopted 29 January 2010, reviewed October 2023).

⁶⁸Wokingham Borough Council Development Plan: Adopted Managing Development Delivery Plan (February 2014).

⁶⁹Wokingham Borough Council (WBC) Strategic Flood Risk Assessment (SFRA) (2020).

⁷⁰BS EN 752:2017 Drain and sewer systems outside buildings – Sewer system management (2017).

- Sewerage Section Guidance Appendix C – Design and Construction Guidance approved version 2.2⁷¹.
- DEFRA Non-Statutory Technical Standards for Sustainable Drainage Systems⁷².
- The SuDS Manual, CIRIA C753⁷³.
- Building Regulations Part H: Drainage and Waste Disposal⁷⁴.

9.4. Assessment Methodology

This ES chapter presents an assessment of the potential impacts and associated likely effects of the Proposed Development on flood risk, groundwater, surface water runoff, including rate and water quality. The assessment also takes into consideration the potential effects of the Proposed Development on the capacity of the foul and surface water drainage networks.

This ES chapter describes the methods used to assess the potential effects of the Proposed Development and the relevant baseline conditions currently existing at the Site and surrounding area. The potential effects of the Proposed Development are assessed, and the likely significant residual effects determined, considering mitigation measures that are required to prevent, reduce or offset any likely significant adverse effects identified.

In line with the Institute of Sustainability & Environmental Professionals ('ISEP') (formally IEMA) guidance, the climate change considerations within the assessment have been accounted for as part of the Future Baseline. In line with NFFP guidance, the surface water drainage system on the Site will be designed to accommodate flows from storms up to a 1 in 100 year event including 40% allowance for climate change by providing sufficient on site attenuation so that there is no flooding generated for storms of this intensity and duration.

9.4.1. Define the Study Area

The study area for this assessment has been defined by based on the sensitive receptors that are adjacent and in close proximity to the Site, these include:

- The Site (within the redline planning boundary)
- Proposed Development access road

The study area has been defined on the basis of hydrological and hydrogeological connectivity rather than arbitrary distance thresholds, ensuring all receptors with a credible impact pathway have been considered.

9.4.2. Data Sources

The following data sources have been used to inform the assessment:

⁷¹ Sewerage Section Guidance Appendix C – Design and Construction Guidance approved version 2.2 (29 June 2022).

⁷² DEFRA Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015).

⁷³ The SuDS Manual, CIRIA C753 (2015).

⁷⁴ Building Regulations Part H: Drainage and Waste Disposal (2010).

- Site-specific Groundsure survey (received August 2025), which provides environmental, geological and historical data.
- Topographical Survey by PRE Chartered Surveyors identifying surface water drainage infrastructure in the Proposed Development access road.
- Asset Location Search maps and sewer records provided by TWUL of local foul and surface water drainage.
- Reading Borough Council – Water Quality Assessment Update (ref. 332611529).
- Thames Water - Water Resources Management Plan (2024).
- Site Specific Flood Risk Assessment and Drainage Strategy report (2026)
- Greenfield runoff rate and Attenuation Storage estimate calculations (2026)
- Phase II Site Investigation Report (2026)

9.4.3. Identification of Receptors

The following receptors have been identified and will be assessed for both the construction and operational phases of the Proposed Development.

Category	Receptor	Sensitivity	Reason for Selection
Surface Water Drainage	TWUL sewer	High	The Proposed Development will discharge surface water runoff to the existing TWUL network.
Foul Water Drainage	TWUL sewer	High	The Proposed Development will generate foul water flows requiring connection to the existing TWUL foul sewer network.
Water quality	Water bodies (River Thames and Caversham Lakes)	Low	There is not a water body within 600m of the Proposed Development, therefore, water bodies have been scoped out of the assessment.
Groundwater quality	Upper aquifer	Medium	Permeable layers support water supplies at a local rather than strategic scale and are classified as minor aquifers. There is a groundwater abstraction licence point within 500m of the Site boundary.
	Lower aquifer	High	A section of site encompasses a principal

Category	Receptor	Sensitivity	Reason for Selection
			aquifer that typically provides a high level of water storage and may support water supply / river base flow on a strategic scale
Groundwater and surface water flooding	Existing local population and infrastructure affected by a change in flood risk	Medium	The Site is in a Flood Zone 1 area. The Site has a moderate risk of groundwater flooding. There is a high-risk river and coastal flooding zone 509m from the Site boundary. There are no areas acting as flood storage within 250m of the Site.
	Proposed Development and its occupants	Medium	The Site is in a Flood Zone 1 area. The Site has a moderate risk of groundwater flooding. There is a high-risk river and coastal flooding zone 509m from the Site boundary. There are no areas acting as flood storage within 250m of the Site.

9.4.4. Assessment Process

A source, pathway receptor model has been adopted for this assessment in line with industry best practice. A source pathway receptor model is used to describe hazard risk. The source is defined as where the hazard comes from; the pathway describes how the hazard travels from the source to the receptor, and the receptor is what is affected by the hazard.

9.4.4.1. Enabling and Construction

The assessment covers potential impacts relating to the enabling works and construction of the Proposed Development and looks at the range of activities which will take place during the construction period that could have a potential impact on receptor, and the standard measures which are put in to protect receptors and mitigate any adverse effects. If an effect is deemed adverse, then appropriate mitigation measures have been recommended to minimise any negative impact.

The potential impacts and associated likely effects have been considered for the following aspects of the Proposed Development:

- Foul and surface water drainage;
- Groundwater quality; and
- Tidal, fluvial, pluvial and groundwater flooding

9.4.4.2. Operational Phase

The assessment covers potential impacts relating to the operation of the Proposed Development once construction has been completed. The impacts resulting from the Proposed Development will be permanent.

The potential impacts and associated likely effects relating to phasing have been considered for the following aspects of the Proposed Development:

- Foul and surface water drainage;
- Groundwater quality; and
- Tidal, fluvial, groundwater and surface water flooding

9.4.5. Reporting of the Environmental Effect and Significance Criteria

The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account the construction and operational stages. The following sections define the approach adopted within the assessment for the determination of sensitivity (or value / importance), magnitude of change / impact, the level of effect and significance.

9.4.5.1. Determining Sensitivity of Receptor

The sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.

Using this approach, receptors are characterised in terms of their sensitivity and their value. The sensitivity of a receptor refers to its ability to absorb change/impact without the baseline being altered. Its value is its importance on a local, regional or national scale or its rarity. Value may be indicated by status afforded through legislation and/or policy. The definitions for the value/sensitivity of a receptor, with specific examples for particular aspects of the water environment, are shown in Table 9-4 **Error! Reference source not found..**

Table 9-4 Definition of Receptor Sensitivity / Value

Value/ Sensitivity of Receptor	Criteria	Flood Risk	Water body	Drainage	Water Supply
High	Feature with a high quality and/or rarity. The receptor is of international or national importance and may be protected by legislation. The receptor is sensitive to change with no ability to absorb impacts without changing the baseline. There may already be existing pressures on the receptor, such that a small shift compared to the baseline could result in significant/permanent change.	Flood Zone 3b – Functional floodplain	Current or target waterbody status identified as high by River Basin Management Plan (RBMP)	Strategic regional off-site sewerage networks	Strategic regional off-site water supply networks
Medium	Feature with a medium quality and/or rarity. The receptor is of national or regional importance and may be protected by legislation. The receptor has limited ability to absorb changes to the baseline without compromising its value. There may already be existing pressures on the receptor, such that a moderate shift compared to the baseline could result in significant/permanent change.	Flood Zone 3a – High probability of flooding	Current or target waterbody status identified as good by RBMP	Regional off-site sewerage networks	Regional off-site water supply networks

Value/ Sensitivity of Receptor	Criteria	Flood Risk	Water body	Drainage	Water Supply
Low	Feature with a low quality and/or rarity. The receptor is of regional or local importance. It may be protected by regional or local policy. The receptor has a moderate ability to absorb change without its value being compromised. Existing pressures are such that a shift compared to the baseline will not cause significant/permanent change to the receptor.	Flood Zone 2 – Medium probability of flooding	Current or target waterbody status identified as moderate, poor or bad by RBMP	Local off-site drainage	Local off-site water supply networks
Very Low	Feature with a very low quality and/or rarity. The receptor is only of local importance. The receptor is able to absorb impacts without resulting in changes to the baseline that affect its value.	Flood Zone 1 – Low probability of flooding	Current or target waterbody status identified as poor by RBMP, or feature is not defined as a waterbody under the Water Framework Directive	No local on-site sewerage network present	No local on-site water supply network present

9.4.5.2. Determining the Magnitude of Change

The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of "High", "Medium", "Small" or "Negligible".

The magnitude of impact is related to the scale, extent and persistence of the impact on a receptor. The criteria for defining the potential impacts represent the anticipated nature of change in the environment, compared to the baseline, and the effects of the impact upon a sensitive receptor. The criteria are set out in Table 9-5.

Table 9-5 Criteria Defining Magnitude of Impact

Magnitude of Impact	Criteria
High	Permanent change over the whole development area and beyond (i.e. strategic or regional scale) to key characteristics or features of receptor. Noticeable change in the baseline condition. Effects certain or likely to occur.
Medium	Permanent or temporary change, over the majority of the development area and potentially beyond, to key characteristics or features of the receptor. Noticeable change in the baseline condition. Effects certain or likely to occur.
Low	Permanent or temporary (during the project duration) change, over a limited/local area, to key characteristics or features of the receptor. Effects would possibly occur.
Negligible	Permanent or temporary (for part of the project duration) change, or barely discernible change for any length of time, over a small area, to key characteristics or features of receptor. Effects unlikely or rarely to occur.

9.4.5.3. Determining the Level of Effect

The level of effect has been informed by the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and Error! Reference source not found. has been a tool which has assisted with this process.

Whilst Table 9-6 provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'.

Table 9-6 Background studies / surveys / evaluations / analysis

		Sensitivity (or Value/Importance)			
		High	Medium	Low	Negligible
	Large	Major	Moderate to Major	Minor to Moderate	Negligible

		Sensitivity (or Value/Importance)			
		High	Medium	Low	Negligible
Magnitude of change / impact	Medium	Moderate to Major	Moderate	Minor	Negligible
	Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

The following terms have been used to define the level of the effects identified and these can be 'beneficial' or 'adverse':

- Major effect: where the Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- Moderate effect: where the Proposed Scheme is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;
- Minor effect: where the Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and
- Negligible: where the Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

9.4.5.4. Determining Significance

For each residual effect, a statement has been made as to whether the level of effect is 'Significant' or 'Not Significant'. This determination has been based on professional judgement and / or relevant guidance/legislation where applicable.

Significance has only been concluded for residual effects (i.e., following the identification of secondary mitigation).

9.4.5.5. Primary and Tertiary Mitigation

This section outlines the primary and tertiary mitigation for both the construction and operational stage to reduce the residual effect on the identified receptors.

