

Earl Shilton SUE

Environmental Statement - Main Report



BLOOR HOMES

Jelson
HOMES

BARWOOD
LAND

Report for

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1. Introduction

1.1 Overview

- 1.1.1 Bloor Homes, Barwood Land, and Jelson Homes (hereafter referred to as 'the Applicants') are seeking outline planning permission from Hinckley and Bosworth Borough Council (HBBC) for a residential led mixed-use development on land at Weavers Fields, located to the south-east of Earl Shilton, Leicestershire (the 'Site') (see **Figure 1.1**).
- 1.1.2 The Site extends to approximately 66 hectares (ha) and forms most of the land allocated as a Sustainable Urban Extension (SUE) by HBBC, as identified in their Core Strategy document¹. The total extent of the SUE includes the Site, plus an additional agricultural field to the north-west of the Wastewater Treatment Works (WwTW) and three fields between Mill Lane and Thurlaston Lane which are the subject of a separate planning application. Historically, Scoping Opinions were adopted by HBBC for development of the entire SUE allocation in 2012 and 2014. However, neither of these proposals were progressed to the point of planning application submission. Presently, the area for which outline permission is sought is 4.2 ha smaller than the SUE allocation.
- 1.1.3 Permission for this mixed-use development will be sought via the submission of two planning applications to HBBC to reflect land control at the Site for the respective Applicants (see **Figure 1.2** and **Chapter 3: The Proposed Development**, specifically **Section 3.2**). The Barwood Land application forms two parcels covering land east of Astley Road and west of the WwTW, and land falling north of Mill Lane (hereafter referred to as 'Application A'). It encapsulates the proposed access on to Astley Road and Mill Lane. The Jelson Homes and Bloor Homes application would cover all remaining land (hereafter referred to as 'Application B') and includes delivery of the main access points onto the A47, and minor accesses onto Breach Lane and Mill Lane. The two applications are considered in this Environmental Statement (ES) and hereafter will collectively be referred to as the 'Proposed Development'.
- 1.1.4 The Proposed Development itself comprises up to 1,500 dwellings, with up to 5.3 ha of space for business uses (Class B8, B2, and E(g)², local centre (including use classes E and hot food takeaway) and a primary school, together with strategic infrastructure including green-space, with all other Matters Reserved apart from strategic vehicular access.

1.2 The applicant and the project team

- 1.2.1 This ES has been prepared on behalf of the Applicants by Wood Group UK Limited (hereafter referred to as 'Wood'), alongside Ecology input from Ecology Solutions Limited (see **Chapter 7: Biodiversity**).
- 1.2.2 Wood is registered with the Institute of Environmental Management and Assessment (IEMA)'s Environmental Impact Assessment Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

¹ Hinckley and Bosworth Borough Council (2009). Hinckley and Bosworth Borough Council Local Development Framework Core Strategy (online) available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (accessed 8 July 2020).

² Recent change to the *Use Classes Order (Amendment Regulations 2020)*, which came into effect from the 1 September 2020 means that the future planning application for the Proposed Development will include the new class E (to replace the former B1).

- 1.2.3 This ES has been prepared by a number of technical specialists who have undergone a rigorous Suitably Qualified and Experienced Persons approval process which addresses competency in the delivery of EIA. A statement outlining the relevant experience and qualifications of the competent experts involved in the delivery of this ES is provided in **Appendix 1A**. A statement from the Applicants that confirms that they consider the specialists to be competent is included in **Appendix 1B**.

1.3 Purpose of the Environmental Statement

- 1.3.1 This ES has been prepared as part of the EIA process for the Proposed Development. EIA is required because the Applicants and HBBC consider that the Proposed Development meets the criteria for EIA development under *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017 No. 571)*³ (here after referred to as the 'EIA Regulations'). Specifically, the Proposed Development requires EIA because it falls within Schedule 2, regulation 10(b) of the EIA Regulations (urban development projects) as the development comprises more than 150 dwellings and the overall development exceeds 5 ha in area.
- 1.3.2 Hence, this ES has been prepared for the purpose of meeting those requirements of the EIA Regulations that pertain to ESs. The ES provides part of the information that will be used by HBBC and others to inform the process of determining the application for permission, under the EIA Regulations, for the Proposed Development.
- 1.3.3 In accordance with good practice, a Scoping Report (reference: 42523-WOOD-XX-XX-RP-O-0001_A_P2.0 LR) was prepared for the Proposed Development to identify the potential likely significant environmental effects arising from its construction and operation/occupation. Of these effects, those that were assessed as being likely to be significant were proposed for further assessment in the ES. This reflects the requirement of the EIA Regulations for the ES to only discuss in depth those effects that are likely to be significant.
- 1.3.4 The Scoping Report was issued to HBBC together with a request for a Scoping Opinion under Regulation 15(1) of the EIA Regulations. Under these regulations the Council is required to consult with the '*consultation bodies*' (as defined in the EIA Regulations). A formal Scoping Opinion was received from HBBC on 12 November 2020.
- 1.3.5 Drawing upon the Scoping Opinion and subsequent assessment work, the ES includes an assessment of the likely significant environmental effects of the Proposed Development, leading to a conclusion about which effects are assessed as being significant.
- 1.3.6 The overall approach that has been taken to defining significance, as well as further information about the approach to preparing the ES, is outlined in **Chapter 4: Approach to Preparing the Environmental Statement**.

1.4 Contents of the Environmental Statement

- 1.4.1 As set out in Schedule 4 of the EIA Regulations, the following information should be included in an ES:
- the location of the development;

³ The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (online). Available at: <https://www.legislation.gov.uk/uksi/2017/571/contents/made> (Accessed 29 March 2021).

- the characteristics and land-use requirements of the Proposed Development, considering construction and operation (including requisite demolition works where relevant);
- operational processes such as energy, materials and natural resources used;
- any residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases);
- the reasonable alternatives that the developer has studied with a comparison of their environmental effects;
- the baseline environment and its evolution in the absence of the development;
- a description of the likely significant effects of the Proposed Development on environmental factors - population, human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage, and landscape;
- a description of the methods used in the assessment to determine whether significant effects are likely to occur;
- a description of measures and monitoring that have been identified to address likely significant effects;
- a description of the development's vulnerability to major accidents and disasters;
- a Non-Technical Summary; and
- a list of references.

1.4.2

Regulation 4 and Schedule 4 of the EIA Regulations require that the environmental topics listed in column 1 of **Table 1.1** need to be considered when preparing an ES. Column 2 then lists where these topics are included in this ES, with reference to the relevant chapter numbers.

Table 1.1 Environmental topics to be addressed in the ES and chapter references

Topics ⁴ that need to be assessed under the EIA Regulations	Chapter titles in this ES
Population	Landscape Chapter 10 ; noise Chapter 11 ; socio-economics and health Chapter 12 ; traffic and transport Chapter 14
Human health	Socio-economics and health Chapter 12
Biodiversity	Biodiversity Chapter 7
Land	Land Quality Chapter 16
Soil	Soils Chapter 13
Water	Water Chapter 15
Air	Air quality Chapter 6
Climate	Climate Chapter 8
Material assets	Scoped out of the ES

⁴ In this ES, the word 'topic' is used when referring to the environment that could be affected by the Proposed Development. Other words with the same general meaning are used in the EIA Regulations, notably 'factor' and 'aspect', but these are not used in the same context within this ES.

Topics ⁴ that need to be assessed under the EIA Regulations	Chapter titles in this ES
Cultural heritage	Historic environment Chapter 9
Landscape	Landscape Chapter 10
The inter-relationship between the above factors	Cumulative effects assessment Chapter 17 and within topic chapters of the ES
Vulnerability to major accidents or disasters	Scoped out of the ES

1.5 Structure of this Environmental Statement

1.5.1 The ES comprises 4 volumes, as follows:

- **Volume 1** is a Non-Technical Summary (NTS), which is also available as a standalone document. This is a non-technical document which serves as a summarised version of the ES. It is intended to be accessible by a range of audiences, providing them with a clear outline of the Proposed Development, the resulting environmental impacts and subsequent mitigation strategies to avoid or lessen potential impacts.
- **Volume 2:** ES main text.
- **Volume 3:** Supporting figures.
- **Volume 4:** Supporting appendices.

1.5.2 The ES is structured as follows:

- **Chapter 2** explains the need for the Proposed Development, outlines the main alternatives considered for meeting this need and indicates the main reasons for the choice of the preferred alternative.
- **Chapter 3** provides a description of the Proposed Development.
- **Chapter 4** details the approach that has been adopted in preparing the ES and undertaking the impact assessment.
- **Chapter 5** provides an overview of the legislation and policies that are relevant to the ES.
- **Chapters 6 to 16** set out the technical assessments for the environmental topics that need to be assessed in the ES.
- **Chapter 17** sets out the results of the cumulative effects assessment of the Proposed Development and other developments in the locality.

1.5.3 A set of abbreviations and a glossary are provided as **Appendix 1C** and **Appendix 1D** respectively.

2. Project need and alternatives

2.1 Need for the project

- 2.1.1 Hinckley and Bosworth Borough Council (HBBC) has identified a need for 9,000 new homes to be provided in the borough between 2006 and 2026. The Council's work on the Hinckley and Bosworth Adopted Core Strategy⁵ identified through consultation and preparatory work on the Plan that respondents were supportive of a development option that concentrated the majority of new development in and around Hinckley. To accommodate this level of development the Core Strategy identified that the sub-regional centres of Earl Shilton and Barwell provide a critical mass to support Hinckley town centre. It also identified that the centres of Earl Shilton and Barwell were in need of regeneration and that to support regeneration of these urban areas, two mixed use Sustainable Urban Extensions (SUEs) should be developed at Barwell and Earl Shilton.
- 2.1.2 These SUEs were included in the version of the Local Plan that was submitted for Examination in May 2009. The Inspector examined the evidence relating to the development strategy and the Core Strategy was subsequently adopted in December 2009. Further detailed requirements for the SUE were set out in the Earl Shilton and Barwell Area Action Plan⁶ (AAP) which forms part of the Adopted Development Plan. The draft AAP was published in November 2010 and was submitted for Examination in late 2013 and formally adopted in September 2014.
- 2.1.3 The Site's allocation was therefore informed by the Development Plan Evidence base work, public and statutory consultation over the years that the Core Strategy and AAP were developed, and the allocation has been examined by an Inspector at Local Plan Examination. Alternative spatial options and sites were tested through the Local Plan process and Examination and therefore the Earl Shilton SUE represents the most sustainable option. It should be noted that the emerging Local Plan has identified the same allocation for the delivery of the Earl Shilton SUE. The SUE itself will assist in regeneration of the area and in meeting the borough's housing need, including affordable housing need, and more broadly the East Midlands.

2.2 Consideration of alternatives

Introduction

- 2.2.1 The EIA Regulations make two references to the consideration of alternatives:
- in paragraph 18(3)(d) of Part 5 it states that an Environmental Statement (ES) should include "*a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.*"; and
 - paragraph 2 of Schedule 4 states that an ES should include "*A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific*

⁵ Hinckley and Bosworth Borough Council (2009). Hinckley and Bosworth Borough Council Local Development Framework Core Strategy (online) available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (accessed 8 July 2020).

⁶ Hinckley and Bosworth Borough Council (2014). Earl Shilton and Barwell Area Action Plan (online) available at: https://www.hinckley-bosworth.gov.uk/downloads/file/4332/earl_shilton_and_barwell_area_action_plan_and_appendices_-_adopted_23_september_2014 (accessed 8 July 2020).

characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

- 2.2.2 The reasonable alternatives that have been studied are outlined below.
- 2.2.3 The Environmental Impact Assessment (EIA) Regulations do not expressly require the developer to study alternatives, although the nature of certain developments and their location may make the consideration of alternative sites a material issue. In this instance, the Site is acknowledged as the Strategic Site for sustainable urban development within the Hinckley and Bosworth AAP⁶, following a process where a number of other sites were considered. Against this background, further consideration of the 'do-nothing' (or 'without development') scenario would not support HBBC's aspirations for the sustainable development. As such, the 'doing nothing' scenario was not considered to be a reasonable alternative.

2.3 Evolution of the Proposed Development

Development design

- 2.3.1 Since the SUE was allocated in the Core Strategy, the Earl Shilton and Barwell AAP was developed. This considered the scale of development, set out objectives for the development of the site and site-specific requirements along with a Development Framework setting out the broad location of land uses/facilities within the SUE. This was informed by available evidence at the time and through public and stakeholder consultation.
- 2.3.2 Work undertaken for a draft planning application for the SUE in 2014 built on the development framework principles established in the AAP. Further technical and environmental work undertaken as part of the draft planning application in 2014 and more recently as part of the current planning application has informed the development of the design.

Layout/location

- 2.3.3 The starting point for the design of the Proposed Development and the location of different land uses on-site was the Development Framework in the adopted AAP as this was informed by the Local Plan evidence base and public and stakeholder consultation. The 2014 draft application work included land controlled by Persimmon Homes to the north of the SUE. This land is now the subject of a separate planning application and does not form part of the current applications, but regard has been given to this part of the SUE in the development of the masterplan.
- 2.3.4 The recent design work has focussed on two aligned planning applications, Application A (Barwood Land) and Application B (Jelson and Bloor Land). The key masterplan revisions that affect the location of key land uses within the Site are set out below. As this is an outline application with all matters apart from access reserved, further detail regarding the layout will be developed as part of future reserved matters applications.

Movement and Access

- 2.3.5 The overall movement and access strategy remains as set out in the AAP and aims to provide easy access for non-local trips onto the A47 at two locations to serve the northern and southern parts of the Proposed Development, improve bus connectivity and enhance links for local trips and active travel to adjoining residential areas. As a result of land control constraints and the need to ensure that the Proposed Development is deliverable, there has been a change to the main southern access of the A47 which is now to be achieved by improving and converting the existing Breach Lane priority junction in to a 4-arm roundabout. This change offers several advantages over the

original access arrangements via Masefield Drive that were set out in the AAP. These advantages include the following:

- it can be delivered on land controlled by the Consortium or within the adopted highway and avoids third party land issues, making the SUE more deliverable;
- the removal of traffic from Masefield Drive reduces the impacts (in particular noise) on existing residents; and
- the access can be used for construction, avoiding impact on existing residents of Masefield Drive and avoids the need for construction of a temporary access.

2.3.6 The main spine road alignment through the Site is similar to that originally proposed although rather than continuing south to join Masefield Drive it will turn south-east to join the A47 at the new southern roundabout. The route will still be designed to accommodate future bus services ensuring that the majority of the SUE is within 400 m of the bus route.

2.3.7 At the very southern part of the Site, it is now proposed to access a small parcel of land directly off Breach Lane. There would be no through vehicular access from this parcel to the remainder of the SUE, only pedestrian and cycle access. This will improve the deliverability of the Proposed Development and help to fund up front infrastructure.

Primary School and Community Hub Location

2.3.8 These uses will remain at the centre of the SUE as required by the AAP. This will ensure good walkability to the facilities. These facilities have been moved slightly eastwards within the Site to split them between the two application areas. The internal movement and access strategy has been adapted to provide flexibility in terms of delivering the infrastructure and phasing. This would assist in enabling the school to be delivered relatively early in the overall construction phase of the Proposed Development. The 2 hectare (ha) land use budget for the school has been split between the two applications and located to be accessible from the main spine road and/or the new internal loop road. A section of footpath will need to be diverted as a result of the school location being moved. A new community hub is similarly split across the two applications and could serve to provide early years facilities, if required.

Open Space Strategy and GI

2.3.9 The approach envisaged in the AAP is maintained, involving provision of some new open space within the SUE, with improvements to the formal sports facilities (for example a new pavilion and/or changing rooms) at Weavers Springs (to be delivered via S106 contributions) to improve its playing capacity.

2.3.10 The above changes are considered to accord with the AAP development framework. The framework is relatively dated (2014) and since its development, further technical and environmental work has been undertaken to provide a greater understanding of the issues which are relevant to the Site. The changes have also been made in the context of the need to ensure that the Proposed Development is deliverable.

Size and scale

2.3.11 The Proposed Development is for up to 1,500 new homes. This accords with the AAP requirement for a minimum of 1,600 new homes, as the Persimmon Homes site to the north of the SUE is now excluded from this application and is the subject of a separate planning application.

- 2.3.12 The scale of other facilities such as the school and community hub are all appropriate for the overall size and nature of the SUE.

Summary of design alternatives considered

- 2.3.13 Even before the start of the EIA process, many development proposals are informed by environmental considerations. For example, early decisions might be made to avoid direct effects to designated nature conservation or cultural heritage features and there will often be recognition of the need to implement standard measures to control noise and dust emissions, and to minimise the risk of pollution incidents. Further opportunities to avoid or reduce potential adverse effects, or to deliver environmental enhancements, may be identified whilst preparing the scoping report.
- 2.3.14 A design led approach has at all stages of design evolution to date sought to acknowledge and mitigate potential environmental effects as well as to incorporate and where possible enhance, environmental features and assets. Measures to mitigate potential environmental effects, alongside enhancement measures where possible, are identified within each topic chapter of this ES.
- 2.3.15 A number of preliminary meetings were held with HBBC officers in relation to the previous development plans at the Site to support the 2012 and 2014 applications, with the previous design evolution being informed by extensive desk study consultations with statutory consultees including statutory undertakers, the Environment Agency, Historic England, Natural England, and the relevant environmental health and highway authorities. The Proposed Development has also been informed by more recent extensive desk study consultations with statutory consultees. Ongoing pre-application discussions have occurred with HBBC Council Officers and other statutory consultees during the preparation of the planning application.
- 2.3.16 The Proposed Development design has sought to be consistent with that set out in the Development Framework and as set out in the adopted AAP as this is the policy starting point. The AAP Development Framework which sets the key parameters for the design was informed by Local Plan evidence base work and consultee comments. The current Proposed Development proposals accord with the overall principles of the AAP, although some changes as set out in the sections above have been proposed as a result of land control issues, further technical work, and the need to ensure that the Proposed Development is deliverable.

3. Description of the Proposed Development

3.1 Introduction

- 3.1.1 The Proposed Development description presented in this section has given consideration to the requirements of Paragraph 1 of Schedule 4 of the Environmental Impact Assessment (EIA) Regulations in which states that the description should include:
- a) *"a description of the location of the development;*
 - b) *a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;*
 - c) *a description of the main characteristics of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; and*
 - d) *an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases."*
- 3.1.2 These requirements are addressed in the sub-sections below.

3.2 Site and surroundings

Site location

- 3.2.1 The Site is located immediately to the south-east of Earl Shilton, approximately 8 km to the west of Leicester in the borough of Hinckley and Bosworth, as shown in **Figure 1.1**. It is centred on National Grid Reference SP447185, 297356. The total Site area is approximately 66ha.

The Site and surroundings

- 3.2.2 The Site currently comprises predominantly arable farmland with boundary hedgerows and intermittent hedgerow trees (see **Figure 1.1**). It is split into two distinct parcels: north and south of Mill Lane. A Severn Trent Wastewater Treatment Works (WwTW) adjoins the eastern boundary of the Site and is accessed separately from Mill Lane.
- 3.2.3 Key features in the surrounding area are the town of Earl Shilton, which borders the Site on its northern and western extent, and to the south and east the A47. The A47 provides a bypass around the towns of Hinckley and Earl Shilton and runs from the A5 to the west to Leicester in the east. Land use beyond the A47 to the south and east predominantly comprises open arable agricultural land interspersed by isolated farmsteads and villages such as Huncote, Stoney Stanton and Croft. Croft Quarry (granite) is also a major feature in the landscape to the east of the Site, beyond the M69 which runs south-west to north-east between the M6 and M1 motorways.
- 3.2.4 There are few designated historical features or sites in the proximity of the Site (see **Figure 3.1**). There is a scheduled monument (Earl Shilton Motte and Bailey Castle), within 1 km, located on the northern outskirts of Earl Shilton. There are also several listed buildings within Earl Shilton town centre.

- 3.2.5 In terms of biodiversity, the closest Statutory Nature Conservation Site is Burbage Common Local Nature Reserve (LNR) which is located approximately 2.2 km to the south-west of the Site. There are ten Local Wildlife Sites (LWS) and seven potential/historic LWS within 1 km. The closest of these is an unnamed pond, located 90 m off-site, to the south-east of the A47.

Land control

- 3.2.6 Land control is primarily split between the following companies and public bodies:
- Bloor Homes;
 - Barwood Land;
 - Jelson Homes; and
 - Earl Shilton Town Council.
- 3.2.7 Control of land comprising Application A (see **Figure 3.2**) is presently split between Barwood Land and Earl Shilton Town Council and accounts for an area of approximately 25 ha. Earl Shilton Town Council own the existing playing fields located to the north-west of the Site along with a children's play area. The remainder of the Site, forming Application B (see **Figure 3.2**) is under the control of Jelson and Bloor Homes and covers a total area of approximately 41 ha. Small parts of the application sites encompass other land included for access purposes.

3.3 Development proposals

Overview

- 3.3.1 The Proposed Development comprises residential, education and employment uses together with areas of formal and informal open space and landscaping. The proposed land use parameters are shown in **Figure 3.3**. The residential and employment use areas are intended to contribute to the Borough's housing provision (see **Section 2.1**) and to provide a source of employment to the local area.
- 3.3.2 It should be noted that the development proposals for which permission is being sought via two separate applications are outline planning applications with all matters, except means of access, reserved for future determination. The components of the Proposed Development described herein will be subject to detailed design and approval through the reserved matters process. **Table 3.1** presents a summary of the key components of the Proposed Development.
- 3.3.3 Where matters are reserved, it is necessary and good practice to establish parameters on which the assessment of the likely significant effects shall be based. This is also known as the 'Rochdale Envelope'. The assessments made within this Environmental Statement (ES) are based on parameters established to represent a 'reasonable worst case' as applicable to the characteristics of the development. These are summarised for the Proposed Development provided in **Table 3.1**.
- 3.3.4 Future reserved matters applications will be accompanied by consideration of whether the development would introduce any new significant adverse effects beyond those identified in this ES.

Table 3.1 Proposed Development components

Component	Description
Residential dwellings	Up to 1,500 dwellings across a net developable area of approximately 35 ha. Dwellings are expected to mainly comprise of a mix of detached, semi-detached, and short terraces of dwellings generally of two (10 m) and two and a half storeys in height (12.5 m). At key gateways or nodes in the Site, there may be potential for some flats and maisonettes and of dwellings up to 3 storeys (15 m) in height subject to further detailed design and assessment at reserved matters. Dwellings would include a range of homes and tenures to be confirmed at reserved matters with one to five bedrooms. An approximate average square footage of 950 ft ² has been assumed.
Employment land	Up to 5.3 ha of flexible employment land to accommodate offices or manufacturing, distribution or other business uses (use classes B2, B8 and E(g)). In this area building heights would be up to approximately 17 m in height to offer a range of flexible and adaptable accommodation.
Primary school	Primary school (class F1) on a site of approximately 2 ha for up to 420 pupils. It is assumed this would be up to three storeys (15 m).
Community hub	A community hub (class F2/C3) of approximately 0.5 ha including a retail centre (class E)(of no more than 2,000 m ²) to meet everyday convenience needs. Although subject to market demand and community need at the time of development, the potential uses could include use classes E, F.1 and F.2, and a hot food take away. It is assumed these would be up to three storeys (15 m).
Public open space	Approximately 19.3 ha of public open space including areas of new planting, landscaping and green corridors. This would also include children's play areas and semi natural greenspace for informal recreation. About an additional 3 ha would comprise Sustainable Urban Drainage Systems (SuDS) features as part of a multifunction green space network. In addition to this there will be dedicated sports pitches extending to an area of approximately 2.5 ha.
Accesses	Five vehicular access points will be created in total. Two accesses direct from the A47 Clickers Way and three connections to Earl Shilton at Mill Lane, Astley Road and Breach Lane. Once the development is completed all the accesses, except for Breach Lane, will be connected internally within the Site to create a permeable and flexible movement network. The final masterplan layout will be designed to incorporate a range of additional pedestrian and cycle connections to Earl Shilton and the wider rights of way network.
Utilities and services	New services such as gas, electricity, water, telecommunications, and drainage.

Indicative Site Layout

- 3.3.5 Residential dwellings would be located north and south of Mill Lane. The entire parcel of land north of Mill Lane would consist of a residential area and informal green space, including the integration of Sustainable Drainage Systems (SuDS). To the south of Mill Lane, residential dwellings would be in three distinct areas; the largest would encompass the southern area of the Site south of the Earl

Shilton Brook, the second largest would be located west of the WwTW, and the smallest would be to the east of the WwTW. The residential areas would be set back from the WwTW and separated from it by a buffer zone of green space and SuDS features.

- 3.3.6 The employment use buildings are located immediately south of Mill Lane, to the north and north-east of the WwTW, fronting the A47. The community hub and primary school are centrally located within the main residential area and on the spine road to maximise connectivity and accessibility by all modes.

3.4 Construction phase

- 3.4.1 Reflecting that the outline permission sought, there is presently limited information available on the precise construction methods that will be employed. For the purposes of this application and technical assessments, indicative and typical information with respect to the nature of the works required is presented. This construction information reflects processes for other similar developments and is therefore considered robust and appropriate. Development phasing is outlined in **Section 3.7**.
- 3.4.2 In advance of any construction works, it is anticipated that the following would be undertaken:
- archaeological investigations, excavation and programme of recording;
 - removal of infrastructure/buildings, such as the two sheds to the west of the WwTW;
 - removal of small sections of hedgerows and trees to create temporary construction access and permanent access points into the Site;
 - earthworks, which would involve the excavation and/or levelling of material to create the required ground levels; and
 - installation of foul water and surface water drainage networks and other utilities infrastructure and connection to existing networks off-site.
- 3.4.3 It is anticipated that the construction of the Proposed Development may involve, but not be limited to, the following activities:
- setting up the construction site and implementing health, safety and management systems as well as security measures;
 - construction of new roadways within the Proposed Development and new access points into and out of the Site;
 - implementation of planting and landscape management measures;
 - implementation of biodiversity enhancement measures;
 - construction of foundations and buildings. Once the buildings are built and weather-tight, work would commence on internal finishes, etc. This work would largely be contained within the building shell and comprises the installation of lighting, heating and cooling systems (where required); and
 - connection of the buildings to the services (gas, water, drainage, electricity and communications networks, etc.) installed within the Site.
- 3.4.4 A Traffic Management Plan will be prepared for each respective application prior to construction. Routes for construction traffic and construction deliveries will be restricted to those identified in the Transport Assessment (TA) (see **Appendix 13.1**). Plant and equipment deliveries requiring

exceptionally large vehicles will avoid times of peak traffic flows and will take place in consultation with the police.

- 3.4.5 The proposed scale and mix of uses at the Site have been used to forecast traffic generation during the operation of the Site (see **Chapter 13: Traffic and transport** and **Appendix 13.1**). The traffic forecasts have been used in the assessment of air quality and noise effects of the Proposed Development traffic (**Chapter 6** and **Chapter 11** respectively).

3.5 Operational phase

- 3.5.1 Upon completion of all construction works, the appropriate arrangements would be made for the ongoing maintenance of public open space, play areas, SuDS and roads situated throughout the Site.
- 3.5.2 The Proposed Development would generate additional traffic, a significant proportion of which would arise from future residents travelling to and from the Site, as well as those employed in the employment area. Other traffic generated would be associated with deliveries and domestic and commercial refuse removal services.
- 3.5.3 A TA has been prepared to support the planning applications. As part of the TA, a Travel Plan (TP) has been prepared. The TP comprises a package of measures to be implemented during the operational phase of the Proposed Development with the purpose of promoting sustainable travel modes.

3.6 Decommissioning phase

- 3.6.1 The EIA Regulations also require consideration of decommissioning. However, given that the Proposed Development would comprise housing, school, employment and retail uses, which would be maintained in the long-term by its owners, and that the buildings would have a design life of many years, it is considered that no assessment of potential effects from decommissioning is required as part of the EIA.

3.7 Development phasing and working hours

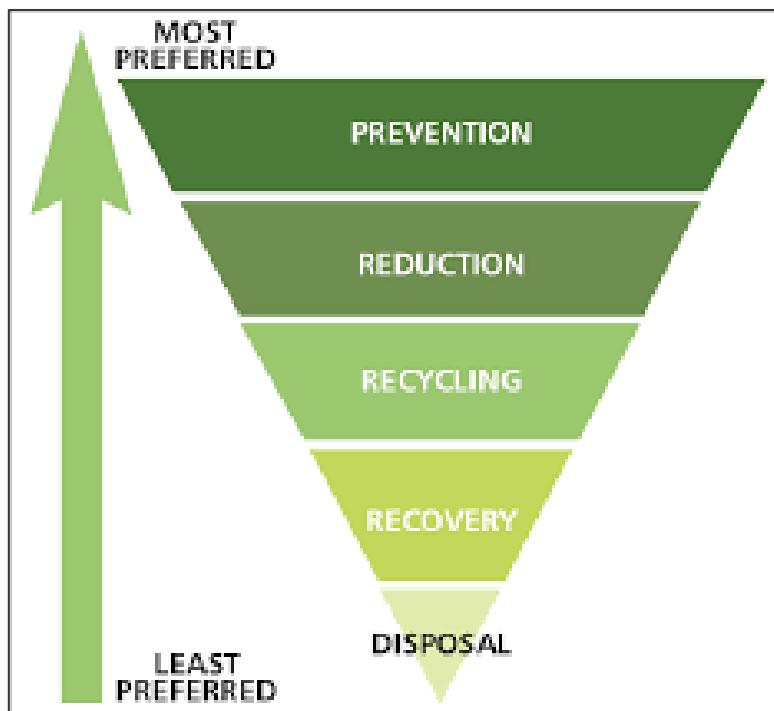
- 3.7.1 At this stage of the project, and given the nature of the permission sought, the exact dates of construction are not known. However, construction of the overall Proposed Development is likely to take up to 10 years, subject to build-out rates. For the purposes of the ES, it is assumed that construction would commence in 2026 and be phased over a 10-year period. First occupation of residential units is assumed to be during 2026.
- 3.7.2 The Proposed Development is likely to be built in a series of phases. Each phase will comprise the following periods:
- site establishment, site clearance, finalisation of detailed design and construction of primary infrastructure (i.e. main roads and utility services); and
 - build-out - construction site set up, physical construction of buildings and completion of ancillary development.
- 3.7.3 It is expected that construction of the Proposed Development would occur during normal working hours: 07:00 to 18:00 on weekdays (Monday to Friday excluding Bank Holidays) and 08:00 to 13:00 on Saturdays. Works outside of these hours would only occur with prior agreement from HBBC. The

Applicants are aware of the COVID19 situation and relevant government guidance would be adopted for any construction work, inclusive of permitted working hours.

3.8 Waste management

- 3.8.1 The waste hierarchy will be applied throughout the construction and operation phases (see **Graphic 3.1**). Construction waste will be minimised and then recycled where possible, and this will be set out and managed via reserved matters applications through an agreed Waste Management Plan via the Construction Environmental Management Plan (CEMP) by the appointed construction contractors for each of the respective plots. Opportunities for waste avoidance, and reduction, as well as sustainable waste re-use, recycling, and disposal, will be used where appropriate. On-site there will be facilities for appropriate collection, segregation, and storage of reusable and recyclable materials.

Graphic 3.1 Waste Hierarchy



- 3.8.2 Construction activities across the Site would result in the generation of arisings including excavated materials. The approach adopted would be to retain as much of this material on-site as possible, with arisings investigated and any contaminated material removed where required noting that significant contamination is not expected given the predominant existing agricultural land use. Re-use of material on-site would be subject to management in accordance with legislation and where necessary, subject to a Materials Management Plan in accordance with the CL:AIRE Definition of Waste: Code of Practice.
- 3.8.3 Wastewater arisings during construction are not anticipated as foundations are not expected to be piled due to the underlying geology, and excavations will likely be less than 5 m deep. Dewatering or groundwater level lowering is therefore not expected to be required, although there may be instances of small amounts of localised dewatering associated with perched aquifers in the limited clay rich gravel superficial geology. There may be small volumes of wastewater from potential equipment washdown, and this would be contained and managed in a similar manner to waste soil, with adequate characterisation/testing to ensure a suitable disposal route is identified.

- 3.8.4 Minor maintenance wastes such as equipment lubrication oil changes and replacement seals would be created during the operation of construction machinery which would be removed off-site via existing waste management procedures.
- 3.8.5 The proposed land use would result in an increase in the generation of household waste in the local area as well as waste associated with the employment uses. The additional waste generation would require collection, treatment, and disposal in accordance with waste management practices for the district. Community recycling facilities would be provided at convenient locations well positioned for residents, well screened and of sufficient size. These would be located where there is easy vehicular access or refuse vehicles. Details of these would be provided in future Reserved Matters planning applications. Each household would be provided with waste and recycling containers in line with that provided elsewhere in the Hinckley and Bosworth Borough Council (HBBC) area.

3.9 Monitoring and management plans

Monitoring

- 3.9.1 If planning permission is granted, there is a need to consider whether it is appropriate to impose monitoring requirements via a condition imposed on the grant of planning permission; or a planning obligation.
- 3.9.2 Monitoring, where it is required, is explained further within the relevant topic chapters (**Chapter 6** to **Chapter 16**).

Management Plans

Construction Environmental Management Plan

- 3.9.3 A CEMP provides an overview of the standard construction management measures that would be implemented as part of the Proposed Development. As such it aims to ensure that construction activities for the Proposed Development are carried out in accordance with legislation and best practice for minimising the effects of construction on the environment and local communities.
- 3.9.4 The key objectives of a CEMP are to:
- provide a mechanism for delivering mitigation described in the ES;
 - ensure compliance with legislation through setting out the need for consultation with consultation bodies (see Regulations 2 and 19(3)(c) in the EIA Regulations), and by obtaining necessary consents and licences from relevant bodies;
 - provide a framework for monitoring and compliance auditing and inspection to ensure the environmental measures included in the scheme are being implemented;
 - ensure environmental best practices are adopted throughout the construction stage;
 - provide a framework for dealing with adverse effects as they occur; and
 - ensure a prompt response should unacceptable adverse effects be identified during the works.
- 3.9.5 For the purposes of this Environmental Statement, it is assumed that the CEMP will be drafted and implemented by the Applicants' appointed construction contractors. All measures which are described herein will be included and implemented as part of the Proposed Development. Examples of such measures (as described in **Chapter 6** to **Chapter 16** and in **Table 4.5**) are as follows:

- prevent pollution spillage – for example by the bunding of construction work areas to prevent run-off reaching watercourses;
- minimise dust generation – for example by locating material stockpiles away from sensitive receptors, covering and/or damping down material stockpiles and implementing wheel-washing facilities close to the Site exit to minimise the spread of dust and material off-site;
- minimise noise – for example by maintaining machinery, using less noisy machinery, locating machinery away from sensitive receptors and so that other features (for example material stockpiles) screen noise from the machinery and where needed enclosing machinery;
- retain topsoil on-site for reuse in landscaping, measures to protect the structure of soils during their stripping and storage and re-use of any surplus topsoil appropriately off-site;
- undertake work in accordance with the Government's 'Guidance for Pollution Prevention';
- ensure the use of Personal Protective Equipment (PPE) for site workers/visitors; and
- ensure that the local community is informed of on-going construction activities.

Other Management Plans

3.9.6

As part of any future reserved matters applications, a number of management plans may be required prior to permitting the commencement of construction. Such other plans may include, but are not limited to the following:

- archaeological written scheme of investigation;
- site waste management plan;
- ecological management plan;
- construction noise and vibration management plan;
- dust management plan;
- environmental spillage and pollutant incident control plan;
- PRoW management plan;
- drainage strategy;
- traffic management plan; and
- lighting strategy.

4. Approach to preparing the Environmental Statement

4.1 The Environmental Impact Assessment process

- 4.1.1 Environmental Impact Assessment (EIA) is a process to identify the likely significant effects of a project (often referred to as a 'Proposed Development') on the environment. It should be systematic, analytical, impartial, consultative and iterative allowing environmental issues to be addressed in the design of a project. Typically, a number of design iterations take place in response to environmental constraints and opportunities identified during the EIA process prior to the final design being achieved. The principal alternatives that have been considered to date are summarised in **Chapter 2: Project Need and Alternatives**.
- 4.1.2 The preparation of the Environmental Statement (ES) is one of the key stages in the EIA process, as it brings together information about any significant environmental effects, which Hinckley and Bosworth Borough Council (HBBC) will use to inform its decision about whether the Proposed Development should be allowed to proceed.

4.2 EIA terminology

Impacts and effects

- 4.2.1 For the purposes of this ES, the term 'impacts' is used to describe the changes that arise as a result of the Project (for example, changes in drainage pattern) and the term 'effects' are the consequences of those changes (for example, habitat is affected by an alteration in the drainage pattern).

Types of effects

- 4.2.2 Paragraph 5 of Schedule 4 of the EIA Regulations states that: *"The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development."*
- 4.2.3 This ES considers these types of effects in the respective environmental topic chapters. Whilst some terms are self-explanatory, a definition of effects has been provided to confirm how these terms have been applied.

Direct effects

- 4.2.4 Those effects that result directly from the Proposed Development. For example, the use of construction equipment may lead to increased emissions to air (e.g. dust).

Indirect and secondary effects

- 4.2.5 Indirect and secondary effects are those which are not caused immediately by the Proposed Development but arise as a consequence of it. An example would be where indirect employment is created as suppliers increase their activities and hire new workers to provide the additional goods and services required by the Proposed Development.

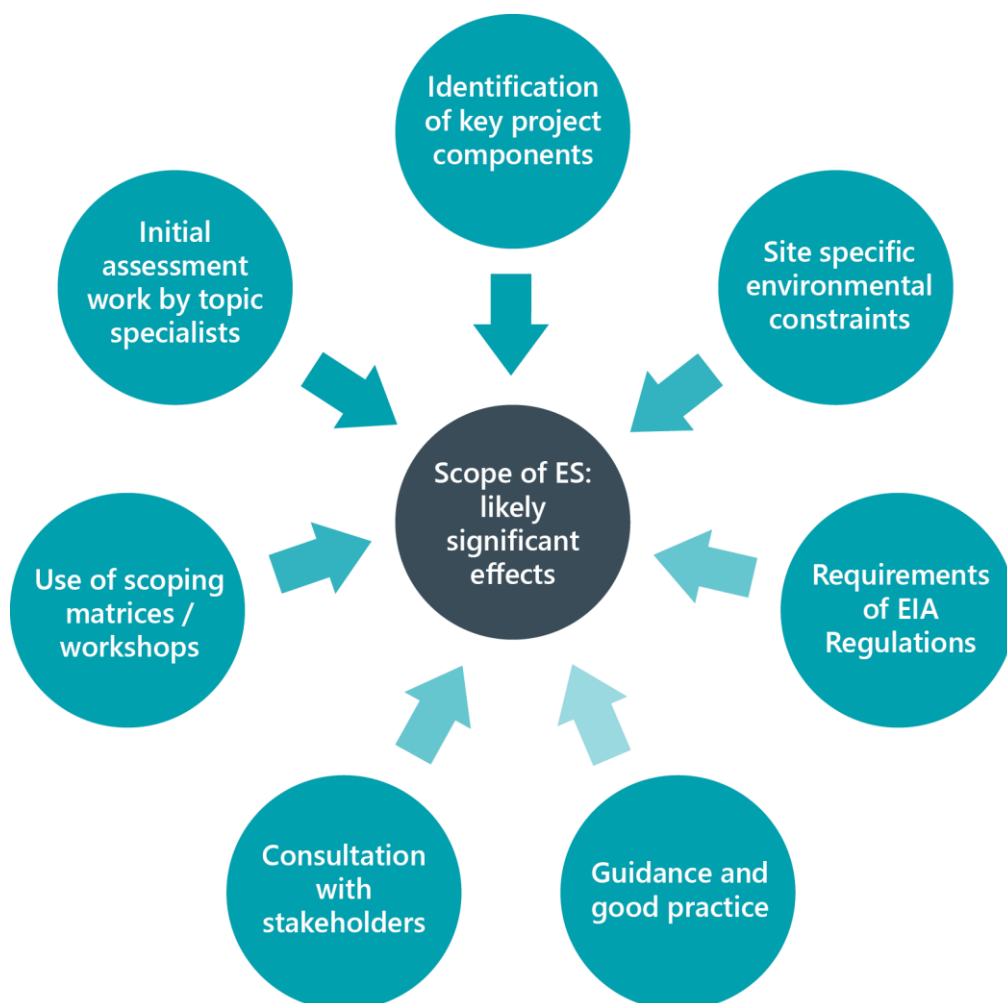
Cumulative effects

- 4.2.6 There are two types of effect, inter-project effects and inter-related effects. The former occurs as a result of two or more project impacts acting together (i.e.) combined, to result in a new or changed effect on a single receptor. The latter arise as a result of the Proposed Development in combination with other large-scale developments or projects.
- 4.2.7 Cumulative effects are dealt with separately within **Section 4.9**.

4.3 EIA scoping

- 4.3.1 Scoping sets the context for the EIA process. It is intended to inform a proportional and robust approach to assessment through initial evaluation and reporting of identified likely significant effects in a scoping report. It is also sets out the proposed methodology for the assessments to be taken forward and reported in the ES, for agreement with the determining authority and consultation bodies.
- 4.3.2 **Graphic 4.1** highlights some of the key inputs into the scoping process.

Graphic 4.1 Overview of the scoping process



- 4.3.3 The scoping process undertaken for the Proposed Development involved identification of:
- the people and environmental resources (collectively known as 'receptors') that could be significantly affected by the Proposed Development;
 - the aspects of the Proposed Development those receptors might be affected by (e.g. loss of habitat affecting a particular species); and
 - the work required to take forward the assessment of these likely significant effects.
- 4.3.4 Scoping was commenced at the outset of the work on the EIA, with the initial conclusions about the likely significant effects of the Proposed Development being set out in the Scoping Report (reference: 42523-WOOD-XX-XX-RP-O-001_A_P2.0LR). The preparation of this report was informed by the legislative and policy context relevant to the Proposed Development.
- 4.3.5 At the EIA scoping stage, the conclusions surrounding significance are usually based upon professional judgement. This is with reference to the Proposed Development description and drawing on, as appropriate, available information about the magnitude and other characteristics of the potential changes that are expected to be caused by the Proposed Development. The receptors' sensitivity to the changes, the effects of the changes on relevant receptors, and where appropriate the value of receptors is analysed and considered. If the information that is available at the EIA Scoping Report stage does not enable a robust and definitive conclusion to be reached as to whether a potential effect is not likely to be significant, the effect is then taken forward for further assessment.
- 4.3.6 The Scoping Report for the Proposed Development sets out what had been identified at that time to be the likely significant environmental effects that needed to be considered in the ES. It outlined the approach to undertaking the assessments of these effects. The report was issued to HBBC to inform its Scoping Opinion under the 2017 EIA Regulations (see **Chapter 1: Introduction**). The scoping stage also enabled statutory and non-statutory organisations, and others with an interest in the Proposed Development (stakeholders) to comment on the proposed scope of the assessment. The Scoping Opinion was issued by HBBC on 12 November 2020.
- 4.3.7 Subsequent to the issuing of the Scoping Report, the scope of the assessment has been progressively refined in response to comments from the determining authority and from consultees (see **Section 4.4**), together with environmental information that has been obtained from survey or assessment work carried out as part of the EIA, and the evolution of the project proposals.
- 4.3.8 The environmental topic chapters (**Chapters 6 to 16**) detail the final scope of the assessment in relation to effects that it was assessed could be significant and therefore needed to be subject to more detailed assessment. In some cases, effects that would normally be scoped-out (because they are not likely to be significant) have been scoped-in on the basis that, in the absence of an explanation being provided, readers of the ES may feel that it is deficient. All other effects (i.e. that are not referred to in the technical chapters) are not likely to be significant.

4.4 Consultation

- 4.4.1 The purpose of consultations (via meetings, telephone and correspondence) was to agree the assessment methodologies for technical studies and identify any sensitivities or concerns associated with the Proposed Development, which may need consideration in the design process and assessment as part of the EIA. Consultation that has been undertaken to date is summarised in the specific technical topic chapters (**Chapter 6 to Chapter 16**).

4.5 Determination of the scope of the assessment

Spatial scope

- 4.5.1 Spatial scope is the area over which changes to the environment are predicted to occur as a consequence of a Proposed Development. In practice, an EIA should focus on those areas where these effects are likely to be significant.
- 4.5.2 The spatial scope for each environmental topic, described as Study Areas, is dependent on the nature of the potential effects and the location of receptors that could be affected. The spatial scope for each assessment therefore takes account of:
- the physical area of the Proposed Development;
 - the nature of the baseline environment; and
 - the manner and extent to which environmental effects may occur.
- 4.5.3 In this ES, the spatial scope varies between environmental topics and is therefore described in each of the topic chapters (**Chapter 6** to **Chapter 16**). A clear explanation is provided as to why the Study Area has been adopted in each instance.

Temporal scope

- 4.5.4 The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur and are typically defined as either being temporary or permanent, as follows.
- Permanent - these are effects that will remain even when the Proposed Development is complete, although these effects may be caused by environmental changes that are permanent or temporary. For example, an excavator that is temporarily driven over an area of valuable habitat could cause a level of damage such that the effect on this vegetation would be permanent (i.e. recovery would not be possible).
 - Temporary – these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes.

4.6 Identification of baseline conditions

- 4.6.1 As the various elements of the Proposed Development would be built over a period of up to 10 years, commencing in 2022/2023 and then operated indefinitely, it cannot be assumed that the baseline conditions in the absence of the Proposed Development would be the same as the current baseline.
- 4.6.2 To determine the baseline conditions that should be used for the assessment of the likely significant effects of the Proposed Development, it is necessary to define the current baseline conditions and then to decide whether these conditions are likely to change by the 'assessment years' that are selected for the construction and operation of the Proposed Development. If this future baseline is more likely to occur than the current baseline, the future baseline is used for the assessment of likely significant effects. However, in many cases it will be concluded that the current baseline is just as likely, or even more likely, to occur in the assessment years than would be the case with any future baseline conditions. In this case, the current baseline is used for the assessment.

- 4.6.3 The current baseline is determined for the Study Area as it applies to each environmental topic by a combination of desk-based research, including consultation with the relevant statutory and non-statutory authorities, together with field survey work (where required).
- 4.6.4 In its simplest form, the Study Area for an environmental topic typically comprises the Site of the Proposed Development. However, for several environmental topics, the Study Area is also likely to include land outside the Site, especially where the effects of the Proposed Development are likely to extend beyond such geographical limits to reflect 'Zones of Influence' (ZoI), where the Proposed Development could affect off-site areas.
- 4.6.5 Details of the relevant ZoI are discussed in the baseline section of each environmental topic chapter. These chapters also explain the basis for defining the future baseline conditions, where this is appropriate. This is based on the following:
- information gathered about the existing environmental conditions;
 - changes that can be predicted based on reasonable assumptions and modelling calculations, e.g. the application of traffic growth factors based on relevant guidance;
 - information relating to other likely and predictable changes, e.g. climate change, which could affect current prevailing environmental conditions; and
 - information about other relevant developments, including the nature of the development proposals, their likely timing, and their location relative to the Proposed Development.

4.7 Overview of assessment methodology

Introduction

- 4.7.1 All the topic assessments presented in the ES have been undertaken on the basis of a common understanding of the nature of the Proposed Development, as described in **Chapter 3: Description of the Proposed Development**.
- 4.7.2 For each topic, the assessment of likely significant effects has been undertaken by competent persons (see **Appendix 1A**) with relevant specialist skills, drawing on their experience of working on other development projects, good practice in EIA and on relevant published information. For some topics, use has been made of modelling or other methodologies, as appropriate.

Significance evaluation

Introduction

- 4.7.3 The methodology applied in this ES is designed to consider whether the impacts of the Proposed Development would have an effect on any environmental or human receptors. Assessments broadly consider the magnitude of impacts and sensitivity of resources or receptors that could be affected in order to classify effects according to the categories shown in **Table 4.1** and **Table 4.2**.
- 4.7.4 The conclusion as to whether an effect should be considered significant is based upon professional judgement, with reference to **Chapter 3: Description of the Proposed Development**, and available information about:
- The magnitude and other characteristics of the potential changes that are expected to be caused by the Proposed Development;
 - The sensitivity of receptors to these changes;

- The effects of these changes on relevant receptors; and (where relevant); and
- The value of receptors.

- 4.7.5 For each of the technical assessments presented in **Chapter 6** to **Chapter 16**, the categories of resource or receptor sensitivity and magnitude of impact are described and defined. The following sections therefore provide the generic criteria for the definition of resource or receptor sensitivity, magnitude of change and classification of effect.
- 4.7.6 The topic chapters provide greater detail on the approach to the assessment and specific guidelines for the definition of impact magnitude and resource or receptor sensitivity. The approach to the assessment undertaken by each environmental topic (**Chapter 6** to **Chapter 16**) broadly follows the approach set out in the following sections. Variations from this approach are applicable to specific environmental aspects whereby professional judgment in the application of standards mandated by professional bodies (for example the Chartered Institute of Ecology and Environmental Management) is applied. Where this is the case, further detail and justification is provided within the topic chapter.

Evaluation matrices

- 4.7.7 Significance evaluation involves combining information about the sensitivity, importance or value of a receptor, and the magnitude and other characteristics of the changes that affect the receptor. The approach to using this information for significance evaluation is outlined in the following sections.

Resource and receptor sensitivity

- 4.7.8 The sensitivity or value of a receptor is largely a product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be defined as being sensitive or important at a county or district level.
- 4.7.9 The use of a receptor also plays a part in its classification. For example, when considering visual amenity, a receptor which is residential in nature may be valued more than a place of work as the environmental quality of the residential receptor is more likely to be an important part of that receptor's use. **Table 4.1** sets out the generic guidelines for the assessment of sensitivity of a resource or receptor.

Table 4.1 Generic guidelines for the assessment of sensitivity

Sensitivity and Value	Guidelines
Very High	Value: Feature or receptor possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site or receptor (for example designated features of international or national importance). Sensitivity: Feature or receptor has little to no capacity to accommodate the proposed form of change.
High	Value: Feature or receptor possesses key characteristics which contribute to the distinctiveness, rarity and character of the site or receptor (for example designated features of international or national importance). Sensitivity: Feature or receptor has a very low capacity to accommodate the proposed form of change.
Medium	Value: Feature or receptor possesses key characteristics which contribute to the distinctiveness and character of the site or feature (for example designated features of regional or county importance). Sensitivity: Feature or receptor has a low capacity to accommodate the proposed form of change.

Sensitivity and Value	Guidelines
Low	Value: Feature or receptor possesses characteristics which are locally significant. Feature or receptor which is either not designated or is designated at a local or district level. Sensitivity: Feature or receptor has some tolerance to accommodate the proposed change.
Very low	Value: Feature or receptor characteristics do not make a significant contribution to local distinctiveness and not designated. Sensitivity: Feature or receptor is generally tolerant and can accommodate the proposed change.

Magnitude of change

- 4.7.10 The magnitude of change affecting a receptor that would be affected by the Proposed Development would be identified on a scale from very low to very high. For certain topics, the magnitude of change would be related to guidance on what levels of change are acceptable (e.g. for air quality or noise) and be based on numerical parameters. For other it will be a matter of professional judgement to determine the magnitude of change, using descriptive terms. **Table 4.2** sets out the generic guidelines of the assessment of the magnitude of change.

Table 4.2 Generic guidelines for the assessment of magnitude of change

Magnitude	Guidelines
Very High	Very large-scale changes over the whole development area, and potentially beyond, to key characteristics or features of the particular environmental aspect's character or distinctiveness.
High	Large scale changes over the majority of the development area, and potentially beyond, to key characteristics or features of the particular environmental aspect's character or distinctiveness.
Medium	Medium scale changes over part of the development area, and potentially beyond, to key characteristics or features of the particular environmental aspect's character or distinctiveness.
Low	Noticeable but very small-scale change over a small part of the development area, and potentially beyond, to key characteristics or features of the particular environmental aspect's character or distinctiveness.
Very low	Barely discernible changes over a very small part of the development area, and potentially beyond, to key characteristics or features of the particular environmental aspect's character or distinctiveness.

Determination of significance

- 4.7.11 The determination of significance is derived with reference to information about the nature of the Proposed Development, the sensitivity or value of receptors that could be affected, together with the magnitudes of change that are likely to occur. For many environmental aspects, significance can be determined by using a matrix (see **Table 4.3**). Variations to this matrix approach, which may be applicable to specific environmental aspects (for example, Biodiversity), are detailed within the respective topic chapters (**Chapter 6** to **Chapter 16**), along with descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant. Definitions of how the categories that are used in the matrix are derived for each environmental aspect are also set out.
- 4.7.12 In addition, professional judgement is applied in the assessment, as the lines between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions may need clarifying.

4.7.13 The overall significance matrix that will be used for the EIA is shown in **Table 4.3**. The generic definitions that will be used to determine the level of significance are shown in **Table 4.4**. Reference is made to:

- **Major effects**, which will always be determined as being significant in EIA terms. These are highlighted in purple in **Table 4.3**;
- **Moderate effects** can be significant, or not significant, based on specific scenarios and professional judgement; and
- **Minor or negligible effects**, which will always be deemed as not significant.

4.7.14 Effects can either be positive or negative.

Table 4.3 Significance evaluation matrix

		Magnitude of change				
		Very high	High	Medium	Low	Very low
Sensitivity/importance/value	Very high	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Potentially significant)
	High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Note: Significant effects are those identified as 'Major'. 'Moderate' effects may be deemed to be significant depending on the environmental topic and the application of professional judgment.

Table 4.4 Generic classification of effect definitions

Level of significance	Description
Major	Very large or large change in environmental or socio-economic conditions. Effects, both negative and positive, which are likely to be important considerations at a national to regional level because they contribute to achieving national or regional objectives, or, which are likely to result in exceedance of statutory objectives or breaches of legislation.
Moderate	Intermediate change in environmental or socio-economic conditions. Effects that are likely to be important considerations at a regional or local level.
Minor	Small change in environmental or socio-economic conditions.
Negligible	No discernible change in environmental or socio-economic conditions. An effect that is likely to have a neutral or negligible influence.

4.8 Mitigation

- 4.8.1 This ES includes a description of the “*measures envisaged in order to avoid prevent or reduce and, if possible, offset likely significant adverse effects on the environment*” (see Schedule 4(7) of the EIA Regulations). The approach adopted for the Proposed Development takes the form of a hierarchy, whereby priority is given to preventing effects, and then (if this was not possible) to reducing or abating them followed, if necessary, through repair (restoring or reinstating) or compensation.
- 4.8.2 The Institute of Environmental Management and Assessment (IEMA)⁷ provides guidance on three categories of mitigation measures: primary, secondary and tertiary measures:
- **primary** – “*modification to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken.*” These are referred to as ‘embedded mitigation’;
 - **secondary** – “*actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent or through inclusion in the ES.*” These are referred to as ‘additional mitigation’; and
 - **tertiary** – “*actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements or actions that are considered to be standard practice used to manage commonly occurring environmental effects.*” These are referred to as ‘best practice measures’.
- 4.8.3 Opportunities for embedded mitigation have been identified throughout the evolution of the design of an implementation strategy for the Proposed Development and the EIA process, whereby potential significant adverse environmental effects have been fed back into the design process to verify whether they can be avoided or otherwise mitigated in accordance with the hierarchy. Alongside this, best practice measures have been identified with reference to legislative requirements and measures of standard practice to manage commonly occurring effects. These embedded mitigation measures and best practice measures are included within the Proposed Development plans and drawings and thus are integrated into the overall design strategy. **Table 4.5** describes the environmental mitigation which has been embedded within the Proposed Development and the means by which the measures will be implemented, i.e. they will be secured through planning conditions and a Section 106 agreement. Greater detail on these measures can be found in each of the topic chapters (see **Chapter 6** to **Chapter 16**).
- 4.8.4 Following the application of embedded mitigation and best practice measures, where the potential for a significant environmental effect remains, ‘additional mitigation’ has been considered to avoid, reduce or compensate this effect.

⁷ IEMA (2016). Environmental Impact Assessment Guide to: Delivering Quality Development, (online). Available at: <https://www.iema.net/document-download/7014> (Accessed 12 August 2020).

Table 4.5 Summary of environmental measures to be implemented

Environmental measure	Responsibility for implementation	Compliance mechanism
Construction and maintenance of Sustainable Drainage Systems (SuDS) to provide treatment to surface water run-off from the Proposed Development.	Applicant/body adopting SuDS	Planning Condition
Raising floor levels of all properties to 0.15m or above local ground levels to minimise the risk of surface water flooding to properties within the Site.	Applicant	Planning Condition
Locating all development within areas least at risk of flooding and using areas of the Site adjacent to watercourses as amenity areas such as public open space and landscaping.	Applicant	Planning Condition
Inclusion of control measures within the Proposed Development which will mimic natural drainage, allow some infiltration where appropriate and manage run-off from the Site. Such measures will include filter strips, plus storage within the drainage system.	Applicant	Planning Condition
The Earl Shilton Brook crossing will be designed to be clear span, so as not to impact on up or downstream flood risk, and also have the road level raised above the modelled 0.1% AEP flood level so that it is sufficiently elevated above predicted flood risk.	Applicant	Planning Condition
Hedgerow loss kept to a minimum. All retained species-poor hedgerow to be enhanced via their widening/thickening and/or gapping up and through appropriate management. 5m of adjacent habitat either side of hedgerow to be retained.	Applicant/Landscape contractor on behalf of the Applicant	Planning Condition
Standard trees to be planted comprising native species of local origin.	Applicant/Landscape contractor on behalf of the Applicant	Planning Condition
Hedgerow planting to comprise a species-rich mix of locally appropriate shrubs with hedgerow trees.	Applicant/Landscape contractor on behalf of the Applicant	Planning Condition
The retention of existing tree and shrub planting along the eastern and southern boundary of the Site and the introduction of additional tree planting to reduce views for visual receptors of built form as it matures. Implementation of structural tree planting to the northern edges of the Site (to the south of Astley Road/Meadow Court Road and Montgomery Road) to filter and soften views of built form.	Applicant/Landscape contractor on behalf of the Applicant	Planning Condition
Planting in retained and enhanced green corridors should give consideration to avoiding encroaching on or blocking views of the church spire of St Simon and St Jude.	Applicant/Landscape contractor on behalf of the Applicant	Planning Condition
Noise emissions (rating level, L_{Ar}) for proposed commercial uses to be designed to meet a noise emissions criterion of +5dB(A) above background noise level at the worst affected receptors.	Applicant	Planning Condition
Temporary diversions of all footpaths, bridleways and cycleways will be agreed with the Council.	Applicant	Section 106 agreement
The capacity of education in the town will be increased through the provision of land for a new primary school within the Site and financial contributions to be made to increase the capacity of educational provision resulting from the development, if required.	Applicant	Section 106 agreement

Environmental measure	Responsibility for implementation	Compliance mechanism
The capacity of GP Surgeries will be increased through the provision of a financial contribution to enhance capacity, if required	Applicant	Section 106 agreement
Financial contribution to off-site highway works to improve junctions as a result of the proposed development, with potential schemes identified in the Transport Assessment.	Applicant	Section 106 agreement
The creation of pedestrian permeability to the external network and existing bus services, via upgrading of PRowS that provide connections to Breach Lane, Astley Road, Montgomery Road and Mill Lane.	Applicant	Section 106 agreement
The internal spine road will be designed to accommodate buses and enable future service routing through the Site.	Applicant	Section 106 agreement
Framework TP which will include measures to facilitate and encourage future occupants to travel by sustainable transport. Residential, Workplace and School Travel Plans will be developed and implemented as the Site is delivered.	Applicant	Section 106 agreement
To minimise water use, the development will be designed to comply with current water efficiency measures. The applicants will work with the local water supply/sewerage undertaker (Severn Trent Water Limited) to detail the expected timeframe over which the development will be completed. This will enable the appropriate infrastructure to be put in place, with the appropriate licences. Where required, applicant contributions will contribute towards the cost of parts of this infrastructure provision.	Applicant	Planning Condition
Topsoils will be removed from areas where it is likely to be affected by development and, where feasible and practicable, will be reused on-site (for example within gardens, landscaping schemes/green space areas). Topsoils will be stripped in phase to limit erosion effects.	Applicant	CEMP
The same applies to subsoils (although as they are less valuable than topsoil and reuse may only be for reprofiling or green space areas etc).		
Where practicable, direct placement of removed soils into their final location will be undertaken in preference to storage and subsequent reuse at a later date.	Applicant	CEMP
Good practice measures for soil storage, handling and sustainable reuse will be incorporated into the construction methodology in line with MAFF 2000 and Defra 2009 guidance.		
These include:		
- Topsoil and subsoil being stripped separately and, where possible, avoiding handling topsoils during or shortly after heavy rainfall. - Storage of topsoil in bunds of no more than 3m in height, grassed and kept free from construction traffic. - Outside areas of development (for example environmental buffers and landscaped areas), minimising requirement for construction trafficking and therefore soil compaction. - Loosening of compacted subsoils before being covered by topsoil		

Environmental measure	Responsibility for implementation	Compliance mechanism
Development of an unexpected contamination protocol.	Applicant	Planning Condition
Adoption of best practice construction techniques to prevent ground contamination (for example the use of bunded fuel tanks, refuelling of plant and equipment on hardstanding)	Applicant	CEMP
Construction management to avoid/ minimise visual disturbance (daytime and night-time), including the following. Selective and sensitive location of the contractors' compound(s), security fencing and temporary storage of materials and plant. Minimise use of cranes. Implementation and monitoring of Site management procedures, including the regular removal of any construction related litter from the immediate environment. Use of designated routes around the Site for construction vehicles and plant.	Applicant	CEMP

4.9 Assessment of cumulative effects

Introduction

4.9.1 Two types of cumulative effects assessment (CEA) are used in this ES, as set out below.

Inter-project effects

- 4.9.2 For each environmental topic that is dealt with in this ES, an assessment is undertaken of how the environmental effects resulting from the Proposed Development, could combine with the same topic-related effects generated by 'other developments' to affect a common receptor. To do this, it is important to first identify which other developments need to be included in the CEA under each environmental topic assessment.
- 4.9.3 As detailed in the Scoping Report at paragraph 4.5.5, a maximum ZOI was defined to encompass all environmental topic ZOIs in order to identify relevant 'other developments'. This maximum ZOI is a 2 km buffer from the Site boundary for major developments⁸, and a 5 km buffer for other major urban expansion projects and Nationally Significant Infrastructure Projects (NSIPs).
- 4.9.4 In conjunction with the above, although specifically intended for NSIPs, the Planning Inspectorate (PINS) Advice Note Seventeen (December 2015)⁹ was also deemed as an appropriate basis for helping to further identify the other developments that should be considered in the CEA. Specifically, **Table 4.6** which shows the hierarchy of other developments was utilised. This acknowledges that the availability of information necessary to conduct a CEA will partly depend on the prevailing status of the relevant other developments. It develops this concept further by grouping the other developments into tiers, which reflect the likely degree of certainty attached to each development, with Tier 1 being the most certain and Tier 2 the least certain.

⁸ HBBC defines major development as: more than 10 dwellings, a proposed floor area of more than 1,000 m² or a site area of larger than 1 ha.

⁹ The Planning Inspectorate, 2015 and updated in August 2019. Advice note seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects. Available at <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf> (accessed 12 August 2021).

Table 4.6 Other developments to be considered in the CEA

Hierarchy of other developments	Certainty of other developments
Tier 1	Under construction*.
	Permitted application(s), whether under the <i>Planning Act 2008</i> or other regimes, but not yet implemented.
	Submitted application(s), whether under the <i>Planning Act 2008</i> or other regimes, but not yet determined.
Tier 2	Projects for which a Scoping Report have been submitted
	Identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

Decreasing
level of detail
likely to be
available

* Where other projects are expected to be completed before construction of the Proposed Development, and the effects of those projects are fully determined, effects arising from such projects are considered as part of the baseline and therefore as part of the assessment of both the construction and operational phases. This ES will therefore clearly distinguish between projects forming part of the baseline and those in the CEA.

4.9.5 In the context of the Proposed Development, there is only sufficient information available via publicly available sources for Tier 1 developments and therefore, such developments, where they are located within the ZoI, have been subject to CEA. Typically, there would not be sufficient information available for Tier 2 developments, however the remaining parts of the Earl Shilton Sustainable Urban Equipment (SUE) and Barwell SUE have been considered within the assessment of cumulative effects. These other developments are discussed, as appropriate, in **Chapter 17: Cumulative Effects Assessment**.

4.9.6 **Appendix 4A** provides the list of other developments that have been considered in the CEA for the Proposed Development.

Inter-related effects

4.9.7 The second type of CEA involves assessing whether any of the individual environmental topic effects resulting from the Proposed Development, which are not significant in their own right, could combine to create effects that are significant.

4.9.8 The first step is to identify the environmental topics that have common receptors, and then to consider whether the topic effects on any common receptors are likely to combine. The most likely types of receptors that could fall into this category are those pertaining to the amenity of the relevant human population. For example, the occupants of a residential property in close proximity to the Proposed Development might be subject to adverse effects in terms of noise, vibration, air quality, traffic, as well as with regard to visual amenity, or any combination thereof, each of which, when assessed individually, is not significant in EIA terms, but when assessed cumulatively, the effects are judged to be significant.

4.9.9 Because this cumulative assessment involves different environmental topic assessments that cannot robustly be combined, the outcome of this CEA will be reliant on the application of professional judgement from, potentially, several different technical specialists. Further details are provided in

the sub-section of each environmental topic chapter (**Chapter 6** to **Chapter 16**) that deals with the assessment of cumulative effects.

4.10 Chapter structure

4.10.1 With a few exceptions, each topic chapter within this ES follows a common format, as outlined below:

- introduction;
- limitations of this assessment;
- legislative and policy context;
- data gathering methodology;
- overall baseline;
- scope of the assessment;
- environmental measures embedded into the Proposed Development;
- assessment methodology;
- assessment of effects;
- assessment of cumulative effects;
- additional mitigation; and
- conclusions of significance evaluation.

4.11 Limitations and Assumptions

4.11.1 Assumptions and limitations are addressed under each environmental topic as identified in the appropriate chapters (**Chapter 6** to **Chapter 16**).

5. Legislative and policy overview

- 5.1.1 This section sets out the legislation and planning policy context for the Proposed Development.
- 5.1.2 Each environmental topic chapter (**Chapters 6 to 16**) includes a topic specific summary of legislation and relevant planning policies where pertinent to the assessment. Throughout the Environment Impact Assessment (EIA) process, legislation and planning policy will be used to guide the assessment scopes and inform the value ascribed to receptors.

5.2 Legislative context

- 5.2.1 As discussed in **Chapter 1: Introduction**, Directive 2014/52/EU¹⁰ resulted in its transposition into UK Law as The Town and Country Planning IA (the EIA Regulations 2017). The Proposed Development has been assessed against these regulations and Hinckley and Bosworth Borough Council (HBBC), as the determining authority, provides permission for construction and other development work on the Earl Shilton Sustainable Urban Extension (SUE) Site. The aim of an EIA is to ensure that the determining authority is aware of any likely significant environmental effects and that these effects are taken into account in the decision-making process.
- 5.2.2 The Environmental Statement (ES) must contain information specified in regulation 18(3) in addition to meeting the requirements of regulation 18(4). It must also include any additional information specified in Schedule 4 of the EIA Regulations which is relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.
- 5.2.3 The location of the information required under the EIA Regulations is described in **Chapter 1: Introduction** of this ES and is not repeated here. Any topic specific legislation is summarised in **Chapters 6 to 16**.

5.3 National planning policy context

- 5.3.1 The main national planning policy relevant to the Proposed Development is the Revised *National Planning Policy Framework (NPPF)*¹¹. The NPPF was published in March 2012 and updated in July 2018, February 2019 and October 2021. It sets out the Government's planning policies for England and is a material consideration in determining planning applications.
- 5.3.2 The NPPF is supported by the Planning Practice Guidance (PPG)¹², which was first published in March 2014 and, together with the NPPF, sets out the Government's overall planning policy framework. The two documents are intended to be read together. PPG is available as a web-based resource and is updated as and when required.

¹⁰ European Commission (2014). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (online). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0052> (Accessed 26 October 2020).

¹¹ Ministry of Housing, Communities and Local Government (2021). Revised National Planning Policy Framework (online). Available at: <https://www.gov.uk/government/collections/revised-national-planning-policy-framework> (Accessed 30 October 2021).

¹² Ministry of Housing, Communities and Local Government (2019). Planning Practice Guidance (online). Available at: <https://www.gov.uk/government/collections/planning-practice-guidance> (Accessed 12 August 2020).

5.4 Local planning policy

The Development Plan

5.4.1 The Development Plan for the Area comprises:

- Hinckley and Bosworth Core Strategy Development Plan Documents (DPD) (2009)⁵;
- Hinckley and Bosworth Site Allocations and Development Management Policies DPD (2016)¹⁴;
- Hinckley Town Centre Area Action Plan (AAP) DPD (2011);
- Earl Shilton and Barwell AAP DPD (2014)¹³; and
- The Leicestershire Minerals and Waste Local Plan (2019)¹⁵.

5.4.2 The Development Plan documents have a number of objectives:

- to have the right facilities, housing, and infrastructure in the right places;
- to support the local communities by addressing the needs and opportunities of an area; and,
- to help to support the growth of the local economy and tourism.

5.4.3 The Hinckley Town Centre AAP is not relevant to this Site and is not considered further in this report.

Hinckley and Bosworth Core Strategy DPD (2009)

5.4.4 The Core Strategy¹ provides the over-arching strategy and long-term vision for Hinckley and Bosworth up to 2026, with the other DPDs implementing this strategy and vision. The Core Strategy assessed seven broad options for housing growth in the borough, with eight areas to accommodate the growth were considered. The land east of Earl Shilton was allocated for development due to it being one of the least constrained areas, as well as offering a catalyst for regeneration of Earl Shilton. To help reach the Hinckley and Bosworth's 9,000 new homes target a mixed-use SUE was put forward located east of Earl Shilton.

Earl Shilton and Barwell Area Action Plan DPD (2014)

5.4.5 The Earl Shilton and Barwell AAP¹³ provides the development framework for the delivery of two SUEs, one in Earl Shilton and the other in Barwell. The AAP will be used to guide development of the SUEs and allocates land for housing, employment, retail, recreation, open space, and community facilities within the existing settlements and SUEs. The AP includes a provision for a minimum of 1,600 homes to be provided in the Earl Shilton SUE.

¹³ Hinckley and Bosworth Borough Council (2014). Earl Shilton and Barwell Area Action Plan (AAP) Development Plan Document (DPD) (online) available at: https://www.hinckley-bosworth.gov.uk/info/856/local_plan_2006_to_2026/439/earl_shilton_and_barwell_area_action_plan (accessed 8 July 2020).

Hinckley and Bosworth Site Allocations and Development Management Policies DPD (2016)

- 5.4.6 The Site Allocations and Development Management Policies DPD¹⁴ allocates land to deliver the development requirements outlined in the Core Strategy. It also includes development management policies which are used to determine planning applications within the borough.

The Minerals and Waste Local Plan (2019)

- 5.4.7 The spatial vision, strategic objectives, and core policies which set out the key principles to guide mineral extraction and waste management development in Leicestershire up to 2031 are outline in The Minerals and Waste Local Plan¹⁵.

5.5 Other strategies

Leicestershire Community Strategy (2017 - 2021)

- 5.5.1 The Leicestershire Community Strategy¹⁶ sets out the priority outcomes for Leicestershire over a five-year period. The aim of these priorities is to improve the quality of life for the people of Leicestershire.

Hinckley and Bosworth Borough Community Plan (2018 – 2022)

- 5.5.2 The Hinckley and Bosworth Community Plan¹⁷ provides the local interpretation of the Leicestershire Community Strategy and sets out the priorities to address the most important challenges the borough will face in achieving this vision.

The Good Design Guide Supplementary Planning Document (2020)

- 5.5.3 The Good Design Guide Supplementary Planning Document (SPD)¹⁸ aspires to substantially raise design quality in the borough of Hinckley and Bosworth whilst ensuring that local identity and heritage is enhanced by providing a guide for those involved in the planning process. The SPD outlines the Council's design principles in order to provide clarity to those who wish to carry out development.

¹⁴ Hinckley and Bosworth Borough Council (2016). Site Allocations and Development Management Policies DPD (online) available at: https://www.hinckley-bosworth.gov.uk/downloads/download/1218/site_allocations_and_development_management_policies_dpd_-_adoption_july_2016 (accessed 8 July 2020).

¹⁵ Leicestershire County Council (2009). The Minerals and Waste Local Plan (online) available at: <https://www.leicestershire.gov.uk/environment-and-planning/planning/minerals-and-waste-local-plan/local-plan-adoption> (accessed 14 July 2020).

¹⁶ Leicestershire County Council (2017). Leicestershire Communities Strategy, 2017 – 21 (online) available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2019/3/8/Communities-Strategy-2017-21.pdf> (accessed 8 July 2020).

¹⁷ Hinckley and Bosworth Borough Council (2016). Site Allocations and Development Management Policies DPD (online) available at: <https://www.hinckley-bosworth.gov.uk/communityplan> (accessed 29 July 2020).

¹⁸ Hinckley and Bosworth Borough Council (2020). The Good Design Guide Supplementary Planning Document 2020 (online) available at: https://www.hinckley-bosworth.gov.uk/downloads/download/1703/the_good_design_guide_supplementary_planning_document_2019 (accessed 23 September 2020).

6. Air quality

6.1 Introduction

- 6.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to air quality, dust and odour. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development** and with respect to relevant parts **Chapter 14: Traffic and Transport**.

6.2 Limitations of this assessment

- 6.2.1 There are recognised uncertainties in the predictive dispersion modelling process used in this assessment. Uncertainties with the background concentrations of pollutants and the systematic errors associated with the modelling components have been considered by undertaking a model verification. Model verification involves the comparison of modelled concentrations and local monitoring data. Full details on the model verification are included in **Appendix 6A**.

6.3 Relevant legislation, planning policy, technical guidance

Legislative context

- 6.3.1 The following legislation is relevant to the assessment of the effects on air quality and odour receptors:
- *Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe*¹ ;
 - *Air Quality Standard Regulations 2010*² ;
 - *Non-Road Mobile Machinery (NRMM) Regulations 2018 (SI 2018/764)*³ ;
 - *The Environment Act 1995*⁴ ;
 - *The Environmental Protection Act 1990*⁵ ; and
 - *The Town and Country Planning Environmental Impact Assessment (EIA) Regulations 2017*⁶ .

¹ The European Commission (2008). Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe. (Online). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0050&from=en> (Accessed November 2021).

² Parliament of the United Kingdom (2010). The Air Quality Standards Regulations 2010. (Online). Available at: <https://www.legislation.gov.uk/ukxi/2010/1001/made/data.pdf> (Accessed November 2021).

³ Parliament of the United Kingdom (2018). The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018. (Online). Available at: <https://www.legislation.gov.uk/ukxi/2018/764/contents/made> (Accessed November 2021).

⁴ Parliament of the United Kingdom (1995). The Environment Act 1995. (Online). Available at: <https://www.legislation.gov.uk/ukpga/1995/25/contents> (Accessed November 2021).

⁵ Parliament of the United Kingdom (1990) Environmental Protection Act 1990. (Online). Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> (Accessed November 2021).

⁶ The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (online). Available at: <http://www.legislation.gov.uk/ukxi/2017/571/contents/made> (Accessed 13 January 2020).

Planning policy context

6.3.2 A summary of the relevant planning policies is given in **Table 6.1**.

Table 6.1 Planning policy issues relevant to air quality and odour

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) ⁷	Specific sections relevant to this air quality and odour assessment include: Paragraph 174 - Preventing new and existing developments from contributing to being put at unacceptable risk from, or being adversely affected by, unacceptable level of soil, air, water or noise pollution. Paragraph 185 - Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the Site or the wider area to impacts that could arise from the development. Paragraph 186 - <i>"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas (AQMAs) and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in AQMAs and Clean Air Zones is consistent with the local air quality action plan."</i>	Section 6.9
The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007) ⁸	The Environment Act 1995 required the adoption of an Air Quality Strategy containing standards, objectives and measures for improving ambient air quality. The Air Quality Strategy is designed to meet that requirement and provides a framework for improving air quality at a national and local level, and supersedes the previous strategy published in 2000⁹. It imposes a number of obligations on local authorities to manage air quality. Central to the Air Quality Strategy are health-based criteria for certain air pollutants; these criteria are based on medical and scientific reports on how and at	Section 6.9

⁷ Ministry of Housing, Communities & Local Government (2021). Revised National Planning Policy Framework (online). Available at: <https://www.gov.uk/government/collections/revised-national-planning-policy-framework> (Accessed 20 October 2021).

⁸ Department for Environment Food & Rural Affairs (Defra). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. London, The Stationary office, 2007 (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf (Accessed November 2021).

⁹ Department of the Environment, Transport and the Regions (DETR) (2000). The National Air Quality Strategy.

Policy reference	Policy issue	Considered in Section
	what concentration each pollutant affects human health and mirror the Air Quality Objectives (AQOs) set out in the <i>Air Quality (England) Regulations 2000</i> . The AQOs are policy targets often expressed as a maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedances, over a specified averaging period.	
Clean Air Strategy (2019)¹⁰	The Department for Environment & Rural Affairs (Defra) Clean Air Strategy outlines the Government's proposed ambitions relating to reducing air pollution in order to protect health and nature, whilst boosting the economy. Amongst other, the clean air strategy proposes to halve the number of people living in locations where concentrations of particulate matter are above the 2005 World Health Organization (WHO) guideline limit ¹¹ of 10 µg/m ³ by 2025. The Proposed Development would not conflict with government's aims of reducing exposure to PM _{2.5} below the 10 µg/m ³ guideline.	Section 6.9
Development plan policies		
Hinckley and Bosworth Borough Council (HBBC) Core Strategy (2009)¹²	To minimise the impacts of climate change by promoting the prudent use of resources through sustainable patterns of development, investment in green infrastructure, minimising the use of resources and energy, increasing reuse and recycling of natural resources, increasing the use of renewable energy technologies and minimising pollution, including greenhouse gas emissions.	Section 6.5
HBBC Site Allocations and DM Policies Development Plan Documents (DPD) (2016)¹³	The DPD aims to guide development within HBBC up to 2026. <i>"Applicants will be required to demonstrate that new development should not result in adverse impacts, including cumulative impacts upon air quality. Appropriate construction design and mitigation measures, appropriate distances and screening between developments and sensitive uses will protect the amenity of residents and workers and the environment."</i> Policy DM10 - Development and Design compliments the objectives of this policy, providing the framework for ensuring design considerations mitigate against any potential light, noise and air pollution through appropriate siting and design.	Section 6.9

¹⁰ Department for Environment Food & Rural Affairs (Defra) (2019). Clean Air Strategy. (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf (Accessed November 2021).

¹¹ WHO Regional Office for Europe (2005). Air Quality Guidelines Global Update 2005. (Online). Available at: https://www.euro.who.int/_data/assets/pdf_file/0005/78638/E90038.pdf (Accessed November 2021).

¹² Hinckley and Bosworth Borough Council (2009). *Core Strategy* (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (Accessed 29 July 2020).

¹³ Hinckley and Bosworth Borough Council (2016). Site Allocations and DM Policies DPD. (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/5295/site_allocations_and_development_management_policies_dpd_-_adopted_july_2016 (Accessed 18 October 2021).

Policy reference	Policy issue	Considered in Section
Earl Shilton and Barwell Area Action Plan (AAP) (2014)¹⁴	<i>Policy 22 – Development and Design</i> <i>“Developments will be permitted providing that the following requirements are met:</i> <i>It does not adversely affect the privacy and amenity of nearby residents and occupiers of adjacent buildings, including matters of lighting, air quality (including odour), noise, vibration and visual intrusion;</i> <i>The amenity of occupiers of the Proposed Development would not be adversely affected by activities in the vicinity of the site.”</i> <i>Paragraph 5.11 – “The design of the Weavers Meadow development must factor in the need to provide an appropriate buffer between the principle sources of odour within the Earl Shilton Waste Water Treatment Works and the development of sensitive land uses such as residential, education, community and employment uses within the (SUE). A buffer of 100 metres is advised.”</i> <i>Paragraph 9.12 – “As traffic generated by new Proposed Developments were not taken into consideration for the 2003 ES relating to the Bypass, any future assessments should be based on detailed traffic modelling of the Proposed Development and identify what mitigation measures might be required.”</i> <i>Paragraph 9.16 – “The Earl Shilton Waste Water Treatment works include a number of sources of odour that have been identified by Severn Trent Water through a FIDOL Report. In consultation with the Environmental Health Department It was advised that careful master-planning is required to ensure that development does not take place within 100m of the primary sources of odour that have been identified by Severn Trent Water.”</i>	Section 6.9

Technical guidance

6.3.3 A summary of the relevant technical guidance is given in **Table 6.2**.

Table 6.2 Technical guidance relevant to air quality and odour

Guidance reference	Guidance issue	Considered in Section
Local Air Quality Management (LAQM) Technical Guidance LAQM.TG16¹⁵	Provides guidance for governmental and private sectors to discharge their obligations under the LAQM regime. It contains guidance on numerous areas including, for example, screening tools and methodologies, air quality monitoring, estimating emissions and dispersion modelling.	Section 6.8

¹⁴ Hinckley and Bosworth Borough (2014). Council Earl Shilton and Barwell Area Action Plan. (online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/4332/earl-shilton-and-barwell-area-action-plan-and-appendices-adopted-23-september-2014> (Accessed 18 October 2021).