Construction Stage

There are no effects that require mitigation or monitoring above the best practice measures already proposed. All works would be carried out in consultation with regulators / authorities with the relevant permits in place prior to the commencement of works. All measures should be clearly set out in the Construction Environmental Management Plan (CEMP). These include:

- Storage tank/contained facilities would be appropriately bunded within designated areas to reduce the likelihood of spills occurring;
- Use of silt treatment measures;
- Appropriate temporary drainage measures to surface water runoff and contain silt/contaminants;

Operational Stage

The following primary and tertiary mitigation which has been evaluated as part of the operational stage assessment is outlined below:

- The Applicant should undertake consultation with TWUL and commission TWUL to undertake a detailed network impact study
- Surface water discharge rate into the TWUL network to be controlled and is subject to an agree rate with TWUL following further consultation
- Petrol interceptors to be incorporated into the surface water drainage network to maintain water quality discharge to the TWUL sewer.
- High-risk oil / petrol leak catchments to include appropriate bunding
- A glycol strategy is so be included to manage the containment in the event of a glycol leak.
- Appropriate licenses to be obtained from the relevant regulatory bodies for the discharging of both foul drainage and surface water drainage.

9.5. Baseline

Table 9-7 summarises all studies / surveys / analysis / evaluations undertaken to inform the assessment presented within this Chapter.

Table 9-7 Background studies / surveys / evaluations / analysis

Study / survey / analysis / evaluation	Overview	Date of completion
Site-specific Groundsure survey (ref: GS-S49-8F4-M1M-8O2)	Studies on site flood risk, existing hydrology, hydrogeology, aquifers, and abstractions	August 2025
Topographical Survey by PRE Chartered Surveyors	Existing surface water and foul drainage TWUL network arrangements	January 2026

Study / survey / analysis / evaluation	Overview	Date of completion
Asset Location Search maps and sewer records provided by TWUL	Existing surface water and foul drainage TWUL network arrangements	November 2025
Wokingham Borough Council Level 1 Strategic Flood Risk Assessment	Flood risk assessment for Wokingham	May 2023
Wokingham Borough Council Level 2 Strategic Flood Risk Assessment	Flood risk assessment for Wokingham	August 2023
Wokingham Level 2 Cumulative Impact Assessment	Catchment plan and associated flood risks	August 2023
Local Flood Risk Management Strategy - Wokingham Borough Council	Sets out how WBC, as Lead Local Flood Authority, will manage local flood risk (surface water, groundwater, ordinary watercourses) — objectives, measures, roles/responsibilities, action plan	April 2015

9.5.1. Current Baseline

The current baseline conditions are outlined in this section of the chapter.

9.5.1.1. Geology

The Site is underlain by made/worked ground, superficial sand and gravel with local clay and silt, and bedrock comprising the Lambeth Group and Chalk formations.

The Lambeth Group underlies the north-eastern half of the Proposed Development with the Chalk Formation directly underlying the superficial deposits in the south-east of the Proposed Development. The Chalk bedrock is mapped as part of the Seaford Chalk and Newhaven Chalk formations⁷⁵.

Superficial deposits have been identified with the north-western corner of the Proposed Development, including Langley Silt Member and Kempton Park Gravels. No landslip deposits or bedrock faults are recorded within 500m of the Site.

⁷⁵ Site-specific Groundsure Survey (August 2025)

9.5.1.2. Hydrogeology

Aquifer records indicate that the Site is underlain by Secondary A aquifer deposits within the superficial geology, this has been recorded as Kempton Park Gravel Member and the Boyn Hill Gravel Member.

Bedrock aquifer mapping also identified the bedrock of the Lambeth Group, also recorded as a Secondary A stratum beneath the Site.

The superficial deposits of the Langley Sily Member are recorded as an unproductive stratum⁷⁶.

9.5.1.3. Tidal and Fluvial Flood Risk

The Proposed Development is in a fluvial Flood Zone 1 area⁷⁷. As part of the Level 2 Strategic Flood Risk Assessment (SFRA), the Proposed Development is within the Thames (Reading to Cookham) catchment⁷⁸ and was assessed as a medium risk catchment in consideration of historic flooding and areas covered by proposed developments following a Cumulative Impact Assessment (CIA)⁷⁹. There are no flood defences or water storage facilities within 500m of the Proposed Development.

9.5.1.4. Water Abstractions

There are no groundwater, surface water or potable water abstraction records within 500m of the Site. Within 2km, the Groundsure report identifies 23 groundwater abstraction records, 11 surface water abstraction records and three potable abstraction records. The nearest groundwater abstraction is located approximately 509m south-west of the Site and is recorded as historical. No Source Protection Zones are recorded within 500m of the Site.

9.5.1.5. Groundwater Flood Risk

The groundwater flood risk within the Site extents is considered Moderate and is based on a 1 in 100-year return period⁸⁰.

9.5.1.6. Flood Risk from Infrastructure Failure

There are no existing flood defences or flood storage areas within 250m of the Proposed Development. Therefore, there is no immediate flood risk from infrastructure failure within the vicinity of the Site.

9.5.1.7. Existing Drainage Infrastructure

There is an existing TWUL combined sewerage network within the private access road to the Proposed Development site. The existing Site currently discharges both surface water drainage and foul sewerage into the combined sewerage

⁷⁶ Phase II Site Investigation Report (June 2026)

⁷⁷ Map – Flood map for planning – GOV.UK

⁷⁸ WBC Level 2 SFRA 2023: Appendix B - Cumulative Impact Assessment

⁷⁹ Wokingham Borough Council Level 2 Strategic Flood Risk Assessment September 2023

⁸⁰ Site-specific Groundsure Survey (August 2025)

network. The exact location of the existing TWUL sewer is to be confirmed, refer to Appendix 9.2.

High intensity rainfall events may result in increased risk of surface water flooding. In line with the NGGP guidance⁸¹ this is accounted for by using an appropriate climate change allowance

9.5.2. Future Baseline

In the absence of the Proposed Development, the future baseline is anticipated to be influenced primarily by climate change, regional population growth and implementation of measures identified within the relevant River Basin Management Plan. Increased rainfall intensity and more frequent extreme weather events may increase surface water runoff and flood risk within the catchment.

The Proposed Development is in a catchment area with a low rank (1 out of 3) for area covered by proposed development sites⁸². This implies that there should not be a significant uplift in impermeable areas and introduce additional capacity requirements to the existing networks.

The Site is located within the Thames and Chilterns South Management Catchment with the Thames water body forming its northern boundary. For flood risk, the Site sits within the Thames CFMP boundary between the Reading (Policy 5) and Loddon (Policy 6) sub-areas, both of which commit the Environment Agency and partners to active flood risk management adapted to climate change.

9.5.2.1. Climate change considerations

The Site is likely to be significantly affected by future climate change. The likely changes to the baseline include:

- Reduced reliability of water supply; and
- Increased occurrence of high intensity rainfall events

In consideration of these likely changes, the Site surface water drainage system will be designed to accommodate flows from storms up to a 1 in 100-year event including 40% allowance for climate change by providing sufficient on-site attenuation so that there is no flooding generated for storms of this intensity and duration. In consideration of the reduced reliability of water supply.

⁸¹ Flood risk assessments: climate change allowances - GOV.UK

⁸² WBC Level 2 SFRA 2023: Appendix B - Cumulative Impact Assessment

9.6. Impact Assessment

9.6.1. Construction Phase

9.6.1.1. TWUL Sewer (Foul and Surface Water)

Works undertaken to connect the Proposed Development to the public foul and surface water sewer would be designed and constructed taking account of TWUL's requirements. Surface water flows will be reduced to the greenfield runoff rate. In addition, the foul discharges produced during construction would be small in comparison to those during operation. There would be a very low impact on the TWUL Sewer (high sensitivity) and therefore the effect is assessed as **Negligible** (not significant).

9.6.1.2. Upper and Lower Aquifers (Groundwater quality and flooding)

There are a number of typical construction activities that pose a hazard to the Site water quality. However, with a CEMP in place the majority of the impacts would be **Negligible**. The CEMP will be in accordance with ISO 14001 and will be secured by planning condition.

Potentially hazardous liquids are likely to be stored and handled on-site, e.g. fuels and chemicals used during construction. This is a short-term impact. In line with standard best practice measures which will be set out in the CEMP. In the event of fuel/chemicals finding a pathway into the aquifer, there would be a temporary, adverse effect on the groundwater quality. However, because this impact is considered unlikely to occur its magnitude is very low. Therefore, the effect on groundwater quality (medium / high sensitivity) will be **Negligible** (not significant).

Construction works result in areas of soil being exposed. During a rainfall event, sediment and other pollutants (including litter and construction debris) could be washed into the ground. This is a short-term impact that could result in a temporary, adverse effect on the groundwater quality, particularly turbidity. However, with appropriate site controls in place (which would be covered within the CEMP), the occurrence of this is unlikely. Therefore, the magnitude of the impact occurring will be very low and the effect on the groundwater quality (medium / high sensitivity) will be **Negligible** (not significant).

9.6.1.3. Existing Local Population and Infrastructure at Risk of Flooding (Pluvial Flooding)

Some construction activities, such as wheel washing, would increase the volume of surface water runoff from the Site in the short-term. However, the volume is likely to be small and therefore the impact is of a very low magnitude. In addition, activities will comply with the C532 Control of Water Pollution from Construction

sites⁸³ and NetRegs Guidance for Pollution Prevention⁸⁴ and this would form part of the CEMP. The effect on flood risk will be **Negligible** (not significant).

Under existing conditions, precipitation falling on the Site would usually flow overland and be collected by the existing site drainage network. To a lesser extent, some precipitation would infiltrate the ground. During construction, the situation would be no different to the existing condition. Works may result in local low-spots and localised ponding of water may take place during a rainfall event. The temporary surface water drainage strategy will comply with the LBTH Construction Code of Practice, and Pollution Prevention Guidance. Construction works on surface water flood risk (low sensitivity) will have a very low impact and therefore be a **Negligible** effect (not significant).

9.6.1.4. Secondary Mitigation or Enhancement

No secondary mitigation or enhancement is required/has been identified

9.6.1.5. Residual Effect and Significance

Table 9-8 outlines the residual effects for the receptors for the construction phase. In the absence of secondary mitigation, the residual effect for all receptors is that same as that reported in the pre-mitigation scenario.