¹⁵ Department for Environment Food and Rural Affairs (Defra). (2018). Local air quality management technical guidance (TG16), (online). Available at: <https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf> (Accessed 18 October 2021).

Guidance reference	Guidance issue	Considered in Section
EPUK/IAQM Guidance on Land-Use Planning and Development Control: Planning for Air Quality¹⁶	Provides a procedure for screening potential air quality effects of new development and a procedure for assessing the significance of air quality effects in planning applications.	Section 6.8
IAQM Guidance on the Assessment of Dust from Demolition and Construction¹⁷	Provides a four-step procedure for evaluating the risk associated with dust emissions from construction and demolition sites on different types of receptors with respect to dust soiling, health effects and ecological effects.	Section 6.8
IAQM Guidance on the Assessment of Odour for Planning¹⁸	Presents useful tools for assessing odour, odour assessment criteria and how to draw conclusions from assessment results.	Appendix 6B
Design Manual for Roads and Bridges (DMRB)¹⁹	Provides a procedure for screening potential air quality effects of new and existing roads and a procedure for assessing the significance of air quality effects associated with traffic emissions (specifically for ecological receptors).	Section 6.8
IAQM Guide to the assessment of air quality impacts on designated nature conservation sites²⁰	IAQM released a guidance document in June 2019 with the aim of providing some clarity on carrying out air quality assessments on impacts to designated sites. This guidance discusses the policy and legal background underpinning the proposed methodology, including the impact of the Wealden Judgement. It outlines the way in which air quality consultants and ecologists should work together, highlighting the responsibilities of each when carrying out Habitats Regulations Assessments.	Section 6.8

6.4 Data gathering methodology

Study area

6.4.1 The selection of a study area with respect to air quality is dependent on a number of factors such as type and location of receptors (i.e. human or ecological), location of the emission source(s), the magnitude of the emissions and the extent to which emissions are dispersed and diluted in the atmosphere. Hence, the Study Area adopted for the Proposed Development is a result of these factors. The emission sources include:

- construction dust emissions; and

¹⁶ Environmental Protection UK and Institute of Air Quality management (IAQM). (2017). Land-use planning and development control: planning for air quality. (online). Available at: <http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf> (Accessed 18 October 2021).

¹⁷ Institute of air quality management (IAQM). (2014). Guidance on the Assessment of Dust from Demolition and Construction. Available from: <https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf> (Accessed 18 October 2021).

¹⁸ Institute of air quality management (IAQM). (2018). Guidance on the assessment of odour for planning. Available from: <http://www.iaqm.co.uk/text/guidance/odour-guidance-2014.pdf> (Accessed 18 October 2021).

¹⁹ Highways England, Transport Scotland, Welsh Government and Department for Infrastructure (2019). Design Manual for Roads and Bridges (DMRB): LA 105 Air Quality. Available from: <https://www.standardsforhighways.co.uk/prod/attachments/10191621-07df-44a3-892e-c1d5c7a28d90> (accessed 22 July 2020)

²⁰ IAQM (2019) A guide to the assessment of air quality impacts on designated nature conservation sites. (Online). Available at: <https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf> (Accessed November 2021).

- operational road traffic emission.

- 6.4.2 The methodology to define the spatial extent of the Study Area, has been informed by the IAQM guidance documents^{16, 17}. The requirements to undertake a detailed air quality assessment has been guided by principles in these documents. A detailed approach to determining the different study areas is provided below, construction dust emissions and traffic emissions are discussed separately.
- 6.4.3 The Study Area for designated ecological areas, extends up to 200 m from road traffic emission sources as per DMRB guidance, and up to 500 m from construction dust sources, as per IAQM dust guidance.

Desk study

- 6.4.4 A summary of the webpages from which data have been obtained, together with the nature of that data is as follows:
- HBBC:
 - ▶ Air Quality Annual Status Report (ASR) published as part of the Local Air Quality Management (LAQM) process²¹.
 - Defra:
 - ▶ Database providing background baseline concentrations of nitrogen oxides (NO_x), nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) predictions for the UK at a 1 km² grid square resolution²².

6.5 Overall baseline

Current baseline

Baseline air quality conditions

- 6.5.1 A review of baseline air quality in the HBBC area has been undertaken by reviewing the Council's ASR²¹ published as part of the LAQM process. The latest Air Quality ASR, reporting concentrations monitored in 2019, indicates that the borough has no declared AQMA at present, however, two areas had the AQMA status revoked in 2004. Both AQMAs were declared in relation to high concentrations of NO₂ arising from traffic emissions on busy roads in the borough. The LAQM reports indicate that the only pollutant of concern is NO₂ emitted from the road network.
- 6.5.2 Although the Council does not operate any automatic air quality monitoring stations, in 2019 it maintained a diffusion tube network to monitor NO₂ concentrations at 16 sites.
- 6.5.3 Two of the sites, Sites 8 and 9, are in the Earl Shilton area. Site 9 is located in the town centre on Wood Street and Site 8 is located near the Earl Shilton bypass (A47 Clickers Way). A description of the monitoring sites and NO₂ diffusion tube results for a five-year period from 2015-2019 is presented in **Table 6.3**.

²¹ Hinckley and Bosworth Borough Council (2020). Air quality annual status report 2020. (Online) Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/5518/air-quality-annual-status-report-2018> (Accessed 18 October 2021).

Table 6.3 Air Quality Monitoring in Earl Shilton by HBBC – NO₂ concentration (µg/m³)

Site ID	Site name	Type	X (m)	Y (m)	2015	2016	2017	2018	2019
8	Earl Shilton Bypass	Suburban	446696	296771	17.4	17.9	17.7	16.2	19.1
9	Wood Street Earl Shilton	Roadside/ Urban Centre	446320	297756	22.8	23.9	21.7	20.9	23.3

- 6.5.4 Results from the two monitoring sites show, that even at roadside locations, concentrations of NO₂ are well below the annual mean AQO of 40 µg/m³. Generally, roadside monitoring locations are likely to measure higher pollutant concentrations than background monitoring locations as they are located closer to the pollution source than relevant public exposure.
- 6.5.5 Background air quality information is also provided in Defra's Background Maps²², making predictions for NO_x, NO₂, PM₁₀ and PM_{2.5} concentrations, using a base year of 2018. This database provides background air quality predictions for the UK at a 1 km² grid square resolution. The average concentration for each of the pollutants for 2019 and 2026, the assessment years are presented in **Table 6.4**.

Table 6.4 Defra mapped background concentrations applicable to the location of the Proposed Development (447500, 297500)

Pollutants (µg/m ³)	2019	2026
NO ₂	10.8	8.4
NO _x	14.2	10.8
PM ₁₀	13.9	12.9
PM _{2.5}	8.8	8.0

- 6.5.6 The Defra background NO₂ concentrations predicted for the Proposed Development Site are much lower than the diffusion tube NO₂ concentrations measured at roadside locations along the principal local road links in Earl Shilton. This is as expected as the background concentrations represent conditions averaged across the 1 km² grid square rather than local peaks in concentration. These background concentrations were used within Defra's NO_x to NO₂ calculator²³ to convert predicted concentrations of road-NO_x to road-NO₂ concentrations to estimate annual mean concentrations at receptors.
- 6.5.7 Based on this review of LAQM reports and Defra background concentrations it can be considered that air quality in the area is good and that pollutant concentrations are well below the UK AQOs.
- 6.5.8 **Table 6.5** details the NO_x background concentrations as well as the nitrogen and acid deposition rates used for Burbage Common and Woods Local Nature Reserve (LNR). Deposition rates were obtained from the Air Pollution Information System (APIS) website²⁴. In the absence of site-specific

²² Defra (2021). Background Mapping data for local authorities. (Online) Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017> (Accessed 18 October 2021).

²³ Defra (2020). NO_x to NO₂ Calculator. (Online) Available at: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/> (Accessed 09/12/2021).

²⁴ APIS (2021). Air Pollution Information System. (Online) Available at: <http://www.apis.ac.uk/> (Accessed 18 October 2021).

values for LNR sites, deposition rates for the nearby Burbage Wood and Aston Firs Site of Special Scientific Interest (SSSI) (Broad-leaved, mixed and yew woodland) were used in the assessment.

- 6.5.9 **Table 6.5** shows the estimated background concentrations of NO_x and deposition rates for nitrogen and acid for 2019 (baseline) and 2026 (assessment year) for the ecological receptors modelled. The DMRB methodology suggests that to account for the decrease in deposition rates in future years, a reduction of 2% per year could be applied, however IAQM guidance states that this approach is no longer appropriate. Instead, ratios were calculated based on the Defra predicted background concentrations, which is widely accepted.
- 6.5.10 As the latest deposition rates available on the APIS website were for 2018, ratios between 2018 to 2019 background concentrations of NO_x (1.05), and 2019 to 2026 (1.29) were applied to deposition rates to calculate future rates.
- 6.5.11 In line with LAQM.TG(16), the background NO_x concentration has been doubled to calculate the daily mean concentrations at all modelled receptor points as a conservative approach.

Table 6.5 Background concentrations and deposition rates used in this assessment for Burbage Common and Woods LNR

X,Y	2019 NO _x concentrations (µg/m ³)	2026 NO _x concentrations (µg/m ³)	2019 background nitrogen deposition (kgN/ha/yr)	2026 background nitrogen deposition (kgN/ha/yr)	2019 background acid deposition (keqN/ha/yr)	2026 background acid deposition (keqN/ha/yr)
444500, 295500	14.1	11.0	44.2	34.2	3.1	2.4

Baseline odour conditions

- 6.5.12 Baseline odour conditions are determined by emissions from local odour sources. For the Proposed Development these have been identified as emissions from the adjacent Severn Trent WwTW.
- 6.5.13 An odour assessment for Earl Shilton WwTW has been undertaken to inform the masterplanning process. The results indicate that the majority of the Proposed Development is located within zones where the risk of odour complaint is slight to negligible. In areas where the odour criterion is predicted to be exceeded, the land has been considered unsuitable for development of high sensitivity receptors, such as dwellings. Only low sensitivity receptors (i.e. employment uses) have been proposed where odour concentrations are above the threshold and not suitable for high sensitivity receptors.
- 6.5.14 The odour assessment has been undertaken through odour modelling that utilises Wood's own library emission rates for the odour sources identified and the most up to date layout of the WwTW site. The odour assessment is included in **Appendix 6B**.

Baseline dust conditions

- 6.5.15 A review of the Earl Shilton area has identified no significant dust generating industries or facilities in proximity to the Proposed Development. However, dust from agricultural activities in proximity to the Proposed Development, such as ploughing and harvesting, is likely to contribute to local levels of dust particulates. Local dust deposition is also likely to be influenced by construction activities for the Proposed Development and nearby developments, particularly earthworks, which are normally short in duration.

- 6.5.16 Dust generation from construction activities can be controlled via appropriate mitigation measures such as dampening down haul roads, sheeting Heavy Goods Vehicles (HGV) and exposed stockpiles etc.
- 6.5.17 There is no monitoring data available to quantify the baseline dust levels of the surrounding area. Predicted Defra mapped background concentrations from **Table 6.4** provides particulate matter baseline.

Future baseline

- 6.5.18 In the absence of the Proposed Development, it is expected there would be a gradual decline in current baseline pollutant concentrations as a result of expected improvements in air quality resulting from the implementation of the Government's clean air strategy objectives and improvements in the emissions performance of road vehicles. The Government recently announced a ban on the sale of new petrol and diesel cars from 2030, with the sale of hybrid cars and vans being permitted until 2035. From 2035 all new cars and vans sold will be fully zero emission²⁵. In addition, measures to encourage the use of walking, cycling, and public transport for shorter journeys are likely to reduce private vehicle use and hence, also contribute to a reduction in pollution associated with this mode of transport.
- 6.5.19 Other committed developments in the vicinity of the Site, which will cause traffic flows increase have been included in the future baseline against which the effects of the Proposed Development have been assessed.
- 6.5.20 With regards to the potential effects of climate change on the future air quality baseline, the 2007 report produced by the Air Quality Expert Group (AQEG)²⁶ indicated that the winter season may become windier with fewer less stable weather conditions by the end of the century, whilst summer seasons are anticipated to become hotter and sunnier, with an increase in unstable weather conditions by the 2040s. The net effect of these anticipated changes on the baseline air quality is difficult to establish but is unlikely to significantly alter the baseline air quality to an extent that it would affect the outcome of this assessment. Other factors such as changes in technology and the move away from combusting fossil fuels, driven by climate change mitigation, would potentially lead to decreases in emissions of the key pollutants considered in this assessment and a corresponding decrease in background concentrations of air pollutants into the future.

6.6 Consultation

- 6.6.1 This chapter has been informed by engagement with Severn Trent Water to understand and confirm the current plant and operations of the Earl Shilton WwTW. It was confirmed that new assets (one Activate Sludge Plant (ASP) and 2 Final Settlement Tanks (FSTs)) were completed in 2019.

6.7 Scope of the assessment

Spatial scope

- 6.7.1 The spatial scope of the assessment of air quality effects covers the area of the Proposed Development, together with roads which would experience an impact on traffic flows due to the

²⁵ HM Government (2020). The Ten Point Plan for a Green Industrial Revolution. (Online) Available at: [The Ten Point Plan for a Green Industrial Revolution \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/90121/ten-point-plan-for-a-green-industrial-revolution.pdf) (Accessed 18 October 2021).

²⁶ Air Quality Expert Group, Air quality and Climate Change: A UK Perspective, 2007. (Online) Available at: <https://uk-air.defra.gov.uk/library/assets/documents/reports/aqeg/fullreport.pdf> (Accessed 18 October 2021).

Proposed Development. The extent of the road network which has been included in the dispersion model assessment is presented in **Appendix 6C**.

Temporal scope

- 6.7.2 The air quality effects have been assessed for 2026 which represents the opening year of the Proposed Development. This is considered a worst-case assumption as baseline pollutant concentrations would decrease in future years.

Potential receptors

Road traffic

- 6.7.3 The human receptors that would potentially be affected by the Proposed Development comprise of residents living in proximity to the Site and along roads (within 200 m of the relevant road sections) that may be affected by traffic related to the Proposed Development. Receptors located within the Proposed Development are also considered as future residential receptors. Representative receptors have been selected and included in the dispersion modelling assessment.
- 6.7.4 The DMRB guidance states that internationally designated biodiversity sites; Special Protected Areas (SPAs), Special Areas of Conservation (SACs), Ramsar sites, and SSSIs within 200 m of an affected route, where there is expected to be an increase >1,000 Annual Average Daily Traffic movements (AADT), need to be considered within an assessment. Beyond 200 m from the roadside, atmospheric concentrations are likely to be at background concentrations due to sufficient dispersion of traffic emissions.
- 6.7.5 Burbage Common and Woods LNR lies approximately 100 m from the B4668 Leicester Road, where an increase in traffic >1,000 AADT is predicted when the Proposed Development is operational. A LNR is not an internationally designated biodiversity site, however the impact of road traffic emissions on Burbage Common and Woods LNR has been considered as a worst-case approach.
- 6.7.6 The location of the human receptors selected as well as the Burbage Common and Woods LNR receptors are presented in **Appendix 6C**.

Construction dust

- 6.7.7 The local community may be concerned that development activities (particularly construction works) would result in regular and persistent dust annoyance, which may affect local amenity and quality of life. A detailed air quality assessment will be undertaken for dust emissions produced from construction activities if:
- a human receptor is within:
 - ▶ 350 m of the boundary of the Site considered; or
 - ▶ 50 m of route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).
 - an ecological receptor is within:
 - ▶ 50 m of the boundary of the Site considered; or
 - ▶ 50 m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Likely significant effects

6.7.8 The receptors that have been taken forward for assessment and the relevant effects assessed are summarised in **Table 6.6**.

Table 6.6 Receptors scoped in for further assessment

Receptor	Relevant assessment criteria	Likely significant effects
Residential properties within 200 m of roads that may be affected by traffic related to the Proposed Development	EPUK/IAQM Guidance on Land-Use Planning and Development Control: Planning for Air Quality	Air quality effects from additional road traffic emissions
Burbage Common and Woods LNR	IAQM Guide to the assessment of air quality impacts on designated nature conservation sites	Ecological effects from additional road traffic emissions
Residential properties located within 350 m of the boundary of the Site considered; and/or, 50 m of route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance(s)	IAQM Guidance on the Assessment of Dust from Demolition and Construction	Dust effect from construction activities

6.7.9 The following effects have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant:

- Potential effects associated with road traffic emissions during the construction phase have been scoped out. As presented in **Table 6.7**, the IAQM criterion to proceed to a detailed dispersion modelling is 100 HGV AADT outside of an AQMA. Based on Wood's own experience of similar schemes, the construction traffic will be less than 100 HGV AADT on any road link;
- Potential Air Quality effects from changes in non-traffic related air quality pollutants, i.e. SO₂, CO, C₆H₆ and 1,3-butadiene: The Proposed Development does not include any likely sources of the non-traffic related air quality pollutants. As the Proposed Development does not include any large-scale combustion activities, i.e. permitted under *the Environmental Permitting Regulations (2016)*, or on-site combustions petrol/diesel storage, the scope of the assessment is confined to the air pollutants associated with road traffic sources;
- Potential effects from emissions from NRMM on air quality. It is expected that the number of plant infrastructure on-site at any one time will be relatively small, a Construction Environmental Management Plan (CEMP), and good practice measures will be applied during the construction period;
- Potential effects from construction dust on ecological receptors. As there are no designated ecological sites within 50 m of the boundary of the Proposed Development or 500m from the Site entrance(s): the two closest designated areas are Burbage Common and Woods LNR, and Croft Hill SSSI, both more than 2 km away from the Proposed Development, the impact on ecological receptors from construction dust will be excluded from this assessment;
- Potential odour effect from the Proposed Development: The Proposed Development does not include any industry or infrastructure that is likely to cause an odour annoyance at existing or proposed receptors; and
- Potential odour effects on future occupants of the Site: these have been assessed in a separate, standalone Odour Assessment for Earl Shilton WwTW. As proposed in the Scoping Report, this Odour Assessment has been undertaken to inform the master planning process. In areas where

the odour criterion was predicted to be exceeded, the land has been considered unsuitable for development of high sensitivity receptors, such as dwellings. A 'cordon sanitaire' will delineate area above the odour criterion. Only non-sensitive receptors (i.e. commercial/industrial uses) are proposed around the WwTW where odour concentrations are above the threshold and not suitable for high sensitivity receptors. The odour assessment has been undertaken through odour modelling that utilises library emission rates for the odour sources identified and the most up to date layout of the WwTW site. This assessment is presented in **Appendix 6B**.

6.8 Assessment methodology

- 6.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this air quality and odour assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this air quality and odour assessment.

Construction dust and fine particulate emissions

- 6.8.2 Construction activities will occur for each phase of the Proposed Development. A desktop assessment has been undertaken to assess the effects of dust emissions to air following the IAQM guidance¹⁷.
- 6.8.3 The dust emitting activities that may take place during the construction phase of the Proposed Development can be divided into four different types:
- **Demolition** – an activity involved with the removal of an existing structure or structures;
 - **Earthworks** – the processes of soil-stripping, ground-levelling, excavation, and landscaping;
 - **Construction** – an activity involved in the provision of a new structure; and
 - **Activities that cause Track-out** – the transport of dust and dirt from the Site onto the public road network. This arises when lorries leave the Site with dusty materials or transfer dust and dirt onto the road having travelled over muddy ground on-Site.
- 6.8.4 The following dust impacts have been considered in accordance with the IAQM guidance methodology:
- annoyance due to dust soiling; and
 - the risk of health impacts due to an increase in exposure to PM₁₀.
- 6.8.5 Detailed air quality assessment involves a three-stage process:
- **Stage 1** - construction sites are classified according to the risk of dust impacts (based upon the scale and nature of the works, plus the proximity of sensitive receptors);
 - **Stage 2** - appropriate site-specific mitigation measures are identified; and
 - **Stage 3** - the significance of effects is then determined.

Operational road traffic emissions

- 6.8.6 **Table 6.7** reports the indicative screening criteria recommended by the IAQM guidance¹⁶ to determine if a detailed air quality assessment of traffic emissions from construction or operational phases is required.

Table 6.7 Screening criteria for detailed air quality assessment of road traffic emissions

Nature of Impact	Screening Criteria for a Detailed Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors (LDV = cars and small vans <3.5 t gross vehicle weight).	A change of LDV flows of: more than 100 AADT within or adjacent to an AQMA; or, more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5 t gross vehicle weight).	A change of HDV flows of: more than 25 AADT within or adjacent to an AQMA; or, more than 100 AADT elsewhere.
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5 m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	The introduction of a new junction or removal of a junction will lead to a detailed air quality assessment when this addition/removal causes traffic to significantly change vehicle acceleration or deceleration, for example, traffic lights, or roundabouts.

- 6.8.7 The transport assessment confirmed that there will be a change of LDV flows of more than 500 AADT associated with the operational phase of the Proposed Development, therefore detailed dispersion modelling has been undertaken using the latest version of ADMS-Roads, developed by Cambridge Environmental Research Consultants (CERC), and approved by Defra. ADMS-Roads calculates pollutant concentrations over specified domains at high spatial resolution (street scale) and in a format suitable for direct comparison with a wide variety of air quality standards for the UK and other countries or other relevant thresholds. Further details about the ADMS-Roads model are provided in **Appendix 6D**.
- 6.8.8 Defra's Emissions Factor Toolkit (EFT) has been used to predict emissions to import into ADMS-Roads. Defra's NO_x to NO₂ calculator has been used to convert predicted concentrations of road-NO_x to road-NO₂ concentrations.
- 6.8.9 The traffic flows for all the modelled scenarios are based on Leicestershire County Council's (LCC) Pan Regional Transport Model (PRTM) which is a SATURN (Simulation and Assignment of Traffic to Urban Road Network) model covering the county and the wider Midlands area. PRTM is an extension of the Leicester and Leicestershire Integrated Transport Model (LLITM). LCC controls the use of PRTM and only LCC approved transport consultants are allowed access and to undertake model testing. The Applicants appointed WSP through LCC to undertake the modelling of the traffic generation from the Earl Shilton SUE proposal using PRTM. Refer to **Chapter 14: Traffic and Transport** for detailed information.
- 6.8.10 The traffic data output from PRTM shows reduction in traffic flows on some of the road links in the future baseline traffic 'with development' scenarios as background traffic is redistributed on the road network based on elasticity of demand: changes to traffic flow conditions on the road network would result in the use of alternative routes. For example, increases in traffic flow on a road link/junction which causes queuing/longer journey times would result in some traffic being reassigned onto different routes which have less congestion/shorter journey times. The traffic data from PRTM reflects the changes on the whole network due to the traffic generated from proposed and committed developments. Therefore, not every road link within the assessment area demonstrates an increase in the traffic flows equal to that generated by the Proposed Development as some baseline traffic would be reassigned due to changes in traffic conditions.

Modelling scenarios

- 6.8.11 Detailed modelling has been undertaken using the following scenarios:
- Current 2019 baseline scenario, representing a full year of air quality monitoring and traffic data. The baseline year will be used for model verification;
 - 2026 Do Minimum Scenario: this scenario will include committed developments within the area, however, exclude the Proposed Development (Do Minimum (DM) 2026); and
 - 2026 Do Something Scenario: a future scenario including the Proposed Development and committed developments to determine a cumulative impact (Do Something (DS) 2026).
- 6.8.12 Do Minimum and Do Something scenarios will be carried out for year 2026, the opening year of the Proposed Development.

Assessment procedure

- 6.8.13 The assessment procedure for concentrations will be as follow:
- calculation of Process Contributions (PC), contribution added by additional traffic associated with the Proposed Development; and
 - estimation of Predicted Environmental Concentrations (PEC), calculated as PC added to the background concentration.
- 6.8.14 Background concentrations will be obtained from UK-Air website for the 1 km² grid square in which the defined receptors are located.
- 6.8.15 For short-term averages, it will be assumed that the short-term background concentration of a substance is twice its long-term concentration. It is also noted background concentrations may already include PCs from the road (without future development) for certain wind conditions. As a first approach (worst-case), no adjustment will be made to avoid double-counted background concentrations, but refinement of the method will be discussed if required.
- 6.8.16 PEC will be compared to the air quality ambient standards as described in **Table 6.8** to determine impact at receptors.
- 6.8.17 The minimum Critical Loads used in the assessment were obtained from the APIS²⁴ website. In the absence of site-specific values for LNR sites, deposition rates for the nearby Burbage Wood and Aston Firs SSSI (Broad-leaved, mixed and yew woodland) were used in the assessment.

Table 6.8 Relevant air quality standards and objectives

Pollutant	Averaging Period	Standard ($\mu\text{g}/\text{m}^3$)	Date by which to be achieved and maintained thereafter	Receptors
Nitrogen dioxide NO_2	Annual mean	40	31 December 2005	Human
	1-hour mean, not to be exceeded more than 18 times a year	200	31 December 2005	
Particulate matter less than $10\text{ }\mu\text{m}$ PM_{10}	Annual mean	40	31 December 2004	
	24-hour mean, not to be exceeded more than 35 times a year	50	31 December 2004	
Particulate matter less than $2.5\text{ }\mu\text{m}$ $\text{PM}_{2.5}$	Annual mean	25	2020	
Oxides of nitrogen NO_x	Annual mean	30	31 December 2000	Ecological
	Daily Mean	75	-	
Nutrient Nitrogen deposition Minimum Critical Load	Annual Mean	15 kg N/ ha/ yr	-	
Acid deposition Minimum Critical Load	Annual mean	0.142 keq N/ ha/ yr	-	

Assessment of effects and determining significance

6.8.18 Different definitions of the magnitude of impacts and receptor sensitivity will be used. The definitions of the magnitude of impacts and receptor sensitivity will follow the IAQM guidance^{16, 17} and are discussed below.

Sensitivity of receptors

Construction dust assessment

- 6.8.19 The sensitivity of the area, i.e. land potentially affected by the construction activities, is determined for three main dust effects: dust soiling, health effects and ecological effects. This is determined for each of the four dust emitting activities, allowing a conclusion to be made about the sensitivity of the area for each dust emitting activity to dust soiling, health effects and ecological effects.
- 6.8.20 The sensitivity of people and property to dust soiling effects, of people to the health effects of PM_{10} and $\text{PM}_{2.5}$, and of biodiversity receptors to ecological effects will be determined using professional judgement and the principles as stated in the IAQM guidance. The receptors will be classified into high, medium, and low sensitivity categories.
- 6.8.21 The overall sensitivity of the area will be determined by using a matrix provided in the IAQM guidance for each of the three dust effects and each dust emitting activity. These matrices incorporate the total number of receptors affected, the distance of these receptors from the source and the sensitivity of these receptors previously determined. Similarly, the receptors will be classified into high, medium, and low sensitivity categories.

Road traffic assessment - human receptors

- 6.8.22 In line with the LAQM Technical Guidance (TG16), sensitive receptors will represent locations where people are likely to be exposed for the appropriate averaging time dependent on the air quality objective being assessed against, as presented in **Table 6.9**.

Table 6.9 Human sensitive receptors

Averaging Period	Sensitive Receptors (Where Air Quality Objectives Should Apply)	Not Considered Sensitive Receptors (Where Objectives Should Generally Not Apply)
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades 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 location where public exposure is expected to be short-term.
24-hour mean and 8-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 location where public exposure is expected to be short-term.
1-hour mean	All locations where the annual mean and: 1. 24 and 8-hour mean objectives apply. 2. Kerbside sites (for example, pavements of busy shopping streets). 3. Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. 4. Any outdoor locations where members of the public might reasonably expect 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.	

(*) Such locations should represent parts of the garden where relevant public exposure to pollutants is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.

Magnitude of change

Construction dust assessment

- 6.8.23 Firstly, the magnitude of each of the dust emitting activities would be considered in isolation. The magnitude is based on the scale of the proposed construction activities and would be categorised according to the small, medium, or large categorisation provided in the IAQM guidance.
- 6.8.24 The magnitude of the dust emitting activities determined before any mitigations measures are put in place and the overall sensitivity of the area surrounding the construction activities, would be used as part of a matrix to determine the risk of dust impacts for the four dust activities as presented in **Table 6.10**, **Table 6.11**, **Table 6.12** and **Table 6.13**. The risk of impacts would be defined as either high, medium, low, or negligible risk and based professional judgment and the principles as stated in the IAQM guidance.
- 6.8.25 Based on the overall risk assessment for the four activities, site-specific mitigation measures may need to be adopted depending on the risk of the impact identified. Should the levels be rated as

high, medium, or low risk, mitigation measures would need to be developed as part of a dust management plan and implemented. The approach to determine the most applicable or effective mitigation measures, for the risk level determined, is based on professional judgement and the principles as stated in the IAQM guidance. However, should the risk level be negligible, no additional mitigation measures may be required other than those required by legislation.

6.8.26 The assessment of the significance of dust effects would be undertaken after applying the site-specific mitigation. This would take account of the risk of dust impacts, and other factors that might affect the risk of dust effects arising, even after any site-specific mitigation has been implemented. The overall significance of the effects arising from the entire construction phase of the Proposed Development is based on professional judgement, taking into account the risk of the effects of each of the four activities (demolition, earthworks, construction, and track-out).

Table 6.10 Matrix for determining risk of impacts from construction dust for Demolition activities¹⁷

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 6.11 Matrix for determining risk of impacts from construction dust for Earthworks activities¹⁷

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 6.12 Matrix for determining risk of impacts from construction dust for Construction activities¹⁷

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 6.13 Matrix for determining risk of impacts from construction dust for Track-out activities¹⁷

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Road Traffic assessment – human receptors

- 6.8.27 Following the *IAQM Planning For Air Quality guidance*¹⁶, the magnitude of change due to an increase in the annual mean concentration of NO₂ and PM₁₀ and other pollutants due to the Proposed Development is described using the criteria presented in **Table 6.14**.
- 6.8.28 These criteria are based on the change in concentration of a pollutant at an existing receptor location due to a new development, as a percentage of the Air Quality Assessment Level (AQAL) (i.e. the AQO). When describing the effect at a specific receptor, the percentage change in concentration relative to AQAL is considered in combination with the long-term average concentration at a receptor in the assessment year, using the approach detailed in **Table 6.14**. The table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. As an example, changes of 0% i.e. less than 0.5% would be described as 'negligible' as detailed in **Table 6.14**.
- 6.8.29 As recommended by the IAQM guidance, the judgement on significance relates to the consequences of the impacts and whether these are expected to influence human health that could be considered significant.

Table 6.14 Impact descriptors for increase in annual mean pollutant concentration when compared to AQAL

Long term average concentration at receptor in assessment year	% Change in concentration relative to air quality assessment level				
	0%	1%	2-5%	6-10%	>10%
75% or less	Negligible	Negligible	Negligible	Slight	Moderate
76–94%	Negligible	Negligible	Slight	Moderate	Moderate
95–102%	Negligible	Slight	Moderate	Moderate	Substantial
103–109%	Negligible	Moderate	Moderate	Substantial	Substantial
110% or more	Negligible	Moderate	Substantial	Substantial	Substantial

Road Traffic assessment – ecological receptors

- 6.8.1 The assessment would determine increments (difference between 2026 DM and 2026 DS scenarios) of acid and nitrogen deposition. In Environment Agency (EA) permitting, an increment of less than 1% of the site-specific critical load is considered to be inconsequential. This indicative threshold has been used to define a negligible impact and insignificant effect.

6.9 Assessment of air quality and dust effects

Predicted effects and their significance

Construction dust assessment

Magnitude of impacts

- 6.9.1 The assessment was undertaken in line with the IAQM Guidance on the assessment of dust from demolition and construction¹⁷.
- 6.9.2 The Site contains two huts located immediately west of the WwTW. These buildings will be removed during the development of the Site. Their total volume is estimated to be less than the

IAQM criterion of 20,000 m³. The dust emission magnitude for the demolition phase of the Proposed Development is therefore considered to be 'small'

- 6.9.3 Potential sources of impacts associated with earthworks/ground preparation activities include fugitive dust/PM₁₀ emissions resulting from disturbance of dusty materials by construction plant, the construction materials used vehicle movements and wind action. The total Site area exceeds the IAQM criterion of 10,000 m². The dust emission magnitude for the earthworks phase of the Proposed Development is therefore considered to be 'large'.
- 6.9.4 Potential sources of impacts associated with construction activities include fugitive dust/ PM₁₀ emissions resulting from disturbance of dusty materials by construction plant, the construction materials used vehicle movements and wind action. The total volume of structures to be constructed would exceed the IAQM criterion of 100,000 m³. The potential dust emission magnitude for construction activities associated with the Proposed Development is therefore considered to be 'large'.
- 6.9.5 Dust emissions during trackout from the Site may occur from the transport of dust and dirt from the construction site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. Due to the size of the development, Wood's traffic team confirmed that there will be between 10 and 50 HDV (>3.5 tonne) outward movements in any one day during the construction phase, which corresponds to a 'Medium' potential dust emission magnitude for trackout activities.
- 6.9.6 The magnitude of impacts from the four activities is summarised in **Table 6.15** below.

Table 6.15 Construction dust emission magnitude

Source	Dust Emission Magnitude
Demolition	Small
Earthworks	Large
Construction	Large
Trackout	Medium

Sensitivity of surrounding area

- 6.9.7 There are between 10 and 100 high sensitivity residential properties within 20m of the Proposed Development Site boundary. The sensitivity of the area, using Table 2 of the IAQM guidance, with respect to dust soiling effects on people and property in relation to demolition, earthworks and construction activities, is therefore considered to be "high".
- 6.9.8 There are between 10 and 100 residential properties within 20 m of the routes likely to be used by construction vehicles on the public highway, up to 500 m from the Site entrance on the A47. The sensitivity of the area with respect to dust soiling effects on people and property in relation to trackout is therefore also considered to be 'high'.
- 6.9.9 The estimated existing background PM₁₀ concentration is 14.3 µgm⁻³ (see **Table 6.4**). Given that there are between 10 and 100 high sensitivity receptors within 20m of the Site boundary and within 500 m from the Site entrance on the public highway, the sensitivity of the area with respect to human health impacts in relation to demolition, earthworks, construction and trackout is 'low'.

- 6.9.10 There are no ecological receptors within 350 m of the Site boundary or within 50 m of the route used by construction vehicles on the public highway, up to 500 m from the Site entrance.
- 6.9.11 The sensitivity of the surrounding area is summarised in **Table 6.16**.

Table 6.16 Sensitivity of surrounding area to dust impacts

	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low

Risk of dust impacts

- 6.9.12 The risk of dust impacts before mitigation is defined using Tables 6, 7, 8 and 9 in the IAQM guidance for earthworks, construction and trackout respectively. The dust emission magnitude classes combined with the sensitivity of surrounding area classes, result in the Site risk categories shown in **Table 6.17**. Before mitigations, there is a high risk of dust soiling associated with earthworks and construction activities and medium risks of dust soiling associated with demolition and trackout activities. Before mitigations, there is a negligible risk of human health effects associated with demolition activities and a low risk associated with earthworks, construction and trackout activities.

Table 6.17 Construction dust summary of dust risk

	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	High Risk	High Risk	Medium Risk
Human Health	Negligible	Low Risk	Low Risk	Low Risk

- 6.9.13 Following the outcome of the risk assessment in **Table 6.17** and in line with the IAQM guidance¹⁷, site-specific mitigation measures would be implemented during the construction phase of the Proposed Development. These measures are presented in **Table 6.19**. These measures would be included within a Dust Management Plan/CEMP as appropriate. The implementation of these site-specific mitigation measures would ensure that the impact of the construction phase on sensitive receptors remains Negligible.

Operation road traffic assessment

- 6.9.14 Full modelling results are presented in **Appendix 6E**.

Human receptors – NO₂

- 6.9.15 Detailed results are presented in **Table 6E1**.
- 6.9.16 No exceedances of the annual mean AQO of 40 µg m⁻³ are predicted at any modelled receptors in any scenarios. In the DS 2026 scenario, the highest annual mean concentration modelled at an existing receptor is 14.9 µg m⁻³ at R29 located on Ashby Road. This represents an increase of 0.1 µg m⁻³ compared to the DM 2026 scenario.

- 6.9.17 The highest predicted increase in NO₂ concentrations with the Proposed Development operational is 0.9 µgm⁻³ at R42, located on Alexander Avenue.
- 6.9.18 Annual mean concentrations are also comfortably below the annual mean AQO of 40 µgm⁻³ at future proposed receptors, with a maximum predicted concentration of 13.8 µgm⁻³ at F7.
- 6.9.19 The impact of the Proposed Development on NO₂ annual mean concentrations is classified as negligible in IAQM/EPUK¹⁶ terms at all receptors, which is considered Not Significant.

Human receptors- PM₁₀

- 6.9.20 Detailed results are presented in **Table 6E2**.
- 6.9.21 No exceedances of the annual mean AQO of 40 µgm⁻³ are predicted at any modelled receptors in any scenarios. In the DS 2026 scenario, the highest annual mean concentration modelled at an existing receptor is 14.5 µgm⁻³ at R3 located on Hinckley Road. This represents an increase of 0.03 µgm⁻³ compared to the DM 2026 scenario.
- 6.9.22 The highest predicted increase in PM₁₀ concentrations with the Proposed Development operational is 0.2 µgm⁻³ at R53, located on Astley Road.
- 6.9.23 Annual mean concentrations are also comfortably below the annual mean AQO of 40 µgm⁻³ at future proposed receptors, with a maximum predicted concentration of 13.9 µgm⁻³ at F3.
- 6.9.24 The impact of the Proposed Development on PM₁₀ annual mean concentrations is classified as negligible in IAQM/EPUK¹⁶ terms at all receptors, which is considered Not Significant.

Human receptors - PM_{2.5}

- 6.9.25 Detailed results are presented in **Table 6E3**.
- 6.9.26 No exceedances of the annual mean AQO of 25 µgm⁻³ are predicted at any modelled receptors in any scenarios. In the DS 2026, the highest annual mean concentration modelled at an existing receptor is 9.0 µgm⁻³ at R51 located on Leicester Road. This represents an increase of 0.05 µgm⁻³ compared to the DM 2026 scenario.
- 6.9.27 The highest predicted increase in PM_{2.5} concentrations with the Proposed Development operational is 0.1 µgm⁻³ at R53, located on Astley Road.
- 6.9.28 Annual mean concentrations are also comfortably below the annual mean AQO of 40 µgm⁻³ at future proposed receptors, with a maximum predicted concentration of 8.4 µgm⁻³ at F3 and F7.
- 6.9.29 The impact of the Proposed Development on PM_{2.5} annual mean concentrations is classified as negligible in IAQM/EPUK¹⁶ terms at all receptors, which is considered Not Significant.

Ecological receptors – Oxides of nitrogen

- 6.9.30 Detailed results are presented in **Table 6E4**.
- 6.9.31 Predicted annual mean concentrations of NO_x are significantly below the 30 µg/m³ AQO in both the DM 2026 and DS 2026 scenarios.
- 6.9.32 The greatest increase in annual mean concentrations between the DM 2026 and DS 2026 scenarios is 0.06 µg/m³ which represents less than 1% of the AQO of 30 µg/m³.
- 6.9.33 The NO_x effects are therefore considered Not Significant.

Ecological receptors – deposition of nitrogen

- 6.9.34 Detailed results are presented in **Table 6E6**.
- 6.9.35 The minimum critical load of 15 kg N/ ha/ yr, as available from the APIS resource, has been used for comparison against predicted nitrogen deposition rates.
- 6.9.36 The change in nitrogen deposition between the DM 2026 and DS 2026 scenarios is predicted to be comfortably below 1% of the critical load.
- 6.9.37 The nitrogen deposition effects are therefore considered Not Significant.

Ecological receptors – deposition of acid

- 6.9.38 Detailed results are presented in **Table 6E7**.
- 6.9.39 The minimum critical load of 0.142 kg N/ ha/ yr, as available from the APIS resource, has been used for comparison against predicted acid deposition rates.
- 6.9.40 The change in acid deposition between the DM 2026 and DS 2026 scenarios is predicted to be comfortably below 1% of the critical load.
- 6.9.41 The acid deposition effects are therefore considered Not Significant.

Table 6.18 Summary of significance of adverse (or beneficial) effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Residential properties potentially impacted by construction dust	High	Negligible	Not significant	Appropriate site-specific dust mitigations would be implemented to ensure dust effects remain negligible.
Residential properties potentially impacted by additional road traffic	High	Negligible	Not significant	Additional concentrations associated with road traffic emissions remain negligible
Burbage Common and Woods LNR	High	Negligible	Not significant	Additional concentrations associated with road traffic emissions remain negligible

6.10 Assessment of cumulative effects

- 6.10.1 Common residential receptors are shared with **Chapter 11: Noise and Vibration**. As detailed in this chapter, air quality and dust effects as a result of the Proposed Development are predicted to be Not significant. Therefore, potential in-combination effects on the same receptors are considered to be unlikely.

6.11 Consideration of additional mitigation or compensation

- 6.11.1 No additional mitigation measures are proposed to further reduce the air quality and dust effects that are identified in this Environmental Statement (ES). This is because all relevant and implementable measures have been embedded into the development proposals and are assessed above in this chapter. These measures are considered to be likely to be effective and deliverable and would mitigate any likely significant effects of the Proposed Development.

6.12 Conclusions of significance evaluation

- 6.12.1 An assessment of potential dust and air quality effects associated with the construction and operational phases of the Proposed Development has been undertaken.
- 6.12.2 Appropriate site-specific mitigations would be implemented during the construction phase of the Proposed Development which would ensure dust effects remain not significant.
- 6.12.3 Air quality effects have been predicted to be negligible at all human and ecological receptors included in the assessment which is not significant.

6.13 Implementation of environmental measures

- 6.13.1 **Table 6.19** describes the environmental measures embedded and considered within the assessment of the Proposed Development. These measures will be implemented by the Site operator.

Table 6.19 Summary of environmental measures to be implemented – relating to construction dust

Mitigation area	Mitigation measures to be incorporated	Additional measures to be considered in the event of substantial dust complaints
Communication	Develop and implement a stakeholder communication 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 Project Manager.	
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.	

Mitigation area	Mitigation measures to be incorporated	Additional measures to be considered in the event of substantial dust complaints
	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 log book.	
Monitoring	Undertake regular 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 window sills within 100m of the Site boundary, with cleaning to be provided if necessary. Carry out regular Site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make an inspection log available to the local authority when asked.	
Operating Vehicle/Machinery and Sustainable Travel	Ensure all vehicles switch off engines when stationary - no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. 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.	
Preparing and Maintaining the Site	Plan the 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 the Site.	
Waste Management	Avoid bonfires and burning of waste materials.	
Demolition	Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. Avoid explosive blasting, using appropriate manual or mechanical alternatives. Bag and remove any biological debris or damp down such material before 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).
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.	For smaller supplies of fine power materials ensure bags

Mitigation area	Mitigation measures to be incorporated	Additional measures to be considered in the event of substantial dust complaints
	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. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	are sealed after use and stored appropriately to prevent dust.
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.	
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 ten m from receptors where possible.	

7. Biodiversity

7.1 Introduction

- 7.1.1 This chapter has been prepared by Ecology Solutions and assesses the likely significant effects of the Proposed Development with respect to Biodiversity. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development** and with respect to relevant parts of other chapters including **Chapter 6: Air Quality**, **Chapter 15: Water Environment** and **Chapter 13: Traffic and Transport**, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects.

7.2 Limitations of this assessment

- 7.2.1 There are no limitations relating to biodiversity that affect the robustness of the assessment of the likely significant effects of the Proposed Development.

7.3 Relevant legislation, planning policy, technical guidance

Legislative context

- 7.3.1 The following legislation is relevant to the assessment of the effects on biodiversity receptors:
- *Conservation of Habitats and Species Regulations (2017)*¹;
 - *Wildlife and Countryside Act (1981)* (as amended)²;
 - *Natural Environment and Rural Communities (NERC) Act (2006)*³;
 - *Countryside and Rights of Way (CROW) Act (2000)*⁴; and
 - *The Protection of Badgers Act (1992)*⁵.

Planning policy context

- 7.3.2 A summary of the relevant planning policies is given in **Table 7.1**.

¹ UK Government (2017). Conservation of Habitats and Species Regulations 2017 (Online). Available at: <https://www.legislation.gov.uk/ukxi/2017/1012/> (Accessed December 2021)

² UK Government (1981). Wildlife and Countryside Act 1981 (Online). Available at: <https://www.legislation.gov.uk/ukpga/1981/69> (Accessed December 2021)

³ UK Government (2006). Natural Environment and Rural Communities Act 2006 (Online). Available at: <https://www.legislation.gov.uk/ukpga/2006/16/> (Accessed December 2021)

⁴ UK Government (2000). Countryside and Rights of Way Act 2000 (Online). Available at: <https://www.legislation.gov.uk/ukpga/2000/37/> (Accessed December 2021)

⁵ UK Government (1992). The Protection of Badgers Act 1992 (Online). Available at: <https://www.legislation.gov.uk/ukpga/1992/51/> (Accessed December 2021)

Table 7.1 Planning policy issues relevant to biodiversity

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) ⁶	Paragraphs 174 – 177 state the identification of effects on: designated sites of international, national and local importance; protected species, habitats and species of principal importance for the conservation of biodiversity. The identification of measures to mitigate adverse effects and of opportunities for enhancing biodiversity. These will all need to be considered in the design and EIA process.	Section 7.8
Development plan policies		
Hinckley and Bosworth Borough Council (HBBC) Site Allocations and Development Management Policies DPD ⁷ Policy DM6	Enhancement of biodiversity relating to delivering biodiversity gains as well as the safeguarding of statutory designated sites, irreplaceable habitats and locally important sites. Safeguarding and enhancement of biodiversity will need to be considered within the design and assessment of the Proposed Development.	Section 7.8
Core Strategy Development Plan Documents (DPD) ⁸ Policy 20	The implementation of the Green Infrastructure Network involves enhancing and protecting the borough's distinctive landscapes, woodlands and biodiversity. The inclusion of green infrastructure will need to be considered within the design and assessment of the Proposed Development.	Section 7.8

Technical guidance

7.3.3 Standards and guidance that have been used to define the assessment include:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial (2018)*⁹;
- *Handbook for Phase 1 Habitat Survey (2010)*¹⁰;
- *Good Practice Guidelines (2016)*¹¹;
- *Bat Workers' Manual*¹² ;

⁶Ministry of Housing, Communities & Local Government (2012). National Planning Policy Framework (Online). Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (Accessed December 2021)

⁷ Hinckley & Bosworth Borough Council (2016). Site Allocations and Development Management Policies DPD (Online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/5295/site-allocations-and-development-management-policies-dpd-adopted-july-2016> (Accessed December 2021).

⁸ Hinckley & Bosworth Borough Council (2009). Local Development Framework Core Strategy (Online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/487/core-strategy-adopted-document> (Accessed December 2021).

⁹ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. (Online). Available at: <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/> (Accessed December 2021).

¹⁰ JNCC. (2010) Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. (Online) Available at: <https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf> (Accessed December 2021).

¹¹ Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. (Online). Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?v=1542281971 (Accessed December 2021).

¹² Mitchell-Jones, A.J. & McLeish, A.P. (2012) The Bat Workers' Manual. Pelagic Publishing, Exeter.

- *Bat Mitigation Guidelines (2004)*¹³;
- *Natural England Standing Advice (badger)*¹⁴;
- *Natural England Standing Advice (otter)*¹⁵;
- *Water Vole Mitigation Handbook (2016)*¹⁶; and
- *Great Crested Newt Mitigation Guidelines (2001)*¹⁷.

7.4 Data gathering methodology

7.4.1 A data-gathering exercise was undertaken in 2010 and updated in 2020 to obtain information relating to statutory and non-statutory nature conservation sites, priority habitats and species, and legally protected and controlled species within the Study Area and further afield.

Study Area

7.4.2 The geographical extent of the Study Area for obtaining information on ecological features is shown in **Figure 7.1** and includes:

- ecological features within the Site;
- statutory biodiversity sites of international importance within 5 km of the Site;
- statutory biodiversity sites of national importance within 5 km of the Site;
- non-statutory sites within 1 km of the Site;
- habitats that are regarded as being of Principal Importance in England and/or a priority in the Local Biodiversity Action Plan (hereafter referred to as 'priority habitats'), within 2.5 km of the Site;
- locations of water bodies within 500 m of the Site; and
- records of species within 1km of the Site and bat roosts within 5 km of the Site.

Desk study

7.4.3 A summary of the organisations that have supplied data, together with the nature of that data is as follows:

- Leicestershire and Rutland Environmental Records Centre (06/05/2010, 14/07/2015 and 13/08/2021):

¹³ Mitchell-Jones, A.J. (2004) Bat Mitigation Guidelines (Online). Available at: <https://webarchive.nationalarchives.gov.uk/ukgwa/20140605171643/http://publications.naturalengland.org.uk/publication/69046?category=31008> (Accessed December 2021).

¹⁴ Natural England and Department for Environment, Food & Rural Affairs(2015). Badgers: surveys and mitigation for development projects (Online). Available at: <https://www.gov.uk/guidance/badgers-surveys-and-mitigation-for-development-projects> (Accessed December 2021).

¹⁵ Natural England and Department for Environment, Food & Rural Affairs(2015). Badgers: surveys and mitigation for development projects (Online). Available at: <https://www.gov.uk/guidance/otters-protection-surveys-and-licences> (Accessed December 2021).

¹⁶ Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. (Online). Available at: <https://dnu7gk7p9afoo.cloudfront.net/water-vole-mitigation-guidance-2016.pdf> (Accessed December 2021).

¹⁷ English Nature (2001). Great Crested Newt Mitigation Guidelines. (Online). Available at: <https://cieem.net/resource/great-crested-newt-mitigation-guidelines/> (Accessed December 2021).

- ▶ Records of notable/protected species and details of non-statutory designated sites.

7.4.4 Further information on designated sites from a wider search area was obtained from MAGIC¹⁸.

Survey work

7.4.5 Extended Phase 1 habitat survey of the Site undertaken between May and September 2010, January and October 2012, April and May 2019 and September 2021;

7.4.6 Protected species surveys have included:

- 2010 surveys: badger, bats, water vole, great crested newt, otter, reptiles, barn owl and breeding birds;
- 2012 surveys: great crested newts;
- 2013 surveys: badger, bats,
- 2015 surveys: badger, barn owl and bats;
- 2016 surveys: great crested newts;
- 2019 surveys: badger, barn owl, bats, great crested newts and reptiles;
- 2020 surveys: bats; and
- 2021 surveys: great crested newts, otter, bats, badger and water vole.

7.4.7 A separate Ecological Assessment was previously undertaken for the area of the Site to the north of Mill Lane in 2007 as part of a former planning application (10/00401/FUL)¹⁹. The report and survey information for the Ecological Assessment was updated in 2012. These reports have also informed the scope of the Ecological Assessment for the Proposed Development.

7.5 Overall baseline

Current baseline

Statutory sites

- 7.5.1 There are no statutory designations of nature conservation value within the Site or immediately adjacent to the Site. The nearest statutory designation is Burbage Common and Woods Local Nature Reserve (LNR) which lies approximately 1.9 km south-west of the Site. This LNR is designated for its unimproved acidic grassland, woodland and scrubland habitats, which support a range of botanical, invertebrate and bird species. This LNR is separated from the Site to the south-west by the newly constructed A47 by-pass with open countryside beyond.
- 7.5.2 The nearest Site of Special Scientific Interest (SSSI) is Croft Hill SSSI which lies approximately 3 km to the east of the Site. This SSSI is designated for its short tussocky grassland habitats. It is separated from the Site to the east by the A47 bypass, the M69 and open countryside beyond.
- 7.5.3 The Site lies within one SSSI Impact Risk Zone (IRZ), which highlights potential impacts from:

¹⁸ Defra (2021) MAGIC [Online]. Available at: <https://magic.defra.gov.uk/> (Accessed December 2021).

¹⁹ Hinckley & Bosworth Borough Council (2010). Planning Application Summary 10/00401/FUL | Erection of 200 residential units with associated landscaping, access and public open space | Land Bound By Mill Lane, Thurlaston Lane And Clickers Way Earl Shilton Earl Shilton Leicestershire (Online). Available at: <https://pa.hinckley-bosworth.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=L2XAISII04000> (Accessed December 2021)

"any discharge of water or liquid waste of more than 20 m³/day to ground (i.e. to seep away) or to surface water such as a beck or stream".

- 7.5.4 This potential impact corresponds to Narborough Bog SSSI, located approximately 6.8 km east of the Site boundary. The Site does not lie within any other IRZs relating to any other statutory designated sites.

Non-statutory sites

- 7.5.5 Normanton Wood Hedgerow Potential Local Wildlife Site (pLWS) is separated from the Site by the A47 road, while Hay Meadow LWS is well-separated from the Site by open agricultural land and the A47 road.
- 7.5.6 Normanton Wood Hedgerow pLWS is separated from the Site by the A47 road, while Hay Meadow LWS is well-separated from the Site by open agricultural land and the A47 road.

Habitats

- 7.5.7 The Site comprises arable land, semi-improved grassland (some of which is species-rich), rough grassland margins, amenity grassland, hedgerows (including some which are species-rich), mature and semi-mature standard trees, scrub, a stream/wet ditches, ponds, buildings and hardstanding.

Species

- 7.5.8 A number of legally protected and/or priority or notable species occur or have the potential to occur on-site for which summary details are provided below:
- 
 - bats: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Myotis sp., noctule, leisler's and brown long-eared bats have been recorded foraging on-site, albeit no roosts have been identified;
 - populations of priority bird species including song thrush, house sparrow, cuckoo, skylark, linnet, starling, and yellowhammer have been recorded utilising habitats on-site;
 - great crested newt: a small population has been confirmed as occurring in a pond in the south-west corner of the Site (P1) during 2012 and 2016 surveys, although the most recent survey in 2021 recorded this species as absent;
 - the Site contains habitat that likely supports an assemblage of common invertebrate species (conclusions drawn in light of existing background records and habitats present on Site);
 - the Site contains habitat that could support an assemblage of other priority species such as common toad and brown hare; and
 - Japanese Knotweed, a non-native and invasive controlled weed species (a *Wildlife and Countryside Act* Schedule 9 species), was located along the western boundary of the Site in 2010 and 2013, adjacent to the school playing fields, however this species has been recorded as absent during recent surveys.

Future baseline

- 7.5.9 In the absence of the Proposed Development, it is assumed that the majority of the habitats would remain in their current condition as they would likely be subject to the same agricultural management. Change will arise through natural processes (e.g. the maturity of woodlands) and natural systems (e.g. river erosion) or, as is often the case, occurs as a result of human activity, land use, management, or neglect.
- 7.5.10 Climate change may also have medium to long-term implications with differing tree species and agricultural change with the potential for new crops to be grown.

7.6 Consultation

- 7.6.1 **Table 7.2** provides a summary of the issues about the Proposed Development that have been raised by consultees and the responses given.

Table 7.2 Summary of issues raised during consultation regarding biodiversity

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
Scope of protected species surveys	Leicestershire County Council (LCC)	The scope of the 2015/2016 ecology surveys was confirmed with the county ecologist, on 13 May 2015. The agreed scope of the 2015 surveys included badger, barn owl, bats and great crested newts.	Section 7.5
Scope of protected species surveys	LCC	The scope of the protected species surveys undertaken were discussed and agreed with Leicestershire County Council in May 2015, with the latest correspondence with the Leicestershire County Council Ecology Team Leader on 17 April 2019. The following further surveys were agreed: • A total of three bat activity and automated detector surveys; and • Great Crested Newt surveys	Section 7.5
Scope of protected species surveys	LCC	The scope of protected species surveys was agreed with Leicestershire County Council on 17 February 2021 which comprised: • Updated walkover; • Badger survey; and • Tree assessment for bats	Section 7.5
Water Vole	LCC	On 1 April 2021, Leicestershire County Council raised that a record of Water Vole had been returned from within the Site. In light of this, specific surveys for this species were undertaken within the Site in 2021.	Section 7.5
Protected Species Surveys	LCC	On 13 July 2021, the Leicestershire County Council Ecology Team Leader's comments referred to protected species surveys being up-to-date. Up-to-date surveys have been undertaken and are detailed within this chapter.	Section 7.5
Biodiversity Net Gain	LCC	On 13 July 2021, the Leicestershire County Council Ecology Team Leader recommends a biodiversity net gain calculation is undertaken to support the Proposed Development. Standalone biodiversity net gain calculations have been undertaken of the Proposed Development.	N/A
Internationally and Nationally Designated Sites	Natural England	Natural England highlighted that the development triggers one IRZ, for Narborough Bog SSSI. An appropriate drainage strategy will be implemented as part of the proposals to ensure no impacts arise to this SSSI as a result of the Proposed Development.	Section 7.8

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
Biodiversity Net Gain	Natural England	Natural England suggested that a Biodiversity Net Gain assessment is undertaken as part of the Proposed Development. Standalone biodiversity net gain calculations have been undertaken of the Proposed Development.	N/A
Protected Species	Natural England	Natural England recommended their standing advice is referred to when considering impacts upon protected species. Natural England's standing advice has been closely followed when undertaking protected species surveys throughout the Site and when considering potential impacts upon those protected species present within the Site.	Sections 7.3, 7.4 and 7.8
District Level Licencing (DLL) for Great Crested Newts	Natural England	Natural England identified that the Site lies within an area with an active DLL scheme. Following the recent results of the Great Crested Newt surveys, it is not considered likely that this species is present within the Site. In the event that this species is recorded within the Site, a licence will be obtained from Natural England before works continue. This licence could take the form of a DLL or traditional licence.	Section 7.8

7.7 Scope of the assessment

Spatial scope

- 7.7.1 The spatial scope of the assessment of biodiversity covers the area of the Proposed Development, together with the Zones of Influence (ZoI) that have formed the basis of the Study Area described in **Section 7.4**.

Temporal scope

- 7.7.2 The temporal scope of the assessment of biodiversity is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction and operational phases.

Potential receptors

- 7.7.3 The ecological features that will potentially be affected by the Proposed Development comprise:
- Protected species: Bats, Badger, Great Crested Newts, Water Vole and birds (Red List, Schedule 1 and Priority Species); and
 - Habitats: arable, semi-improved grassland, amenity grassland, hedgerows, trees, scrub, stream, and ponds.

Likely significant effects

- 7.7.4 The biodiversity receptors that have been taken forward for assessment are summarised in **Table 7.3**.

Table 7.3 Biodiversity receptors scoped in for further assessment

Receptor	Relevant assessment criteria	Likely significant effects
Statutory Designated Sites	The Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines for ecological impact assessment ⁹	Potential impacts to Narborough Bog SSSI from discharge of water or liquid waste to ground or to surface water such as a beck or stream.
Non-statutory Designated Sites	CIEEM guidelines for ecological impact assessment ⁹	The Proposed Development may lead to increased levels of pollution from dust upon Normanton Wood Hedgerow pLWS during the construction phase albeit this is of very low likelihood of significance given the existing A47 road.
Arable	Extended Phase 1 Habitat Survey	Loss of this habitat to the Proposed Development/ conversion of areas into open space.
Semi-improved Grassland	Extended Phase 1 Habitat Survey	Losses of this habitat to the Proposed Development/ conversion of areas into open space.
Rough Grassland Margins	Extended Phase 1 Habitat Survey	Loss of parts of this habitat to the Proposed Development.

Receptor	Relevant assessment criteria	Likely significant effects
Hedgerows and trees	<i>Hedgerow Regulations 1997</i> ²⁰ ; Extended Phase 1 Habitat Survey	Minor losses to hedgerows and trees. Temporary effects: potential damage to retained sections of hedgerow during the construction phase, and dust deposition (and potentially other pollution) to retained hedgerows during the construction phase.
Scrub	Extended Phase 1 Habitat Survey	Loss of parts of this habitat to the Proposed Development
Stream and ditches	Extended Phase 1 Habitat Survey	Minor losses to bankside vegetation to facilitate the construction of bridges across the watercourse to link new internal roads. Potential pollution from contaminated run-off during the construction and operational phases, could potentially have a detrimental impact on the riparian habitats.
Ponds	Extended Phase 1 Habitat Survey	Potential pollution from contaminated run-off during the construction and operational phases, could potentially have a detrimental impact on the habitat.
Japanese Knotweed		Potential spread of Japanese Knotweed during the construction phases.
Badger	<i>The Protection of Badgers Act 1992</i> ⁵	Loss of potential foraging grounds. Potential loss of outlier sett. Potential construction effects on Badgers such as accidental trapping/injury. Potential increase in road traffic accidents from operation of new roads.
Bats	Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> ² (as amended) and Schedule 2 of the <i>Conservation of Habitats and Species Regulations 2017</i> ¹	Losses to trees and minor losses hedgerows, that offer suitable foraging and commuting opportunities for bats; potential disturbance from lighting on foraging and commuting routes during the construction and operational phases (albeit the majority of activity is by bat species that are relatively more tolerant of lighting).
Water Vole	Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> ² ; <i>Water Vole Mitigation Handbook</i> ¹⁶	Potential loss of bankside vegetation. Potential impacts to burrows from construction of three bridges. Potential disturbance during construction and potential for restricted movement along watercourses from bridge structures post-development.
Other Mammals		Loss of suitable foraging habitat for a range of mammals.
Birds	Section 1 of the <i>Wildlife & Countryside Act 1981</i> ²	Loss of suitable foraging and nesting habitat for bird species (including displacement of ground nesting species to surrounding countryside). Potential for killing and injury of birds and / or damage or destruction of nests during clearance of vegetation.
Great Crested Newt	Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> ² (as amended) and Schedule 2 of	Areas of grassland and scrub are to be lost within 250 m of pond P1. Very low potential for killing or injury during clearance works.

²⁰ UK Government (1997). The Hedgerow Regulations 1997 (Online). Available at: <https://www.legislation.gov.uk/ukxi/1997/1160/contents/made> (Accessed December 2021).

Receptor	Relevant assessment criteria	Likely significant effects
	<i>the Conservation of Habitats and Species Regulations 2017¹</i>	
Invertebrates		Loss of suitable habitat for common invertebrates; potential pollution of the ditches from contaminated run-off during the construction and operational phases.

- 7.7.5 The following receptors have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant:
- Statutory Designated Sites (given the proposed drainage strategy, the Proposed Development will not have a direct or indirect impact on Croft Hill SSSI or Narborough Bog SSSI or any other statutory designated site); and
 - Amenity Grassland (this habitat is to be retained as part of the Proposed Development).

7.8 Environmental measures embedded into the development proposals

- 7.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 3.3**. **Table 7.4** outlines how these embedded measures will influence the biodiversity assessment.

Table 7.4 Summary of the embedded environmental measures and how these influence the biodiversity assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Non-statutory Designated Sites	An increased level of dust may arise from the passage of construction traffic and earthworks. Deposition of this dust on the surrounding vegetation may lead to temporary declines in hedgerow flora of the pLWS.	Measures to mitigate dust emissions will be implemented during the construction phase. Any potential effects would be easily minimised through use of standard mitigation techniques such that residual effects are of negligible significance. Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate any ditches that lie within close proximity to the pLWS.
Arable	Loss of this habitat to the Proposed Development / conversion of areas into open space.	The areas of arable land that are to be converted to open space will be sown with a native species-rich wildflower grassland mixture (such as Emorsgate's Standard General Purpose Meadow Mixture EM2) and be subject to a suitable management regime to increase its floristic diversity accordingly. In addition, new native tree planting is to occur within these areas of new wildflower grassland.
Semi-improved Grassland	Losses of this habitat to the Proposed Development / conversion of areas into open space.	Retained areas of semi-improved grassland will be enhanced through the oversowing of a species-rich wildflower seed mixture and new areas will be created on existing habitats of lower value (e.g. arable – see previous). Enhanced/newly created wildflower grasslands will be subject to an appropriate management regime to enhance its floristic diversity.

Receptor	Changes and effects	Embedded measures and influence on assessment
		Where appropriate, off-site measures via an offsetting scheme (or financial contributions to such schemes) would address any potential residual effects arising from losses of this habitat.
Rough Grassland Margins	Loss of parts of this habitat to the Proposed Development.	The grassland surrounding the attenuation features will be sown with a native wildflower grassland seed mixture (such as Emorsgate's Tussock Mixture EM10 / or Emorsgate's Meadow Mixture for Wetlands EM8) and will be subject to a suitable management regime that will increase the floristic diversity of the Site.
Hedgerows and trees	Minor losses to hedgerows and trees. Temporary effects: potential damage to retained sections of hedgerow during the construction phase, and dust deposition (and potentially other pollution) to retained hedgerows during the construction phase.	In general, the retained hedgerows will be well buffered from any built form by wide green corridors / open space within the Proposed Development. However, measures will be put in place to ensure that retained sections of hedgerows are safeguarded from direct impacts during the construction phase. It is recommended that all retained hedgerows/trees within the Site be fenced at canopy width (as required) according to the current British Standards before construction work commences, to protect roots from compaction. Fences should remain in place until construction work is complete within the vicinity of these trees/hedgerows. In addition, retained hedgerows will be enhanced via planting of native species and subjected to a more favourable management regime to increase species diversity and improve their structure. Measures to mitigate dust emissions will be implemented during the construction phase. Any potential effects would be easily minimised through use of standard mitigation techniques such that residual effects are of negligible significance. Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate the ditches or stream. Even with these measures in place, there remains a slight risk that the hedgerow and trees might be affected by very occasional dust-soiling impacts. New hedgerow planting of a length / area greater than that lost will be included within the Proposed Development. The new hedgerow planting will be based around native species of local provenance. New trees will also be included within the landscape proposals, which will be based around native species of local provenance. The planting of new hedgerows and trees will more than mitigate for the loss of hedgerows to the development proposals.
Scrub	Loss of parts of this habitat to the Proposed Development	The planting of new native hedgerows, trees and scrub as part of the Proposed Development will offset losses to this habitat.
Stream and ditches	Minor losses to bankside vegetation to facilitate the construction of bridges across the watercourse to link new internal roads. Potential pollution from	Any new roads crossing over the retained section of the stream will use clear-span bridges wherever possible, or use culverts designed to maintain wildlife

Receptor	Changes and effects	Embedded measures and influence on assessment
	contaminated run-off during the construction and operational stages, could potentially have a detrimental impact on the riparian habitats.	corridor functions and minimise impacts on bankside vegetation. Where appropriate, as an enhancement, the banks of the stream will be sown with a native species-rich seed mixture tolerant of wet conditions (such as Emorsgate's Pond Edge mixture EP1), and the vegetation along the banks will be allowed to grow long and tussocky. The stream will also be enhanced through planting of appropriate native wetland species and oversowing of the areas of open space adjacent to the stream with a species-rich native wildlife seed mixture (such as Emorsgate's Meadow Mixture for Wetlands EM8) and subject to a suitable management regime to increase its floristic diversity accordingly. Implementation of best practice methods and effective engineering solutions will be employed to ensure that contaminated run-off is prevented from entering the stream or any wet ditches, as well as the new attenuation features, during both the construction and operational phases.
Ponds	Potential pollution from contaminated run-off during the construction and operational stages, could potentially have a detrimental impact on the habitat.	The clearance of scrub around pond P1 will allow more light to reach the pond, thereby providing enhanced habitat post-development. Implementation of best practice methods and effective engineering solutions will be employed to ensure that contaminated run-off is prevented from entering the pond and new attenuation features, during both the construction and operational phases.
Japanese Knotweed	Potential spread of Japanese Knotweed during the construction phases.	A precautionary watching brief should be put in place during construction/ground works in the location where this species was previously recorded.
Badgers	Loss of potential foraging grounds. Potential loss of outlier sett. Potential construction effects on Badgers such as accidental trapping/injury. Potential increase in road traffic accidents from operation of new roads.	
Bats	Losses to trees and minor losses hedgerows, that offer suitable foraging and commuting opportunities for bats; potential disturbance from lighting on foraging and commuting routes during the construction and operational phases (albeit the majority of activity is by bat species that are relatively more tolerant of lighting).	The losses of the hedgerows and trees will be offset by new tree and hedgerow planting of a length / area greater than that lost is to be included within the Proposed. Where roads intersect the green corridors, sensitive lighting and new planting will be carried out to help bats navigate across the new roads. In addition, large areas of open space will be created within the Site, which will partly be sown/oversown with a native species-rich wildflower seed mixture, which will provide an invertebrate food source for foraging bats. The areas of open space will also be subject to new native tree and hedgerow planting, and new attenuation features created, which will diversify habitats present and provide enhanced foraging opportunities for bats.

Receptor	Changes and effects	Embedded measures and influence on assessment
		During the operational phase, although there is likely to be an increase in lighting within the Site, 'dark' corridors will be maintained using a sympathetic lighting regime, e.g. involving the use of directional, low-powered, warm white spectrum LED lighting to minimise light spillage. 'Dark' corridors will be maintained along existing and new hedgerows to maintain suitable navigational and foraging opportunities for bats. Where lighting is necessary during construction, any potential light spillage will be reduced by directing light below the horizontal plane, preferably at an angle less than 70 degrees away from features that offer suitable foraging opportunities for bats, e.g. the hedgerows and trees. In the event that losses are proposed to any trees identified as having potential to support roosting bats, these would be subject to further surveys. If any bats or evidence of bats is recorded, a Natural England European Protected Species licence may be required prior to any felling works commencing and appropriate mitigation would need to be provided. This would be based around bat boxes (hollow and crevice types) that mimic tree roost features. As an enhancement, new bat boxes will also be provided throughout the Site on retained mature trees, which will provide additional roosting opportunities for bats.
Water Vole	Potential loss of bankside vegetation. Potential impacts to burrows from construction of three bridges. Potential disturbance during construction and potential for restricted movement along watercourse from bridge structures post-development.	The banks of the stream will be sown with a native species-rich seed mixture and the vegetation along the banks will be allowed to grow long and tussocky. The stream will also be enhanced through planting of appropriate native wetland species and oversowing of the areas of open space adjacent to the stream with a species-rich native wildlife seed mixture. Such measures will provide enhanced opportunities for this species post-development. Further surveys will be undertaken prior to construction by an ecologist for the presence of Water Voles, to try and locate the bridges away from any Water Vole burrows (and thus ensure no Water Vole burrows are impacted by the construction of the bridges over S1). If this is not possible a Natural England licence would need to be applied for and appropriate mitigation would be implemented. The bridges will be designed to ensure that wildlife movement will be maintained along the stream post-development.
Other Mammals	Loss of suitable foraging habitat for a range of mammals.	The planting of new native trees and hedgerows, and the creation of new species-rich wildflower grassland, will maintain foraging and shelter opportunities for a range of mammals.
Birds	Loss of suitable foraging and nesting habitat for bird species (including displacement of ground nesting species to surrounding countryside). Potential for killing and injury of birds and / or	The provision of new native trees and hedgerows throughout the areas of open space will provide suitable new nesting opportunities for a range of bird species, while the creation of new areas of wildflower grassland and attenuation features will provide new

Receptor	Changes and effects	Embedded measures and influence on assessment
	damage or destruction of nests during clearance of vegetation.	and enhanced foraging opportunities for bird species, including Barn Owl. The wildflower grassland within areas of open space will also provide some suitable nesting opportunities for ground-nesting species. In order to safeguard any nesting bird species within the Site, the clearance of any hedgerows and trees will be undertaken outside of the bird breeding season (March-July inclusive). Should this not be possible potential nesting habitat will be subject to a check survey immediately prior to its removal by an experienced ecologist. Should any nesting birds be identified then the nest should be fully safeguarded in situ and subject to a disturbance buffer of at least 5 m and only removed once it has been confirmed any fledglings have left the nest. As an enhancement, new bird nest boxes will be provided on suitable retained trees/new buildings within the Site, within the retained areas of open space and on new buildings. These will provide new nesting opportunities for a range of birds. Using nest boxes of varying designs would maximise the species complement attracted to the Site and, where possible, could be tailored to provide opportunities for Red Listed / Priority Species, e.g. Starling or House Sparrow, that are known from the local area.
Great Crested Newt	Areas of grassland and scrub are to be lost within 250 m of pond P1. Very low potential for killing or injury during clearance works.	Given the most recent survey results, it appears that Great Crested Newts are no longer utilising any ponds within the Site. As such, it is considered that impacts to Great Crested Newts are unlikely. It is not considered that a licence would be necessary as part of the proposed development and implementation of Reasonable Avoidance Measures (RAMs) during construction would avoid any potential impacts to Great Crested Newts. Removal of habitat present within 250 m of the on-site pond will be carried out under a RAMs method statement to ensure Great Crested Newts are not impacted. If necessary, the habitat to be cleared will be subject to a thorough fingertip search by a suitably qualified ecologist prior to removal, to ensure Great Crested Newts are not present. If a Great Crested Newt is recorded during the search, all works will stop within suitable habitat and a protected species licence will be obtained from Natural England, before works can continue. There is also the option for District Licensing to be pursued at the Site if required/preferred. The creation of new areas of wildflower grassland within 250 m of the on-site pond will provide new suitable terrestrial habitat for Great Crested Newts. New attenuation features are to be sown with a native wildflower seed mixture tolerant of wet/damp conditions, which will provide new and enhanced terrestrial habitat for Great Crested Newts. The creation of log piles/hibernacula within the Site, associated with the new attenuation features, will also

Receptor	Changes and effects	Embedded measures and influence on assessment
		provide new suitable new hibernation opportunities for amphibians.
Invertebrates	Loss of suitable habitat for common invertebrates; potential pollution of the ditches from contaminated run-off during the construction and operational phases.	The planting of new native trees, hedgerows and the creation of new areas of species-rich grassland, within the Site, as well as the creation of new attenuation features, will provide enhanced habitat for a range of invertebrates. The creation of log piles within areas of open space would benefit a range of saproxylic species (as well as providing refuge for reptiles and amphibians). The implementation of other measures recommended above would also likely provide knock-on benefits for invertebrates, e.g. through tree planting and use of planting of wildlife benefit.

7.9 Assessment methodology

- 7.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this biodiversity assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this biodiversity assessment.
- 7.9.2 The evaluation and impact assessment method has been undertaken with due regard to the guidelines produced by the CIEEM⁹, which avoids the provision of definitions as to how to assign habitats and species different levels of value and relies on an approach that involves professional judgement and the use of available guidance and information.
- 7.9.3 The value of each resource is determined within a defined geographical context:
- International;
 - UK;
 - National (England/Northern Ireland/Scotland/Wales);
 - Regional;
 - County (or Metropolitan – e.g. in London);
 - District (or Unitary Authority, City or Borough);
 - Local or Parish; or
 - Within ZOI only.
- 7.9.4 A number of other key considerations include:
- Designated Sites and Features (e.g. Special Protection Areas (SPAs), SSSIs, important hedgerows etc.);
 - Biodiversity Value (Use of Biodiversity Action Plans, development plans and other published documents);
 - Potential Value;

- Secondary or Supporting Value;
- Social or Economic Value; and
- Legal Issues.

7.9.5 The *Leicester, Leicestershire and Rutland Biodiversity Action Plan (2016)*²¹ is a useful tool that has been used to assist in valuing features and developing mitigation strategies, where necessary. Consideration has also been given to policies contained within the Local Plans.

7.9.6 Having identified the ecologically important features likely to be affected by the Proposed Development, the current guidance promotes a transparent approach in which an impact is determined to be significant or not on the basis of a discussion of the factors that categorise it. This includes characterising the nature of the likely impacts on each important feature in terms of ecological structure and function, by considering the following parameters:

- Beneficial or adverse;
- Extent;
- Magnitude;
- Duration;
- Reversibility; and
- Timing and frequency.

7.9.7 Where it is concluded that there would be an impact (beneficial or adverse and including cumulative impacts) on a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, it is described as significant in the following terms; major, moderate, minor, negligible and none.

7.10 Assessment of biodiversity effects

Baseline conditions

Current baseline

7.10.1 The Site comprises arable, semi-improved grassland and amenity grassland fields, separated by hedgerows, ditches and trees. There are three buildings/structures present within the Site and two ponds present in the centre of the Site (there is also a balancing pond located just off-site to the north and another pond to the east adjacent to/separated by the A47). Areas of scrub are present, associated with the ponds and boundary features, and Earl Shilton Brook runs through the central and eastern parts of the Site, associated with the Wastewater Treatment Works (WwTW), with small areas of hardstanding also present.

Predicted future baseline

7.10.2 In the absence of the Proposed Development, it is assumed that the majority of the habitats would remain in their current condition as they would likely be subject to the same agricultural management. Change would arise through natural processes (e.g. the maturity of woodlands) and

²¹ Leicestershire and Rutland Wildlife Trust (2016). Space for Wildlife: Leicester, Leicestershire and Rutland Biodiversity Action Plan (LLRBAP). (Online) Available at: <https://www.lrwf.org.uk/about-us/caring-wild-places/biodiversity-action-plan> (Accessed December 2021)

natural systems (e.g. river erosion) or, as is often the case, occurs as a result of human activity, land use, management, or neglect.

- 7.10.3 Climate change may also have medium to long-term implications with differing tree species and agricultural change with the potential for new crops.

Predicted effects and their significance

- 7.10.4 A summary of the results of the assessment of the biodiversity is provided in **Table 7.5**.

Table 7.5 Summary of significance of adverse or beneficial effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Non-statutory Designated Sites	Low	Low	Minor	Low likelihood of impacts to non-statutory sites.
Arable	Low	Medium	Minor/moderate	Large areas of low value habitat lost and replacement of a greater value habitats.
Semi-improved Grassland	Medium	Medium	Minor/moderate	Areas of a relatively greater value habitat lost, will be offset through the provision of replacement species-rich grassland.
Rough Grassland Margins	Low	Low	Minor/moderate	Minor losses to low value habitat, will be enhanced through species-rich grassland seed mix.
Hedgerows and trees	High	Low	Minor/moderate	Minor losses to greater value habitats, will be offset through the provision of new hedgerows/trees of a greater/equal area/length to that lost.
Scrub	Low	Low	Minor	Minor losses to low value habitat.
Stream and ditches	High	Low	Minor	Banks enhanced with species-rich seed mixture.
Ponds	High	Low	Minor	Enhancements to pond through scrub clearance.
Japanese Knotweed	Medium	Low	Minor	Eradicate species from the Site in the event it is present during construction.
Badger	High	Medium	Minor/moderate	Loss of foraging grounds.
Bats	High	Low	Minor/moderate	Potential impacts from lighting, enhancements through new tree/hedgerow planting.
Water Vole	High	Medium	Minor	Potential impacts to bankside vegetation and suitable Water Vole habitat through the construction of bridges.
Other Mammals	Low	Low	Minor	Creation of new habitats to provide opportunities for a range of common mammals.
Birds	Medium	Medium	Minor	Provision of new trees/hedgerows provide enhanced nesting/foraging habitat for a range of bird species.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Great Crested Newt	High	Low	Minor	Provision of species-rich grassland would provide enhanced terrestrial habitat for this species.
Invertebrates	Low	Low	Minor	Creation of new habitats to provide opportunities for a range of invertebrates.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 7.9** and is defined as, low, medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 7.9** and is defined as, low, medium, and high .
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 7.9**.

7.11 Consideration of optional additional mitigation or compensation

- 7.11.1 No additional mitigation measures are proposed to further reduce the biodiversity effects that are identified in this ES. This is because all relevant and implementable measures have been embedded into the development proposals and are assessed above in this chapter. These measures are considered to be likely to be effective and deliverable and address the likely significant effects of the Proposed Development.

7.12 Conclusions of significance evaluation

- 7.12.1 Following mitigation and enhancement measures, overall impacts are considered to be positive at the local level and will ensure no net loss in biodiversity terms.

7.13 Implementation of environmental measures

- 7.13.1 **Table 7.6** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented, i.e. they will have been secured through the planning conditions or implementation of a Construction Environmental Management Plan (CEMP)/Landscape Ecological Management Plan (LEMP).

Table 7.6 Summary of environmental measures to be implemented – relating to biodiversity

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Provision of suitable drainage strategy	Applicant/Contractor	Planning condition or CEMP	Section 7.8
Use of dust suppression techniques	Applicant/Contractor	Planning condition or CEMP	Section 7.8
Creation of species-rich grassland	Applicant/Contractor	LEMP	Section 7.8
Planting of new native trees/hedgerows and bolster planting existing hedgerows	Applicant/Contractor	LEMP	Section 7.8
Creation of new attenuation features	Applicant/Contractor	LEMP	Section 7.8
Creation of new areas of amenity grassland	Applicant/Contractor	LEMP	Section 7.8
Precautionary approach to Japanese Knotweed removal	Applicant/Contractor	CEMP	Section 7.8
Safeguarding Badgers, Water Vole, Great Crested Newts and nesting birds during construction	Applicant/Contractor	CEMP / LEMP	Section 7.8
Sympathetic Lighting Strategy	Applicant/Contractor	CEMP / LEMP	Section 7.8

8. Climate

8.1 Introduction

- 8.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to climate change. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development** and with respect to relevant parts of other chapters (**Chapter 6: Air Quality, Chapter 7: Biodiversity, Chapter 9: Historic Environment, Chapter 10: Landscape and Visual, Chapter 12: Socio-economics and Health, Chapter 13: Soils, Chapter 14: Traffic and Transport and Chapter 15: Water**) where common receptors have been considered and where there is an overlap or relationship between the assessment of effects.
- 8.1.2 The chapter focuses on the likely significant effects of Greenhouse Gas (GHG) emissions from the construction and operation of the Proposed Development. The aim of the GHG assessment is to calculate the emissions that are anticipated to be produced as a result of the Proposed Development. These calculations have been used to inform the extent to which the Proposed Development has a material effect on the UK Government's targets for decarbonisation.
- 8.1.3 Carbon dioxide (CO₂) is the primary GHG and Carbon dioxide equivalent (CO₂e) is a quantity that describes, for a given amount of GHG emissions, the amount of CO₂ that would have the same Global Warming Potential (GWP), when measured over a timescale of 100 years.
- 8.1.4 The vulnerability of the Proposed Development to climate change has been considered within the following chapters in the Assessment: **Chapter 7: Biodiversity** and **Chapter 15: Water**.
- 8.1.5 The measures to ensure climate change resilience of the Proposed Development have been addressed and reported in relevant documents such as the Flood Risk Assessment (FRA) and Outline Drainage Strategy and/or other design detail contained in planning application documents, including the Design and Access Statement (DAS).

8.2 Limitations of this assessment

- 8.2.1 Assumptions have been made in order to characterise the likely activities associated with the Proposed Development and therefore enable GHG emissions to be determined. These assumptions ensure a proportionate assessment has been carried out.
- 8.2.2 Construction of the residential element of the Proposed Development is expected to start in 2026 and is planned to be phased over a ten-year period. Where the construction time frames of other land uses (commercial properties and schools) are not currently known, it has been assumed that construction would take place throughout the ten-year construction period for the main build out.
- 8.2.3 In the absence of specific data for the Proposed Development, the total transport distance of construction materials is assumed to be 110 km (55 km to the Site and 55 km return journey). This assumption is based on the location of the Proposed Development and its proximity to major conurbations. It includes a 10% uplift factor from 100 km, which accounts for the additional transport distance a delivery lorry would be required to travel to collect further loads of dry construction materials.

- 8.2.4 Assumptions based on building type and size, have been made for the specific type and quantity of materials required for construction of each land use type. A Carbon factor has been used to estimate embodied carbon for each type of material (and transportation) used in construction. These were obtained from the Inventory of Carbon and Energy (ICE) Database¹. Where no suitable category has been found, Department for Business, Energy and Industrial Strategy (BEIS) 2020 provisional UK GHG emission national statistics² were used.
- 8.2.5 As the precise number of workers which may be required on-site is unknown at this stage, the industry benchmark from the Environment Agency (EA) Carbon Calculator³ has been used. In the EA Carbon Calculator, the project qualifies as Very large (construction cost more than £10 million, more than 25 people permanently on-site).
- 8.2.6 The precise details of the nature and quantity of plant and machinery for each sub-phase of construction are unknown at this stage. Therefore, a combination of the cost of the Proposed Development and an industry benchmark for process emissions, published by Royal Institution of Chartered Surveyors (RICS), has been used to calculate construction process emissions. These include emissions related to energy consumption, plant use and waste. The RICS Key Performance Indicator (KPI) states that emissions should not exceed 1,400 kg CO₂e/£100k⁴.
- 8.2.7 In order to reduce complexity, although construction of the Proposed Development would occur over a number of phases across a 10-year period, the baseline for energy consumption during construction, accounts for up to 1,500 dwellings, employment (including retail, small scale manufacturing/distribution and light industry) and a two-form entry primary school.
- 8.2.8 As the assessment covers the full life cycle of the Proposed Development, emissions factors have been used to characterise conditions throughout the operational phase, considered to be 60 years from the completion of construction. All emissions factors and projections of future conditions have been based on published material and used government statistics where available. These include projections of the carbon intensity of power in the grid⁵ vehicle emissions factors⁶.
- 8.2.9 In the operation phase the assumption for residential water use is based on UK Government building regulations⁷. Due to a lack of information on commercial retail and other commercial water use, the reference for residential water use (125 litres per person, per day) has been used. This is likely to be an overestimate for non-residential uses, however it represents the bases for a worst-case scenario estimation.

¹ Circular Ecology (2019). Embodied Carbon – The ICE Database. (online). Available at: https://circularecology.com/embodied-carbon-footprint-database.html#.XKX_oJhKhPY (Accessed 05 August 2021).

² BEIS (2020). Provisional UK greenhouse gas emissions national statistics. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/875488/2019_UK_greenhouse_gas_emissions_provisional_figures_data_tables.xlsx (Accessed 5 August 2021).

³ Environment Agency (2016). Carbon Planning Tool. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/571707/LIT_7067.pdf (Accessed 05 March 2021).

⁴ RICS (2017). Professional standards and guidance, UK: Whole life carbon assessment for the built environment (online). Available at <https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the-built-environment-november-2017.pdf> (Accessed 01 September 2021)

⁵ BEIS (2020). Energy and emissions projections (online). Available at <https://www.gov.uk/government/collections/energy-and-emissions-projections> (Accessed 01 September 2021)

⁶ Department for Transport (2021). TAG Data Book (online). Available at <https://www.gov.uk/government/publications/tag-data-book> (Accessed 01 September 2021)

⁷ UK Government (2015). The Building Regulations 2010: Sanitation, hot water safety and water efficiency (2015 edition). (online). Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/504207/BR_PDF_AD_G_2015_with_2016_amendments.pdf (Accessed 01 September 2021)

8.3 Relevant legislation, planning policy, and technical guidance

Legislative context

8.3.1 The following legislation is relevant to the assessment of the effects on climate receptors:

- The *Climate Change Act 2008* (as amended in 2019)⁸ commits the UK to reduce its net GHG emissions by 100% below 1990 levels by 2050 (the 'UK carbon target', often referred to as 'net zero') and requires the Government to establish 5-year Carbon Budgets⁹. In 2011, the UK government issued its *Carbon Plan*, which sets out how the UK will achieve decarbonisation within the framework of UK energy policy and make the transition to a low carbon economy. The most recent Carbon Budget, the sixth, was released in 2020 and describes the carbon budget for the period 2033-2037 (965 Mt CO₂e representing a 78% reduction below 1990 levels by 2035).
- The *Town and Country Planning Environmental Impact Assessment (EIA) Regulations 2017*¹⁰ Schedule 4, Regulation 18(3) refers to 'climate' in the following way: "A description of the factors specified in regulation 4(2) likely to be significantly affected by the development... climate (for example greenhouse gas emissions, impacts relevant to adaptation)", and: "A description of the likely significant effects of the development on the environment resulting from, inter alia... the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change".

Planning policy context

8.3.2 A summary of the relevant planning policies is given in **Table 8.1**.

Table 8.1 Planning policy issues relevant to climate

Policy reference	Policy issue	Considered in Section
International planning policies		
The United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement ¹¹	The UNFCCC is the major international body responsible for managing climate change and carbon emissions. In 2015, it adopted the Paris Agreement, the aims of which are stated as: "This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; and (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production". The agreement sets targets for countries' GHG emissions, but these are not legally binding or enforceable.	

⁸ UK Government (2018). Climate Change Act 2008. (online). Available at:

https://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_20080027_en.pdf (Accessed 21 July 2020).

⁹ BEIS (2016). Guidance: Carbon Budgets. (online). Available at: <https://www.gov.uk/guidance/carbon-budgets> (Accessed 21 July 2020).

¹⁰ UK Government (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017. (online). Available at: <https://www.legislation.gov.uk/uksi/2017/571/contents/made> (Accessed 05 March 2021).

¹¹ NFCCC. (2015). The Paris Agreement. (online). Available at: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> (Accessed December 2021)

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) (2021)¹²	The NPPF acts as guidance for local planning authorities and decision-makers, both for developing plans and making decisions about planning applications. Chapter 2: Project Need and Alternatives provides an explanation of the relevance of the NPPF to the Project in general terms. In Paragraph 152, the revised NPPF from 2021 states: <i>"The planning system should support the transition to a low carbon future in a changing climate... shape places in ways that contribute to radical reductions in greenhouse gas emissions... and support renewable and low carbon energy and associated infrastructure"</i> . It also requires, in Paragraph 154, that new development should be planned for in ways that <i>"can help to reduce greenhouse gas emission, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards"</i> . Furthermore, in Paragraph 157, it is stated that local planning authorities should expect new development to: <i>"a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the Applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption."</i> Local planning authorities are required to set out the strategic priorities for the area in their Local Plans, and this should include policies to deliver climate change mitigation and adaptation (among other priorities). Therefore, the NPPF climate change principles are reflected in the Local Plans relevant to the Project, as listed below.	Section 8.10
Government's Response to the Committee on Climate Change's (CCC) 2021 Progress Report to Parliament¹³	The Government Response to the CCC's 2020 Progress Report to Parliament – this white paper is the UK Government's response to the CCC's 2020 Progress Report and sets out policy recommendations for Government departments.	
Clean Growth Strategy¹⁴	Sets out policies and targets out to 2050 for reducing GHG emissions in the UK. These policies and targets are in sectors which are of directly relevance to the Proposed Development, including the commercial, residential, transport and public sectors.	
Committee on Climate Change (CCC), Net Zero	The UK's contribution to global warming mitigation, 2019 ¹⁵ – this report responded to a request from the UK governments to provide updated advice on the UK's long-term emission target. It suggests that the UK <i>"should set and vigorously pursue an ambitious target to reduce greenhouse gas emissions (GHGs) to 'net-zero' by 2050"</i> .	
UK Government The Ten Point Plan for a Green Industrial Revolution¹⁶	This plan sets out the UK Government's approach to "build back better" following the impacts of the COVID-19 pandemic in 2020. It includes details of how the government intend to accelerate the path to net zero	

¹² Ministry of Housing, Communities and Local Government (2021). National Planning Policy Framework. (online). Available at: [National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.planning.service.gov.uk/national-planning-policy-framework)

¹³ Committee on Climate Change (2021). CCC Reducing UK emissions: 2020 Progress Report to Parliament, (online). Available at: <https://www.theccc.org.uk/publication/2021-progress-report-to-parliament/> (Accessed 29 July 2021).

¹⁴ BEIS (2017). Clean Growth Strategy. (online). Available at: <https://www.gov.uk/government/publications/clean-growth-strategy> (Accessed July 21 2020).

¹⁵ Committee on Climate Change (2019). Net Zero: The UK's contribution to stopping global warming. (online). Available at: <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf> (Accessed 21 July 2020).

¹⁶ UK Government (2020). The Ten Point Plan for a Green Industrial Revolution (online). Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf (Accessed 04 August 2020).

Policy reference	Policy issue	Considered in Section
	in line with the commitment made in the <i>Climate Change Act</i> . Included within the plan of relevance to this assessment is the pledge to put homes, workplaces and schools at the heart of the green economic recovery. This includes commitments to make buildings more energy efficient and move away from fossil fuel boilers and the replacement of appliances with lower carbon alternatives.	
Ministry of Housing, Communities and Local Government (MHCLG) Future Homes Standard¹⁷	Consultation document setting out plans for the Future Homes Standard that the UK Government has committed to introducing in 2025 as part of the journey to net zero by 2050. This includes Part L of the Building Regulations related to the conservation of fuel and power.	
Department for Environment, Food and Rural Affairs (DEFRA) Environment Bill 2020¹⁸	The emerging Environment Bill 2020 sets out how the environment will be put at the centre of policy making. The Bill aims to help the Government achieve the net zero carbon emissions target. It will establish a new public body, the Office for Environmental Protection which will act as an independent, domestic watchdog. All climate change legislation (including carbon budgets) will be within the enforcement remit of the body, ensuring that there is no governance gap in relation to climate change legislation.	Section 8.10
Development plan policies		
Hinckley and Bosworth Borough Council (HBBC) Core Strategy Development Plan Documents (DPD) (2009)¹⁹	The Core Strategy provides the over-arching strategy and long-term vision for HBBC. It forms part of the HBBC Local Plan 2006 to 2026. Policies that are relevant to climate change and GHG emissions are: • <i>Policy 2: Development in Earl Shilton</i> states that employment allocations within the mixed use Sustainable Urban Extension (SUE) "should aim to achieve zero-carbon development", and the homes should be "environmentally sustainable". Sustainable on-site power generation should be investigated and implemented if viable. Alternatives to car travel are required as part of the development; • <i>Policy 5: Transport Infrastructure in the Sub-regional Centre</i> states that public transport linkages should be improved from proposed developments into Earl Shilton including pedestrian and cycle linkages and supporting the reopening of the Elmesthorpe passenger railway station; • <i>Policy 24: Sustainable Design and Technology</i> states that all residential developments must meet the Code for Sustainable Homes level 6 requirement unless it would make the development unviable. The requirement for Code for Sustainable Homes is no longer definitive as the scheme is now voluntary. Schools are required as a minimum to meet BREEAM (or equivalent) assessment rating of "excellent"; and • <i>Spatial Objective 12: Climate Change and Resource Efficiency</i> states that the prudent use of resources should be promoted to minimise the impacts of climate change. This includes investing in green infrastructure, minimising the use of resources and energy, increased re-use and recycling,	Section 8.10

¹⁷ Ministry of Housing, Communities and Local Government (2019). The Future Homes Standard 2019 Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for new dwellings. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/852605/Future_Homes_Standard_2019_Consultation.pdf (Accessed 29 July 2021).

¹⁸ Defra (2020). Environment Bill (online). Available at: <https://publications.parliament.uk/pa/bills/cbill/58-01/0009/20009.pdf> (Accessed 05 March 2021).

¹⁹ Hinckley and Bosworth Borough Council (2009). Local Development Framework: Core Strategy. (online). Available at: https://www.hinckley-bosworth.gov.uk/download/downloads/id/487/core_strategy_adopted_document.pdf (Accessed 05 March 2021).

Policy reference	Policy issue	Considered in Section
	increasing the use of renewable energy technologies and minimising pollution, including GHGs.	
HBBC Draft Local Plan: 2020-2039 Consultation (2021) ²⁰	HBBC is currently consulting on a draft Local Plan. The Local Plan is the key planning document for the borough, and it will guide future development in Hinckley and Bosworth up to 2039 and is expected to be adopted in 2022. An objective in the document is <i>"to protect, maintain or enhance those elements of the built and natural environment of local or historic value and mitigate for climate change"</i> . With respect to the air quality and carbon emission objectives the plan states that HBBC will contribute to <i>"minimising carbon emissions from new developments (to within government guidelines)."</i>	Section 8.10
Earl Shilton and Barwell Area Action Plan (AAP) DPD (2014) ²¹	The AAP is part of the Local Plan for HBBC and sits under the Core Strategy. The document set outs what the Council considers the most appropriate approach for the development of the two settlements to the year 2026. Policies relevant to the climate change chapter are: • <i>Policy 1: Sustainable Urban Extensions</i> sets out the allocation of the relevant land; • <i>Spatial Objective 9</i> is to <i>"enable the achievement of sustainable lifestyles which involve a reduction in energy use in the areas of home occupation and travel"</i>; • <i>Policy 6: Earl Shilton Urban Extension</i> states that proposals should have regard to the design principals in the Urban Design Guidance. This states that local, sustainable sources should be used for material and sustainable urban drainage systems should be used; • <i>Policy 8: Employment in Earl Shilton Urban Extension</i> that states that developments <i>"Should aim to achieve zero-carbon"</i>; • <i>Policy 11: Walking and Cycling in Earl Shilton Urban Extension</i>; and • <i>Policy 22: Development and Design</i> states that developments are required to meet the requirements of Core Strategy Policy 24.	Section 8.10
HBBC Corporate Plan 2017 – 2021 ²²	The Corporate Plan provides the Council's vision reflecting national and local priorities. The Annual Statement of commitment 2019 to 2020 includes a commitment to producing an Action Plan setting out how HBBC are working towards being a carbon neutral borough by 2030.	Section 8.10
HBBC Climate Change Strategy 2020 to 2021 ²³	The Climate Change Strategy supports the Corporate Plan. In July 2019, HBBC declared a climate change emergency. The strategy sets out actions that HBBC will take to address the climate crisis. The vision stated in the strategy is <i>"to work towards making HBBC carbon neutral by 2030 ... and empower others to take similar actions"</i> . The strategy states that HBBC will use their regulatory powers to ensure positive change occurs including the following actions relevant to the climate change assessment: • Minimise the climate impact of new development through the Local Plan policies and development management decisions;	Section 8.10

²⁰ Hinckley and Bosworth Borough Council (2021). Draft Local Plan, 2020-2039 (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/7356/draft_local_plan_2020_-_2039 (Accessed 29 July 2021).

²¹ Hinckley and Bosworth Borough Council (2014). Local Plan 2006 – 2026: Earl Shilton and Barwell Area Action Plan. (online). Available at: https://www.hinckley-bosworth.gov.uk/download/downloads/id/4332/earl_shilton_and_barwell_area_action_plan_and_appendices_-_adopted_23_september_2014.pdf (Accessed 05 March 2021).

²² Hinckley and Bosworth Borough Council (2020). Corporate Plan 2017-2021. (online). Available at: <https://www.hinckley-bosworth.gov.uk/corporateplan> (Accessed 22 July 2020).

²³ Hinckley and Bosworth Borough Council (2020). Climate Change Strategy 2020 to 2021. (online). Available at: https://www.hinckley-bosworth.gov.uk/info/200331/fairtrade_and_sustainable_development/1622/climate_change_consultation/2 (Accessed 21 July 2020).

Policy reference	Policy issue	Considered in Section
	- Enforce buildings standards to ensure new builds are meeting their planning permission targets and - Encourage active environments within new housing developments, leading to increased cycling and walking.	
Leicestershire Minerals and Waste Local Plan (2019)²⁴	The Minerals and Waste Local Plan sets out key principles to guide waste management in the County of Leicestershire to the end of 2031. Policy SM1: Sustainable Development states that <i>"Proposals should contribute to the three dimensions (economic, environmental and social) of sustainable development, as well as providing clear evidence of how a proposal would make a positive contribution to reducing its effects on climate change."</i>	Section 8.10
Leicestershire County Council (LCC) Environment Strategy 2018 – 2030: Delivering a better future²⁵	The Environmental Strategy includes a commitment to <i>"achieve carbon neutrality by 2030 for our own operations and to work with others and to lobby the government to achieve carbon neutrality for Leicestershire by 2050 or before"</i> .	Section 8.10

Technical guidance

8.3.3 EIA guidance of relevance to the climate change assessment is provided in **Table 8.2**.

Table 8.2 EIA technical guidance relevant to the GHG emission assessment

Guidance	Relevance	IEMA Principle
2017 Institute of Environmental Management and Assessment (IEMA) guidance on Assessing GHG Emissions and Evaluating their Significance²⁶	Provides guidance on assessment and mitigation of GHG emissions within an EIA context. The guidance includes a focus on proportionate and robust assessment. The IEMA Guidance is based on the five IEMA Principles on Climate Change Mitigation and EIA. The way these principles have been treated in this assessment is described below.	
	The GHG emissions from all projects will contribute to climate change; the largest interrelated cumulative environmental effect.	The global atmosphere is the receptor for all GHG emissions in this assessment. In accordance with the guidance, all emissions to the atmosphere are considered negative, direct and permanent effects
	The UK has legally binding GHG reduction targets – EIA must therefore give due consideration to how a project will contribute to the achievement of these targets.	Where available, the principles for meeting the UK targets and Carbon Budget, sector budgets and local targets are used to contextualise the emissions from the Proposed Development in the assessment.
	GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from	All increases in emissions to the atmosphere are considered negative, direct and permanent effects. Therefore, a climate change assessment is required. However, this climate change assessment does not consider that all emissions are necessarily significant. The climate change assessment instead assesses the extent to which the Proposed

²⁴ Leicestershire County Council (2019). Leicestershire Minerals and Waste Local Plan up to 2031. (online). Available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2019/10/3/Leicestershire-Minerals-and-Waste-Local-Plan-Up-to-2031-Adopted-2019.pdf> (Accessed 05 March 2021).

²⁵ Leicestershire County Council (2020). Environment Strategy 2018 – 2030: delivering a better future (Revised May 2020). (online). Available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2020/7/13/Environment-Strategy-2018-2030-delivering-a-better-future.pdf> (Accessed 21 July 2020).

²⁶ IEMA (2017). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance. (online). Available at: https://www.iaia.org/pdf/wab/EIA%20Guide_GHG%20Assessment%20and%20Significance_IEMA_16May17.pdf (Accessed 21 July 2020).

Guidance	Relevance	IEMA Principle
	a project might be considered to be significant.	Development reduces the ability of the UK Carbon Budget ⁹ and other targets to be met and requires satisfactory mitigations to be put in place to reduce emissions wherever practicable. This is considered a more proportionate response, as it enables an assessment of the magnitude of effect to be considered rather than assuming any emissions result in a significant effect.
	The EIA process should, at an early stage, influence the location and design of projects to optimise GHG performance and limit likely contribution to GHG emissions.	Where possible, mitigations would be put in place to reduce GHG emissions and to reduce the magnitude of the effect of the Proposed Development. Mitigations that are embedded in the Proposed Development would be considered in the ES.

8.3.4 Carbon management standards of relevance to this assessment include:

- Publicly Available Standard (PAS) 2080: 2016 – Carbon Management in Infrastructure²⁷ – this provides an approach to management of reduction of GHG emissions from infrastructure projects, working with stakeholders throughout the project lifecycle;
- The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (GHG Protocol)²⁸ – this provides standards and guidance for preparing a GHG emissions inventory; and
- BS EN ISO 14064-1²⁹ – sets out guidance for quantification and reporting of GHG emissions and removals. The methodology for quantification of GHGs for the Proposed Development follows this guidance and the stated guidance on reporting would be taken into account as part of this assessment.

8.3.5 Sector specific housing and residential strategies of relevance to this assessment include:

- UK Green Building Council Driving Sustainability in new homes: a resource for local authorities³⁰ – guidance document to help cities and local authorities to drive sustainability of new homes; and
- CCC UK housing: Fit for the future?³¹ – provides recommendations for new homes to become fit for the future in terms of climate change adaptation or mitigation.

8.3.6 This assessment has been undertaken with reference to the following international scientific reports:

²⁷ British Standards Institution (BSI) (2016). PAS 2080:2016. Carbon management in infrastructure. BSI; UK.

²⁸ World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) (2014). The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard, March 2014. (online). Available at: <http://www.ghgprotocol.org/sites/default/files/ghgp/standards/ghg-protocol-revised.pdf> (Accessed 21 July 2020).

²⁹ BSI (2019). BS EN ISO 14064-1: 2019 Greenhouse gases. Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (online). Available at: <https://shop.bsigroup.com/ProductDetail?pid=000000000030327038> (Accessed 05 March 2021).

³⁰ UK Green Building Council (2018). Driving sustainability in new homes: a resource for local authorities. (online). Available at: <https://www.ukgbc.org/wp-content/uploads/2018/07/Driving-sustainability-in-new-homes-UKGBC-resource-July-2018-v4.pdf> (Accessed 22 July 2020).

³¹ Committee on Climate Change (2019). UK housing: Fit for the future? (online). Available at: <https://www.theccc.org.uk/wp-content/uploads/2019/02/UK-housing-Fit-for-the-future-CCC-2019.pdf> (Accessed 22 July 2020).

- Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6): Climate Change 2021 - The Physical Science Basis (2021)³². In August 2021 the contribution of Working Group I to the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) was published. The publication reinforces the evidence presented in the previous IPCC report (AR5) and, through the utilisation of updated climate model simulations and analyses, states that "it is unequivocal that human influence has warmed the atmosphere, ocean and land". It is highlighted that "global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO₂ and other greenhouse gas emissions occur in the coming decades". The publication states that "*limiting human-induced global warming to a specific level requires limiting cumulative CO₂ emissions, reaching at least net zero CO₂ emissions, along with strong reductions in other greenhouse gas emissions*" and it is this assertion which will underpin the international response to global warming. These factors are used to contextualise the GHG emissions created by the Proposed Development.

8.4 Data gathering methodology

Study Area

- 8.4.1 Given that the only receptor for GHG emissions for consideration in relation to the Proposed Development is the global climate, the Study Area for GHG emissions is defined by the location of all emissions associated with the Proposed Development. This approach has been represented by considering the Proposed Development's contribution to national climate targets. The temporal scope of the baseline information provided is consistent with the period over which the Proposed Development would be in construction (considered to be ten years) and operation (considered to be 60 years).

Desk study

- 8.4.2 A summary of the organisations from which data have been obtained, together with the nature and scope of the data provided is as follows:
- Circular Ecology:
 - ▶ Embodied Carbon – The ICE Database (2019)¹: used to assess the embodied carbon of the Proposed Development based on material quantities.
 - Department for BEIS:
 - ▶ Provisional UK GHG emission national statistics (2020)²: used to assess the embodied carbon of the Proposed Development based on material quantities;
 - ▶ BEIS 2019 Energy and Emissions Projections (EEP)³³ have been used in the development of the future scenarios for electricity mix; and

³² (Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)). Cambridge University Press. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Online) Available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (Accessed 01 September 2021).

³³ BEIS (2019), Greenhouse gas reporting: conversion factors 2019 (online). Available at <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019> (Accessed 09 June 2021).

- ▶ Emissions factors for GHG reporting (2020)³⁴: emissions factors for traffic and transport emissions.
- EAY:
 - ▶ Carbon Calculator (2016)³⁵: industry benchmark for the number of workers expected on-site.
- Chartered Institution of Building Services Engineers (CIBSE):
 - ▶ Energy Benchmarks (2008)⁵⁶: industry benchmark for on-site energy and freshwater use.
- Department of Transport (DfT):
 - ▶ Commuting trends in England (2016)³⁵: Construction staff commuting distances; and
 - ▶ Transport Analysis Guidance (TAG) Data Book⁶ for emissions projections from transport and proportion of vehicle kilometres by vehicle type (petrol, diesel and electric).
- Waste and Resources Action Programme (WRAP):
 - ▶ Net Waste Tool (2008)³⁶: wastage rates used to assess the amount of waste based on material quantities.
- Office for National Statistics (ONS):
 - ▶ 2011 Census³⁷: Population and Household Estimates for the United Kingdom used to estimate the number of people per household; and
 - ▶ Nomis - Official Labour Market Statistics (2011)³⁸: distance data from the 2011 census for journey to work by residents for Hinckley and Bosworth.

8.5 Overall baseline

Current baseline

- 8.5.1 This section provides details of the existing GHG emissions from the residential and transport sectors in the UK, and details of the emissions at the Site, as defined in **Section 8.1**.
- 8.5.2 Across the UK, the total GHG emissions from domestic buildings and transport are presented in millions of tonnes of carbon dioxide equivalents (Mt CO₂e).
- 8.5.3 In 2019, UK GHG emissions were 44% lower than 1990 levels and net CO₂ emissions were estimated at 455 MtCO₂e. This represented a decrease of 3% in comparison to 2018.³⁹ The provisional figures

³⁴ BEIS (2020). Government emission conversion factors for greenhouse gas company reporting. (online). Available at: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020> (Accessed 20 July 2020).

³⁵ Department for Transport (2019). National Travel Survey Table NTS0403. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/821477/nts0403 ods (Accessed 21 July 2020).

³⁶ WRAP (2008). Net Waste Tool: Guide to Reference Data, Version 1.0. (online). Available at: <https://nwtool.wrap.org.uk/Documents/WRAP%20NW%20Tool%20Data%20Report.pdf> (Accessed 19 March 2021).

³⁷ ONS (2015). 2011 Census data by area (Online) Available at: <https://www.ons.gov.uk/aboutus/transparencyandgovernance/freedomofinformationfoi/2011censusdatabyarea> (Accessed 20 July 2020).

³⁸ NOMIS (2011). Distance travelled to work (Workday population) (Online). Available at: <https://www.nomisweb.co.uk/query/construct/summary.asp?mode=construct&version=0&dataset=154> (Accessed 20 July 2020).

³⁹ BEIS (2021). Final UK greenhouse gas emissions national statistics: 1990 to 2019 (online). Available at <https://www.gov.uk/government/collections/final-uk-greenhouse-gas-emissions-national-statistics> (Accessed 1 August 2021).

for 2020 show a further decrease, estimating UK net emissions at 414 Mt CO₂e. Final emissions for 2020 will be published in February 2022.⁴⁰

- 8.5.4 Residential GHG emissions accounted for 67 Mt CO₂e in 2019 (15 % of total UK emissions).³⁹ Direct emissions, resulting from use of fossil fuels (primarily gas) for heating, make up the vast majority of this total. The provisional figures for 2020 show a slight rise, both in absolute terms to 68 Mt CO₂e, and as proportion of total UK emissions (16%).⁴⁰
- 8.5.5 In 2019, 27% of UK GHG emissions, or 122 Mt CO₂e, were from the transport sector. Road transport accounts for the vast majority of these emissions (111 Mt CO₂e).³⁹ The provisional figures for 2020 show a decrease of emissions from transport to 97 Mt CO₂e.⁴⁰ This figure is likely to have been heavily influenced by the Covid-19 pandemic and still represents 23% of UK GHG emissions.
- 8.5.6 The Site currently comprises predominantly arable farmland with boundary native hedgerows and intermittent hedgerow trees. Existing playing fields are located in the north-west corner of the land parcel south of Mill Lane (on the south-eastern outskirts of Earl Shilton) along with a children's play area.
- 8.5.7 The baseline for the Site is defined as GHG emissions associated with agricultural activities and current sequestration potential of the existing land at the baseline year of 2020. GHG emissions from current uses are considered to be significantly lower than from constructing and operating the Proposed Development and therefore an increase in emissions is anticipated. A calculation of baseline emissions has not been undertaken for this EIA, agreed with relevant stakeholders in the Scoping Opinion.

Future baseline

- 8.5.8 Construction of the Proposed Development is expected to start in 2026 and is planned to be phased over a ten-year period. It is not expected that there would be any other significant change to the baseline land-use of the Site over the period during which the Proposed Development would be constructed and in operation and therefore, the future baseline emissions from activities at the Site are considered to be low.
- 8.5.9 UK GHG emissions from the residential sector have decreased overall from a peak of 91 Mt CO₂ in 1996 to 65 Mt CO₂ in 2019. In line with the UK net zero target, the Clean Growth Strategy¹⁴ suggests a pathway to reducing residential emissions to 58 Mt CO₂ by 2032.
- 8.5.10 UK GHG emissions from the transport sector have decreased overall from a peak of 136 Mt CO₂ in 2007 and are expected to steadily decrease to 102 Mt CO₂ in 2035, the last year for which data is available.

8.6 Consultation

- 8.6.1 **Table 8.3** provides a summary of the issues concerning the Proposed Development that have been raised by consultees and the responses which have been provided.

⁴⁰ BEIS (2021), Provisional UK greenhouse gas emissions national statistics: 1990 to 2020. (online) Available at: <https://data.gov.uk/dataset/9a1e58e5-d1b6-457d-a414-335ca546d52c/provisional-uk-greenhouse-gas-emissions-national-statistics> (Accessed December 2021)

Table 8.3 Summary of issues raised during consultation regarding climate change assessment

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
<i>"The scoping report identifies the relevant Policy and legislation relating to Climate Change however the Applicant should also consider the range of GI principles and opportunities in the Green Infrastructure Strategy to inform potential schemes which can contribute towards climate change mitigation and adaptation. The council agrees that this topic should be included within the Environmental Statement (ES) supporting any future application."</i>	HBBC	The HBBC Green Infrastructure Strategy ⁴¹ has been considered in the EIA and reported in the ES and is included in the design of the Proposed Development (e.g. consideration to carbon sequestration, greenways for active and low carbon travel, flood risk alleviation and reducing the urban heat island effect). It has also been considered in relevant documents such as the DAS, FRA, Outline Drainage Strategy, and ES Chapter 7: Biodiversity, Chapter 10: Landscape and Visual, Chapter 12: Socio-economics and Health, and Chapter 15: Water.	Section 8.11 and Section 8.15
<i>"The England Biodiversity Strategy published by DEFRA establishes principles for the consideration of biodiversity and the effects of climate change. The ES should reflect these principles and identify how the Proposed Development's effects on the natural environment would be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment 'by establishing coherent ecological networks that are more resilient to current and future pressures' (NPPF Para 174), which should be demonstrated through the ES."</i>	Natural England	Relevant environmental topics (e.g. Chapter 7: Biodiversity and Chapter 15: Water environment) consider the impacts of climate change within their topic specific assessments and provide appropriate mitigations where relevant. Consideration of climate change has been given in the future baseline section within Chapter 7: Biodiversity , and therefore will need to be taken forward to environmental assessment. The England Biodiversity Strategy ⁴² is considered in Chapter 7: Biodiversity.	Chapter 7: Biodiversity

8.7 Scope of the assessment

Spatial scope

- 8.7.1 The spatial scope of the assessment of GHG emissions covers the area of the Site, together with the Zone of Influence (ZoI) that has formed the basis of the Study Area described in **Section 8.4**.
- 8.7.2 The Study Area for GHG emissions assessment for the construction phase covers GHG emissions associated with the Proposed Development's construction activities and materials usage, included within **Section 8.9**, within the area of the Site. The emissions associated with the transport of materials from outside of the Site and the transportation of construction workers has also been estimated. This Study Area is appropriate as it captures the emissions from the Proposed Development's construction activities and materials usage as well as emissions from staff travel and movements associated with construction materials and waste.

⁴¹ Hinckley and Bosworth Borough Council (2020). Green Infrastructure Strategy 2020. (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/7097/green_infrastructure_strategy_2020 (Accessed 05 March 2021).

⁴² Defra (2020). Biodiversity 2020: A strategy for England's wildlife and ecosystem services. (online). Available at: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services> (Accessed 05 March 2021).

- 8.7.3 The Study Area for GHG emissions assessment for the operational phase is the area covered by the Proposed Development, and the roads in the vicinity of the Proposed Development that are likely to be affected by changes in traffic movements as a result of the Proposed Development. The roads identified and included in **Chapter 14: Transport and Traffic** have been used to assess GHG emissions.

Temporal scope

- 8.7.4 The temporal scope of the assessment of GHG emissions addresses the timescale over which the Proposed Development would be carried out, and therefore covers the construction phase (considered to be a ten-year period commencing in 2026 and operational (considered to be 60 years) periods.

Potential receptors

- 8.7.5 The global climate is the only receptor for the climate change assessment.
- 8.7.6 In accordance with IEMA guidance²⁶, all GHG emissions from the Proposed Development may be considered potentially significant due to the high sensitivity of the receptor (the global climate). Therefore, the total estimated GHGs emitted to the receptor associated with construction and operation of the Proposed Development when compared to the future baseline have been assessed.

Likely significant effects

- 8.7.7 The GHG emissions receptors that have been taken forward for assessment are summarised as follows:
- 8.7.8 Global climate: GHG emissions: Emissions to the global climate receptor are considered direct, negative and permanent in all cases. The estimated GHG emissions during construction and operation of the Proposed Development have been contextualised against local and regional contributions to global GHG emissions and the target of net zero by 2050. The construction of the Proposed Development would be an activity that runs from approximately 2026 to 2036. GHG emissions from the construction phase would therefore fall within the fourth (2023 to 2027), fifth (2028 to 2032) and sixth (2033 to 2037) carbon budgets. The emissions from the first year of the operation phase (2037) would also fall into the sixth carbon budget. The remainder of the operation phase would fall into any subsequent future budgets from 2038 and beyond.
- 8.7.9 No other identified potential effects have been scoped out at this stage.

8.8 Environmental measures embedded into the development proposals

- 8.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 3.3. Table 8.4** outlines how these embedded measures influence the GHG assessment. These measures have not been factored into GHG emissions calculations, therefore emissions presented in this chapter are considered to be conservative.

Table 8.4 Summary of the embedded environmental measures and how these influence the GHG emissions assessment

Receptor	Changes and effects	Embedded measures
Global atmosphere	Material resources and waste: • use of green building materials with low embodied energy and recycled materials; • avoidance of fully filled cavities where possible; • use of ground granulated blast-furnace slag (GGBS) in concrete where possible; • reuse and recovery of materials where possible. For example, by setting appropriate phasing of construction to allow the opportunity for the construction waste materials to be reused or recycled on-site in subsequent stages of the Proposed Development; • endeavouring to achieve a cut and fill balance to avoid excavation waste. Topsoils would be removed from areas where it is likely to be affected by the Proposed Development and, where feasible and practicable, would be reused on-site (for example within gardens, landscaping schemes/green space areas). The same applies to subsoils (although as they are less valuable than topsoil and reuse may only be for reprofiling or green space areas etc); and • implementation of a Site Waste Management Plan to record the movements of waste and encourage better waste management practices.	The use of raw materials resources and the production of waste would be minimised. This would reduce transport movements, the requirement of raw materials and therefore GHG emissions.
Global atmosphere	Construction: • One of the objectives for the Proposed Development is to improve construction productivity, including supporting Modern Methods of Construction (MMC)⁴³. These methods include prefabrication of units and products off-site.	
Global atmosphere	Energy: • minimise energy requirements and emissions from equipment and plant (including minimising the use of diesel or petrol powered generators and instead using mains electricity or battery powered equipment); • power down of equipment / plant during periods of non-utilisation; optimising vehicle utilisation; • energy efficient window units and frames with certified thermal and acoustic insulation properties; • thermal insulation of walls and roof voids of all units to reduce heat losses and demand; • use of more efficient heating (e.g. ground or air source heat pumps); • passive design, including orientation and minimising solar gain; • improve performance of glazing; • use of low energy lighting throughout the Proposed Development. For example, use energy efficient street lighting and/ or switch streetlights off for periods of the night; and • include solar photovoltaic cells within all suitable properties.	

⁴³ RICS (2018), Modern Methods of Construction - A forward-thinking solution to the housing crisis? (online). Available at: <https://www.rics.org/globalassets/rics-website/media/news/news--opinion/modern-methods-of-construction-paper-rics.pdf> (Accessed 06 October 2021).

Receptor	Changes and effects	Embedded measures
Global atmosphere	Water conservation: install blue infrastructure (e.g. landscape features). specification of water recycling and low-flow taps and showers	
Global atmosphere	Landscape – tree planting and landscaping to absorb GHG emissions	
Global atmosphere	Transport: implement an active travel strategy, transport strategy and travel plan aimed at reducing encouraging more sustainable of travel with less GHG emissions; develop electric vehicle charging point strategy with provision in residential and employment locations; seek to develop an electric vehicle car club in conjunction with an operator; and seek to develop a rental bike scheme, including electric bikes; and providing passive provision for electric vehicle charging at homes with allocated spaces as well as to on-street parking areas.	

8.9 Assessment methodology

- 8.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this GHG emissions assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this GHG emissions assessment.
- 8.9.2 To determine the scale and significance of GHG emissions associated with the Proposed Development the estimated net change in emissions from 'with Proposed Development' and 'without Proposed Development' are compared against carbon budgets.

Table 8.5 Carbon budgets

Budget	Carbon budget level (million tCO ₂ e)	Reduction below 1990 levels
3 rd Carbon Budget (2018 to 2022)	2,544	37% by 2020
4 th Carbon Budget (2023 to 2027)	1,950	51% by 2025
5 th Carbon Budget (2028 to 2032)	1,725	57% by 2030
6 th Carbon Budget (2033 -2037)	965	78% by 2035

- 8.9.3 The receptor for all emissions is the global atmosphere. For the purpose of the climate change assessment, emissions have been quantified in two building life cycle assessment stages as defined by RICS⁴⁴ (see **Graphic 8.1**):
- product and construction process stage: embodied carbon (the GHG emitted during the manufacture, transport and construction of building materials required for all stages of the

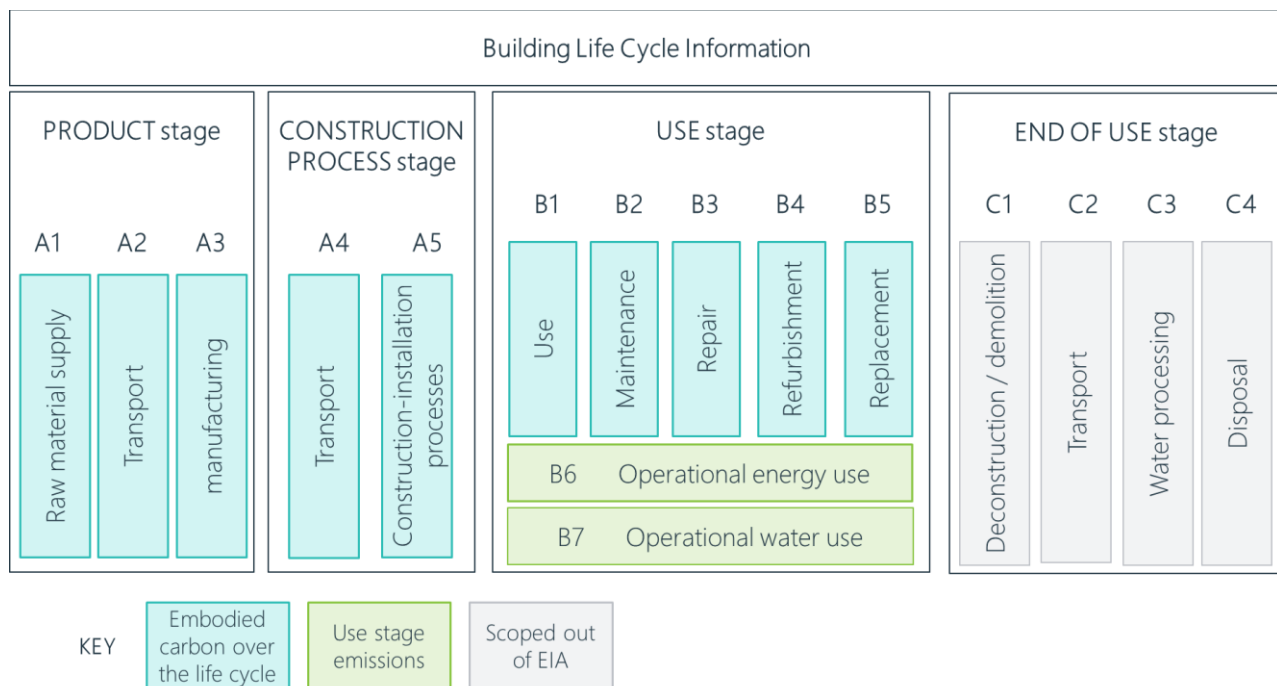
⁴⁴ RICS (2017). Whole life carbon assessment for the built environment. (online) Available at: <https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the--built-environment-november-2017.pdf> (Accessed 21 July 2020).

Proposed Development), surface access (i.e. road use) for construction staff and equipment, component transportation and on-site energy use during the construction period; and

- operational/use stage: GHG emissions from residential and non-residential buildings, and associated emissions sources (e.g. infrastructure).

8.9.4 The end of use stage has been scoped out of the EIA assessment as stated in **Section 3.3**. This is given that the Proposed Development, comprising housing, school, employment and retail uses, would be maintained in the long-term by its owners, and that the buildings would have a design life of many years.

Graphic 8.1 Building life cycle assessment stages defined by RICS. Adapted for the GHG emissions assessment



Construction GHG emissions

- 8.9.5 For construction emissions, the cumulative emissions of processes up to handover of the construction phase to the operational phase have been considered.
- 8.9.6 The British Standard for Life Cycle Assessment (BS EN 15978 LCA)⁴⁵ sets out the standard modules for consideration.
- 8.9.7 A significant proportion of the emissions from the Proposed Development are likely to be associated with embodied carbon which represents the sum of GHG emissions covering extraction of raw and primary materials and their manufacture and refinement into products and construction materials, as well as the transport and supply logistics to the factory gate. The RICS methodology to calculate embodied carbon⁴⁴ along with the ICE Database¹ has been used.
- 8.9.8 Surface access emissions associated with construction activities have been estimated based on trip length and using BEIS emissions factors for GHG reporting³⁴. Construction staff commuting distances have been estimated from the DfT³⁵.

⁴⁵ BSI (2011). Sustainability of construction works – Assessment of environmental performance of buildings. BSI; UK.

- 8.9.9 The EA Carbon Calculator has been used to determine the GHG emissions related to workers travelling to the Site. As the precise number of construction workers expected on-site is unknown at this stage, the industry benchmark from the EA Carbon Calculator⁴⁶ has been used to determine the GHG emissions from workers travelling to the Site. Using the EA Carbon Calculator, the project qualifies as Very large and therefore more than 25 people are assumed to be permanently on-site.
- 8.9.10 On-site energy use resulting from the construction process has been estimated based on available guidance and best practice (e.g. research on typical on-site GHG emissions^{47,48}).

Operational GHG emissions

- 8.9.11 Operational Use stage GHG emissions relate to any processes or building energy use required that is not related to construction (e.g. electricity supply to the Site, heating of houses etc.).
- 8.9.12 Given the limited level of design detail expected at this stage of the design process, energy use has been calculated using estimation of electricity and heating demand of the building types of the Proposed Development based on CIBSE characterisation^{49,56} rather than any bespoke energy modelling.
- 8.9.13 Efficiency features of the new infrastructure have been considered within the assessment. Annual emission calculations have considered the carbon intensity of UK grid electricity (gCO₂e/kWh) which reflect the projected rate of decarbonisation over time. This rate is based on BEIS Emissions efficiency projections⁵.

Assessment of GHG emissions

- 8.9.14 Current IEMA principles and guidance⁵⁰ state that due to the combined environmental effect that they have, any GHG emissions or reductions from a project might be considered to be significant. Therefore, the assessment methodology aims to determine the relative scale of the impact of the Proposed Development on global climate change by considering the sensitivity of the receptor, the relevant impacts and the magnitude of those impacts on carbon budgets and targets.

Sensitivity

- 8.9.15 The only receptor for the climate change assessment is the global climate. Climate change is the largest inter-related cumulative environmental effect²⁶, so the global climate is considered a high sensitivity receptor and any increase or decrease to GHG emissions can be considered to be potentially significant and therefore require detailed assessment²⁶.

Magnitude

- 8.9.16 The magnitude of the GHG emissions is assessed based on the scale in **Table 8.6**, drawing on the magnitude tests stated below.

⁴⁶ Environment Agency (2016). Carbon Planning Tool. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/571707/LIT_7067.pdf (Accessed 25 May 2021).

⁴⁷ Seo, M.-K., Kim, T., Hong, G. and Kim, H. (2016) On-site measurements of CO₂ emissions during the construction phase of a building complex. *Energies*, 9, 599, doi: 10.3390/en9080599.

⁴⁸ Jannse, R.M.J. (2014). Assessing onsite energy usage: an explorative study. Master's Thesis, University of Twente.

⁴⁹ CIBSE (2012). GVF2012 Guide F: Energy Efficiency in Buildings.

⁵⁰ IEMA (2017). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (online). Available at: https://www.iaia.org/pdf/wab/EIA%20Guide_GHG%20Assessment%20and%20Significance_IEMA_16May17.pdf (Accessed December 2021).

Table 8.6 Description for magnitude of GHG emissions

Magnitude	Negligible	Low	Medium	High
Description	GHG emissions can reasonably be described as net zero.	GHG emissions, but compliant with all magnitude tests.	Evidence of non-compliance with one magnitude test or evidence of compliance with all magnitude tests but with considerable uncertainty regarding more than one.	Evidence of non-compliance with more than one magnitude test or evidence of compliance with all magnitude tests but with considerable uncertainty regarding multiple tests.

8.9.17 The magnitude of the impact is assessed based on the following tests⁵¹:

- the scale of total GHG emissions from the Proposed Development is contextualised within the national, regional, and local targets for carbon neutrality by 2050 or before. The extent to which the Proposed Development affects the ability of Leicestershire County Council to meet its Environment Strategy 2018 – 2030²⁵ targets, UK sector budgets for buildings in the sixth carbon budget⁵² and any evolving local or regional climate change policies or strategies will be considered;
- the Proposed Development adheres to appropriate policies and sector guidance as described in **Section 8.3**:
 - requirements for sustainable transport including those within the NPPF¹² and HBBC Local Plan¹⁹. Evolving strategic direction from the HBBC Climate Change Strategy 2020 to 2021²³, and any expectations within the UK carbon budgets will also be considered;
 - requirements for educational facilities including the HBBC Local Plan¹⁹ and guidance in the Royal Institute of British Architects (RIBA) 2030 Climate Challenge⁵³ will also be considered;
 - requirements for residential and non-residential buildings in the HBBC Local Plan¹⁹. Guidance and recommendations in the LCC Environment Strategy²⁵, Future Homes Standard⁵⁷, and the CCC UK housing: Fit for the future document³¹ will also be considered; and
- satisfactory mitigations are in place to reduce GHG emissions through design, construction and use stages⁵⁴ wherever practicable.

Determination of significance

8.9.18 The significance of the effect of GHGs associated with the Proposed Development on climate change, has been determined based on **Table 8.7**.

⁵¹ The list of documentation relevant to the magnitude tests will be updated in the ES to account for policy/strategy updates at the national and local level.

⁵² The latest publicly available carbon budget will be used to contextualise residential and non-residential carbon budgets.

⁵³ RIBA (2021). 2030 Climate Challenge. (online). Available at: <https://www.architecture.com/about/policy/climate-action/2030-climate-challenge> (Accessed 05 March 2021).

⁵⁴ Use stage mitigations do not apply to residential buildings.

Table 8.7 Matrix for determining impact

		Magnitude (positive/negative)			
		Negligible	Low	Medium	High
Sensitivity	High	Negligible	Minor	Moderate	Major
	Medium	N/A	N/A	N/A	N/A
	Low	N/A	N/A	N/A	N/A

8.9.19 Negligible or minor impacts are considered not significant, whilst moderate and major impacts are considered significant.

8.10 Assessment of GHG emissions effects

Construction

Embodied carbon of materials

- 8.10.1 For the construction (build out) phase, the material resources and waste assessment has assumed activities would be undertaken between 2026 and 2036.
- 8.10.2 One of the objectives for the Proposed Development is to improve construction productivity, including supporting MMC. However, the use of traditional construction methods has been assumed as it would provide for a reasonable worst-case assessment. The material resources required for the construction of the Proposed Development would likely consist of those normally associated with a development of this nature, including items such as structural steel, bricks, windows, rooftiles, blocks, bulk timber, timber trusses, ready mixed concrete, plasterboard, dense bitumen/stone macadam, concrete kerbing and sub-base crushed concrete.
- 8.10.3 An estimated list of material resources has been used to calculate embodied carbon. All material resources have been categorised according to the types and subtypes specified in the ICE Database¹ or BEIS 2019 provisional UK GHG emission national statistics². Where detailed information was not available, assumptions were made regarding the materials in order to obtain a carbon emission factor.
- 8.10.4 The lifetime GHG emissions associated with the embodied carbon of material resources needed for the construction of the Proposed Development are estimated to be 313.04 ktCO₂e.

Surface Access

- 8.10.5 It is intended that required key material resources for the construction of the Proposed Development would be imported by road.
- 8.10.6 An estimated total of 473,573 tonnes of material is likely to be required for the construction of the Proposed Development. The total GHG emissions arising from transportation of this material during the construction of the Proposed Development are estimated to be 4.73 ktCO₂e.
- 8.10.7 As the precise number of workers expected on-site is unknown at this stage, the industry benchmark from EA Carbon Calculator⁴⁶ has been used. In the EA Carbon Calculator, the Proposed Development qualifies as Very large (construction cost more than £10 million, more than 25 people permanently on-site), giving total estimated emissions of 1.05 ktCO₂e.

- 8.10.8 This gives a total combined GHG surface access emissions of 5.77 ktCO₂e during construction.

Energy

- 8.10.9 On-site plant and equipment that would likely be utilised during the construction phase may indicatively include scrapers, dozers, 360° excavators, backhoe loaders, dumpers, dump trucks, rollers and compressors. There are likely to be secure compounds and any perimeter fencing/hoarding and lighting required for operational purposes associated with construction when working during the late afternoon in the winter period (including light from headlamps of vehicles). Concrete crushers/sorters/riddlers would be needed to crush any concrete pads on-site and sort/grade materials from excavation. Other heavy equipment may also be required during the construction of buildings including lifting plant, cranes and forklift trucks.
- 8.10.10 Construction process GHG emissions have been estimated using the RICS construction KPI for process emissions per construction cost⁵⁵, giving an estimated total lifetime GHG emissions of 377 ktCO₂e.

Construction summary

- 8.10.11 As shown in **Table 8.8** across the construction phase of the Proposed Development, the calculated estimates indicate that GHG arising from construction processes, embodied carbon of materials and energy, would total 696 ktCO₂e.

Operation

Maintenance and Repair

- 8.10.12 During the operational phase, works to maintain and repair elements of the Proposed Development would be required. The assessment of the carbon emissions considers the activities and new materials for the maintenance, repair, replacement and refurbishment of the infrastructure during the use stage/operation of infrastructure. These have been estimated for each land use type of the Proposed Development as a percentage of emissions during the construction phase. The estimated the total carbon emissions from these activities and materials is 141 ktCO₂e.

Water

- 8.10.13 As the volume of water that may be required for the operation of the Proposed Development is currently unknown, the industry benchmark for fresh water, published by CIBSE⁵⁶ has been used to make an estimate of the GHG emissions arising from the use of water on-site. It has been estimated that approximately 11,384,920 m³ of water would be utilised, which represents an equivalent of 1.7 ktCO₂e.

Operational Energy

- 8.10.14 An estimation of emissions arising from operational energy use of the Proposed Development has been based on CIBSE characterisation⁵⁶ using the most suitable defined component categories and occupancy adjusted energy benchmarks. These calculations have considered the energy required, operational hours (per year) each land and floorspace of each land use type of the Proposed

⁵⁵ RICS (2017). Whole life carbon assessment for the built environment. (online) Available at: <https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the-built-environment-november-2017.pdf> (Accessed 1 May 2021).

⁵⁶ CIBSE (2008). TM46: Energy Benchmarks (online). Available at: <https://www.guidos.co.uk/wp-content/uploads/2015/08/CIBSE-TM46-Energy-Benchmarks.compressed.pdf> (Accessed 25 May 2021).

Development. Improvements in energy efficiency have also been considered within the calculations. It should be noted that given the forthcoming changes in Part L of the Building Regulations⁵⁷-which represent a significant uplift in mandatory energy efficiency for residential new builds- the emissions estimates used for this assessment are likely to be considered conservative. Following these calculations, the total operational energy emissions of the Proposed Development are 501 ktCO₂e.

Other Operational Processes

- 8.10.15 The building life cycle assessment stages (defined by RICS) include the category Other Operational processes. This represents other process GHG emissions arising from the Proposed Development to enable it to operate and deliver its service. For the purposes this assessment, the emissions from operational transport are considered. The estimate for emissions for operational transport, which considers the changing mix of vehicles by fuel type and forecast vehicle efficiency improvements, are 198 ktCO₂e.

Operation Summary

- 8.10.16 Across the operational phase of the Proposed Development, the calculated estimates indicate that total GHG arising from maintenance and repair, water, operational energy and transport would total 842 ktCO₂e.

Summary

- 8.10.17 The GHG assessment described above has considered the GHG emissions from each assessed GHG source during the construction and operation phases of the Proposed Development. **Table 8.8** provides a summary of estimated GHG emissions across all stages of the project lifecycle. **Table 8.9** shows these these GHG emissions contextualised against the Third, Fourth, Fifth and Sixth Carbon Budgets
- 8.10.18 Overall GHG emissions associated with the Proposed Development during its construction and operation are estimated to be 1,537.5 ktCO₂e.

⁵⁷ Ministry of Housing, Communities & Local Government, (2021). The Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956094/Government_response_to_Future_Homes_Standard_consultation.pdf (Accessed 1 Dec 2021).

Table 8.8 Lifecycle Emissions (over the course of the Proposed Development)

	Main stage of Proposed Development life cycle	tCO ₂ e (lifecycle)	ktCO ₂ e (lifecycle)
Pre-construction	A0 – pre-construction	Scoped out	
	A1 – A2 – A3 - Raw materials supply, transport and manufacture	313,037.62	313.04
Construction	A4 – Construction Transport (HGV and workers)	5,774.90	5.77
	A5 - Construction process stage	377,300.00	377.30
Operation	B1 - Boundary of use stage - installed products and materials	Scoped out	
	B2 – B5 – Maintenance, repair, replacement and refurbishment	141,024.85	141.02
	B6 – Operational energy	500,750.81	500.75
	B7 – Operational water	1,696.35	1.70
	B8 – Other operational processes	197,910.94	197.91
	B9 – User's utilisation	Scoped out	
Decommissioning	C1 – C2 -C3 -C4 – End of life, including deconstruction, transport, waste processing for recovery and disposal	Scoped out	Scoped out
Total			1,537.50

Table 8.9 Contextualised against Carbon Budgets

Proposed Development phases	Estimated lifetime GHG emissions for the Proposed Development (ktCO ₂ e)	Net Proposed Development GHG emissions per relevant carbon budget (ktCO ₂ e)			
		3rd (2018 to 2022)	4th (2023 to 2027)	5th (2028 to 2032)	6th (2033 to 2037)
Construction	696.1	-	63.3	316.4	253.1
Operation	841.4	-			13.8
Decommissioning	-	-	-	-	-
Total	1,537.5		63.3	316.4	266.9
Total carbon budget (ktCO₂e)		2,544,000	1,950,000	1,725,000	965,000
% contribution		0.000%	0.003%	0.018%	0.028%

8.11 Vulnerability to climate change

- 8.11.1 The vulnerability of the Proposed Development to climate change has been considered within the following relevant chapters in the Assessment: **Chapter 7: Biodiversity** and **Chapter 15: Water**. Due to this, further assessment of the vulnerability of the Proposed Development to climate change has not been conducted.
- 8.11.2 **Chapter 7: Biodiversity** states that due to the length of the timeline over which the Proposed Development would be delivered, climate effects would not be factored into the future baseline for Biodiversity.
- 8.11.3 Furthermore, all habitat prescriptions would be developed to provide a community that would be resilient to climate change, and that the management of habitats would be adaptive, allowing for future changes and best practice to be reflected.
- 8.11.4 As a result of this, it can be asserted with confidence, that the climate change effects on Biodiversity have been given sufficient consideration within **Chapter 7: Biodiversity**.
- 8.11.5 **Chapter 15: Water** details that, in terms of fluvial flooding, hydraulic modelling was undertaken with climate change uplifts applied. A finding of this modelling is that flooding is broadly constrained to the Earl Shilton Brook channel corridor (due to the well-defined banks and floodplain). Because of this, it is assumed that future climate change induced surface water flows would also be contained.
- 8.11.6 The hydraulic model also included storm sewer overflows as inputs to the channel, from the sewage treatment works, and for the inflows for climate change runs, these were uplifted.
- 8.11.7 The climate change uplift for the hydraulic modelling was 50%, in line with the Upper End EA guidance for the relevant river basin district. This was also the uplift applied to the storm sewer overflow inputs.

- 8.11.8 Although surface water modelling was not undertaken, given the topography, it is assumed that with climate change the surface water flood risk would not pose a significant risk to the Site, given the steep sides of the watercourse corridor which it is broadly confined to.
- 8.11.9 In addition, a surface water drainage strategy has been completed. This includes Sustainable Drainage Systems (SuDs) which have been designed to suitably attenuate runoff up to the 1% AEP event, plus 40% for climate change. The SuDs would ensure that the Proposed Development remains safe from runoff and does not increase downstream flood risk up to this design event.
- 8.11.10 As a result of this, it can be asserted with confidence, that the flood risk assessment has given sufficient consideration to climate change.

8.12 Assessment of cumulative effects

Cumulative effects of the Proposed Development can occur as a result of interrelationships between different environmental topics, which are referred to as 'intra-project effects'. For climate, interrelationships are identified with **Chapter 10: Landscape and Visual**, **Chapter 12: Socio-economics and Health** and **Chapter 13: Soils**. However, these interrelationships do not result in a cumulative effect for the GHG emissions impact assessment as the effects of all GHG emissions presented within this assessment are essentially cumulative.

8.13 Consideration of optional additional mitigation or compensation

- 8.13.1 No additional mitigation measures are proposed to further reduce the GHG emissions effects that are identified in this ES. This is because the embedded measures (see **Table 8.4**) are considered to be likely to be effective and deliverable and address the likely significant effects of the Proposed Development.

8.14 Conclusions of significance evaluation

- 8.14.1 The only receptor for the GHG assessment is the global climate, which is a highly sensitive receptor due to the global impacts of climate change. All increases in GHG emissions to the atmosphere are considered negative, direct, and permanent effects.
- 8.14.2 As stated in **Section 8.5**, in 2019, total UK territorial GHG emissions were 455 MtCO₂e. Achieving the UK carbon target of net zero by 2050⁵⁸, requires an average emissions reduction of around 15 MtCO₂e per year over the next 30 years.⁵⁹ The carbon budgets also require the UK to continually reduce emissions in line with the UK carbon target.⁵⁹
- 8.14.3 The magnitude of the GHG emissions from the Proposed Development is assessed based on the tests described in **Section 8.9**. When contextualised within the UK carbon target of net zero by 2050, the UK carbon budgets (see **Table 8.9**), the GHG emissions associated with the Proposed Development are relatively small in scale.
- 8.14.4 This assessment has established that the Proposed Development net GHG emissions from the Proposed Development would contribute 0.003% of the UK's fourth carbon budget of 1,950 MtCO₂e between 2023 to 2027 and 0.018% to the UK's fifth carbon budget of 1,725 MtCO₂e

⁵⁸ CCC (2019). Net Zero – The UK's contribution to stopping global warming (online). Available at: <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf> (Accessed 1 August 2021).

⁵⁹ The Carbon Budgets Order 2009 (online). Available at: <https://www.legislation.gov.uk/uksi/2009/1259/contents/made> (Accessed 1 August 2021).

between 2028 and 2032. Following this, the Proposed Development would make a contribution of 0.028% to the sixth carbon budget of 965 MtCO₂e for 2033 to 2037.

- 8.14.5 Therefore, it is considered unlikely that the emissions from the Proposed Development, which are estimated to be 1,537.5 ktCO₂e, would materially affect the ability of the UK to meet its carbon target for net zero by 2050, as legislated in the *Climate Change Act*⁸.
- 8.14.6 In accordance with the assessment methodology for defining significance in **Section 8.9**, the Proposed Development is assessed as having a low (adverse) magnitude (see **Table 8.6**) and a minor effect (see **Table 8.7**). It is therefore assessed as **not significant**.

Table 8.10 Summary of significance of adverse effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Global climate: GHG emissions associated with the construction phase (embodied carbon from the product stage and emissions from the construction processes stage), operation phase (the use stage including operational processes and maintenance) and decommissioning (the end of use stage) of the Proposed Development.	High	Low (adverse)	Not significant (minor adverse)	Overall GHG emissions associated with the Proposed Development during its construction and operation are estimated to be 1560.3 ktCO ₂ e. Due to the relatively small scale of GHG emissions associated with the Proposed Development, it is considered that the Proposed Development would not have a material effect on the UK meeting its net zero carbon target and the UK carbon budget, constituting a low (adverse) magnitude of change. Based on the high sensitivity of the receptor and the magnitude of change, the Proposed Development is considered to have a minor (adverse) effect upon the global climate and therefore the effect is not significant .

1. The sensitivity/importance/value of the receptor is defined using the criteria set out in paragraph 8.9.15 and is defined as high.
2. The magnitude of change on the receptor resulting from activities relating to the Proposed Development is defined using the criteria set out in **Table 8.6** and is defined as negligible, low (adverse), and high (adverse).
3. The significance of the environmental effect is based on the combination of the sensitivity/importance/value of the receptor and the magnitude of change and is expressed as major adverse (significant), minor adverse (not significant) or negligible, subject to the evaluation methodology outlined in **Table 8.7**.

8.15 Implementation of environmental measures

- 8.15.1 **Table 8.11** describes the environmental measures embedded within the Proposed Development and the means by which they would be implemented.

Table 8.11 Summary of environmental measures to be implemented

Environmental measure	Responsibility for implementation	Compliance mechanism	ES Section reference
Construction use of green building materials with low embodied energy and recycled materials	Applicant/Contractor	Construction Environmental Management Plan (CEMP)	Section 8.8
Avoidance of fully filled cavities where possible	Applicant /Contractor	CEMP	Section 8.8
Use of Ground Granulated Blast-furnace Slag (GGBS)	Applicant /Contractor	CEMP	Section 8.8
Reuse and recovery of materials where possible. For example, by setting appropriate phasing of construction	Applicant /Contractor	CEMP	Section 8.8
Achievement of a cut and fill balance to avoid excavation waste. Topsoils and subsoils to be reused on-site.	Applicant /Contractor	CEMP	Section 8.8
Implementation of a Site Waste Management Plan to record the movements of waste and encourage better waste management practices.	Applicant /Contractor	CEMP	Section 8.8
Use of MMC, including prefabrication of units and products off-site.	Applicant /Contractor	CEMP	Section 8.8
Minimising energy requirements and emissions from equipment and plant (including using mains electricity or battery powered equipment);	Applicant /Contractor	CEMP	Section 8.8
Installation of energy efficient window units and frames with certified thermal and acoustic insulation properties and thermal insulation of walls and roof voids of all units to reduce heat losses and demand;	Design team	Review of detailed design	Section 8.8
Use of more efficient heating (e.g. ground or air source heat pumps);	Design team	Review of detailed design	Section 8.8
Passive design, including orientation and minimising solar gain;	Design team	Review of detailed design	Section 8.8
Use of low energy lighting throughout the Proposed Development. For example, use energy efficient street lighting and/or switch streetlights off for periods of the night; and include solar photovoltaic cells within all suitable properties.	Design team	Review of detailed design	Section 8.8

Environmental measure	Responsibility for implementation	Compliance mechanism	ES Section reference
Water conservation through installation of blue infrastructure (e.g. landscape features) and specification of water recycling and low-flow taps and showers	Design team	Review of detailed design	Section 8.8
Tree planting and landscaping to absorb GHG emissions	Design team	Review of detailed design	Section 8.8
More sustainable travel with less GHG emissions	HBBC	Travel Plan	Section 8.8

9. Historic Environment

9.1 Introduction

- 9.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to the Historic Environment. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development**.
- 9.1.2 The Historic Environment comprises "all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora"¹. This includes built heritage, parks, and gardens, as well as buried archaeological remains, both at a designated and non-designated level.
- 9.1.3 Designated heritage assets are those that have been identified as having heritage values that warrant preservation through legislation and can include both physical structures and buried remains. Designated assets include listed buildings, scheduled monuments, conservation areas, wrecks, battlefields and registered parks and gardens.
- 9.1.4 Non-designated heritage assets are stated as being "buildings, monuments, sites, places, areas, or landscapes identified as having a degree of significance meriting consideration in planning decisions" but are not formally designated heritage assets¹.
- 9.1.5 Both designated and non-designated heritage assets are protected locally through regional planning policies, and nationally through policies contained within the National Planning Policy Framework (NPPF)².
- 9.1.6 Designated assets are further afforded legislative protection through acts such as the *Ancient Monuments and Archaeological Areas Act 1979* (which relates to Scheduled Monuments), and the *Planning (Listed Buildings and Conservation Areas) Act 1990*.

9.2 Limitations of this assessment

- 9.2.1 The following overall limitations have been identified:
- desk-based assessment is a predictive tool and relies on a series of assumptions and extrapolations to develop an understanding of the potential extent and character of archaeological remains within the Site:
 - ▶ initial data is obtained from the Historic Environment Record (HER). This is continually updated as further data regarding the historic environment becomes available; for example, when the results of recent archaeological investigations are made available. As the HER is a record only of known features, it is not a reliable predictive tool, but can provide useful information that can be used with other information to develop an understanding of the potential presence, nature and significance of archaeological remains;

¹ Ministry of Housing, Communities and Local Government (2021). *National Planning Policy Framework Annex 2: Glossary*. (Online). Available at: <https://www.gov.uk/guidance/national-planning-policy-framework/annex-2-glossary> (Accessed September 2021).

² Ministry of Housing, Communities and Local Government (2021). *National Planning Policy Framework*. (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf (Accessed September 2021).

- geophysical survey is based on taking physical measurements that may have a number of causes, and conclusions from this type of survey remain predictive, but allows more refined inferences to be drawn on the basis of the nature and morphology of discrete anomalies;
- evaluation trenching allows inferences made on the basis of desk-based and geophysical survey to be tested. While this approach considers a sample area of a site, it allows a clear understanding of the location, nature and significance of heritage assets which can be considered robust; and
- where assessment conclusions are based on desk-based or geophysical survey only, the robustness of conclusions is based on a reasonable worst-case scenario.

9.2.2 These limitations are not considered to affect the robustness of the assessment of the likely significant effects of the Proposed Development.

9.3 Relevant legislation, planning policy, technical guidance

Legislative context

9.3.1 The following legislation is relevant to the assessment of the effects on Historic Environment receptors:

- *Ancient Monuments and Archaeological Areas Act 1979*: Under the terms of the act, an archaeological site or historic building of national importance can be designated as a Scheduled Monument and is registered with the Department of Culture, Media and Sport (DCMS). Any development that might affect either the Scheduled Monument or its setting is subject to the granting of Scheduled Monument Consent. Historic England advises the DCMS on individual cases for consent and offers advice on the management of Scheduled Monuments.
- *The Planning (Listed Buildings and Conservation Areas) Act 1990*: covers the registration of listed buildings³ and designation of conservation areas⁴. A Listed Building may not be demolished, altered, or extended in any manner which would affect its character as a building of special architectural or historic interest without Listed Building Consent being granted. There are three grades of listing:
 - ▶ Grade I: buildings of exceptional interest;
 - ▶ Grade II*: particularly important buildings of more than special interest; and
 - ▶ Grade II: buildings of special interest, warranting every effort to preserve them.
- *Historic Buildings and Ancient Monuments Act 1953*: Historic England is enabled by the *Historic Buildings and Ancient Monuments Act 1953* (as amended by the *National Heritage Act 1983*) to maintain a register of parks, gardens and battlefield sites which appear to Historic England to be of special historic interest. Registration in this way makes the effect of a Proposed Development on any scoped parks, gardens and battlefields as well as their settings a material consideration. Historic England are a statutory consultee in relation to works affecting Grade I/II* Registered Parks and Gardens;
- *Treasure Act 1996; Treasure (Designation) Order 2002*: This Act defines what constitutes "treasure". Any find of "treasure" must be reported to the local Coroner;

³ Buildings that are seen to be of special architectural or historic interest

⁴ Areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance

- *The Hedgerow Regulations 1997*: These regulations set out criteria to be used to determine the importance of hedgerows and protect important hedges from removal. Selection criteria include heritage-based considerations;
- *Burial Act 1857*: It is generally an offence to remove human remains from a place of burial without a licence from the Secretary of State; and
- *Protection of Military Remains 1986*: This Act sets out specific protections for aircraft which have crashed or vessels which have sunk or been stranded while in military service. It sets out a general prohibition on any disturbance or removal of such remains without a licence granted by the Secretary of State.

Planning policy context

9.3.2 A summary of the relevant planning policies is given in **Table 9.1**.

Table 9.1 Planning policy issues relevant to Historic Environment.

Policy reference	Policy issue
National Policy	
NPFF (2021)²	Paragraphs 189 and 190 directs Local Planning Authorities to set out “...a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats”. In doing so, they should recognise that heritage assets “are an irreplaceable resource and conserve them in a manner appropriate to their significance”. Paragraph 194 states that applicants for development therefore need to provide appropriate information on the significance of heritage assets affected by a proposal and provide assessment outlining the impact of the Proposed Development on that significance. This should be in the form of a desk-based assessment and, where necessary, field evaluation may be required to assess this impact. Paragraphs 199 and 202 state that in determining planning applications, great weight should be given to the conservation of heritage assets designated under the relevant legislation. In weighing applications that either directly or indirectly affect the significance of a non-designated heritage asset, a judgement would be required regarding the scale of any harm or loss and the significance of the heritage asset.
Development plan policies	
HBBC Core Strategy (2009)⁵	Spatial Objective 10 (natural environment and cultural assets): To deliver a linked network of green infrastructure, enhancing and protecting the borough’s distinctive landscapes, woodlands, geology, archaeological heritage and biodiversity and encourage its understanding, appreciation, maintenance and development. Spatial Objective 11 (built environment and townscape character): To safeguard, enhance and where necessary regenerate the borough’s distinctive built environment including its wider setting, particularly that associated with conservation areas, listed buildings and historic industries.
Site Allocations and Development Management Policies DPD (2016)⁶	Policy DM11 (Protecting and Enhancing the Historic Environment): This states that development proposals which may affect a heritage asset will be required to

⁵ Hinckley & Bosworth Borough Council (2009). *Local Development Framework Core Strategy. Adopted December 2009*. (Online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (Accessed April 2021).

⁶ Hinckley & Bosworth Borough Council (2016). *Hinckley and Bosworth Local Plan 2006-2026 Site Allocations and Development Management Policies DPD*. (Online). Available at: <https://www.hinckley->

Policy reference	Policy issue
	demonstrate an understanding of the asset and its setting and the impact of the proposal on the significance of the asset, as well as measures to minimise or avoid impacts and how the benefits of the development outweigh harm. Policy DM12 (Heritage Assets): <i>"All development proposals affecting heritage assets and their setting will be expected to secure their continued protection or enhancement, contribute to the distinctiveness of the areas in which they are located and contribute to the wider vibrancy of the borough"</i>. With regard to designated and other heritage assets, the policy states that: Listed Buildings – proposals for change of listed buildings and development affecting their settings should demonstrate that the <i>"proposals are compatible with the significance of the building and its setting"</i>. Conservation Areas – proposals should ensure the heritage significance is preserved and enhanced through consideration of features including boundary treatments, preservation of key views, replacement of dead or dying important trees, and retention of character with reference to historic street pattern, street furniture, materials and spaces. Historic Landscapes – Development proposals within or adjacent to the historic landscape of Bosworth Battlefield should seek to better reveal the historic significance of the area, with reference to topographical features and educational or tourism provision. Scheduled Monuments – <i>"Proposals which adversely affect a scheduled monument or its setting should be wholly exceptional and accompanied by clear and convincing justification"</i>. Locally Important Heritage Assets – <i>"Assets identified on the Locally Important Heritage Asset List should be retained and enhanced wherever possible"</i>. Policy DM13 (Preserving the Borough's Archaeology): Where a proposal may affect a site of archaeological interest then an assessment, including a desk study a possibly field survey should be completed. The local authority may require archaeological remains to be preserved but where this is not feasible or justified, archaeological remains will be excavated and recorded in advance of development.

Technical guidance

- 9.3.3 A summary of technical guidance relevant to the Historic Environment assessment is given in **Table 9.2**.

Table 9.2 Technical guidance relevant to Historic Environment

Technical guidance	Relevance to this assessment
National Planning Practice Guidance (PPG) Historic Environment⁷	This provides advice on enhancing and conserving the historic environment whilst outlining the main legislative framework for the historic environment. The document explains positive strategies for conservation and enjoyment of the historic environment as well as describing the term 'significance' in relation to the historic environment and its importance in plan making. The guidance explains the significance of setting in decision making and how the optimum viable use for a heritage asset is taken into account in planning decisions. The

[bosworth.gov.uk/downloads/file/5295/site allocations and development management policies dpd - adopted july 2016](https://www.bosworth.gov.uk/downloads/file/5295/site%20allocations%20and%20development%20management%20policies%20dpd%20-%20adopted%20july%202016) (Accessed November 2021).

⁷ Ministry of Housing, Communities and Local Government (2019). *National Planning Practice Guidance (PPG) Historic Environment*. (Online). Available at: <https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment> (Accessed April 2021).

Technical guidance	Relevance to this assessment
Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment⁸	possibility of harm towards a heritage asset is important and the guidance seeks to explain the significance of this harm whilst weighing it against potential public benefits. The guidance seeks to define Designated and Non-designated heritage assets and how to approach potential impacts towards the heritage significance of these assets. Provides guidance and information to assist local authorities, planning and other consultants, owners, applicants, and other interested parties in implementing historic environment policy and ensuring compliance with NPPF fundamentals. It is important to understand the nature, extent and level of significance of an asset, and the contribution of its setting to its significance, in order to understand the impact of the proposals on that significance and for decisions to be made in line with legal requirements, objectives of the development plan and the policy requirements of the NPPF. The significance of an asset is the sum of its archaeological, architectural, historic, and artistic interests. Whilst not providing a methodology for producing impact assessments for the historic environment, the guidance draws on Conservation Principles to set out appropriate steps to follow in order to build a robust understanding of the significance of heritage assets (both designated and undesignated). The guidance emphasises that information required in support of applications for Planning Permission and Listed Building Consent should be proportionate to the significance of the heritage assets affected and the impact on that significance.
Good Practice Advice in Planning Note 3: The Setting of Heritage Assets⁹	Good Practice Advice in Planning Note 3 sets out that the setting of an asset is the surrounding in which a heritage asset is experienced. Elements of setting may make a positive, or negative, contribution to its significance. This guidance document sets out the parameters by which setting should be explored, documented and presented within assessments. The document sets out five steps to follow to ensure an appropriate level of assessment is achieved.
Conservation Principles¹⁰	Sets out principles for the assessment of heritage significance and its management. It sets out six high-level principles. 'Conservation Principles' sets out a method for thinking systematically and consistently about the heritage values that can be ascribed to a place and its significance. These values include historical value, evidential value, aesthetic value and communal value. A draft version of the revised conservation principles for the sustainable management of the historic environment has been completed but not yet adopted. The draft version defines significance with the attributed values of archaeological, architectural, artistic and historic.

⁸ Historic England (2015). *Managing Significance in Decision-Taking in the Historic Environment Historic Environment Good Practice Advice in Planning: 2*. (Online). Available at: <https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/gpa2/> (Accessed April 2021).

⁹ Historic England (2017). *The Setting of Heritage Assets Historic Environment Good Practice Advice in Planning Note 3 (Second Edition)*. (Online). Available at: <https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/> (Accessed April 2021).

¹⁰ Historic England (2017). *Conservation Principles for the Sustainable Management of the Historic Environment*. (Online). Available at: <https://historicengland.org.uk/content/docs/guidance/conservation-principles-consultation-draft-pdf/> (Accessed April 2021).

Technical guidance	Relevance to this assessment
Advice Note on Statements of Heritage Significance¹¹	This Historic England advice note covers the NPPF requirement for applicants for heritage and other consents to describe heritage significance to help local planning authorities to make decisions on the impact of proposals for change to heritage assets.
Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment¹²	Sets out standards for the provision of consultancy advice in the historic environment.
Standard and guidance for archaeological field evaluation 2014¹³	Sets out the standards to define good practice for the execution and reporting of archaeological field evaluation.

9.4 Data gathering methodology

Study area

- 9.4.1 In order to place the Site within its context and assist in identifying the potential for the presence of further features, the following two spatial elements were assessed as components of the overarching Study Area for the assessment:
- A 2 km area extending from the boundary of the Site has been used to identify heritage assets that may be subject to potentially significant indirect effects; and
 - A 1 km area extending from the boundary of the Site has been used to identify heritage assets which may be subject to potentially significant direct effects.

Previous Work

Desk Studies

- 9.4.2 Previous archaeological work on the Site includes two archaeological desk studies: the first by CGMS in 2007¹⁴ and the second by Nexus Archaeology in 2010¹⁵. An ES chapter focusing on the archaeological potential of the Site was completed by Amec Foster Wheeler (now Wood) in 2014. These documents have informed this assessment and additional desk-based assessment has been completed as part of the preparation of this assessment. Key findings of the desk studies are listed in **Table 9.3**.

¹¹ Historic England (2019). *Statement of Heritage Significance: Analysing Significance in Heritage Assets Historic England Advice Note 12*. (Online). Available at: <https://historicengland.org.uk/images-books/publications/statements-heritage-significance-advice-note-12/heag279-statements-heritage-significance/> (Accessed April 2021).

¹² Chartered Institute for Archaeologists (2014). *Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment*. (Online). Available at: https://www.archaeologists.net/sites/default/files/CIfAS&GCommissioning_1.pdf (Accessed April 2021).

¹³ Chartered Institute for Archaeologists (2014). *Standard and guidance for archaeological field evaluation*. (Online). Available at: https://www.archaeologists.net/sites/default/files/CIfAS&GFieldevaluation_1.pdf (Accessed April 2021).

¹⁴ CgMs Consulting. (2007). *Archaeological Desk Based Assessment: Land at Thurlaston Lane, Earl Shilton, Leicestershire*. Unpublished Technical Report. (Available on request)

¹⁵ Nexus Heritage. (2010). *Land at Earl Shilton, Leicestershire: Archaeological Desk-Based Assessment Unpublished Technical Report No: 30 3041.R01*. (Available on request)

Table 9.3 Previous Desk Based Assessments

Report	Conclusions
CGMS, 2007 Archaeological Desk Based Assessment. Land at Thurlaston Lane, Earl Shilton, Leicestershire	This report is related to the area of land north of Mill Lane. It concluded that the Site had potential for the sub-surface archaeological remains to survive within it, particularly those relating to the Roman period. It suggested that a programme of geophysical survey should be commissioned to further define the archaeological potential of the Site.
Nexus Heritage, 2010. Land at Earl Shilton, Leicestershire: Archaeological Desk-Based Assessment	This report concerns the main area of the Site south of Mill Lane. It concluded that the potential for sub-surface archaeological remains relating to the Prehistoric and Roman periods would likely be encountered on the Site. The report notes a 'moderate' potential for Saxon/Early medieval remains, medieval remains and post-medieval archaeological remains.