Table 9-8 Residual Effect for Construction Phase

Receptor	Description of Residual Effect	Nature of Residual Effect*				
		Significance**	+ -	D I	P T	ST MT LT
TWUL Sewer (Foul and Surface Water)	Foul discharge from construction activities increase load on sewer	Not Significant	N/A	D	T	St
Upper and lower aquifers (Groundwater quality)	Effect of foundations on abstractions	Not Significant	N/A	D	T	St
	Reduced water quality due to spills of potentially hazardous liquids on site	Not Significant	N/A	D	T	St

⁸³ Ciria January 2021

⁸⁴ Guidance for Pollution Prevention (GPP) documents | NetRegs | Environmental guidance for your business in Northern Ireland & Scotland

Receptor	Description of Residual Effect	Nature of Residual Effect*				
		Significance**	+ -	D I	P T	ST MT LT
	Reduced water quality due to sediments / debris washed into docks from construction site.	Not Significant	N/A	D	T	St
Existing Local Population and Infrastructure at Risk of Flooding	Increased surface water runoff due to construction activity.	Not Significant	N/A	D	T	St
Notes: * - = Adverse/ + = Beneficial; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; St- Short term/ Mt – Medium term / Lt – Long term. **Significant / Not Significant						

9.6.2. Operational Phase

9.6.2.1. TWUL Sewer (Foul and Surface Water)

The key principle of the surface water drainage strategy for the Proposed Development (as set out in the Flooding and Drainage Technical note) is that where possible surface water runoff should be infiltrated. Sustainable Drainage Systems (SuDS), such as swales, drainage ditches and tree pits have been proposed, to align with the Planning Practice Guidance drainage hierarchy to promote infiltration. The advantage of any additional infiltration compared to the baseline will reduce capacity requirements on the TWUL sewer.

The Proposed Development includes a glycol, fire effluent, diesel and ad-blue isolation strategies to locally contain hazardous chemicals following a leak detection on site to maintain water quality discharge in accordance with Thames Water Trade Effluent Consent requirements. Following a leak, the collection tank will be locally pumped and transported off site for processing.

It is currently assumed that the surface water runoff can be conveyed via gravity to the existing TWUL network. Correspondence is ongoing with Thames Water to understand an acceptable discharge rate in consideration of the capacity of the existing TWUL sewer. The Proposed Development discharge rate will be controlled through upstream attenuation features.

To determine if the existing foul sewerage network can accommodate the industrial wastewater demands associated with a data centre, the volumes from a similar data centre case study have been assessed. This case study obtained planning approval in 2025 and now is under construction. The case study shares multiple similarities to the Thames Valley data centre, including power demand, geographical location and climate, and will produce approximately 12-15l/s of industrial wastewater during operation. Therefore, it is assumed that Proposed Development will also produce approximately 12-15l/s of industrial wastewater during operation.

The existing site has an existing industrial wastewater strategy, and in consideration of the anticipated industrial and domestic wastewater volumes, it is assumed that the existing network will have capacity to accommodate the Proposed Development. Appropriate licenses will be obtained for the discharging of both surface water and foul water to the TWUL network.

With this drainage and hazardous chemical strategy in place for the surface water drainage, the impact on the TWUL network (high sensitivity) will be very low and effect will be **Negligible** (Not Significant). With consideration of the anticipated reduction in foul sewerage volumes, there will be a **Minor Beneficial** impact on the TWUL network (high sensitivity).

9.6.2.2. Upper and Lower Aquifers (Groundwater Quality and flooding)

Infiltration drainage systems will be restricted to chemical risk adverse catchments. High-risk catchments, susceptible to hazardous chemical leaks, will be drain to the Proposed Development drainage network to prevent the risk of groundwater contamination. BRE365 testing has identified that infiltration within the site was not favourable and should not relied upon to subsidise engineered attenuation storage in large storm events.

The use of PFA liquids is not required for the operation of the Proposed Development.

The proposed drainage design includes oil interception treatment prior to discharge to the TWUL sewer network to protect receiving infrastructure and maintain water quality standards. Fuel storage and refuelling activities will be confined to impermeable surfaced areas with secondary containment (bunding) to prevent accidental spills and leaks from entering the ground. These measures will prevent contamination to the groundwater within the Upper and Lower Aquifers and ensure protection of groundwater quality.

Therefore, the impact on the groundwater quality (medium / high sensitivity) will be very low and effect will be **Negligible** (Not Significant).

The surface levels and layout of the Proposed Development will be designed to mitigate the risk of groundwater being contained on site and introducing groundwater flooding. Therefore, the impact on the groundwater flood risk (medium sensitivity) is low, so the effect would be **Negligible** (Not Significant).

9.6.2.3. Existing Local Population and Infrastructure at Risk of Flooding (Pluvial Flooding)

The pluvial flooding strategy includes on-site attenuation storage to facilitate a controlled discharge rate to the TWUL. The size of attenuation storage will be designed to accommodate a 1 in 100-year + 20% uplift for climate change storm event. The Proposed Development surface water drainage strategy will collect and contain all catchments within the Site boundary and prevent the conveyance of overland flows into neighbouring plots to prevent the risk of flooding existing infrastructure.

The existing Site predominantly consists of impermeable areas, with areas of permeable landscaping bordering the Site boundary. A comparison between the areas of impermeable and permeable of the existing and Proposed Development indicate that there will be no less infiltration than previously.

With this surface water drainage network in place, the effect on pluvial flooding will not be impacted / improved compared to the existing situation at the Site. Therefore, the impact on the surface water flood risk (low sensitivity) is low, so the effect would be **Negligible** (Not Significant).

9.6.2.4. Proposed Development and its Occupants (Pluvial Flooding)

The surface water flooding strategy includes on-site attenuation storage to facilitate a controlled discharge rate to the TWUL. The size of attenuation storage will be designed to accommodate a 1 in 100-year + 20% uplift for climate change storm event. The

The existing Site predominantly consists of impermeable areas, with areas of permeable landscaping bordering the Site boundary. A comparison between the areas of impermeable and permeable of the existing and Proposed Development indicate that there will be no less infiltration than previously.

With this surface water drainage network in place, the effect on pluvial will not be impacted / improved compared to the existing situation at the Site. Therefore, the impact on the surface water flood risk (low sensitivity) is low, so the effect would be **Negligible** (Not Significant).

9.6.2.5. Secondary Mitigation or Enhancement

No secondary mitigation or enhancement is required/has been identified.

9.6.2.6. Residual Effect and Significance

Table 9-9 outlines the residual effects for the receptors for the operational phase. In the absence of secondary mitigation, the residual effect for all receptors is that same as that reported in the pre-mitigation scenario.

Following the implementation of embedded and proposed mitigation measures, no significant residual effects on the water environment are anticipated. Surface water runoff would be managed through an on-site attenuation system with controlled discharge to the Thames Water Utilities Limited (TWUL) surface water sewer, while foul water flows are expected to decrease because of the proposed redevelopment.

Potential contamination risks to groundwater, including the upper and lower aquifers, would be controlled through a positive drainage strategy that captures and manages runoff from high-risk areas. The proposed drainage and site design would maintain existing flood risk conditions and would not increase flood risk to surrounding receptors, infrastructure, or future site occupants. Consideration of groundwater flood risk within the Site layout and finished levels design would provide a minor beneficial effect. Consequently, all residual effects are assessed as not significant.

Table 9-9 Residual Effect for Operational Phase

Receptor	Description of Residual Effect	Nature of Residual Effect*				
		Significance**	+ -	D I	P T	ST MT LT
TWUL Sewer (Surface Water)	Surface water drainage network to include on-site attenuation to manage discharge to TWUL sewer.	Not Significant	N/A	D	P	LT
TWUL Sewer (Foul Sewerage)	Foul sewerage volumes to decrease because of plot repurposing.	Not Significant	+	D	P	LT
	High-risk catchments (hazardous substances) to be contained on site through drainage strategy	Not Significant	N/A	D	P	LT
Upper and lower aquifers	High-risk catchments (hazardous substances) to be collected through	Not Significant	N/A	D	P	LT

Receptor	Description of Residual Effect	Nature of Residual Effect*				
		Significance**	+ -	D I	P T	ST MT LT
(Groundwater quality)	positive drainage network solution					
Existing Local Population and Infrastructure at Risk of Flooding	The proposed surface water drainage strategy would align with the existing site condition and therefore, surface water flood risk	Not Significant	N/A	D	P	LT
	The proposed layout and associated levels are to be designed in consideration of groundwater flooding	Not Significant	+	D	P	LT
Proposed Development and its Occupants	The proposed surface water drainage strategy would align with the existing site condition and therefore, pluvial flood risk	Not Significant	N/A	D	P	LT
	The proposed layout and associated levels are to be designed in consideration of groundwater flooding	Not Significant	+	D	P	LT
Notes: * - = Adverse/ + = Beneficial; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; St- Short term/ Mt – Medium term / Lt – Long term. **Significant / Not Significant						

9.7. Limitations & Assumptions of Assessment

To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- Engagement is required with TWUL to gain a full understanding of the existing sewer network capacity.

9.8. Interrelationship Effects

As per standard EIA groundwater and ground contamination has been assumed to covered within the Geotechnical and Contamination these have been assessed and scoped out as part of the scoping process.

9.9. Cumulative Impacts Assessment

The cumulative effects of the cumulative schemes, as presented in Table 2-5 have been taken into consideration.

9.9.1. Construction Phase

9.9.1.1. TWUL Sewer (Foul and Surface Water)

There is a Negligible effect on the TWUL sewer as works undertaken to connect the Proposed Development to the public foul and surface water sewer would be designed and constructed taking account of TWUL's requirements. Engagement with Thames Water is ongoing to agree a discharge rate to take into account wider redevelopment within the surrounding area.

9.9.1.2. Upper and Lower Aquifers (Groundwater quality and flooding)

There is a Negligible effect on the groundwater quality and flooding in consideration of the deep depth of groundwater and low likelihood of requiring significant dewatering. Any dewatering activity above 20,000l/day would be managed by the EA licencing process.

9.9.1.3. Existing Local Population and Infrastructure at Risk of Flooding (Pluvial Flooding)

The flood risk to existing population and infrastructure is Negligible (Not Significant) since the cumulative schemes would be permitted by the Wokingham Borough Council in line with their Local Plan for managing development. Which require all new developments to ensure that their scheme does not increase flood risk elsewhere.

9.9.2. Operational Phase

9.9.2.1. TWUL Sewer (Foul and Surface Water)

Further development may increase the amount of impermeable surfacing and therefore increase the amount of surface water runoff to be discharged to the sewer network. TWUL and EA regulations would ensure surface water runoff from new developments does not cause adverse effects through the use of their statutory powers. Therefore, the cumulative effects on the TWUL strategic network would be **Negligible** (Not Significant).

Further development within the surrounding area has the potential to increase foul water discharges to the Thames Water Utilities Limited (TWUL) network. As a result, operational impacts could be cumulative, placing additional demand on the

existing network and potentially increasing the risk of sewer flooding. However, any new connections to the network are subject to approval by TWUL to ensure that sufficient capacity is available and that the sewerage system does not become overloaded. Consequently, the cumulative effect on the TWUL strategic sewer network is considered to be **Negligible** and not significant.

9.9.2.2. Upper and Lower Aquifers (Groundwater Quality and flooding)

It is considered that there would be a **Negligible** (Not Significant) cumulative effect on the groundwater regime at the Site since any dewatering activities and / or abstractions at the Site of cumulative schemes would be regulated by the EA.

9.9.2.3. Existing Local Population and Infrastructure at Risk of Flooding (Pluvial Flooding)

The National Planning Policy Framework (NPPF) states that flood risk to a development should not be increased relative to the existing baseline conditions and that the proposed development should not increase flood risk elsewhere. Consequently, cumulative developments must incorporate appropriate mitigation measures to manage flood risk effectively. Provided that these requirements are met, the cumulative effects on existing communities, infrastructure, and property, as well as on the proposed development and its future occupants, would be considered **Negligible** and not significant.

9.9.2.4. Proposed Development and its Occupants (Pluvial Flooding)

The National Planning Policy Framework (NPPF) states that flood risk to a development should not be increased relative to the existing baseline conditions and that the proposed development should not increase flood risk elsewhere. Consequently, cumulative developments must incorporate appropriate mitigation measures to manage flood risk effectively. Provided that these requirements are met, the cumulative effects on existing communities, infrastructure, and property, as well as on the proposed development and its future occupants, would be considered **Negligible** and not significant.

9.10. Summary and Conclusion

Table 9-10 provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter.

The table only provides a summary of the residual effects identified within the assessment and details of all primary, secondary and tertiary mitigation that has been taken into account is set out in detail within the Chapter.

Table 9-10 Summary of Receptors, Likely Significant Impacts, Mitigation Measures and Residual Effects

Receptors	Likely Significant Impact	Mitigation Measures	Residual Effect
Construction Phase			

Receptors	Likely Significant Impact	Mitigation Measures	Residual Effect
TWUL Sewer (Foul and Surface Water)	Detrimental impact on receiving water body/downstream network	CEMP	Low likelihood of contaminated runoff reaching the receiving water body or downstream drainage network due to implementation of pollution prevention and drainage controls.
Existing Local Population and Infrastructure at Risk of Flooding	Localised pluvial flooding around Proposed Development site during construction without established permanent drainage network	CEMP	Temporary drainage systems and site water management measures will reduce likelihood and severity of localised flooding during construction.
TWUL Sewer (Foul and Surface Water)	Detrimental impact on receiving water body/downstream network	CEMP	Low likelihood of contaminated runoff reaching the receiving water body or downstream drainage network due to implementation of pollution prevention and drainage controls.
Operational Phase			
TWUL Sewer (Surface Water)	Detrimental impact on receiving water body/downstream network	Surface water discharged at agreed rate with TWUL and infiltration methods promoted	Negligible residual impact on the receiving water body and downstream drainage network. Operational drainage and water quality treatment measures are expected to maintain runoff quality and flow rates at acceptable levels, resulting in no significant effects.
TWUL Sewer (Foul Sewerage)	Insufficient capacity in downstream	Foul sewerage discharged at	Minor beneficial as foul sewerage volumes are

Receptors	Likely Significant Impact	Mitigation Measures	Residual Effect
	network to accommodate flow volumes and rates	agreed rate with TWUL	anticipated to decrease from the existing site volumes and will be
Upper and lower aquifers (Groundwater quality)	Hazardous chemicals, required for the operation of the Proposed Development, enter a pathway to the aquifer and contaminate the groundwater	Glycol, fire effluent, petrol and ad-blue strategies implemented to contain leaks on site.	Risk of local contamination entering a pathway from unforeseen spill location. e.g. oil leak from vehicle parked in non-standard location.
Existing Local Population and Infrastructure at Risk of Flooding	Surface water catchment on Proposed Development is not contained on site and overland flows convey outside of the Site boundary	Drainage network designed to accommodate a 1 in 100-year +20% uplift for climate change.	Negligible to minor adverse residual effect where exceedance flows are utilised during extreme rainfall events.
Proposed Development and its Occupants	Localised pluvial flooding on Proposed Development during larger storm events	Drainage network designed to accommodate a 1 in 100-year +20% uplift for climate change	Negligible residual effect due to exceedance routes ensuring the dissipation of localised pluvial flooding.

10. Waste

10.1. Introduction and Key Issues

This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development on Waste. In line with current EIA guidance, the assessment considers both materials/resource consumption and waste generation.

This Chapter describes the assessment methodology, the baseline conditions at the Application Site and surrounding area, a summary of the likely significant effects, the mitigation measures required to prevent, reduce or offset any significant negative effects, and the likely residual effects after these measures have been employed.

The assessment has been undertaken in accordance with the Institute of Sustainability & Environmental Professionals (ISEP) (formally IEMA) Guide to Materials and Waste in EIA (2020)⁸⁵ and focuses on the efficient use of material assets and the capacity of waste management infrastructure to accommodate waste arising from the Proposed Development.

This Chapter (and its associated figures and appendices) should be read together with the introductory Chapters of this ES (Chapters 1-5), as well as Chapter 12: Summary of Residual Effects. This Chapter is accompanied by the following appendices:

- Appendix 10.1 - Policy, Legislation and Guidance; and
- Appendix 10.2 – Map of Waste Management Infrastructure <10km of the Proposed Development.

10.2. Experience

This Chapter has been prepared by Lucy Cooper, Senior Environmental Consultant at Tyréns Hilson Moran. Lucy holds an MGeol in Geological Sciences and has five years' experience in environmental consultancy, including the preparation of EIAs and Waste Management Strategies. She is an Associate of the Institute of Environmental Sciences (AMIEEnvSc).

This chapter has been reviewed by Rose Gibbon, Senior Environmental Consultant at Tyréns Hilson Moran. Rose holds a BSc degree and has over five years of experience in environmental consultancy, including the preparation of EIAs. She is a member of the ISEP.

⁸⁵ Institute of Environmental Management and Assessment (IEMA), Guide to: Materials and Waste in Environmental Impact Assessment – Guidance for a Proportionate Approach, March 2020.

10.3. Consultation

No formal consultation specific to waste has been undertaken in relation to the Proposed Development. The scope of the assessment has therefore been informed by relevant legislation, policy and guidance, professional judgement, and an understanding of the Proposed Development and environmental baseline.

10.4. Scope of Assessment

The assessment has been proportionately scoped to address environmental topics for which there is potential for likely significant effects, while demonstrating that other topics can be scoped out where appropriate.

Table 10-1 Waste Assessment Scope

Potential Effect	Scoped In / Out	Justification
Waste generation and effects on waste management infrastructure during demolition	In	Demolition of the existing office buildings and associated infrastructure will generate waste requiring reuse, recovery, recycling and disposal. Potential effects may arise from demand placed upon regional waste management infrastructure.
Waste generation and effects on waste management infrastructure during construction	In	Construction of the proposed data centre, administration building, substation, temporary fuel cell infrastructure and associated external works will generate construction waste requiring management through licensed recovery and disposal facilities.
Consumption of material assets	In	Construction of the Proposed Development will require the use of primary construction materials. Opportunities to reduce the consumption of finite resources through efficient design, reuse and recycling have the potential to influence environmental effects.
Excavated materials and earthworks	In	Site preparation, foundations and underground services are expected to generate excavated materials requiring reuse on-site or management off-site.
Hazardous waste generation	In	Hazardous materials may be encountered during demolition and construction, requiring specialist handling, treatment and disposal.
Operational waste generation and management	Out	Operational waste generated by the proposed data centre would comprise relatively low quantities of general office, packaging and

Potential Effect	Scoped In / Out	Justification
		maintenance-related waste during normal operation. Periodic replacement of IT equipment and server racks, anticipated approximately every three years, may generate larger quantities of waste electrical and electronic equipment (WEEE) and associated packaging. These materials would be managed in accordance with the waste hierarchy, prioritising reuse, refurbishment, manufacturer take-back and recycling through appropriately licensed contractors. Subject to suitable storage, segregation and management arrangements, significant environmental effects are not anticipated.

10.4.1.1. Effects Not Considered to be Significant

The following effects were not considered significant and are not considered further in this Chapter:

- Operational waste generation and management

10.4.1.2. Effects Considered Likely to be Significant

Table 10-2 outlines the potential effects that have been scoped into the assessment and are assessed within this Chapter.

Table 10-2 *Effects considered likely to be Significant*

Potential Effect	Receptor(s)	Applicable Stage
Consumption of material assets	Material assets	Construction
Generation of construction, demolition and excavated waste.	Waste management infrastructure	Demolition and Construction
Generation and management of hazardous waste	Waste management infrastructure	Demolition and Construction

10.5. Legislation, Planning Policy & Guidance

The assessment presented within this Chapter has been undertaken with regard to relevant legislation, planning policy and guidance relating to waste management and the sustainable use of resources. A summary of the principal documents that have informed the assessment is provided below. Further detail is provided within Appendix 10-1.

10.5.1. Legislation

The assessment has been undertaken with regard to the following legislation:

- Environmental Protection Act 1990 (as amended)⁸⁶;
- Waste (England and Wales) Regulations 2011 (as amended)⁸⁷;
- Hazardous Waste (England and Wales) Regulations 2005 (as amended)⁸⁸; and
- Environmental Permitting (England and Wales) Regulations 2016⁸⁹.

10.5.2. Planning Policy

National Planning Policy

The assessment has had regard to the following national planning policy documents:

- National Planning Policy Framework (NPPF)⁹⁰;
- National Planning Policy for Waste (2014)⁹¹; and
- Waste Management Plan for England (2021)⁹².

Local Planning Policy

The Proposed Development lies within the administrative area of Wokingham Borough Council. Waste planning policy is provided through the adopted Central and Eastern Berkshire Joint Minerals and Waste Plan (2023)⁹³.

The following policies are considered relevant to this assessment:

- Policy W1 – Sustainable Waste Development Strategy;
- Policy W2 – Safeguarding of Waste Management Facilities;
- Policy W3 – Waste Capacity Requirements;
- Policy DM1 – Sustainable Development; and
- Policy DM9 – Protecting Public Health, Safety and Amenity.

10.5.3. Guidance

The assessment has also been informed by the following guidance documents:

- Planning Practice Guidance (PPG)⁹⁴;
- Institute of Environmental Management and Assessment (IEMA) Guide to Materials and Waste in Environmental Impact Assessment (2020);

⁸⁶ Environmental Protection Act 1990, c.43, particularly Section 34 relating to the duty of care for controlled waste.

⁸⁷ The Waste (England and Wales) Regulations 2011, SI 2011/988, as amended.

⁸⁸ The Hazardous Waste (England and Wales) Regulations 2005, SI 2005/894, as amended.

⁸⁹ The Environmental Permitting (England and Wales) Regulations 2016, SI 2016/1154, as amended.

⁹⁰ Ministry of Housing, Communities and Local Government, National Planning Policy Framework, 17 August 2026.

⁹¹ Department for Communities and Local Government, National Planning Policy for Waste, October 2014.

⁹² Department for Environment, Food and Rural Affairs, Waste Management Plan for England, January 2021.

⁹³ Central and Eastern Berkshire Authorities, Central and Eastern Berkshire Joint Minerals and Waste Plan, adopted January 2023.

⁹⁴ Ministry of Housing, Communities and Local Government, Planning Practice Guidance: Waste.

- Waste Duty of Care Code of Practice⁹⁵;
- CL:AIRE The Definition of Waste: Development Industry Code of Practice (Version 2)⁹⁶; and
- Environment Agency Waste Classification Technical Guidance (WM3)⁹⁷.

10.6. Assessment Methodology

This section describes the methodology adopted to identify and assess the likely significant environmental effects associated with waste arising from the Proposed Development.