Geophysical Survey

- 9.4.3 Two programmes of geophysical survey have been undertaken within the Site. The land to the north of Mill Lane was surveyed in June 2008 by Stratascan¹⁶ (now part of the SUMO Group). The larger portion of the Site south of Mill Lane was surveyed in October 2012 by Northamptonshire Archaeology¹⁷ (now trading as MoLA Northampton). The conclusions from these surveys are shown in **Table 9.4**.

Table 9.4 Geophysical surveys within the Site

Report	Conclusions
Stratascan. 2008. Geophysical Survey Report: Thurlaston Lane, Earl Shilton.	This work surveyed the land to the north of Mill Lane. The survey showed the presence of a series of linear anomalies interpreted as possible former ridge and furrow surviving on a generally north to south alignment. In addition, the survey identified a number of areas of possible sub-surface archaeological remains, including a circular feature, a rectilinear anomaly, various possible linear features, and a possible earthwork.
Northamptonshire Archaeology. 2012. Archaeological Geophysical Survey of Land to the south-east of Earl Shilton, Leicestershire	This work surveyed the land to the south of Mill Lane. The geophysical survey results show evidence of ridge and furrow in most of the fields as well as a number of former field boundaries. In addition, the survey identified four areas of possible sub-surface archaeological remains.

Evaluation Trenching

- 9.4.4 Evaluation trenching was undertaken across the Site following, and targeting, the results of the geophysical surveys. The land to the north of Mill Lane was excavated between 17 and 31 March 2010 by University of Leicester Archaeological Services (ULAS)¹⁸. South of Mill Lane, evaluation trenching was carried out by Headland Archaeology between 16 September and 4 October 2013¹⁹. The conclusions of the trenching are summarised in **Table 9.5**.

¹⁶ Stratascan. 2008. *Geophysical Survey Report: Thurlaston Lane, Earl Shilton*. Report No. J2475. Unpublished Technical Report. (Available on request)

¹⁷ Northamptonshire Archaeology. 2012. *Archaeological Geophysical Survey of Land to the south-east of Earl Shilton, Leicestershire* October to November 2012. Unpublished Technical Report No. 12/199. (Available on request)

¹⁸ ULAS 2010. *An Archaeological Evaluation of land between Thurlaston Lane and Mill Lane, Earl Shilton, Leicestershire*. Unpublished Technical Report. (Available on request)

¹⁹ Headland Archaeology, 2013. *Land to the south-east of Earl Shilton, Leicestershire: Archaeological Evaluation* (Available on request)

Table 9.5 Evaluation trenching within the Site

Report	Conclusions
ULAS. 2010. An Archaeological Evaluation of land between Thurlaston Lane and Mill Lane, Earl Shilton, Leicestershire.	The evaluation comprised 26 trenches which targeted geophysical anomalies as well as testing blank areas. Twelve trenches produced clear evidence for archaeological activity relating to an Iron Age rectilinear ditched enclosure, a medieval circular feature (possibly a windmill mound), and several adjacent, parallel and perpendicular gullies and ditches potentially dating to the Iron Age or Roman period.
Headland Archaeology, 2013. Land to the south-east of Earl Shilton, Leicestershire: Archaeological Excavation	The evaluation comprised 33 trenches that revealed archaeological remains from several periods. The most significant remains date to the Bronze Age and Early Iron Age. The majority of these remains were located in the north-eastern part of the area surveyed and took the form of ditches, pits and a cremation indicative of occupation. The evaluation indicates that geophysical survey was only partially successful at identifying archaeological remains.

Further Survey

- 9.4.5 The geophysical surveys and targeted evaluation trenching have established that there are features of archaeological interest within the Site that may be totally removed as a result of the Proposed Development. This includes evidence for prehistoric and Romano-British occupation. As part of the embedded measures and in line with paragraph 205 of the NPPF², mitigation in the form of archaeological recording will be implemented to the areas of known archaeology within the Site. The methods of recording will be agreed and secured through a planning condition.
- 9.4.6 In order to clarify the extent of the sub-surface archaeology across the remainder of the Site, it is proposed that further evaluation trenching should be carried out across the whole of the Site (see **Table 9.7**), including the three areas of highest relative archaeological potential in the north-east of the Site. Recent archaeological investigations within Leicestershire have identified that deposits of prehistoric origin are generally less magnetically responsive and therefore not easily identified through geophysical surveys alone. As a result, it is necessary to undertake further targeted trial trenching across those larger parts of the Proposed Development area which appeared as blank during the geophysical survey results. The details of such an evaluation need to be determined in consultation with the Historic & Natural Environment Team, Leicestershire County Council archaeologist (LCC Archaeology) and a Written Scheme of Investigation (WSI) has been prepared and submitted to LCC Archaeology. This work may be secured through a suitably worded planning condition. The results of the trial trenching would inform the scope of further mitigation required which may include an excavation or a watching brief ahead of or during construction.

Desk study

- 9.4.7 A summary of the organisations from which data has been obtained, together with the nature of that data is outlined in **Table 9.6**.

Table 9.6 Requested Data

Organisation	Data requested
Leicestershire and Rutland HER	HER data within 1 km radius from the Site. The datasets are presented in Appendix 9A .

Organisation	Data requested
Historic England	Registers of Designated Heritage Assets including scheduled monuments, listed buildings, registered parks and gardens and registered battlefields within 2 km of the Site. The datasets are presented in Appendix 9A .
Hinckley and Bosworth Borough Council	Conservation area data within 2 km of the Site.
Environment Agency	LiDAR information within the Site.
Various Sources	Previous archaeological work carried out as part of the Proposed Development (see Table 9.4 and Table 9.5). Historic Ordnance Survey mapping and aerial photography.

9.5 Overall baseline

Current baseline

Archaeological and historical background

Prehistoric

- 9.5.1 The HER documents three instances of prehistoric activity within the north-eastern extent of the Site in land north of Mill Lane (MonUID: MLE17049 and MLE17958) that relate to the remains recorded on the 2008 geophysical survey and tested during the 2010 evaluation trenching. Remains identified on the Site date to the Bronze Age and Iron Age.
- 9.5.2 In the south-western corner of the field north of Mill Lane, a feature identified as a rectilinear anomaly on the geophysical survey¹⁶ (Stratascan 2008) was later recorded as forming part of a ditched enclosure with associated pits, gullies and post-holes during trial trenching. Iron Age pottery recovered from the fill of the enclosure suggested that it dates from the third century BC to the first century AD and this is supported by further Iron Age material found in a pit. A gully identified in two of the trenches was suggested to represent an eaves-drip gully, indicating the possibility of settlement related activity¹⁸.
- 9.5.3 The majority of remains identified during the trial trenching in 2013¹⁹ were located in the north-eastern fields below Mill Lane. The evidence appears to represent a distinct area of activity relating to the Bronze Age and Early Iron Age periods. These later prehistoric remains in this part of the Site may be taken to be indicative of occupation in this area. The settlement activity may have extended towards the north-east and east, as supported by the excavation results from land to the north of Mill Lane¹⁸. There are a number of ditches and pits present, and the evaluation report suggests that they may be associated with settlement related activity. In addition, the evaluation identified a cremation surviving as a severely truncated urned burial, with only the lower portion remaining (Headland 2013, MonUID: MLE22071); ploughing had damaged the top of the vessel so that none of the rim survived. The HER notes a possible prehistoric trackway within the vicinity of this activity (MonUID: MLE20593). Other likely prehistoric remains are recorded across the Site comprising pits and postholes (MonUID: MLE20794, MLE22070). These may be best characterised as peripheral to, but possibly related to, the occupation to the north-east of the Site¹⁹.

- 9.5.4 The HER records a possible enclosure (MonUID: MLE20594) within the south-western portion of the Site. This area was tested during trial trenching in 2013¹⁹ and no evidence of an enclosure was identified.
- 9.5.5 Within the Study Area, outside the Site, there are concentrations of activity in the prehistoric period covering the Bronze and Iron Ages. The landscape around Earl Shilton is characterised by two distinct ridges, in the north and the south-west, which frame the modern settlement. The HER indicates that the ridges were the focus of later prehistoric activity. There is evidence of ritual or funerary monuments dating to the Bronze Age (MonUID: MLE9771) towards the eastern limit of the north ridge, with increasing evidence for settlement and land division during the Iron Age (MonUID: MLE16734). Adjacent to the Site, a programme of archaeological fieldwork was conducted prior to the construction of the A47. The evaluation identified a number of features in a discrete area adjacent to the field north of Mill Lane. The work identified two ring ditches, which were interpreted as the ploughed out remains of an Early Bronze Age barrow cemetery that was subsequently incorporated into an Iron Age and transitional Roman agricultural landscape²⁰.

Late Iron Age/Romano-British

- 9.5.6 There are only two features within the Site that potentially date to the Late Iron Age or Romano-British period. The first feature comprises a substantial ditch, identified across four trial trenches in the north-western quarter of the fields to the north of Mill Lane. The ditch formed alongside several adjacent, parallel and perpendicular gullies and ditches which were interpreted as being of Iron Age or Roman date and forming part of an agricultural field system¹⁸ (MonUID: MLE20592, MLE17958).
- 9.5.7 Within the Study Area, a suggested Roman site (MonUID: MLE9783) was identified at Huit Farm from the identification of Roman material, approximately 340m south-east of the Site boundary. The remaining records relating to the Roman period are findspots of pottery (MonUID: MLE10232, MLE7937, MLE15864) and a brooch (MonUID: MLE10232).

Early medieval, medieval and post-medieval

- 9.5.8 A circular crop-mark and geophysical anomaly was identified during the geophysical survey. The HER formally listed it as a possible Neolithic or Early Bronze Age henge or enclosure. This feature was tested during trial trenching and was interpreted as a possible a windmill mound dating to the medieval period¹⁸.
- 9.5.9 The geophysical survey to the south of Mill Lane showed evidence of ridge and furrow in most of the fields within the Site boundary¹⁷. However, a site walkover in March 2021 confirmed no extant earthworks of demonstrably medieval origin, indicating the degradation of the ridge and furrow, likely from the arable use of the land.
- 9.5.10 Within the Study Area, the HER indicates that a medieval settlement was located on the northern ridge and developed to form the Earl Shilton settlement core today. A second ridge extends from this and is marked by the medieval settlement core of Elmesthorpe (MonUID: MLE70). Between these two ridges is a lower lying area which was the focus, in the medieval and post-medieval periods, of agricultural land associated with Earl Shilton. This is supported by the recent geophysical survey results.

Modern

- 9.5.11 There are no records of significant archaeological material dating from the modern period within the Site. Four animal burials, a stone construction soak away and a concentration of modern ditches were identified in land to the south of Mill Lane¹⁹. During this period, the Site has predominantly

²⁰ ULAS. (2008). *Archaeological Fieldwork in advance of the Earl Shilton Bypass, Leicestershire: Site D, north of Mill Lane, Earl Shilton* (SP 479 979). ULAS Report 2008-110.

been used as agricultural arable land, with the addition of sports fields and a public park to the north-eastern extent of the Site.

Non-designated heritage assets summary

- 9.5.12 There are 129 HER monument records located within the 1 km Study Area, 11 of which are located within the Site boundary. These include a ring ditch (MLE20595), Neolithic/Bronze Age site (MLE20794), possible trackway (MLE20593), enclosures (MLE20594, MLE17049), a medieval windfarm (MLE9772), a Bronze Age/Iron Age site (MLE22071), a possible Roman Ditch (MLE20592), an Iron Age/Roman field system (MLE17958), a possible ditch (MLE20596) and a possible prehistoric pit (MLE22070).
- 9.5.13 The Leicestershire and Rutland HER (LHER) includes 76 records of previous archaeological investigations undertaken across the 1 km Study Area, 8 of which were investigated within the Site boundary. These investigations include desk-based assessments, fieldwalking, geophysical surveys and trial trenching.
- 9.5.14 Non-designated heritage records are illustrated on **Figure 9.1**.

Designated heritage assets summary

- 9.5.15 There are no designated heritage assets within the Site. There is a total of 17 designated heritage assets within 2 km of the Site boundary: two conservation areas, two scheduled monuments and 14 listed buildings. Designated heritage assets are presented on **Figure 9.2** and represented by their National Heritage List for England (NHLE) number.
- 9.5.16 The nearest conservation area to the Site is Earl Shilton Conservation Area, located approximately 580 m to the west. Barwell's Arthur Street Conservation Area lies at the western extent of the Study Area, approximately 1.9 km from the Site.
- 9.5.17 The scheduled Earl Shilton Motte and Bailey Castle (NHLE: 1010302) is located approximately 500 m north of the Site boundary. Elmsethorpe Church (NHLE: 1005076) is located approximately 770 m to the south-west. Due to intervening built development and topography, there is no inter-visibility between the scheduled monuments and the Site.
- 9.5.18 Of the 14 listed buildings, 13 are listed at Grade II and one at Grade II*. The II* listed building is the Church of St Simon and St Jude (List Entry 1074259). The listed buildings typically relate to post medieval houses, public houses, and associated features, such as garden walls and an icehouse. The nearest listed buildings are the Grade II listed 71 and 73 High Street (NHLE: 1180230 and 1295021 respectively) located approximately 300 m to the north. There is no inter-visibility between these listed buildings and the Site. The spire of the Church of St Simon and St Jude can be seen from the Site.

Heritage assets subject to potential direct effects

Archaeological heritage assets

- 9.5.19 The landscape around Earl Shilton is characterised by two distinct ridges, in the north and the south-west, that frame the modern settlement. The northern ridge forms the Earl Shilton settlement core today. The second ridge extends from this and is marked by the settlement core of Elmesthorpe (HER Ref. MLE70). Between these two ridges is a lower lying area where the Site is situated which was the focus, in the medieval and post-medieval periods, of agricultural land associated with Earl Shilton.

- 9.5.20 Archaeological fieldwork has indicated remains dating to the prehistoric period across the Site, with a concentration towards the north-east of the Site where the land rises towards a ridge. The prehistoric remains indicate agricultural activity on the edge of a settlement. Data provided by the HER supports the idea that the majority of land within the Site was located outside of the identified concentrations of later prehistoric settlement but rather the activity within the Site was linked to agricultural activity. Prehistoric settlement was instead focused on the ridges, and peripheral to the main settlement areas of Earl Shilton. Settlement also later became focused in both Earl Shilton and Elmesthorpe during the medieval period and predominantly Earl Shilton in the post-medieval period.
- 9.5.21 The areas of highest potential for the survival of archaeological remains within the Site can be summarised as follows (see **Figure 9.1**):
- the evaluation identified a potential Iron Age to Romano-British field system to the north of Mill Lane (**Figure 9.1, Area 1**). The field system comprised a substantial ditch with several adjacent, parallel and perpendicular gullies and ditches. These remains have archaeological interest from their ability to enhance the understanding of Iron Age to Romano-British field systems and agricultural practices. As a result, the remains are considered to be of low heritage significance for their archaeological value;
 - the geophysical survey identified an anomaly in the south-western corner of the field north of Mill Lane (**Figure 9.1, Area 2**). The subsequent evaluation confirmed the feature as an Iron Age enclosure, part of which appears to have been removed by modern development. The enclosure contributes to our understanding of Iron Age settlement activity and is therefore considered to hold low heritage significance based on its archaeological value;
 - the evaluation identified Bronze Age and Iron Age activity and burial evidence to the south of Mill Lane, including a Bronze Age cremation urn (**Figure 9.1, Area 3**). The prehistoric activity contributes to a limited understanding of the late Bronze Age to early Iron Age transition period, as well as burial practices during the Bronze Age. The significance of the urn relates to the barrow cemetery immediately to the east of the Site and the possibility of the existence of a wider Bronze Age burial landscape that could extend into the Site. As a result, the remains are considered to be of medium heritage significance for their archaeological value;
 - the geophysical survey identified a circular feature to the north-west of the Site. The evaluation confirmed the feature as the remains of a medieval windmill mound (**Figure 9.1, Area 4**). The remains are well preserved but are not of an unusual character. It provides an insight to medieval agricultural practices and is therefore considered to be of low heritage significance for its archaeological and historic value; and
 - the evaluation confirmed prehistoric remains to the south and west of the Site, comprising elements of a field system (**Figure 9.1, Area 5 and 6**). These areas are considered to be peripheral areas to the main settlement areas in the core of Earl Shilton focused on the northern ridge, as they comprise more fragmentary remains. Any remains provide a contribution to our understanding of field systems during the prehistoric period. As a result, they are considered to be of low heritage significance for their archaeological value.
- 9.5.22 Geophysical survey has also identified areas of ridge and furrow across the Site. The medieval agricultural remains are indicated by the evaluations to be fragmentary and lacking a coherent pattern. The site visit confirmed no evidence for visible earthworks.
- 9.5.23 There is also potential for further, previously unrecorded archaeological heritage assets to be present within the Site, within areas which have not been subject to evaluation trenching. Evaluations within Leicestershire have previously identified additional features which were not identified in preceding geophysical surveys, leading to the understanding that geophysical survey

alone cannot be used as a tool to determine the presence or absence of archaeological deposits, particularly those of prehistoric origin, which are generally less magnetically responsive. Given the significance of known heritage assets within the Site, it is anticipated that these could range from low to medium heritage significance.

Historic Landscape Characterisation

- 9.5.24 The Leicestershire, Leicester and Rutland Historic Landscape Characterisation (HLC) Project (2010) was carried out between 2006 and 2009 by John Robinson for Leicestershire County Council.
- 9.5.25 The character of the historic landscape on Site is of 'fields and enclosed land' as illustrated on **Figure 9.3**. The Fields and Enclosed Land Broad Type dominates the Leicestershire, Leicester and Rutland HLC; accounting for just below 77% of the total area characterised.
- 9.5.26 The majority of the north-eastern part of the Site is defined by piecemeal enclosure, whereas the remainder of the Site is defined by re-organised piecemeal enclosure. Piecemeal enclosure represents 7.5% of the landscape characterised as Fields and Enclosed Land, forming the fourth largest sub-type. Re-organised piecemeal enclosure is an HLC Type derived from Piecemeal Enclosure patterns that have undergone a process of significant field boundary loss or straightening of boundaries since the publication of the 1st edition 6" OS map. Re-organised piecemeal enclosure represents 23% of the 'fields and enclosed' land. The rationalisation of field boundaries is a process that was occurring from the mid-18th century and Reorganised Piecemeal Enclosure also includes groups of fields with a late post-medieval date. The HLC areas of both piecemeal and re-organised piecemeal enclosures are considered to hold low heritage significance.

Historic Hedgerows

- 9.5.27 There are several field boundaries marked by hedgerows throughout the Site that date to at least 1886, as shown on **Figure 9.3**. It has not been determined whether these boundaries were formed prior to 1850; it is, therefore, uncertain whether they would be considered "important" under the *Hedgerow Regulations 1997*. However, based on the HLC categories of piecemeal enclosure, it is considered likely that the hedgerows date to before 1886. The hedgerows are considered to hold low heritage significance.

Heritage assets subject to potential indirect effects

Barwell Arthur Street Conservation Area

- 9.5.28 The historic core of Barwell (Arthur Street) is designated as a conservation area for its **high** heritage significance due to a combination of historic and architectural interest²¹. Key characteristics of the conservation area include:
- built heritage representing the industrial landscape in the village as it existed at the highpoint of the boot and shoe industry;
 - retention of original 19th century features including cast iron windows, simple brick elevations, granite kerbstones with four set gutters, decorative entrance doors and raised loading docks;
 - short straight sectioned roads reinforcing industrial character of buildings; and
 - three distinct building types representing the framework knitting and shoe industry from different periods.

²¹ Hinckley and Bosworth Borough Council. (2010). *Barwell Conservation Area Appraisal*. (Online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/1492/appraisal_-_barwell (Accessed April 2021).

- 9.5.29 During the 1840s, the principal trade in Barwell was framework knitting in residential homes or small workshops. In the succeeding years, during the 1860s the Leicester boot and shoe manufacturers moved part of their production process to the area. However, it was not until the late 1880s that the process was centralised with new factories built within the village. The conservation area encompasses these former factory buildings, which were located along Arthur Street, King Street, George Street and Kirby Road.
- 9.5.30 Buildings on Kirby Road are set back behind a small garden bordered by brick walls. King Street and Arthur Street are narrow with factory buildings generally standing close to the road edge, channelling views within the streets. However due to the rising topography and curvature of the streets the interest of the buildings is still predominantly appreciated up close. Open views within the conservation area are limited, due to the built nature of the street front buildings. The only open space is located at a demolished building site in the courtyard area of George Street, King Street and Arthur Street (**Appendix 9B**, specifically **Graphic 9.1**). However, the modern office buildings within this area detract from appreciating the former industrial buildings in longer views. With the exception of this modern office at the intersection with King Street, the remaining buildings are either single or two stories in height, which is in keeping with the residential properties around the area that were built very close to or tight up to the back edge of its pavements, keeping with the grain of the area.
- 9.5.31 There are no listed buildings or scheduled monuments within the conservation area. There are several “unlisted buildings of local historic and architectural importance” that contribute to the special interests of the conservation area as a reminder of its industrial past. These include:
- Sperope Factory;
 - Hall and Geary Factory Offices;
 - H Grewcock Factory;
 - Konfidence Works (Hodgkin & Powers);
 - H Garner & Co;
 - George Ward Ltd;
 - Small Workshop;
 - Amos Moore and Co; and
 - Moulds & Moore.
- 9.5.32 Key views from outside the conservation area are considered to be from the western entrance to Arthur Street, looking into the conservation area (**Appendix 9B**, specifically **Graphic 9.2** and **9.3**). This view looks towards an Edwardian residential terrace that incorporates a Victorian shop front at the entrance to the conservation area. Key views within the conservation area include those looking north and south along King Street, looking south towards Moulds and Moore factory and north along the brick line street towards former workshops and factories retaining its industrial character.
- 9.5.33 Despite the expansion of the population of the village and newer modern buildings, the heritage of the boot and shoe industry still ensures a prevailing image of an industrial settlement. As a result, the retention of the former factories, their associated buildings and yards contribute to the preservation of the character of the conservation area.
- 9.5.34 The conservation area is surrounded by two-storey residential properties. To the west, buildings are generally Victorian or Edwardian terraces and beyond, to the east they are short terraces and semi-detached dwellings dating from the 1930s or 1950s.

- 9.5.35 The heritage interests of the conservation area are predominately appreciated from within its limits, due to the limited views from outside the conservation area. However, the residential properties outside the conservation area contrast with the character of the built form of the former factories contributing to the unique stylistic form of the buildings within the conservation area.

Earl Shilton Conservation Area

- 9.5.36 The historic core of Earl Shilton is designated as a conservation area for its high heritage significance due to a combination of historic, archaeological, and architectural interest²². Key characteristics of the conservation area include:
- unique street scene comprising a patchwork of building styles;
 - the quality and variety of the area's historic buildings representing the stocking knitting and boot and shoes industries in the late 19th century;
 - a traditional building line for all buildings directly fronting the pavement, with subtle variations in the building, eave and ridge lines; and
 - the retention of original features on the majority of dwellings including terracotta bricks, detailed brickwork, date stones, ridge and eave details, wooden window frames, natural stone windowsill and lintel details, boot scrapers, original chimney stacks, and arched garden passageways.
- 9.5.37 The conservation area encloses the former historic industrial core of the town and is now primarily residential in use. It is a small area of similar development, comprising red brick residential terraces, factories and workshops constructed due to the expansion of the boot and shoe industry in the late 19th century. The conservation area is focused on linear roads, where properties generally stand close to the road, opening directly onto the pavement, channelling views down the streets with no open views (**Appendix 9B**, specifically **Graphic 9.4**).
- 9.5.38 The conservation area is surrounded to the north, west and south by residential areas containing some industrial buildings, and to the east the commercial and retail core of Earl Shilton local centre.
- 9.5.39 There are no listed buildings or scheduled monuments within the conservation area. There are a number of "unlisted buildings of local historic and architectural importance" that contribute to the special interests of the conservation area as a reminder of its mixed industrial and residential past. These include:
- 1-5 New Street (formerly A Abbott Ltd);
 - The Caprice Building, 6 New Street (formerly R Loxley & Co); and
 - Chelsea Row, 9-17 Hinckley Road 6 Boot and Shoe Workshops.
- 9.5.40 Key views towards the conservation area are centred within or around the immediate vicinity of the boundary of the conservation area, from where the key characteristics of the conservation area can be discerned. The views focus primarily on the rows of residential terracing running north-east to south-west along Hinckley Road, and the terraces running north-westwards on New Street, including the former factor 1-5 New Street (**Appendix 9B**, specifically **Graphic 9.4**), as well as significant views towards converted boot and shoe factories on New Street (**Appendix 9B**, specifically **Graphic 9.5**) and behind Chelsea Row.

²² Hinckley and Bosworth Borough Council. (2010). *Earl Shilton Conservation Area Appraisal*. (Online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/1220/appraisal_-_earl_shilton (Accessed April 2021).

- 9.5.41 1-5 New Street was the former A Abbott Ltd factory, a three storey Victorian industrial premises that has recently been converted into 12 flats. The factory was built in 1880 as part of the boot and shoe industry. The converted building retains most of the original features including the red and blue brickwork detail, however modern replacement windows are unsympathetic to the original design. Due to the prominent height of the building, and its retained historic features, the former factory holds heritage significance which contributes to the conservation area as a significant local building.
- 9.5.42 6 New Street, or the Caprice Building, (formerly R Loxley & Co) is a three-storey former industrial premises that has been converted into flats. The factory was constructed in the late 19th century by R Loxley and Co, for manufacturing boots and shoes. Features remain in their original condition on many of the buildings, including iron cast windows, external red and blue brickwork detailing, slate roof tiles and timber roof trusses at third floor level. Its retained historic features contribute to the architectural interest of the former factory, which in turn contributes to the heritage significance of the conservation area.
- 9.5.43 Chelsea Row is a row of six cottages which were originally built for framework knitting in 1860. Although modernised, the cottages retain their long-arched window openings on the ground floor which is considered a unique design feature being placed on the ground floor. Within the communal passageway and yard are outworkers workshops that were formerly used for basket work for the boot and shoe industry, prior to the construction of the factories. The workshops retain original features including wooden sash windows, red brick chimneys, and in one a copper boiler. Chelsea Row's cottages retain historic interest as part of the pre-factory industrial work in town and architectural interests from their retained historic features.
- 9.5.44 The settings of the buildings within the conservation area contribute to heritage significance primarily by allowing the individual buildings to be seen in the context of the former industrial part of the town. This context helps to reinforce their historic and architectural interests. The setting of the conservation area itself being surrounded by later development is predominately appreciated from within its limits and on the outskirts of its boundary along Hinckley Road and New Street.

Earl Shilton Motte and Bailey (Scheduled Monument, NHLE: 1010302)

- 9.5.45 The scheduled monument of Earl Shilton motte and bailey castle is located within the northern edge of the town, west of the Church of St Simon and St Jude (Grade II* Listed, 1074259), and is of high heritage significance for its historic and archaeological interest. The castle was built by the Earl of Leicester during the late 11th century and was demolished in the late 12th century. The circular motte is approximately 50 m in diameter with a flat-top and a considerable slope to the north. The remains of an encircling ditch and part of the bailey can be seen on the south side although the original dimensions have been obscured by modern development on the western side. The retention of the extant mound contributes to both the historic and archaeological interests of the motte and bailey. The extent of the bailey enclosure is today likely reflected in the churchyard boundary. There is a fake stone gateway and wooden bridge erected on the south side of the motte which have been excluded from the scheduling (**Appendix 9B**, specifically **Graphic 9.6**).
- 9.5.46 The landscape has been designed to incorporate a pathway which closely spirals around the south and west side of the motte and subsequently leading on top of the motte to a bench with views of the trees and shrubbery that line the southern extent of the heritage asset. There is a sense of enclosure within the motte and bailey, particularly when looking to the south. However, its elevated position allows views towards the church of St Simon and St Jude to its east (**Appendix 9B**, specifically **Graphic 9.7**), and residential buildings to its north and west. Although these views are partially obscured by trees, the inclusion of the pathway to the top of mounds provides an additional area for its historic interests to be discerned and experienced; this particularly relates to the survival of its mound and therefore heightened topography in comparison with the

surrounding landscape in the Queen Elizabeth II Hall Field park. Despite the sense of enclosure when looking to the south, noise from dog walkers and children playing in the park to its south can be heard.

- 9.5.47 The setting of the castle has been altered by more recent development and is visually separated from the majority of the town from its bounded space within the northern section of the Queen Elizabeth II Hall Field park. Historic interest is derived from the relationship with the town and its associated buildings. Its proximal relation to the Church adds to its historic interest by demonstrating the importance of the historic location in the town. Its position allows the interests of the motte to be appreciated from the open space of the Queen Elizabeth II Hall Field park.
- 9.5.48 Archaeological interest is derived from surviving buried remains which contribute to our understanding of the castle's significance. These are likely to survive only within the interior of the castle. Modern development surrounding the castle is likely to have removed any other extensive remains.

Church of St Simon and St Jude (Grade II Building, NHLE: 1074259)*

- 9.5.49 The Church of St Simon and St Jude is located within the northern edge of the town, east of the scheduled Earl Shilton motte and bailey castle. It is a rebuilt parish church constructed in 1855-1856 by Slater and Carpenter. Although the origins of the former church are unknown, the west tower dating to the 15th century is still extant. The church is constructed of random rubble with freestone dressings, and a plain tile roof with stone coped verges. The church is situated within a churchyard enclosed by a mixture of a rubble stone wall, red brick wall and metal railing.
- 9.5.50 The church is set on raised ground in a central location bordered by Almonry Road, and Church Street on three sides, with the motte and bailey castle on its fourth side. These roads are lined by two-storey residential dwellings, forming a central square where the church is seen as the focal point. This higher position provides prominence to the church, particularly when approached from the east, along Church Road (**Appendix 9B**, specifically **Graphic 9.8**). Whilst forming a central focus point in its immediate environs, there is generally a sense of enclosure and separation from the rest of the town to the south. This is created by the mature trees to the west of church, as well as the fronts of residential properties lining Almonry and Church Road. Despite this sense of immediate enclosure, the church spire can be seen in longer views on the approach along Church Road, to the east, as well as in views from varying places within and outside Earl Shilton including within the Site (**Appendix 9B**, specifically **Graphic 9.9**).
- 9.5.51 The principal contribution of the setting of the church is to historic interest. Historic interest is drawn from the people who are buried within the churchyard and have been associated with the church's history and events that have taken place there. The visual relationship between the church and the town contributes to this interest, particularly the view of the church spire in longer views on the approach along Church Road, which would have formed the primary route of travel to the current and former parish church. Its proximal relation (**Appendix 9B**, specifically **Graphic 9.10**) to the motte and bailey castle adds to its historic interest by demonstrating the importance of the historic location in the town.
- 9.5.52 The architectural interest of the church is primarily experienced from within the churchyard and in close views from Church Road and Almonry Lane (**Appendix 9B**, specifically **Graphic 9.11**), where the church, on raised land, forms as a focal point.
- 9.5.53 Archaeological interest is derived from potential surviving buried remains relating to the former parish church, which would have dated to at least the 15th century. In turn, the location of the current church and former church contributes to the understanding of the town's development.

Elmesthorpe Church (Scheduled Monument, NHLE: 1005076) and Church of St Mary (Grade II Listed, NHLE: 1074693)

- 9.5.54 The Church of St Mary, formerly known as Elmesthorpe Church, is located on to the western side of Station Road in Elmesthorpe. The church was originally built in the 14th century but became ruinous by the 17th century. In 1868, the chancel was re-built with a new roof, though the nave was not restored and remains open to the sky. The church is designated as a Grade II listed building, however the original 14th century features including the ruined nave and west tower are scheduled.
- 9.5.55 The church is located within its own churchyard bordered by shrubbery on four sides (**Appendix 9B**, specifically **Graphic 9.13**). The Elmesthorpe Brewery Co, formerly Elmesthorpe Farm, is located north of the church. The primary approach to the church is along Station Road. Travelling east, the church is first seen in views along Station Road at its junction with Wilkinson Lane. The church cannot be seen along Station Road on the approach from the west until directly in front of the building.
- 9.5.56 The principal contribution of the setting of the church is to historic interest. Historic interest is drawn from the people who are buried within the churchyard and have been associated with the church's history and events that have taken place there. Architectural interests are experienced from within the churchyard where the architectural details can be discerned. Despite the expansion of the village along Bridle Path Road to the south, and although enclosed by low shrubbery on four sides, the church is afforded a sense of openness, with long views to the south that refer back to the medieval and post-medieval open common fields that formerly comprised part of the church's setting. Archaeological interest would be drawn from buried archaeological remains within the churchyard that contribute to the understanding of the church's origins and development and the people buried there.

Future baseline

- 9.5.57 There are no known committed development(s) or forecasted changes that would materially alter the baseline conditions during the construction, and operation phases of the Proposed Development. It is likely, however, that continuing intensive arable cultivation of the Site would result in the progressive disturbance of any archaeological remains that may be present.
- 9.5.58 In the absence of built development within the Site, it is likely, that the archaeological remains on the Site would remain in-situ. However, there would likely be a progressive disturbance to the remaining archaeology due to continuing intensive arable cultivation of the Site. As such there would be no change to the current baseline.
- 9.5.59 In the absence of development within the Site, the historic landscape characterisation and hedgerows within the Site are likely to continue to exist in a similar condition therefore retaining the legibility of their historic character. Therefore, there would be no change to the current baseline.

9.6 Consultation

- 9.6.1 **Table 9.7** provides a summary of the issues relating to the Proposed Development that have been raised by consultees and the responses given.

Table 9.7 Summary of consultee responses regarding Historic Environment

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
The assessment should include the effect on the historic landscape.	Historic England and Hinckley and Bosworth Borough Council (HBBC)	HLC data was obtained within a 2 km Study Area. The effects and impact on the historic landscape have been assessed.	Section 9.10
The assessment should include impact on both designated and non-designated heritage assets within a 2 km radius.	Historic England and HBBC	Up to date HER information was obtained from Leicestershire HER including event information within a 2 km Study Area of the Site. A study Area of 1 km was used to inform the archaeological potential on Site and data out to 2 km was assessed for indirect effects This data has been incorporated into the baseline and assessment of the chapter. The following designated heritage assets have been included as part of the assessment: Earl Shilton Conservation Area and associated locally important buildings, Barwell Arthur Street Conservation Area and associated locally important buildings, Earl Shilton Motte and Bailey (Scheduled Monument, NHLE: 1010302), Church of St Simon and St Jude (Grade II* Building, NHLE: 1074259), Elmesthorpe Church (Scheduled Monument, NHLE: 1005076) and Church of St Mary (Grade II Listed, NHLE: 1074693). All of the scoped designated heritage assets were visited on 9 March 2021 to assess their settings.	Section 9.10
The Applicant should provide a thorough and comprehensive update of the baseline archaeological information as part of any forthcoming assessment.	Leicester County Council (LCC) Archaeology	Up to date HER information was obtained from Leicestershire HER including event information within a 2 km Study Area of the Site. This data has been incorporated into the baseline of the chapter to inform assessment of the archaeological potential on Site.	Section 9.10
The Applicant should be required to undertake further targeted trial trenching across those larger parts of the Proposed Development area that were missed in the initial surveys, in order to complete the necessary evaluation.	LCC Archaeology	Consultation with LCC Archaeology has been carried out as part of the production of this assessment, including discussion on the scope for additional targeted trial trenching. Following this, a Written Scheme of Investigation (WSI) has been prepared and submitted to LCC Archaeology. To minimise the potential loss of crops, agreement from HBBC will be sought to undertake this in advance of commencement of development.	Section 9.12

9.7 Scope of the assessment

Spatial scope

- 9.7.1 The spatial scope of the assessment of Historic Environment covers the area of the Proposed Development with a 2 km Study Area. Within this spatial scope, a 1 km Study Area has been used to assess archaeological potential on Site and to identify likely direct effects (see **Figure 9.1**). Indirect effects to heritage assets have been assessed beyond 1 km (see **Figure 9.2**).

Temporal scope

- 9.7.2 The temporal scope of the assessment of Historic Environment is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction and operational periods (see **Chapter 3: Description of the Proposed Development**).

Potential receptors

- 9.7.3 The receptors taken forward for detailed assessment have been identified through desk-based assessment, field evaluation and consultation with the Principal Planning Archaeologist and Senior Archaeologist at LCC and the regional monuments inspector for Historic England.
- 9.7.4 The receptors that would potentially be affected by the Proposed Development comprise:
- sub-surface archaeological remains surviving within the Site;
 - historic landscape characterisation; and
 - identified scheduled monuments, listed buildings, and conservation areas and their associated listed and locally important buildings (see **Section 9.5** and **Table 9.3**).

Likely significant effects

- 9.7.5 The Historic Environment receptors that have been taken forward for assessment are summarised in **Table 9.8**.

Table 9.8 Historic Environment receptors scoped in for further assessment

Receptor	Relevant assessment criteria	Likely significant effects
Sub-surface archaeological remains	NPPF (2021) ² – Chapter 16	There is the potential for effects as a result of groundworks and other construction activities that are likely to completely or partially remove identified and as yet unknown heritage assets.
Earl Shilton Conservation Area and associated locally important buildings	NPPF (2021) ² – Chapter 16	There is the potential for effects as a result of construction activities and the built development that could impact the setting of the heritage assets.
Barwell Arthur Street Conservation Area and associated locally important buildings		
Earl Shilton Motte and Bailey (Scheduled Monument, NHLE: 1010302)		

Receptor	Relevant assessment criteria	Likely significant effects
Church of St Simon and St Jude (Grade II* Building, NHLE: 1074259) Elmesthorpe Church (Scheduled Monument, NHLE: 1005076) and Church of St Mary (Grade II Listed, NHLE: 1074693)		
Historic Landscape Characterisation	NPPF (2021) ² – Chapter 16	There is the potential for effects as a result of construction and operational activities that are likely to completely remove or change key characteristics of the historic landscape character.
Historic Hedgerows	NPPF (2021) ² – Chapter 16 <i>Hedgerow Regulations 1997</i>	There is the potential for effects as a result of groundworks and other construction activities that are likely to completely or partially remove identified historic hedgerows.

9.8 Environmental measures embedded into the development proposals

- 9.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 3.3**. Opportunities for embedded mitigation have been identified throughout the evolution of the design of and implementation strategy for the Proposed Development and the Environmental Impact Assessment (EIA) process, whereby potential significant adverse environmental effects have been fed back into the design process to verify whether they can be avoided or otherwise mitigated in accordance with the hierarchy. Alongside this, good best practice measures have been identified with reference to legislative requirements and measures of standard practice to manage commonly occurring effects. **Table 9.9** outlines how these and additional embedded measures would influence the historic environment assessment.

Table 9.9 Summary of the embedded environmental measures and how these influence the Historic Environment assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Church of St Simon and St Jude	Indirect effects to the significance of the heritage asset through change to its setting	Views will be retained of the Church of St Simon and St Jude Church spire from along Public Rights of Way (PRoW) along the east of (e.g. along Thurlaston Lane and Mill Lane), and within the Site. A number of the proposed retained and enhanced green corridors within the Site frame views of the spire and in the detailed design of Proposed Development along or near to these corridors, consideration should be given to avoiding encroaching on or blocking these views. . This is most notable along the western PRoW (T90) within the Site. Specifically, the retention of existing tree and shrub planting along the eastern and southern boundary of the Site and the introduction of additional tree planting will help to mask the built form as it matures in views of and from the asset. The greenery will influence the assessment of views towards the church spire from Thurlaston Road.
Historic Hedgerows	Direct effects to historic hedgerows and historic landscape character	Hedgerow loss has been kept to a minimum. All retained species-poor hedgerow is to be enhanced via their widening/thickening

Receptor	Changes and effects	Embedded measures and influence on assessment
	arising from the removal of historic hedgerows	and/or gapping up and through appropriate management. This will include incorporation of five metre buffer zones to either side of retained hedgerows. This measure will minimise the loss of historic hedgerows and reduce impacts to historic landscape character.
Sub-surface Archaeology	Direct effects to sub-surface archaeology following prior to its removal.	In line with paragraph 205 of the NPPF ¹ , the existing known archaeology within the Site will be mitigated through archaeological recording such as an excavation or watching brief. The exact method of archaeological recording would need to be agreed and would subsequently be secured through a planning condition.

9.9 Assessment methodology

- 9.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this Historic Environment assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Historic Environment assessment.

Determination of Significance

Predicting effects: Assessment of heritage significance

- 9.9.2 Heritage assets that may be affected by the Proposed Development have been assigned a level of sensitivity known as “heritage significance” in accordance with the NPPF².
- 9.9.3 The NPPF² requires change to the significance of heritage assets to be considered in developing an understanding of the potential effects of a Proposed Development.
- 9.9.4 The significance of a heritage asset is a product of the value which it holds to this and future generations as a result of its historic, archaeological, architectural or artistic interests, and these provide the basis for considering the significance of each heritage asset (including the contribution of its setting to those interests). These interests are set out in NPPF² (Annex 2, Page 71). These comprise:
- Archaeological – the ability of a heritage asset to hold information about the past which can be retrieved through specialist investigation;
 - Historical – which can be through association with past events or people, or where a heritage asset is illustrative of a particular asset type, theme, or period; and
 - Architectural/Artistic – values which derive from a contemporary appreciation of a heritage asset’s aesthetics.
- 9.9.5 The NPPF² notes that setting contributes to an asset’s significance. Setting is defined in both the NPPF² and by Historic England: as:

“...the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or

negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral.”²³

- 9.9.6 GPA 3 advises that the following aspects of setting should be considered in addition to any identified key attributes:
- The physical surroundings of the asset, including its relationship with other assets;
 - The way the asset is appreciated; and
 - The asset’s associations and patterns of use.
- 9.9.7 For the purposes of assessing the significance of effects within this assessment, heritage significance has been assigned to one of four classes, with reference to the heritage interests described above and relying on professional judgement as informed by policy and guidance. The hierarchy given in **Table 9.10** reflects the distinction between designated and non-designated heritage assets, and also distinguishes between designated assets of the highest heritage significance (i.e. scheduled monuments, protected wreck sites, battlefields, Grade I and II* listed buildings, Grade I and II* registered parks and gardens, and World Heritage Sites) and other designated heritage assets.
- 9.9.8 The assignment of assets into one of the four classes of heritage significance is based on professional judgement. There may be assets which are currently non-designated but may, as set out in the NPPF², be considered of ‘schedulable quality’, i.e. to hold equivalent significance to scheduled monuments. Locally significant sites may be considered of higher than ‘low’ significance, for example when they cover significant areas.
- 9.9.9 The classifications of heritage significance are set out in **Table 9.10**.

Table 9.10 Establishing the value/sensitivity of receptors

Heritage Significance	Summary Rationale	Example Asset Class
High	Asset has significance for an outstanding level of archaeological, architectural, historic and/or artistic interest.	All designated heritage assets or non-designated assets of demonstrably schedulable quality.
Medium	Asset has significance for a high level of archaeological, architectural, historic and/or artistic interest.	Locally listed buildings and buildings of merit.
Low	Asset has significance for elements of archaeological architectural, historic, or artistic interest.	Locally significant archaeological site.
Negligible	Due to its nature of form/condition/survival, cannot be considered as an asset in its own right.	Non-extant HER record.

²³ Historic England (2017) The Setting of Heritage Assets Historic Environment Good Practice Advice in Planning Note 3 (Second Edition). (Online). Available at: <https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/> (Accessed April 2021).

Magnitude of Change

- 9.9.10 The magnitude of change is based on the consequences of the Proposed Development on the heritage significance of a heritage asset. The magnitude of change is considered following the incorporation of environmental measures embedded within the design.
- 9.9.11 The magnitude of an impact is based on a number of factors:
- the duration of the impact (temporary, permanent, or reversible);
 - physical changes caused by the impact (both positive and negative);
 - the extent of the heritage asset that would be affected (e.g. the whole or a very small part);
 - whether they are likely to give rise to cumulative effects;
 - the nature of the heritage asset that would be affected; and
 - the overall impact of changes on the values and significance of the heritage asset (including its setting).
- 9.9.12 The magnitude of change arising through change in the setting of a heritage asset may depend on individual aspects of that setting, and assessments must be, by their nature, specific to the individual assets being considered.
- 9.9.13 The NPPF² further distinguishes between 'less than substantial harm' and 'substantial harm'. For the purposes of this assessment, any adverse change to a designated heritage asset would normally be considered to comprise less than substantial harm, while a high magnitude of change would approach or constitute substantial harm. Comments on the magnitude of any harm accruing to designated heritage assets or non-designated heritage assets of equivalent heritage significance are made in the narrative of the assessment.
- 9.9.14 Impacts can be adverse or beneficial. The criteria for assessing magnitude of change are set out in **Table 9.11**.

Table 9.11 Establishing the magnitude of change

Magnitude	Description (adverse)	Description (beneficial)
High	Loss of significance of an order of magnitude that would result from permanent and irreversible total or substantial demolition/disturbance of a heritage asset or from the disassociation of an asset from its setting. Impacts of this magnitude would generally be considered substantial harm to the heritage significance of an asset.	Sympathetic restoration of an at-risk or otherwise degraded heritage asset and/or its setting and bringing into sustainable use with robust long-term management secured.
Medium	Loss of significance arising from partial disturbance or inappropriate alteration of asset which will adversely affect its importance. Change to the key characteristics of an asset's setting, which gives rise to lasting harm to the significance of the asset, but which still allows its archaeological, architectural, or historic interest to be appreciated. Impacts of this magnitude would generally be considered less than substantial harm on the heritage significance of an asset.	Appropriate stabilisation and/or enhancement of a heritage asset and/or its setting that better reveal the significance of the asset or contribute to a long-term sustainable use or management regime.
Low	Minor loss to or alteration of an asset which leaves its current significance largely intact. Minor and/or short-term changes to setting which do not affect key characteristics and where historical context remains substantially intact.	Minor enhancements to a heritage asset and/or its setting that better reveal its significance or contribute to its sustainable use and management.

Magnitude	Description (adverse)	Description (beneficial)
Negligible	Impacts of this magnitude would generally be considered less than substantial harm on the heritage significance of an asset. Minor alteration of an asset which does not affect its significance in any discernible way. Minor and/or short term or reversible change to setting which does not affect the significance of the asset. Impacts of this magnitude would generally be considered of limited harm to heritage significance.	Minor alteration of an asset which does not affect its significance in any discernible way. Minor and/or short term or reversible change to setting which does not affect the significance of the asset.

Evaluation matrix

9.9.15 The classification of the effect of the Proposed Development is judged on the basis of the magnitude of change to the receptor sensitivity.

9.9.16 The classifications of effect are set out in **Table 9.12**.

Table 9.12 Level of effect

Receptor Sensitivity	Magnitude of Change			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

9.9.17 Following the classification of an effect, as presented in **Table 9.12**, a clear statement is made as to whether the effect is 'significant' or 'not significant'. As a general rule, major and moderate effects are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is also applied where appropriate.

All effects identified can either be classified as beneficial or adverse, the EIA must give appropriate weight to both types of effects.

9.10 Assessment of Historic Environment effects

Construction Phase Direct Impacts

Sub-surface archaeology

9.10.1 Intrusive groundworks would take place across the Site, including topsoil stripping and sub-soil disturbance during the construction of the foundations for new buildings, roadways, pathways, drainage, and utilities. Invasive works of this nature would adversely affect any surviving

sub-surface archaeological remains, reducing or removing their ability to be further interpreted. This would result in, at worst, a total loss of archaeological interest.

- 9.10.2 Based on the desk-based assessments and field evaluations undertaken on the Site along with a comparison investigation of adjacent sites, it may be assumed that any surviving sub-surface archaeological remains would be relatively shallow. There are specifically six areas of known sub-surface archaeology on site, all of which may be subject to direct effects during the construction phase (**Figure 9.1**):
- later prehistoric to Romano-British field system to the north of Mill Lane (Area 1);
 - part of an Iron Age enclosure north of Mill Lane (Area 2);
 - Bronze Age and Iron Age activity and burial evidence to the south of Mill Lane (Area 3);
 - medieval Mill Mound (Area 4); and
 - prehistoric remains to the south and west of the Site (Area 5 and 6).
- 9.10.3 There is also the potential of surviving remains elsewhere on the Site, including in areas not sampled by trial trenching to date. A better understanding of these areas will be achieved through a forthcoming programme of further trial trenching to be agreed with LLC.
- 9.10.4 Based on available information, the heritage significance of archaeological remains within the Site boundary is considered to be low to medium. The Proposed Development can be expected to result in the loss of the majority archaeological remains currently surviving within the Site. This would represent a medium to high magnitude of change to assets of low to medium heritage significance, resulting in a moderate to major adverse effect, which is considered to be significant. However, with appropriate mitigation measures agreed within a planning condition, as per paragraph 205 in the NPPF, the work would result in a minor adverse effect which would be considered not significant in EIA terms.
- 9.10.5 A summary of the results of the assessment on specific features of the Historic Environment is provided in **Table 9.13**.

Historic landscape character

- 9.10.6 The Proposed Development would result in the loss of some of the boundaries and entirely change the use of land within the Site. The Proposed Development has been designed to retain several of the boundaries which would be enhanced by new planting which would limit boundary loss. However, there are areas of the boundaries which would be removed for the construction of entrances or larger areas within the Site. Construction activity would introduce new visual and audible elements to an otherwise agricultural landscape.
- 9.10.7 The change resulting from the loss of character would result in a medium magnitude impact to an asset of low heritage significance. This would give rise to a minor adverse effect which would be not significant.

Historic Hedgerows

- 9.10.8 There are several hedgerows throughout the centre of the Site and to the northern boundary of the Site that date to at least 1886, although the categorisation as piecemeal enclosure in the HLC indicates the boundaries are likely to be older. Some of these boundaries will be removed for entrances and some of these boundaries will be left in situ and enhanced by new planting. Those retained, would partially preserve the legibility of historic landscape ensuing a low magnitude of change, on an asset of low heritage significance, resulting in an effect which is neither beneficial or adverse, and which is not significant.

Construction Phase Indirect Impacts

Indirect effects on the setting of heritage assets

- 9.10.9 The following heritage assets have been scoped into assessment at the request of Historic England and HBBC (see **Table 9.7**) as they may be subject to indirect effects resulting from the Proposed Development:
- Barwell Arthur Street Conservation Area and associated locally important buildings;
 - Earl Shilton Conservation Area and associated locally important buildings;
 - Earl Shilton Motte and Bailey (Scheduled Monument, NHLE: 1010302);
 - Church of St Simon and St Jude (Grade II* Building, NHLE: 1074259); and
 - Elmeſthorpe Church (Scheduled Monument, NHLE: 1005076) and Church of St Mary (Grade II Listed, NHLE: 1074693).
- 9.10.10 With the exception of the Church of St Simon and St Jude (Grade II* Building, NHLE: 1074259), initial desk-based assessment and a site visit has determined that there is unlikely to be any anticipated indirect effects to the setting of scoped in heritage assets during the construction phase. The Proposed Development is located away from the scoped in heritage assets, ensuring no visual, noise or dust impacts will arise. Construction traffic is very unlikely to pass through either Earl Shilton or Barwell conservation areas. As such, scoped in assets within these areas will not experience any impacts from increased vehicle movements during construction. In addition, openness which forms a key aspect to the setting of Elmeſthorpe Church is discerned and experienced from the south of the church. The Proposed Development is situated to the north-east of the church and will have no impact on this key view to the south. Overall, there will be no change to the key views and approaches that contribute to the heritage assets.
- 9.10.11 There would be no impact on the heritage significance of these assets during the construction phase and no effect would arise.

Church of St Simon and St Jude (Grade II, NHLE: 1074259)

- 9.10.12 The Church of St Simon and St Jude (Grade II* Listed, NHLE: 1074259) lies within the historic core of Earl Shilton. Surrounded by the later development of the town, there would be no visibility between the main body of the church or its churchyard and the Site. Construction activity would be visible from the church spire at a distance and across the existing residential buildings that separate the Site and the church. However, there is no visible vantage point where the Site can be seen from within the spire that is accessible, and the spire will have been built to be seen rather than as a vantage point for outward views. As a result, these views do not contribute to the significance of the church as the views cannot be experienced by anyone. The southern part of the Site would be most visible due to its rising topography; the northern part of the Site, currently comprising sports fields, would not be visible.
- 9.10.13 Construction activity north of Mill Lane will be visible in views of the church spire from the approach along Thurlaston Lane from the east. Construction activity will be seen in the foreground with residential buildings beyond and the spire visible above and at a distance. Due to the lower topography, views of the church spire cannot be seen from the A47 (Clicker's Way).
- 9.10.14 As the church is located 530 m north of the Site, there would be no impact from noise or dust during the construction phase.

- 9.10.15 Construction activity would not affect any key relationships between the church and any of the heritage assets within the conservation area or town. Whilst representing a change of use within the parish, the Proposed Development would not sever the relationship between the church and the parish.
- 9.10.16 Construction activity impacts would therefore be confined to views of the church spire from the eastern end of Thurlaston Lane.
- 9.10.17 The magnitude of change would be greatest during the later phases of construction, when at height working, vehicle movements and site lighting would be seen along with the nearly complete Proposed Development in these views. These construction phase impacts would be temporary and those relating to construction activity would be reversible. This would, at most, represent negligible magnitude of change to the historic interest of the church, affecting the sense of approach to the church. Architectural and archaeological interests of the church would be unaffected. A negligible magnitude of change to an asset of high heritage significance would result in a negligible adverse effect, which would not be significant.

Table 9.13 Summary of significance of effects during the construction phase

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
Later prehistoric to Romano-British field system to the north of Mill Lane. (Area 1)	Low	Medium	Minor (Not significant) With mitigation – Minor (Not significant)	The presence of surviving buried remains associated with a later Prehistoric to Romano-British field system in the north-east of the Site has been demonstrated through previous evaluation work. They have a low level of heritage significance for their archaeological interest which is likely to consist of stratified sub-surface archaeological remains and a limited range of dateable artefacts. The majority of the heritage asset is not included within the Site boundary. However, groundworks for houses, roads and paths shown on the Figure 3.2 have the potential to remove all sub-surface archaeological remains associated with these field systems within the Site boundary during the construction phase of the development but would leave the majority of the archaeology untouched as it is located outside the Site boundary; this would lead to a medium magnitude of change. This would represent at medium magnitude of change to an asset of low heritage significance, resulting in a minor adverse effect. With appropriate mitigation measures involving the excavation and recording of archaeological remains, agreed and secured through a planning condition, the effect is considered not significant in EIA terms.
Part of an Iron Age enclosure north of Mill Lane (Area 2)	Low	High	Moderate (Significant) With mitigation – Minor (Not significant)	Part of an Iron Age enclosure has been identified in the north-east of the Site through archaeological evaluation. They have a low level of heritage significance for their archaeological interest which has been demonstrated to consist in stratified sub-surface archaeological remains and a limited range of dateable artefacts. Groundworks associated with residential dwellings, paths and roads shown on Figure 3.2 have the potential to remove all sub-surface archaeological remains associated with the Iron Age enclosure during the construction phase of the development; this would lead to a high magnitude of change. This would represent at high magnitude of change to an asset of low heritage significance, resulting in a moderate adverse effect. With appropriate mitigation measures involving the excavation and recording of archaeological remains, agreed

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
				and secured through a planning condition, the effect is considered not significant in EIA terms.
Bronze Age and Iron Age activity and burial evidence to the south of Mill Lane (Area 3)	Medium	High	Major (Significant) With mitigation – Minor (Not significant)	There were remains dating to the Bronze Age and Iron Age and a human cremation identified in the north-east of the Site, south of Mill Lane. As shown on the Figure 3.2, groundworks associated with houses, paths and roads have the ability to remove all sub-surface archaeological remains associated within the Bronze Age and Iron Age activity during the construction phase of the development; this would lead to a high magnitude of change. This would represent at high magnitude of change to an asset of medium heritage significance, resulting in a major adverse effect. With appropriate mitigation measures involving the excavation and recording of archaeological remains, agreed and secured through a planning condition, the effect is considered not significant in EIA terms.
Medieval Mill Mound (Area 4)	Low	High	Moderate (Significant) With mitigation – Minor (Not significant)	Remains associated with a medieval mill mound are present within the north-east of the Site. They have a low level of heritage significance for their archaeological interest which has been demonstrated to consist in stratified sub-surface archaeological remains as well as associated dateable artefacts including predominantly ceramics. The Figure 3.2 identifies a new building at the location of the medieval mill mound. Groundworks associated with the construction of this building and its surrounding landscaping would have the potential to remove all sub-surface archaeological remains associated with this heritage asset. This would represent at high magnitude of change to an asset of low heritage significance, resulting in a moderate adverse effect. With appropriate mitigation measures involving the excavation and recording of archaeological remains, agreed and secured through a planning condition, the effect is considered not significant in EIA terms.
Prehistoric remains to the south and west of the Site (Area 5 & 6)	Low	High	Moderate (Significant)	Sub-surface archaeological remains of negligible to low heritage significance are known to survive within western and south-western area of the Site. Remains are considered to relate include elements of a field system peripheral to the main prehistoric core focused on the ridges in Earl Shilton.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
			With mitigation – Minor (Not significant)	Following Figure 3.2, groundworks associated with new roads, pathways buildings and a pond would remove all sub-surface archaeological remains associated with the field systems. This would represent at high magnitude of change to an asset of low heritage significance, resulting in a moderate adverse effect. With appropriate mitigation measures involving the excavation and recording of archaeological remains, agreed and secured through a planning condition, the effect is considered not significant in EIA terms.
Other sub-surface archaeological remains	Low to medium	High	Moderate to Major (Significant) With mitigation – Minor (Not significant)	Both stratified and un-stratified sub-surface archaeological remains of negligible to low heritage significance are known to survive within the Site boundary. It is assumed that intrusive groundwork associated with the construction of the Proposed Development would, at worst, remove all sub-surface archaeology that may be present within areas of intrusive groundworks in the Site; this would lead to a high magnitude of change. This would represent at high magnitude of change to an asset of low to medium heritage significance, resulting in a moderate to major adverse effect. With appropriate mitigation measures involving the excavation and recording of archaeological remains, agreed and secured through a planning condition, the effect is considered not significant in EIA terms.
Historic Landscape Characterisation	Low	Medium	Minor (Not significant)	The Proposed Development would result in the loss of some boundaries, and the retention of others following the embedded measures. The Proposed Development would entirely change the use of land within the Site boundary. Construction activity would introduce new visual and audible elements to an otherwise enclosed agricultural landscape. The change resulting from the loss of character would result in a medium magnitude impact to an asset of low heritage significance. This would give rise to a minor adverse effect which would be not significant.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
Historic Hedgerows	Low	Low	Neither beneficial nor adverse	There are several hedgerows throughout the centre of the Site and to the northern boundary of the Site that date to at least 1886. Some of these boundaries would be removed or partially removed. Many of these boundaries would be left in situ and enhanced by new planting. This would preserve the legibility of historic landscape ensuing a low magnitude of change to an asset of low heritage significance. This would result in neither a beneficial nor adverse effect.
Barwell Arthur Street Conservation Area and associated locally important buildings	High	None	None	The Barwell Arthur Street Conservation Area is located 1.9 km west of the Site. The conservation area is considered to hold high heritage significance as a result of its historic and architectural interests. The built form of the intervening areas of Earl Shilton and Barwell would ensure no visual, noise or dust impacts would arise. Construction would be situated away from the conservation area. As a result, the conservation area and its associated buildings as well as the key views along Arthur Street would not experience any impacts from increased vehicle movements during construction. There would be no impact on heritage significance during the construction phase and no significance of effect would arise.
Earl Shilton Conservation Area and associated locally important buildings	High	None	None	The Earl Shilton Conservation Area is located 580 m north-west of the Site, focused on Hinckley Road and New Street. The conservation area is considered to hold high heritage significance as a result of its historic and architectural interests. Key views in the conservation area are focused on the rows of residential terracing along Hinckley Road and New Street as well as significant views towards converted boot and shoe factories on New Street and behind Chelsea Row. The built form of the intervening areas of the Earl Shilton would ensure no visual, noise or dust impacts would arise towards these key views. Construction traffic would be situated away from the conservation area. As a result, the conservation area, its associated buildings and key views would not experience any impacts from increased vehicle movements during construction. There would be no impact on heritage significance during the construction phase and no significance of effect would arise.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
Earl Shilton Motte and Bailey (Scheduled Monument, NHLE: 1010302)	High	None	None	The Earl Shilton Motte and Bailey is located 485 m north of the Site. The scheduled monument is considered to hold high heritage significance as a result of its historic and archaeological interests. Earl Shilton Motte and Bailey is visually separated from the majority of the town from its bounded space within the northern section of the Queen Elizabeth II Hall Field park. The key aspects of its setting that contribute to its significance is derived from its proximal relationship to the Church of St Simon and St Jude as well as its position within the park where its interests can be discerned. Due to the built form of the intervening areas of Earl Shilton there would be no visual, noise or dust impacts that would arise to impact on these key aspects of its setting. In addition, construction traffic would be situated away from the scheduled monument. Therefore, the motte and bailey would not experience any impacts from increased vehicle movements during construction that could affect key views towards the asset. There would be no impact on heritage significance during the construction phase and no significance of effect would arise.
Church of St Simon and St Jude (Grade II* Building, NHLE: 1074259)	High	Negligible	Negligible (Not Significant)	The Church of St Simon and St Jude is located 530 m north of the Site. The listed building is considered to hold high heritage significance as a result of its historic, architectural and archaeological interests. Construction activity relating to the current field north of Mill Lane would be visible in views of the church spire from the approach along Thurlaston Lane from the east. Due to the lower topography, views of the church spire cannot be seen from the A47 (Clicker's Way). As the church is located away from the Site, there would be no impact from noise or dust during the construction phase. Construction activity would not affect any key relationships between the church and any of the heritage assets within the town, or its relationship with the parish. Construction phase impacts would be temporary and reversible. This would represent at most a negligible magnitude of change to the historic interest of the church, affecting the sense of approach to the church. Architectural and archaeological interests of the church would be unaffected. A negligible magnitude of change to an

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
Elmesthorpe Church (Scheduled Monument, NHLE: 1005076) and Church of St Mary (Grade II Listed, NHLE: 1074693)	High	None	None	asset of high heritage significance would result in a negligible adverse effect, which would not be significant.
				The Elmesthorpe Church and the Church of St Mary is located 760 m south-west of the Site. The scheduled monument and listed building are considered to hold high heritage significance because of its historic, architectural and archaeological interests.
				The varying topography of the landscape and the separation from the Proposed Development would ensure no visual, noise or dust impacts would arise. Construction traffic is likely to be confined to the A47, north of the church, and is therefore situated away from the scheduled monument and listed building. As a result, the church would not experience any impacts from increased vehicle movements along this road during construction. In addition, the church experiences a sense of openness to its south that forms a key aspect of its setting and allows its interests to be discerned. The Proposed Development and its associated construction work will be situated to the north-east of the church and would therefore have no effect on this key view to the south. There would be no impact on heritage significance during the construction phase and no significant effect would arise.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 9.9** and is defined as negligible, low medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 9.9** and is defined as none, negligible, low medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 9.9**.

Operational Phase Direct Impacts

Sub-surface archaeology

- 9.10.18 The construction phase of the Proposed Development will have removed any sub-surface archaeological remains across the Site. As a result, there would be no additional effects in the operational phase.

Historic landscape character

- 9.10.19 No additional adverse effects are anticipated in the operational phase, as removal of boundaries and change of land use would have occurred during the construction phase.
- 9.10.20 The Proposed Development has been designed to include pathways that follow the routes of three current PRow through the Site, with only slight diversions. These have been established since at least 1886, as shown on the Ordnance Survey Map (Leicestershire XXXVI.SW 1886). The retention of these routeways will preserve one aspect of historic landscape character and its wider legibility. This would result in no adverse, but also no beneficial, effect.

Historic Hedgerows

- 9.10.21 Through the strengthening of some of the historic hedgerows throughout the centre and at the north of the Site, a minor beneficial effect is anticipated. This would increase over time as the planted vegetation matures and increases the legibility of the historic boundaries and the piecemeal enclosures they demarcate. This would represent a minor beneficial effect, which would be not significant.

Operational Phase Indirect Impacts

Indirect effects on the setting of heritage assets

- 9.10.22 There would be no impact to the majority of the identified heritage assets and as such the significance of effects on the setting of the majority of the heritage assets is summarised in **Table 9.14**. A detailed description on the effects on the Church of St Simon and St Jude is outlined in paragraphs 9.10.70 to 9.10.74.

The Church of St Simon and St Jude (Grade II Listed, NHLE: 1074259)*

- 9.10.23 The Church of St Simon and St Jude (Grade II* Listed, NHLE: 1074259) lies within the historic core of Earl Shilton. Surrounded by the later development of the town, there would be no visibility between the main body of the church or its churchyard and the Site. The Site would be visible from the church spire, at a distance and across the existing residential buildings that separate the Site and the church. Despite this, there would be no actual viewpoint from the spire that can see the Site and therefore nobody would be able to perceive the change to setting.
- 9.10.24 As during the construction phase, views which will include both the church spire and the Site would exist from Thurlaston Lane, when approached from the east, until the views of the church spire are obscured by trees once past the Site in the adjacent field. As a result, by the time Thurlaston Lane turns into Church Road, one of the primary approaches to the church, the Site would no longer be visible in views towards the church. The Proposed Development would be seen in the foreground of existing residential buildings with the spire at a distance in the background. Mitigation has been designed into the Proposed Development, in the form of additional tree and shrub planting along

the southern boundary, which would soften the appearance of the built form. The proposed buildings would fit into the residential character that is already established in the views on the approach along Thurlaston Lane. In addition, the introduction of buildings into this approach would not block views towards the church, and the prominence of the tower visible above the houses would be retained.

- 9.10.25 The Site has been designed to retain views of the St Simon and St Jude Church spire from within the Site boundary. In particular, a number of the proposed retained and enhanced green corridors frame views of the spire and the detailed design of the Proposed Development along or near to these corridors will give consideration to avoiding encroaching on or blocking these views. . In addition, the rising topography to the south of the Site would also help to maintain these views of the spire from within the Site (**Appendix 9B**, specifically **Graphic 9.13 to 9.15**). As a result, a visual relationship between the residents of the Proposed Development and the parish church would be maintained.
- 9.10.26 Impact from noise is considered to only affect noise sensitive receptors in residential areas close to the Proposed Development (see **Chapter 11: Noise and Vibration**). Therefore, there would be no impact from noise during the operation of the Site.
- 9.10.27 The presence of the Proposed Development during the operation phase would result in, at most, a negligible magnitude of change to the historic interest of the church by changing the view on the initial approach to the town but by not significantly impacting on the significance of the church, due to the existing modern residential development that separates the Site from the church. The architectural and archaeological interests of the church, which are confined to the immediate environs surrounding the church would be unaffected. A negligible magnitude of change to an asset of high heritage significance would result in a negligible adverse effect.

Table 9.14 Summary of significance of effects during the operational phase

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
Sub-surface archaeological remains	Low to medium	None	None	The construction phase of the Proposed Development will have removed any sub-surface archaeological remains across the Site. As a result, there would be no additional effects in the operational phase.
Historic Landscape Characterisation	Low	None	None	All effects due to changes to the historic character would have occurred during the construction phase of the Proposed Development.
Historic Hedgerows	Low	Low	Minor	Through the strengthening of some of the historic hedgerows throughout the centre and at the north of the Site, a minor beneficial effect is anticipated. This would increase over time as the planted vegetation matures and increases the legibility of this historic boundary. This would represent a not significant beneficial effect.
Barwell Arthur Street Conservation Area and associated locally important buildings	High	None	None	The Barwell Arthur Street Conservation Area is approximately 1.9 km away from the Proposed Development. More recent development to the south-east of Earl Shilton precludes any visibility or audibility of the Proposed Development. The Proposed Development would not affect any key relationships or characteristics identified as important contributors to either the conservation area's or its locally important buildings' heritage significance. Consequently, the assets would not be affected. There would be no impact on heritage significance during the operation phase and no effect would arise.
Earl Shilton Conservation Area and associated locally important buildings	High	None	None	The Earl Shilton Conservation Area is situated to the north-west part of Earl Shilton, away from the Proposed Development. Key views in the conservation area are focused on the rows of residential terracing along Hinckley Road and New Street as well as significant views towards converted boot and shoe factories on New Street and behind Chelsea Row. The buildings within and surrounding the conservation area precludes visibility of the Proposed Development in views of or from the conservation area. In addition, the intervening more recent development would prevent any audibility of operation activity. As a result, the Proposed Development would not affect any key relationships between the conservation area and its constituent parts or the key views that contribute to its significance. Consequently, the asset would not be affected in any way.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
				There would be no impact on heritage significance during the operation phase and no effect would arise.
Earl Shilton Motte and Bailey (Scheduled Monument, NHLE: 1010302)	High	None	None	The Motte and Bailey castle is located in the northern part of Earl Shilton, adjacent to the Church of St Simon and St Jude, north of Queen Elizabeth II Hall Field. More recent development to the south precludes any visibility or audibility of the Proposed Development. The Proposed Development would not affect any key relationships between the castle or features that contribute to their heritage significance, including the Church of St Simon and St Jude. The Proposed Development would have no impact on the key relationships with the assets setting including with the park where its interests are discerned. Consequently, the asset would not be affected. There would be no impact on heritage significance during the operation phase and no effect would arise.
Church of St Simon and St Jude (Grade II* Building, NHLE: 1074259)	High	Negligible	Negligible	The church is located in the northern part of Earl Shilton, adjacent to the Earl Shilton Motte and Bailey. More recent development to the south of the church separates the Proposed Development from the main body of the church and where its key historic and architectural interests are discerned. As a result, the Proposed Development would not affect any key relationships between the church, its churchyard or features that contribute to their heritage. The presence of the Site during the operation phase would result in, at worst, a negligible magnitude of change to the historic interest of the church by affecting the sense of the initial approach to the town. This approach has already been changed by the existing modern residential development that separates the Site from the church and therefore the Site would fit into the character of this approach. The architectural and archaeological interests of the church would be unaffected. A negligible magnitude of change to an asset of high heritage significance would result in a negligible adverse effect.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance of effect ³	Summary rationale
Elmesthorpe Church (Scheduled Monument, NHLE: 1005076) and Church of St Mary (Grade II Listed, NHLE: 1074693)	High	None	None	The Elmesthorpe Church and the Church of St Mary is located 760m south-west of the Site along Station Road in Elmesthorpe. Key aspects that contribute to the significance of the church include the sense of openness to the south of the heritage asset. The Proposed Development is located north-east of the Church and therefore would not impact on the key aspects this sense of openness contributes to the significance of the church. In addition, the Proposed Development would not affect any other key relationships between the church, its churchyard or features that contribute to their heritage significance. Consequently, the asset would not be affected. There would be no impact on heritage significance during the operation phase and no effect would arise.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 9.9** and is defined as negligible, low medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 9.9** and is defined as none, negligible, low medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 9.9**.

9.11 Cumulative effects

- 9.11.1 Cumulative effects of the Proposed Development can occur as a result of interrelationships between different environmental topics, which are referred to as 'intra-project effects'. For Historic Environment, interrelationships are identified with **Chapter 10: Landscape** and **Chapter 11: Noise and Vibration**. However, these interrelationships do not result in a cumulative effect for the Historic Environment impact assessment.

9.12 Consideration of optional additional mitigation or compensation

- 9.12.1 No additional mitigation measures are proposed to further reduce the Historic Environment effects that are identified. This is because all relevant and implementable measures have been embedded into the development proposals and are assessed above in this chapter. These measures are considered to be likely to be effective and deliverable and address the likely significant effects of the Proposed Development.

9.13 Conclusions of significance evaluation

- 9.13.1 Intrusive groundwork associated with the construction of the Proposed Development may, at worst, remove all sub-surface archaeology within areas of intrusive groundworks in the Site. The archaeology within the Site is anticipated to be of low to medium heritage significance and the potential loss of sub-surface archaeological remains would lead to a high magnitude of change, resulting in a moderate to major adverse effect, without mitigation.
- 9.13.2 Following the implementation of mitigation to be agreed with the archaeologist for LCC and secured via planning condition(s), no significant effects to archaeological remains would be anticipated. Minor adverse effects would still be anticipated where archaeological remains are to be removed through a programme of archaeological mitigation. This is due to preservation by record being less favourable than preservation in-situ.
- 9.13.3 The Proposed Development would result in the loss of HLC within the Site during the construction phase through change of land use and removal of some boundaries. This is anticipated to be a minor adverse effect which would not be significant.
- 9.13.4 The Site comprises hedgerows and field boundaries that date to at least 1886. There is insufficient cartographic data to confirm whether the boundaries are pre-1850 and, therefore, whether they would be considered important under the *Hedgerows Regulations 1997*. However, these hedgerows do still contribute to historic legibility of the landscape. Many of these boundaries will be left in situ and enhanced by new planting. This would preserve some legibility of historic landscape character, resulting in, at worst, a low magnitude of change, on an asset of low heritage significance, resulting in a neither a beneficial or adverse effect.
- 9.13.5 Effects to heritage assets off-site are confined to the Church of St Simon and St Jude. There are no effects expected to arise to any other scoped in heritage assets within the Study Area.
- 9.13.6 The Site will be seen in views towards the spire of the Church of St Simon and St Jude along Thurlaston Road. The presence of the Site during the construction and operation phase would result in, at most, a negligible magnitude of change to the historic interest of the church by changing the view on the initial approach to the town, along which the church is a prominent feature. However, this would not represent more than a negligible magnitude of change to the setting of the church, due to the existing modern residential development that separates the Site from the church. The residential buildings would not impact from where its key historic and

architectural interests are discerned in its immediate environs and churchyard. In addition, key relationships between the church, its churchyard and the people who experience its interests would be unaffected by the development of residential buildings. A negligible magnitude of change to an asset of high heritage significance would result in a negligible adverse effect which would not be significant.

9.14 Implementation of environmental measures

9.14.1 **Table 9.15** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented, i.e. they will have been secured through a Planning Condition.

Table 9.15 Summary of environmental measures to be implemented – relating to Historic Environment

Environmental measure	Responsibility for implementation	Compliance mechanism	ES Section reference
To retain reviews of the St Simon and St Jude Church Spire from visual receptors along PRowS located east of, and within the Site, the location of public open space (without built form) and positioning of roads and infrastructure have retained and framed views of the Church from where the spire is visible. This is most notably along the western PRow within the Site and the PRow adjacent to the eastern boundary of the Site.	Developer	Reflected in illustrative development masterplan, with final layout to be the subject of future reserved matters applications	Section 9.8
Hedgerow loss kept to a minimum. All retained species-poor hedgerow to be enhanced via their widening/thickening and/or gapping up and through appropriate management. 5 m of adjacent habitat either side of hedgerow to be retained.	Developer/Landscape contractor on behalf of the developer	Planning Condition	Section 9.8
The retention of existing tree and shrub planting along the eastern and southern boundary of the site and the introduction of additional tree planting to reduce views for visual receptors of built form as it matures. Implementation of structural tree planting to the northern edges of the Site (to the south of Astley Road/Meadow Court Road and Montgomery Road) to filter and soften views of built form	Developer/Landscape contractor on behalf of the developer	Planning Condition	Section 9.8

10. Landscape & Visual

10.1 Introduction

- 10.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to landscape and visual impact. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development** and with respect to relevant parts of **Chapter 7: Biodiversity** in relation to landscape elements within the Site such as hedgerows, grassland and trees.

10.2 Limitations of this assessment

- 10.2.1 Limitations of the Landscape and Visual Impact Assessment (LVIA) are as follows:
- Whilst photography has been undertaken when vegetation was still in leaf, the assessment has duly considered seasonal changes and a worse-case winter scenario when vegetative screening is minimal to accord with the *Guidelines for Landscape and Visual Impact Assessment, Third Edition*¹ (hereafter referred to as 'GLVIA3').

10.3 Relevant legislation, planning policy, technical guidance

Legislative context

- 10.3.1 The following legislation is relevant to the assessment of the effects on landscape and visual receptors:
- *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, Statutory Instrument No. 571*²;
 - Hedgerows are protected in England and Wales under the *Hedgerow Regulations 1997*³; and
 - *The European Landscape Convention 2000 Treaty Series No. 36*⁴. The European Landscape Convention (ELC) is a Council of Europe initiative that provides a broad framework for landscape planning and management across all member states including the UK, which ratified the ELC in 2007. The status of this convention is not affected by Brexit. The ELC defines landscape as, "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" and is committed to several core principles and actions. These commitments are implemented by existing domestic policy and legislation (as set out in **Table 10.1**) rather than through any ELC-specific framework

¹ Landscape Institute and the Institute of Environmental Management and Assessment, (2013). *Guidelines for Landscape and Visual Impact Assessment. 3rd edition*. London. Routledge.

² UK Government (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (online). Available at: <http://www.legislation.gov.uk/uksi/2017/571/contents/made> (Accessed 13 January 2020).

³ UK Government (1997). Statutory Instrument 1997 No. 1160 *The Hedgerows Regulations 1997*. (online). Available at: <http://www.legislation.gov.uk/uksi/1997/1160/made> (Accessed December 2021).

⁴ Council of Europe. (2000). *European Landscape Convention*. (online). Available at: <https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=09000016802f80c6> (Accessed December 2021).

Planning policy context

10.3.2 A summary of the relevant planning policies is given in **Table 10.1**.

Table 10.1 Planning policy issues relevant to landscape and visual effects

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF)⁵	Paragraph 130 requires that planning policies and decisions should ensure that developments (amongst other criteria): <i>"(b) are visually attractive as a result of good architecture, layout and appropriate and effective landscaping;</i> <i>(c) are sympathetic to local character and history, including the surrounding built environment and landscape setting"</i> Paragraph 170 states that planning policies and decisions should contribute to and enhance the natural and local environment by (amongst other criteria) <i>"a) protecting and enhancing valued landscapes... (in a manner commensurate with their statutory status or identified quality in the development plan); and</i> <i>b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;"</i>	Sections 10.10 and 10.11
Development plan policies		
Hinckley and Bosworth Borough Council (HBBC) Core Strategy Development Plan Documents (DPD)⁶	Land has been allocated under Policy 2 for the development of a mixed use Sustainable Urban Extension (SUE) to the south of Earl Shilton. The policy states that the detailed requirements for the SUE including boundaries, facilities to be provided, layout and design, will be set out in an Area Action Plan (AAP). The policy also sets out a number of requirements to ensure that development respects the character of Earl Shilton and builds on its sense of place.	Section 10.10
Site Allocations and Development Management (DM) Policies DPD⁷	Policy DM10 states that developments will be permitted providing that a number of requirements are met. Those most pertinent to this landscape and visual assessment are as follows: <i>"a) It would not have a significant adverse effect on the privacy and amenity of nearby residents and occupiers of adjacent buildings, including matters of lighting, air quality (including odour), noise, vibration and visual intrusion;</i> <i>b) The amenity of occupiers of the proposed development would not be adversely affected by activities in the vicinity of the site;</i> <i>c) It complements or enhances the character of the surrounding area with regard to scale, layout, density, mass, design, materials and architectural features;</i>	Sections 10.8, 10.10 and 10.11

⁵ Ministry of Housing, Communities & Local Government. (2021). *National Planning Policy Framework*. (online). Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf (Accessed December 2021).

⁶ Hinckley and Bosworth Borough Council (2009). *Core Strategy* (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (Accessed 29 July 2020).

⁷ Hinckley and Bosworth Borough Council. (2006). *Site Allocations and Development Management Policies DPD*. (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/download/1218/site_allocations_and_development_management_policies_dpd_-_adoption_july_2016 (Accessed December 2021).

Policy reference	Policy issue	Considered in Section
	<i>d) The use and application of building materials respects the materials of existing, adjoining/neighbouring buildings and the local area generally;</i> <i>e) It incorporates a high standard of landscaping where this would add to the quality of the design and siting"</i>	
Earl Shilton and Barwell AAP⁸ Policy 6: Earl Shilton Urban Extension	Policy 6 requires proposals to have regard to the design principles set out in the Urban Design Guidance. The SUE Design Guidance is contained within Appendix 2 of the Plan and includes sections relating to retaining existing landscape features, street trees and establishing character and identity. Policy 22 requires developments to meet a number of requirements. This includes that the development does not adversely affect the privacy and amenity of nearby residents and occupiers of adjacent buildings, including matters of visual intrusion. Other requirements which are pertinent to landscape and visual effects are as follows: <i>"b) There is no detriment to the character or appearance of the host building or the surrounding area;</i> <i>c) The siting and density respect the character and layout of the area;</i> <i>d) It respects the local distinctiveness of existing buildings and landscape settings;</i> <i>e) The design respects the scale, proportions and height of the existing building, neighbouring structures and overall street scene;</i> <i>f) Fenestrations are well proportioned, well balanced within the elevations and sympathetic to adjoining/neighbouring buildings;</i> <i>g) The use and application of building materials respects the materials of existing, adjoining/neighbouring buildings and the local area generally; and</i> <i>h) It incorporates a high standard of landscaping where this would add to the quality of the design and siting."</i>	Sections 10.8 and 10.10

Technical guidance

10.3.3 A summary of technical guidance relevant to the LVIA is given in **Table 10.2**.

Table 10.2 Technical guidance relevant to the landscape and visual assessment

Technical guidance	Relevance to this assessment
GLVIA3¹	The third edition of this guidance which is produced by the Landscape Institute and Institute of Environmental Assessment is widely regarded by landscape and planning professions as the 'industry standard' together with best practice and professional experience.