The methodology has been developed with reference to the legislation, planning policy and guidance described in Section 10.4, including the principles set out in the ISEP (formally IEMA) Guide to Materials and Waste in EIA (2020). The assessment adopts a proportionate approach, reflecting the current stage of design and the information available for the Proposed Development.

The assessment focuses on the direct environmental effects associated with the consumption of material assets and the generation and management of waste. Indirect environmental effects associated with waste generation, including traffic movements, greenhouse gas emissions, air quality, noise, vibration, land contamination and water quality, are assessed within the relevant technical chapters of this Environmental Statement and are therefore not considered further within this Chapter.

10.6.1. Define the Study Area

The study area has been defined to identify the environmental receptors with the potential to be affected by the Proposed Development during the demolition and construction phases.

Two study areas have been adopted:

- Application Site Study Area – comprising the Application Site where demolition, Site preparation, enabling works, construction activities and associated waste generation will occur.
- Regional Study Area – comprising the wider network of licensed waste management facilities and material resources that may supply construction materials to, or receive waste generated by, the Proposed Development.

A review of Environment Agency permitted waste management facilities⁹⁸ has been undertaken within a 10 km radius of the Application Site to establish the availability of local waste management infrastructure and inform the baseline

⁹⁵ Department for Environment, Food and Rural Affairs and Environment Agency, Waste Duty of Care Code of Practice, March 2016, updated November 2018.

⁹⁶ CL:AIRE, The Definition of Waste: Development Industry Code of Practice, Version 2, March 2011.

⁹⁷ Environment Agency, Waste Classification: Guidance on the Classification and Assessment of Waste – Technical Guidance WM3, First Edition, Version 1.2.GB, updated September 2021.

⁹⁸ Environment Agency, Environmental Permitting Regulations – Waste Operations Public Register.

assessment. The identified facilities are considered representative of the waste management network available to manage demolition, construction, excavation and hazardous waste streams arising from the Proposed Development.

Whilst waste generated by the Proposed Development may ultimately be transported to facilities beyond 10 km, depending on contractor procurement and market conditions, the 10 km study area provides an appropriate basis for assessing the availability and capacity of local waste management infrastructure.

For the assessment of material assets, no fixed geographic study area has been defined. Construction materials may be sourced from a range of regional, national and international suppliers. The assessment therefore adopts a regional-scale approach, reflecting the nature of modern construction material supply chains and the availability of materials within the wider market.

10.6.2. Data Sources

The assessment has been informed by the following information sources:

- Site location plans and the proposed development parameters;
- Available architectural and engineering design information;
- Existing site information;
- Relevant national legislation, planning policy and guidance;
- Published EA and DEFRA information relating to waste management;
- Central and Eastern Berkshire Joint Minerals and Waste Plan (2023); and
- Professional judgement based on experience of comparable developments.

Given the current stage of design, detailed construction methodologies, waste forecasts and material quantities are not available. The assessment has therefore been undertaken using reasonable worst-case assumptions.

10.6.3. Identification of Receptors

In accordance with the ISEP Guide to Materials and Waste in EIA (2020), the assessment considers the following receptors:

- **Material assets** – comprising finite natural resources required during demolition and construction, including aggregates, soils, concrete, steel and other construction materials.
- **Waste management infrastructure** – comprising licensed facilities responsible for the collection, transfer, treatment, recovery and disposal of demolition, construction, excavated and hazardous wastes.

These receptors have been selected as they represent the environmental resources most likely to be affected by the Proposed Development.

10.6.4. Assessment Process

The assessment considers the demolition and construction phases of the Proposed Development. Operational waste has been scoped out of the assessment, as described in Section 10.3.

As the scheme is at a speculative stage, detailed material quantities, waste forecasts and construction methodologies are not yet available. Consequently, the assessment has been undertaken using a reasonable worst-case scenario based on the proposed development parameters.

The assessment considers:

- consumption of material assets;
- generation and management of construction, demolition and excavation waste;
- generation and management of hazardous waste; and
- demand placed upon existing waste management infrastructure.

10.6.4.1. Construction Phase

The construction phase assessment considers the demolition of the existing office buildings together with the construction of the proposed data centre, administration building, substation, fuel cell infrastructure and associated external works.

The assessment considers the direct environmental effects associated with the consumption of material assets and the generation and management of demolition waste, construction waste, excavated materials and hazardous waste. The assessment has been undertaken having regard to the principles of sustainable resource management and the waste hierarchy, seeking to maximise opportunities for waste prevention, reuse, recycling and recovery whilst minimising disposal.

It has been assumed that waste arising during demolition and construction will be managed in accordance with relevant legislation and industry good practice, including the Environmental Protection Act 1990, the Waste (England and Wales) Regulations 2011 and the Environmental Permitting (England and Wales) Regulations 2016. Waste is assumed to be segregated, stored appropriately and transferred by licensed waste carriers to suitably permitted waste management facilities.

Where practicable, excavated materials suitable for reuse are assumed to be retained and reused within the Proposed Development to reduce the consumption of primary materials and minimise off-site disposal. Surplus materials unsuitable for reuse would be managed at appropriately licensed recovery or disposal facilities.

10.6.4.2. Operational Phase

Operational waste generation has been scoped out of the assessment. Consequently, no detailed operational phase assessment has been undertaken.

10.6.5. Reporting of the Environmental Effect and Significance Criteria

The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account the demolition and construction stages. The following sections define the approach adopted within the assessment for determining receptor sensitivity, magnitude of change, the resulting level of effect and significance.

10.6.5.1. Determining Sensitivity of Receptor

The sensitivity of affected receptors has been considered on a scale of High, Medium, Low and Negligible.

Receptor sensitivity reflects the importance, value, scarcity, capacity and ability of the receptor to accommodate change resulting from the Proposed Development.

The sensitivity criteria adopted within this assessment are presented in Table 10-3.

Table 10-3 Receptor Sensitivity Criteria

Sensitivity	Material Assets	Waste Management Infrastructure
High	Finite natural resources of national or regional importance with limited availability or limited opportunity for replacement or recovery.	Strategically important waste management infrastructure operating at, or close to, available capacity with limited ability to accommodate additional waste.
Medium	Material resources of regional importance with moderate availability and opportunities for replacement, reuse or recovery.	Waste management infrastructure with moderate available capacity capable of accommodating additional waste without affecting its operation.
Low	Commonly available construction materials with good opportunities for replacement, reuse or recovery.	Waste management infrastructure with sufficient available capacity to accommodate additional waste with limited effect on operation.

Sensitivity	Material Assets	Waste Management Infrastructure
Negligible	Material resources that are readily available and of negligible environmental value.	Waste management infrastructure with substantial available capacity where additional waste would have no discernible influence on operation.

10.6.5.2. Determining the Magnitude of Change

The magnitude of change reflects the scale of the change arising from the Proposed Development in relation to the baseline conditions.

The assessment considers the quantity and nature of material resources consumed, the quantity and type of waste generated, opportunities for waste prevention, reuse, recycling and recovery, and the resulting demand placed upon waste management infrastructure.

Magnitude of change has been assessed on a scale of Large, Medium, Small and Negligible.

Table 10-4 Magnitude of Change Criteria

Magnitude	Criteria
Large	A substantial increase in the consumption of material resources or generation of waste resulting in considerable demand on waste management infrastructure or a substantial reduction in resource efficiency.
Medium	A noticeable increase in material consumption or waste generation resulting in additional demand on waste management infrastructure but within its anticipated operational capacity.
Small	A limited increase in material consumption or waste generation resulting in a minor increase in demand on waste management infrastructure that can be readily accommodated.
Negligible	Minimal change in material consumption or waste generation resulting in no discernible effect on material assets or waste management infrastructure.

10.6.5.3. Determining the Level of Effect

The level of effect has been informed by the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and Table 10-5 has been used as a tool to assist with this process.

Whilst Table 10-5 provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. In addition to the

sensitivity of the receptor and the magnitude of change, the assessment has considered the nature of the effect, its duration, reversibility and the effectiveness of embedded mitigation measures.

For each effect, it has been concluded whether the effect is beneficial or adverse.

Table 10-5 Background studies / surveys / evaluations / analysis

		Sensitivity (or Value/Importance)			
		High	Medium	Low	Negligible
Magnitude of change / impact	Large	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

The following terms have been used to define the level of the effects identified:

- **Major effect:** where the Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- **Moderate effect:** where the Proposed Scheme is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;
- **Minor effect:** where the Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and
- **Negligible:** where the Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

10.6.5.4. Determining Significance

For each residual effect, a statement has been made as to whether the effect is **Significant** or **Not Significant**.

Significance has been determined through professional judgement, taking account of:

- receptor sensitivity;
- magnitude of change;
- the resulting level of effect;
- the implementation of primary, tertiary and, where appropriate, secondary mitigation measures; and
- relevant legislation, planning policy and guidance.

Significance has only been concluded for residual effects following the implementation of mitigation.

10.6.5.5. Primary and Tertiary Mitigation

Construction Stage

The following primary and tertiary mitigation measures have been assumed as embedded within the Proposed Development and have therefore been taken into account within the assessment:

- preparation and implementation of a Site Waste Management Plan or equivalent Contractor's Waste Management Plan;
- application of the waste hierarchy, prioritising waste prevention, reuse, recycling and recovery before disposal;
- procurement of materials to minimise waste generation and promote efficient use of resources;
- segregation of waste streams to maximise opportunities for reuse and recycling;
- reuse of demolition materials on Site where practicable;
- reuse of suitable excavated materials on Site or a suitable receiver site in accordance with the CL:AIRE DoWCoP, where applicable;
- storage, handling and transfer of hazardous waste in accordance with relevant legislation and EA guidance;
- transfer of waste by licensed waste carriers to appropriately permitted waste management facilities;
- compliance with the Environmental Protection Act 1990 Duty of Care requirements and the Waste (England and Wales) Regulations 2011; and
- monitoring and recording of waste generation and recycling performance throughout the demolition and construction phases.

These measures represent standard industry practice and are considered to reduce the consumption of primary material resources, minimise waste

generation and ensure waste is managed in accordance with legislative requirements and the principles of sustainable resource management.

Operational Stage

Operational waste generation has been scoped out of this assessment. Consequently, no operational mitigation measures have been identified.

10.7. Baseline

The baseline assessment has been undertaken to establish the existing conditions relevant to the assessment of material assets and waste management infrastructure. The baseline has been informed by available Site information, the proposed development parameters, published legislation, planning policy and guidance, and professional judgement.

The baseline considers:

- the existing characteristics and use of the Application Site;
- the use of material assets required during construction; and
- the existing waste management framework and infrastructure available to manage demolition, construction and hazardous waste.

10.7.1. Current Baseline

10.7.1.1. Material Assets

Material assets comprise finite natural resources and manufactured construction products required to support demolition and construction activities, including primary aggregates (land-won sand and gravel, crushed rock and marine-dredged aggregates), recycled and secondary aggregates, concrete, cement, steel and timber. The assessment of material assets focuses on the consumption of resources during construction and opportunities to maximise resource efficiency through reuse, recycling and efficient design.

The Application Site is currently occupied by existing commercial office buildings and associated infrastructure. Development of the Proposed Development would require the demolition of existing structures and the construction of new buildings and associated infrastructure, resulting in the consumption of construction materials throughout the demolition, enabling works, earthworks and construction phases.

Representative sources of key construction materials are presented in Table 10-6.

Table 10-6 Principal Material Assets

Material Asset	Principal Regional Source
Sand and gravel	Local quarries and neighbouring mineral planning authorities

Material Asset	Principal Regional Source
Crushed rock	Imported from neighbouring authorities
Recycled aggregates	Safeguarded aggregate recycling facilities within Central and Eastern Berkshire
Concrete	Regional batching plants
Structural steel	National supply chain

The Site is located within the Central and Eastern Berkshire Joint Minerals and Waste Plan area, where construction material demand is met through a combination of locally sourced aggregates, imported minerals, recycled aggregates and secondary materials. The Joint Minerals and Waste Plan promotes the efficient use of mineral resources and seeks to encourage the use of recycled and secondary aggregates in place of primary materials wherever practicable.

At a regional level, established supply chains exist for the provision of construction materials, including aggregates, ready-mix concrete and structural steel. Whilst these resources are available to support future development, primary mineral resources remain finite and their extraction, processing and transportation are associated with environmental impacts. Consequently, efficient resource use and the application of circular economy principles are important considerations for the Proposed Development.

The baseline therefore indicates that suitable construction materials are available to support the Proposed Development, whilst recognising the importance of minimising the consumption of primary resources through good design, procurement and material management practices.

10.7.1.2. Waste Management Infrastructure

Waste management infrastructure comprises the network of licensed facilities responsible for the collection, transfer, treatment, recycling, recovery and disposal of waste arising from construction, demolition and excavation activities. Such infrastructure forms an important component of the circular economy by facilitating the diversion of waste from landfill and supporting the recovery of materials for beneficial reuse.

The Application Site is located within Thames Valley Park, approximately 4 km east of Reading town centre, with direct access to the strategic highway network via the A329(M) and M4 motorway. This location provides good connectivity to the wider regional waste management network serving Reading, Wokingham and neighbouring local authority areas.

The Central and Eastern Berkshire Joint Minerals and Waste Plan safeguards a range of waste management facilities capable of managing construction, demolition and excavation waste. These include waste transfer stations, recycling and recovery facilities, hazardous waste management facilities, metal recycling facilities and inert disposal facilities, which support the diversion of waste from disposal and the recovery of materials for beneficial reuse.

A review of Environment Agency permitted waste facilities within 10 km of the Application Site identified an established network of infrastructure capable of managing construction, demolition, excavation and hazardous waste streams. The identified facilities comprise six waste transfer stations, five recycling and recovery facilities, two hazardous waste facilities, one metal recycling facility and one inert landfill facility. Representative facilities include Playhatch Quarry, Select Environmental Services, Darwin Close Transfer Station, Smallmead Waste Management Centre, Reynolds Skip Hire, Sheffield Bottom Waste Transfer Facility, Fleetwood Recycling, Sonning Quarry, R Collard Limited and Reading Quarry.

Table 10-7 Waste Management Infrastructure within 10 km of the Application Site

Facility Type	Number of Facilities Identified	Function
Waste Transfer Stations	6	Receiving, bulking and transfer of construction, demolition and excavation waste for onward treatment, recovery or disposal
Recycling and Recovery Facilities	5	Treatment and recovery of inert construction, demolition and excavation materials for reuse as recycled aggregates or engineering materials
Hazardous Waste Facilities	2	Transfer and treatment of hazardous wastes arising during demolition and construction activities
Metal Recycling Facilities	1	Recovery and recycling of ferrous and non-ferrous metals arising from demolition and construction activities
Inert Disposal Facilities	1	Disposal of inert materials that cannot be reused or recovered

The distribution of permitted waste management infrastructure within 10 km of the Application Site is shown in Appendix 10-2.

The safeguarded facilities, together with the wider regional waste management network, demonstrate that there is an established system for the management of construction, demolition and excavation waste. The availability of recycling, recovery and metal recycling facilities also provides opportunities for recovered materials to be reprocessed and returned to the construction market, reducing reliance on primary material extraction and supporting the principles of the circular economy.

The Joint Minerals and Waste Plan further notes that residual non-hazardous waste arising within Central and Eastern Berkshire is managed through regional landfill facilities outside the Plan Area, principally at Sutton Courtenay Landfill in Oxfordshire. This reflects the established regional approach to residual waste management and the limited operational landfill provision within the Plan Area itself.

At this stage of the Proposed Development, the specific waste management facilities that would receive waste generated during demolition and construction have not been identified and would be selected by the appointed contractor. Nevertheless, the established network of transfer, recycling, recovery, hazardous waste and disposal facilities demonstrates that suitable capacity exists within the wider area to manage anticipated demolition, construction, excavation and hazardous waste arisings associated with the Proposed Development.

10.7.2. Future Baseline

In the absence of the Proposed Development, the Application Site would be expected to remain in commercial use and the demolition and construction activities associated with the Proposed Development would not occur. As a result, there would be no additional demand for construction materials or waste management infrastructure arising from the Site.

At the regional level, construction activity is anticipated to continue throughout the plan period, resulting in ongoing demand for both primary and secondary construction materials and for waste management infrastructure capable of managing construction, demolition and excavation wastes. National legislation and planning policy are expected to continue driving improvements in resource efficiency, increased reuse and recycling of materials, and the diversion of waste from landfill.

Continued investment in waste recovery infrastructure, together with the safeguarding of existing waste management facilities through the Central and Eastern Berkshire Joint Minerals and Waste Plan, is expected to maintain sufficient capacity to manage future waste arisings within the wider region. The future baseline is therefore anticipated to comprise an established and resilient

network of material suppliers and waste management facilities operating within an increasingly circular economy.

10.8. Impact Assessment

The following sections assess the likely significant effects arising from the Proposed Development during the demolition and construction phases.

The assessment has been undertaken in accordance with the methodology presented in Section 10.5 and considers the effects on the identified receptors of Material Assets and Waste Management Infrastructure.

Primary and tertiary mitigation measures described within Section 10.5.5 have been assumed to form part of the Proposed Development and have therefore been taken into account when determining the pre-secondary mitigation effects.

10.8.1. Construction Phase

10.8.1.1. Consumption of Material Assets

The sensitivity of Material Assets is considered to be Medium. Construction of the Proposed Development will require the use of finite natural resources, including aggregates, concrete, structural steel, reinforcement, drainage materials and other construction products. Although these resources are finite, the wider region benefits from an established supply chain capable of supporting development, supplemented by recycled and secondary materials.

Construction of the Proposed Development will result in the consumption of materials throughout the demolition, enabling works, earthworks and construction phases. The Proposed Development comprises a large-scale data centre campus including three data halls, an administration building of approximately 4,915 m², associated electrical infrastructure and external works. As such, substantial quantities of construction materials are anticipated to be required, particularly concrete, steel and aggregate-based materials.

Notwithstanding the scale of the Proposed Development, the baseline assessment demonstrates that construction materials are available through established regional and national supply chains. Primary and tertiary mitigation incorporated within the Proposed Development includes efficient material procurement, application of the waste hierarchy, specification of recycled and secondary materials where practicable, and reuse of suitable demolition and excavated materials on Site. These measures would reduce demand for primary materials and improve overall resource efficiency.

Taking these embedded measures into account, the magnitude of change is considered to be Small.

Therefore, there is likely to be a direct, temporary, short-term, adverse effect which is considered to be Minor.

Secondary Mitigation or Enhancement

No secondary mitigation or enhancement has been identified.

The embedded mitigation measures incorporated within the Proposed Development are considered sufficient to minimise the consumption of material resources.

Residual Effect

In the absence of secondary mitigation, the residual effect for Material Assets is the same as that reported in the pre-mitigation scenario.

The sensitivity of Material Assets remains Medium and the magnitude of change remains Small. Consequently, the residual effect is considered to be direct, temporary, short-term, adverse and of Minor significance.

Significance

This effect is considered to be Not Significant.

10.8.1.2. Generation of Construction, Demolition and Excavation Waste

The sensitivity of Waste Management Infrastructure is considered to be Low. The baseline assessment identifies an established network of waste transfer, recycling, recovery, hazardous waste and inert waste facilities within the wider Study Area. A number of EA permitted facilities have been identified within 10 km of the Application Site that are potentially capable of accepting construction, demolition and excavation waste generated by the Proposed Development.

The Proposed Development will require the demolition of the existing office buildings, comprising approximately 22,867.2 m² of floorspace, and the construction of the proposed data centre development. These activities will generate construction, demolition and excavation waste.

Preliminary earthworks information indicates that approximately 61,981 m³ of cut and 9,140 m³ of fill would be required, resulting in a net surplus of approximately 52,841 m³ of excavated material, as shown in Appendix 10-3. This has the potential to represent a substantial material stream during construction. Where suitable, excavated material would be retained and beneficially reused on Site. The overwhelming majority of the excavated material is anticipated to comprise clean, uncontaminated natural soils, which could also be transferred to suitable receiver sites for beneficial reuse within the local construction industry. On-site reuse and the direct transfer of suitable material to receiver sites would be undertaken in accordance with the CL:AIRE DoWCoP, where applicable, thereby maximising diversion from landfill. Any remaining material that cannot be

beneficially reused would be transported to an appropriately permitted recovery or disposal facility.

Although detailed construction and demolition waste forecasts are not currently available, demolition of the existing office building is expected to generate notable quantities of predominantly inert and recyclable materials. These are likely to include concrete, masonry, metals, timber and plasterboard, alongside packaging and other waste generated during construction. A substantial proportion of these materials is expected to be suitable for reuse, recycling or recovery.

The waste hierarchy forms an embedded part of the Proposed Development. Waste materials will be segregated where practicable; suitable demolition and excavated materials will be reused on Site where feasible; and remaining waste will be transported by registered waste carriers to appropriately permitted facilities for reuse, recycling, recovery or disposal. These embedded measures will maximise material recovery and minimise the quantity of waste requiring final disposal.

Taking account of the established regional waste-management network and the embedded mitigation measures, the magnitude of change is considered to be Small.

The generation of construction, demolition and excavation waste would therefore result in a direct, temporary, short-term adverse effect of Minor significance.

Secondary Mitigation or Enhancement

No secondary mitigation or enhancement has been identified.

Residual Effect

In the absence of secondary mitigation, the residual effect for Waste Management Infrastructure is the same as that reported in the pre-mitigation scenario.

The sensitivity of the receptor remains Low and the magnitude of change remains Small. Consequently, the residual effect is considered to be direct, temporary, short-term, adverse and of Minor significance.

Significance

This effect is considered to be Not Significant.