⁸ Hinckley and Bosworth Borough Council. (2006). *Earl Shilton and Barwell Area Action Plan*. (online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/4332/earl-shilton-and-barwell-area-action-plan-adopted> (Accessed December 2021).

Technical guidance	Relevance to this assessment
Technical Guidance Note 06/19 Visual Representation of Development Proposals⁹	Provides supplementary guidance to GLVIA3 ¹ as to appropriate techniques to capture site photography and the selection, production and presentation of types of visualisation appropriate to the circumstances in which they will be used.
Technical Guidance Note 02/21 Assessing landscape value outside national designations¹⁰	Provides information and guidance to landscape professionals and others who need to make judgments about the value of a landscape (outside national landscape designations) in the context of the UK Town and Country Planning system.

10.4 Data gathering methodology

Study area

- 10.4.1 Taking into account the location, nature and scale of the Proposed Development, the Study Area has been defined as a 1 km offset extending from the boundary of the Site. This places the Proposed Development within a local context, concentrating the assessment upon the potential landscape and visual receptors which are most likely to sustain higher magnitudes of change in accordance with the principle of proportionality set out in paragraph 3.16 of GLVIA3¹ that states;

"The level of detail provided should be that which is reasonably required to assess the likely significant effects. It should be appropriate and proportional to the scale and type of development and the type and significance of the landscape and visual effects likely to occur."

- 10.4.2 The Study Area is illustrated in **Figure 10.1**.

Desk study

- 10.4.3 Sources of information used for the LVIA are listed in **Table 10.3**.

Table 10.3 Sources of desk study information

Source	Data
OS mapping	Ordnance Survey 1:25,000 scale mapping (OS Explorer Map 233 Leicester and Hinckley) ¹¹
Google Earth Pro	Aerial photography (imagery date February 2018) and Street View
HBBC	<i>Hinckley and Bosworth Borough Landscape Character Assessment</i> ¹²
Blaby District Council	<i>Blaby Landscape and Settlement Character Assessment</i> ¹³
Natural England	<i>NCA Profile: 94 The Leicestershire Vales</i> ¹⁴

⁹ Landscape Institute. (2019). *Technical Guidance Note 06/19 Visual Representation of Development Proposals*. (online). Available at: <https://www.landscapeinstitute.org/visualisation/>

¹⁰ Landscape Institute (2021). *Technical Guidance Note 02/21 Assessing landscape value outside national designations*. (online). Available at: <https://www.landscapeinstitute.org/news/new-guidance-assessing-landscape-value-outside-national-designations/>

¹¹ Ordnance Survey (2015). Explorer Map 233 Leicester and Hinckley. (Accessed 29 July 2020).

¹² LUC. (2017). *Hinckley and Bosworth Borough Landscape Character Assessment*. (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/download/308/landscape_character_assessment (Accessed 29 July 2020).

¹³ LUC for Blaby District Council. (2020). *Blaby Landscape and Settlement Character Assessment*. (online). Available at: <https://www.blaby.gov.uk/media/3804/blaby-landscape-and-settlement-character-assessment-accessible-version-lr.pdf>

¹⁴ Natural England (2014). *NCA Profile 94 Leicestershire Vales*. (online). Available at: <http://publications.naturalengland.org.uk/publication/4900422342934528> (Accessed 29 July 2020).

Source	Data
FPCR	Land east of Earl Shilton Tree Survey ¹⁵
Leicestershire County Council	Public Rights of Way (PRoW) ¹⁶
Campaign to Protect Rural England (CPRE)	Light pollution and dark skies mapping ¹⁷

Zone of Theoretical Visibility

- 10.4.4 A Zone of Theoretical Visibility (ZTV) has been generated to inform the LVIA. ZTV is defined in GLVIA3¹ as “a map, usually digitally produced, showing areas of land within which a development is theoretically visible” and represents the desk top component of the visibility analysis.
- 10.4.5 The ZTV has been calculated using software that has been developed for use in respect of wind farms together with a Digital Terrain Model (DTM) (OS Terrain 5), which illustrates the topographic constraints on the visual influence of the Proposed Development. Given the presence of a high proportion of built form concentrated within Earl Shilton to the north and west of the Site, the DTM data has been amended to include the limited areas of woodland within the Study Area and built form as depicted in OS VectorMap District to allow their screening effect to be incorporated in the ZTV calculation. A height of 12 m has been used for the woodland exclusion zones (with the exception of the vegetation along the A47 corridor which has been modelled at a conservative height of 3 m) with a height of 8 m used for existing buildings. This ZTV is shown in **Figure 10.1**.
- 10.4.6 Parameters used in the modelling of the ZTV are as follows:
- Residential development across the Site has been modelled at a maximum height of 12 m Above Ground Level (AGL) with the exception of an area of development towards the centre of the Site. Development within this central area, which includes a proportion of residential development, the primary school and community hub, has been modelled at a height of 15 m AGL in accordance with the maximum parameters set out in **Chapter 3: Description of the Proposed Development**; and
 - Buildings within the Employment Land have been modelled at a height of 17 m AGL to represent the maximum height parameter within this area.

Survey work

- 10.4.7 Field survey work was undertaken in October 2021 by a Wood landscape consultant to look more closely at landscape features that had been identified from desk-based sources and to further understand the nature of existing and potential views of the Proposed Development and the screening/filtering role which is played by existing vegetation, built-form and localised variation in topography. The survey work involved accessing the Site via the existing PRoW network and the wider Study Area via local roads and highway footpaths.
- 10.4.8 As part of the survey work, viewpoint photography was undertaken at 21 locations representing the views of potential visual receptors. All photography has been undertaken in accordance with the Landscape Institute's *Visual Representation of Development Proposals*⁹ and has been taken using:

¹⁵ FPCR. (2021). Land East of Earl Shilton Tree Survey.

¹⁶ Leicestershire County Council. (2021). Interactive Public Right of Way Map. (online). Available at: <https://www.leicestershire.gov.uk/roads-and-travel/cycling-and-walking/where-to-walk-in-leicestershire> (Accessed December 2021).

¹⁷ Campaign to Protect Rural England. (2016). Night-Blight: Mapping England's light pollution and dark skies. (online). Available at: <https://www.nightblight.cpre.org.uk/> (Accessed December 2021).

- A high resolution digital SLR camera with a 'full frame' sensor (i.e. 36 x 24 mm) with the camera set at 1.5 m AGL¹⁸;
- A 50 mm fixed focal length (prime) lens; and
- A professional quality tripod fitted with a panoramic head.

10.4.9 Accurate locations were established using a hand-held Global Positioning System (GPS) unit and recorded on a standardised proforma.

10.4.10 The viewpoint locations set out in **Table 10.4** were originally agreed with HBBC during previous LVIA baseline data collection in 2012 with further consultation undertaken in 2014. A condensed list of eight locations was presented in Table 9.3 of the Scoping Report and received no comment in the Scoping Opinion. A review of the proposed 2012 viewpoint locations against the current visual baseline and ZTV shown in **Figure 10.1**, which has been undertaken as part of the EIA process, indicated that the original agreed locations provide a more comprehensive coverage of the close and middle-distance views which are available to visual receptors from locations adjacent to the Site and from within the wider landscape and their inclusion would be of benefit to the LVIA to aid the understanding baseline views and likely visual effects.

10.4.11 The locations listed in **Table 10.4** are shown in **Figure 10.1** in relation to the ZTV. The viewpoint photographs are presented in **Figures 10.2 to 10.22**. The rationale for their selection is also set out in **Table 10.4**.

Table 10.4 Viewpoint locations

Viewpoint reference	Location	Reason for selection	Figure number
1	Mill Lane to the north-west of the Site	Representative of the close distance views available to residents on Mill Lane and Union Mill Close on the eastern edge of Earl Shilton.	Figure 10.2
2	Southern end of footpath T90 close to Breach Lane	Representative of the close distance views available to recreational visual receptors using the local PRoW network within the southern part of the Site, close to Breach Lane.	Figure 10.3
3	Footpath T89 to the north of Elmesthorpe	Representative of the middle-distance views available to recreational visual receptors using the local PRoW network to the south of the Site.	Figure 10.4
4	Bridleway U105 to the south of Mill Lane and east of the A47	Representative of the close distance views available to recreational visual receptors using the local PRoW network to the east of the Site.	Figure 10.5
5	Bridleway U16 to the north of the Wastewater Treatment Works (WwTW)	Representative of the close distance views available to recreational visual receptors using the local PRoW network within the Site.	Figure 10.6
6	Bridleway U16 to the east of the WwTW.	Representative of the close distance views available to recreational visual receptors using the local PRoW network within the Site.	Figure 10.7
7	Footpath U17 to the south of the WwTW	Representative of the close distance views available to recreational visual receptors using the local PRoW network within the Site.	Figure 10.8

¹⁸ Scottish Natural Heritage (now NatureScot). (2017), *Visual Representation of Wind Farms Guidance Version 2.2*. (online). Available at: <https://www.nature.scot/visual-representation-wind-farms-guidance> (Accessed December 2021).

Viewpoint reference	Location	Reason for selection	Figure number
8	Footpath U17 to the north of the Site boundary.	Representative of the close distance views available to recreational visual receptors using the local PRow network to the north of the Site close to Parry Close, Montgomery Road/Montgomery Walk and Columbus Lane on the edge of Earl Shilton.	Figure 10.9
9	Footpath T89 as it passes through the Site	Representative of the close distance views available to recreational visual receptors using the local PRow network within the Site.	Figure 10.10
10	Northern end of footpath T90 close to Astley Road/ Meadow Court Road	Representative of the close distance views available to recreational visual receptors using the local PRow network within the Site and of residents in properties along the southern side of Astley Road and Meadow Court Road in Earl Shilton.	Figure 10.11
11	Footpath U17/ bridleway U16 close to Huit Farm to the south of the A47.	Representative of the middle-distance views available to recreational visual receptors using the local PRow network to the south of the Site and residents at Huit Farm.	Figure 10.12
12	Breach Lane, close to Breach Lane Farm and the northern end of footpath T89	Representative of the middle-distance views available to recreational visual receptors using the local PRow network to the south of the Site and residents at Breach Lane Farm.	Figure 10.13
13	Bridleway U105 adjacent to the southern boundary of the Site	Representative of the close distance views available to recreational visual receptors using the local PRow network within the Site.	Figure 10.14
14	Thurlaston Lane close to Normanton Wood	Representative of the middle-distance views available to drivers and vehicle passengers travelling west along Thurlaston Lane.	Figure 10.15
15	Weaver Springs Park	Representative of the close distance views available to recreational receptors using the Weaver Springs Park and of residents at properties on The Leecrofts, Astley Road and Weaver Road.	Figure 10.16
16	King Richard's Hill to the west of the Site	Representative of the close distance views available to residents at properties along King Richard's Hill on the north-eastern edge of Earl Shilton	Figure 10.17
17	Thurlaston Lane close to the northern boundary of the Site	Representative of the close distance views available to drivers and vehicle passengers travelling along Thurlaston Lane.	Figure 10.18
18	Footpath T86 to the north of Earl Shilton	Representative of the middle-distance views available to recreational visual receptors using the local PRow network to the north of the Site.	Figure 10.19
19	A47 to the north of the Site	Representative of the middle-distance views available to drivers and vehicle passengers travelling south along the A47.	Figure 10.20
20	A47 to the east of the Site	Representative of the close distance views available to drivers and vehicle passengers travelling south along the A47.	Figure 10.21
21	Mill Lane	Representative of the close distance views available to users of Mill Lane which passes through the Site.	Figure 10.22

10.5 Overall baseline

Current baseline

Landscape baseline

- 10.5.1 Earl Shilton exerts a strong urban influence, especially within the northern and western parts of the Site where views back to the urban edge of Earl Shilton create an urban fringe character. Land uses within the Site include arable land, semi-improved grassland and improved grassland fields with a well-used network of informal paths and five PRow which run predominantly in a north to south direction throughout the Site, as shown in **Figure 10.23**.
- 10.5.2 Land uses along the Site boundary also contribute to the urban fringe character, including the adjoining operational Wastewater Treatment Works (WwTW), scout hut, culvert and the A47 road corridor which dissected field boundaries, PRow and local roads (Breach Lane and Mill Lane) when it opened in 2009.
- 10.5.3 The principal landscape elements within the Site and immediate surroundings include:
- medium to large scale fields associated with arable farming bounded by native hedgerows and intermittent hedgerow trees. The characteristics of rectilinear field patterns found in the wider Study Area are not present across the Site where the majority of fields are of irregular shape. The Tree Survey¹⁵ identified 22 hedgerows within the Site or along its boundaries;
 - there is no woodland cover within the Site and tree cover is limited to native species associated with hedgerow boundaries. A mature stand of trees encloses the WwTW, offering some screening from the surrounding area. The Tree Survey¹⁵ highlights that the trees within the Site are predominantly of low to moderate quality, with 5% of the individual/groups of trees or hedgerows being category A (trees of high quality with an estimated remaining life expectancy of at least 40 years), 20% being category B (trees of moderate quality with an estimated remaining life expectancy of at least 20 years) and 74% being Category C (trees of low quality with an estimated remaining life expectancy of at least ten years, or young trees with a stem diameter below 150 mm);
 - the recreational ground within the northern (central) part of the Site (Weaver Springs Park) provides amenity and play provision for local residents. A small play area and several grassed sports pitches make-up the grounds which are bounded by existing hedgerows; and
 - the boundaries of the Site are generally defined by residential back gardens to the north and west (along the edge of Earl Shilton) and the A47 road corridor to the south and east which includes infrastructural boundary treatment such as fencing and roadside vegetation (trees and shrubs) implemented when the road was constructed and became operational in 2009.

Topography

- 10.5.4 Typical of the surrounding area, the Site's topography is undulating with two noticeable high points to the north (102.5 m Above Ordnance Datum (AOD) and to the south (106.76 mAOD) separated by the Earl Shilton Brook in a low-lying valley (89.24 mAOD). From this valley, the land rises northwards toward Weaver Springs Park and Earl Shilton, giving the town its character of being situated on a ridgeline of high ground. To the south of the A47, the topography gradually descends to an elevation of 80 mAOD close to the M69 motorway.

Public Rights of Way and Weaver Springs Park

- 10.5.5 An extensive network of PRowS is located in the surrounding area and throughout the Site. Five local PRow run through the Site or adjacent to its boundary as shown in **Figure 10.23** as follows:
- Bridleway U16, which follows a route south of Mill Lane in the north to converge with Bridleway 105 and Footpath U17 close to the south-eastern corner of the WwTW;
 - Footpath U17, which runs from Footpath U19 south of Parry Close, Earl Shilton to Bridleway U16 east and south of the WwTW;
 - Footpath T89 which bisects the Site running north to south;
 - Footpath T90, which crosses the Site in the west between Meadow Court Road and Breach Lane; and
 - Bridleway U105 which follows the boundary of the Site, parallel with the A47.
- 10.5.6 In addition, there are numerous informal footpaths which traverse the Site that are well used by local residents due to their proximity and access to land immediately within the Site.
- 10.5.7 Weaver Springs Park is located in the northern (central) part of the Site and includes several playing pitches and a play area predominantly set to amenity grass.

Landscape character

National level landscape character

- 10.5.8 At a national level, the Site and Study Area lie within National Character Area (NCA) 94: Leicestershire Vales¹⁶ which extends between Hinckley in the west to Leicester in the north-east and southwards towards Market Harborough and Lutterworth.
- 10.5.9 The key characteristics of the NCA that relate to the Site and Study Area are as follows:
- *"An open landscape of gentle clay ridges and valleys underlain by Mercia Mudstone and Lias groups bedrock but with an extensive cover of superficial deposits occasionally giving rise to moderately steep scarp slopes. There is an overall visual uniformity to the landscape and settlement pattern;*
 - *Land use characterised by a mixture of pasture and arable agriculture that has developed on the neutral clay soils;*
 - *The density, height and pattern of hedgerows varies throughout;*
 - *Diverse levels of tranquillity associated with contrasts between busy urban areas and some deeply rural parts. Large settlements dominate the open character of the landscape.....and related infrastructure, including major roads, are often visually dominant*
 - *Frequent small towns and large villages often characterised by red brick buildings and attractive stone buildings in older village centres and eastern towns and villages. Frequent, imposing spired churches are also characteristic, together with fine examples of individual historic buildings."*

District level landscape character

- 10.5.10 At a local level, the *Hinckley and Bosworth Borough Landscape Character Assessment*¹² places the Site within Urban Character Area (UCA) 10: Earl Shilton which covers the settlement of Earl Shilton and adjoining SUE allocation encompassing the Site as illustrated in **Figure 10.24**. The key characteristics of this UCA are as follows:

- "1) Ridgetop settlement with views over the open landscape to the north and south, visible on the skyline in views from the countryside to the north;*
- 2) Defined, wide high street with a range of retail and non-retail services. Residential development in the outskirts of the town is of mixed character;*
- 3) Workers terraces and factory buildings of red brick are a reminder of the industrial heritage of the town from the boot and shoe industry in the 19th and 20th centuries;*
- 4) Modest scale of predominantly two storey buildings fronting directly onto the street;*
- 5) Some interesting and architecturally distinctive buildings;*
- 6) Red brick and white or off-white cement render are common building materials/finishes, with slates or plain tile roofs;*
- 7) The Church of St Simon and St Jude, is a landmark feature*
- 8) The historic site of a former motte and bailey castle and adjacent Hall Field open space."*

10.5.11 The key sensitivities and values of UCA 10: Earl Shilton are cited as:

- "1) Views to the surrounding rural landscape (to the north and south) provide a sense of place and suburban character;*
- 2) The northern settlement edge which is modest in the scale of buildings, with the church spire creating a generally well-integrated visual balance with the surrounding landscape and is vulnerable to change;*
- 3) The legacy left by the boot and shoe industry in the remnant factory buildings and terraced workers' cottages provides a sense of local identity;*
- 4) Interesting buildings and historic features including the Red Lion pub add local distinctiveness;*
- 5) The area of the church, castle site and Hall Field provides a sense of history and green open space, enhanced by views to the open landscape beyond the town to the north;*
- 6) The Church of St Simon and St Jude is a local landmark with historic and architectural interest forming a visible skyline feature in views from the surrounding rural area to the north;*
- 7) Public footpaths and bridleways connecting the settlement with the surrounding countryside which are tied into the local history of the area (e.g. Oak and Ash tree footpath to Peckleton)*
- 8) The rural gateways to the town from the south and north provide links with the surrounding countryside."*

10.5.12 The *Hinckley and Bosworth Borough Landscape Character Assessment*¹² also lists eight townscape strategies, three of which are of relevance to the Site and Proposed Development:

- *"Encourage local distinctiveness and high quality design in new developments, reinforcing the distinct identities of Earl Shilton and Barwell;*
- *The Sustainable Urban Extension to the south-east of Earl Shilton should aim to create a distinct new and contemporary identity and character(s) whilst responding to the existing context e.g. by using opportunities for woodland planting along the new edge*
- *Encourage planting of new street trees and soft landscaping to soften the streetscape."*

10.5.13 The agricultural landscape to the east of the A47 and south of Thurlaston Lane is defined as Landscape Character Area (LCA) F: Burbage Common Rolling Farmland which encompasses an open expanse of gently rolling farmland below the ridgeline of the urban areas of Hinckley,

Burbage, Earl Shilton and Barwell to the north and west. The key characteristics of this LCA which are present within the Study Area are as follows:

- *"Large scale, gently rolling arable and pasture farmland with local variations in topography influenced by small streams;*
- *Medium to large scale rectilinear field pattern bounded by low hedgerows and post and wire fencing with smaller scale pasture fields around the settlements. Field boundaries and hedgerows generally follow contours;*
- *Urban fringe influences as a result of exposed settlement edges of Hinckley and Earl Shilton situated on higher ground;*
- *Sparse settlement within the area, comprising individual buildings and scattered farm complexes;*
- *Major transport corridors dissect the landscape and introduce noise and movement*
- *Open landform and lack of tree cover allows for expansive and distant views to edge of settlement, often situated on the skyline, and punctuated by major infrastructure."*

10.5.14 Landscape strategies set out in the extant Assessment¹² for this LCA and which are of relevance to the Site and Proposed Development are:

- *"Respect and enhance the essentially rural character of the landscape. Ensure any new and existing development is integrated into the landscape such as ensuring built form is orientated to provide broken rooflines and integrated with woodland copses*
- *The Sustainable Urban Extension to the south-east of Earl Shilton should aim to create a distinct new and contemporary identity and character(s) whilst responding to the existing context."*

10.5.15 **Figure 10.24** illustrates the distribution of other LCAs within the Study Area which include:

- LCA D - Newbold and Desford Rolling Farmland (as defined in the *Hinckley and Bosworth Borough Landscape Character Assessment*¹²);
- LCA E - Stoke Golding Rolling Farmland (as defined in the *Hinckley and Bosworth Borough Landscape Character Assessment*¹²);
- LCA 6: Elmeothorpe Floodplain (as defined in the *Blaby Landscape and Settlement Character Assessment*); and
- LCA 11: Normanton Agricultural Parkland (as defined in the *Blaby Landscape and Settlement Character Assessment*).

10.5.16 Although illustrated on **Figure 10.24**, LCA 15 Stoney Stanton Rolling Farmland (as defined in the *Blaby Landscape and Settlement Character Assessment*), lies outside of the Study Area and therefore has not been considered further in the assessment.

Landscape designations

10.5.17 The Site and surrounding landscape (within a 1 km radius) are not covered by any national or local landscape designations.

Visual context and extent of visibility

10.5.18 The ZTV illustrated in **Figure 10.1** identifies the potential extent of visibility for the Proposed Development and incorporates the screening provided by existing buildings and woodland. The ZTV illustrates that the potential extent of visibility within the 1 km Study Area is primarily concentrated to the south, east and north of the Site where the open, rolling agricultural fields and

limited tree cover facilitate open views. Conversely, the screening provided by built form within Earl Shilton means that the settlement falls outside of the ZTV with the exception of its southern edge, and also has the consequence that land to the north and north-west of the town is also largely excluded from the ZTV. To the south-west of the Site, fragmented ZTV coverage extends across Elmeathorpe.

- 10.5.19 The Site as a whole is not visible from any single vantage point due to a combination of scale, the presence of the WwTW and intervening topography and vegetation within the Site and immediate surroundings. This is demonstrated in the viewpoint photography presented in **Figure 10.2** to **Figure 10.22** which illustrates the differing visibility of the Site.
- 10.5.20 Principal views of the Site are available to visual receptors within close proximity to the Site, notably from the southern and eastern edges of Earl Shilton, local PRowS which lie adjacent to or pass through the Site and roads (e.g. Thurlaston Lane and the A47) within the immediate vicinity. With the exception of the PRowS which pass through the Site, these views are typically restricted to the edges and elevated areas of the Site, with the lower lying and central parts of the Site typically screened from view by a combination of vegetation and lower lying topography. Views are typically of fields and recreation grounds that lie immediately adjacent to the visual receptors and are filtered and foreshortened by boundary or internal vegetation. Depending upon the angle of view, urban form associated with Earl Shilton is often visible, particularly when viewed from locations to the south or east of the Site.
- 10.5.21 From further afield to the south and east, views of the Site are limited due to the descending topography and the presence of constructed cuttings and embankments associated with the A47. Whilst views of the existing Site are more limited, there is potential for views of the Proposed Development located on elevated parts of the Site to be available to visual receptors in these locations. These views are typically available across agricultural land and are filtered through intervening vegetation associated with field boundaries and local roads.
- 10.5.22 Visually the Site has developed into an urban fringe landscape. The previous rural framework has been altered by its proximity to Earl Shilton, areas of poor management and the presence of a variety of infrastructure elements.

Future baseline

- 10.5.23 Landscape change is an ongoing and inevitable process and would continue across the Study Area irrespective of whether the Proposed Development proceeds. Change can arise through natural processes (e.g. the maturity of woodlands) and natural systems (e.g. river erosion) or, as is often the case, occurs as a result of human activity, land use, management, or neglect.

Wider landscape change

Ash dieback

- 10.5.24 Chalara dieback of ash became established in the UK in 2012 with the consequence that the future of common ash (*Fraxinus excelsior*) as a woodland, hedgerow and urban tree species became under threat. Reference to the Forestry Commission's map¹⁹ of confirmed infection sites for the UK indicates that the OS 10 km grid square within which Earl Shilton and the Site is located has a record of confirmed infection of ash trees within a natural environment. The *Tree Survey*¹⁵ identified that a proportion of the individual trees, trees within groups and hedgerows within the Site contain Ash trees. Impacts on the landscape are likely to develop relatively slowly, starting with the decline

¹⁹ Defra project team (including Fera, Natural Resources Wales and Forestry Commission). (2021). Chalara Map (online) Available at: <https://secure.fera.defra.gov.uk/chalaramap/> (Accessed December 2021).

of young trees and only becoming readily apparent if mature trees are felled. This may open up views for visual receptors, alter the structure of existing woodlands and has implications with regard to tree species proposed as part of the landscape mitigation.

Other forces for change

- 10.5.25 Reference to the *National Character Area Profile 94: Leicestershire Vales*¹⁶ indicates that alongside climate change which may make subtle and varied changes to tree and woodland cover due to pests and disease, wind-blow and fire, other key drivers for change include the continued trend in the increase in arable farming with response to food production demands resulting in continued pressure to convert grassland to arable use.
- 10.5.26 The potential long-term changes as a result of Chalara dieback or climate change are unpredictable and as a consequence, the assessment will be carried out against the current baseline.

10.6 Consultation

- 10.6.1 Consultation was first undertaken in November 2012 with HBBC Officers to agree the location of photographic viewpoints and visual receptors within a 1 km Study Area of the Site. In response, HBBC agreed with the proposed locations for photographic viewpoints and the identified visual receptors.
- 10.6.2 The Scoping Opinion received from HBBC outlined issues HBBC and Natural England would seek to be addressed as part of the LVIA. **Table 10.5** provides a summary of these issues and the responses given.

Table 10.5 Summary of issues raised during consultation regarding landscape and visual effects

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
Policy DM10: Development and Design of the Site Allocations and Development Management Policies DPD should be included.	HBBC	Policy PM10 has been referred to as part of the policy context set out in Table 10.1 and considered as part of this assessment.	Sections 10.3 and 10.10
The council agrees that this topic should be included within the Environmental Statement supporting any future application.	HBBC	This chapter provides the LVIA of the Proposed Development, undertaken in accordance with a methodology based upon GLVIA3 ¹ .	Sections 10.1 to 10.14
Location of photographic viewpoints representative of visual receptors	HBBC	The location of photographic viewpoints was agreed with HBBC officers. Panoramic photography from the agreed viewpoint locations is presented as Type 1 photographs in accordance with the Landscape Institute's <i>Technical Guidance Note 06/19 Visual Representation of Development Proposals</i> ¹⁰ in Figures 10.2 to 10.22 .	Sections 10.11 and Figures 10.2 to 10.22.
Details of local landscape character areas should be mapped at a scale appropriate to the development site as well as any relevant management plans or strategies pertaining to the area.	Natural England	Local LCAs and UCAs have been mapped and shown on Figure 10.24 . They have been judged to be at an appropriate scale in relation to the Proposed Development and accords with the approach advocated by paragraph 5.14 of GLVIA3 ¹ which states "Local authority assessments provide more detail on the types of landscape that occur in the study area. They can be mapped to show how the proposals relate to them and the descriptions and definition of key characteristics can be used to inform the description of the landscapes that may be affected by the proposal."	Sections 10.5 and 10.10
The EIA should include assessments of visual effects on the surrounding area and landscape together with any physical effects of the development, such as changes in topography.	Natural England	At this outline application stage, the full extent of land remodelling for the development platform, which may affect the topography across the Site is not yet known. As a consequence, this has not been assessed as part of the LVIA.	N/A
The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area.	Natural England	A cumulative LVIA forms part of Chapter 17: Cumulative Effects Assessment .	Chapter 17: Cumulative Effects Assessment
The assessment should refer to the relevant National Character Areas which can be found on our website.	Natural England	National Character Areas have been referred to as part of the baseline and provide landscape context as recognised in paragraph 5.14 of GLVIA3 ¹ which states "Broad-scale assessments set the scene and reference can be made to the descriptions of relevant character types or areas to indicate the key characteristics that may be apparent in the study area."	Sections 10.5

10.7 Scope of the assessment

Spatial scope

- 10.7.1 The spatial scope of the assessment of landscape and visual effects covers the Site and LVIA Study Area described in **Section 10.4** together with the ZTV as illustrated in **Figure 10.1**.
- 10.7.2 It is acknowledged that this Study Area will not mark the absolute limits of the Proposed Development's visibility, but beyond this distance it is considered highly unlikely that the Proposed Development would be a prominent visual element with the associated potential to generate significant visual effects.

Temporal scope

- 10.7.3 The temporal scope of the assessment of landscape and visual effects is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction and operational periods as described in **Chapter 3: Description of the Proposed Development**.

Potential receptors

- 10.7.4 Receptors potentially affected by the Proposed Development comprise:
- landscape elements within the Site that may be directly affected by the Proposed Development;
 - potential direct or indirect effects on the LCAs and UCAs within the 1 km Study Area as defined by the extant *Hinckley and Bosworth Borough Landscape Character Assessment*¹²; and
 - visual receptors which coincide with the ZTV in **Figure 10.1** including residential visual receptors in the community of Earl Shilton (notably those adjacent to the Site) and recreational visual receptors using the network of PRoW/recreational space within the Site and wider 1 km Study Area. The views of vehicular visual receptors which coincide with the ZTV (drivers and their passengers travelling along the A47 and Thurlaston Lane) may also be affected.

Likely significant effects

- 10.7.5 The landscape and visual receptors that have been taken forward for assessment are summarised as in **Table 10.6**.

Table 10.6 Landscape and visual receptors scoped in for further assessment

Receptor	Relevant assessment criteria	Likely significant effects
Landscape elements: • Arable and pasture land; • Hedgerows; and • Trees (individual and groups)	The methodology outlined in Section 10.9 and Appendix 10A which accords with GLVIA3 ¹ .	Direct landscape effects as a consequence of land-take/land cover change causing temporary and permanent changes to landscape elements within the Site.
Landscape Character: • UCA 10: Earl Shilton; and • LCA F: Burbage Common Rolling Farmland.	The methodology outlined in Section 10.9 and Appendix 10A which accords with GLVIA3 ¹ .	• UCA 10: This is the host LCA and would therefore sustain some direct impacts upon its existing landscape elements. New landscape elements would be introduced; with potential effects upon defined key characteristics and character; and • LCA F: This LCA lies to the immediate east of the Site and a large proportion of the

Receptor	Relevant assessment criteria	Likely significant effects
		northern part of the LCA coincides with the ZTV. Its proximity means that the Proposed Development may give rise to indirect effects upon the defined visual and perceptual characteristics of this LCA.
Residential visual receptors adjacent to the Site boundary: - Residents at properties on Mill Lane and Union Mill Close; - Residents at properties on Breach Lane; - Residents at properties on King Richards Hill; - Residents at properties on Equity Road East; - Residents at properties on Meadow Court Road and Astley Road; - Residents at properties on The Leecrofts; - Residents at properties on Weaver Road; and - Residents at properties on Montgomery Road.	The methodology outlined in Section 10.9 and Appendix 10A which accords with GLVIA3 ¹ .	The proximity of these receptors to the Proposed Development means that changes to receptors' private views and visual amenity may be significant.
Residential visual receptors which coincide with the ZTV: - Residents at Mirfield Farm; - Residents at Huit Farm; - Residents at Breach Lane Farm; - Residents within Elmesthorpe; and - Residents of Earl Shilton with middle distance views of the Site.	The methodology outlined in Section 10.9 and Appendix 10A which accords with GLVIA3 ¹ .	These receptors coincide with the ZTV and changes to receptors' private views and visual amenity may be significant.
Recreational visual receptors (see Figure 10.23): - Users of the PRoW in the north-eastern part of the Site (PRoW no.1); - Users of the PRoW immediately south of the WwTW (PRoW no.2); - Users of the PRoW running centrally through the Site (PRoW no.3); - Users of the PRoW in the western part of the Site (PRoW no.4); - Users of the PRoW immediately adjacent to the eastern edge of the Site (PRoW no.5); - Users of the PRoW leading toward Mirfield Farm (PRoW no.6); - Users of the PRoW east of the A47 (PRoW no.7); - Users of the PRoW leading toward Huit Farm from the south-east (PRoW no.8); - Users of the PRoW south of Breach Lane Farm (PRoW no.9); - Users of the PRoW south of the Site (PRoW no.10); - Users of the PRoW to the north of Earl Shilton (PRoW no.11); - Users of Mill Lane;	The methodology outlined in Section 10.9 and Appendix 10A which accords with GLVIA3 ¹ .	The proximity of these receptors to the Proposed Development means that changes to receptors' views and visual amenity may be significant.

Receptor	Relevant assessment criteria	Likely significant effects
- Users of the A47 highway footpath; and - Users of Weaver Springs Park.		
Vehicular visual receptors: - Users of Thurlaston Lane; and - Users of A47	The methodology outlined in Section 10.9 and Appendix 10A which accords with GLVIA3 ¹ .	The proximity of these receptors to the Proposed Development means that changes to receptors' views and visual amenity may be significant.

- 10.7.6 The following receptors have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant:
- Landscape effects: NCAs:
 - ▶ Whilst NCAs provide landscape context, they are too extensive and generalised to potentially experience significant landscape effects. This approach is advocated by paragraph 5.14 of *GLVIA3*¹ and the smaller borough and district level LCAs are to be taken forward as receptors in the LVIA. NCA 94 will therefore not require further assessment and is scoped out of the LVIA.
 - Landscape effects – LCAs. Effects upon LCAs are not entirely dependent on the presence of a visual effects pathway i.e. the landscape receptor being located within the ZTV. Landscape effects can also be generated by changes to other perceptual characteristics impacting upon landscape qualities such as tranquillity. Hence the scope of the landscape assessment has been determined by reviewing the defined key characteristics of the LCAs in the LVIA Study Area and a consideration of the potential for these characteristics to be impacted by the Proposed Development. The following LCAs will not require further assessment and are scoped out of the LVIA:
 - ▶ LCA D: Newbold and Desford Rolling Farmland: The ZTV illustrated in **Figure 10.1** indicates some intervisibility with the Proposed Development from within a small peripheral area of this large LCA concentrated within its south-eastern corner. A review of its key characteristics and sensitivities as set out in the *Hinckley and Bosworth Borough Landscape Character Assessment*¹² allied with the existing presence of settlements within this LCA and the proximity of the area to the A47, which would disrupt perceptual qualities such as tranquillity, means that significant landscape effects upon its key characteristics and character as a consequence of the Proposed Development are assessed to be highly unlikely to arise;
 - ▶ LCA E: Stoke Golding Rolling Farmland: The ZTV illustrated in **Figure 10.1** indicates some limited intervisibility with the Proposed Development from within a peripheral area on the eastern edge of this large LCA. However, the existing presence of the northern settlement edges of Earl Shilton and further to the west, of Barwell and Hinckley means that significant landscape effects upon its key characteristics and character as a consequence of the Proposed Development are assessed to be highly unlikely to arise;
 - ▶ LCA 6: Elvesthorpe Floodplain: Some fragmented invisibility with the Proposed Development could occur from within this LCA as indicated in the ZTV in **Figure 10.1**. However, the separation between this LCA and the Site and its baseline characteristics where the "Traffic noise and movement associated with the M69 and A47 impacts on the tranquillity and rural qualities of the landscape." allied with the presence of Elvesthorpe, means that significant landscape effects upon its key characteristics and character as a consequence of the Proposed Development are assessed to be highly unlikely to arise; and

- ▶ LCA 11: Normanton Agricultural Parkland: A small part of this large LCA lies within the Study Area and partially within the ZTV in **Figure 10.1**. The proximity of this area to the A47 means that perceptual qualities are likely to be disrupted under baseline conditions and where *“Views from within the character area tend to be channelled and over short distances”* forms a key characteristic. As a consequence, significant landscape effects upon its key characteristics and character as a result of the Proposed Development are assessed to be highly unlikely to arise.
- Visual effects:
 - ▶ Visual effects cannot be experienced by visual receptors with no potential views of any component of the Proposed Development i.e. those visual receptors located outside the ZTV shown in **Figure 10.1**.

10.8 Environmental measures embedded into the development proposals

10.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 3.3. Table 10.7** outlines how these embedded measures will influence the LVIA assessment.

Table 10.7 Summary of the embedded environmental measures and how these influence the Landscape and Visual assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Landscape elements: Trees and hedgerows within the Site boundary	The loss of key landscape elements which either play a strong landscape role and consequently their loss could dilute the local landscape character, or a strong visual and screening role.	Hedgerows and Trees: • Retention of existing hedgerows where practicable to ensure that hedgerow loss is kept to a minimum; • All retained species-poor hedgerow to be enhanced via their widening/thickening and/or gapping up and through appropriate management (including advanced planting to strengthen the boundary hedgerow along Breach Lane); • Implementation of structural tree planting to the northern edges of the Site (to the south of Astley Road/Meadow Court Road and Montgomery Road) to filter and soften views of built form; • The retention of existing tree and shrub planting along the eastern and southern boundary of the Site and the introduction of additional tree planting to reduce views for visual receptors of built form as it matures; • Standard trees to be planted comprising native species of local origin; • Trees to be retained would be protected in accordance with <i>British Standard (BS) 5387:2012 Trees in relation to design, demolition and construction – Recommendations</i>;
Visual receptors	Changes to visual amenity during the construction period due to construction activities.	Construction management to avoid/ minimise visual disturbance (daytime and night-time), including the following: • Selective and sensitive location of the contractors' compound(s), security fencing and

Receptor	Changes and effects	Embedded measures and influence on assessment
		temporary storage of materials and plant. Minimise use of cranes; • Implementation and monitoring of Site management procedures, including the regular removal of any construction related litter from the immediate environment; and • Use of designated routes around the Site for construction vehicles and plant.
Visual receptors	Changes to views toward St Simon and St Jude Church Spire	The church spire of St Simon and St Jude is a local landmark as recorded in the baseline viewpoint photography. A number of the proposed retained and enhanced green corridors frame views of the spire and in the detailed design of development along or near to these corridors, consideration would be given to avoiding encroaching on or blocking these views.
Visual receptors	Changes to existing views and visual amenity associated with the introduction of new residential development and built features to the view.	The retention of existing tree and shrub planting along the eastern and southern boundary of the Site and the introduction of additional tree planting to reduce views for visual receptors of built form as it matures. The building heights parameters plan included in the DAS indicates that building heights and densities along the Site boundaries and adjacent to existing residential properties would be restricted to 2-2.5 storeys.

10.9 Assessment methodology

10.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the Environmental Statement**, and specifically in **Section 4.5 to Section 4.7**. However, whilst this has informed the approach that has been used in this LVIA, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this LVIA.

Methodology for prediction of effects

10.9.2 This LVIA has been undertaken in accordance with the methodology set out in **Appendix 10A** and conforms to the GLVIA3¹ which is widely accepted throughout the UK as the appropriate approach to use.

Significance evaluation methodology

10.9.3 The level of landscape and visual effect (and whether this is significant) is determined through consideration of the 'sensitivity' of the landscape or visual receptor and the 'magnitude of change' which would be brought about by the Proposed Development.

10.9.4 Landscape or visual sensitivity specific to this development is ranked from high, through medium to low and the magnitude of landscape or visual change is ranked from high, medium, low to very low as indicated in **Table 10.8**. The type of effect is also considered and may be direct or indirect, temporary (reversible) or permanent, cumulative, and positive, neutral, or negative.

10.9.5 The LVIA unavoidably involves a combination of both quantitative and subjective assessment and wherever possible the assessment has sought to gain a consensus of professional opinion through

consultation, peer review, and the adoption of a systematic, impartial, and professional assessment approach.

- 10.9.6 In this assessment, effects are considered to be significant or not significant according to the matrix in **Table 10.8**.

Table 10.8 Matrix of EIA Significance

		Sensitivity of receptor		
		High	Medium	Low
Magnitude of change	High	Major (Significant)	Major (Significant)	Moderate (Potentially Significant)
	Medium	Major (Significant)	Moderate (Potentially Significant)	Minor (Not Significant)
	Low	Moderate (Potentially Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Very Low	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

10.10 Assessment of landscape effects

Predicted effects and their significance

Overview of landscape changes during the construction phase

- 10.10.1 This section provides an assessment of the predicted landscape changes that would be generated by the activities associated with the construction of the Proposed Development.
- 10.10.2 The principal activities that could have an effect on landscape elements, pattern and character of the landscape during the construction phase include:
- the loss of landscape elements and land cover including the removal of arable fields, areas of semi-improved or improved grassland, several lengths of hedgerow with native tree species and individual trees; and
 - the introduction and operation of a variety of construction plant such as cranes, earth moving equipment, contractors' compounds, materials and storage areas, security fencing, signage and associated increased traffic movements.
- 10.10.3 Trees and hedgerows to be retained would be protected in accordance with *BS 5387:2012 Trees in relation to design, demolition and construction– Recommendations*²⁰ to ensure their continued protection and growth throughout the construction and operation of the Proposed Development.
- 10.10.4 Due to the progressive phasing of the Proposed Development, the character of the Site would become typical of any construction that extends over several hectares (ha). A sense of transience, high levels of plant and vehicular movement, introduction of new elements (materials, storage, compounds, fencing), regular changes in the composition of landscape patterns and possible disruption to baseline low levels of tranquillity would all be experienced as land cover is periodically removed and new areas are prepared to receive development. The introduction of such elements would alter the existing landscape pattern and character within the Site.

- 10.10.5 As the construction period is phased there would be a gradual rolling out of this landscape character type across the Site. The balance of effects associated with construction would gradually transfer to those generated by operation.

Overview of landscape changes during the operational phase

- 10.10.6 The main landscape change would be associated with the permanent loss of land cover and the alteration from an area of agricultural land (with associated landscape elements and features) to the introduction of a new urban development with a new urban character type.
- 10.10.7 The completed development would introduce new built and natural elements into the Site. These additional elements combined with extra infrastructure would create a character resembling that found in many other similar sized urban developments and bring with it increased noise and movement resulting in a possible decline in tranquillity.
- 10.10.8 Hedgerows and trees are important landscape features that serve to visually sub-divide the Site creating the landscape pattern. The majority of these features are to be retained as part of a new landscape network of green corridors, linked public open spaces and continued access into the wider countryside as described in the DAS. In certain areas of the Proposed Development, these features would be complemented by additional street tree planting (e.g. along primary roads) and a linked Sustainable Drainage System (SuDS) network.

Assessment of landscape effects: landscape elements within the Site

Agricultural land (arable land, semi-improved grassland and improved grassland)

Landscape sensitivity

- 10.10.9 The main land use across the Site comprises a mix of arable and pasture land. The overall sensitivity of this landscape elements is assessed as **Low** based on consideration of the following:
- The overall landscape value of grassland and arable land within the Site is assessed as Low:
 - ▶ Rarity – arable land and grassland are prevalent landscape elements within the wider landscape and are a non-designated, ordinary landscape element (Low);
 - ▶ Condition – condition within the Site appears to be moderate with some fields under active and managed arable production. However, some unmanaged areas of grassland are also present as illustrated in the baseline photograph from Viewpoint 10 (**Figure 10.11**) (Medium to Low); and
 - ▶ Role – the mix of arable land and pasture is not noted as being a key characteristic of UCA 10: Earl Shilton. Field patterns within the Site have been altered in recent years to accommodate new transport infrastructure and do not reflect the rectilinear field pattern prevalent within the wider landscape (Low).
 - Susceptibility: the relative ease with which these elements could be replaced, and the short timescales involved to achieve this (e.g. a single growing season) indicates a Low susceptibility.

Magnitude of landscape change and level of effect

- 10.10.10 Throughout the ten-year construction period, areas of existing grassland and arable land would gradually be replaced across the Site with a more varied combination of hard and soft landscape elements which are more characteristics of an urban environment including built form, roads and

footpaths, play spaces and SuDS features and areas of native tree planting. The magnitude of change would be **High** and would result in a level of landscape effect which would be **Moderate** and **neutral**.

- 10.10.11 Although the outcome of this assessment is that the level of effect would be Moderate (and therefore potentially significant under the level of effect methodology set out in **Table 10.8**), the loss of existing grassland and arable land would not alter the key characteristics of the host UCA or the neighbouring LCAs given its prevalence within the wider landscape and is consequently assessed as **Not Significant**.

Hedgerows

Landscape sensitivity

- 10.10.12 In terms of the sensitivity of this landscape element to change, this is assessed as **Medium** based on consideration of the following:
- The overall value of hedgerows within the Site is assessed as Medium:
 - ▶ Rarity – the majority of hedgerows are non-designated, ordinary landscape elements. **Chapter 7: Biodiversity** and its supporting appendices identify nine species-rich hedgerows within the Site which may qualify under the *Hedgerow Regulations* comprising of seven or more woody species (Low to High);
 - ▶ Condition – the Tree Survey records eight of the 22 hedgerows within or along the boundaries of the Site as being Category B (Trees of moderate quality) whilst the remaining 14 hedgerows are categorised as Category C (Trees of low quality) (Medium to Low); and
 - ▶ Role – The hedgerows provide a landscape pattern and visually sub-divide the Site but have been disrupted in recent years to accommodate the A47. They are not cited as a key characteristic or sensitive feature of UCA 10: Earl Shilton although they do form a key characteristic of the neighbouring LCA F: Burbage Common Rolling Farmland (Medium to Low).
 - Susceptibility: An element which could be replaced but would require a moderate amount of time to fulfil a similar role and value to those hedgerows that are present as part of the baseline conditions (Medium).

Magnitude of landscape change and level of effect

- 10.10.13 A large proportion of the hedgerows across the Site have been incorporated into the Proposed Development within the landscape framework with the exception of a small number of short sections that would be removed to facilitate access and the internal road network during the operational phase.
- 10.10.14 In addition to the retained hedgerows which would be reinforced and improved through gapping up and widening, new hedgerow would be created both within the Site and along its boundaries, where appropriate. The proposed hedgerow planting would compensate for that lost and the magnitude of change would be **Very Low** giving rise to long-term landscape effects which would be **Negligible, Not Significant** and **neutral** (i.e. the net effect of hedgerow loss and reinstatement elsewhere within the Site would neither add to nor detract from the quality and character of the Site and wider landscape).

*Trees (individual and groups)**Landscape sensitivity*

- 10.10.15 In terms of the sensitivity of trees within the Site to landscape change, this is assessed as **High** based on consideration of the following:
- The overall value of trees within the Site is assessed as Medium:
 - ▶ Rarity – the trees within the Site are non-designated (no Tree Preservation Orders²⁰), ordinary landscape elements (Low);
 - ▶ Condition – with regard to individual trees, the Tree Survey records nine of the 87 individual trees within the Site as being Category A (trees of high quality), 17 trees as being category B (trees of moderate quality) whilst the majority of individual trees (60 of the 87) are assessed as being as Category C trees. A similar pattern of quality exists in relation to groups of trees with seven of the 54 groups being categorised as Category B and the majority (46 of the 54 groups) being assessed as Category C (Medium to Low); and
 - ▶ Role – the trees and groups of trees within the Site contribute to scenic quality and provide seasonal interest and diversity. They are not cited as a key characteristic or sensitive feature of UCA 10: Earl Shilton or of the neighbouring LCA F: Burbage Common Rolling Farmland (Medium to Low).
 - Susceptibility: these mature and semi-mature trees may be replaced, but replacement would require considerable time to achieve a similar landscape (and visual) role to that of the baseline (High).

Magnitude of landscape change and level of effect

- 10.10.16 A small number of trees would be removed during the construction phase to accommodate the development. The majority of individual and groups of trees would be retained and incorporated into a network of green corridors that run throughout the Site to filter views of new built form and create a sense of maturity and enclosure to different areas of the Site. In addition to the retained trees, individual trees are proposed along the green corridors, within the development blocks and as street trees.
- 10.10.17 The loss of a small number of trees and the subsequent introduction of additional trees within the Site would give rise to a **Low** magnitude of change and long-term landscape effects would be **Moderate** and **beneficial**. This Moderate level of effect is assessed as being **Not Significant** as a consequence of the limited contribution that trees make to the wider landscape character.

*Assessment of landscape effects: landscape character**UCA 10: Earl Shilton**Landscape sensitivity*

- 10.10.18 The sensitivity of UCA 10: Earl Shilton to the type of change proposed is set out in **Table 10.9**.

²⁰ Hinckley and Bosworth Borough Council. (2021). *Tree preservation order - online map*. (online). Available at: <https://www.hinckley-bosworth.gov.uk/tpomap> (Accessed December 2021).

Table 10.9 Landscape sensitivity assessment: UCA 10: Earl Shilton

Value criteria	Commentary	Value
Landscape designations	There are no national (National Park/Area of Outstanding Natural Beauty (AONBs)) or local landscape designations within the UCA. The Townscape Strategies set out in the Hinckley and Bosworth Borough Landscape Character Assessment ¹⁵ focus on conservation and enhancement.	Medium
Landscape quality, condition and intactness:	Landscape patterns across the Site have been previously disrupted and weakened as a consequence of the A47 corridor and the Tree Survey recorded generally moderate to low levels in the quality of the trees and hedgerows across the Site. Whilst the extant Assessment ¹² records some distinctive buildings within Earl Shilton, it also notes that there are <i>"poor quality shop fronts and buildings in poor state of repair, poor quality public spaces and public realm, and areas where the streetscape has poor legibility"</i> . The Assessment ¹² continues <i>"Cul-de-sacs and standard housing types of 20th and 21st century residential development unfortunately often pay little regard to local distinctiveness and dilutes character and sense of place"</i> .	Medium to Low
Scenic quality	Scenic quality is generally moderate and the UCA is of ordinary aesthetic appeal. Minor detracting features include the WwTW which is partially visible through gaps in its perimeter vegetation and distant views towards the pylons which cross the landscape to the east. Positive scenic qualities include views to the spire of the Church of Saint Simon and St. Jude and of the mature trees within the Site.	Medium
Rarity and representativeness	This is a landscape/townscape which includes features that are common and not rare.	Low
Conservation interests and associations	There are no nature conservation designations within the UCA. Earl Shilton includes a single scheduled monument (Earl Shilton motte and bailey castle) and a small number of listed buildings. The Earl Shilton conservation area is a small area of similar development comprising residential terraces, factories and workshops which were constructed during the expansion of the boot and shoe industry in the settlement in the late 19 th century.	Low
Recreation value	There are no regionally or nationally promoted walking or cycling routes within this UCA. A moderately dense network of local ProWs (footpaths and bridleways) is present across the Site providing connecting routes beyond the current settlement boundary. The extant Assessment ¹² cites Wood Street Community Park as an attractive space close to the town centre and notes that Hall Field is an important open space adjacent to the Site of the castle earthworks.	Medium
Perceptual aspects	This is an urban/urban fringe landscape which lies adjacent to the A47. The developed nature of the landscape and the visual and aural influence of vehicles travelling along the A47 disrupt tranquillity and a sense of remoteness at a local level. This observation was recorded during the field survey which noted that the aural influence of the A47 was present at all 21 viewpoint locations.	Low
Overall value	The landscape is undesignated, and criteria range from 'Medium' (landscape designations, scenic quality and recreational value) to 'Medium to Low' (landscape quality, condition and intactness) through to 'Low' (rarity/representativeness, conservation interests and perceptual aspects). The overall value is assessed as Medium.	Medium
Susceptibility criteria	Commentary	Susceptibility
Physical characteristics	The landscape within the Site comprises a relatively simple palette of arable land, grassland, trees and hedgerows where landscape patterns have previously been weakened through the introduction of the A47 bypass (Clickers Way) which opened in 2009. The presence of similar development to the type proposed indicates capacity for development.	Low
Visual characteristics	The urban landscape within the Earl Shilton offers high levels of visual containment with the exception of the peripheral areas where <i>"There are frequent views out to the landscape to the south from southerly-orientated residential roads in the eastern part of</i>	Medium

Value criteria	Commentary	Value
	<i>the town (for example Vicarage Street, Avenue Street). There are also views to the landscape to the north from around the church and site of the castle."</i> ¹² There are moderate levels of intervisibility with both the spire of the Church of Saint Simon and St. Jude which provides a historic landmark feature on the skyline and the surrounding landscape to the east of the UCA. This includes LCA F: Burbage Common Rolling Farmland whilst the southern parts of LCA 11: Normanton Agricultural Parkland are recorded in the <i>Blaby Landscape and Settlement Character Assessment</i> as being overlooked from Earl Shilton. Reference to CPRE's light pollution and dark skies mapping ¹⁷ indicates that radiance levels across this UCA are moderately high.	
Perceptual characteristics	Visibility of built development allied with the presence of the A47 combine to reduce levels of tranquillity and sense of remoteness. Observations made during the field survey note the constant presence of traffic noise indicating that this is a landscape with development capacity.	Low
Overall susceptibility	Overall susceptibility to the type of development proposed is considered to be Low.	Low
Overall sensitivity to the Proposed Development The overall value of this LCA is Medium and the overall susceptibility is Low resulting in a Low overall sensitivity.		

Magnitude of landscape change and level of effect

- 10.10.19 Construction phase: The introduction of uncharacteristic elements during the 10-year construction phase including materials stockpiles, compound(s), lighting, security fencing, plant and vehicles and the gradual emergence of built form and highways infrastructure, would all combine to alter existing landscape patterns, and introduce a shifting series of elements and increasing complexity across the Site. Direct (physical) landscape effects upon UCA 10 would be concentrated within the eastern part of the UCA whilst there would be a limited visual effects pathway with the remaining parts of the UCA as a consequence of the screening provided by existing built form as indicated in the ZTV in **Figure 10.1**. Whilst the aural influence of construction activities may be slightly more extensive than the visual influence, this would be perceived within the baseline context of an urban environment and where the aural influence of the A47 already has a role. The majority of the most valued landscape elements within the Site (hedgerows and trees) would be retained and protected during the construction phase and whilst the urban fringe character within the Site would change, the key characteristics of UCA 10 as defined by the extant Assessment¹² would not be altered. The magnitude of landscape change is assessed as **Medium** due to the presence of uncharacteristic elements and activities across the Site which represents a moderate proportion of the UCA and landscape effects would be **Minor, adverse** and **Not Significant**.
- 10.10.20 Operational phase: The completed built development, set within a framework of retained hedgerows and trees which visually sub-divide the Site, would reflect development which is already present within the UCA in terms of density, scale, height and land use as described in the Design and Access Statement. The Proposed Development would contribute to three of the Townscape Strategies for this UCA as set out in the *Hinckley and Bosworth Borough Landscape Character Assessment*¹² (and as outlined in the baseline in **Section 10.5**) in relation to the SUE to the south-east of Earl Shilton, the planting of new street trees and high quality design in new developments. The key characteristic and sensitivity relating to "Views to the surrounding rural landscape (to the north and south)" would continue to be present albeit the southern settlement edge of Earl Shilton would move from its baseline position to a new, clearly defined settlement edge formed by the A47. All other key characteristics and key sensitivities would remain unaltered with limited intervisibility between the Proposed Development and the remainder of the UCA as indicated by the ZTV in **Figure 10.1**. Whilst the character within the Site would alter, this would not be uncharacteristic of the UCA and when considering UCA 10 as a whole, the magnitude of change

would be **Low**. When combined with the Low sensitivity of this UCA to the type of change proposed, long-term landscape effects would be **Negligible, beneficial and Not Significant**.

LCA F: Burbage Common Rolling Farmland

Landscape sensitivity

10.10.21 The sensitivity of LCA F: Burbage Common Rolling Farmland to the type of change proposed is set out in **Table 10.10**.

Table 10.10 Landscape sensitivity assessment: LCA F: Burbage Common Rolling Farmland

Value criteria	Commentary	Value
Landscape designations	There are no national (National Park/AONB) or local landscape designations within the LCA. The Landscape Strategies set out in the <i>Hinckley and Bosworth Borough Landscape Character Assessment</i> ¹² focus on conservation and enhancement.	Medium
Landscape quality, condition and intactness:	This LCA covers large scale, gently rolling arable and pasture farmland where the field pattern is one of traditional geometric fields defined by managed hedgerows. There has been some field boundary loss as a result of farm intensification whilst at its northern edge, the field pattern and rural lanes and PROWs have been interrupted by the A47.	Medium
Scenic quality	Scenic quality is generally moderate and the LCA is of ordinary aesthetic appeal. Existing detracting features include pylons within and beyond the boundaries the LCA which can be locally prominent features within this semi-rural landscape. The <i>Hinckley and Bosworth Borough Landscape Character Assessment</i> ¹² also notes that the urban edges elevated ridgeline settlements including Earl Shilton are often visible as a result of their location and the relatively open settlement edge, "particularly the modern red brick residential properties at Earl Shilton". The A47 and M69 in the south also introduce movement within the landscape. Positive scenic qualities include views to the spire of the Church of Saint Simon and St. Jude. The landscape within this LCA is valued from within the adjoining UCA 10: Earl Shilton which records "views over the open landscape to the north and south" ¹² as a key characteristic with "Views to the surrounding rural landscape (to the north and south) provide a sense of place and suburban character" ¹² cited as a key sensitivity and value.	Medium
Rarity and representativeness	This is a landscape which includes features that are common and not rare.	Low
Conservation interests and associations	There are no nature conservation or heritage designations within the LCA.	Low
Recreation value	There are no regionally or nationally promoted walking or cycling routes within this LCA. A moderate number of PROWs (footpaths and bridleways) are present crossing the agricultural landscape between the A47 and M69.	Medium
Perceptual aspects	This is semi-rural landscape which lies between the A47 and the M69. The visual and aural influence of vehicles travelling along both major transport corridors disrupt tranquillity and a sense of remoteness at a local level. This is reflected in the <i>Hinckley and Bosworth Borough Landscape Character Assessment</i> ¹² which notes that "The landscape is influenced by large scale infrastructure such as the M69 and the A47 as well as the Leicester to Nuneaton railway line, which introduce noise and movement into an otherwise rural landscape" and the aural influence of the A47 was also observed during the field survey.	Medium to Low
Overall value	The landscape is undesignated, and criteria range from 'Medium' (landscape designations, landscape quality, condition and intactness, scenic quality and recreational value) to 'Medium to Low' (perceptual aspects) through to 'Low'	Medium

Value criteria	Commentary	Value
	(rarity/representativeness, conservation interests). The overall value is assessed as Medium.	
Susceptibility criteria	Commentary	Susceptibility
Physical characteristics	There would be no physical changes to this LCA as a result of the Proposed Development.	N/A
Visual characteristics	One of the key characteristics of this landscape is the <i>"Open landform and lack of tree cover allows for expansive and distant views to edge of settlement, often situated on the skyline"</i> ¹² . Church spires in Earl Shilton and Burbage also form historic landmark structures in the landscape. Both factors are indicative of a higher visual susceptibility. However, this is counterbalanced by the existing levels of visual intrusion from pylons and settlement edges as well as by the movement of traffic along the A47. Reference to CPRE's light pollution and dark skies mapping ¹⁷ indicates that radiance levels across this LCA are moderate.	Medium
Perceptual characteristics	This is a landscape which displays some visual contributors to tranquillity (i.e. presence of natural features) but also features recognised visual detractors from tranquillity including visibility of urban development and overt human impact in the pylons which traverse the landscape. The LCA is bounded along its northern edge by the A47, which introduces movement within the landscape with the associated aural influence of traffic. The proximity of this landscape to the neighbouring heavily settled landscape of UCA 10 means that it is a landscape in which perceptions of remoteness, tranquillity and naturalness range from Medium to Low depending on location.	Medium to Low
Overall susceptibility	Overall susceptibility to the type of development proposed is considered to be Low.	Medium
Overall sensitivity to the Proposed Development		
The overall value of this LCA is Medium and the overall susceptibility is Medium resulting in a Medium overall sensitivity.		

Magnitude of landscape change and level of effect

- 10.10.22 Construction phase: A review of baseline photography from viewpoints within this LCA (Viewpoints 3, 4, 11 and 12) indicates that ground and low-level construction activities across the Site would be largely screened as a consequence of separation distance allied with the coalescence of intervening field boundary vegetation including occasional mature trees and the gradually maturing vegetation along the northern and southern sides of the A47 and its embankments/cuttings. This would weaken the visual effects pathway between this LCA and construction activities within the Site. As demonstrated in the baseline photograph from Viewpoint 11 (see **Figure 10.12**), from some areas within the LCA closer to its northern boundary, the more elevated field to the east of the WwTW and south of Mill Lane would be visible. Construction activities within this part of the Site would introduce a contrast in colours and textures with the intervening and surrounding agricultural landscape but the clearly defined sense of separation between these works and the LCA which is created by the A47 and the urban fringe context within which these activities would be perceived would reduce the potential effects.
- 10.10.23 In terms of perceptual effects, the noise, movement and disturbance associated with construction activities would take place close to the A47 and where *"Major transport corridors dissect the landscape and introduce noise and movement"* is a key characteristic of LCA F. As a consequence, this activity would be incremental to the audible role that traffic on the A47 already has and the resultant lower levels of tranquillity already established across the northern part of this LCA.
- 10.10.24 The magnitude of change is assessed as **Low**, which when combined with a medium receptor sensitivity (as concluded in **Table 10.10**), would give rise to a **Minor** level of effect which would be **adverse** and **Not Significant**.

- 10.10.25 Operational phase: The operational development extending across the Site would introduce built development closer to this LCA with a corresponding slight intensification in urbanising influence. However, this would represent an incremental effect to a baseline key characteristic which notes the *"Urban fringe influences as a result of exposed settlement edges of Hinckley and Earl Shilton situated on higher ground"*¹² as opposed to a new or uncharacteristic effect. This intensification would principally affect the northern fringes of the section of LCA within the Study Area closest to the A47, which represents an area where higher levels of movement and audible role of traffic along the A47 already contribute to lower levels of tranquillity and where built form within Earl Shilton are a visual component in outward views as demonstrated in the photograph from Viewpoint 11 in **Figure 10.12**. The visual and perceptual effects pathway between the Proposed Development and this LCA would weaken with increasing separation distance and the remaining key characteristics would not be altered. This small, partial change to the landscape character, primarily affecting a localised geographical extent along the northern fringes would give rise to **Low** magnitude of change. When combined with the Medium sensitivity of this LCA, the effects would be **Minor, adverse** and **Not Significant**.
- 10.10.26 A summary of the results of the assessment of the landscape effects is provided in **Table 10.11**.

Table 10.11 Summary of significance of adverse landscape effects during construction and operation

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Agricultural land (arable land, semi-improved grassland and improved grassland)	Low	High	Moderate Not Significant	The sensitivity of this landscape element when considering its value (Low) and susceptibility (Low) is assessed as Low. Areas of existing grassland and arable land would gradually be lost as the construction phase progresses and would be replaced with a more varied combination of hard and soft landscape elements which are more characteristics of an urban environment. The magnitude of change would be High and would result in a level of landscape effect which would be Moderate. Although a moderate level of effect is potentially significant under the methodology set out in Table 10.8, the loss of existing grassland and arable land would not alter the key characteristics of the host UCA or the neighbouring LCAs given its prevalence within the wider landscape and would therefore be Not Significant.
Hedgerows	Medium	Very Low	Negligible Not Significant	The sensitivity of this landscape element when considering its value (Medium) and susceptibility (Medium) is assessed as Medium. A large proportion of the hedgerows across the Site have been incorporated into the Proposed Development with the exception of a small number of short sections that would be removed to facilitate access and the internal road network. Retained hedgerows would be reinforced and improved through gapping up and widening, whilst new hedgerow would be created along the boundaries of the Site where appropriate and would compensate for that lost.
Trees (individual and groups)	High	Low	Moderate Not Significant	The sensitivity of this landscape element when considering its value (Medium) and susceptibility (High) is assessed as High. The majority of on-site individual trees and group of trees have been incorporated into the Proposed Development within a landscape framework. The small loss of trees and the subsequent introduction of additional trees within the Site along the green corridors, within the development blocks and as street trees would give rise to a low magnitude of change. The resultant Moderate level of effect is assessed as being Not Significant as a consequence of the limited contribution that trees make to the wider landscape character.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
UCA 10: Earl Shilton	Low	Medium (construction)	Minor (construction) Not Significant	The landscape sensitivity of this UCA is assessed as Low in Table 10.9 as a result of a value which is judged to be medium and the susceptibility to the type of change proposed assessed as being low. During the ten-year construction phase, the introduction of uncharacteristic elements associated with construction activities and the gradual emergence of built form and highways infrastructure, would alter existing landscape patterns and would lead to increased complexity across the Site. Direct landscape effects would be concentrated within the eastern part of the UCA with a limited visual effects pathway occurring elsewhere due to the screening provided by existing built form. Any aural influence of construction activities would be perceived within the baseline context of an urban environment and the A47. The majority of valued landscape elements within the Site (hedgerows and trees) would be retained and protected and the key characteristics of UCA 10 would not be altered. The completed built development, set within a framework of retained hedgerows and trees would reflect development which is already present within the UCA in terms of density, scale, height and land use and would contribute to three of the Townscape Strategies for this UCA set out in the <i>Hinckley and Bosworth Borough Landscape Character Assessment</i>¹². Whilst the character within the Site would alter, this would not be uncharacteristic of the UCA, and its key characteristics would remain unchanged.
		Low (operation)	Negligible (operation) Not Significant	
LCA F: Burbage Common Rolling Farmland	Medium	Low (construction)	Minor (construction) Not Significant	Ground and low-level construction activities across the Site would be largely screened as a consequence of separation distance and topography allied with the coalescence of intervening vegetation including the gradually maturing vegetation along the A47. This would weaken the visual effects pathway between this LCA and construction activities within the Site. From some areas within the LCA closer to its northern boundary, the more elevated fields would be visible and construction activities within this part of the Site would introduce a contrast in colours and textures with the intervening and surrounding agricultural landscape. However, the sense of separation created by the A47 and the urban fringe context within which these activities would be perceived would reduce the potential effects. Any perceptual effects from noise would be incremental to the audible role that traffic on the A47 already has and the resultant lower levels of tranquillity already established across the northern part of this LCA. The operational development would introduce built development closer to this LCA with a corresponding slight intensification in urbanising influence but would not represent a new or uncharacteristic visual element as built form within Earl Shilton is already a
		Low (operation)	Minor (operation) Not Significant	

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				component in baseline outward views. The visual and perceptual effects pathway between the Proposed Development and this LCA would weaken with increasing separation distance and the partial change to the landscape character would primarily affect a localised geographical extent along the northern fringes of this LCA.

1. The sensitivity of a receptor is defined using the criteria set out in **Section 10.9** and **Appendix 10A** and is defined as low, medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 10.9** and **Appendix 10A** and is defined as very low, low, medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity of a receptor and the magnitude of change and is expressed as major (Significant) or moderate (Potentially Significant) or minor/negligible (Not Significant), subject to the evaluation methodology.

10.11 Assessment of visual effects

Residential visual receptors

Residents at properties on Mill Lane and Union Mill Close

- 10.11.1 A small number of residents at private properties along Mill Lane (to the east of Earl Shilton Cemetery) experience oblique and filtered views of a small portion of arable fields within the Site to the south of Mill Lane from windows and curtilage at the front of their properties. Views towards the fields within the northern part of the Site are also potentially available from rear gardens and windows. At ground level some of these views are filtered by hedgerows located along Mill Lane or by sheds and outbuildings in rear gardens, however, from upper storey windows views across parts of the Site to the north and south of Mill Lane are likely to be available. Views further into the Site are screened by vegetation associated with the WwTW. For residents in properties on Union Mill Close, the field survey noted that views across the Site to the south of Mill Lane are available from rear windows and gardens over the low boundary fence which separates the gardens from the Site. The baseline view from a location close to the properties on Mill Lane (to the east of Union Mill Close) is shown in Viewpoint 1 in **Figure 10.2**.

Residents at properties on Breach Lane

- 10.11.2 There are a small number of properties along the southern side of Breach Lane which are orientated north-east towards the Site and whose residents are likely to experience filtered views, principally from upper storey windows, of arable fields within the southern parts of the Site. These are filtered through a combination of garden vegetation as well as overgrown but sparse hedgerow that follows the northern side of Breach Lane.

Residents at properties on King Richard's Hill

- 10.11.3 Private properties on King Richard's Hill (between Thurlaston Road and Mill Lane) are located adjacent to the north-western corner of the Site and as a result, residents at seven properties experience partially filtered views fields within the northern part of the Site from the front or rear of their two-storey properties. Further views of the Site (south of Mill Lane) are screened due to intervening vegetation and topography. Viewpoint 16 represents the view from King Richard's Hill and the baseline photography from this location is shown in **Figure 10.17**.

Residents at properties on Equity Road East

- 10.11.4 Residents at properties along the eastern side of Equity Road East (to the south of Townlands Church of England Primary School) currently have a limited visual relationship with the Site. Whilst the two-storey properties are orientated broadly east-west with the potential for residents to experience views towards the fields within the southern part of the Site from rear windows and long back gardens, mature tree cover along the eastern boundary of the gardens, a section of which coincides with the western boundary of the Site, heavily filters views.

Residents at properties on Meadow Court Road and Astley Road

- 10.11.5 Residents at two-storey properties along Meadow Court Road and Astley Road back onto a short section of the northern boundary of the Site and as a result experience partially filtered, close distance views of un-managed grassland, scrub and hedgerows within the western part of the Site from their rear gardens and windows on the rear elevation of their properties. Further views of the Site are screened due to intervening vegetation and topography within the Site. As Astley Road

heads northwards, properties along its eastern side are orientated west-east with open or partially filtered views which extend across Weaver Springs Park with some occasional long-distance views to the east also available.

Residents at properties on, The Leecrofts

- 10.11.6 Residents in the two-storey properties along the eastern side of The Leecrofts are orientated east-west. Easterly views towards the Site are restricted by a dense hedgerow which follows the eastern boundary of Weaver Springs Park.

Residents at properties on Weaver Road

- 10.11.7 Two-storey semi-detached properties along the southern side of Weaver Road are orientated north-south with rear gardens which extend to the south. Residents ground level views are foreshortened by the dense hedgerow which lines the northern boundary of Weaver Springs Park which contains a proportion of coniferous species. The rear gardens of some of the properties in this group also contain tall coniferous trees. Partial views across Weaver Springs Park and towards the overgrown hedgerows which visually divide the Site would be available from rear, upper storey windows.

Residents at properties on Montgomery Road

- 10.11.8 Residents in two and three-storey properties on Montgomery Road, to the west of its junction with Parry Close experience views primarily of un-managed grassland, the recreational grounds and scrub and overgrown hedgerows within the northern (central) part of the Site. Properties are orientated north-south and the field survey indicated These views are often partially or more substantially filtered through rear garden and boundary vegetation and are primarily from the rear, upper storey windows of properties and potentially from ground floor windows and rear gardens. Views of arable fields on the elevated southern parts of the Site are filtered through intervening Site hedgerows/hedgerow trees and views of the low-lying central parts of the Site are restricted due to the topography.

Residents in the community of Earl Shilton with middle distance views of the Site

- 10.11.9 Intervening built form restricts middle distance views from the majority of residents within Earl Shilton. However, as land rises to the north, a limited number of properties may have oblique and filtered views from upper storey windows of more elevated parts of the Site, predominantly the southern and northern elevated fields, as intervening vegetation restricts other views across the Site.

Residents at Mirfield Farm

- 10.11.10 The two-storey farmhouse at Mirfield Farm is located on the southern side of Mill Lane and is orientated north-south with gardens which extend to the north between the property and Mill Lane. The garden is enclosed along its western, northern and eastern boundaries by deciduous trees and hedgerow whilst single storey agricultural buildings are sited to the west, with a larger barn located to the south-west of the dwelling. A combination of the farm buildings and garden boundary vegetation is likely to foreshorten residents' views towards the Site. In winter months residents may experience heavily filtered views through garden boundary vegetation of the fields within the northern part of the Site (north of Mill Lane)

Residents at Huit Farm

- 10.11.11 There are two properties at Huit Farm. The southern-most property is a bungalow which is orientated east-west so that residents' views are directed towards the Site. However, a hedgerow along the western garden boundary is likely to foreshorten views from the garden and ground floor windows.
- 10.11.12 The two-storey property to the north is orientated north-south with a small garden which extends to the south. A line of mature copper beech trees forms part of the hedgerow along the western side of Breach Lane to the west of this property and its garden and is likely to heavily filter views towards the Site from any western, gable end windows and rear garden in the summer month and partially filter westerly views in the winter months. The field survey indicated that a number of outbuildings associated with the farm are located to the north of the property and are likely to interrupt views towards the northern part of the Site from windows on the front (northern) elevation. As a consequence, residents' views towards the northern part of the Site are likely to be partial, with middle distance views including the WwTW and the built form of Earl Shilton. Views of the low-lying central and elevated southern parts of the Site are restricted because of local variations in topography and hedgerow boundaries. The baseline view from a location close to Huit Farm is shown in Viewpoint 11 in **Figure 10.12**.

Residents at Breach Lane Farm

- 10.11.13 The two-storey private property at Breach Lane Farm is located on the southern side of Breach Lane and is orientated east-west with two ground floor and two upper storey windows on the northern elevations. Residents of Breach Lane Farm experience no views of the fields within the Site due to cuttings associated with the A47, maturing vegetation on the roadside cutting and intervening hedgerow/hedgerow tree cover including that in close proximity to the property on the northern side of Breach Lane. The baseline view from a location close to Breach Lane Farm is shown in Viewpoint 12 in **Figure 10.13**.

Residents within the community of Elvesthorpe

- 10.11.14 A number of properties along Station Road and Leighton Crescent within Elvesthorpe coincide with the ZTV as shown in **Figure 10.1**. The field survey indicated that residents within the community of Elvesthorpe have no views of the fields within the Site and the coalescence of intervening mature trees, hedgerows and roadside vegetation along the A47 together with the on-site topography restrict views. The baseline view from a location close to the northern edge of Leighton Crescent is shown in Viewpoint 3 in **Figure 10.4**.

Recreational visual receptors

Users of the PRoW in the north-eastern part of the Site (PRoW no. 1)

- 10.11.15 Users of the PRoW (Bridleway U16) in the north-eastern part of the Site running from Mill Lane to the A47 (PRoW No. 1 on **Figure 10.23**) experience open views eastwards, primarily across the large adjacent arable field. Dense vegetation surrounding the WwTW obstructs views of the low-lying central areas and filters views toward the south and west of the Site. Views towards the agricultural landscape to the east of the A47 are available from the more elevated northerly section of the route whilst from the southern section, easterly views are foreshortened by an embankment and gradually maturing vegetation alongside the A47. Baseline views from this route are shown in **Figure 10.6** and **Figure 10.7** (Viewpoints 5 and 6).

Users of the PRoW immediately south of the WwTW (PRoW no.2)

- 10.11.16 Users of the PRoW immediately south of the WwTW (Footpath U17), running north toward Earl Shilton (PRoW No. 2 on **Figure 10.23**) experience a range of views along its length due to changes in topography and intervening vegetation. From the northern section of the PRoW foreground views are predominantly of un-managed grassland, scrub, the WwTW and a scout hut in the distance. Further views of arable fields along the eastern parts of the Site are visible above hedgerows but the remainder of the Site is screened by intervening vegetation (refer to Photographic Viewpoint 8, **Figure 10.9**). Due to its location along the low-lying valley, views from southern section of the PRoW consist of foreground views of arable fields with the A47 embankment and associate gradually maturing vegetation foreshortening views to the east as illustrated in the baseline view from Viewpoint 7 in **Figure 10.8**. Rising topography and intervening hedgerows obstruct any further views of the Site.

Users of the PRoW running centrally through the Site (PRoW no.3)

- 10.11.17 Users of the PRoW (Footpath T89) running centrally through the Site (PRoW No. 3 on **Figure 10.23**) experience different views along its length. Views from the northern section of the PRoW (looking southward) are predominantly of un-managed grassland and overgrown hedgerows. Intervening hedgerows in the foreground filter views to the elevated southern parts of the Site. Views from the southern section of the PRoW (looking northward) are predominantly of open arable fields with Earl Shilton on the skyline. Low-lying central parts of the Site are screened by hedgerows as are views west of the Site. The baseline view north from this route is represented by Viewpoint 9 in **Figure 10.10**.

Users of the PRoW in the western part of the Site (PRoW no.4)

- 10.11.18 Users of the PRoW in the southern part of the Site (Footpath T90), running from Breach Lane to Meadow Court Road (PRoW No. 4 on **Figure 10.23**) have views across arable fields looking toward Earl Shilton with the St Simon and St Jude Church Spire forming a prominent local landmark on the skyline as illustrated in the baseline view from Viewpoint 2 in **Figure 10.3**. Looking in a southerly direction from Viewpoint 10 (**Figure 10.11**), intervening overgrown hedgerow and trees which form the boundary of the fields restrict any further views to the south or east of the Site. Intervening hedgerow and tree cover also obstruct views of low-lying central parts of the Site.

Users of the PRoW immediately adjacent to the southern edge of the Site (PRoW no.5)

- 10.11.19 PRoW (Bridleway U105) users immediately adjacent to the southern edge of the Site (PRoW No. 5 on **Figure 10.23**) experience partial and filtered views across the Site with the intervening boundary hedgerow and gradually maturing trees and shrubs introduced as part of the A47 development filtering views across the Site. There are partial views of arable fields within the Site and of the WwTW with properties on the southern edge of Earl Shilton visible along the ridgeline in the middle distance. The spire of the St Simon and St Jude Church is a prominent local landmark which can be seen at certain points along the bridleway's length. Central low-lying areas are less visible due to intervening hedgerows within the Site. The baseline view from this PRoW is represented by Viewpoint 13 in **Figure 10.14**.

Users of the PRoW leading toward Mirfield Farm (PRoW no.6)

- 10.11.20 Users of the PRoW (Footpath T88) leading toward Mirfield Farm from Barrow Hill Quarry (PRoW No. 6 on **Figure 10.23**) have partial views of fields within the elevated parts of the Site with other views across the fields restricted due to the embankment associated with the A47 road corridor and

Mirfield Farm. Properties within Earl Shilton and mature trees within the Site can be seen above the A47 road embankment.

Users of the PRoW east of the A47 (PRoW no.7)

- 10.11.21 Users of the PRoW to the east of the A47 (Bridleway U16/PRoW No.7 on **Figure 10.23**) running from the Mill Lane entrance to Huit Farm experience a range of views as they travel along its length. From along the majority of the route and where the bridleway runs parallel with the A47, views towards the Site are obscured by the A47 embankment with a concrete underpass providing the only a glimpsed view towards the Site as illustrated in the baseline view from Viewpoint 4 in **Figure 10.5**. However, further towards the entrance gate along Mill Lane (from along the far northern section of the route where the embankment is absent), partial views of the Site are available through and above the hedgerow which lines the eastern boundary of the Site and the gradually maturing trees and shrubs introduced as part of the A47 development, with the edge of Earl Shilton visible on the ridgeline.
- 10.11.22 For receptors travelling north-bound from Huit Farm, the type of view available is indicated by the baseline view from a location on the bridleway close to Huit Farm which is shown in Viewpoint 11 in **Figure 10.12**. Middle distance views of the field to the south of Mill Lane are available which also include the WwTW and the built form of Earl Shilton. Views of the low-lying central and elevated southern parts of the Site are restricted because of local variations in topography and hedgerow boundaries whilst views of the fields to the north of Mill Lane are restricted by the hedgerow which marks the route of Mill Lane.

Users of the PRoW leading toward Huit Farm from the south-east (PRoW no.8)

- 10.11.23 Northbound users of the PRoW leading toward Huit Farm from the south-east (PRoW No. 8 on **Figure 10.23**), experience occasional glimpsed, transient and oblique views of the elevated, southern arable fields and of the rising arable field to the south of Mill Lane. However, the views are partially restricted by foreground and more distant intervening hedgerows and hedgerow trees, farm buildings within Huit Farm and a fall in topography toward the stream to the south.

Users of the PRoW south of Breach Lane Farm (PRoW no.9)

- 10.11.24 The view from the northern end of this PRoW (Footpath T89/PRoW No. 9 on **Figure 10.23**) as it exits onto Breach Lane is shown in the baseline view from Viewpoint 12 in **Figure 10.13** which indicates that there are no views across the fields within the Site due to cuttings associated with the A47, maturing vegetation on the roadside cuttings and intervening hedgerow/hedgerow tree cover including that along the northern side of Breach Lane. This situation would be maintained for receptors travelling northbound along the route to the south of Viewpoint 12 where the limited availability of views across the Site would be reinforced by the lower topography, increasing separation distance and additional layers of vegetation between the route and the Site as demonstrated in the baseline photography from Viewpoint 3 in **Figure 10.4**.

Users of the PRoW south of the Site (PRoW no.10)

- 10.11.25 The ZTV in **Figure 10.1** indicates that a large proportion of the routes in this area (PRoW No. 10 on **Figure 10.23**), specifically the bridleway which runs parallel with the A47, lie outside of the ZTV. The exception is a short section of route where footpaths U20 and U21 converge although in reality, the intervening hedgerows (which are not reflected in the ZTV calculation) means that no views of the Site are available from this route.