10.8.1.1. Generation and Management of Hazardous Waste

The sensitivity of Waste Management Infrastructure is considered to be Low. Hazardous waste may arise during demolition and construction activities through the removal of asbestos-containing materials (where present), contaminated

soils, oils, fuels, electrical equipment and other hazardous construction materials. The quantity and composition of hazardous waste will be confirmed through pre-demolition surveys and site investigations.

The baseline assessment demonstrates that hazardous waste transfer and treatment facilities are present within the wider Study Area and capable of managing hazardous waste arisings generated by the Proposed Development.

Embedded mitigation includes the classification, segregation, storage, transport and disposal of hazardous waste in accordance with the Environmental Protection Act 1990, the Hazardous Waste (England and Wales) Regulations and the Environmental Permitting Regulations. Hazardous waste will be managed by licensed contractors and transferred to appropriately permitted facilities.

Taking account of these embedded mitigation measures, the magnitude of change is considered to be Negligible.

Therefore, there is likely to be a direct, temporary, short-term, adverse effect which is considered to be Negligible.

Secondary Mitigation or Enhancement

No secondary mitigation or enhancement has been identified.

Residual Effect

In the absence of secondary mitigation, the residual effect for Waste Management Infrastructure is the same as that reported in the pre-mitigation scenario.

The sensitivity of the receptor remains Low and the magnitude of change remains Negligible. Consequently, the residual effect is considered to be direct, temporary, short-term, adverse and Negligible.

Significance

This effect is considered to be Not Significant.

10.8.2. Operational Phase

Operational waste generation associated with the Proposed Development has been scoped out of this assessment, as outlined in Section 10.3.1.

The completed development is anticipated to generate relatively low quantities of commercial waste, packaging materials, WEEE and maintenance-related wastes. These waste streams would be managed through established commercial waste collection arrangements and are not anticipated to result in likely significant environmental effects or place undue demand on existing waste management infrastructure.

Consequently, no further operational assessment has been undertaken.

10.9. Limitations & Assumptions of Assessment

To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment has been undertaken at the current stage of the Proposed Development, and detailed construction methodologies, demolition methodologies, material quantities and waste forecasts are not yet available.
- As the Proposed Development is speculative, the appointed contractor, construction programme and final procurement strategy have not been confirmed.
- The assessment has therefore been undertaken using a reasonable worst-case scenario based on the maximum development parameters currently available.
- The assessment assumes that demolition and construction activities will be undertaken in accordance with current legislation, industry good practice and the embedded mitigation measures described in Section 10.5.5, including implementation of a CEMP and a Site Waste Management Plan (SWMP) (or equivalent Contractor's Waste Management Plan).
- The specific waste management facilities that would receive waste generated by the Proposed Development have not been identified. It has been assumed that waste will be managed by appropriately licensed waste carriers and transferred to suitably permitted facilities in accordance with the waste hierarchy and proximity principle.
- Operational waste generation has been scoped out of the assessment, as it is not anticipated to give rise to likely significant environmental effects.

Notwithstanding the above limitations, sufficient information is available to undertake a robust and proportionate assessment of the likely significant effects associated with materials and waste.

10.10. Interrelationship Effects

The assessment of materials and waste has considered the relationship with other environmental topics assessed within this Environmental Statement.

The generation and management of construction and demolition waste has the potential to result in indirect environmental effects associated with vehicle movements, emissions, noise, vibration and the handling of potentially contaminated materials. These effects are not assessed within this Chapter, as they are considered within the relevant technical chapters of the Environmental Statement and other standalone reports.

Table 10-8 Summary of Interrelationship Effects

Environmental Topic	Relationship with Waste Assessment
Traffic and Transport	Construction and demolition waste will require transportation to appropriately permitted waste management facilities. The effects associated with construction traffic will be assessed separately through a Transport Assessment.
Air Quality	The handling, storage and transportation of demolition materials, excavated materials and construction waste has the potential to generate dust and vehicle emissions. These effects are assessed within Chapter 6: Air Quality.
Noise and Vibration	Demolition, waste handling and vehicle movements associated with construction activities have the potential to generate noise and vibration. These effects are assessed within Chapter 7: Noise.
Land Contamination and Ground Conditions	Excavated materials and hazardous wastes generated during demolition and construction are closely linked to ground conditions and any contamination encountered during site preparation. These matters are considered within the Phase I Contaminated Land Assessment,
Greenhouse Gas	The consumption of construction materials and management of demolition and construction waste are associated with embodied carbon and greenhouse gas emissions. Climate-related effects are assessed within Chapter 8: Greenhouse Gas.

No significant interrelationship effects have been identified beyond those assessed within the relevant technical chapters of this Environmental Statement.

10.11. Cumulative Impacts Assessment

The potential for cumulative effects principally relates to overlapping demolition and construction activities, which could increase the combined consumption of construction materials and demand placed upon waste-management infrastructure.

The identified cumulative developments comprise a mixture of major mixed-use redevelopment, residential development, depot redevelopment and changes of use. Their construction programmes and detailed material and waste quantities are not fully known. A reasonable worst-case assumption has therefore been made that some construction activities could overlap with the Proposed Development.

10.12. Construction Phase

Concurrent construction of the Proposed Development and the identified cumulative developments could increase demand for construction materials and

waste-management infrastructure. The larger schemes may also generate notable quantities of demolition, construction and excavated materials, although the precise quantities and degree of programme overlap are not known.

Construction materials would be obtained through established regional and national supply chains. The baseline also identifies an established network of permitted facilities capable of managing construction, demolition, excavated and hazardous waste. Each development would be expected to apply the waste hierarchy and appropriate material and waste-management controls.

The majority of surplus excavated material from the Proposed Development is anticipated to comprise clean, uncontaminated natural soil suitable for beneficial reuse, potentially within the local construction industry.

Taking these factors into account, the cumulative construction effect on Material Assets and Waste Management Infrastructure is considered to be temporary, adverse and Minor, and therefore **Not Significant**.

10.13. Operational Phase

Operational waste generation associated with the Proposed Development has been scoped out of the detailed assessment. During normal operation, the data centre would generate relatively low quantities of general commercial, packaging and maintenance related waste. Periodic replacement of IT equipment and server racks would generate WEEE and associated packaging, which would be managed through established reuse, refurbishment, manufacturer take-back and specialist recycling arrangements.

Although the Proposed Development and cumulative developments would collectively increase operational waste generation, these waste streams would be managed through established commercial collection and waste-management arrangements. The Proposed Development is not expected to materially affect the capacity or operation of regional waste-management infrastructure.

The cumulative operational effect is therefore considered to be **Not Significant**.

10.14. Summary and Conclusion

This Chapter has assessed the likely effects of the Proposed Development on Material Assets and Waste Management Infrastructure during the demolition and construction phase. Operational waste generation was scoped out because it is not anticipated to result in likely significant environmental effects.

Embedded mitigation includes application of the waste hierarchy, efficient material procurement, segregation of waste streams, beneficial reuse of suitable materials, use of licensed waste carriers and permitted facilities, and implementation of a Site Waste Management Plan or equivalent.

Following implementation of these measures, residual effects on Material Assets and Waste Management Infrastructure would range from Negligible to Minor adverse and would be Not Significant. No significant cumulative effects have been identified.

Table 10-9 Summary of Receptors, Likely Significant Impacts, Mitigation Measures and Residual Effects

Receptor	Likely Impact	Mitigation Measures	Residual Effect
Construction Phase			
Material Assets	Consumption of finite construction materials, including aggregates, concrete and structural steel.	Efficient design and procurement; application of the waste hierarchy; use of recycled and secondary materials where practicable; and reuse of suitable demolition and excavated materials.	Direct, temporary, adverse effect of Minor significance – Not Significant.
Waste Management Infrastructure	Generation of demolition, construction and excavated waste, increasing demand for waste-transfer, recycling, recovery and disposal facilities.	Implementation of a Site Waste Management Plan or equivalent; segregation of waste streams; beneficial reuse of suitable materials on Site or at receiver sites; and transfer of remaining waste by licensed carriers to appropriately permitted facilities.	Direct, temporary, adverse effect of Minor significance – Not Significant.
Waste Management Infrastructure	Generation and management of hazardous waste during demolition and construction.	Pre-demolition surveys and site investigations; appropriate classification, segregation and storage; and transfer by licensed contractors to appropriately permitted hazardous-waste facilities.	Direct, temporary, adverse effect of Negligible significance – Not Significant.
Operational Phase			
Waste Management Infrastructure	Generation of general commercial, packaging and maintenance-related waste, together with periodic WEEE from the replacement of IT equipment and server racks.	Established commercial waste arrangements; segregation; reuse and refurbishment; manufacturer take-back; and specialist WEEE recycling.	Scoped out of detailed assessment. No likely significant effect anticipated.

11. **Assessment of Cumulative Effects**

This chapter of the ES summarises the potential cumulative effects arising from the Proposed Development at Thames Valley Park, as required under Schedule 4 of the 2017 EIA Regulations.

As discussed in Section 2.8, two types of cumulative effect have been considered:

- Intra-project cumulative effects, comprising interactions between different environmental effects arising from the Proposed Development; and
- Inter-project cumulative effects, comprising the combined effects of the Proposed Development and the other developments identified in Table 2-5.

The assessment considers the demolition and construction phase, including the later electrical and mechanical fit-out works, and the operational phase of the Proposed Development.

11.1. **Intra-Project Cumulative Effects**

11.1.1. **Demolition and Construction Phase**

Nearby residential receptors could experience a combination of construction dust, noise and vibration during demolition and construction. Construction noise and vibration effects are assessed as Negligible adverse and Not Significant following implementation of a CEMP and BPM.

Earthworks, construction runoff and the generation of excavated and waste materials could also interact to affect water quality, drainage infrastructure and flood risk. These effects would be controlled through the CEMP, temporary drainage arrangements, pollution-prevention measures and appropriate management of excavated materials and waste. No additional significant effect is anticipated from these interactions.

The consumption and transportation of construction materials and management of waste would contribute to the greenhouse-gas emissions assessed within Chapter 8. These emissions are already incorporated into the GHG assessment and do not represent a separate additional effect.

11.1.2. **Operational**

Operational plant could result in combined air-quality and noise effects at nearby residential and ecological receptors. Operational noise would be controlled through plant noise limits and appropriate acoustic mitigation incorporated during detailed design. Residual operational noise effects are assessed as Not Significant.

Climate-related heatwave and drought effects could interact with operational water requirements, drainage performance and the resilience of buildings,

infrastructure, human health and ecological receptors. Water-resource and flood-risk effects would be controlled through the proposed drainage strategy, closed-loop cooling system and agreement of discharge arrangements with Thames Water.

No additional significant intra-project effect has been identified beyond the Significant adverse heatwave and drought effects reported within Chapter 8.

11.2. Inter-Project Cumulative Effects

The potential for inter-project cumulative effects arising from the Proposed Development alongside the developments identified in Table 2-5 has been assessed within the relevant technical chapters.

Where construction programmes are unavailable, a reasonable worst-case assumption has been made that some demolition and construction activities could overlap with those associated with the Proposed Development.

11.2.1. Demolition and Construction

Concurrent construction could result in combined dust, noise, vibration, material consumption, waste generation and water-resource effects.

Construction noise and vibration would be temporary and controlled through development-specific CEMPs, BPM and planning controls. Significant cumulative noise and vibration effects are therefore not anticipated.

Construction dust and fugitive PM₁₀ emissions will be controlled at an individual site level. It is assumed that any cumulative schemes within this radius will also have measures in place to minimise their construction dust emissions in accordance with best practise industry measures.

Concurrent construction could increase demand for construction materials and waste-management infrastructure. However, established regional and national material supply chains and permitted waste-management facilities are available to support the identified developments. The cumulative effect on Material Assets and Waste Management Infrastructure is assessed as Minor adverse and Not Significant.

Cumulative effects on the Thames Water sewer network, groundwater and flood risk would be controlled through statutory approvals, development-specific drainage strategies and the Environment Agency licensing regime. These cumulative effects are assessed as Negligible and Not Significant.

GHG emissions are inherently cumulative because emissions from individual developments combine within the global atmosphere. Upfront embodied-carbon and construction-traffic emissions from the Proposed Development are assessed

as Significant against the local carbon budget, but Not Significant against the regional and UK carbon budgets.

11.2.2. Operational

Operational noise would be controlled through established noise limits and detailed acoustic design. Other developments would similarly be expected to comply with relevant planning controls and environmental legislation. Significant cumulative operational noise effects are therefore not anticipated.

Operational building emissions (NO₂, PM₁₀, CO) will be minimised through embedded design measures. With the incorporation of an SCR system to reduce generator emissions, and the placement of stacks at height, and away from sensitive receptors.

Additional development could increase surface-water runoff and foul-water discharges to the Thames Water network. However, new connections and discharge rates would be subject to approval by Thames Water, while drainage systems would be required to avoid increasing flood risk elsewhere. Cumulative effects on the sewer network, groundwater and pluvial flood risk are assessed as Negligible and Not Significant.

Operational waste would be managed through established municipal and commercial collection arrangements. The relatively low quantities of operational waste generated by the Proposed Development would not materially increase cumulative demand on waste-management infrastructure.

Operational GHG emissions would contribute to the cumulative effect on the global atmosphere. Operational energy is assessed as Significant against the local and regional carbon budgets. In-use embodied carbon, backup-generator emissions and operational traffic emissions are also Significant against the local carbon budget but Not Significant against the regional and UK carbon budgets.

Significant adverse climate-resilience effects associated with heatwave and drought are identified for buildings and infrastructure, human health, and ecology and the natural environment.

Figure 11-1. Summary of Inter-Project Cumulative Effects

Environmental topic	Demolition and construction	Operational	Significance
Air Quality	Temporary effects controlled through IAQM best practise measures and a CEMP.	Operational emissions controlled through embedded design measures.	Not Significant
Noise and Vibration	Temporary effects controlled through CEMPs and BPM.	Operational effects controlled through noise	Not Significant

Environmental topic	Demolition and construction	Operational	Significance
		limits and detailed acoustic design.	
Climate Change and GHG	Significant effects against the local carbon budget from upfront embodied carbon and construction traffic.	Significant GHG effects against the local and, for operational energy, regional carbon budgets. Significant heatwave and drought effects are also identified.	Significant
Water Resources	Negligible cumulative effects on sewers, groundwater and flood risk.	Negligible cumulative effects on the sewer network, groundwater and pluvial flood risk.	Not Significant
Waste	Minor adverse cumulative effect on Material Assets and Waste Management Infrastructure.	No material cumulative effect on waste-management infrastructure anticipated.	Not Significant

11.3. Summary and Conclusion

The assessment has considered interactions between the environmental effects of the Proposed Development and its combined effects with the developments identified in Table 2-5.

No additional significant intra-project effects have been identified beyond those reported within the individual technical chapters. Construction related noise, vibration, water resource and waste effects would be controlled through established mitigation and are not expected to combine to produce a significant effect.

Significant cumulative effects are principally associated with GHG emissions and climate change resilience. Significant adverse GHG effects are identified against the local carbon budget during construction and operation, with operational energy also resulting in a Significant effect against the regional carbon budget. Significant adverse resilience effects associated with heatwave and drought are identified for buildings and infrastructure, human health, and ecology and the natural environment.

Other inter-project cumulative effects relating to noise and vibration, water resources, air quality and waste are assessed as Not Significant.

12. Summary

This chapter of the Environmental Statement ('ES') provides a summary of the residual effects arising from the Proposed Development, following the implementation of mitigation measures, identified in chapters 6-10 of the ES.

Table 12-1 provides a summary of the significant effects arising from the Proposed Development, i.e., those of moderate or major significance unless otherwise stated, and identifies the mitigation measures recommended upon which the residual effect reported is reliant. The residual effects that are significant are identified in bold and summarised in Table 12-2.

Table 12-1 Summary of Significant Effects, Mitigation Recommendations and Significance of Residual Effects

Topic	Effect	Mitigation	Duration	Significance of Residual Effect (Scale)
Demolition and Construction Phase				
Air Quality	Impact from the generation of demolition and construction dust and PM ₁₀ emissions upon existing receptors.	Implementation of best practice measures from the IAQM guidance, including a DMP and CEMP.	Temporary	Negligible
	Impact of road traffic emissions generated by construction vehicles (NO ₂ , PM ₁₀ and PM _{2.5}).		Temporary	Negligible
Acoustics	Impact from demolition and construction noise and vibration.	Implementation of best practice measures and a CLP.	Temporary	Negligible
GHG & Climate Change	Upfront embodied carbon emissions associated with the product and construction (A1-A5).	Select materials with low embodied impact. Optimise material use and efficiency. Re-use materials (where possible) to save embodied carbon.	Permanent	Negligible (National) – Minor Adverse (Regional)
	Impact of traffic emissions generated by construction vehicles (GHG).	Implement measures to reduce direct emissions.	Permanent	Negligible (National & Regional)
	Emissions associated with water consumption during construction and commissioning stages.	-	Permanent	Negligible (National, Regional & Local)
Water Resources	Detrimental impact on receiving water body/downstream network	Implement measures incorporated into the CEMP	Permanent	Negligible – Minor Adverse

Topic	Effect	Mitigation	Duration	Significance of Residual Effect (Scale)
	Localised pluvial flooding around Proposed Development site during construction without established permanent drainage network		Temporary	Negligible – Minor Adverse
Waste	Consumption of finite construction materials, including aggregates, concrete and structural steel.	Efficient design and procurement; application of the waste hierarchy; use of recycled and secondary materials where practicable; and reuse of suitable demolition and excavated materials.	Temporary	Minor Adverse
	Generation of demolition, construction and excavated waste, increasing demand for waste-transfer, recycling, recovery and disposal facilities.	Implementation of a SWMP or equivalent; segregation of waste streams; beneficial reuse of suitable materials on Site or at receiver sites; and transfer of remaining waste by licensed carriers to appropriately permitted facilities.	Temporary	Minor Adverse
	Generation and management of hazardous waste during demolition and construction.	Pre-demolition surveys and Site investigations; appropriate classification, segregation and storage; and transfer by licensed contractors to appropriately permitted hazardous-waste facilities.	Temporary	Minor Adverse
Operational Phase				
Air Quality	Building emissions associated with the operation of the fuel-cells and testing of the back-up generators (NO ₂ , PM ₁₀ , CO)	Implementation of best practice design measures, including the incorporation of SCRs. No further site-specific mitigation not required.	Permanent	Negligible
Acoustics	Operational Noise – Residential Amenity	Operational plant noise limits; low-noise plant selection; acoustic screening; enclosures; attenuators; anti-vibration mounts;	Permanent	Negligible – Minor Adverse

Topic	Effect	Mitigation	Duration	Significance of Residual Effect (Scale)
		rooftop screening where required.		
	Operational Noise – Ecological Receptors	Habitat buffers and stand-off distances; operational plant noise limits; low-noise plant selection; acoustic screening and attenuation where required; detailed acoustic design at reserved matters stage	Permanent	Negligible – Minor Adverse
Climate Change and Resilience	In-use embodied carbon, associated with the repair, maintenance and refurbishment stages (B1-B5)	-	Permanent	Minor Adverse (Regional) - Negligible (National)
	Impact of traffic emissions generated by operational vehicles (GHG).	-	Permanent	Minor Adverse (National)
	Emissions associated with operational energy (B6).	-	Permanent	Negligible (National, Regional and Local)
	Emissions associated with the supply and treatment of water (B7).	-	Permanent	Negligible (National & Regional)
	Emissions associated with the testing of the back-up generators.	-	Permanent	Negligible (National & Regional)
Water Resources	Detrimental impact on receiving water body/downstream network.	Surface water discharged at agreed rate with TWUL and infiltration methods promoted.	Permanent	Negligible
	Insufficient capacity in downstream network to accommodate flow volumes and rates.	Foul sewerage discharged at agreed rate with TWUL.	Permanent	Minor Beneficial
	Hazardous chemicals, required for the operation of the Proposed Development, enter a pathway to the aquifer and contaminate the groundwater.	Glycol, fire effluent, petrol and ad-blue strategies implemented to contain leaks on site.	Permanent	Negligible – Minor Adverse

Topic	Effect	Mitigation	Duration	Significance of Residual Effect (Scale)
	Surface water catchment on Proposed Development is not contained on site and overland flows convey outside of the Site boundary.	Drainage network designed to accommodate a 1 in 100-year +20% uplift for climate change.	Permanent	Negligible – Minor Adverse
	Localised pluvial flooding on Proposed Development during larger storm events.	Drainage network designed to accommodate a 1 in 100-year +20% uplift for climate change.	Permanent	Negligible
Decommissioning				
GHG & Climate Change	Embodied carbon impact associated with the end-of-life stages.	-	Permanent	Negligible (Local) – Minor Adverse (Regional & National)

Table 12-2 Summary of Significant Residual Effects

Topic	Effect	Mitigation	Duration	Significance of Residual Effect (Scale)
Demolition and Construction Phase				
GHG & Climate Change	Upfront embodied carbon emissions associated with the product and construction (A1-A5)	Select materials with low embodied impact. Optimise material use and efficiency. Re-use materials (where possible) to save embodied carbon.	Permanent	Major Adverse (Local)
	Impact of traffic emissions generated by construction vehicles (GHG).	Implement measures to reduce direct emissions.	Permanent	Moderate Adverse (Local)
Operational Phase				
GHG & Climate Change	In-use embodied carbon, associated with the repair, maintenance and refurbishment stages (B1-B5)	-	Permanent	Major Adverse (Local)
	Impact of traffic emissions generated by operational vehicles (GHG).	-	Permanent	Moderate Adverse (Local)

Topic	Effect	Mitigation	Duration	Significance of Residual Effect (Scale)
	Emissions associated with operational energy (B6).	-	Permanent	Moderate Adverse (Regional) – Major Adverse (Local)
	Emissions associated with the testing of the back-up generators.	-	Permanent	Moderate Adverse (Local)



**Places shaped for
people and plane**