Users of the PRoW to the north of Earl Shilton (PRoW no.11)

- 10.11.26 The northern half of this PRoW (Footpath T86/PRoW No. 11 on **Figure 10.23**) lies within the ZTV shown in **Figure 10.1**. The baseline view from Viewpoint 18 in **Figure 10.19** indicates that whilst the northern fringes of Earl Shilton are clearly visible, the intervening field boundary hedgerows (which are not reflected in the ZTV calculation) foreshorten views to the south-east towards the northern edge of the Site. As a consequence, there are no baseline views across the Site.

Users of Mill Lane

- 10.11.27 Mill Lane is not a dedicated PRoW but signage at its western and eastern ends indicates that it is used by pedestrians, cyclists and horse riders. Users of Mill Lane experience glimpsed views of the northern parts of the Site (i.e. the fields immediately north and south of Mill Lane, extending as far as the WwTW) through infrequent gaps in hedgerow vegetation running along both sides of Mill Lane as illustrated in the baseline view from Viewpoint 21 in **Figure 10.22**.

Users of the highway footpath along the A47

- 10.11.28 Users of the A47 footpath and cycleway experience similar views to A47 road users; however, their view is sustained over a longer period of time due to the lower speed of travel. Views at locations along the footpath are represented by the baseline views from Viewpoints 19 and 20 in **Figures 10.20** and **10.21** respectively. From the section of footpath to the north of the Thurlaston Lane Bridge, a combination of roadside hedgerow, gradually maturing roadside trees and roadside cuttings which form steep banking to the east of the footpath filter or foreshorten views. As a consequence, there are no baseline views across the Site from this section of the highway footpath.
- 10.11.29 For the section of the A47 to the south of Thurlaston Lane, views towards the Site are initially foreshortened by the steep sided cutting to the east of the A47. To the south of Mill Lane, this cutting is no longer present, and views are instead filtered by the hedgerow along the eastern boundary of the Site and by gradually maturing roadside trees and shrubs. Views from along this section of highway footpath are represented by the baseline photograph in Viewpoint 20 (**Figure 10.21**) which illustrates that partial views across the Site to the south of Mill Lane are available with properties along the southern edge of Earl Shilton also evident in receptors views. The A47 and associated highway footpath remains at grade or at a slightly higher elevation compared to the Site over an approximately 850 m section of the route to the south of the Mill Lane, after which roadside cuttings and gradually maturing vegetation again restrict views across the Site.

Users of Weaver Springs Park

- 10.11.30 Users of Weaver Springs Park which is accessed via Astley Road experience clear open views across of the arable fields within the eastern part of the Site with the WwTW and the smaller scale fields which comprise un-managed grassland around the settlement edge screened by the overgrown hedgerow along the eastern perimeter of the Park. Further overgrown hedgerows separating the northern most fields area are visible as is the un-managed grassland across fields immediately south of the managed grassland of the sports pitches. There are distant views of the agricultural landscape to the east (and beyond) punctuated by pylons which are visible above the distant horizon. Views of southern parts of the Site become screened due to rising topography, intervening hedgerows/hedgerow trees and built form to the edge of Earl Shilton. The baseline view from the north-western corner of the Weaver Springs is shown in Viewpoint 15 (**Figure 10.16**).

Vehicular visual receptors

Road users of Thurlaston Lane (Refer to Photographic Viewpoint 14 and 17 – Figures 10.10 and 10.12)

- 10.11.31 Road users travelling east or westbound along the section of Thurlaston Lane to the east of the A47 experience views of the northern most field over a well-maintained northern boundary hedge or through field gates as represented in the baseline photograph from Viewpoint 17 in **Figure 10.18**.
- 10.11.32 For receptors travelling west-bound to the east of the A47, views across the fields within the Site are restricted by intervening hedgerows along the southern side of Thurlaston Lane and along the eastern and western boundaries of the fields which lie either side of the A47. There are partial views of the rooftops of built form associated with the north-eastern edge of Earl Shilton.

Road users of A47 (Refer to Photographic Viewpoint 13 and 19 – Figures 10.10 and 10.13)

- 10.11.33 The types of views available to drivers and vehicle passengers travelling along the A47 is comparable to those described for users of the highway footpath although views would be experienced at higher speeds (60 mph).

Predicted effects and their significance

Overview of visual changes

- 10.11.34 Visual changes associated with the construction phase are driven principally by the loss of vegetation, land cover and a change to the composition of views as a consequence of plant and materials that would be operating and stored on-site. Existing views may potentially be foreshortened through the introduction of new elements; opened up through the removal of vegetation or altered upon by the introduction of new activities and elements.
- 10.11.35 Due to the localised nature of views and the extent of the Site, only certain phases of construction would be experienced by visual receptors. In addition, construction effects would be replaced on a phased basis with views of new and operational built form and construction and operation effects would overlap in some views. However, due to limited information available on the phasing of the Proposed Development at this outline application stage, construction and operational effects have been assessed separately.
- 10.11.36 Visual changes associated with the operation of the Site would result from permanent changes in land-use and the introduction of new built form and its operation. Similar to the construction period, no visual receptors would have a complete view of the entire Proposed Development.
- 10.11.37 The assessment of the visual effects for the construction phase is provided in **Table 10.12** and the operational phase in **Table 10.13**. The type of visual effect during the construction phase is assessed as adverse for all receptors unless a neutral or beneficial visual effect is specifically referred to under an individual receptor entry. This is due to construction activities typically being considered as incongruous visual components, contrasting with the natural features and semi-rural nature of baseline views.
- 10.11.38 The type of change (i.e. adverse, beneficial or neutral) is more difficult to establish in relation to the operational phase, noting there would often be improvements to the visual amenity experienced by a receptor between Year 1 and Year 15 views following the growth of mitigation planting. The Proposed Development layout has accommodated existing PRow, largely set within green corridors where existing planting would be retained where possible and supplemented with new planting. In addition, appropriate privacy distances and orientation between existing residential properties and the proposed residential units has been carefully considered. Notwithstanding the mitigation

proposals, it is accepted that some existing views across the Site, predominantly rural in character would be replaced by views that would be more suburban in character. Consequently, the type of change is typically assessed as adverse, noting that the magnitude of change relative to the baseline view may reduce as a result of the growth of mitigation planting.

Table 10.12 Assessment of the visual effects during construction

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Residential visual receptors Sensitivity: Residents are assessed as possessing high susceptibility in accordance with GLVIA3 paragraph 6.33. There is a high likelihood that these receptors attach a medium or high value to the private views that are available from the windows and curtilage of their properties with views that are often of moderate scenic quality. As such the sensitivity of receptors is assessed as High.				
Residents in properties adjacent to the Site boundary				
Residents at properties on Mill Lane and Union Mill Close (Refer to Viewpoints 1 and 21 – Figures 10.2 and 10.22)	High	Medium to High	Major Significant	A small number of residents at five private properties on the northern side of Mill Lane (nos 115-123) would experience oblique, filtered views of construction activities in the north-eastern part of the Site (north and south of Mill Lane). Receptors looking south from the ground floor windows and curtilage of the properties, would experience oblique views of elevated construction activities (e.g. the tops of machinery and plant such as cranes or concrete silos) above the existing native hedgerow whereas from upper floor windows, receptors would experience clear, close and middle distance oblique views of construction activities. Views towards the southern parts of the Site are screened by intervening vegetation surrounding the WwTW. Views north from windows on the rear elevation and rear gardens would feature construction activities that would appear as a noticeable feature in winter months when garden vegetation has a minimal screening role and would introduce elements considered incongruous to existing views across the adjacent agricultural fields. Views from the rear ground floor and upper storey windows and gardens of five, two-storey private properties on Union Mill Close would also feature construction activities across the fields to the south of Mill Lane, visible above the low boundary fence or partially filtered through the overgrown field hedgerow although any elevated crane activities deployed for the construction of the employment units would be visible above the intervening vegetation. Overall, it is considered that construction activities would result in a medium to high magnitude of change due to the proximity of residents to construction activity and the moderate to large proportion of their views which would be altered.
Residents at properties on Breach Lane (Refer to Viewpoint 2 – Figure 10.3)	High	Medium	Major Significant	Residents at four private properties would experience close distance views of construction activities associated with the SuDS and dwellings in the southern part of the Site. These would be filtered through vegetation associated with the overgrown, single-width hedgerow along Breach Lane and existing domestic garden vegetation. As a consequence, views would predominantly be available from upper floor windows although the sparse nature of the hedgerow along the northern side of Breach Lane means that filtering may be less effective during the winter views with views potentially

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				available from ground floor windows and the curtilages of properties. Once dwellings along the northern edge of Breach Lane have been constructed these would obscure other construction activities across the Site. Overall, the magnitude of change in winter months for this small proportion of private residents is considered to be Medium
Residents at properties on King Richard's Hill (Refer to Viewpoint 16 – Figure 10.17)	High	Medium	Major Significant	A small number of residents on the eastern side of King Richard's Hill would experience views of construction activities within the northern part of the Site (north of Mill Lane). Private properties along this edge are predominantly orientated so that residents' views are directed away from the Site and back gardens comprise of fencing along with domestic vegetation. Four properties are orientated so that residents' views from the front of their properties are directed towards the Site whilst residents at a further three dwellings may have views from the rear of their properties. Whilst the foreground of residents' views would remain unaltered, the limited vegetation along the northern boundary of the closest part of the Site to King Richard's Hill means that construction activities would appear as a noticeable feature and would introduce elements considered incongruous within existing views. Elevated construction activities within the far northern spur of the Site would also be visible above the intervening mature hedgerows which lines the western boundary of this part of the Site. Existing domestic garden vegetation may filter some views reducing the magnitude of visual change however construction would still give rise to visual disturbance and contrast and would be a noticeable visual component resulting in a medium magnitude of change. Due to the receptor's orientation (only having views west and east), construction activity across other parts of the Site would not be visible.
Residents at properties on Equity Road East	High	Low	Moderate Not Significant	Residents at properties along the eastern side of Equity Road East (to the south of Townlands Church of England Primary School) currently have a limited visual relationship with the Site. Whilst the two-storey properties are orientated broadly east-west with the potential for residents to experience views towards the fields within the southern part of the Site from rear windows and long back garden, mature tree cover along the eastern boundary of the gardens, a section of which coincides with the western boundary of the Site heavily filters views. As a consequence, ground and low-level construction activities would have a limited visual role once they move into the southern part of the Site. Should cranes be deployed, the upper parts may be visible through the intervening vegetation for a brief period, occupying a narrow proportion of the horizontal field of view hence the magnitude of change would not exceed Low. The brevity of visual change as a consequence of potential elevated construction activities means that the Moderate level of effect is assessed as being Not Significant.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Residents at properties on Meadow Court Road and Astley Road	High	Medium to High	Major Significant	16 properties along the southern side of Meadow Court Road and Astley Road are orientated north-south with small rear gardens which extend to the south providing opportunities for residents to experience views across the northern fields within the Site. Fencing, garden boundary hedgerow and occasional garden shrub/tree cover provides screening from ground floor windows and gardens for residents at private properties within this western half of this group whilst more open views would be available from upper storey windows and the five eastern most properties. The construction activities would be visible in the foreground from upper storey windows and from properties and rear gardens on Astley Road and would extend across a moderate to large proportion of residents' southerly views. As a consequence, the magnitude of change in winter months when vegetative screening is less effective would be Medium to High. For residents in up to 17 private properties along the eastern side of Astley Road as it turns and heads north, there would be direct and oblique views of construction activities as they extend across the Site beyond Weaver Springs Park, with partial screening/filtering provided by rear garden vegetation and the overgrown hedgerows within the Site. The degree of contrast and moderate extent of the view which may be altered as a consequence of construction activities extending across the middle ground and by elevated construction activities as they extend across a greater proportion of the Site would give rise to a Medium magnitude of change.
Residents at properties on The Leecrofts	High	Low	Moderate Not Significant	The views of residents of private properties along the eastern side of The Leecrofts would be screened by the dense hedgerow which follows the eastern boundary of Weaver Springs Park. The east-west orientation of properties and presence of intervening hedgerows within the Site means that views towards construction activities from ground floor windows on the eastern elevation and east facing gardens are likely to be limited. Taller construction activities taking place across the field to the east of Weaver Springs Park may be evident for a short duration from upper storey windows, affecting a limited proportion of the horizontal angle of view. The magnitude of change would be Low.
Residents at properties on Weaver Road	High	Medium	Major Significant	Residents at two-storey private properties along the southern side of Weaver Road would experience middle-distance views of ground level construction activity as it extends across fields to the south and west of the WwTW. The dense hedgerow which lines the northern boundary of the Park (which contains some coniferous species) and moderate proportion of coniferous tree cover within rear gardens results in views that are primarily from rear upper storey windows with views from ground floor windows

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				(i.e. rooms that might normally be expected to be occupied in daylight hours) and gardens generally restricted. The foreground of residents' views across Weaver Springs Park would remain unchanged. Elevated construction activities across other parts of the Site may also be evident above overgrown hedgerows within the Site. The degree of contrast generated by this activity and the moderate proportion of residents' views that would be affected would give rise to a Medium magnitude of change
Residents at properties on Montgomery Road	High	High (properties between Avenue South and Ronald Toon Road) Low (properties between Ronald Toon Road and Parry Road)	Major Significant Moderate Not Significant	From six two-storey properties along the southern side of Montgomery Road between Avenue South and Ronald Toon Road, ground level and elevated construction activity would be evident in close proximity, extending across land to the south of the properties' rear gardens and southern boundaries. The field survey indicated that relatively open views are available above a low boundary hedgerow from both ground floor (i.e. rooms that might normally be expected to be occupied in daylight hours) and upper storey windows. The degree of visual contrast, proximity and extent of residents' southerly views which would be altered would give rise to a High magnitude of change. The orientation of dwellings between Ronald Toon Road and Parry Close means that residents' views towards the Proposed Development would be oblique and partially filtered by the mature hedgerow which lines the boundary of the Site to the south of the properties or would be interrupted by other built form within this block of dwelling. For this sub-group of residents, the magnitude of change as a consequence of the construction activities across the northern most fields to the east of Weaver Springs Park would be Low.
Residents in properties which coincide with the ZTV				
Residents in Earl Shilton with middle distance views of the Site	High	Very Low	Minor Not Significant	For a small number of residents within Earl Shilton, oblique, distant views of elevated construction activities could potentially be visible from upper storey windows, above rooftops of intervening built form within and along the edges of Earl Shilton. Construction activities would form a small part of existing view of built form and would be available from upper storeys of private properties which may not be rooms normally occupied in waking or daylight hours (as set out in paragraph 6.36 of GLVIA3) resulting in a Very Low magnitude of change.
Residents at Mirfield Farm	High	Low	Moderate Not Significant	Residents at the private property associated with Mirfield Farm would experience oblique, heavily filtered views through both mature garden boundary trees and intervening vegetation associated with the A47, of construction activities across the north-eastern field within the Site (north of Mill Lane), during the winter months. Views

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				towards construction activities across areas of the Site to the south of Mill Lane, from windows on the southern (rear) elevation, would be limited as a consequence of farm outbuildings to the west of the property, the heavily oblique nature of the views and the layers of vegetation in the intervening landscape. As a consequence, the magnitude of change would not exceed Low during winter months and the Moderate level of effect is assessed as being Not Significant given the seasonal nature of this effect
Residents at Huit Farm (Refer to Viewpoint 11 – Figure 10.12)	High	Low	Moderate Not Significant	Residents in the private bungalow at Huit Farm would experience very limited views of construction activities across the southern part of the Site as a consequence of the garden boundary hedgerow which extends to the west of the property. The baseline view in Figure 10.12 indicates that for receptors at the two-storey farmhouse, construction activities extending across the rising field to the south of Mill Lane and field south of the WwTW would be available from windows on the northern elevation although these would be framed between farm outbuildings which extend to the north of the property. A minimum separation distance of 450 m together with the framed nature of the view and baseline visual context in which the WwTW and properties within Earl Shilton are already components of the view, means that construction activities are unlikely to be of a scale which would give rise to a magnitude of change which would exceed Low.
Residents at Breach Lane Farm (Refer to Viewpoint 12 - Figure 10.13)	High	Low	Moderate Not Significant	Residents at the private property associated with Breach Lane Farm would experience no views of ground or low level construction activities across the southern part of the Site due to the screening provided by gradually maturing vegetation along the cuttings associated with the A47. Should cranes be deployed within this part of the Site, the upper parts may be visible above the intervening vegetation for a brief period, occupying a narrow proportion of the field of view hence the magnitude of change would not exceed Low. The brevity of visual change as a consequence of potential elevated construction activities means that the Moderate level of effect is assessed as being Not Significant.
Residents in the community of Elvesthorpe (Refer to Viewpoint 3 – Figure 10.4)	High	Very Low	Minor Not Significant	A small number of residents on the northern edge of Elvesthorpe have the potential to experience oblique, filtered, middle distance views of elevated construction activities across the southern elevated part of the Site. The cutting and gradually maturing vegetation associated with the A47, intervening tree cover and hedgerows both within gardens and the wider landscape plus built form to the south of Breach Lane would restrict views of ground and low level construction activities across of the Site and would heavily filter views of elevated activities which, if deployed, would occupy a

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				narrow proportion of residents' views. This would result in a very low magnitude of change.
Recreational visual receptor Recreational receptors are assessed as possessing high susceptibility in accordance with GLVIA3 paragraph 6.33 and there is a high likelihood that these receptors attach at least a medium value to the views that are available from the routes that cross the rural landscape which are of moderate scenic quality. As such, the sensitivity of recreational receptors is assessed as High. With regard to users of Weaver Springs Park, the primary purpose of receptors is to visit to play park or engage in team sports. In accordance with GLVIA3 paragraph 6.34, people engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape are of low susceptibility. The views that are available to recreational receptors in this location are of moderate scenic quality, giving rise to a Low sensitivity.				
Users of the PRoW in the north-eastern part of the Site (PRoW no.1) (Refer to Viewpoints 5 and 6 – Figures 10.6 and 10.7)	High	High	Major Significant	Based on findings during the Site visit this PRoW was considered well used by the local community. Users of this PRoW would experience views of construction activities associated with the employment units and dwellings to the south as they extend across the fields either side of the route. Dense hedgerows and hedgerow trees surrounding the WwTW would filter views across other parts of the Site further to the south. Within these views, construction activities would replace existing views of agricultural fields to the east and the gradual emergence of employment units would begin to foreshorten and frame wider views toward the agricultural landscape to the south and east. As a result of the close proximity of the construction activity along the length of this PRoW and the moderate to large extent of receptors views which would be affected when travelling either north or south-bound, the magnitude of change is considered to be High.
Users of the PRoW immediately south of the WwTW (PRoW no.2) (Refer to Viewpoints 7 and 8 – Figures 10.8 and 10.9)	High	High	Major Significant	Construction activities associated with residential development within the centre of the Site would be visible in close proximity to users of this route as they move through the Site. Views of construction activity, vehicle movements, materials and the construction of highway infrastructure as well as any works required to create the SuDS and public open space located adjacent to the route would replace views across open agricultural fields and would add complexity and contrasting elements to baseline views. The gradual emergence of built form would also begin to alter the composition of and frame/foreshorten views. The proximity of this route to the construction activities within the Site would lead to a High magnitude of change for receptors travelling in either direction. The exception to this relates to a short section of the route which lies beyond the Site boundary, represented by Viewpoint 8 (Figure 10.9) and where intervening overgrown hedgerows would heavily filter walkers' views across the Site.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Users of the PRoW running centrally through the Site (PRoW no.3) (Refer to Viewpoint 9 – Figure 10.10)	High	High	Major Significant	Based on findings during the Site visit this PRoW was considered well used by the local community. Users of the PRoW traversing through the centre of the Site would experience a range of views of construction activities. These would either be views of construction activities occurring adjacent to the footpath which would alter the composition of baseline views, views of the upper part or elevated of construction activities where overgrown hedgerow boundaries provide some screening, or framed views through gaps in hedgerows. Along its length, the construction activities would alter the composition of views out towards the countryside to the east and south and toward Earl Shilton to the north. There would be a gradual foreshortening of views as built form begins to emerge and construction activities would appear as a prominent feature in the foreground along the majority of this PRoW, creating a High magnitude of change.
Users of the PRoW in the western part of the Site (PRoW no.4) (Refer to Viewpoint 10 – Figure 10.11)	High	High	Major Significant	Baseline views contain arable land (contained to the foremost fields due to topography and hedgerow boundaries), hedgerows and the edge of Earl Shilton on the skyline. Construction activities associated with the residential development within the western part of the Site would be directly visible with construction activity, vehicle movements, materials and the construction of highway infrastructure taking place in close proximity which would lead to increased visual complexity, whilst the gradual emergence of built form would frame/foreshorten views and would replace views across arable farmland. The proximity of the footpath to this activity and the high proportion of receptor's horizontal field of the view which would be affected, would give rise to a High magnitude of change.
Users of the PRoW immediately adjacent to the eastern edge of the Site (PRoW no.5) (Refer to Viewpoint 13 – Figure 10.14)	High	High	Major Significant	Based on findings during the Site visit, this PRoW was considered well used by the local community. The existing hedge which runs parallel with this footpath along the south-eastern boundary of the Site together with gradually maturing trees and shrubs associated with the A47 would provide some partial screening of construction activities as they extend across the southern most fields and more elevated parts of the Site. Elevated construction activities such as cranes which would periodically be deployed and built form as it gradually emerges and increases in height would be also visible, appearing as prominent features above the intervening hedgerow. Construction activities would change the composition of views of agricultural land, hedgerows and the edge of Earl Shilton replacing these visual components with construction activities and emerging built form directly in the foreground creating a high magnitude of change.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Users of the PRoW leading toward Mirfield Farm (PRoW no.6)	High	Low	Moderate Not Significant	Transient views of elevated construction activities associated with the periodic deployment of cranes and the gradual emergence of built form extending above the embankment associated with the A47 road corridor would be experienced from along the length of the PRoW as users travel in a westerly direction. This elevated activity would be viewed against a backdrop of built form within Earl Shilton on the ridgeline above the Site. Partial middle distance views of ground or low level construction activities extending across the elevated fields within the Site (such as to the south of Mill Lane) would also be discernible.
Users of the PRoW east of the A47 (PRoW no.7) (Refer to Viewpoints 4 and 11 – Figures 10.5 and 10.12)	High	Low	Moderate Not Significant	Along the majority of its length, views of all construction activities would be completely restricted due to the steep embankment and concrete underpass of the A47 road corridor. However, at the entrance of the footpath (at Mill Lane) construction activities across part of the Site to the east and south would be visible from a short section of the route extending to no more than 100 m. For receptors travelling north-bound along this bridleway from Huit Farm, construction activities extending across the rising field to the south of Mill Lane and field south of the WwTW would be available in the middle distance replacing views of arable fields and hedgerows. When considering the route as a whole and as a consequence of views that are mainly restricted by the A47 embankment, magnitude of visual change would be low.
Users of the PRoW leading toward Huit Farm from the south-east (PRoW no.8)	High	Low	Moderate Not Significant	Occasional glimpsed, transient views of the elevated construction activities such as the periodic deployment of cranes within the Site and the gradual emergence of built form along the southern edge of the Site would be experienced by walkers travelling north-bound. Intervening hedgerows and hedgerow trees would filter middle distance views and a descent in topography to the south would also play a role in restricting views towards construction activities. Where visible, the elevated construction activities would occupy a narrow proportion of the receptor's field of view in the middle distance leading to a magnitude of change which would not exceed Low.
Users of the PRoW south of Breach Lane Farm (PRoW no.9) (Refer to Viewpoint 12 – Figure 10.13)	High	Low	Moderate Not Significant	Users of the PRoW would experience filtered, transient views of elevated construction activities, restricted to the periodic deployment of cranes within the Site with vegetation associated with the A47 cuttings and other intervening elements such as tree cover, hedgerows and Breach Lane Farm building limiting views. Views would be limited to short sections of the footpath closer to its northern end as the topography descends to the south toward a local stream valley, restricting further views. The magnitude of change is considered low due to the low level of change affecting a small proportion of the view.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Users of the PRoW south of the Site (PRoW no.10)	High	Very Low	Minor Not Significant	Existing hedgerows, A47 landforms and built form combine to restrict views of construction activities across the Site from this PRoW. Intermittent and elevated construction activities may be obliquely viewed but these views would be transient and the resultant changes would be small and capable of being missed by a recreational user. The magnitude of change is considered to be very low.
Users of the PRoW to the north of Earl Shilton (PRoW no.11) (Refer to Viewpoint 18 – Figure 10.19)	High	Very Low	Minor Not Significant	For south-bound walkers, the intervening hedgerows would restrict all views of ground and low-level construction activity across the Site including that which would extend across the northern most field. The exception is the possible periodic deployment of cranes within the field to the north of Mill Lane which could extend above the intervening hedgerows and be visible on the skyline. These would occupy a narrow proportion of the field of view and the magnitude of change is unlikely to exceed very low
Users of Mill Lane (Refer to Viewpoints 1 and 21 – Figure 10.2 and 10.22)	High	Low	Moderate Not Significant	Pedestrians, cyclists and horse riders travelling in either direction along Mill Lane would experience very limited views of ground and low level construction activities with the tall, established hedgerows either side of Mill Lane restricting views to glimpsed transient views through field gates. Any elevated construction activities and the gradual emergence of the upper sections of built form, particularly the taller employment units to the south of Mill Lane which may extend up to 17 m in height, would potentially be visible above the hedgerows depending on their final footprint and proximity to Mill Lane. The partial and oblique nature of views of elevated construction activity would give rise to a low magnitude of change. The resultant moderate level of effect would be not significant as a consequence of the enclosed nature of baseline views in which built form (for receptors travelling in a north-westerly direction) and vertical components (telegraph poles) are already present.
Users of the highway footpath along the A47 (Refer to Viewpoints 13, 19 and 20 – Figures 10.14, 10.20 and 10.21)	Medium	Medium	Moderate Not Significant	Users of the footpath associated with the busy A47 are likely to be travelling along it as a convenient route rather than for the appreciation of the landscape. As a consequence, the susceptibility of receptors using the highway footpath along the A47 is judged to be medium with views that are of moderate to low scenic quality hence the sensitivity is assessed as Medium. Walkers on the approach to the Site from the north or south would experience restricted views of construction activities due to road cuttings and roadside vegetation. These views then open out into partial views across the Site above or through the boundary hedgerow and gradually maturing planting associated with the A47. The A47 runs at grade or slightly above the level of the Site for approximately 850 m and at a walking speed of 3 mph (4.8 kmph), receptors would experience view of construction

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				activities extending across the Site for a journey time of approximately ten minutes. Construction activities immediately adjacent to the A47 would appear as prominent features in the foreground replacing existing views of arable fields, hedgerows and hedgerow trees whilst elevated construction activity associated with the period deployment of cranes would be visible above the intervening vegetation. The gradual emergence of built form along the eastern and southern edges of the Site would foreshorten any further views across the Site. Due to the transient nature of the view, which is restricted in parts, the magnitude of change is considered to be medium. The Moderate level of effect is assessed as being Not Significant given the baseline context in which views of built form within Earl Shilton is already a feature and the continued rural views available to the east.
Users of Weaver Springs Park (Refer to Viewpoint 15 – Figure 10.16)	Low	Medium	Minor Not Significant	Due to the elevated nature of the Park in relation to adjacent fields to the south and east, construction would be partially visible above or filtered through the overgrown hedgerows which form the perimeter of the Park and which would be retained as part of the Proposed Development. The foreground of the view would be maintained as sports pitches and as such, it is unlikely that extensive construction activities would extend across this part of the Site. The partial nature of views of activities including elevated cranes which may periodically be deployed, and the gradual emergence of built form in the middle ground would give rise to a Medium magnitude of change.
Vehicular visual receptors Drivers and their passengers are typically assessed as possessing medium susceptibility in accordance with GLVIA3 paragraph 6.33 with the exception of those travelling along fast-moving motorways and dual carriageways who are assessed as possessing low susceptibility. Travellers moving through rural landscapes are likely to place at least a medium value to the views available whilst those on more utilitarian roads are likely to place less value on the views available.				
Road users of Thurlaston Lane (Refer to Viewpoints 14 and 17 – Figures 10.15 and 10.18)	Medium	Low	Minor Not Significant	Road users of Thurlaston Lane would experience prominent views of construction activities and in particular elevated construction activities in their views above the Site's boundary hedgerows as they travel west bound over the A47 and immediately adjacent to the northern boundary of the Site for a distance of less than 150 m. At speeds of 60 mph views would be fleeting, lasting for approximately 5 seconds. For drivers and their passengers travelling west bound along the section of Thurlaston Lane to the east of the A47, the periodic deployment of cranes and the gradual emergence of built form across fields to the north and south of Mill Lane would potentially be visible above the intervening field boundary hedgerows. The brevity of views means that the magnitude of change is assessed as Low.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Road users of A47 (Refer to Viewpoints 13, 19 and 20 – Figures 10.14, 10.20 and 10.21)	Medium	Low	Minor Not Significant	Changes to the views of drivers and their passengers travelling north-bound or south-bound along the A47 would be comparable to those described for users of the highway footpath. However, at a speed of 60 mph, drivers travelling along the 850 m section which is at grade or slightly higher than the Site would experience views of construction activities within the Site for approximately 30 seconds. The brevity of the views results in a magnitude of change which is best described as Low.

1. The sensitivity of a receptor is defined using the criteria set out in **Section 10.9** and **Appendix 10A** and is defined as low, medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the Proposed Development is defined using the criteria set out in **Section 10.9** and **Appendix 10A** and is defined as very low, low, medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology.

Table 10.13 Assessment of the visual effects during operation

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Residential visual receptors Sensitivity: Residents are assessed as possessing high susceptibility in accordance with GLVIA3 paragraph 6.33. There is a high likelihood that these receptors attach a medium or high value to the private views that are available from the windows and curtilage of their properties with views that are often of moderate scenic quality. As such the sensitivity of receptors is assessed as High.				
Residents in properties adjacent to the Site boundary				
Residents at properties on Mill Lane and Union Mill Close (Refer to Viewpoint 1 in Figure10.2)	High	Medium to High	Major Significant	A small number of residents at five private properties on the northern side of Mill Lane would experience views from ground floor and upper storey windows of the employment units positioned south of Mill Lane and housing north of Mill Lane. Views south towards the employment land would be oblique and partial, filtered by existing hedgerows running along Mill Lane and from ground floor windows (i.e. rooms that might normally be expected to be occupied in daylight hours), only the upper facades of the development would be visible above the intervening hedgerows. Due to intervening vegetation associated with the boundary of the WwTW and the employment units themselves, the rest of the Proposed Development would not be visible. Looking north from windows on the rear elevation and garden of the private properties, the dwellings proposed across the northern field (north of Mill Lane) would appear as noticeable features, foreshortening existing views across the agricultural fields. Existing domestic garden vegetation may filter some views reducing the magnitude of visual change. Views from the rear windows and gardens of five, two-storey private properties on Union Mill Close would feature the employment units proposed across the field to the south of Mill Lane, rising above their boundary fence line and the overgrown field hedgerow to the east. At a maximum height of 17 m, these units would be a prominent feature in the foreground giving rise to a High magnitude of change.
Residents at properties on Breach Lane	High	Very Low	Minor Not Significant	Views of the Proposed Development would be restricted to the dwellings proposed across the southern part of the Site. The gradual maturation of planting implemented early in the construction phase to strengthen the limited winter screening offered by the narrow but tall boundary hedgerow under baseline conditions, means that views towards the Site would be heavily filtered in winter months for residents along Breach

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				Lane. This screening, allied with the orientation of a number of properties with resident's principal views directed away from the Site or presence of garden vegetation (including coniferous vegetation), means that the magnitude of change for this group of residents would be Very Low.
Residents at properties on King Richard's Hill (Refer to Viewpoint 16 – Figure 10.17)	High	Low	Moderate Not Significant	A small number of residents on the eastern side of King Richard's Hill would experience views of proposed residential development within the northern part of the Site (north of Mill Lane). Four private properties are orientated so that residents' views from the front of their properties are directed towards the Site whilst residents at a further three dwellings may have views from the rear of their properties. The foreground of residents' views would remain unchanged whilst proposed dwellings would be partially visible with rooftops appearing above the existing mature hedgerow which lines the western boundary of the northern spur of land or above a new boundary hedgerow and vegetation proposed along the northern boundary of the field to the north of Mill Lane. The foreground mature trees, domestic garden vegetation, garden walls and fences would interrupt clear views towards the Site and partial views of the proposed built view beyond the intervening field would give rise to a Low magnitude of change.
Residents at properties on Equity Road East	High	Very Low	Minor Not Significant	Residents at private properties along on the eastern side of Equity Road East (to the south of Townlands Church of England Primary School) would have limited views of the residential development proposed across the closest western part of the Site due to dense back garden vegetation and structural planting proposed around the periphery of the development. During the winter, residents may experience glimpsed or filtered views of the rooftops and upper storeys of dwellings from their rear windows and long gardens giving rise to a Very Low magnitude of change.
Residents at properties on Meadow Court Road and Astley Road	High	High to Low	Major (five eastern most properties along the southern side of Astley Road) Significant Moderate (properties	The 16 properties along the southern side of Meadow Court Road and Astley Road are orientated north-south with small rear gardens which extend to the south providing opportunities for residents to experience views across the northern fields within the Site. Fencing, hedgerows and occasional garden shrub/tree cover provides ground floor screening for residents at private properties along Meadow Court Road within the western half of this group with more open views available from upper storey windows and the five eastern most properties on Astley Road. For residents at these five eastern most properties, the proposed residential development proposed across the land to the immediate south would be clearly visible in the foreground and would extend across a moderate to large proportion of residents' southerly views. As a consequence, the magnitude of change in winter months would be High for a small proportion of

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
			along Meadow Court Road and the eastern side of Astley Road) Not Significant	residents. For residents at the remaining properties along Meadow Court Road, the gradual maturation of boundary planting would reinforce the vegetative screening already available under baseline conditions, leading to a magnitude of change which would be Low, with views available from upper storey windows only (i.e. rooms that less likely to be occupied in daylight hours) and visual effects would be Not Significant. For residents in private properties along the eastern side of Astley Road as it turns and heads north, there would be partial views of a small proportion of residential development beyond Weaver Springs Park, with screening/filtering provided by rear garden vegetation and the overgrown hedgerows within the Site. The small extent of the view which may be altered as a consequence of the introduction of a limited proportion of built form in the middle ground would give rise to a Low magnitude of change and the resultant Moderate level of effect which is assessed as being Not Significant.
Residents at properties on The Leecrofts	High	Low	Moderate Not Significant	Proposed residential built form would be partially visible beyond Weaver Springs Park and intervening overgrown hedgerows within the Site to residents in properties along the eastern side of The Leecrofts. The west-east orientation of the two-storey properties with views that are typically from upper storey windows (i.e. rooms that less likely to be occupied in daylight hours) allied with the overgrown eastern boundary hedgerow to Weaver Springs Park means that the upper facades and rooflines of proposed dwellings within the field to the east of the Park, viewed against a backdrop of tree cover further to the east, would have limited visual influence resulting in Low magnitude of change. The resultant Moderate level of effect is assessed as being Not Significant as the changes would apply to only a small proportion of the residents' views and the foreground of the views from upper storey windows would not be fundamentally changed.
Residents at properties on Weaver Road	High	Low	Moderate Not Significant	Residents at two-storey private properties along the southern side of Weaver Road would experience partial, middle-distance views of built form as it extends across fields to the south and west of the WwTW. The dense hedgerow which lines the northern boundary of the Park (which contains some coniferous species) and moderate proportion of coniferous tree cover within rear gardens results in views that are primarily from rear upper storey windows with views from ground floor windows (i.e. rooms that might normally be expected to be occupied in daylight hours) and gardens generally restricted. The foreground of residents' views across Weaver Springs Park would remain unchanged, whilst the proposed residential built form would be visible between or above retained overgrown hedgerows within the Site and against a

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				landscape backdrop which already contains some distant urbanising visual components (pylons). Consideration of the separation between residents on Weaver Close and the proposed built form, partial screening provided by both foreground and mid-ground vegetation (both existing and proposed) which would reduce the proportion of the baseline view which would be altered through the introduction of built form, would give rise to a Low magnitude of change. The resultant Moderate level of effect is assessed as being Not Significant as the changes would apply to only a small proportion of the residents' views and the foreground of these views would not be fundamentally changed.
Residents at properties on Montgomery Close	High	High (properties between Avenue South and Ronald Toon Road) Low (properties between Ronald Toon Road and Parry Road)	Major Significant Moderate Not Significant	From six two-storey properties along the southern side of Montgomery Road between Avenue South and Ronald Toon Road, built form would be evident in close proximity, foreshortening baseline views across unmanaged grassland which extends to the south of the properties' rear gardens and southern boundaries. The field survey indicated that relatively open views are available above a low boundary hedgerow from both ground floor (i.e. rooms that might normally be expected to be occupied in daylight hours) and upper storey windows. Whilst the proposed residential development is set back slightly from the properties by a proposed internal access road, the built form would represent a noticeable change to the composition of baseline views. The orientation of dwellings between Ronald Toon Road and Parry Close means that residents' views towards the Proposed Development would be oblique and partially filtered by the mature hedgerow which lines the boundary of the Site to the south of the properties. For this sub-group of residents, the magnitude of change as a consequence of the proposed residential development across the northern most fields to the east of Weaver Springs Park would be Low. The resultant Moderate level of effect is assessed as being Not Significant as the changes would apply to only a small proportion of the residents' views
Residents in properties which coincide with the ZTV				
Residents within Earl Shilton with middle distance views of the Site	High	Very Low	Minor Not Significant	For a small number of residents within Earl Shilton oblique, middle-distance views of the operational development could potentially be visible from upper storey windows above the rooftops of intervening built form within and along the edges of Earl Shilton. Only built form on the more elevated southern parts of the Site would be visible and in time would be filtered by trees incorporated into the Proposed Development. The operational development would form a small part of the existing view of built form thereby reducing visual contrast and would be available from upper storeys of private

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				properties which may not be rooms normally occupied in waking or daylight hours (as set out in paragraph 6.36 of GLVIA3) resulting in a Very Low magnitude of change and neutral effect.
Residents at Mirfield Farm	High	Low	Moderate Not Significant	Residents of at the private property associated with Mirfield Farm would experience oblique, heavily filtered views of through mature garden boundary trees and above the intervening field boundary hedgerow which runs parallel with the A47 of the rooftops of dwelling proposed across the north-eastern field within of the Site (north of Mill Lane), during the winter months. Views towards the built development proposed across areas of the Site to the south of Mill Lane, from windows on the southern (rear) elevation, would be limited as a consequence of farm outbuildings to the west of the property, the heavily oblique nature of the views, separation distance and the layers of vegetation in the intervening landscape. As a consequence, the magnitude of change would not exceed Low during winter months and the Moderate level of effect is assessed as being Not Significant given the seasonal nature of this effect
Residents at Huit Farm (Refer to Viewpoint 11 – Figure 10.12)	High	Low	Moderate Not Significant	Residents in the private bungalow at Huit Farm would experience very limited views of the operational development across the southern part of the Site as a consequence of the garden boundary hedgerow which extends to the west of the property. For residents at the two-storey farmhouse, the employment units proposed across the rising field to the south of Mill Lane and dwellings proposed within the field south of the WwTW would be visible in views from windows on the northern elevation of the private property although these would be framed between farm outbuildings which extend to the north. Properties within Earl Shilton are already components of the view, and the Proposed Development would extend the proportion of the field of view in which built development plays a visual role. The employment units, with a maximum height of 17 m may also rise above the distant horizon. The incremental effect of additional built form and the framed nature of the view means that the magnitude of change would be Low.
Residents at Breach Lane Farm (Refer to Viewpoint 12 – Figure 10.13)	High	Very Low	Minor Not Significant	Residents at the private property associated with Breach Lane Farm would experience very limited views of the operation development during the summer months as consequence of the screening provided by gradually maturing vegetation on the cuttings associated with the A47. A reduction in vegetative screening during the winter months means that the rooflines and upper parts of the dwellings proposed along the southern edge of the Site may be visible in filtered northerly views, with a corresponding very low magnitude of change and neutral effect.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Residents in the community of Elmeſthorpe (Refer to Viewpoint 3 – Figure 10.4)	High	Very Low	Minor Not Significant	A small number of residents on the northern edge of Elmeſthorpe have the potential to experience oblique, heavily filtered middle-distance views of the rooflines of dwellings along the southern elevated parts of the Site. The cutting and gradually maturing vegetation associated with the A47, Breach Lane Farm, intervening tree cover and hedgerows both within gardens and the wider landscape plus new built form to the south of Breach Lane would restrict views of low-level built elements within the Site with a resulting Very Low magnitude of change and neutral effect.
Recreational visual receptor Recreational receptors are assessed as possessing high susceptibility in accordance with GLVIA3 paragraph 6.33 and there is a high likelihood that these receptors attach at least a medium value to the views that are available from the routes that cross the rural landscape which are of moderate scenic quality. As such, the sensitivity of recreational receptors is assessed as High. With regard to users of Weaver Springs Park, the primary purpose of receptors is to visit to play park or engage in team sports. In accordance with GLVIA3 paragraph 6.34, people engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape are of low susceptibility. The views that are available to recreational receptors in this location are of moderate scenic quality, giving rise to a Low sensitivity.				
Users of the PRoW in the north-eastern part of the Site (PRoW no.1) (Refer to Viewpoints 5 and 6 – Figures 10.6 and 10.7)	High	High	Major Significant	Users of this PRoW would experience prominent views of the north-eastern part of the Proposed Development (south of Mill Lane) which would include; employment units with a maximum height of 17 m, residential dwellings and SuDS. This built form would foreshorten views of the surrounding countryside and appear as prominent features in the foreground. Southerly views of the rest of the Proposed Development would be filtered due to intervening hedgerows and trees. The proximity of this route to the Proposed Development would lead to a high magnitude of change for receptors travelling in either direction.
Users of the PRoW immediately south of the WwTW (PRoW no.2) (Refer to Viewpoints 7 and 8 – Figure 10.8 and 10.9)	High	High	Major Significant	Views of built form associated with the residential areas would be noticeable elements in walkers' views from along the length of the PRoW beyond an area of proposed Public Open Space and SuDS network which encompasses the PRoW. This would provide visually beneficial elements and would offset the built form by at least 50 m from this route The proximity of this route would lead to a high magnitude of change for receptors travelling in either direction. The exception to this relates to a short section of the route which lies beyond the Site boundary, represented by Viewpoint 8 (Figure 10.9) and where intervening overgrown hedgerows would heavily filter walkers' views across the Site.
Users of the PRoW running centrally through the Site (PRoW no.3)	High	High	Major	Similar to the two previous PRoWs, prominent views of built form in the foreground would replace baseline views across arable fields. Built form would be visible along the

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
(Refer to Viewpoint 9 – Figure 10.10)			Significant	length of PRoW enclosing any wider views of the rest of the Proposed Development proposed across the Site. Framed views of Earl Shilton to the north would still be available to north-bound walkers and the magnitude of change would be high. SuDS features, additional planting and the retention of existing hedgerows would be incorporated into the layout of the Proposed Development to create a visually beneficial green link running through the centre of the Site.
Users of the PRoW in the western part of the Site (PRoW no.4) (Refer to Viewpoint 10 – Figure 10.11)	High	High	Major Significant	Residential built form within the western part of the Site would be directly visible, appearing as a prominent feature along the full length of this PRoW. The wider development across the remainder of the Site would not be visible due to the proposed built form in the foreground which would foreshorten wider views. Framed views of the St Simon and St Jude Church Spire would be incorporated into the Proposed Development to ensure that it remains a landmark feature in the distance.
Users of the PRoW immediately adjacent to the eastern edge of the Site (PRoW no.5) (Refer to Viewpoint 13 – Figure 10.14)	High	High	Major Significant	The existing hedge which runs parallel with this footpath along the south-eastern boundary of the Site together with gradually maturing trees and shrubs associated with the A47 would restrict provide some partial screening of residential built form across the south-eastern part of Proposed Development. This built form would be prominent above the hedgerow within the foreground of views from this PRoW replacing views of open arable farmland and hedgerows. Built form along this edge would restrict any further views of the wider development which extends north toward the edge of Earl Shilton. The magnitude of change is considered to be high.
Users of the PRoW leading toward Mirfield Farm (PRoW no.6)	High	Low	Moderate Not Significant	Filtered, transient views of residential built form introduced along the south-eastern edge of the Site extending above the embankment associated with the A47 road corridor would be experienced from along the length of the footpath as users travel in a westerly direction. The employment units across the field to the south of Mill Lane would also be visible above the embankment given their increased height (to a maximum height of 17 m). Intervening hedgerow vegetation would also filter middle distance views towards the Site. The upper storeys and rooftops of built form would be noticeable in the middle ground but would affect a small part of the view in which built form within Earl Shilton is already a baseline component hence reducing the level of visual contrast. As a result, the magnitude of change would be low.
Users of the PRoW east of the A47 (PRoW no.7)	High	Low	Moderate	Employment units across the field to the south of Mill Lane and residential built form along the south-eastern and eastern edge of the Site would form a noticeable and

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
(Refer to Viewpoints 4 and 11– Figures 10.5 and 10.12)			Not Significant	prominent feature from a short section of this route extending to no more than 100 m from its entrance point at Mill Lane. Subsequent views from the section of route to the south would be restricted by the A47 embankment which no views of the operational development available with the exception of glimpsed views channelled through the concrete underpass. For receptors travelling north-bound along the bridleway from Huit Farm, the employment units extending across the rising field to the south of Mill Lane and residential development within the field to the south of the WwTW would be visible in the middle distance. Properties within Earl Shilton are already components of the view from this route and the Proposed Development would extend the proportion of the field of view in which built development plays a visual role. This incremental visual role and when considering the route as a whole with views that are mainly restricted by the A47 embankment, the overall magnitude of change is considered to be low.
Users of the PRoW leading toward Huit Farm from the south-east (PRoW no.8)	High	Low	Moderate Not Significant	Occasional glimpsed, transient views of residential development proposed along the southern edge of the Site would be experienced by walkers travelling north-bound. Intervening hedgerows and hedgerow trees would filter middle distance views and a descent in topography to the south would also play a role in restricting any views of the built form above intervening hedgerows. Properties within Earl Shilton are already components of northerly views from this route and the Proposed Development would consequently have an incremental visual role within a small proportion of existing views. As a result, the magnitude of change would not exceed low.
Users of the PRoW south of Breach Lane Farm (PRoW no.9) (Refer to Viewpoint 12 – Figure 10.13)	High	Very Low	Minor Not Significant	Users of the PRoW would experience glimpsed, transient views of the upper storeys and rooftops of residential development in the southern elevated parts of the Site. Views would be limited to short sections of the footpath due to localised changes in topography and would be heavily filtered as a consequence of vegetation associated with the A47 cuttings and other intervening elements such as tree cover, hedgerows and Breach Lane Farm buildings. As a result, the magnitude of change is considered to be very low and effects would be neutral.
Users of the PRoW south of the Site (PRoW no.10)	High	No Change	No Effect	Existing hedgerows, A47 landforms and built form combine to restrict views of residential development across the western and southern parts of the Site from this PRoW. As a consequence, it is assessed that there would be no views of the Proposed Development for walkers using this small network of PRoWs.
Users of the PRoW to the north of Earl Shilton (PRoW no.11)	High	No Change	No Effect	For south-bound walkers, the intervening hedgerows (which are not included in the ZTV calculation) would restrict views of residential built form across the northern most

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
(Refer to Viewpoint 18 – Figure 10.19)				field within the Site. As a consequence, it is unlikely that there would be any views of the operational development from this PRoW.
Users of Mill Lane (Refer to Viewpoints 1 and 21 – Figures 10.2 and 10.22)	High	Low	Moderate Not Significant	Pedestrians, cyclists and horse riders travelling in either direction along Mill Lane would potentially experience views north towards residential development and south towards the proposed employment buildings. Dense and in parts, tall hedgerows along Mill Lane would screen views towards the lower parts of the built form and car parking areas associated with the employment land however upper storeys and rooftops would potentially extend above the intervening hedgerow depending on the final footprint and proximity of units to Mill Lane. The two-storey residential development proposed to the north of Mill Lane would represent a continuation of existing dwellings in the views of receptors travelling in a north-westerly direction along this local route. This partial change to baseline views would give rise to a low magnitude of visual change and the resultant moderate level of effect would be not significant as a consequence of the enclosed nature of baseline views which already contain built form and urbanising visual influences (telegraph poles).
Users highway footpath along the A47 (Refer to Viewpoints 13, 19 and 20 – Figures 10.14, 10.20 and 10.21)	Medium	Medium	Major Significant	Users of the footpath associated with the busy A47 are likely to be travelling along it as a convenient route rather than for the appreciation of the landscape. As a consequence, the susceptibility of receptors using the highway footpath along the A47 is judged to be medium with views that are of moderate to low scenic quality hence the sensitivity is assessed as Medium. Walkers on the approach to the Site from the north or south would experience restricted views of the operational built form due to road cuttings and associated vegetation. These views then open out into partial views of built form along the eastern and southern edge of the Site above or through the boundary hedgerow and gradually maturing planting associated with the A47. The A47 runs at grade or slightly above the level of the Site for approximately 850 m and at a walking speed of 3mph (4.8 kmph), receptors would experience view of new built form extending across the Site for a journey time of approximately ten minutes Built form immediately adjacent to the A47 would appear as prominent features in the foreground replacing existing views of arable fields, hedgerows and hedgerow trees and limiting further views across more northerly parts of the Site. However, baseline views already include views of properties along the southern edge of Earl Shilton and as a consequence, the built development would not form an uncharacteristic

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
				component in receptors views. Due to the transient nature of the view, which is restricted in parts, the magnitude of change is considered to be medium.
Users of Weaver Springs Park (Refer to Viewpoint 15 – Figure 10.16)	Low	Medium	Minor Not Significant	The foreground of receptors views is unlikely to fundamentally change as the Proposed Development indicates the continued presence of sports pitches across Weaver Springs Park. Residential development to the east and south of the Park would be partially visible through or above the overgrown hedgerows which line its perimeter and which would be retained as part of the Proposed Development. The dwellings would represent noticeable built elements in typically close to mid distance views which are available from within the Park due to its slightly elevated location giving rise to a medium magnitude of change.
Vehicular visual receptors Drivers and their passengers are typically assessed as possessing medium susceptibility in accordance with GLVIA3 paragraph 6.33 with the exception of those travelling along fast-moving motorways and dual carriageways who are assessed as possessing low susceptibility. Travellers moving through rural landscapes are likely to place at least a medium value to the views available whilst those on more utilitarian roads are likely to place less value on the views available.				
Road users of Thurlaston Lane (Refer to Viewpoints 14 and 17 – Figures 10.15 and 10.18)	Medium	Low	Minor Not Significant	Road users of Thurlaston Lane would experience views of the upper facades and rooftops of residential development within the northern most field and above the Site's boundary hedgerows as they travel west bound over the A47 and immediately adjacent to the northern boundary of the Site for a distance of less than 150 m. At speeds of 60 mph views would be fleeting, lasting for approximately 5 seconds. For drivers and their passengers travelling west-bound along the section of Thurlaston Lane to the east of the A47, built form across fields to the north and south of Mill Lane would potentially be visible above the intervening field boundary hedgerows. The brevity of views means that the magnitude of change is assessed as Low.
Road users of the A47 (Refer to Viewpoint 13, 19 and 20 – Figures 10.14, 10.20 and 10.21)	Medium	Medium	Moderate Not Significant	Changes to the views of drivers and their passengers travelling northbound or south-bound along the A47 would be comparable to those described for users of the highway footpath. However, at a speed of 60 mph, drivers travelling along the 850 m section which is at grade or slightly higher than the Site would experience views of built form within the Site for approximately 30 seconds. The brevity of the views results in a magnitude of change which is best described as Low

1. The sensitivity of a receptor is defined using the criteria set out in **Section 10.9** and **Appendix 10A** and is defined as low, medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the Proposed Development is defined using the criteria set out in **Section 10.9** and **Appendix 10A** and is defined as very low, low, medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology.

10.12 Cumulative effects

- 10.12.1 Cumulative effects of the Proposed Development can occur as a result of interrelationships between different environmental topics, which are referred to as 'intra-project effects'. For the LVIA, interrelationships and related common receptors are identified as follows:
- 10.12.2 **Chapter 6: Air Quality** identifies residential properties within 20m of the Proposed Development Site boundary which are receptors shared with the visual assessment. Residents at these properties could potentially be impacted by dust from demolition, earthworks and construction activities. However, appropriate site-specific dust mitigation would be implemented to ensure dust effects during the construction phase are of a negligible magnitude of change. In terms of the air quality effects associated with an additional road traffic during the operational phase, this is also assessed as being of a negligible magnitude of change. The Air Quality assessment therefore concludes that air quality and dust effects as a result of the Proposed Development are predicted to be Not Significant.
- 10.12.3 **Chapter 7: Biodiversity** identifies arable land, semi-improved grassland, hedgerows and trees as common receptor groups with the landscape assessment. The provision of mitigation and enhancement measures through the introduction of new hedgerows, trees and species-rich grassland and habitats that are of higher biodiversity value than the baseline agricultural land means that the overall biodiversity impacts on these receptor groups are considered to be positive at a local level and would ensure no net loss in biodiversity terms.
- 10.12.4 **Chapter 9: Historic Environment** identifies historic hedgerows as a receptor. The Historic Environment assessment concludes that the loss of short sections of historic hedgerow during the construction phase and the retention and enhancement of other lengths of historic hedgerow would lead to a low magnitude of change, on an asset of low heritage significance, resulting in an effect which is neither beneficial or adverse, and Not Significant. During the operational phase, this minor and Not Significant effect would be beneficial.
- 10.12.5 **Chapter 11: Noise and Vibration** identifies residential areas forming the Site boundary to the west/north of the Site, (i.e. residential properties on Equity Road East, Meadow Court Road, Astley Road, The Leecrofts, Weaver Road, Montgomery Road, Mill Lane and Union Mill Close) and residential areas to the south-west of the Site, opposite Breach Lane (Masfield Drive/Oaklands Way) as common receptors which are shared with the visual assessment. The assessment concludes that short-term effects would be minor to negligible and Not Significant for these receptor groups, with long-term effects being negligible and Not Significant.
- The long-term minor or negligible and Not Significant effects predicted in relation to the other environmental topics where common receptors have been identified, limits the potential for significant intra-project effects on the same receptors to occur as set out below: In relation to hedgerows, the long-term negligible landscape effect, minor historic environment effect and minor/moderate biodiversity effect are all assessed as being not significant and as a consequence, there is no potential for significant intra-project effects to occur for this receptor group.
 - For agricultural land and trees, the long-term moderate and not significant landscape effect and minor/moderate and not significant biodiversity effect results in intra-project effects that would also be not significant for these receptor groups.
 - With regard to human receptors, whilst long-term significant visual effects have been concluded for residents in a small number of properties on Mill Road, Union Mill Close, Astley Road and Montgomery Road, the negligible and not significant effects assessed for the same

receptor group in relation to noise and air quality means that there is no potential for significant intra-project effects to occur.

10.13 Consideration of optional additional mitigation or compensation

- 10.13.1 No additional mitigation measures are proposed to further reduce the landscape and visual effects that are identified in this ES. This is because all relevant and implementable measures have been embedded into the development proposals and are assessed above in this chapter. These measures are considered to be likely to be effective and deliverable, and address the likely significant effects of the Earl Shilton Urban Extension project.

10.14 Conclusions of significance evaluation

Landscape effects

- 10.14.1 The LVIA has assessed the effects during the construction and operational phases of the Proposed Development on three groups of landscape elements within the Site and on the character of the host UCA (UCA 10: Earl Shilton) and on the neighbouring LCA (LCA F: Burbage Common Rolling Farmland). This has concluded that there would be no significant landscape effects as a consequence of the Proposed Development and the following conclusions have been drawn:
- The principal landscape elements within the Site relate to arable land/grassland, hedgerows and groups of or individual trees. Consideration of the value of these landscape elements and their susceptibility to change has concluded that the overall landscape sensitivity ranges from Low (arable land and grassland) through to Medium (hedgerows) and High in relation to individual and groups of trees.
 - Whilst a High magnitude of change would occur in relation to the arable land/grassland as the construction phase progresses and the landcover is gradually replaced by a more varied combination of hard and soft landscape elements more characteristics of an urban environment, the resultant Moderate level of effect is assessed as Not Significant given the prevalence of this landscape element within the surrounding landscape.
 - In relation to hedgerows and individual and groups of trees which are of higher sensitivity, the Proposed Development would retain many of these valued elements and features including the majority of trees and hedgerows, within a comprehensive landscape framework. Short sections of hedgerow would be removed to facilitate access and the internal road network whilst occasional trees would also be removed during the construction period. The limited loss of hedgerow and trees and the high proportion of trees and hedgerows that would be introduced across the Site would result in Very Low or Low magnitudes of change and effects that would be Not Significant.
 - In relation to landscape character, the sensitivity of UCA 10 has been assessed as Low through consideration of the value of the landscape within this character area (Medium) and its susceptibility to the type of change proposed (Low). The magnitude of landscape change during the construction phase is assessed as Medium due to the presence of uncharacteristic elements and activities across the Site which represents a moderate proportion of the UCA and landscape effects would be Minor, adverse and Not Significant. The completed built development, set within a framework of retained hedgerows and trees, would reflect development which is already present within the UCA in terms of density, scale, height and land use. Whilst the character within the Site would alter, this would not be uncharacteristic of the UCA and when considering UCA 10 as a whole, the magnitude of change would be Low. Long-

term landscape effects would therefore be Negligible, beneficial (the Proposed Development would contribute to three of the townscape strategies set out in the extant Character Assessment¹²) and Not Significant.

- The sensitivity of LCA F: Burbage Common Rolling Farmland which encompasses the landscape to the east of the A47 has been assessed as Medium (medium value and medium susceptibility). Ground and low-level constructions activities across the Site would be largely screened as a consequence of separation distance allied with the coalescence of intervening vegetation and the embankments/cuttings along the A47 which would weaken the visual effects pathway. Perceptual effects associated with construction activities would be incremental to the audible role that traffic on the A47 already has and the resultant lower levels of tranquillity already established across the northern part of this LCA. The operational development would introduce built development closer to this LCA with a corresponding slight intensification in urbanising influence, representing an incremental effect to a baseline key characteristic as opposed to a new or uncharacteristic effect. The small, partial change to the landscape character, primarily affecting a localised geographical extent along the northern fringes would give rise to Low magnitude of change for both phases of the Proposed Development and effects would be Minor, adverse and Not Significant.

Visual effects

- 10.14.2 The visual assessment of effects on receptors' views as a consequence of the Proposed Development has considered the extent to which the Proposed Development can be viewed and the degree to which the composition of baseline views would change. The assessment has considered the views of 29 visual receptor groups as follows:
- residents at 13 individual or small groups of private properties;
 - recreational receptors travelling along 11 PRoWs and two highway footpaths (along Mill Lane and the A47);
 - recreational receptors using an area of public open space (Weaver Springs Park); and
 - drivers and their passengers travelling along a primary route (the A47) and a single local highway.
- 10.14.3 The assessment, which reflects a worst-case winter scenario when vegetative screening is minimal, has concluded that significant operational visual effects would occur for the following groups of receptors:
- Residents at private properties on Mill Lane (five properties) and Union Mill Close (five properties);
 - Residents at private properties on Astley Road (five properties to the east of Northleigh Way);
 - Residents at private properties on Montgomery Road (six properties);
 - Users of the PRoW in the north-eastern part of the Site (PRoW no.1);
 - Users of the PRoW immediately south of the WwTW (PRoW no.2);
 - Users of the PRoW running centrally through the Site (PRoW no.3);
 - Users of the PRoW in the western part of the Site (PRoW no.4); and
 - Users of the PRoW immediately adjacent to the eastern edge of the Site (PRoW no.5).

- 10.14.4 All of the significant visual effects would occur for receptors which reside in private properties adjacent to the Site boundary or are using PRowS adjacent to or within the Site itself. For these receptors, their proximity to the Site, absence of screening and the moderate to large proportion of their views which would be altered by the Proposed Development during both its construction and subsequent operation/occupation phase, would give rise to a High or Medium magnitude of change. Their High visual sensitivity, taking into account their susceptibility to visual change and the value of the baseline views which are available, would lead to a Significant visual effect. Baseline views of arable fields, grassland, hedgerows/hedgerow trees and in some cases, longer distance views towards the surrounding countryside would be replaced by views which are greater in complexity as a consequence of contrasting construction activities including the periodic deployment of cranes during the construction phase. During the subsequent operational phase, views would be foreshortened or framed by occupied built form. Structural planting to the Sites' boundaries and within the Site, retention of existing hedgerows and further maturation of hedgerows along the A47 corridor would play a role in softening and filtering views of built development, which would be introduced into baseline views which already contain the built form of Earl Shilton on the ridgeline to the north and west of the Site, depending on the direction of travel for users of PRowS.
- 10.14.5 In terms of the private residential receptors for which significant visual effects are predicted to occur, these are localised effects, representing a small proportion of the residents within the community of Earl Shilton. The visual assessment has also reported the worst-case scenario during the winter months when vegetative screening from garden or boundary vegetation is minimal with effects for a number of receptors likely to reduce during the summer months. Furthermore, whilst the inclusion of private residential views was agreed through the Scoping Request, there is an established planning principle that private individuals do not have a right to a view. The visual amenity of receptors using publicly accessible community spaces within Earl Shilton would not be significantly affected.
- 10.14.6 The presence of the five PRowS within the Site and the close proximity of users to the Proposed Development, allied with the nature of their baseline views as evidenced in the photography from Viewpoints 2, 5-7, 9 and 10 means that moderate to high levels of visual change would occur. Local opportunities for views which are more rural in nature, would continue to exist to east of the Site and north of Earl Shilton for residents in Earl Shilton seeking this type of view.
- 10.14.7 For each of the remaining visual receptors, views of construction activities relating to the Proposed Development and its subsequent operation/occupation are often oblique or transient and filtered by existing vegetation, which, allied with increasing separation distances results in a minor to moderate level of effect. Visual effects of these receptors are considered to be Not Significant.

10.15 Implementation of environmental measures

- 10.15.1 **Table 10.14** describes the environmental measures embedded within the Proposed Development and the means by which they would be implemented, i.e. they would have been secured through the Reserved Matters Applications and Planning Conditions.

Table 10.14 Summary of environmental measures to be implemented – relating to landscape and visual effects

Environmental measure	Responsibility for implementation	Compliance mechanism	ES Section reference
Retention of the majority of individual trees, groups of tree and hedgerows within the Site.	Developer/Contractor	Reserved Matters Applications and Planning Condition requiring a tree protection plan to be submitted.	Section 10.10
Creation of site-wide Green Infrastructure which includes: • additional tree and hedgerow planting; • formal and informal green public open space including existing sports pitches, and children's play spaces; • new attenuation ponds and sustainable surface water drainage features that provide habitats for local wildlife; and • a network of footpaths (including existing PRow) providing enhanced connectivity and green links.	Developer/Contractor	Planning condition requiring full details of the landscape scheme proposed and landscape management plan	Section 10.10 and 10.11
Gapping up/thickening of retained hedgerows and appropriate management	Developer/Contractor	Planning condition requiring a landscape management plan	Section 10.10

11. Noise & Vibration

11.1 Introduction

- 11.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to noise and vibration. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development** and with respect to relevant parts of other chapters, namely **Chapter 13: Traffic and Transport**, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects.
- 11.1.2 Noise and vibration can have an effect on the environment and on the quality of life, health and well-being of individuals and communities. It can also pervade and affect the quality of natural resources.
- 11.1.3 A separate Site Suitability Report has been completed for the residential aspects of the Proposed Development.

11.2 Limitations of this assessment

- 11.2.1 Due to COVID-19 restrictions, no noise surveys have taken place for this EIA. The assessment considers effects due to changes in road traffic noise. Many years' experience of using the Calculation of Road Traffic Noise¹ (CRTN) methodology has demonstrated that the prediction tool, particularly where it has been used to determine noise change due to changes in traffic flow, is accurate and errs towards a conservative assessment. Therefore, utilising CRTN without validation is considered robust and appropriate for this assessment. This was agreed with the Environmental Health Officer (EHO) for Hinckley and Bosworth Borough Council (HBBC).

11.3 Relevant legislation, planning policy, technical guidance

Legislative context

- 11.3.1 The following legislation is relevant to the assessment of the effects on noise and vibration receptors:
- *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (EIA Regulations)*²;
 - *The Control of Pollution Act 1974 (CoPA)*³;
 - *The Environmental Protection Act 1990*⁴ (as amended by the *Noise and Statutory Nuisance Act 1993*⁵) (EPA);

¹ The Department of Transport (1988). *Calculation of Road Traffic Noise*. DfT, London, UK.

² UK Government (2017). *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017* (online). Available at: <http://www.legislation.gov.uk/uksi/2017/571/contents/made> (Accessed 13 January 2020).

³ UK Government (1974). *The Control of Pollution Act 1974* (online). Available at <https://www.legislation.gov.uk/ukpga/1974/40/contents/made> (Accessed 30 July 2020).

⁴ UK Government (1990). *The Environmental Protection Act 1990* (online). Available at <https://www.legislation.gov.uk/ukpga/1990/43/contents/made> (Accessed 30 July 2020)

⁵ UK Government (1993). *Noise and Statutory Nuisance Act 1993* (online). Available at <https://www.legislation.gov.uk/ukpga/1993/40/contents/made> (Accessed 30 July 2020)

- *The Noise Insulation Regulations 1975 (NIR)*⁶ (as amended by 1988 Amendment⁷); and
- *The Noise Act 1996 (NA)*⁸.

Planning policy context

11.3.2 A summary of the relevant planning policies is given in **Table 11.1**.

Table 11.1 Planning policy issues relevant to noise and vibration

Policy reference	Policy issue
National planning policies	
National Planning Policy Framework (NPPF) ⁹	The NPPF states that planning policies and decisions should: 1. <i>Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development</i> 2. <i>Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions</i> 3. <i>Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.</i> The NPPF also states that “<i>The planning system should contribute to and enhance the natural and local environment by: (...) preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.</i>” Regarding existing businesses and community facilities the NPPF states “<i>Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.</i>”
Noise Policy Statement for England (NPSE) ¹⁰	The NPSE sets out the long-term vision of Government noise policy, i.e. to “<i>promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.</i>” This vision is supported by the following aims: 1. <i>avoid significant adverse impacts on health and quality of life;</i> 2. <i>mitigate and minimise adverse impacts on health and quality of life; and</i> 3. <i>where possible, contribute to the improvement of health and quality of life.</i> To identify “significant adverse” and “adverse” impact in line with the three aims of NPSE, the policy statement notes that:

⁶ UK Government (1975). *The Noise Insulation Regulations 1975* (online). Available at: <https://www.legislation.gov.uk/uksi/1975/1763/contents/made> (Accessed 30 July 2020)

⁷ UK Government (1988). *The Noise Insulation (Amendment) Regulations 1988* (online). Available at: <https://www.legislation.gov.uk/uksi/1988/2000/contents/made> (Accessed 30 July 2020)

⁸ UK Government (1996). *The Noise Act 1996* (online). Available at: <https://www.legislation.gov.uk/ukpga/1996/37/contents/made> (Accessed 30 July 2020)

⁹ Ministry of Housing, Communities & Local Government (2021). *Revised National Planning Policy Framework* (online). Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (Accessed 3 December 2021).

¹⁰ Department for Environment, Food & Rural Affairs (2010). *Noise Policy Statement for England* (online). Available at: <https://www.gov.uk/government/publications/noise-policy-statement-for-england> (Accessed 30 July 2020).

Policy reference	Policy issue
	<i>"there are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organization. They are:</i> <i>- No Observed Effect Level (NOEL): This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.</i> <i>- Lowest Observed Adverse Effect Level (LOAEL): This is the level above which adverse effects on health and quality of life can be detected. Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.</i> <i>- Significant Observed Adverse Effect Level (SOAEL). This is the level above which significant adverse effects on health and quality of life occur."</i> The policy states <i>"The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur."</i> The NPSE notes that <i>"it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."</i>
Planning Practice Guidance- Noise (PPG-N), 2019¹¹	PPG-N relates in terms of a noise hierarchy the levels of perception to noise exposure with expected outcomes and required actions.
Local development plan	
HBBC Site Allocations and Development Management Policies DPD¹²	Policy DM7 – Preventing Pollution and Flooding To ensure that developments do not cause noise or vibration levels which would disturb areas that are valued for their tranquillity in terms of recreation or amenity. Policy DM10 – Development and Design To ensure that developments do not have a significant adverse effect on the privacy and amenity of nearby residents and occupiers of adjacent buildings including matters of noise and vibration.

Technical guidance

11.3.3 A summary of the technical guidance relevant to the assessment of effects on noise and vibration is given in **Table 11.2**.

Table 11.2 Relevant technical guidance

Technical guidance	Summary
Institute of Environmental Management and Assessment (IEMA), Guidelines for Environmental Noise Impact Assessment¹³	Presents guidelines on how the assessment of noise effects should be presented within the Environmental Impact Assessment (EIA) process. The

¹¹ Ministry of Housing, Communities & Local Government. (2019). *Planning Practice Guidance, Noise*. (online). Available at <https://www.gov.uk/guidance/noise--2> (Accessed 14 September 2021).

¹² Hinckley & Bosworth Borough Council (2016). *Site Allocations and Development Management Policies DPD*. (online) Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/5295/site-allocations-and-development-management-policies-dpd-adopted-july-2016> (Accessed 23 March 2021).

¹³ Institute of Environmental Management and Assessment (2014). *Guidelines for Environmental Noise Impact Assessment*. IEMA; Lincoln, UK.

Technical guidance	Summary
	IEMA guidelines cover aspects such as; scoping, baseline, prediction and example definitions of significance criteria.
Acoustics – Attenuation of sound during propagation outdoors: Part 2 General Method of Calculation, 1996 (ISO 9613-2)¹⁴	Defines a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at distances from a source.
BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound¹⁵	'Methods for rating and assessing industrial and commercial sound' is used to rate and assess sound of an industrial nature including, but not limited to, assessing sound from proposed, new, modified or additional sources of industrial sound, and sound at proposed new dwellings. It contains guidance on the monitoring and assessment of industrial and commercial sound sources (including fixed installations comprising mechanical and electrical plant and equipment) affecting sensitive receptors.
BS 8233:2014, Guidance on sound insulation and noise reduction on buildings¹⁶	Presents design criteria for noise within habitable rooms in a new residential development to avoid adverse impacts on suitability for the intended use.
The Department of Transport, Calculation of Road Traffic Noise¹	Provides a calculation methodology for road traffic noise, which will be used if any increase in HGV numbers is likely to result in an increase of more than 1 dB(A) in road traffic noise.
Highways England, Design Manual for Roads and Bridges (DMRB)¹⁷	Presents a methodology for determining impacts upon noise sensitive receptors from changes in road traffic noise due to road projects.
Transport and Road Research Laboratory – Converting the UK traffic noise index $L_{A10, 18hr}$ to EU noise indices for noise mapping, 2002 (TRL PR/SE/451/02)¹⁸	A method for converting the road traffic noise indexes described in CRTN to produce outputs in the form of European Union indices, in particular <i>TRL Method 2</i> which outlines the conversion of the $L_{A10, 18hr}$ noise indices to the $L_{Aeq, 16hr}$ and $L_{Aeq, 8hr}$ indexes.
ProPG: Planning & Noise 'Professional Practice Guidance on Planning & Noise'¹⁹	ProPG provides practitioners with guidance on a recommended approach to the management of noise for new residential development within the planning system in England. The guidance encourages better acoustic design for new residential development and aims to protect people from the harmful effects of noise.
Building Bulletin 93 (BB93:2015) Acoustic design of schools: performance standards²⁰	BB93:2015 sets out minimum performance standards for the acoustics of school buildings and external areas, and describes the normal means of demonstrating compliance with the Building Regulations.

¹⁴ International Organization for Standardization (1996). *Acoustics – Attenuation of sound during propagation outdoors: Part 2 General Method of Calculation (ISO 9613-2)*. ISO; Geneva, Switzerland

¹⁵ British Standards Institution (2014). *BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound*. ISBN: 978 0 539 02069 4. BSI; London, UK

¹⁶ British Standards Institution (2014). *BS 8223:2014, Guidance on sound insulation and noise reduction on buildings*. BSI; London, UK

¹⁷ Highways England (2020). *Design Manual for Roads and Bridges, LA 111 – Noise and Vibration (Revision 2)* (online). Available at: <https://www.standardsforhighways.co.uk/dmrB/search/cc8cfc7-c235-4052-8d32-d5398796b364> (Accessed 30 July 2020).

¹⁸ TRL and Casella Stanger (2002). *Method for Converting the UK Road Traffic Noise Index $L_{A10, 18h}$ to the EU Noise Indices for Road Noise Mapping*

¹⁹ Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health (2017), *ProPG: Planning & Noise - Professional Practice Guidance on Planning & Noise – New Residential Development*. (online) Available at: <https://www.ioa.org.uk/sites/default/files/14720%20ProPG%20Main%20Document.pdf> (Accessed 30 July 2020).

²⁰ Education funding Agency (2015). *Acoustic design of schools: performance standards: Building bulletin 93* (online) Available at: <https://www.ioa.org.uk/sites/default/files/14720%20ProPG%20Main%20Document.pdf> (Accessed 30 July 2020).

11.4 Data gathering methodology

Study Area

- 11.4.1 The Study Area for the data gathering process for the preparation of this chapter consists of the Proposed Development itself, the local roads, properties bounding the Proposed Development and major roads running near to the Proposed Development (i.e. the A47 and M69).

Survey work

- 11.4.2 It was established at this scoping stage that a baseline ambient noise survey was inappropriate due to the ongoing COVID-19 pandemic and the influence this may have had on road traffic noise levels. A desk study of the area concluded that road traffic noise was likely to be dominant within the Study Area and therefore baseline ambient noise levels would be best achieved through 3D noise modelling, as discussed in **Section 11.10**.

Desk study

- 11.4.3 This section describes the desk study that has been undertaken to inform the noise and vibration assessment. In order to establish the baseline situation, data was obtained from the sources listed below to identify existing data about the Site and the surrounding area.
- 11.4.4 A summary of the key sources of data, together with the nature of that data is as follows:
- Google® Earth Pro Version 7.3.4.8248²¹:
 - ▶ satellite imagery for establishing location of existing noise sensitive receptors and current baseline conditions.
 - Leicestershire City Council (LCC):
 - ▶ predicted traffic flows to be used within the noise model.
 - Defra Magic Map²²:
 - ▶ local footpaths, listed buildings, habitats and species which can be used when identifying receptors.
 - Extrium England Noise and Air Quality Viewer²³:
 - ▶ Defra Round 3 road noise mapping and railway mapping data.

11.5 Overall baseline

Current baseline

- 11.5.1 The Proposed Development currently comprises of agricultural land. As such, there are few noise sources within the Site boundary, although there is an existing Wastewater Treatment Works (WwTW) located adjacent to the eastern area of the Proposed Development. Whilst WwTWs can sometimes include noisy operations, depending on the types of filtration/processing operations

²¹ Google (2021). *Google Earth Pro version 7.3.4.8248*. (online). Available at: <https://www.google.com/earth/download/gep/agree.html?hl=en-GB> (Accessed 26 August 2021).

²² DEFRA (2021). *Magic Map Application*. (online) Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed 26 August 2021).

²³ Extrium (2021). *England Noise and Air Quality Viewer*. (online) Available at: <http://www.extrium.co.uk/noiseviewer.html> (Accessed 26 August 2021).

undertaken, from observations during a Site visit in July 2012 it was observed that there was generally no noisy plant operating in this area, with the exception of heavy vehicle movements. It is understood that since this Site visit, the WwTW have improved on their operating processes. It is assumed that on this basis the noise contribution at the Proposed Development from the WwTW would be no higher than in 2012.

- 11.5.2 Other noise sources in the area include the A47 (Clicker's Way) which borders the south and east of the Proposed Development and is expected to be the major constraining factor with respect to noise. Noise emissions from the A47 were previously noted to be continuous during the day, with steady traffic flows also likely during the night-time period.
- 11.5.3 The M69 motorway runs south-east of the Site. The motorway noise was deemed to be a significant contributor to the noise environment during the Site visit in 2012. Given the domination of traffic noise from the A47 on the Site, it is not anticipated that changes in motorway noise would have a significant effect on the noise environment at the Site. With the increase in electric cars in the future, road traffic noise could decrease on site.

Future baseline

- 11.5.4 The following factors are considered likely to influence existing baseline noise levels in and around the Proposed Development in the future:
- increases in local traffic ('natural' traffic growth) during daytime and night-time periods, particularly on the A47;
 - increases in local traffic due to other committed developments in and around Earl Shilton; and
 - any potential changes to the operation of the WwTW to include additional filtration operations.
- 11.5.5 Possible increases in road traffic noise on major routes around the Proposed Development will be considered when determining noise mitigation requirements for the Proposed Development. This will principally be carried out to protect residential amenity for proposed new housing close to the A47.

11.6 Consultation

- 11.6.1 **Table 11.3** provides a summary of the issues about the Proposed Development that have been raised by consultees and the responses given.

Table 11.3 Summary of issues raised during consultation regarding noise and vibration

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
The scoping report identifies relevant policy and legislation relating to the Noise and Vibration, however Policy DM7: Preventing Pollution and Flooding and Policy DM10: Development and Design of the Site Allocations and Development Management Policies DPD are not referenced and should be included and considered. The council agrees that this topic should be included and assessed within the Environmental Statement supporting any future application.	HBBC	It is agreed that the mentioned policies should be referenced, included and considered as part of this ES. The mentioned policies are now provided in Section 11.3 .	Section 11.3
General aspects (in relation to road traffic) to be addressed in all cases include: Adverse change to noise and air quality should be given particular consideration, including relation to compliance with the European air quality limit values and/or in local authority designated Air Quality Management Areas (AQMAs).	Highways England	Traffic related noise impacts have been assessed as part of this chapter.	Section 11.10
The northern edge of the Site borders Blaby District (on the opposite side of Thurlaston Lane). This part of Blaby District is predominantly rural in nature, with the closest settlements to the Site being Elmeesthrope, approximately ½ km to the south-west, and Thurlaston, approximately 2km to the east. However, there are isolated properties and farms in closer proximity within Blaby District, including Elms Farm and Oakfield, both on Thurlaston Lane to the north, and the impact of the Proposed Development on the residential amenities of these properties should be considered.	Blaby District Council	Traffic-related noise effects have been assessed on roads likely to experience significant effects. Noise impacts on receptors closer to the Site will provide a worst-case assessment of impacts that could potentially be felt at receptors at a greater distance (i.e. those on Thurlaston Lane).	Section 11.7

11.7 Scope of the assessment

Spatial scope

- 11.7.1 The identification of receptors is based on relevant guidance and the professional judgement of a qualified technical specialist who has undertaken a desk study for the Proposed Development location.
- 11.7.2 The following considerations have been taken into account when identifying potential sensitive receptors:
- the extent to which the receptor will be affected by changes that are expected to result from the Proposed Development;
 - the sensitivity of the receptors to the changes that are likely to occur;
 - the likely magnitude, duration, and other characteristics of the effects;
 - the importance or value of the receptor at a local, regional, and national level; and
 - relevant best practice and guidance where specialist methodologies have been developed, as detailed below.

Temporal scope

- 11.7.3 The temporal scope of the assessment of noise and vibration considers the noise impact of the Proposed Development in its fully built state, as this would represent the long-term future change. The opening year and future year are considered to assess short-term and long-term impact of traffic noise on roads affected by the Proposed Development.

Potential receptors

- 11.7.4 The receptors that will potentially be affected by the Proposed Development comprise of existing local residents and schools adjacent to road traffic routes affected by Proposed Development, which are potentially expected to experience an increase in road traffic noise levels (indirect effects).

Existing NSRs

- 11.7.5 Existing NSRs in close proximity to the Proposed Development are located as follows:
- residential areas to the west/north of the Site, forming the Site boundary at these locations, including (from west to east) residential properties on Equity Road East, Meadow Court Road, Astley Road, The Leecrofts, Weaver Road, Montgomery Road, Parry Close, Columbus Lane, Bartlett Close, Mill Lane and Union Mill Close;
 - residential areas to the south-west of the Site, opposite Breach Lane (Masfield Drive/Oaklands Way);
 - Townlands Church of England and St Simon and St Jude primary schools, also located west/north of the Site on Meadow Court Road and Alexander Avenue, respectively; and
 - other residential areas on major road traffic routes in the vicinity of the Proposed Development potentially experiencing a significant increase in road traffic noise levels.

Future NSRs

- 11.7.6 There is other residential development within this area, but it is assumed that, given it is also part of the SUE, that residents there would not experience the change in traffic noise level as experienced by the existing residents. Therefore, future NSRs are not included within this assessment.

Likely significant effects

- 11.7.7 The likely significant noise and vibration effects that will be taken forward for assessment are summarised in **Table 11.4**.

Table 11.4 Likely significant noise and vibration effects

Activity	Effect	Receptor
Additional road traffic on local routes generated by the Proposed Development	Potential for adverse impacts due to noise arising from Site activity and off-site traffic generation.	Nearby NSRs.

- 11.7.8 The effects scoped out from further assessment are:
- potential effects on NSRs due to noise and vibration arising from on-site activities during the construction phase: with regards to noise and vibration, it is inevitable with any development that there will be some disturbance caused to nearby receptors during construction phases. However, noise disruption due to construction is temporary, limited to the Proposed Development and is dependent on the rate of annual dwelling completions, likely to be for approximately 10 years (see **Chapter 3: Description of the Proposed Development**). Construction activities would also move around the Proposed Development, as the Proposed Development is built out and are only likely to be in close proximity to NSRs for short durations. A range of best practice environmental measures would be incorporated into the Proposed Development via the Construction Environmental Management Plan (CEMP), in order to minimise and manage potential construction noise effects, with which contractors will need to comply. Construction hours can also be controlled through a CEMP to decrease periods of noise disturbance. Piling methodology will also be dealt with using the CEMP. Construction effects are not expected to be significant provided these measures are in place.
 - potential effects on NSRs due to vibration during the operational phase: no sources of vibration have been identified or are considered likely to occur due to the proposed location of the commercial elements of the Proposed Development. If vibratory industry is subsequently located in one of the commercial units, this is likely to require engineering to mitigate vibration at source in any case.
 - potential effects on NSRs due to vibration from road traffic during the operation phase: Section 1.4 *DMRB*¹⁷ states "Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effects." The A47 is a trunk road maintained by National Highways (formally Highways England) and/or HBBC and as such the potential for significant effects is considered to be negligible.
 - potential effects on NSRs due to fixed plant and other commercial activity relating to the proposed schools and commercial/industrial buildings: as shown in **Section 11.14**, an embedded measure of the Proposed Development is that the rating level for proposed commercial uses are to be designed to meet a noise emissions criterion of +5 dB(A) above background noise level at the worst affected receptors, which will be part of the Proposed

Development. Given the distance between the proposed commercial properties and the nearest existing NSRs, it is considered unlikely that emissions from fixed plant/commercial activity would lead to a significant effect.

- future occupants of the Proposed Development, including the occupants of proposed residential, commercial and educational uses: future occupants are considered to be outside of the scope of an EIA and therefore will not be assessed but are instead assessed in a separate, standalone Site Suitability Report.

11.8 Environmental measures embedded into the development proposals

- 11.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 4.8**. **Table 11.5** outlines how these embedded measures will influence the noise and vibration assessment.

Table 11.5 Summary of the embedded environmental measures and how these influence the noise and vibration assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Existing NSRs	Increase in ambient noise levels due to proposed commercial areas	Noise emissions (rating level, LAr) for proposed commercial uses to be designed to meet a noise emissions criterion of +5dB(A) above background noise level at the worst affected receptors. As the worst affected receptors will be built as part of the development and not considered as part of this ES, no assessment of industrial sources has taken place in this ES chapter but instead is addressed in a separate Site Suitability Report.

11.9 Assessment methodology

- 11.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this noise and vibration assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this noise and vibration assessment.
- 11.9.2 Government noise policy, namely that set out within the NPSE¹⁰ and the policies listed in **Table 11.1**, requires that noise and vibration assessments identify effects that would result in significant adverse impacts on health and quality of life from a proposed development.
- 11.9.3 In NPSE¹⁰ and NPPG¹¹ the effect levels in relation to adverse impacts on health and quality of life are set out as:
- No Observed Effect Level (NOEL)– level below which no effect on health and quality of life is detected;
 - Lowest Observed Adverse Effect Level (LOAEL) – level above which adverse effects on health and quality of life can be detected;
 - Significant Observed Adverse Effect Level (SOAEL)– level above which significant adverse effects on health and quality of life occur; and
 - Unacceptable Adverse Effect Level (UAEL) – level above which adverse effects are unacceptable.

- 11.9.4 The NPPG¹¹ links the increasing effect levels to an effect, perception by receptor and associated action, as summarised in **Table 11.6**.

Table 11.6 NPPG, summary of noise exposure hierarchy

Increasing effect level	Effect	Perception	Action
Less than NOEL	No effect	Not noticeable	No specific measures
Greater than NOEL	Effect	Noticeable but not intrusive	No specific measures
Greater than LOAEL	Adverse effect	Noticeable and intrusive	Mitigate and reduce to a minimum
Greater than SOAEL	Significant adverse effect	Noticeable and disruptive	Avoid
Greater than UAEL	Unacceptable adverse effect	Noticeable and very disruptive	Prevent

- 11.9.5 In relation to the effect levels summarised in **Table 11.6**, NPSE¹⁰ sets out three aims:
- avoid developments or activities which are demonstrated to have significant observed adverse effects i.e. greater than the SOAEL;
 - mitigate and minimise developments or activities where the effect lies between the LOAEL and the SOAEL; and
 - contribute to the improvement of health and quality of life through the effective management and control of environmental noise.
- 11.9.6 The NPSE¹⁰ states that it is not possible to have a 'single objective' noise (or vibration) based measure applicable to all sources and receptors that define the on-set of the LOAEL or the SOAEL. It is however possible to define threshold levels for the onset of each of the effect levels, based upon available Standards and technical guidance.
- 11.9.7 The Standards and technical guidance used within this assessment to define the NPSE¹⁰ threshold levels, and associated reasoning, are detailed below.

Establishing receptor sensitivity

- 11.9.8 The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are '*likely to be significantly affected by the development*'.
- 11.9.9 The EIA Regulations do not define significance and it is necessary to state how this is defined for EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.
- 11.9.10 The precise determination of the sensitivity of a receptor relies on professional judgement.
- 11.9.11 **Table 11.7** details the basis for assessing receptor sensitivity which has been produced on the basis of experience and assessing similar facilities, and on professional judgement.

Table 11.7 Establishing the sensitivity of receptors

Sensitivity	Example
High	Hospital operating theatres, recording studios
Medium	Dwellings, schools, hotels
Low	Offices, public amenity areas
Negligible	Industrial and commercial areas

Significance of effect evaluation methodology

- 11.9.12 The evaluation of significance differs depending on the sensitivity of the assessed receptor(s). National noise policy and standards documents generally focus on the effects of noise on residential receptors in isolation, whilst there is a requirement within the NPSE¹⁰ and NPPG¹⁰ to evaluate the effects on a community basis; such as within a neighbourhood. The evaluation of significance within a community is therefore a combination of advice derived from standards and policy, in addition to considerations of context and receptor sensitivity.
- 11.9.13 The precise determination of impact magnitudes for operational noise effects are based on relevant guidance and professional judgement. For example, DMRB provides criteria which may be directly transposed to different impact magnitude categories (see **Table 11.10** and **Table 11.11**).
- 11.9.14 The overall significance of effect rating is based on the evaluation of significance matrix presented in **Table 11.8**.

Table 11.8 Significance of effect matrix for noise and vibration

Level of significance to sensitivity of receptor/resource	Magnitude of change			
	High	Medium	Low	Negligible
High	Major (significant)	Moderate/Major (significant)	Minor/Moderate (potentially significant)	Minor (not significant)
Medium	Moderate/Major (significant)	Minor/Moderate (potentially significant)	Minor (not significant)	Negligible/Minor (not significant)
Low	Minor/Moderate (potentially significant)	Minor (not significant)	Negligible/Minor (not significant)	Negligible (not significant)

Residential receptors

- 11.9.15 For assessment purposes, where the calculated noise or vibration exposure at a residential receptor is greater than the SOAEL and is therefore a significant observed adverse impact on health and quality of life in Government noise policy terms; this will also be treated as a likely significant adverse effect in the context of the EIA Regulations.
- 11.9.16 Effects at the assessed residential receptors which are shown to be lower than the LOAEL are not considered to be adverse in terms of EIA Regulations. However, where possible, mitigation has been recommended with the aim to positively improve the health and quality of life of those receptors. This approach is in keeping with the third aim of NPSE¹⁰.

- 11.9.17 The second aim of NPSE¹⁰ refers to situations where the impact lies between the LOAEL and the SOAEL, where there is a requirement to *'mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development'*. In this case reasonable steps should be taken to mitigate and minimise the impact. The NPSE¹⁰ however recognises that this does not necessarily mean such adverse effects cannot occur.
- 11.9.18 The decision-making process as to whether or not an adverse effect at a residential receptor occurs when the noise or vibration exposure is between the LOAEL and SOAEL can require additional quantitative and qualitative considerations. These require elements of professional judgement and consideration of the context within which the effect occurs. In summary, these considerations include:
- the magnitude of the effect;
 - the change in magnitude of the effect;
 - the type of effect, including its intermittency;
 - the existing acoustic environment;
 - the effectiveness of mitigation, including best practicable means (BPM); and
 - the duration of effect.
- 11.9.19 The NPPG¹¹ advises that noise effects may be partially offset if the residents of affected dwellings have access to:
- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;
 - a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;
 - a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;
 - a relatively quiet, protected, external publicly accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance).
- 11.9.20 Furthermore, the NPPF⁹ requires consideration to be given to the likely effects at receptors of noise and vibration together from the Site in isolation and in-combination with other relevant committed and proposed projects.

Non-residential receptors

- 11.9.21 For non-residential receptors, the evaluation of significance has taken into account the considerations outlined in the previous section, and the sensitivity of the non-residential receptor's existing use.
- 11.9.22 The assessment as to whether there will be a significant adverse effect in terms of the EIA Regulations is based upon the quantitative and qualitative considerations in the Significance evaluation methodology section, namely:
- the magnitude of the effect;

- the change in magnitude of the effect;
- the type of effect, including its intermittency;
- the existing acoustic environment;
- the effectiveness of mitigation, including BPM; and
- the duration of effect.

Operational road traffic noise methodology

- 11.9.23 Changes in noise levels arising from variations in road traffic volumes on the local network (associated with the Proposed Development) have been assessed using the CRTN¹ and DMRB¹⁷.
- 11.9.24 In accordance with DMRB, daytime (06:00 – 00:00) levels have been predicted and assessed using the $L_{10,18h}$ noise metric. No traffic flows have been provided for night-time and therefore a night-time noise level was predicted by using the methodology within TRL document 'Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping'²⁴. This methodology uses the $L_{A10,18h}$ daytime to provide a $L_{Aeq,8h}$ night-time (23:00 – 07:00). NPSE levels are identified below for both periods and metrics.
- 11.9.25 Road traffic noise has been predicted using LimA software, with the exception of receptors on Astley Road, which are closer to the road than standard CRTN methodology would account for and which have been calculated using a spreadsheet to ensure conformity with the standard. The road traffic models were based upon total vehicle flow, percentage HGVs and average speed data for the daytime and night-time average hourly traffic flows in both the baseline and 'with development' scenarios.

Residential receptors

- 11.9.26 DMRB¹⁷ states that LOAELs and SOAELs should be set out in accordance with **Table 11.9**, although it also provides scope for the application of professional judgement in modifying these values where it is appropriate to do so.

Table 11.9 Summary of road traffic noise threshold levels

Noise sources	Receptor	Period	LOAEL	SOAEL
Operational noise – road traffic	Residential	Daytime	50 dB $L_{Aeq, 16h}$ (free field) 55 dB $L_{A10, 18h}$ (façade)	63 dB $L_{Aeq, 16h}$ (free-field) 65 dB $L_{A10, 18h}$ (façade)
		Night-time	40 dB $L_{Aeq, 8h}$ (free-field)	55 dB $L_{Aeq, 8h}$ (free-field)

- 11.9.27 Consideration has been given to the items listed in paragraph 11.9.18 to evaluate the magnitude of significance in terms of the EIA Regulations; where the road traffic noise effects at residential receptors lie between the LOAEL and the SOAEL.

²⁴ TRL Limited (2002). 'Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping'. (online). Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20130402151656/http://archive.defra.gov.uk/environment/quality/noise/research/crtn/documents/noise_crtn.pdf (Accessed 16 December 2021).

- 11.9.28 In addition to the considerations summarised in the significance evaluation methodology section, the determination as to whether there is a significant adverse effect in terms of the EIA Regulations from road traffic noise will consider the likely magnitude of change.
- 11.9.29 DMRB¹⁷ presents the interpretation of changes in road traffic noise levels ($L_{A10, 18hr}$ and/or $L_{Aeq, 8hr}$) for determining the potential magnitude of impact. DMRB sets out differing criteria associated with change in noise level for short term (i.e. immediately after the Proposed Development opening) and long-term (ideally 15 years from the Proposed Development opening) impacts; as outlined in **Table 11.10** and **Table 11.11**, respectively (terminology amended from DMRB to align with significance of effect matrix).

Table 11.10 DMRB¹⁷ classification of magnitude of noise impacts in the short term

Noise change in dB $L_{A10, 18h}$	Magnitude of impact
0.1 – 0.9	Negligible
1 – 2.9	Low
3 – 4.9	Medium
5+	High

Table 11.11 DMRB¹⁷ classification of magnitude of noise impacts in the long-term

Noise change in dB $L_{A10, 18h}$	Magnitude of impact
0.1 – 2.9	Negligible
3 – 4.9	Low
5 – 9.9	Medium
10+	High

- 11.9.30 DMRB advocates a staged approach for the assessment of likely significant effects. This takes the form of an initial assessment where minor or negligible change magnitudes on NSRs in the short term are deemed not significant and change magnitudes moderate or above are deemed to be significant.
- 11.9.31 DMRB¹⁷ considers that where the magnitude of change is deemed 'negligible' in the initial assessment then no further assessment required for these NSRs.
- 11.9.32 For NSRs where the magnitude of change is found to be minor, moderate, or major in the initial assessment then there are series of additional factors to consider before the final significance determination can be made, these include:
- whether the noise level change is close to the boundary, i.e. a moderate impact magnitude is less than 1 dB above the minor impact range;
 - where the long-term and short-term outcomes differ:
 - ▶ where long-term impact is predicted to be greater than short-term impact, it can be appropriate to conclude that a minor change in the short term is a likely significant effect;

- ▶ where the long-term impact is predicted to be less than the short-term, it can be appropriate to conclude that a moderate or major change in the short term is not significant; or
- ▶ a similar change in long-term and non-project noise can indicate that change is not due to the project and therefore not an indication of a likely significant effect;
- a noise change where all do-something absolute noise levels are below SOAEL requires no modification of the initial assessment;
- where any do-something absolute noise levels are above SOAEL, a noise change in the short term of 1 dB or over results in a likely significant effect;
- consideration of the locations of the noise sensitive parts of the receptor;
- acoustic context – i.e. is the noise source being introduced different in character to the existing soundscape; and
- likely perception of change by residents – i.e. non-acoustic factors.

Non-residential receptors

- 11.9.33 The DMRB criteria above is applied to non-residential receptors. However, an initial screening criterion is used to assess whether the absolute noise level is potentially significant. For example, a major increase in traffic noise at a school would not be considered significant if the total noise was below a set noise level.
- 11.9.34 BS 8233:2014¹⁶ sets out desirable internal ambient noise levels in rooms intended for a variety of activities. The desirable internal ambient noise levels are set based upon impacts from noise sources that do not have a specific distinguishable character, such as a tone or strong low-frequency content.
- 11.9.35 In the absence of façade construction information for each of the non-residential receptors, the internal ambient noise criteria have been related to an external criterion by applying a +15 dB correction. This approach is advocated by the calculation methodology set out within BS 8233:2014¹⁶ and assumes a 15 dB attenuation across a partially open window.
- 11.9.36 The Department for Education²⁰ has set out acoustic performance standards appropriate for education facilities covered by The Building Regulations Approved Document E²⁵. In BB93²⁰, the most conservative limit for indoor ambient noise is 35dB $L_{Aeq, 30min}$ and is specified for rooms where the uses include, nursery school rooms, primary or secondary school classrooms, teaching areas, or laboratories. This indoor noise limit has been adopted as the daytime impact criterion for the educational facilities non-residential receptor group. The associated daytime external criteria is 50 dB $L_{Aeq, T}$, assuming a 15 dB correction for a partially opened window. For the purposes of this assessment, it is assumed that the $L_{Aeq, 30 min}$ is represented by an $L_{Aeq, 16 hour}$, which is obtained by deducting 2.2 dB from the $L_{A10, 18 hour}$ as per TRL methodology²⁶. The 50 dB level is considered as a screening threshold for further assessment of the traffic noise change from the Proposed Development.

²⁵ UK Government (2015). *The Building Regulations 2010 Approved Document E: Resistance to the passage of sound*. [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/468870/ADE_LOCKED.pdf [Accessed 16 December 2021].

²⁶ TRL Limited (2002). 'Converting the UK traffic noise index LA10,18h to EU noise indices for noise mapping'. (online). Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20130402151656/http://archive.defra.gov.uk/environment/quality/noise/research/crtn/documents/noise_crtn.pdf (Accessed 16 December 2021).

Site suitability

- 11.9.37 As previously stated, a Site Suitability assessment is considered to be outside of the scope and therefore will not be assessed in this ES, but has instead been assessed in a separate, standalone, Site Suitability Report. This report has assessed whether the Site will be suitable for its intended purposes and outlines the nature and level of measures which may be required to meet acceptable external and internal amenity levels. Residential areas have been assessed in accordance with guidance given in ProPG: Planning and Noise: New Residential Development¹⁹. Any new school sites will be assessed in accordance with Building Bulletin 93: Acoustic Design in Schools (BB93:2015)²⁰.

11.10 Assessment of noise and vibration effects

Predicted effects and their significance

- 11.10.1 Calculations completed in accordance with CRTN¹ allow the determination of road traffic noise emissions from various routes around the Proposed Development. Noise change due to the Proposed Development has been determined at NSRs within the Study Area. The change in noise has been assessed for the following:
- Short term: Do Minimum Opening Year (DMOY) compared against the Do Something Opening Year (DSOY).
 - Long term: Do Minimum Opening Year (DMOY) compared against the Do Something Future Year (DSFY).
- 11.10.2 A comprehensive noise model was developed using LimA, a computational noise modelling suite. The LimA noise modelling suite allows a 3-dimensional environmental model to be constructed using digital mapping and topographic data. As such, it takes into account the following factors potentially affecting levels of noise propagation in the area surrounding a particular noise source:
- noise source location, as shown by digital mapping data;
 - noise emission data, calculation of source emission sound pressure levels from total road traffic volumes, percentage of HGVs, road segment speeds etc (in accordance with CRTN¹);
 - relative distances between noise sources/receptors and any noise attenuating barriers;
 - locations and dimensions of barriers between noise source and receptor;
 - ground contours, contributing to the relative heights of sources/receptors and barriers; and
 - ground attenuation, relating to the attenuation provided by ground cover between the sources and receptors.
- 11.10.3 LimA allows the calculation of noise levels at specific, single points or over a calculation grid of a specified size. In order to assess the potential effects of road traffic noise during daytime and night-time periods, calculation grids were determined at the following heights:
- Daytime, 1.5 m (ground level); and
 - Night-time, 4 m (first floor).
- 11.10.4 The change in road traffic noise levels was calculated for a sample of potentially affected properties on the local road network, shown in **Figure 11.1**.
- 11.10.5 In order to evaluate the potential magnitude of changes in traffic in residential areas located on or close to these routes, the differences in predicted noise levels for short term effect, and long term

effect have been assessed with reference to Do Minimum (DM) 2026, Do Something (DS) 2026, and Do Something (DS) 2036 with the results provided in **Table 11.12** to **Table 11.15**.

Table 11.12 Predicted change in road traffic noise levels, daytime – short term effect

Receptor ID	Receptor name	DM2026 predicted noise level $L_{A10,18h}$, dB (Facade)	DS2026 predicted noise level $L_{A10,18h}$, dB (Facade)	DS2026 – DM2026, dB	Significance of effect (Adverse unless otherwise identified)
1	Columbus Lane	53	52	-1	Beneficial
2	Parry Close	53	53	0	No change
3	Weaver Road	46	50	4	Minor / Moderate
4	Astley Road (North)	57	63	6	Moderate / Major
5	The Leecrofts	52	52	0	No change
6	Astley Road (South)	59	60	1	Minor
7	Meadow Court Road 1	62	64	2	Minor
8	Meadow Court Road 2	60	61	1	Minor
9	Meadow Court Road 3	59	60	1	Minor
10	Equity Road East	41	42	1	Minor
11	Oaklands Way	44	44	0	No change
12	Masefield Place 1	45	45	0	No change
13	Breach Lane	46	46	0	No change
14	Masefield Place 2	56	55	-1	Beneficial
15	Masefield Place 3	47	48	1	Minor
16	Oaklands Drive 1	47	48	1	Minor
17	Oaklands Drive 2	52	52	0	No change
18	St Simon & St Jude Primary School Façade	58	65	7	Moderate / Major
19	St Simon & St Jude Primary School Free Field	53	56	3	Minor / Moderate
20	Townlands C of E Primary	49	49	0	No change

11.10.6

The predicted effects for medium sensitivity receptors are largely of **minor adverse** significance using the matrix presented in **Table 11.8**. However, a high impact is identified for the following receptors:

- Astley Road residences – high impact on medium sensitivity receptor resulting in moderate to major adverse significance. Considered of moderate **significant adverse** effect because of the proximity to the medium impact criteria as well as the SOAEL not being exceeded.
- St Simon & St Jude Primary School - noise levels at the façade exceed the screening criteria of 50 dB and a high impact on medium sensitivity receptor resulting in a moderate to major adverse significance is predicted which is considered to be a moderate **significant adverse** effect as the without development scenario would already be exceeding the screening criteria (i.e. mitigation would likely already need to be in place to meet internal ambient noise criteria with windows open). The playground area noise level would be considered minor adverse as it is on the boundary between a low and medium impact.

Table 11.13 Predicted change in road traffic noise levels, night-time – short term effect

Receptor ID	Receptor name	DM2026 predicted noise level $L_{Aeq,8h}$, dB (Free field)	DS2026 predicted noise level $L_{Aeq,8h}$, dB (Free field)	DS2026 – DM2026, dB	Significance of effect (Adverse unless otherwise identified)
1	Columbus Lane	45	44	-1	Beneficial
2	Parry Close	46	45	-1	Beneficial
3	Weaver Road	38	41	3	Minor / Moderate
4	Astley Road (North)	48	54	6	Moderate / Major
5	The Leecrofts	44	44	0	No change
6	Astley Road (South)	52	53	1	Minor
7	Meadow Court Road 1	55	56	1	Minor
8	Meadow Court Road 2	53	54	1	Minor
9	Meadow Court Road 3	53	53	0	No change
10	Equity Road East	35	36	1	Minor
11	Oaklands Way	38	39	1	Minor
12	Masefield Place 1	40	40	0	No change
13	Breach Lane	40	41	1	Minor
14	Masefield Place 2	48	48	0	No change
15	Masefield Place 3	42	43	1	Minor
16	Oaklands Drive 1	41	42	1	Minor
17	Oaklands Drive 2	44	45	1	Minor

11.10.7

The predicted effects for medium sensitivity receptors are largely of **minor adverse** significance or without change using the matrix presented in **Table 11.8**. However, a high impact is identified for the following receptors:

- Astley Road residences – high impact on medium sensitivity receptor resulting in moderate to major adverse significance. Considered of moderate **significant adverse** effect because of the proximity to the medium impact criteria as well as the SOAEL not being exceeded.

Table 11.14 Predicted change in road traffic noise levels, daytime – long term effect

Receptor ID	Receptor name	DM2026 predicted noise level $L_{A10,18h}$, dB	DS2036 predicted noise level $L_{A10,18h}$, dB	DS2036 – DM2026, dB	Significance of effect (Adverse unless otherwise identified)
1	Columbus Lane	53	52	-1	Beneficial
2	Parry Close	53	53	0	No change
3	Weaver Road	46	50	4	Minor
4	Astley Road (North)	57	64	7	Minor / Moderate
5	The Leecrofts	52	52	0	No change
6	Astley Road (South)	59	60	1	Negligible
7	Meadow Court Road 1	62	64	2	Negligible
8	Meadow Court Road 2	60	61	1	Negligible
9	Meadow Court Road 3	59	60	1	Negligible
10	Equity Road East	41	42	1	Negligible
11	Oaklands Way	44	44	0	No change
12	Masefield Place 1	45	45	0	No change
13	Breach Lane	46	46	0	No change
14	Masefield Place 2	56	55	-1	Beneficial
15	Masefield Place 3	47	48	1	Negligible
16	Oaklands Drive 1	47	48	1	Negligible
17	Oaklands Drive 2	52	52	0	No change
18	St Simon & St Jude Primary School Façade	58	66	8	Minor / Moderate
19	St Simon & St Jude Primary School Free Field	53	56	3	Minor
20	Townlands C of E Primary	49	49	0	No change

11.10.8

The predicted effects for medium sensitivity receptors are largely of negligible or minor adverse effect and **not significant** using the matrix presented in **Table 11.8**. However, a medium impact is identified with the following receptors:

- Astley Road residences – medium impact on medium sensitivity receptor resulting in minor to moderate adverse significance. Considered of minor adverse effect and **not significant** because the SOAEL has not been exceeded.
- St Simon & St Jude Primary School - noise levels at the façade exceed the screening criteria of 50 dB and a medium impact on medium sensitivity receptor resulting in a minor to moderate adverse significance. Considered of minor adverse effect and **not significant** as the without development scenario would already be exceeding the screening criteria (i.e. mitigation would likely already need to be in place to meet internal ambient noise criteria with windows open).

Table 11.15 Predicted change in road traffic noise levels, night-time – long term effect

Receptor ID	Receptor name	DM predicted noise level $L_{Aeq,8h}$, dB	DS predicted noise level $L_{Aeq,8h}$, dB	DS2036 – DM2026, dB	Significance of effect (Adverse unless otherwise identified)
1	Columbus Lane	45	45	0	No change
2	Parry Close	46	45	-1	Beneficial
3	Weaver Road	38	42	4	Minor
4	Astley Road (North)	48	55	7	Minor / Moderate
5	The Leecrofts	44	45	1	Negligible
6	Astley Road (South)	52	53	1	Negligible
7	Meadow Court Road 1	55	57	2	Negligible
8	Meadow Court Road 2	53	55	2	Negligible
9	Meadow Court Road 3	53	54	1	Negligible
10	Equity Road East	35	36	1	Negligible
11	Oaklands Way	38	39	1	Negligible
12	Masefield Place 1	40	40	0	No change
13	Breach Lane	40	41	1	Negligible
14	Masefield Place 2	48	48	0	No change
15	Masefield Place 3	42	43	1	Negligible

Receptor ID	Receptor name	DM predicted noise level $L_{Aeq,8h}$, dB	DS predicted noise level $L_{Aeq,8h}$, dB	DS2036 – DM2026, dB	Significance of effect (Adverse unless otherwise identified)
16	Oaklands Drive 1	41	43	2	Negligible
17	Oaklands Drive 2	44	45	1	Negligible

- 11.10.9 The predicted effects for medium sensitivity receptors are largely of **negligible** or **minor adverse** significance or without change using the matrix presented in **Table 11.8**. However, a medium impact is identified with the following receptors:
- Astley Road residences – medium impact on medium sensitivity receptor resulting in a minor to moderate adverse significance. Considered of minor adverse effect and **not significant** because the SOAEL has not being exceeded.
- 11.10.10 A summary of the results of the assessment of the noise and vibration is provided in **Table 11.16**.

Table 11.16 Summary of short-term significance of adverse effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Period	Magnitude of change ²	Significance ³	Summary rationale
Residential receptors at the 20/01225/FUL site, Equity Road East and Breach Lane	Medium	Day	No change	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at the Future SUE site, 20/01225/FUL, The Leecrofts and Masefield Place	Medium	Night	No change	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at the Future SUE site, Weaver Road, The Leecrofts and Masefield Place	Medium	Day	Negligible	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at Weaver Road, Astley Road (South) and Meadow Court Road	Medium	Night	Negligible	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at Astley Road (South), Meadow Court Road, Oaklands Way, Masefield Place and Oaklands Drive	Medium	Day	Low	Minor (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at Oaklands Way, Masefield Place and Oaklands Drive	Medium	Night	Low	Minor (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential at Astley Road (North)	Medium	Day	High	Moderate (significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential at Astley Road (North)	Medium	Night	High	Moderate (significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Townlands Church of England Primary School	Medium	Day	Negligible	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
St Simon & St Jude Primary School	Medium	Day	High	Moderate (significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 11.8** and is defined as low, medium, and high.

2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 11.8** and is defined as negligible, low, medium, and high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 11.8**.

Table 11.17 Summary of long-term significance of adverse effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Period (Day/Night)	Magnitude of change ²	Significance ³	Summary rationale
Residential receptors at the 20/01225/FUL site, Columbus Lane, Parry Close, The Leecrofts, Equity Road East, Breach Lane and Masfield Place	Medium	Day	No change	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at the 20/01225/FUL site, Columbus Lane, Parry Close, Equity Road East and Breach Lane	Medium	Night	No change	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at the Future SUE site, Weaver Road, Meadow Court Road, Oaklands Way, Masfield Place and Oaklands Drive	Medium	Day	Negligible	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential receptors at the future SUE site, Weaver Road, The Leecrofts, Astley Road, Meadow Court Road, Oaklands Way, Masfield Place and Oaklands Drive	Medium	Night	Negligible	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential at Astley Road (North)	Medium	Day	Medium	Minor (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Residential at Astley Road (North)	Medium	Night	Medium	Minor (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.
Townlands Church of England Primary School	Medium	Day	Negligible	Negligible (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Period (Day/Night)	Magnitude of change ²	Significance ³	Summary rationale
St Simon & St Jude Primary School	Medium	Day	High	Minor (not significant)	Predicted change in noise level and subsequent assessment have been calculated using the methodology presented in DMRB and CRTN.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 11.8** and is defined as low, medium, and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 11.8** and is defined as negligible, low, medium, and high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 11.8**.

11.10.11 Beneficial effects would also be felt at Columbus Lane and Parry Close in the short-term, with a slight decrease in noise levels.

11.11 Assessment of cumulative effects

- 11.11.1 As outlined in **Section 4.8**, consideration has been given as to whether any of the noise and vibration receptors that have been taken forward for assessment in this chapter are likely to be subject to cumulative noise and vibration effects because of noise and vibration effects generated by other developments.
- 11.11.2 The traffic flows for all the scenarios are based on LCC Pan Regional Transport Model (PRTM) which is a SATURN (Simulation and Assignment of Traffic to Urban Road Network) model covering the county and the wider Midlands area. PRTN is an extension of the Leicester and Leicestershire Integrated Transport Model (LLITM). LCC controls the use of PRTN and only LCC approved transport consultants are allowed access and to undertake model testing. The Applicant appointed WSP through LCC to undertake the modelling of the traffic generation from the Earl Shilton SUE proposal using PRTM (.refer to **Chapter 14: Traffic and Transport** for further information).
- 11.11.3 The traffic data output from PRTM shows a reduction on some of the road links in the future baseline traffic in the 'with development' (do something) scenarios as background traffic is redistributed on the road network based on elasticity of demand; changes to traffic flow conditions on the road network will result in the use of alternative routes. For example, increases in traffic flow on a road link/junction which causes queuing/longer journey times will result in some traffic being reassigned onto different routes which have less congestion/shorter journey times. The traffic data from PRTM reflects the changes on the whole network due to the traffic generated from proposed and committed developments. Therefore, not every road link within the assessment area demonstrates an increase in the traffic flows due to the Proposed Development, as some baseline traffic will be reassigned due to changes in the traffic conditions.
- 11.11.4 As the traffic modelling considers traffic generated from proposed and committed developments and road traffic noise is the dominant source of noise in the area, cumulative effects are embedded into the noise and vibration assessment.
- 11.11.5 The list of other developments to be considered for the Cumulative Effects Assessment presented in **Appendix 4A** has been reviewed and, whilst a selection of the developments sits within 1 km of the Proposed Development, these are all residential developments in nature. Due to the proximity of the developments, construction noise of these developments could be considered to lead to a cumulative effect, however the closest is approximately 500m from the Proposed Development. It is unlikely that anything other than piling works would be audible at the NSRs considered in this assessment, and construction works of the Proposed Development would be the dominant noise source at the NSRs. Therefore, it is considered unlikely that the construction of other committed and proposed developments would lead to an increase in noise levels at the NSRs considered in this assessment.

11.12 Assessment of in-combination effects

- 11.12.1 Common receptors are shared with **Chapter 6: Air Quality**. As detailed in **Chapter 6**, air quality and dust effects as a result of the Proposed Development are predicted to be Not Significant. Therefore, whilst a Significant noise effect is being predicted at St Simon & St Jude Primary School, potential in-combination effects with air quality on the same receptors are considered to be unlikely.

11.13 Consideration of optional additional mitigation or compensation

- 11.13.1 The assessment set out above has concluded that it will be necessary to implement some further mitigation measures. These have been identified through the iterative process of scheme design and would be in addition to those outlined and assessed in **Section 11.8**. These additional measures have not been assessed as part of the Proposed Development.
- 11.13.2 Mitigation measures will be required at St Simon & St Jude Primary School to mitigate against the additional traffic on Astley Road. This could be in the form of a noise barrier between the receptor and the road for example or through sound insulation upgrades on affected façades. There are various mechanisms in planning that can be employed to facilitate the required acoustic improvements at the school for example, s106 financial contributions to the school or planning condition requirements to provide acoustic barriers on the Proposed Development following detailed noise surveys.

11.14 Conclusions of significance evaluation

- 11.14.1 In general, the predicted effects from the Proposed Development are of minor adverse significance and are not considered significant in EIA terms and therefore no further mitigation is required.
- 11.14.2 The exceptions to this are St Simon & St Jude Primary School and residences on Astley Road which are predicted to experience a significant adverse effect due to additional traffic using Astley Road and access to the Site. Mitigation may be required to ensure the school's amenity areas and teaching areas are not adversely affected by the Proposed Development.

11.15 Implementation of environmental measures

- 11.15.1 **Table 11.18** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented, i.e. they will have been secured through the planning conditions.

Table 11.18 Summary of environmental measures to be implemented – relating to noise and vibration

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Noise emissions (rating level, LAr) for proposed commercial uses to be designed to meet a noise emissions criterion of +5dB(A) above background noise level at the worst affected receptors	Developer	Planning condition	Section 11.14

12. Socio-economics and health

12.1 Introduction

- 12.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to socio-economics and health. The chapter should be read in conjunction with the development description provided in **Chapter 3: The Proposed Development** and with respect to relevant parts of other chapters: **Chapter 6: Air Quality**, **Chapter 11: Noise and Vibration**, **Chapter 13: Traffic and Transport**, and **Chapter 15: Water**, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects.

12.2 Limitations of this assessment

- 12.2.1 The assessment is reliant upon the use of secondary data and use of assumptions in order to generate an understanding of the likely significant effects that might arise, particularly those relating to employment and wider benefits associated with the construction and operational phases.

12.3 Relevant legislation, planning policy, technical guidance

Legislative context

- 12.3.1 The following legislation is relevant to the assessment of the effects on socio-economics and health receptors:
- *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017*¹ (EIA Regulations) require “an assessment of the direct and indirect significant effects of the development on [...] population and human health [...]”.
- 12.3.2 This is typically interpreted as requiring an assessment of socio-economic effects (i.e. how the interaction of social and economic factors arising from the Proposed Development affect people and their health).

Planning policy context

- 12.3.3 A summary of the relevant planning policies is given in **Table 12.1**.

Table 12.1 Planning policy issues relevant to Socio-economics and health

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) (2021) ²	An emphasis on achieving sustainable development; where sustainability is conceived as having an economic and social dimension as well	Section 12.7

¹ UK Government (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, (online). Available at: <http://www.legislation.gov.uk/uksi/2017/571/contents/made> (Accessed 23 September 2021).

² Ministry of Housing, Communities and Local Government (2021). Revised National Planning Policy Framework (online). Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (Accessed 23 September 2021).

Policy reference	Policy issue	Considered in Section
	as environmental, with the planning system aiming to achieve a balance of the three. Specific sections relevant to this socio-economic assessment include: • Paragraph 8 – provision of sufficient land and infrastructure for economic growth and supporting healthy communities with housing and service provision. • Paragraph 11 – presumption in favour of sustainable development and meeting the specific development and housing needs of an area. • Paragraphs 60 to 66 – delivering a sufficient supply of homes for local needs. • Paragraph 81 to 83 – importance of supporting economic growth and local businesses. • Paragraphs 92 to 93 – aiming to achieve healthy, inclusive and safe communities and providing the social, recreational and cultural facilities that the community needs. • Paragraph 95 – provision of sufficient school places to meet community needs. • Paragraph 98 – access to open spaces and the opportunity for physical activity.	
Development plan policies		
Hinkley and Bosworth Borough Council (HBBC) Core Strategy³	Policy 2 (development in Earl Shilton): Prime policy for Earl Shilton Sustainable Urban Extension. A sustainable extension providing housing, employment land, neighbourhood shops, primary school and children's centre. Policy 15 (affordable housing): To ensure that the affordable housing needs of the existing and future residents are met in the interests of supporting a cohesive and diverse community. Policy 16 (housing density mix and design): To ensure that the green space and pitch/play needs of the existing and future residents are met in the interests of supporting health and social opportunities.	Sections 12.7, 12.11, 12.12, 12.13 and 12.14 Sections 12.7 and 12.13 Sections 12.7 and 12.13
Site Allocations and Development Management Policies Development Plan Documents (DPD)⁴ Policy DM3 Infrastructure Delivery	Where development will create a need to provide additional or improved infrastructure, amenities or facilities, developers will be expected to make such provision directly or indirectly through the appropriate funding mechanism.	Sections 12.7 and 12.8
Site Allocations and Development Management Policies DPD Policy DM8 Safeguarding Open Space, Sport and Recreational Facilities	Planning permission will not be granted for proposals resulting in the loss of land or buildings in recreational or sporting use and areas of open space, except where a replacement	Sections 12.7, 12.8 and 12.14

³ HBBC (2009) Hinckley and Bosworth Core Strategy. Available online at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (Accessed 23 September 2021)

⁴ HBBC (2016) Site Allocations and Development Management Policies DPD. Available on line at: https://www.hinckley-bosworth.gov.uk/downloads/download/1218/site_allocations_and_development_management_policies_dpd_-_adoption_july_2016 (Accessed 23 September 2021)

Policy reference	Policy issue	Considered in Section
	of equivalent typology is provided in an appropriate location, or it is demonstrated that there is surplus recreational land. The development of a small part of a larger site in recreational use would result in the enhancement of recreational facilities on the remainder of the site, or on a nearby site serving the same community. .	
Earl Shilton and Barwell Area Action Plan (AAP)⁵	Policy 2 (provision of community facilities): Where applicable, development in Earl Shilton shall contribute towards the enhancement or increased provision of community facilities within the existing settlement equivalent to the need arising from the Sustainable Urban Extensions (SUEs). Policy 3 (primary, secondary and upper education provision): Development in Earl Shilton will contribute towards additional pupil capacity at existing secondary and upper education facilities, equivalent to the respective need arising from the SUEs. Primary schools will be developed within the SUEs to meet the need arising from the developments. Should additional pupil capacity be required, contributions will be sought towards capacity improvements at appropriate existing local primary schools. Policy 4 (provision of indoor sports and leisure facilities): Where appropriate, development in Earl Shilton shall contribute towards the provision of appropriate indoor sports and leisure facilities commensurate to the need arising from the SUEs. Policy 7 (housing in Earl Shilton): A minimum of 1,600 homes will be provided within the Earl Shilton SUE. Policy 8 (employment in Earl Shilton urban extension): The development will provide for a minimum of 4.5 hectares (ha) of employment land, predominantly for industrial and warehousing use within classes B2 and B8 of which at least 0.5 ha for B1 use classes. The development should primarily support local employment opportunities, including starter and grow-on units, and should aim to achieve zero carbon development. A buffer must be provided between the employment area and any surrounding land allocated for residential use to protect their amenity. Policy 9 (neighbourhood centre in Earl Shilton urban extension): A neighbourhood centre will be	Section 12.8 Sections 12.7 and 12.14 Sections 12.7 and 12.13

⁵ HBBC (2014) Earl Shilton and Barwell AAP. Available at <https://www.hinckley-bosworth.gov.uk/downloads/file/4332/earl-shilton-and-barwell-area-action-plan-adopted> (Accessed 23 September 2021)

Policy reference	Policy issue	Considered in Section
	provided at the heart of the urban extension, including a new primary school, local convenience retail provision, community and recreation facilities.	
Earl Shilton & Barwell AAP Policy 11 Walking and cycling in Earl Shilton Urban Extension	The policy requires direct, safe and attractive walking and cycling routes which achieve access between the urban extension and the town centre and other destinations.	Section 12.8
Earl Shilton & Barwell AAP Policy 19 Regeneration of the District Centres	Where appropriate, contributions towards improvements to the public realm which conform with the respective public realm strategies in Appendix 4 will be required from development within: • Earl Shilton SUE towards Earl Shilton District Centre; and • Barwell SUE towards Barwell District Centre.	Section 12.8
Earl Shilton & Barwell AAP Policy 20 Skills Development	Through the development of Earl Shilton and Barwell, the Council will seek to negotiate commitments from developers to provide employment and training opportunities within construction.	Section 12.10
Earl Shilton & Barwell AAP Policy 25 Safeguarding Open Space, Sport and Recreational Facilities	Planning permission will not be granted for proposals resulting in the loss of land or buildings in recreational or sporting use and areas of open space, as identified in the most recent Open Space, Sport and Recreational Facilities Study, except where: • A replacement of an equivalent typology is provided, as defined by the most recent Open Space, Sport and Recreational Facilities Study, in an appropriate location serving the local community; or • It is demonstrated that there is a surplus of recreational land, facilities or open space of the same typology exceeding the needs of the local community; or • The development of a small part of a larger site in recreational use would result in the enhancement of recreational facilities on the remainder of the site, or on a nearby site serving the same community.	Section 12.14

Technical guidance

12.3.4 A summary of technical guidance relevant to the socio-economic assessment is given in **Table 12.2**.

Table 12.2 Technical Guidance relevant to socio-economics

Technical guidance	Relevance to this assessment
The Green Book: Appraisal and Evaluation in Central Government⁶	The Green Book provides a broad framework for how policies, programmes and projects in the UK should be appraised and evaluated to inform decision making. It sets out guidelines for how the economic and social effects of policy should be conducted
Additionality Guide Fourth Edition⁷	The Additionality Guide provides more specific guidance on how to assess impact of a policy intervention (or a private sector investment) on the local, regional and national economy
Employment Density Guide, 3rd Edition⁸	This guide provides advice to practitioners involved in regeneration and economic development projects on employment densities associated with different types of property use.
The Economic Footprint of House Building in England and Wales⁹	Research on the economic footprint of house building which identifies a range of benefits associated with house building, including an estimate of employment associated with the construction of new homes.

12.4 Data gathering methodology

12.4.1 The socio-economic assessment has been informed by a desk-based study. All data was collated from secondary sources, concerning the following key areas:

- education;
- health;
- retail;
- sport and recreation;
- employment and the economy;
- deprivation;
- community safety;
- community facilities; and
- housing.

12.4.2 The principal data sources used to inform the assessment for socio-economic effects comprise:

⁶ HM Treasury (2020). The Green Book. Central Government Guidance on Appraisal and Evaluation. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938046/The_Green_Book_2020.pdf (Accessed 23 September 2021).

⁷ Homes and Communities Agency (2014). Additionality Guide 4th Edition. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf (Accessed 23 September 2021).

⁸ Homes & Communities Agency (2015) Employment Density Guide, 3rd Edition, HCA. London

⁹ Lichfields and Home Builders Federation (2018). The Economic Footprint of House Building in England and Wales. (online). Available at: <https://lichfields.uk/media/4313/the-economic-footprint-of-uk-house-building.pdf> (Accessed 23 September 2021).

- Office for National Statistics (ONS) 2011 Census Data;¹⁰
- Nomis - official labour market statistics, ONS;¹¹
- Public Health England (PHE) Health Profiles;¹² and
- The Local Plan evidence base, including studies relating to open space and town centres.

Study area

- 12.4.3 Given the scale and nature of the Proposed Development, the local study area comprises: the Site, the Town (Earl Shilton) and District (Hinckley and Bosworth). Consideration of effects on employment during the operational phase also includes use of a regional multiplier. Comparative data for the East Midlands region, England, or Great Britain provided has been used where appropriate.

Desk study

- 12.4.4 The assessment of potential effects on socio-economics and human health has used data that is in the public domain and no organisations have supplied additional data.

Survey work

- 12.4.5 No additional survey work was required to inform the assessment of potential effects on socio-economics and human health.

12.5 Overall baseline

Current baseline

- 12.5.1 There are a number of existing community facilities within, adjacent and nearby to the Site. There are also a number of Public Rights of Way (PRoW) that cross the Site providing linkages into Earl Shilton and the surrounding countryside (see **Figure 12.1**).
- 12.5.2 Baseline information has been compiled on all those facilities within and serving Earl Shilton in respect of education, health, retail, sports and recreation and community safety, and is presented in the following sub-sections.

¹⁰ Office for National Statistics (2019). Welcome to the Office for National Statistics. (online). Available at: <https://www.ons.gov.uk/> (Accessed 23 September 2021).

¹¹ Office for National Statistics (2021). Nomis – official labour market statistics, (online). Available at: <https://www.nomisweb.co.uk/> (Accessed 23 September 2021).

¹² Public Health England (2019). Local Authority Health Profiles, (online). Available at: <https://fingertips.phe.org.uk/profile/health-profiles> (Accessed 23 September 2021)

Education

12.5.3 **Table 12.3** sets out primary and secondary school provision in Earl Shilton, detailing the current number of pupils and capacity.¹³

Table 12.3 Current (January 2020) school capacity

School	Type and age range	Pupils on roll	School capacity	Spare pupil spaces
Primary				
Saint Peters Catholic Voluntary Academy	4 to 11	195	210	15
Townlands C of E Primary Academy	4 to 11	342	420	78
St Simon and St Jude Church of England	5 to 11	166	210	44
Total				137
Secondary				
Heath Lane Academy	11 to 16	610	784	174
Total				174

12.5.4 The information presented in **Table 12.3** indicates that all three primary schools are denominational and that there is currently capacity in each of them. There is presently capacity in the 11 to 16 age range, although a shortfall of 97 places is forecast by January 2022, allowing for housing gain.

Health

12.5.5 The latest available local authority health profile for Hinckley and Bosworth highlights the following:¹⁴

- The health of people in Hinckley and Bosworth is varied compared with the England average. About 11% (2,025) children live in low-income families, compared to 17% in England. Life expectancy for both men and women across Hinckley and Bosworth is higher than the England average, however life expectancy is 5.5 years lower for men and 4.6 years lower for women in the most deprived areas of Hinckley and Bosworth than in the least deprived areas;
- In Year 6, 14.9% (176) of children are classified as obese, better than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 30 (per 100,000 population), compared to a rate of 31.6 in England. Levels of breastfeeding are worse than the England average. Levels of teenage pregnancy are better than the England average;
- The rate for alcohol-related harm hospital admissions is 603 (per 100,000 population), better than the average for England. This represents 696 admissions per year;

¹³ Leicestershire County Council: Hinckley and Bosworth Borough Narrative Members Briefing – September 2019 (online). Available at: https://resources.leicestershire.gov.uk/sites/resource/files/field/pdf/2019/11/7/Hinckley-and-Bosworth-narrative-primary-and-secondary-forecasts_0.pdf (Accessed 23 September 2021)

¹⁴ Public Health England (2019) Local Authority Health Profile. Available at <https://fingertips.phe.org.uk/static-reports/health-profiles/2019/e07000132.html?area-name=hinckley%20and%20bosworth> (Accessed 23 September 2021)

- The rate for self-harm hospital admissions is 120 per 100,000, better than the average for England. This represents 125 admissions per year;
- The rates of new sexually transmitted infections, killed and seriously injured on roads and new cases of tuberculosis are better than the England average;
- The rate of hip fractures in older people (aged 65+) is worse than the England average; and
- The rates of violent crime (hospital admissions for violence) and employment (aged 16-64) are better than the England average.

12.5.6 The nearest doctors' surgery to the Site is the Heath Lane Surgery (seven General Practitioners) (GP's). Earl Shilton is also within the practice catchments of the Barwell Medical Centre (four GPs) and the Centre Surgery in Hinckley (two GPs).¹⁵ Health facilities are shown in **Figure 12.1**.

12.5.7 Accident and Emergency and a range of inpatient and outpatient services are provided at Hinckley and District Hospital, Hill Street, Hinckley.

Retail

12.5.8 Earl Shilton's retail provision is concentrated in the town centre (located approximately 300 m to the north-east of the Site boundary). The town centre provides a selection of local services including a Co-op supermarket, other everyday shops and public houses, see **Figure 12.1**.

12.5.9 A review of town centres, including Earl Shilton, undertaken in 2017 concluded that:¹⁶

- the centre is anchored by a good sized Co-Op store and there are a range of shopping and retail services which enable day to day local needs to be met;
- the majority of the offer comprises of independent stores;
- most users of the centre visit the centre for food shopping (based on the results of a telephone survey);
- vacancy rates appeared to have decreased, possibly reflecting a reduction in prime retail rents; and
- the environmental quality of the centre is for the most part reasonable, although the eastern end of the High Street has a noticeably weaker environmental quality than the rest of the centre and would benefit from investment/enhancement.

12.5.10 The Earl Shilton District Centre Delivery Plan sets out the Council's vision for the centre.¹⁷ This includes a number of priority redevelopment sites in the town centre, improvements to the public realm and a heritage trail. The Earl Shilton SUE is also identified in the Delivery Plan.

Sport and recreation

12.5.11 Both the Earl Shilton Town Cricket and Sports Club and the Kingscroft Bowls Club are situated to the north of the Site about 1 km away. There is a further bowls club in Barwell about 4 km to the west of the Site. Heath Lane Academy (formerly William Bradford Community College) Sports Hall was refurbished in 2004 and is about 2.6 km from the Site (see **Figure 12.1**). The Leicestershire and Rutland sports facility assessment indicates that the quality of the sports hall is very good, and that

¹⁵ NHS Services Near You (online). Available at <https://www.nhs.uk/service-search/find-a-gp> (Accessed 23 September 2021)

¹⁶ HBBC (2017) Town and District Centres Study (Online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/download/1362/hinckley_and_bosworth_town_and_district_centres_study_2017. (Accessed 23 September 2021)

¹⁷ HBBC (2018) *Earl Shilton District Centre Delivery Plan* (Online). Available at: https://www.hinckley-bosworth.gov.uk/download/downloads/id/6011/earl_shilton_district_centre_delivery_plan.pdf (Accessed 23 September 2021)

the changing facilities are also good. The sports hall is normally available to the public from 4pm and it is used predominantly by sports clubs and community associations.

- 12.5.12 Hinckley Leisure Centre is a large centre with a range of facilities, including and eight court sports hall, spin studio, fitness studios, gym and swimming pool. This was refurbished in 2009 and is approximately 6 km south-west of the Site.
- 12.5.13 HBBC's Open Space and Recreation Study¹⁸, considers a range of open space types:
- formal;
 - country parks;
 - natural areas (applies to new provision only;
 - green corridors;
 - amenity areas;
 - children play areas;
 - facilities for teenagers;
 - outdoor sports facilities;
 - allotments;
 - cemeteries and churchyards; and
 - civic spaces.
- 12.5.14 The study concluded that there is a deficiency in amenity areas, formal parks and facilities for young people. The study also concluded that a significant challenge facing Earl Shilton is the lack of natural and semi-natural open space.
- 12.5.15 The Open Space and Recreation Study includes details of an existing area of open space within the Site of the Proposed Development - the Weaver Springs Recreation Ground (5.15 ha). This area includes equipped children's play space, neighbourhood parks and green spaces and outdoor sports provision. The 2016 study included an assessment of the quality of each site and the Recreation Ground scored 76%. The quality target for all open space was set at 80% in the study.
- 12.5.16 Within the Site there are five PRow (three footpaths and two bridleways), a cycle route/bridleway (along Mill Lane) and numerous informal footpaths. The most easterly of these routes is the recently improved and diverted bridleway running from Mill Lane to the north-east to Breach Lane in the south-west, following the A47 for the majority of its length (see **Figure 12.1**).
- 12.5.17 The national restrictions associated with the coronavirus (Covid 19) pandemic has impacted on the ability of indoor facilities and limited the time available for outdoor activity.¹⁹

Employment and the economy

- 12.5.18 **Table 12.4** indicates that economic activity in the borough is high relative to the region and Great Britain.

¹⁸ HBBC (2016) Open space and recreational facilities study (Online). Available at https://www.hinckley-bosworth.gov.uk/downloads/file/6520/open_space_and_recreation_study_2016 (Accessed 23 September 2021)

¹⁹ Institute of Government (2021) Timeline of UK coronavirus lockdowns, March 2020 to March 2021 (Online). Available at <https://www.instituteforgovernment.org.uk/sites/default/files/timeline-lockdown-web.pdf> (Accessed 23 September 2021)

Table 12.4 Employment statistics (Apr 2020 – Mar 2021)

	HBBC	East Midlands	Great Britain
Economically active (% of working age population)	83.3	79.2	78.7
In employment (% of working age population)	79.0	74.7	74.8
Unemployed (% model based)	4.5	5.5	4.9

Source: NOMIS Official Labour Market Statistics

12.5.19 **Table 12.5** shows the breakdown in employment by Standard Occupational Classification (SOC) for the borough, region and Great Britain. Overall, the proportion of employment in Group 1-3, which includes managers, professional occupations and associate profession and technical occupations is higher than for the region and Great Britain. The proportion of employment in Group 8-9, which includes process plant and machine operatives and elementary occupations is low relative to the region but higher than that for Great Britain.

Table 12.5 Employment breakdown by occupation

Issue raised	HBBC (%)	East Midlands (%)	Great Britain (%)
SOC 2010 Major Group 1-3	54.7	44.0	49.9
SOC 2010 Major Group 4-5	19.0	19.8	19.2
SOC 2010 Major Group 6-7	10.6	17.8	16.1
SOC 2010 Major Group 8-9	15.7	18.5	14.8

Source: NOMIS Official Labour Market Statistics

12.5.20 As of 2019 (the latest period for which data are available), 2,250 people in the borough were employed in the construction sector. This represents 5.2% of total employment in the borough, which compares to 4.7% in the East Midlands and 4.9% in Great Britain.²⁰

12.5.21 The coronavirus pandemic has impacted on the economy, with many sectors struggling. In Q2 2020, construction output fell by 36% compared to an overall GDP fall of 20%. However, the sector is expected to grow at an average rate of 4.4% across 2021-25, meaning that nationally, construction will need to recruit 43,000 workers nationally.²¹

12.5.22 A review of employment land and premises in the borough notes that, in contrast to the national picture of a structural decline in manufacturing, the manufacturing sector continues to employ a large proportion (18.6%) of people in Hinckley and Bosworth. This proportion is well above the East Midlands average (13.7%) and particularly the national average of 8.1%. This reflects the presence of some proportionally large manufacturing and production businesses in the borough, including Caterpillar and Triumph.²²

12.5.23 The review also notes that, of the employed residents who live in the borough, 17,419 also work in the borough. In terms of travel to work to other areas, the borough's strongest relationship is with

²⁰ Nomis (2021) Employee Jobs (online). Available at: <https://www.nomisweb.co.uk/reports/lmp/la/1946157144/report.aspx#tabempocc> (Accessed 23 September 2021.)

²¹ Construction Skills Network (2020) *Industry Outlook (5 year forecast 2021-2025)* (Online). Available at: https://www.citb.co.uk/media/b4fpu2hg/uk_summary.pdf. (Accessed 23 September 2021).

²² Hinckley and Bosworth Borough Council (2020) *Employment Land and Premises Study* (online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/3476/employment-land-and-premises-review-2020> (Accessed 23 September 2021)

Leicester, with 6,251 residents employed there. Overall, the borough is a net exporter of workers with a daily net outflow of 11,158 workers.²²

- 12.5.24 Demand remains strong for small-midsized industrial properties of up to 1,000 m² to meet local business needs, and units up to 500 sqm for new businesses. Anything greater than 9,000 m² in size will likely serve the strategic market and can take time to let. Smaller space can attract rents of £75/m² (£7.0/sqft), larger units rents of £60/m² (£6.0/sqft). While older units can attract rents of around £56/m² (5.25/sqft). There is a shortage of units of all sizes to meet local needs, with development focusing on strategic options.²²

Indices of Deprivation

- 12.5.25 The English Indices of Deprivation measure relative levels of deprivation in 32,844 small areas or neighbourhoods, called Lower-layer Super Output Areas (LSOAs), in England. It considers a range of factors: income, employment, education, health, crime, barriers to housing and services and quality of the living environment.
- 12.5.26 Deciles are calculated by ranking the 32,844 LSOAs in England from most deprived to least deprived and dividing them into ten equal groups. Decile 1 represents the most deprived 10% of areas nationally and decile ten represents the least deprived 10% of areas nationally.
- 12.5.27 In 2019, Hinckley and Bosworth ranked 232 out of 317 local authorities, using the rank of average summary measure. Deprivation in Earl Shilton varies in significance, e.g. the central area is in the 30% most deprived neighbourhoods in the country, but other LSOAs are in the 40% most deprived neighbourhoods in the country.²³ **Figure 12.2** shows the results for the rank of average summary measure for Earl Shilton wards.

Community safety

- 12.5.28 The adopted Core Strategy states that:³
- "Surveys indicate high overall levels of satisfaction with the area as a place to live, and the borough as a whole has relatively low levels of deprivation.....Index of Multiple Deprivation ranks the area as only the 286th most deprived district out of 354. Behind these figures however, lie pockets of much higher deprivation. Lack of skills, low incomes, crime and a poor environment variously affect parts of the urban areas."*
- 12.5.29 Earl Shilton is not identified as a crime hot-spot. The Core Strategy goes on to state that:
- "Overall vehicle crime, burglary and theft have been falling, however, assault and criminal damage have been rising and there are a number of crime hot spots around the M1 junction 22, around the Hinckley town centre and the Dodwells Bridge/Harrowbrook industrial estates. Above all it is perhaps the fear of crime aggravated by nuisance or anti-social behaviour-which puts crime at the top of people's concerns."*

Community facilities

- 12.5.30 Earl Shilton town centre is located 300m from the Site boundary and is accessible most directly via Astley Road and, thereafter, either Alexander Avenue or Equity Road East. There is also access to the town centre from the eastern area of the Site via Mill Lane and Alexander Avenue. The centre and the wider town offers a range of local and higher level services including:

²³ HM Government (2019) English indices of deprivation (Online). Available at <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019> (Accessed 23 September 2021)

- shops;
- foodstores;
- community uses (including a library);
- primary and secondary schools;
- recreation uses;
- a large medical practice; and
- a range of industrial and commercial employers.

Housing

- 12.5.31 The Hinckley and Bosworth Housing Strategy 2018 to 2023 highlights key issues facing the borough including:²⁴
- availability of affordable housing;
 - support for people's needs and aspirations; and
 - housing standards.
- 12.5.32 For the period 2017-18 to 2019-20 the number of homes required in the borough was 1,277 dwellings. The borough delivered 1,172 homes (92% of the homes required). The Council is required to prepare an Action Plan to demonstrate to identify the reasons for under-delivery, explore ways to reduce the risk of further under-delivery and set out measures the authority intends to take to improve levels of delivery.²⁵
- 12.5.33 The Council's Housing Needs Study identifies that the proportion of households with dependent children is about average in the borough, although there are a relatively high proportion of married couples and relatively few lone parents. There has been only modest past growth in the number of 'family' households and a slight reduction in the number of households with non-dependent children (likely in many cases to be grown-up children living with parents). Projecting forward, there is expected to be an increase in the number of households with dependent children – increasing by 17% over the 2016-2036 period, which would impact on the type of housing required. The Study also identifies the need for 4,976 affordable rented housing for the period 2018-2036.²⁶

Future baseline

- 12.5.34 The population of Hinckley and Bosworth is projected to increase by 24% between 2018 and 2043. This is higher than the region (14.2%) and England (10.3%). With the overall change in the population will also come changes to the age profile. The largest growth would be in people aged 65 and over. In 2043, it is projected that there will be 35,986 people aged 65 and over. This is an increase of 11,457 from 2018, representing growth of 46%. The population aged 85 and over is projected to increase by 112%. Looking at the other end of the age spectrum the data shows that

²⁴ HBBC (2018) *Hinckley and Bosworth Housing Strategy (2018 to 2023)* (Online). Available at: https://www.hinckley-bosworth.gov.uk/download/downloads/id/6252/housing_strategy_2018_-_2023.pdf (Accessed 1 April 2021)

²⁵ Ministry of Housing, Communities and Local Government (2021) *Housing Delivery Test Measurement* (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/953303/HDT_2020.ods (Accessed 27 September 2021)

²⁶ HBBC (2019) *Housing Needs Study* (Online). Available at https://www.hinckley-bosworth.gov.uk/info/1004/planning_policy_and_the_local_plan/1610/housing_needs_study_2019 (Accessed 23 September 2021)

there is projected to be an 18% increase in the number of children (those aged under 15), with increases or decreases shown for other age groups.²⁷

- 12.5.35 The Construction Industry Network has produced a range of forecasts for the period 2021-2025 based on various assumptions about the ongoing impact of the coronavirus pandemic. Growth is fairly evenly spread across all regions with housing being a key sector along with infrastructure work in most areas. Limited recruitment and a rise in unemployment in the sector are anticipated in the short term, with a consequent drop in new apprenticeships. In the medium term (2023-2025) it is anticipated that apprenticeship starts and recruitment will pick up. Output associated with public housing is forecast to grow by 8.2% per annum and private housing 7.8%.²¹
- 12.5.36 The employment land review undertaken on behalf of the borough (referred to at **Section 12.5** above) identifies a need for between 10.2 ha and 48.2 ha of employment land between 2019 and 2036²². Note that this is in addition to the employment allocation identified in the Core Strategy as part of the Proposed Development.
- 12.5.37 It is assumed that other elements of the Council's District Centre Delivery Plan (referred to at **Section 12.5**) would be implemented, including the potential for redevelopment of sites and improvements to the public realm.¹⁷
- 12.5.38 In the absence of the Proposed Development, it is assumed that the Weaver Springs Recreation Ground would remain in situ.

12.6 Consultation

- 12.6.1 **Table 12.6** provides a summary of the issues about the Proposed Development that have been raised by consultees and the responses given.

Table 12.6 Summary of issues raised during consultation regarding socio-economics and health

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
The scoping report identifies the relevant Policy and legislation relating to Socio-economics and Health, however Policy 11: Walking and Cycling in Earl Shilton Urban Extension of the Earl Shilton and Barwell AAP is not referenced and should be included and considered. Also Policy DM8: Safeguarding Open Space, Sport and Recreational Facilities of the Site Allocations and Development Management DPD should be included and considered.	HBBC	The policies have been referenced in Table 12.1.	Table 12.1

12.7 Scope of the assessment

Spatial scope

- 12.7.1 The study area comprises: the Site, the Town (Earl Shilton) and District (Hinckley and Bosworth). The consideration of effects employment during the operational phase also includes use of a regional

²⁷ Office of National Statistics (2018). Subnational population projections for England: 2018 based (Online). Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/localauthoritiesinenglandtable2> (Accessed 23 September 2021)

multiplier. Comparative data for the East Midlands region, England, or Great Britain are provided where appropriate.

Temporal scope

- 12.7.2 The temporal scope of the assessment of socio-economics and health is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction and operational phases. **Chapter 3**, specifically **Section 3.2**, sets out the assumed duration of the construction period and assumptions around the delivery of the employment area and community infrastructure.

Potential receptors

- 12.7.3 The receptors that would potentially be affected by the Proposed Development comprise:
- local and regional economic receptors - those who are working age in the study area and local businesses;
 - local housing receptors - those seeking accommodation in the area; and
 - local community receptors - residents and visitors using local facilities, including the town centre, schools, healthcare, community facilities and open space.

Likely significant effects

- 12.7.4 The likely significant community and socio-economic effects that have been taken forward for assessment are summarised in **Table 12.7**.

Table 12.7 Socio-economics and health receptors scoped in for further assessment

Receptor	Relevant assessment criteria	Likely significant effects
Local and regional economic receptors – those who are working age in the study area and local businesses	Direct, indirect and induced employment during construction phase.	Potential temporary direct, indirect and induced effects on the local community as a result of opportunities for employment during the construction phase and benefits associated with spend in the local economy. These may arise as a result of employment generated by the construction phase of the Proposed Development.
Local and regional economic receptors – those who are working age in the study area and local businesses	Direct, indirect and induced employment during the operational phase.	Direct, indirect and induced employment during the operational phase.
Local businesses	Potential increased spending effects on the local economy and community as a result of an increased population: The Proposed Development offers an opportunity to increase local expenditure due to the presence of an increased population in the area, which would have effects on the local economy.	Increase in spending from the new community during the operational phase.
Local housing receptors - those seeking accommodation in the area	Amount of new housing provided, including affordable homes.	Potential beneficial effects associated with the provision of up to 1,500 homes as part of a sustainable urban extension.

Receptor	Relevant assessment criteria	Likely significant effects
Local community receptors: residents and visitors using open space	Amount of previously inaccessible green space opened up during the operational phase.	Potential beneficial effects associated with access to open space. The Proposed Development would include large areas of public open space and would provide new access to areas not currently available to the public.

12.8 Environmental measures embedded into the development proposals

- 12.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 3.3**. **Table 12.8** outlines how these embedded measures influence the socio-economics and health assessment.

Table 12.8 Summary of the embedded environmental measures and how these influence the socio-economics and health assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Children of school age and those working in existing schools	Increase in number of children associated with new housing.	The capacity of education in the town would be increased through the provision of land and capital funding for a new primary school. Financial contribution to be made to the capacity of education provision up to 18 years old. Potential effects on education facilities were scoped out of the assessment.
Existing users of health care facilities and those working in facilities	Increase in population accessing health facilities.	The capacity of primary healthcare provision in the town would be increased through the provision of a financial contribution to enhance the capacity of the Heath Lane Surgery. Potential effects on health facilities were scoped out of the assessment.
Users of footpaths, bridleways and cycleways	Temporary diversion of footpaths, bridleways and cycleways.	Temporary diversions of all affected footpaths, bridleways and cycleways would be agreed with the Council. These measures informed the assessment of effects on open space provision.
Users of footpaths, bridleways and cycleways	Upgrade of PRoWs to improve the permeability of the network for pedestrians.	There would be pedestrian permeability to the external network via upgrading of PRoWs that provide connections to Breach Lane, Astley Road and Montgomery Road. These measures informed the assessment of effects on open space provision.

12.9 Assessment methodology

- 12.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this socio-economics and health assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this socio-economics and health assessment.
- 12.9.2 The assessment included:

- desk-top review of baseline data: baseline data collated from data sources set out in **Section 12.4**;
- direct, indirect and induced employment during the construction phase has been derived from the HBF tool referred to at **Section 12.3**;
- employment and economy: The potential job yield from the proposed level of employment floorspace was estimated using assumptions about the density of different uses. An assessment of the level of indirect and induced employment was undertaken. This assessment drew on the Homes and Communities Agency research referred to at **Section 12.3**;
- an assessment of the effects of the increase in spending from the new community on the local economy will be undertaken using the research from the HBF referred to above; and
- open spaces: The information set out in HBBC's open space study ¹⁸ and the requirements of Core Strategy Policy 19³ will be used to identify the current amount of open space within the study area and current and future needs for green spaces. The population predictions for the Proposed Development have been used to determine the change in the number of people per hectare of open space once the Proposed Development is complete, taking into account the provision of green space within the Proposed Development. The assessment also takes into account the changes in population and green spaces brought about by other consented developments in the study area.

12.9.3 The assessment of employment effects during construction and operational considers the following:

- Direct Employment: temporary and permanent employment arising immediately from the proposed mixed-use development;
- Indirect Employment: employment created/supported in the businesses which supply the products, materials and services during the construction phase of the Proposed Development; and
- Induced Employment: employment supported by persons employed directly and indirectly who spend part of their incomes in the local area.

12.9.4 Conclusions on the significance of an effect are based on professional judgement with available information about:

- the magnitude and other characteristics of the potential changes that are expected to be caused by the Proposed Development;
- the sensitivity of receptors to these changes;
- the effects of these changes on relevant receptors; and (where relevant); and
- the value of receptors.

12.9.5 All references in **Section 12.10** to **Section 12.14** to sensitivity, magnitude of change and significance of effect are based on the criteria and methodology provided in **Section 4.7**, in particular **Table 4.1**, **Table 4.2** and **Table 4.3**.

12.10 Assessment of effects: Direct, indirect and induced employment during the construction phase

Predicted effects and their significance

- 12.10.1 Construction is likely to take up to ten years depending on build-out rates. For the purposes of the EIA, it is assumed that construction of housing would start in 2026 and be phased over the following ten years. First occupation is assumed to commence in 2026.
- 12.10.2 Application B (approximately 1.3 ha) allows for a 1.5FE school to be delivered and scaled to accommodate the children expected. The allocation within Application A (approximately 0.7 ha) allows for the expansion of the primary school from a 1.5FE to a full 2FE.
- 12.10.3 The mixed-use community hub is expected to be around 0.5 ha, including no more than 2,000 m² of retail floorspace. Although subject to market demand at the time of development, the potential uses of the primary school and community hub collectively could be E, F.1 and F.2 and a hot food take away.
- 12.10.4 Research undertaken on behalf of the HBF reported that for every 50,000 homes built, approximately 75,000 direct jobs are supported (or 1.5 direct jobs per dwelling built). The research also reports that for every direct construction job 1.5 indirect and induced jobs are created elsewhere in the wider supply chain and wider UK economy.²⁸
- 12.10.5 Applying these ratios to 1,500 dwellings and assuming a ten-year construction period suggests that the Proposed Development would directly support 225 full time equivalent (FTE) jobs and 337 indirect and induced FTE jobs over the ten year period, which could include construction related apprenticeships. The Site would also support additional temporary employment associated with construction of the primary school, employment area and community hub. It has been assumed that the total number of gross direct, indirect and induced construction jobs would be equal to the net additional construction jobs, i.e. that there will be no displacement or leakage of benefits. This assumption is made on the basis that there is current spare capacity in the construction industry and it is unlikely that other schemes will be cancelled/postponed as a result of the Proposed Development taking place.
- 12.10.6 Given the impact of the coronavirus pandemic on the construction sector, in the medium term the sensitivity of receptors and magnitude of change are judged to be medium. A moderate (potentially significant beneficial effect) in relation to direct, indirect and induced employment during the construction phase is therefore anticipated.
- 12.10.7 A summary of the results of the assessment of the results for direct, indirect and induced employment associated with the construction phase is presented in **Table 12.10**.

12.11 Assessment of effects: Direct, indirect and induced employment during the operational phase

Predicted effects and their significance

- 12.11.1 The Proposed Development would provide up to 5.3 ha of flexible employment land to accommodate offices or small-scale manufacturing, distribution or other business uses. It is

²⁸ HBF (2018) *The Economic Footprint of House Building in England and Wales* (online). Available at <https://lichfields.uk/media/4313/the-economic-footprint-of-uk-house-building.pdf> (Accessed 23 September 2021)

assumed that at least 0.5 ha is within Use Class E (previously B1) in accordance with Policy 8 of the AAP⁵ (referred to in **Table 12.1**). The community hub would include a small retail centre (no more than 2,000m²). **Table 12.9** provides an estimate of permanent direct employment associated with these elements of the Proposed Development using assumptions from the *HCA Guidance*⁸ and having regard to recent changes to the *Use Classes Order*.²⁹

Table 12.9 Direct employment associated with the Proposed Development

Use Class	Hectares (Ha)	Plot ratio (%)	Developed Area (Ha)	Gross Internal Floorspace (m ²)	Net internal area	Employment density (m ²)	Derived jobs
E	0.5	40%	0.2	2,000	1,700	12	142
B2	2.4	40%	0.96	9,600	8,160	36	227
B8		40%	0.96	9,600	8,160	40	204
Retail centre	-	-	-	2,000	400	20	20
Total							592
Net jobs allowing for substitution (at 25%)							503

- 12.11.2 The Proposed Development would also include a 2-form entry school that would also provide employment and this is assumed to provide a total of 60 FTE jobs. The Proposed Development would therefore provide a total of 563 direct jobs in the operational phase.
- 12.11.3 Based on research findings, the Additionality Guide⁷ suggests that a multiplier of 1.1 at the local level and 1.5 at the regional level is appropriate as an indicator of average linkages. Therefore, the employment associated with the Proposed Development would support an additional 56 jobs at the local level and 282 jobs at the regional level associated with indirect and induced employment in the operational phase.
- 12.11.4 The sensitivity of receptors and magnitude of change are judged to be medium. A moderate (potentially significant beneficial effect) in relation to direct, indirect and induced employment during the operational phase is therefore anticipated. A summary of the results of the assessment of direct employment is provided in **Table 12.10**.

12.12 Assessment of effects: Spending from the new community in the local economy

Predicted effects and their significance

- 12.12.1 The Proposed Development offers an opportunity to increase local expenditure. The net scale of these benefits would be determined by the expenditure patterns of the residents of the Proposed Development, and the extent to which these residents move into the area from elsewhere.

²⁹ HM Government (2020) *The Town and Country Planning (Use Classes) (Amendment) (England) Regulations 2020*. Available at: <https://www.legislation.gov.uk/uksi/2020/757/contents/made>. (Accessed 23 September 2021)

- 12.12.2 Average weekly household expenditure in the East Midlands between 2018 and 2020, excluding mortgage interest payments, fuel and power, council tax, and transport was £380.70 per week.³⁰ Once the Proposed Development is completed, this would be equivalent to expenditure of £29.7m per annum. The extent to which this expenditure is retained locally will depend on the extent of leakage to other centres, convenience stores and e-commerce.
- 12.12.3 The potential for increased spend in the local economy provides the opportunity to help meet the objectives of the Earl Shilton District Centre Delivery Plan¹⁷. There are uncertainties in relation to how much of the potential spend would be captured locally. The sensitivity of receptors and magnitude of change are judged to be medium. A moderate (potentially significant beneficial effect) in relation to spending from the new community in the local economy is anticipated. A summary of the results of the assessment of is provided in **Table 12.10**.

12.13 Assessment of effects: Provision of new homes

Predicted effects and their significance

- 12.13.1 HBBC has estimated that at least 9,000 new homes will be required in the borough by 2026. The Adopted HBBC Local Development Framework Core Strategy³ sets out this requirement and assessed seven broad options for housing growth in the Borough, with eight areas to accommodate the growth considered. The HBBC Core Strategy proposed two SUEs, one for Earl Shilton and one for Barwell to assist in the provision of the long-term housing needs of the borough. The land south-east of Earl Shilton was allocated for development due to it being one of the least constrained areas, as well as offering a catalyst for regeneration of Earl Shilton.
- 12.13.2 The Earl Shilton SUE is a key part of the HBBC's Core Strategy and would provide a minimum of 1,600 homes, of which the Proposed Development would provide up to 1,500 homes. The Earl Shilton and Barwell AAP⁵ describes the vision for the SUEs and the relevant policies to enable the growth of the region to maintain the identity and character of the community, providing attractive and accessible living and working environments, whilst developing in a sustainable manner. The Proposed Development would therefore help to meet the current, and identified future, housing needs in the HBBC, and more broadly the East Midlands.
- 12.13.3 A range of house types and tenures of between one and five bedrooms will be delivered to provide an appropriate mix of housing. see **Section 3.3 of Chapter 3: Description of the Proposed Development**).
- 12.13.4 The housing offer would boost the choices available to local purchasers. The town has a strong local identity which would be promoted through providing housing that allows local buyers to 'trade up' and meet their housing needs without having to look elsewhere.
- 12.13.5 The provision of larger four and five bedroomed properties would serve to establish the town to potential residents as an attractive place to live. This would assist in diversifying the local population, increasing the proportion of professional occupations, increasing average household incomes. An increase in local spending power would provide significant benefits to the local economy, support the choice and quality of local services and so make a substantial contribution to the regeneration needs of the town.

³⁰ ONS (2021) Family spending workbook 3: expenditure by region (Online). Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/familyspendingworkbook3expenditurebyregion> (Accessed 23 September 2021)

- 12.13.6 Up to 20% of the dwellings within the Proposed Development would be affordable housing. This would be the subject of further negotiation and consideration of viability to be undertaken during the determination of the application.
- 12.13.7 Given the requirement to meet future housing needs, including affordable housing needs the sensitivity of receptors is judged to be high. Given that the Proposed Development is a key element of the adopted development plan the magnitude of change is high. Overall a major significant beneficial effect is anticipated. A summary of the results of the assessment of is provided in **Table 12.10**.

12.14 Assessment of effects: Local community receptors: residents and visitors using open space

Predicted effects and their significance

- 12.14.1 Core Strategy Policy 19: Green Space and Play Provision³ sets out the relevant standards for the quantity and accessibility of provision. The standards are as follows:
- equipped children's play space 0.15 ha/1,000 population;
 - outdoor sport provision 1.6 ha/1,000 population;
 - casual/informal play space 0.7 ha/1,000 population; and
 - accessible natural green space 2.00 ha/1,000 population.
- 12.14.2 The Open Space and Recreation Study referenced at **Section 12.5** highlights existing shortfalls in formal open space, amenity areas and facilities for teenagers within Earl Shilton.
- 12.14.3 Open space would form an extensive part of the Proposed Development, covering up to 21.2 ha of the Site area, and would include the following key elements:
- extensive areas of new green space - children's play areas, public open spaces, and semi-natural greenspace for informal recreation, including up to 19.3 ha of public open space. This would also include children's play areas and semi natural greenspace for informal recreation;
 - dedicated sports pitches, of an area of approximately 2.5 ha;
 - a financial contribution towards improvements to the Weavers Springs Playing Fields to increase their capacity and use;
 - retention and enhancement of existing footpaths and bridleways, and the provision of new cycle routes, to provide connectivity within the Proposed Development and with Earl Shilton town centre;
 - areas of drainage infrastructure laid out within the green linkages; and
 - ecological benefits - including the retention of existing trees and hedgerows, green corridors, semi natural habitats associated with water bodies and the Thurlaston Brook.
- 12.14.4 Further details on the Green Infrastructure provided as part of the Proposed Development are provided in the Design and Access Statement.
- 12.14.5 Newly accessible open space and landscaping forms a major part of the development proposals. The Proposed Development would meet the requirements of Policy 19 of the Core Strategy³ in full to meet the needs not only of new residents but also of the existing community.

12.14.6

The Proposed Development includes open space provision that would help meet the needs of existing and future residents of Earl Shilton. Given existing shortfalls in some elements of open space in Earl Shilton the sensitivity of receptors is judged to be medium and the magnitude of change is judged to be medium. A moderate beneficial effect is therefore identified. **Table 12.10** summarises the potential effects.

Table 12.10 Summary of significance of beneficial effects associated with the Proposed Development during the construction and operational phases

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Local and regional economic receptors – direct employment during the construction phase	Medium	Medium	Moderate	The sensitivity of receptors and magnitude of change are judged to be medium. A moderate (potentially significant beneficial effect) in relation to direct, indirect and induced employment during the construction phase is therefore anticipated.
Local and regional economic receptors – direct employment during the operational phase	Medium	Medium	Moderate	The sensitivity of receptors and magnitude of change are judged to be medium. A moderate (potentially significant beneficial effect) in relation to direct, indirect and induced employment during the operational phase is therefore anticipated.
Local businesses– spend from the new community in the local economy	Medium	Medium	Moderate	The potential for increased spend in the local economy provides the opportunity to help meet the objectives of the Earl Shilton District Centre Delivery Plan. There are uncertainties in relation to how much of the potential spend would be captured locally. A moderate (potentially significant beneficial effect) in relation to spending from the new community in the local economy is anticipated.
Local housing receptors - Potential beneficial effects associated with the provision of 1,500 homes as part of a sustainable urban extension.	High	High	Major	Given the requirement to meet future housing needs, including affordable housing needs the sensitivity of receptors is judged to be high. Given that the Proposed Development is a key element of the adopted development plan the magnitude of change is high. Overall a major significant beneficial effect is anticipated.
Local community receptors: residents and visitors using open space - Potential beneficial effects associated with the provision of open space.	Medium	Medium	Moderate (potentially significant)	The Proposed Development includes open space provision that would help meet the needs of existing and future residents of Earl Shilton and a financial contribution towards improvements to the Weavers Springs Playing Fields. Given existing shortfalls in some elements of open space in Earl Shilton the sensitivity of receptors is judged to be medium and the magnitude of change is judged to be medium. A moderate beneficial effect is therefore identified.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Table 4.1** and **Section 12.9** and is defined as very low, low, medium, high and very high. Amend range as appropriate for this chapter.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Table 4.2** and **Section 12.9** and is defined as very low, low, medium, high and very high. Amend range as appropriate for this chapter.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Table 4.3** and **Section 12.9**.

12.15 Consideration of optional additional mitigation or compensation

- 12.15.1 No additional mitigation measures are proposed in relation to socio-economics and health effects. This is because all relevant and implementable measures have been embedded into the development proposals and are assessed above in this chapter. These measures are considered to be likely to be effective and deliverable, and the help to deliver significant beneficial effects from the Proposed Development. No significant adverse effects are identified to require mitigation or compensation.

12.16 Conclusions of significance evaluation

- 12.16.1 Likely significant effects have been considered in relation to the following topics:
- direct, indirect and induced employment during construction phase (a moderate, potentially significant beneficial effect is identified);
 - direct, indirect and induced employment during the operational phase (a moderate, potentially significant beneficial effect is identified);
 - increase in spending from the new community during the operational phase that could benefit local businesses, including those in Earl Shilton town centre (a moderate, potentially significant effect beneficial is identified);
 - potential beneficial effects associated with the provision of up to 1,500 homes (a major significant beneficial effect is anticipated); and
 - Potential beneficial effects associated with access to open space (a moderate, potentially significant beneficial effect is identified).
- 12.16.2 The potential for beneficial cumulative effects is identified in relation to employment in the construction sector during the construction phase and spend in the local economy from new households during the operational phase.

12.17 Implementation of environmental measures

- 12.17.1 **Table 12.11** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented, i.e. they will have been secured through the use of planning conditions and a Section 106 Agreement.

Table 12.11 Summary of environmental measures to be implemented – relating to Socio-economics and health

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
The capacity of education in the town would be increased through the provision of land for a new primary school within the Site and financial contributions to be made to increase the capacity of educational provision resulting from the development, if required.	Applicant	Section 106 Agreement	Section 12.8
The capacity of GP Surgeries would be increased through the provision of a financial contribution to enhance capacity, if	Applicant	Section 106 Agreement	Section 12.8

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
required. Potential effects on health facilities were scoped out of the assessment.			
Temporary diversions of all footpaths, bridleways and cycleways would be agreed with the Council. These measures informed the assessment of effects on open space provision.	Applicant	Planning Condition	Section 12.8
There would be the creation of pedestrian permeability to the external network and existing bus service via upgrading of PRowS that provide connections to Breach Lane, Astley Road, Montgomery Road. These measures informed the assessment of effects on open space provision.	Applicant	Planning Condition	Section 12.8

13. Soils

13.1 Introduction

- 13.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to agricultural land quality and soils. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development**.

13.2 Limitations of this assessment

- 13.2.1 The existing playing fields and a strip of land alongside the A47 along the length of the eastern Site boundary (totalling 5.23 hectares (ha)) has not been subject to a detailed ALC survey and professional judgement has been used to present a worst-case assessment in which all this land is assumed to be Best and Most Versatile (BMV) agricultural land. This assumption is not considered to affect the robustness of the assessment of the likely significant effects of the Proposed Development.

13.3 Relevant legislation, planning policy and technical guidance

Legislation

- 13.3.1 There is no national legislation specifically relevant to the assessment of effects on agriculture and soils, other than the *Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI No 571)*¹ (the EIA Regulations) which requires that soils are considered in Environmental Impact Assessments (EIAs).

Planning policy

- 13.3.2 A summary of the relevant planning policies is given in **Table 13.1**.

Table 13.1 Planning policy issues relevant to agricultural land quality and soils

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) ² paras.	Paragraphs 174 and 175 detail that planning decisions should protect soils and recognise the economic and other benefits of the BMV agricultural land. Policy provides guidance that where significant development of agricultural land is necessary, areas of poorer quality should be preferred to those of a higher value.	Section 13.9 and 13.10

¹ UK Government (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (online) Available at: <https://www.legislation.gov.uk/uksi/2017/571/contents/made> (Accessed November 2021).

² Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework (NPPF) (online) Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (Accessed September 2021)

Policy reference	Policy issue	Considered in Section
National Policy Statement for National Networks (NN NPS)^{3,4}	Paragraph 5.176 provides guidance on the value of BMV agricultural land within the decision-making process.	Section 13.7 and Section 13.9
Guide to assessing development proposals on agricultural land ^{Error! Bookmark not defined.}	This refers to the assessment of agricultural land and the requirement to consult with Natural England where there is an impact on BMV land which is likely to cause the loss of more than 20 ha if the land is not included in a development plan	Section 13.10
A Strategy for England; Safeguarding our Soils⁵	This sets out the Government's aim to protect agricultural soils, particularly where BMV land is present.	Section 13.10
25 Year Environment Plan⁶	Includes plans to tackle problems of soil degradation and to enhance our natural capital (which includes soils) with an ambition that by 2030 all of England's soils should be managed sustainably.	Section 13.10
Development plan policies		
HBBC Policy DM4, Safeguarding the Countryside and Settlement Separation, adopted 2016	This policy details that the countryside (which includes agricultural land) will be safeguarded from unsustainable development and sets out the exceptions which may be considered appropriate. Requirement for identification of total area of land which may be lost or significantly damaged if planning permission was implemented.	Section 13.5 and 13.10

Technical guidance

13.3.3 This assessment has been undertaken with reference to the following guidance documents:

- Defra Construction Code of Practice for the sustainable reuse of soils on construction sites⁷;
- Good Practice Guide for Handling Soils⁸; and
- British Standard Specification for Topsoil and Requirements for Use (BS3882:2015).

³ It is noted that the NN NPS is only applicable to nationally significant infrastructure projects for road and rail. However, the NN NPS has been included in the referenced planning policy as it nevertheless provides useful guidance and information to support the assessment process in the absence of national legislation on agriculture and soils assessments,

⁴ Department for Transport (2014) National Policy Statement for National Networks (online) Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf (Accessed November 2021).

⁵ Defra (2011) Safeguarding our soils (online) Available at: <https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england> (Accessed October 2021).

⁶ Defra (2021) 25 Year Environmental Plan (online) Available at: <https://www.gov.uk/government/publications/25-year-environment-plan> (Accessed October 2021).

⁷ Defra (2009) Construction Code of Practice for the Sustainable use of soils on construction sites (online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/716510/pb13298-code-of-practice-090910.pdf (Accessed November 2021).

⁸ Maff (2000) Good practice for handling soils (online) Available at: <https://webarchive.nationalarchives.gov.uk/20090317221756/http://www.defra.gov.uk/farm/environment/land-use/soilguid/index.htm> (Accessed October 2021).

13.4 Data gathering methodology

Study area

- 13.4.1 It is noted that the potentially significant effects on agriculture and soils are geographically discreet and not substantially influenced by changes to the surroundings, i.e., they will only be significantly affected by changes or activities (temporary or permanent) taking place on or at the resource itself.
- 13.4.2 Therefore, the spatial scope of the assessment and the related study area covers only the land required for the Proposed Development.

Desk study

- 13.4.3 Baseline agriculture and soils data for the study area has been obtained from desk studies using the following sources of information.
- UK Government, Open data website (Provisional ALC and detailed (Post 1988) ALC data);
 - Defra, Magic Map website (Provisional ALC and detailed (Post 1988) ALC data)⁹;
 - Cranfield University, National Soils Research Institute (soilscape mapping, soil descriptions and characteristics)¹⁰; and
 - HBBC Local Plan 2006 to 2026, Agricultural Land Study¹¹.

Survey Work

- 13.4.4 No new ALC surveys have been undertaken by Wood to inform this assessment. Previous ALC surveys were undertaken in 1997 and 2020 as reported in:
- Agricultural Land Classification Detailed Post 1998 Survey ALCC09596, Natural England, 1997.
 - Agricultural Quality of Land Surrounding Settlements in the Hinckley and Bosworth District Report 1454/2, Land Research Associates, May 2020.
- 13.4.5 Copies of ALC survey results have been obtained from the sources outlined above as part of the desk study.

13.5 Overall baseline

Current baseline

Agricultural Land Classification

- 13.5.1 Most of the Site comprises arable fields and semi-improved grassland separated by hedgerows and trees.

⁹ Defra (no date) Magic Maps (online) Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed September 2021)

¹⁰ Cranfield university (no date) National Soils Research Institute (online) Available at: <http://www.landis.org.uk/soilscales/> (Accessed September 2021)

¹¹ Hinckley & Bosworth Borough Council Local Plan 2006 to 2026 (2020) Agricultural Land Study (online) Available at: https://www.hinckley-bosworth.gov.uk/info/856/local_plan_2006_to_2026/1660/agricultural_land_study_may_2020 (Accessed September 2021)

- 13.5.2 The ALC system classifies land into five grades (Grade 1 = excellent to Grade 5 = very poor, inclusive) with Grade 3 subdivided into subgrades 3a (good quality) and 3b (moderate quality). BMV agricultural land is defined as 'land in Grades 1, 2 and 3a of the ALC'.
- 13.5.3 **Table 13.2** summarises the quantum of agricultural land at the Site by grade and the distribution of grades is shown on **Figure 13.1**.

Table 13.2 Agricultural Land Classification grades

ALC Grade	Area (ha)	Area (%)
Grade 1 (BMV)	0	0
Grade 2 (BMV)	25.44	38.9
Grade 3a (BMV)	12.24	18.7
Grade 3b	21.88	33.5
Grade 4	0	0
Grade 5	0	0
Other/Non agricultural	0.58	0.9
Not surveyed	5.23	8.0
TOTAL	65.37	100.00

- 13.5.4 Most of the Site is BMV agricultural land with a mix of Grade 2 and Grade 3a land. The remainder of the Site is predominantly non-BMV Grade 3b agricultural land.
- 13.5.5 The Grade 3b land is concentrated within a central belt of the Site, with Grade 2 and 3a generally lying to the north and south of this belt. The area to the north and east of the existing Wastewater Treatment Works is mainly classified as Grade 2. A small area around Ash Lodge is classified as 'other' and the parts of the A47 within the site boundary are non-agricultural land.
- 13.5.6 The existing playing fields are not covered by a detailed ALC survey, neither is a strip of land alongside the A47 along the length of the eastern Site boundary. As detailed in **Section 13.3**, the assessment presented in **Section 13.10** assumes these areas to be BMV agricultural land in order to present a worst-case assessment.

Soils

- 13.5.7 The soilscape mapping¹⁰ indicates that most of the Site is covered by slightly acid, loamy and clayey soils with impeded drainage. The northern and southern parts of the Site are covered by freely draining, slightly acidic loamy soils.
- 13.5.8 The soil descriptions and characteristics indicate that the soils of the site are classified as Wick 1 (541r) and Whimble 3 (572f)¹⁰.
- 13.5.9 The Wick soils, which cover most of the site, are "deep well drained coarse loamy and sandy soils, locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion". The Whimble soils are "reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar clayey soils on brows. Slowly permeable seasonally waterlogged fine loamy and fine silty over clayey soils on lower slopes"¹⁰.

Future baseline

- 13.5.10 It is considered unlikely that the baseline conditions associated with agricultural land and soils would change in the absence of the Proposed Development as the grade of agricultural land is determined predominantly by the soils physical characteristics (in particular texture and structure) which will not change significantly over time.
- 13.5.11 Climate change is considered likely to influence soil characteristics, potentially reducing soil carbon levels and affecting yields as a result of increased temperatures and increased intensity of rainfall events. However, the main soil type at the Site is a well-drained sandy soil and, therefore, climate change is unlikely to change the baseline over the period of the Proposed Development.

13.6 Consultation

- 13.6.1 **Table 13.3** provides a summary of the issues about the Proposed Development that have been raised by consultees and the responses given.

Table 13.3 Summary of issues raised during consultation regarding agricultural land quality and soils

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
The scoping report identifies the relevant Policy and legislation relevant to Soils. The council agrees that this topic should be included within the Environmental Statement supporting any future application. It should be noted that this section does not need to include Policy DM9: Safeguarding Natural and Semi-Natural Open Spaces of the Site Allocations and Development Management Policies DPD as there are no allocated natural or semi-natural open spaces within the site or adjacent to the site. HBBC's recently published Agricultural Land Quality Report (2020) may also provide some useful baseline information as an assessment was completed of the site.	HBBC	Agreement that this topic should be included in the ES is noted. Reference to Policy DM9 has been removed from the relevant policy table as noted by HBBC as not being relevant to the scope of the assessment. A copy of the 2020 agricultural land quality report has been obtained and the information used to update the agricultural land quality baseline for the site.	- Section 13.3 Section 13.4 and Section 13.5
Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile (BMV) agricultural land as set out in paragraph 170 of the NPPF. We also recommend that soils should be considered in the context of the sustainable use of land and the ecosystem services they provide as a natural resource, as also highlighted in paragraph 170 of the NPPF. (it is noted that Natural England's paragraph reference is to the 2019 version of the NPPF which has since been superseded and the text to which they refer is at paragraph 174 of the current NPPF (2021)).	Natural England	Existing ALC surveys have been undertaken to determine the grade of agricultural land at the Site. Methodology for assessment of effects gives weight to BMV agricultural land as the most sensitive receptor type. Reuse of soils in the context of the sustainable use of land and the ecosystem benefits they provide have been considered when considering environmental measures to prevent loss of soil resources.	Section 13.5 Section 13.9 Section 13.12
Soil is a finite resource that fulfils many important functions and services (ecosystem services) for society, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. It is therefore important that the soil resources are protected and used sustainably.	Natural England	The assessment considers effects on soil resources taking into account the environmental measures embedded into the Proposed Development to prevent loss of soil resources.	Section 13.8 and Section 13.10
The applicant should consider the following issues as part of the Environmental Statement: 1. The degree to which soils are going to be disturbed/harmed as part of this development and whether 'best and most versatile' agricultural land is involved. This may require a detailed survey if one is not already available. For further information on the availability of existing agricultural land classification (ALC) information see www.magic.gov.uk. Natural England Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land also contains useful background information.	Natural England	Spatial scope of the assessment takes into consideration potential for significant effects on agricultural land within the whole of the Site. Existing ALC surveys have been undertaken in line with Natural England guidance to determine the grade of agricultural land at the Site.	Section 13.7 Section 13.5 Section 13.8

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
2. If required, an agricultural land classification and soil survey of the land should be undertaken. This should normally be at a detailed level, e.g. one auger boring per hectare, (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, i.e. 1.2 metres. 3. The Environmental Statement should provide details of how any adverse impacts on soils can be minimised. Further guidance is contained in the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites.		The assessment considers environmental measures embedded into the design of the project for handling of soils, including reference to Defra good practice guidance.	
As identified in the NPPF new sites or extensions to new sites for peat extraction should not be granted permission by Local Planning Authorities or proposed in development.	Natural England	The Proposed Development is not a new site of peat extraction or an extension to an existing site of peat extraction.	-

13.7 Scope of the assessment

Spatial scope

- 13.7.1 The spatial scope of the assessment comprises all the land required for the Proposed Development that is currently in agricultural use and where soil resources are present.

Temporal scope

- 13.7.2 As detailed in **Chapter 3: Description of the Proposed Development**, the Proposed Development is likely to be built in phases over a period of ten years with construction starting in 2026 and first occupation assumed to be during 2026.
- 13.7.3 For the assessment of the likely significant effects on agricultural land, the temporal scope of the assessment assumes a worst-case scenario in which all the land required for the Proposed Development is lost at the outset of this period.
- 13.7.4 For the assessment of the likely significant effects on soil resources, the temporal scope of the assessment considers the fact that the Proposed Development would be built in phases under which soil resources would be progressively stripped and stored before being reused.

Potential receptors

- 13.7.5 The receptors that will potentially be affected by the Proposed Development comprise:
- BMV agricultural land; and
 - Soils (topsoil and subsoil).

Likely significant effects

- 13.7.6 The likely significant soil effects that will be taken forward for assessment are summarised in **Table 13.4**.

Table 13.4 Likely significant agricultural land quality and soils effects scoped in for further assessment

Activity	Effect	Receptor
Construction activities for the Proposed Development	Temporary loss BMV agricultural land	BMV agricultural land
	Permanent loss of BMV agricultural land	BMV agricultural land
	Permanent loss of soils	Soils (topsoil and subsoil)
	Changes to soil structure due to inappropriate storage and/or handling of soils or due to the use of heavy machinery which causes compaction	Soils (topsoil and subsoil)

- 13.7.7 An assessment of each of the following potential effects has led to the conclusion that they are not likely to be significant and hence do not require further assessment, and will be scoped-out from further consideration in this assessment:
- Permanent or temporary loss of, or damage to non-BMV agricultural land:

The NPPF² states that in relation to planning decisions they should recognise “the economic and other benefits of the best and most versatile agricultural land”. Although the NPPF and UK Government guidance does not preclude development on BMV land, it puts emphasis on using poorer quality land, that is land classified as Grade 3b, 4 and 5 of the ALC. Whilst the NN NPS⁴ is not strictly applicable to this Proposed Development, it also supports this position, stating that “the decision maker should give little weight to the loss of agricultural land in grades 3b, 4 and 5”, i.e. non-BMV agricultural land.

For these reasons, only BMV land (defined as Grade 1, 2 and 3a of the ALC) is assessed to be of sufficient value that an effect on it could be significant.

13.8 Environmental measures embedded into the development proposals

13.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 13.4. Table 13.5** outlines how these embedded measures will influence the agricultural land quality and soils assessment. It is anticipated that all the embedded measures will be secured through development of a Soils Management Plan, which will form a condition of the Proposed Development.

Table 13.5 Summary of the embedded environmental measures and how these influence the agricultural land quality and soils assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Permanent or temporary loss of soils	Topsoil will be removed from areas where it is likely to be affected by development and, where feasible and practicable, will be reused on site (for example within gardens, landscaping schemes/green space areas). The same applies to subsoils (although as they are less valuable than topsoil and reuse may only be for reprofiling or green space areas etc).	Prevents permanent loss of soil resources.
Changes to soil structure due to inappropriate storage and/or handling of soils or due to the use of heavy machinery which causes compaction	Where practicable, direct placement of removed soils into their final location will be undertaken in preference to storage and subsequent reuse later. Good practice measures for soil storage, handling and sustainable reuse will be incorporated into the construction methodology in line with MAFF 2000 ⁸ and Defra ⁷ guidance. These include: • Topsoil and subsoil being stripped separately and, where possible, avoiding handling topsoil during or shortly after heavy rainfall. • Storage of topsoil in bunds of no more than 3 meters (m) in height, grassed and kept free from construction traffic. • Outside areas of development (for example environmental buffers and landscaped areas), minimising requirement for construction trafficking and, therefore, soil compaction. • Loosening of compacted subsoils before being covered by topsoil.	Direct placement eliminates potential for damage to soil structure from storage and minimises potential for damage to soil structure from multiple handling of soil. Good practice measures minimise potential for damage to soil structure during storage and reuse.

13.9 Assessment methodology

- 13.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this soils assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this soils assessment.
- 13.9.2 The methodology for the assessment of likely significant effects on soils is based on the grade of agricultural land and the extent of soils that might be affected by the Proposed Development and whether those effects would be permanent or temporary. This includes consideration of both:
- The value of the agricultural land or soil resource (i.e. the sensitivity of the receptor); and
 - The magnitude/consequence of the loss or damage to that resource.
- 13.9.3 The approach to assigning levels of sensitivity is summarised in **Table 13.6**.

Table 13.6 Sensitivity classifications for agricultural land and soils

Value / Sensitivity	Description Example
Very high	Grade 1 and 2 agricultural land. Soils with a high susceptibility to structural damage and soil erosion including heavily textured, poorly structured soils (such as soils with high clay and silt content and organic and peaty soils).
High	Grade 3a agricultural land. Soils with some seasonal susceptibility to structural damage and soil erosion (such as heavy loams).
Medium	Grade 3b agricultural land. Soils with medium textures (such as silty loams).
Low	Grade 4 agricultural land, arable or grassland areas. Soils with medium to coarse textures and some resistance to structural damage (such as soils with high sand fraction).
Very Low	Grade 5 and non-agricultural agricultural land. Course textured and stony soils with little potential for structural damage (such as soils with high gravel content).

- 13.9.4 The approach to assigning the consequence of any damage or loss is summarised in **Table 13.7**.
- 13.9.5 It is noted that there is no published guidance on thresholds for assessing what scale of loss or damage to agricultural land or soils should be regarded as significant and Natural England's guidance **Error! Bookmark not defined.** notes only that consultation with Natural England is required if development proposals are likely to cause the loss of 20 ha or more of BMV land and are not in accordance with an approved development plan. Consequently, the criteria outlined in **Table 13.7** are based on losses below the 20 ha threshold being considered to have only a low or very low consequence.

Table 13.7 Magnitude classifications for agricultural land quality and soils

Magnitude	Description Example
Very high	Permanent loss or degradation of over 100 ha of agricultural land or more than 25% of the locally available resource. Permanent loss of soil resources or damage to soil function.
High	Permanent loss or degradation of between 50 ha to 100 ha of agricultural land or between 10% and 25% of the locally available resource. Long term temporary (> 5 years) loss of access to agricultural land or soil resources with high degradation of soil function.
Medium	Permanent loss or degradation of between 20 ha to 50 ha of agricultural land or between 5% and 10% of the locally available resource. Short to medium term temporary (1-5 years) loss of access to agricultural land or soil resources with some degradation of soil function.
Low	Permanent loss or degradation of between 10 ha to 20 ha of agricultural land or between 1% and 5% of the locally available resource. Short term temporary loss (6 months - 1 year) of access to agricultural land or soil resources or damage to soil function which will rectify without mitigation.
Very Low	Permanent loss or degradation of under 10 ha of agricultural land or less than 1% of the locally available resource. Very short-term temporary (<6 months) loss of access to agricultural land or soil resources with no loss of or damage to soil function.

13.9.6 The predicted level of effect is based upon the consideration of magnitude of impact and sensitivity of the resource/receptor to provide an assessment of how important this effect is as outlined in **Table 13.8**. Error! Reference source not found..

Table 13.8 Level of effect for agricultural land quality and soils

Receptor Sensitivity	Magnitude of Impact				
	Very High	High	Medium	Low	Very Low
Very High	Major	Major	Major	Major	Moderate
High	Major	Major	Major	Moderate	Minor
Medium	Major	Major	Moderate	Minor	Negligible
Low	Major	Moderate	Minor	Negligible	Negligible
Very Low	Moderate	Minor	Negligible	Negligible	Negligible

13.9.7 Major and moderate effects will always be determined as being 'significant' in EIA terms. Minor or negligible effects will always be determined as 'not significant'.

13.10 Assessment of agricultural land and soils effects

Predicted effects and their significance – BMV agricultural land

- 13.10.1 Based on the ALC surveys, a total of 42.91 ha of BMV agricultural land is present, which includes a total of 5.23 ha of land that has not been surveyed and, therefore, as a worst-case assumption has been assumed to be BMV agricultural land. The BMV agricultural land on the Site is predominantly Grade 2 agricultural land (which has a very high sensitivity classification) and Grade 3a agricultural land (which has a high sensitivity classification).
- 13.10.2 The remainder of the Site comprises non-BMV Grade 3b agricultural land (which has a medium sensitivity classification) and non-agricultural land (which has a very low sensitivity classification).
- 13.10.3 As all the land will be used as part of the Proposed Development, and the Proposed Development does not include any future agricultural use, there will be a permanent loss of between 20-50 ha of BMV agricultural land, which represents a medium impact.
- 13.10.4 Based on the high to very high sensitivity of BMV agricultural land as a receptor and the medium impact, the level of effect of the Proposed Development on BMV agricultural land is major and, therefore, significant.

Predicted effects and their significance – soil resources

- 13.10.5 Desk study data indicates that the topsoils and subsoils are loamy and silty/sandy soils, which have a low to medium sensitivity classification.
- 13.10.6 Environmental measures have been embedded into the design of the Proposed Development to manage the removal of topsoil and subsoil and reuse these soils onsite. This will, therefore, result in soils being progressively stripped as the Proposed Development progresses, with soils initially being stockpiled or used to create perimeter screening bunds followed by reuse as part of the wider green infrastructure.
- 13.10.7 As detailed in **Chapter 3: Description of the Proposed Development**, green infrastructure (including public open spaces) will cover approximately 19.3 ha, which represents a total of approximately 29% of the total land at the Site. Under the embedded environmental measures, the existing soil resources would be appropriately reused within these areas to provide other ecosystem benefits for nature conservation and amenity land use within the Proposed Development. Existing soil resources would also be used within residential gardens.
- 13.10.8 Consequently, there is unlikely to be any large-scale permanent loss of soil resources and based on a phased construction period over 10 years, temporary loss of access to soil resources is likely to be limited to between one to five years, which represents a medium impact.
- 13.10.9 Based on the low to medium sensitivity of the soil resources and the medium impact, the level of effect of the Proposed Development on soil resources is, in the worst-case, moderate and, therefore, significant.

Predicted effects and their significance – soil structure

- 13.10.10 Desk study data indicated that the Wick soils are well drained, which would suggest they are relatively resistant to structural damage. The Whimble soils are slowly permeable and seasonally waterlogged suggesting they are less resistant to structural damage.
- 13.10.11 Best practice measures for the stripping and handling of topsoils and subsoils in line with MAFF⁸ and Defra guidance⁷ have been embedded into the design of the Proposed Development. Changes to soil structure due to inappropriate storage and/or handling of soils or due to the use of heavy

machinery which causes compaction are therefore likely to be limited. As a result, any changes are likely to either rectify without additional mitigation measures or have only degradation in soil function, which represents a low to medium impact.

- 13.10.12 Based on the low to medium sensitivity of the soil resources and the low to medium impact, the level of effect of the Proposed Development on soil structure is, in the worst-case moderate and, therefore, significant.

Predicted effects and their significance – summary

- 13.10.13 A summary of the results of the assessment of the soils and agricultural land quality is provided in **Table 13.9**.

Table 13.9 Summary of significance of adverse agricultural land quality and soils effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
BMV agricultural land				
Permanent or temporary loss of BMV agricultural land	High to Very high	Medium	Major and Significant	42.91 ha of BMV agricultural land (high to very high sensitivity) will be lost to the Proposed Development, which represents a medium impact.
Soils (topsoil and subsoil)				
Permanent or temporary loss of soils	Low to Medium	Medium	Moderate and Significant ⁴	Soils are loamy and silty/sandy soils, which have a low to medium sensitivity classification. Measures are embedded into the design for reuse of soils. Loss of soil resources will, therefore, be temporary of between 1 to 5 years during phased stripping, stockpiling and reuse, which represents a medium impact.
Changes to soil structure due to inappropriate storage and/or handling of soils or due to the use of heavy machinery that causes compaction	Low to Medium	Low to Medium	Moderate and Significant ⁴	Soils indicated to be of low to medium sensitivity to structural damage and best practice mitigation measures for stripping and handling are embedded into the design resulting in a low to medium magnitude of impact.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 13.9** and is defined as very low, low, medium, high, and very high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 13.9** and is defined as very low, low, medium, high, and very high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 13.9**.
4. The stated significance is based on a worst-case scenario taking the highest sensitivity of the receptor and the highest magnitude of change.

13.11 Assessment of cumulative effects

- 13.11.1 None of the receptors identified in **Table 13.4** have been identified as being common to other topics. Therefore, cumulative effects with regards to potential in-combination effects from other topics on the same receptor are considered to be negligible.
- 13.11.2 A cumulative assessment has also been considered for the effects of the Proposed Development in conjunction with other developments. The cumulative assessment is presented in **Chapter 18: Cumulative Effects Assessment**.

13.12 Consideration of optional additional mitigation or compensation

- 13.12.1 It is noted that the location of the Proposed Development has already been identified by HBBC in their Core Strategy document¹², as the location of a Sustainable Urban Extension (SUE). As a result, this selection already incorporates the requirements of the NPPF² and HBBC Policy DM4 to give weight to the use of non BMV agricultural land over BMV agricultural land and safeguard the countryside (which includes agricultural land) from unsustainable development.
- 13.12.2 Accordingly, no further environmental measures are proposed to be incorporated into the design of the Proposed Development with respect to the significant effect resulting from the loss of BMV agricultural land.
- 13.12.3 The loss of and damage to soil resources is identified in this chapter as being significant. The loss of soil resources would also have been considered as part of site being identified as the location of a SUE. In addition, this assessment accounts for implementation of the MAFF⁸ and Defra⁷ best practice guidance on reuse and handling of soils. Therefore, all the relevant and useable measures have already been embedded into the Proposed Development and are assessed as part of this chapter.
- 13.12.4 Furthermore, and as noted by Natural England in their Scoping Opinion response (see **Table 13.3**), soils should be considered in the context of the sustainable use of land and the ecosystem services they provide as a natural resource. Consequently, reuse of the soil resources as part of the wider green infrastructure has been considered when determining that there are no further measures that could be employed to mitigate the significant effects on soil resources.

13.13 Conclusions of significance evaluation

- 13.13.1 This chapter presents the approach and findings of the assessment of potential effects on soils and agricultural land quality. The assessment has been undertaken in line with guidance published by Natural England and considers the Scoping Opinion responses received in November 2020.
- 13.13.2 The baseline agricultural land quality conditions have been established from detailed ALC surveys and desk study data, which identified predominantly Grade 2 and Grade 3a BMV agricultural land and Grade 3b non-BMV agricultural land to be present along with topsoils and subsoils described as loamy and silty/sandy.

¹² Hinckley and Bosworth Borough Council (2009). Hinckley and Bosworth Borough Council Local Development Framework Core Strategy (online) Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (Accessed September 2021).

- 13.13.3 The Proposed Development would result in the permanent loss of 42.91 ha of BMV agricultural land and a temporary loss of between one to five years of soil resources during phased construction.
- 13.13.4 Mitigation measures would be incorporated into the Proposed Development to prevent the loss of soil resources (through the design of the Proposed Development to remove topsoils and subsoils and reuse these on-site) and reduce the reduce potential for damage to soil structure (through incorporation of Defra⁷ and MAFF⁸ guidance on good practice measures for storage, handling and reuse of soils into a Soil Management Plan).
- 13.13.5 Accordingly, the residual effect of the Proposed Development on the loss of BMV agricultural land is major and, therefore, a significant effect. The temporary loss of soil resources and changes to soil structure are moderate and significant effects.
- 13.13.6 It is noted that whilst the effect of the loss of agricultural land and temporary loss of soil resources is significant, the selection of the Site in the HBBC Core Strategy¹¹ already incorporates the requirements of the NPPF² to give weight to the use of poorer non-BMV agricultural land over higher quality BMV agricultural land and protect soil resources. Accordingly, the significance of these effects has already been considered and acknowledged through the Site selection process and no further mitigation is possible. Furthermore, it is noted that the other ecosystem benefits of the proposed green infrastructure plans incorporating the reuse of soils appropriately for nature conservation and amenity land use can be considered a mitigating factor against the loss of agricultural land use.

13.14 Implementation of environmental measures

- 13.14.1 **Table 13.10** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented.

Table 13.10 Summary of environmental measures to be implemented for agricultural land quality and soils

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Incorporation of good practice measures for soil storage, handling and sustainable reuse into the construction methodology in line with MAFF 2000 and Defra 2009 guidance.	Applicant/Contractor	Development of soil management plan secured through planning condition on the Proposed Development	Section 13.8

14. Traffic

14.1 Introduction

- 14.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to Traffic and Transport. The chapter should be read in conjunction with the development description provided in **Chapter 3: The Proposed Development** and with respect to relevant parts of other chapters, **Chapter 6: Air Quality** and **Chapter 11: Noise and Vibration** which assess the effects resulting from changes in traffic flows where common receptors have been considered and where there is an overlap or relationship between the assessment of effects. The chapter should be read in conjunction with the Transport Assessment (TA) and Framework Travel Plan (TP) that have also been produced.

14.2 Limitations of this assessment

- 14.2.1 There are no limitations relating to Traffic and Transport that affect the robustness of the assessment of the likely significant effects of the Proposed Development.

14.3 Relevant legislation, planning policy, technical guidance

Legislative context

- 14.3.1 There is no specific legislation that needs to be considered when determining the scope of this assessment.

Planning policy context

- 14.3.2 A summary of the relevant transport-specific national, regional and local policies and plans is provided below in **Table 14.1**. These policies and plans have been considered to help define the scope of the assessment.

Table 14.1 Planning policy issues relevant to Traffic and Transport

Policy reference	Implications	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) ¹	The NPPF, in Chapter 9: Promoting Sustainable Transport, identifies the need to favour sustainable transport modes to enhance travel choice, and to locate developments that generate significant movement where the need to travel will be minimised and the use of sustainable transport modes can be maximised. It has the following key paragraphs concerning transport, transport impacts and developments: Paragraph 104 – Transport needs to be considered early in the process to ensure: <i>“The environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for</i>	Sections 14.7 and 14.10

¹ Ministry of Housing, Communities and Local Government (2021). *Revised National Planning Policy Framework* (online). Available at: <https://www.gov.uk/government/collections/revised-national-planning-policy-framework> (Accessed 10 September 2021).

Policy reference	Implications	Considered in Section
	<i>avoiding and mitigating any adverse effects, and for net environmental gains."</i> Paragraph 111 – <i>"Development should only be prevented or refused on highway grounds if there would be an unacceptable impact on safety or if the residual cumulative effects are severe."</i> Paragraph 113 – <i>"All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed."</i>	
Development plan policies		
Leicestershire County Council Strategic Plan 2018 - 2222²	This plan was adopted in 2018, and revised in 2020, and outlines Leicestershire County Council's (LCC) five desired outcomes to be achieved in its administrative area. These outcomes are: Strong Economy; Well Being and Opportunity; Keeping People Safe; Great Communities; and Affordable and Quality Homes. There are supporting outcomes and measures to monitor their progress. Transport indicators contribute to the measure of all five indicators. Transport plays a key role in all of the measures identified including indicators concerning: congestion, emissions, bus service satisfaction, electric vehicle uptake and provision levels. Other transport related indicators within the plan include: road casualty levels, sustainable transport use, physical activity levels and satisfaction with accessibility to country parks and with the right of way network.	Sections 14.7 and 14.10
Hinckley and Bosworth Borough Council (HBBC) Core Strategy³	Earl Shilton has been recognized as an important part of Hinckley & Bosworth sub-regional centre, closely connected to and supporting Hinckley's town centre whilst providing local services for their immediate populations. Policy 2: Development in Earl Shilton - sets out the approach to support the regeneration of Earl Shilton, identifying a mixed land use development for sustainability. It is expected that new development will integrate with and improve existing sustainable infrastructure. Policy 5: Transport Infrastructure in the Sub-regional Centre - sets out proposed transport interventions to support additional development in the area, including Earl Shilton, to promote sustainable development. Interventions comprise links and improvements to public and active transport modes/networks including public transport provision/priority measures and supporting the reopening of the Elmhurst passenger railway station to serve Earl Shilton and Barwell.	Sections 14.7 and 14.10

² Leicestershire County Council (2020) *Working together for the benefit of everyone Leicestershire County Council Strategic Plan 2018 – 22* (online). Available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2021/2/1/LCC-Strategic-Plan-2018-22.pdf> (Accessed 10 September 2021)

³ Hinckley and Bosworth Borough Council (2009). *Core Strategy* (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (Accessed 10 September 2021).

Policy reference	Implications	Considered in Section
Earl Shilton and Barwell Area Action Plan (AAP)⁴	This plan sets out the strategy for Earl Shilton and Barwell's development. It is highlighted that developments in the Urban Extensions should maximise sustainable travel. There are site specific policies provided, concerning transport: to reduce the need to travel by car and increase sustainable travel with good public and active transport routes and accesses from the Site. Policy 10: General Highways Provision for Earl Shilton Urban Extension - covers highway requirements in the Earl Shilton Urban Extension including outlining: an access point south of Mill Lane, use of Masefield Drive, improving and utilising Astley Road and Mill Lane for access to the town centre and the need for a spine road in the development suitable for bus use. It, also states that increased vehicle traffic on Breach Lane is not permitted. Policy 11: Walking and Cycling in Earl Shilton Urban Extension - set outs expectation concerning walking and cycling in the SUE for quality provision including: access between the development and Earl Shilton, Barwell and Hinckley for employment, residential and recreation destinations, new/improved crossings over the A47 and relocation/enhancement of Public Rights of Way (PRoW) routes in the area.	Sections 14.10 and 14.14
Hinckley and Bosworth Draft Local Plan 2020-2039⁵	This is the draft local plan for Hinckley and Bosworth. Transport is a social and environmental objective of the plan. Draft policies in the plan concerning transport include: PMD01 High Quality Design; PMD02 Active Design and Travel; EP02 New Employment Development; CLT01 New Community Facilities; HT01 Highways and Transportation; HT02 Parking Standards, HT03 Electric Vehicle Charging Infrastructure and HT04 A5 Improvement Corridor. More details of these policies are provided in the supporting TA, specifically Section 2.2.	Section 14.10
Leicestershire Local Transport Plan 3 (2011-2026)⁶	The Leicestershire Local Transport Plan (LTP) 3 sets out the strategic transport plans in the area from 2011 to 2026. It includes goals (1, 3 and 5) for accessible and efficient transport particularly by public and active transport; which will contribute to a reduced carbon footprint and the County's economic aims. It also includes goals concerning road safety improvements.	Sections 14.10 and 14.14
Leicester and Leicestershire Working Together Strategic Transport Priorities 2020 – 2050 (2020)⁷	This document outlines challenges and aims for transport in Leicester and Leicestershire including the prioritisation of active and sustainable travel.	Section 14.14

⁴ Hinckley and Bosworth Borough Council (2014). *Earl Shilton and Barwell area action plan* (online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/4332/earl-shilton-and-barwell-area-action-plan-and-appendices-adopted-23-september-2014> (Accessed 10 September 2021).

⁵ Hinckley and Bosworth Borough Council (2020). *Hinckley and Bosworth Local Plan 2020-2039* (online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/7356/draft-local-plan-2020-2039> (Accessed 17 September 2021)

⁶ Leicestershire County Council (2014). *Leicestershire Local Transport Plan 3 (2011-2026)* (online). Available at: https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2017/1/9/Local_transport_plan.pdf (Accessed 10 September 2021)

⁷ Leicester City Council and Leicestershire County Council (2020). *Leicester and Leicestershire Working Together Strategic Transport Priorities 2020 – 2050* (online). Available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2020/11/23/Leicester-and-Leicestershire-Strategic-Transport-Priorities-LLSTP.pdf> (Accessed 13 September 2021)

Policy reference	Implications	Considered in Section
LCC Cycling and Walking Strategy (2021)⁸	This strategy covers LCC's walking and cycling strategy. It outlines that new developments must consider and provide for these modes to be in line with national and local policy. It also sets out the expectation for Travel Plans, developer contributions and the location of developments to allow for active travel trips.	Sections 14.10 and 14.14
Strategic Growth Plan Leicester & Leicestershire 2050: Our Vision for Growth (2018)⁹	This document is a vision for the strategic growth of the Leicester and Leicestershire area, congestion and network connectivity are highlighted as key challenges and reducing private car use is a key aim.	Section 14.14
LCC Passenger Transport Policy¹⁰	This document outlines LCC's passenger transport policy (PTP) including PTP4 which outlines the need for new developments to consider the long-term and viability of any offered passenger transport services.	Section 14.14
LCC Passenger Transport Strategy¹¹	Outlines the strategy to achieve the LCC Passenger Transport Policy.	Section 14.14
Green Infrastructure Strategy¹²	This document outlines the boroughs strategy concerning the conservation and expansion of green infrastructure and includes a key theme of active travel.	Section 14.14

Technical guidance

14.3.3 The assessment has been undertaken with reference to the guidance identified in **Table 14.2**.

Table 14.2 Relevant technical guidance

Guidance reference	Guidance issue
Guidelines for the Environmental Assessment of Road Traffic (GEART)¹³	Provides the framework for assessment of road traffic on the environment.
Manual For Streets¹⁴	Provides guidance for well-designed streets.

⁸ Leicestershire County Council (2021). *Cycling and Walking Strategy* (online). Available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2021/7/27/Cycling-and-walking-strategy.pdf> (Accessed 13 September 2021)

⁹ Strategic Growth Plan (2018) Strategic Growth Plan Leicester & Leicestershire 2050: Our Vision for Growth (online). Available at: <https://www.l1strategicgrowthplan.org.uk/wp-content/uploads/2019/01/Strategic-Growth-Plan-September-2018-Final-for-governance.pdf> (Accessed 13 September 2021)

¹⁰ Leicestershire County Council (uploaded 2019). *Passenger Transport Policy* (online). Available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2019/5/10/Passenger%20Transport%20Policy.pdf> (Accessed 13 September 2021)

¹¹ Leicestershire County Council (uploaded 2019). *Passenger Transport Strategy* (online). Available at: <https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2019/5/10/Passenger%20Transport%20Strategy.pdf> (Accessed 13 September 2021)

¹² Hinckley and Bosworth Borough Council, LUC (2020) *Hinckley and Bosworth Green Infrastructure Strategy* (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/file/7097/green_infrastructure_strategy_2020 (Accessed: 17 September 2021)

¹³ Institute of Environmental Assessment (IEA).1(993). *Guidelines for the Environmental Assessment of Road Traffic (GEART)*. IEA; Lincoln, UK.

¹⁴ Department for Transport, Communities and Local Government and Welsh Government (2007) *Manual For Streets* (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/341513/pdfmanforstreets.pdf (Accessed September 2021).

Guidance reference	Guidance issue
Design Manual for Roads and Bridges¹⁵	Provides information on highways design.

14.4 Data gathering methodology

Study area

- 14.4.1 The study area for the TA and consequently the Traffic and Transport assessment has been informed through scoping discussions with LCC Highways and includes junctions and highway links which may be affected by the Proposed Development. These are set out below in **Table 14.3**.

Table 14.3 Study Area – Junctions and Roads

Junctions – assessed in TA	Road – assessed in Traffic and Transport Chapter of the ES	
A47/Leicester Road (North)	Desford Road (B582)	A47 (South of Barwell)
A47/Station Road (B581)	Leicester Lane (B582)	The Common
A47/Wilkinson Lane	A47 (Northeast of Earl Shilton)	Leicester Road (B4668)
A47/Masefield Drive	Leicester Road (west of A47)	Ashby Road
A47/Leicester Road (West)	A47 (Earl Shilton Bypass – Clickers Way)	Mill Lane
	Masefield Drive	Alexander Avenue
	Wilkinson Lane/Station Road	Astley Road
	Station Road (B581)	High Street
	Leicester Road (North of A47)	Wood Street

Desk study

- 14.4.2 The sources of information used for the Traffic and Transport assessment are listed in **Table 14.4**.

Table 14.4 Sources of information used for the Traffic and Transport assessment

Source	Date Provided	Data
WSP on behalf of LCC	05/07/2021	Traffic flows from the Pan Regional Traffic Model (PRTM) for scenarios 2021 Baseline, 2036 Future Baseline, 2036 with Development.
National Data Collection (NDC)	July 2022	Traffic count data of junctions within the Study Area.
LCC/Bing Maps – OS Maps	06/09/2021	The Definitive Map to identify PRoW.

¹⁵ National Highways (2021). *Design Manual for Roads and Bridges* (online). Available at: <https://standardsforhighways.co.uk/dmr/b/> (Accessed September 2021).

Source	Date Provided	Data
CrashMap Pro	20/09/2021	Personal Injury Accident data.
Google Traffic	03/09/2021	Indication of traffic conditions on the road network.
Google Street View	03/09/2021	Desk study.
Arriva Bus and Traveline	06/09/2021	Bus services.
National Rail	06/09/2021	Train Services.
Sustrans	09/09/2021	Cycle routes.

Survey work

- 14.4.3 The survey work that has been undertaken for the purpose of the TA, Travel Plan and the Traffic and Transport assessment is summarised in **Table 14.5**.

Table 14.5 Survey work used for the Traffic and Transport assessment

Source	Conducted by	Date
Site Audit	Wood Transport Team	Comprehensive Site Audits were undertaken as part of the work conducted in 2014. An update was undertaken in June 2021.

Transport documents

- 14.4.4 The scale of the traffic generation from the Proposed Development is such that in addition to the EIA, a stand-alone TA has been produced as a supporting document. The TA covers the entire Site and has been produced based on scoping discussions held with LCC, as the highway authority.
- 14.4.5 A separate Framework TP has also been produced based on LCC's *Writing a Successful Travel Plan a Guide to Developers (2013)*¹⁶.

14.5 Overall baseline

Current baseline

- 14.5.1 A description of the local road network (LRN) and strategic road network (SRN) is provided in the following sections and illustrated in **Figure 14.1**. Roads with existing or proposed vehicular accesses to the Site are discussed first and include:
- A47 'Clickers Way' bypass;
 - Astley Road;
 - Breach Lane; and
 - Mill Lane.

¹⁶ Leicestershire County Council (2013). *Writing a Successful Travel Plan a Guide to Developers*. (Online). Available at: <https://www.choosehowyoumove.co.uk/wp-content/uploads/2019/12/writing-a-successful-travel-plan.pdf> (Accessed September 2021).

A47 Clickers Way – Earl Shilton Bypass

- 14.5.2 The Site is bounded to the east by the A47 'Clickers Way' bypass. The A47 links Nuneaton with Leicester, Peterborough and King's Lynn. It provides a bypass around the towns of Hinckley and Earl Shilton, routing from the A5 to the west to Leicester in the east. Clickers Way extends between the A47 Leicester Road to the west and Leicester Road/A47 Leicester Road to the north. The A47 is a high standard single carriageway two-way road with a shared cycle and pedestrian route along the western side. There are various entries/exits along the route that serve local destinations and, in the vicinity of the Site, provide access to Earl Shilton.
- 14.5.3 Mill Lane and Breach Lane are 'No Through Roads' which provide access to a number of residential properties in Earl Shilton. On-street parking is prevalent on these neighbouring residential streets. Breach Lane provides a pedestrian and cycle route to join the A47 'Clickers Way' bypass, Mill Lane allows pedestrian access onto the A47. To the north, Thurlaston Lane also provides a pedestrian/cycle link to the A47.
- 14.5.4 The speed limit between the junction with A47 (E)/A47 (W)/Leicester Road to just east of the junction with Masefield Drive is 40 mph. Routing eastward from this point the national speed limit applies. This road has a fairly consistent road width, with a typical full road width of approximately 8 meters (m) - 9.5 m. Two points of vehicular access for the Proposed Development onto Clickers Way would be provided.

Astley Road

- 14.5.5 Astley Road is a single carriageway two-way which links Equity Road (East) to Alexander Avenue, via Meadow Court Road. It has a speed limit of 30 mph, pedestrian footways on both sides and streetlights along the whole route. There are centre line road markings from the Alexander Avenue junction to the Earl Shilton Sports Pavilion access, after which, there are none, until Meadow Court Road at the junction with Equity Road (East). This road has a width typically between 5.8 m and 6.5 m approximately.
- 14.5.6 At the northern end of Astley Road is St Simon and St Jude Church of England Primary School, and to the west (where it becomes Meadow Court Road) is Townlands Church of England Primary School.
- 14.5.7 Astley Road is a key route to the town centre. Key points along the route have been identified from south to north as:
- Astley Road (Meadow Court Road)/Equity Road (East) priority junction with Meadow Court Road giving way to Equity Road (East). Equity Road (East) provides a link to Station Road via Breach Lane.
 - Townlands Church of England Primary School - 'Keep Clear' road markings are present at the junction with the school access.
 - To the south of Weaver Avenue is a gated access to the Earl Shilton Town Council Sports Pavilion, which is only open when the facility is being used.
 - St Simon and St Jude Church of England Primary School - speed calming and traffic management measures in the form of 'Slow' and 'School Keep Clear' road markings are present on the approach to the school and at the school gate.
 - Astley Road/Alexander Avenue priority junction with Astley Road giving way to Alexander Avenue. Speed calming measures in the form of 'Slow' are present on every arm of this junction because of the access to St Simon and St Jude Church of England Primary School.

Breach Lane

- 14.5.8 Breach Lane is a single carriageway two-way road from its junction with Station Road with a road width of 5.5 m, frontage access, footways on both sides, street lighting and a speed limit of 30mph. It only has central road markings near the junction with Station Road.
- 14.5.9 Along the Site boundary, Breach Lane is approximately 3 m in width, is not lit and does not have footways. It provides vehicular access to four properties. The road is also used as a link to the shared use footway/cycleway along the western side of the A47.
- 14.5.10 Key points along the route have been identified from west to east as:
- Breach Lane/Station Road priority junction with Breach Lane giving way to Station Road.
 - Breach Lane/Equity Road (East) priority junction with Equity Road (east) giving way to Breach Lane.
 - Pedestrian/cycle link to shared use provision on A47 to the east.

Mill Lane

- 14.5.11 Mill Lane is a single carriageway of varying widths of between 5.5 m and 6.7 m with frontage access, street lighting and 30 mph speed limit. At its western end is St Peter's Voluntary Academy, a primary school. Along the northern side there is a continuous footway of 1.8 m width. On the southern side, there is a wide verge between the Site and Alexander Avenue and beyond this, as far as the primary school, there is a 2.6 m footway and additional verge width.
- 14.5.12 Mill Lane runs through the northern part of the Site as a narrow rural lane of approximately 2.8 m width with grass verges of up to around 3 m on either side and provides pedestrian and cycle access to the A47.
- 14.5.13 Key points along the route have been identified from west to east are:
- Mill Lane/Almey's Lane priority junction which provides a link to Church Street in the north. Church Street connects to Leicester Road which links to the A47 to the north.
 - St Peter's Voluntary Academy – in the vicinity of the primary school, the overall highway width narrows down with a footway width of approximately 1 m adjoining the school and a nominal margin of 0.7 m on the opposite side. This section of road is, however, within a school 'safety zone' protected by a 20 mph speed limit and 'zigzag' markings to restrict parking taking place. Outside of this zone, the speed limit is 30 mph.
 - Mill Lane/Earl Street priority junction which connects to Alexander Avenue.
 - Mill Lane/Alexander Avenue priority junction – Alexander Avenue connects to the High Street in the west, providing access to the town centre.
 - Pedestrian/cycle link to shared use provision on A47 to the east.

A47 (between A47(E)/Leicester Road/A47(S) Junction and Leicester Lane (B582)/A47/Desford Road (B582))

- 14.5.14 The A47 between A47/Leicester/A47(S) junction and Leicester Lane/A47/Desford Road junction is a single carriageway two-way road with a 50mph speed limit and street lighting at the junctions. This section of the A47 has an on-road cycle lane of approximately 1.5 m width on both sides for the majority of the route, and a 580 m length of footway on the eastern side from the Leicester Road roundabout. There are a few lay-bys along this section of the road. The carriageway width for vehicles is approximately 6.5 m. The junction of A47 (east)/Leicester Road/A47(south) is a standard

roundabout with good cycle and pedestrian facilities around the junction. The junction of Leicester Lane/A47/Desford Road is signal controlled junction with a pedestrian crossing facility.

Alexander Avenue

- 14.5.15 Alexander Avenue is a single carriageway two-way road which runs between High Street and Mill Lane. A 30 mph speed limit applies to this road. The road has a footway on both sides, street lighting and direct frontage access. The road has a varying road width, the majority is between approximately 5 m and 6.5 m but with narrower sections for example near the junction with Earl Street and the additional Alexander Avenue Crescent. Traffic management measures are present in the form of 'School Keep Clear' road markings at the access to the St Simon and St Jude Church of England Primary School. There are centre line road markings from the High Street junction to Vicarage Street and in a short section near Mill Lane junction, after which, there are none.

Avenue South

- 14.5.16 Avenue South routes between Montgomery Road, to the south, and Almey's Lane, to the north. It is a single carriageway road with footways on both side, street lighting and a 30 mph speed limit. The typical road width on this road is between approximately 5 m-6 m. It crosses Alexander Avenue, with Avenue South giving way at the priority junction. Avenue South has central road markings near the junction with Avenue North and Alexander Avenue only. There is pedestrian access into the Site via an ungated footpath at the end of the road. A footpath routes alongside the field boundaries within the Site.

Church Street

- 14.5.17 Church Street is a single carriageway two-way road with a footway on both sides, street lighting and direct frontage access. The road width is typically between 5 m and 6 m, with the western section of the street being narrower. This road provides a link between the Site and facilities in the north of the town centre. Church Street only has central road markings near the junction with Leicester Road. It has a speed limit of 30 mph.

Elmesthorpe Lane

- 14.5.18 Elmesthorpe Lane is a single carriageway two-way road which is connected to Leicester Road by a mini roundabout. It provides access to the residential area located north-east of the A47(east)/Leicester Road Carrs Hill/A47(west) junction. This road is no-through road at the southern end but there is pedestrian link to the A47 bypass. At its northern end there is a pedestrian link to Hinkley Road. This road has a footway on the east side of the road, street lighting and direct frontage access. The road width typically varies between approximately 5.5 m and 6.5 m along this road. This road has 'Slow' road marking within the residential sections of the route and has a 30 mph speed limit.

Equity Road East

- 14.5.19 Equity Road East is a single carriageway two-way road which runs parallel to Station Road and provides a link between Station Road and Breach Lane. The road has a footway on each side, street lighting, frontage access and a speed limit of 30 mph. Equity Road East has a variable road width of between approximately 5 m and 6.5 m. The majority of this road has no centre line road markings, apart from short sections near both ends of the road.

Leicester Road Carrs Hill

- 14.5.20 Leicester Road (Carrs Hill) is a single carriageway two-way road which connects to the A47 via a roundabout to the south and becomes Hinckley Road in the north. It has a footway on west side of the road. Routing north from the A47 the speed limit of this road is 40mph until just before the mini roundabout with Elmesthorpe Lane where the speed limit is 30mph. This road has typically has widths in excess of 6.5 m with greater road widths particularly located at the mini roundabout junction with Elmesthorpe Lane and the pedestrian crossing point near the transition into Hinckley Road. Leicester Road (Carrs Hill) currently has a 7.5 tonnes weight limit imposed, except for loading.

Montgomery Road

- 14.5.21 Montgomery Road is a single carriageway road which routes between Avenue South and Alexander Avenue. This road offers pedestrian access opportunities into the Site via a PRoW. This road has footways on both sides of the carriageway, street lighting and a 30 mph speed limit. Montgomery Road has no central line markings. For the majority of the road, the width is between 5 m and 6 m. There is a narrow section (approximately 3 m) between Montgomery Terrace and Montgomery Walk, which form a pedestrian link between Montgomery Road and Livingstone Lane.

Old A47 (Hinckley Road, Wood Street, High Street and Leicester Road)

- 14.5.22 The old A47 is the main spine road that runs through Earl Shilton town centre and comprises Hinckley Road, Wood Street, High Street and Leicester Road. This is a standard single carriageway two-way road. The section of road between Belle Vue Road and Church Street has a footway on each side, street lighting and direct frontage access. Hinckley Road has a 30 mph speed limit, which reduces to 20 mph on Wood Street east of the junction with Heath Lane up to the Ivydene Close junction, and then reverts back to 30 mph until east of the junction with Church Street where the speed limit increases to 50 mph.
- 14.5.23 There is a section of shared cycle and pedestrian footway alongside Hinckley Road. There are various pedestrian crossing points including zebra crossings, signalised crossings and island crossing points. From the A47 (NE)/A47(S)/Leicester Road junction routing towards Earl Shilton, there is a 7.5 tonnes weight limit imposed, except for loading. The road width along this route varies given the provision of on-road cycle and bus provisions, pedestrian crossing facilities and some areas of designated on street parking.
- 14.5.24 Several traffic calming and management measures are in place within the town centre sections. A number of minor roads are linked to this major spine road with different types of junctions, such as priority, mini roundabouts and signals. East of the junction with Station Road up to Keates Lane, there are sections of road without central road markings.

Station Road (Wilkinson Lane)

- 14.5.25 Station Road is a single carriageway two-way road which provides a direct link between Earl Shilton Town centre to the north and the new A47 bypass, via Wilkinson Lane to the south. This road has a footway on each side, street lighting, direct frontage access and a 30 mph speed limit. The road width varies along its extent between approximately 5 m and 7 m. The northern junction with Wood Street/The Hollow is a three-arm signal junction with pedestrian crossings and advanced cycle stop lines on all arms. The southern junction with the A47 is also a three-arm signal controlled junction and has pedestrian crossings on all arms. The road only has central road markings on approach to these junctions. There are several minor roads that are linked to Station Road by simple priority junctions. This road currently has a 7.5 tonnes weight limit imposed except for loading. The majority of the road is 30 mph, but approaching the junction with Wood Street the speed limit is reduced to 20 mph.

Station Road (B581)

- 14.5.26 Station Road (B581) is a single carriage way two-way road which routes from A47 Clicker's Way, at the village of Elmesthorpe, to Stoney Stanton, Primethorpe, Broughton Astley and Dunton Bassett to the east. Here, it joins the A426 Lutterworth Road which provides a connection to the M1 to the south at Junction 20, and Leicester to the north. The Station Road (B581) and A47 Clickers Way junction is signalised, with a lane per directional movement for turning onto the A47. From this junction south eastward, the speed limit is 40 mph until just after a junction with Burbage Common Road where the national speed limit applies. The road width varies, typically between 5 m and 7 m and there is footway provision on one or both sides.

Strategic Road Network

- 14.5.27 The SRN comprises all the motorways and trunk roads in the vicinity of the Site. It covers all of the routes of national strategic importance which are operated and maintained by National Highways (formerly Highways England).
- 14.5.28 National Highways operate and maintain the A5 to the south-west of the Site, the M69 to the east of the Site and the M1 to the north of the Site.
- 14.5.29 The A47 provides a route from the Site to the A5, which connects to the M69 at Junction 1 to the south-east and the M42 at Junction 10 to the north-west. The A5 is a long-distance route from London and crosses into Wales (ceasing to be operated and maintained by National Highways), to the Port of Holyhead, passing through large parts of central and southern England. It routes locally between Tamworth and Rugby, and also is part of a connection from Earl Shilton to Nuneaton. The M69 routes between Coventry to the south and Leicester to the north. The M1 routes from London north to near Leeds, connecting to the A1 (M) for further northward travel. The M1 provides connections to the north of Earl Shilton including towards the settlements of Nottingham, Derby, Sheffield and Leeds; it is also a key southbound connector from the Earl Shilton area towards London.

Traffic flows

- 14.5.30 The assessment of potentially significant effects requires a comparison to be made between the likely environmental conditions in the presence of the Proposed Development and baseline situation.
- 14.5.31 The traffic flows for all the scenarios are based on LCC's Pan Regional Transport Model (PRTM). Refer to Section 5 of the TA for detailed information.
- 14.5.32 The baseline traffic has been provided by WSP from LCC's PRTM model and are summarised in **Table 14.6**.

Table 14.6 Baseline two-way traffic flows (PCU) - 2021

Link No	Link Name	AM Peak	PM Peak
1	A47 (Hinkley Road North) - North of junction with B582	1,353	1,352
2	B582 Desford Lane - South of junction with A47	1,357	1,344
3	A47 (Hinkley Road South) - South of junction with B582	1,311	1,521
4	B582 Leicester Lane - Northwest of junction with A47	937	937

Link No	Link Name	AM Peak	PM Peak
5	Leicester Road - West of junction with A47	452	520
6	A47 Clickers Way - North of junction with the proposed site access (north)	925	913
7	A47 Clickers Way - South of junction with the proposed site access (north)	925	913
8	A47 Clickers Way - Northeast of junction with Masefield Drive	925	913
9	A47 Clickers Way - Southwest of junction with Masefield Drive	970	950
10	A47 Clickers Way - West of junction with Wilkinson Lane	1,210	1,278
11	Wilkinson Lane - North of junction with A47	452	549
12	Station Road (B581) - South of junction with A47	1,021	1,051
13	A47 - Southwest of junction with Station Road	1,708	1,808
14	A47 - Southwest of junction with Leicester Road	2,490	2,675
15	Leicester Road (Carrs Hill) - North of junction with A47	970	1,101
16	B4668 Leicester Road - South of junction with A47	1,423	1,514
17	A47 Normandy Road - West of junction with B4668 and The Common	1,230	1,332
18	The Common - North of junction with A47	569	665
19	B4667 Ashby Road - South of junction with A47	1,302	1,406
20	A47 Normandy Road - West of junction with Ashby Road	1,632	1,593
21	A447 Ashby Road - North of junction with A47	1,536	1,449
22	Mill Lane near Site Access	3	4
23	Alexander Avenue - South of Mill Lane	62	75
24	Alexander Avenue - West of junction with Astley Road	65	66
25	Astley Road - North of the proposed site access	130	103
26	Astley Road - South of the proposed site access	130	103
27	High Street - North of junction with Alexander Avenue	420	531
28	High Street - South of junction with Alexander Avenue	476	594
29	Wood Street - West of junction with Station Road	551	678

Public Right of Way

14.5.33 There are five identified PRoW (see **Figure 14.2**) which cross the Site or are in the surrounding area, as follows:

- T90: runs through the field between Meadow Court Road and Breach Lane;

- T89: links Montgomery Road to Bridleway U105, which follows the Site's southern boundary;
- U17: links Footpath U19, south of Parry Close Bridleway U16 south-east of the Wastewater Treatment Works (WwTW);
- U16: links Mill Lane, Huit Farm and Breach Lane and meets Bridleway 105 and Footpath U17 near the WWTW south-eastern corner; and
- U105: Bridleway U105 is parallel with the A47 on the Site's south boundary.

Pedestrian network

- 14.5.34 There are footways on all major routes from the Site towards Earl Shilton town centre. For example, there are footways along Astley Road, Alexander Avenue, Wood Street, and Station Road with street lighting along all of these routes. Footways vary in location compared with the carriageway, width and quality. There is segregated shared cycle and pedestrian route along the A47, with pedestrian access from Breach Lane and Mill Lane. In both cases this access is reached via a stretch of narrow carriageway without pedestrian footways.

Cycle network

- 14.5.35 The main cycle provisions are a shared cycle and pedestrian route runs along the A47, which can also be accessed from Breach Lane, Mill Lane and Thurlaston Lane and a stretch of shared cycle and pedestrian path on Hinckley Road. There is also a shared cycle/pedestrian connection between Thurlaston Lane and the A47. Part of Mill Lane is open for all traffic including pedestrian and equestrian and allows pedestrian access to the A47. There is a short section of shared cycle and pedestrian route between Oaks Way and Wood Street. Wood Street has a junction with Station Road and a supermarket entrance with advanced stop lines for cyclists. Cycle route provision is shown in **Figure 14.3**.

Bus services and facilities

- 14.5.36 Earl Shilton is served by three local bus services and has good connectivity to major local destinations such as Leicester, Barwell, Hinckley and Nuneaton. The nearest bus stops to the Site are located on Astley Road, approximately 350 m from the centre of the Site and within the recommended maximum walking distance of 400 m, as stated in IHT guidance. Bus stops are also located on Astley Road near to Northleigh Way and on Equity Road East near to Lyndene Close. These two stops are in proximity to the western part of the Site at, approximately, 470 m and 370 m walking distance from the Site boundary at the Astley Road access. Existing bus stops near the northern part of the Site are on Mill Lane, the closest is approximately 340 m from the Site. Bus stops located near to the Site only have bus timetable information and no shelter or seats, with the exception of Astley Road. The bus provision is shown in **Figure 14.4**.
- 14.5.37 Details on bus frequency and routes are provided in the TA (specifically Section 3.4).

Rail services and stations

- 14.5.38 The nearest rail station to the Site is Hinckley Station, approximately 7.5 km by road to the south-west. Hinckley Station provides rail connection to major destinations such as Leicester and Birmingham, generally on an hourly service.
- 14.5.39 A more detailed overview of Hinckley Station's service frequencies on different days and the station's parking provisions are provided in Section 3.5 of the accompanying TA.

Local road safety considerations and assessment

- 14.5.40 Personal Injury Accident (PIA) data has been sourced from Crashmap Pro¹⁷ and Crashmap¹⁷ for the LRN described above, and their junctions. This Study Area and the accident locations are shown in **Figure 14.5**. Data was collated from Crashmap Pro for the period 2016-2020, with additional 2020 data sourced from Crashmap. A summary of the accident data for the study area is given in **Appendix 14A**.
- 14.5.41 The purpose of assessing recorded PIAs is to determine whether there is a history of accidents in proximity to the Site and to investigate whether there are any patterns or contributing factors to the accidents recorded. For example, clusters of accidents could indicate that improvements are required to enable the Proposed Development to come forward. Further consideration has been given to those accidents involving vulnerable road users (cyclists/pedestrians) during the assessment.
- 14.5.42 The impact of casualties differs according to the severity of the injuries sustained. Three groups are usually differentiated as follows:
- Fatal: any death that occurs within 30 days from causes arising out of the accident.
 - Serious: records casualties who require hospital treatment and have lasting injuries, but who do not die within the recording period for a fatality.
 - Slight: where casualties have injuries that do not require hospital treatment, or, if they do, the effects of the injuries quickly subside.
- 14.5.43 **Table 14.7** provides a summary of the data from Crashmap and Crashmap Pro for the junctions where accidents were recorded along Clickers Way A27 and the A47 north of Earl Shilton to Desford Road (B582). Accidents at these junctions were categorised as being within 20 m of the junction or in a position where the junction is assumed to be a factor.

Table 14.7 PIA summary 2016-2020: Junctions

Link Section/Junction	Slight	Serious	Fatal	Total	Accident Rate Per Annum	Number of Accidents Involving Vulnerable Casualties *
A47 Clickers Way/Station Road B581	1	0	0	1	0.2	-
A47 Clickers Way/Station Road	1	0	0	1	0.2	-
A47 Clickers Way/Masefield Drive	2	0	0	2	0.4	-
A47 Clickers Way/ Breach Lane	1	0	0	1	0.2	-
A47 Clickers Way/Mill Lane	0	1	0	1	0.2	-
A47 Clickers Way/A47 Leicester Road (W)/Leicester Road Carrs Hill	2	1	0	3	0.6	-
A47 Clickers Way/Leicester Road (W)/ A47 (N)	3	0	0	3	0.6	Pedestrian: 1 and

¹⁷ Department for Transport data published by www.crashmap.co.uk (Accessed 16 December 2021).

Link Section/Junction	Slight	Serious	Fatal	Total	Accident Rate Per Annum	Number of Accidents Involving Vulnerable Casualties *
Child: 1						
A47/Dans Lane Junction	3	2	0	5	1	-
A47/Peckleton Lane Junction	3	1	1	5	1	-
Leicester Lane B582/Desford Road B582/A47 junction	4	1	0	5	1	-
Total	20	6	1	27	-	-

*Vulnerable road users are defined as pedal cycles and pedestrians. Accident involving child casualties are also noted.

Base Data Source: Department for Transport data published by www.crashmap.co.uk

14.5.44

Table 14.8 summarises the data for all other roads within the Study Area where accidents have occurred during the period 2016-2020. Estimations of annual accident rate per million vehicle km have been calculated for those road sections that have traffic turning count data. Where traffic data for peak times is available it has been used to give an estimate of the average annual daily traffic (AADT). The AADT and PIA per annum/million vehicle km for these roads sections is included in **Table 14.8**.

Table 14.8 PIA summary 2016-2020: Links (excluding accidents recorded at the junctions in Table 14.7)

Link Section/Junction	Slight	Serious	Fatal	Total	Accident Rate Per Annum	Estimated AADT for Link	Approximate Link Length (km)	PIA per Annum per million vehicle km	Number of Accidents Involving Vulnerable Casualties *
Astley Road and Meadow Court Road	1	0	0	1	0.2		0.73 km		Pedestrian (including child): 1
Montgomery Road	1	0	0	1	0.2		0.54 km		Pedal Cycle (child): 1
Alexander Avenue	1	1	0	2	0.4		0.82 km		-
Station Road and Wilkinson Lane	3	2	0	5	1	6956	1.06 km	0.39	Pedestrian: 1 and Child: 1
A47 Clickers Way: Between Leicester Road Carrs Hill and Leicester Road (W)	2	0	0	2	0.4	10390	4.35 km	0.03	Child: 1

Link Section/Junction	Slight	Serious	Fatal	Total	Accident Rate Per Annum	Estimated AADT for Link	Approximate Link Length (km)	PIA per Annum per million vehicle km	Number of Accidents Involving Vulnerable Casualties *
Station Road (B581) between: A47 Clickers Way and Leighton Crescent	4	1	0	5	1	10805	1.07 km	0.25	Pedestrian: 1 Pedal Cycle (including child): 1
A47: Between Leicester Road (W) and Desford Road B582	6	2	0	8	1.6		4.19 km		
Between Dan's Lane and Desford Road B582	4	2	0	6	1.2	16230	1.83 km	0.12	Pedal Cycle: 1
Between Dan's Lane and Leicester Road (W)	3	0	0	3	0.6	15499	2.36 km	0.05	
'Old A47' Total	3	2	2	7	1.4		3.96 km		
Leicester Road (S)	0	0	0	0	0	11593	0.61 km	0	
Hinckley Road	0	0	0	0	0		0.87 km		
Wood Street	1	1	2	4	0.8		0.41 km		Pedestrian: 1 Pedal Cycle: 1
The Hollow	0	0	0	0	0		0.25 km		
High Street (inc. Hilltop)	0	0	0	0	0		0.53 km		
Leicester Road (N)	2	1	0	3	0.6	6603	1.29 km	0.13	Pedestrian: 1
Total	22	8	2	32	-				-

*Vulnerable road users are defined as pedal cycles and pedestrians. Accident involving child casualties are also noted.

Base Data Source: Department for Transport data published by www.crashmap.co.uk

14.5.45 **Table 14.7** and **Table 14.8** show that 59 accidents were recorded over the five-year period, of which 42 were slight, 14 serious and three fatal. Some of these accidents involved vulnerable road users: six accidents were recorded as involving pedestrian casualties and four involving pedal cyclist casualties. Six accidents involved child casualties. Routes connecting to the Site or in the vicinity (Mill Lane, Equity Road (East), Breach Lane, Church Street, Elmesthorpe Lane and Avenue South) all recorded zero accidents between 2016-2020.

14.5.46 The accident rate per annum is generally low at the reported junctions and roads. Although there are clusters of accidents at junction within the Study Area, no junctions have an annual accident rate > 1.

- 14.5.47 Two roads record an annual accident rate in excess of 1, which are the 'old A47' and the A47 section going north from the Leicester Road (W)/Clickers Way A47 junction. The old A47 comprises various roads which taken individually have low accident rates per annum, with the exception of Wood Street which recorded two fatal accidents. The A47, specifically the link from Leicester Road (W)/Clickers Way/A47 (N) to Dan's Lane has an annual accident rate <1, with the section between Dan's Lane and Desford Road (B582) having an annual accident rate >1. The DfT (2021) reported road casualties for Great Britain, in RAS10002¹⁸. The national accident rate per million vehicle kms by road classification for 2020 are as follows:
- urban A road: 0.42;
 - rural A road: 0.11;
 - urban other roads: 0.3; and
 - rural other roads: 0.19.
- 14.5.48 Within the Study Area, the A47 is considered to be an urban A road on Clickers Way, and north of Earl Shilton a rural A road. All other roads in the Study Area are considered to be urban other roads.
- 14.5.49 Comparing the links (see **Table 14.8**) where count data is available¹⁹, it is observed that:
- Station Road (and Wilkinson Lane) has an accident rate above the national average, at 0.39, though the average annual rate on this link is only 1; and
 - The link section north of Earl Shilton on the A47 between Dan's Lane and Desford Road (B582), is above the national average, for a rural A road, at 0.12 compared with 0.11.
- 14.5.50 Overall, accident levels are low and the Study Area does not exhibit any severe accident hot spots.

Future baseline

Local road network

- 14.5.51 LCC is proposing to upgrade the signalised A47/B582 staggered crossroads junction to a four-arm roundabout in order to support the delivery of major new housing and employment at the New Lubbesthorpe development to the east and the Barwell and Earl Shilton SUEs.

Traffic data

- 14.5.52 Traffic data for the future baseline has been derived from the PRTM model which has been run by WSP on behalf of the Applicant. Model runs have been produced for the year of opening, 2026, and the year of completion which is anticipated to be 2036. For the purpose of the assessment, the following two future year scenarios have been assessed:
- 2036 without development (includes committed development traffic), i.e. the 2036 Future Baseline; and
 - 2036 Future Base with development traffic.
- 14.5.53 The 2036 baseline flows incorporate planning data that has been provided by HBBC and includes all committed development and allocated sites that are expected to be delivered up to 2036.

¹⁸ Department for Transport (2021) RAS10012: Accidents and accident rates by road class and severity (Online). Available at: <https://www.gov.uk/government/statistical-data-sets/reported-road-accidents-vehicles-and-casualties-tables-for-great-britain> (Accessed: 12 October 2021)

¹⁹ from that surveyed by NDC in July 2021.

- 14.5.54 WSP reviewed the PRTM planning inputs and uncertainty logs which confirm that the model includes the proposed SUE access arrangements, highway improvements associated with SUE and the Earl Shilton SUE development. The Baseline Scenario models using the NTEM constrained version of PRTM was updated to remove the existing Earl Shilton SUE and associated infrastructure.
- 14.5.55 For the traffic impact assessment of any development, it is important that the 'Baseline Scenario', against which the impact of the development is assessed is based on the most realistic projection of transport schemes and planned land use that would be present near the Proposed Development in the assessment year.
- 14.5.56 In the context of the Earl Shilton SUE, the Barwell Sustainable Urban Extension (SUE) is a major committed development nearby and is likely to have a significant impact on the traffic in the surrounding area. It was therefore important that the Barwell SUE is included in the 'Baseline Scenario' of the model used for the Earl Shilton assessment.
- 14.5.57 **Table 14.9** summarises the predicted 2036 Future Baseline.

Table 14.9 Baseline two-way traffic flows (2036)

Link No.	Link Name	AM Peak	PM Peak
		All vehicles (PCU)	All Vehicles (PCU)
1	A47 (Hinkley Road North) - North of junction with B582	1,716	1,784
2	B582 Desford Lane - South of junction with A47	1,895	1,789
3	A47 (Hinkley Road South) - South of junction with B582	1,923	1,965
4	B582 Leicester Lane - Northwest of junction with A47	1,268	1,332
5	Leicester Road - West of junction with A47	544	566
6	A47 Clickers Way - North of junction with the proposed site access (north)	1,258	1,116
7	A47 Clickers Way - South of junction with the proposed site access (north)	1,258	1,116
8	A47 Clickers Way - Northeast of junction with Masefield Drive	1,258	1,116
9	A47 Clickers Way - Southwest of junction with Masefield Drive	1,303	1,153
10	A47 Clickers Way - West of junction with Wilkinson Lane	1,520	1,483
11	Wilkinson Lane - North of junction with A47	395	522
12	Station Road (B581) - South of junction with A47	1,054	1,153
13	A47 - Southwest of junction with Station Road	1,960	2,105
14	A47 - Southwest of junction with Leicester Road	2,876	2,976
15	Leicester Road (Carrs Hill) - North of junction with A47	1,086	1,226
16	B4668 Leicester Road - South of junction with A47	1,660	1,727
17	A47 Normandy Road - West of junction with B4668 and The Common	1,496	1,559
18	The Common - North of junction with A47	709	883

Link No.	Link Name	AM Peak	PM Peak
		All vehicles (PCU)	All Vehicles (PCU)
19	B4667 Ashby Road - South of junction with A47	1,247	1,429
20	A47 Normandy Road - West of junction with Ashby Road	1,838	1,740
21	A447 Ashby Road - North of junction with A47	1,361	1,330
22	Mill Lane near Site Access	3	5
23	Alexander Avenue - South of Mill Lane	63	79
24	Alexander Avenue - West of junction with Astley Road	59	61
25	Astley Road - North of the proposed site access	143	112
26	Astley Road - South of the proposed site access	143	112
27	High Street - North of junction with Alexander Avenue	479	548
28	High Street - South of junction with Alexander Avenue	530	606
29	Wood Street - West of junction with Station Road	577	687

14.6 Consultation

14.6.1 **Table 14.10** provides a summary of the issues that have been raised by consultees and the responses given.

Technical engagement

14.6.2 Wood has additionally participated in technical engagement with LCC and National Highways to discuss the proposals for the Earl Shilton SUE and the traffic modelling using PRTM. Key aspects are identified in **Table 14.10**.

Table 14.10 Summary of issues raised during consultation regarding Traffic and Transport

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
Temporal scope – questioning of opening year	LCC and National Highways	The temporal scope for the traffic modelling and TA has been identified as 2026 (year of opening) and 2036 (year of completion). These years also coincide with the modelled years within PRTM. The Scoping Report for the EIA identified a different year for year of opening which was questioned by National Highways. This has now been resolved and 2026 has been identified in both the ES and TA.	Section 14.7
Version of PRTM to be used	LCC and National Highways	The PRTM used is the latest version released in November 2020 and includes the latest available planning data for HBBC available at the time	Section 14.5
Traffic generation – trips rates and internalisation of trips need to be consistent with those for Barwell SUE	LCC	Trip rates and internalisation of trips for the purpose of the traffic modelling are consistent with those adopted for the Barwell SUE assessment work	Section 14.5
Traffic distribution needs to be based on 'parent zones' near to the development which have similar attributes	LCC	The parent zones adopted for traffic distribution are similar to the development and are therefore representative.	Transport Assessment, specifically Section 5.4

14.7 Scope of the assessment

- 14.7.1 This chapter considers the potential effects of changes in road traffic movements on receptors, i.e. the users of this road network (pedestrians, cyclists, equestrians and drivers) and those living close to it. The accompanying TA considers transport capacity, traffic movements and road safety issues and effects at local junctions within the scope of the road network set out below.

Spatial scope

- 14.7.2 The spatial scope of the assessment is set out in **Table 14.3**, comprising the highway links that will be used by the traffic generated by the Proposed Development, based on the distribution of traffic as identified within the TA.
- 14.7.3 These highway links provide comprehensive coverage of the routes surrounding the Site. Beyond these roads, traffic from the Proposed Development would access the wider road network where its effect would be diluted by existing traffic on these routes or would distribute to a point where the effects from traffic would be minimal.
- 14.7.4 The receptors along the highways identified above have been identified as forming the scope of the assessment in relation to potentially traffic-related effects.

Temporal scope

- 14.7.5 The temporal scope of the assessment of Traffic and Transport is the year of completion, which will be 2036.

Potential receptors

- 14.7.6 Receptors are the users or beneficiaries of the highways network assets and facilities such as pedestrians, cyclists, equestrian, and drivers who travel within the vicinity of the Proposed Development.
- 14.7.7 The scope of the assessment provides comprehensive coverage of the routes surrounding the Proposed Development and it will consider the implications of construction and operational traffic.
- 14.7.8 GEART¹³ identifies the following groups and special interest groups that may be affected:
- people at home;
 - people at work;
 - sensitive groups including children, elderly and disabled;
 - sensitive locations such as hospitals, churches, schools and historical buildings;
 - pedestrians;
 - cyclists;
 - open spaces, recreational areas, and shopping areas;
 - sites of ecological and nature conservation value; and
 - sites of tourist/visitor attractions.

Likely significant effects

14.7.9 The likely significant Traffic and Transport effects receptors that have been taken forward for assessment are summarised in **Table 14.11**.

Table 14.11 Likely significant effects

Activity	Effect	Receptor
Additional road traffic on local routes generated by the Proposed Development	Potential increase in traffic flows on the local road network and impact on: • severance; • driver delay; • pedestrian delay; • pedestrian amenity; • fear and intimidation; and • accidents and safety.	Occupants (residents, workers, schools, shopping areas, etc – groups identified in GEART ¹³) alongside the roads used by construction traffic and users of the roads such as drivers, pedestrians and cyclists.

Effects scoped out

14.7.10 The following potential effects have been scoped out of further assessment because they are not considered to be significant:

- Potential effects on users of the road network and adjacent land uses as a result of construction traffic from the Proposed Development. The volume of total traffic generated by the operational phase of the Proposed Development would be greater than that during the construction phase and therefore the operational phase represents the likely worst-case traffic effects arising from the Proposed Development.
- Hazardous loads – No hazardous loads are anticipated given the nature of the Proposed Development and are therefore not considered further within this chapter..

14.8 Environmental measures embedded into the development proposals

14.8.1 A range of environmental measures have been embedded into the development proposals. As a mixed-use site, there will be internalisation of trips, such as residential to primary school, employment to convenience retail, etc whereby the journey remains within the Site. Alternatively there may be linked trips such as a commuter from the residential land use dropping off at the primary school and then carrying on to work outside of the Site. This is an embedded measure which will reduce trips out of the Site.

14.8.2 Other embedded measures relevant to the Traffic and Transport assessment and how these embedded measures will influence the assessment are set out below.

14.8.3 A Construction Traffic Management Plan (CTMP) will be developed to minimise traffic impacts during the construction period of the Proposed Development. The CTMP would control movements and routing of HGVs through the following measures:

- traffic routing strategy – ensuring vehicles access the Proposed Development via the most appropriate route and avoid unnecessary conflict with sensitive areas;

- temporary signage – in accordance with DfT Traffic Signs Manual, Chapter 8²⁰ to inform local road users of construction access points and the presence of HGVs;
- traffic marshals – to marshal access points to the Proposed Development and PRow crossings whilst deliveries are taking place; and
- temporary traffic management – provided on approaches to accesses to the Proposed Development in the form of traffic warning signs, possible reductions in speed limit signs to ensure safe passage of vehicles. All signage will be in accordance with DfT's Traffic Signs Manual, Chapter 8²⁰.

- 14.8.4 There will be good active travel permeability within the Proposed Development and external links to Earl Shilton via Breach Lane, Astley Road, Avenue South, Montgomery Road and Mill Lane to enable short journeys to be undertaken by foot and cycle.
- 14.8.5 A TP will be implemented, based on the Framework TP, to facilitate and encourage sustainable travel to reduce journeys by car and traffic generation.
- 14.8.6 The Proposed Development will enhance existing bus service provision. The spine road through the Site will accommodate bus services to enable travel by public transport, thereby reducing journeys by car and traffic generation.

14.9 Assessment methodology

Methodology for the predication of effects

- 14.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to the Assessment**, and specifically in **Section 4.5** to **Section 4.7**. However, whilst this has informed the approach that has been used in this Traffic and Transport assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Traffic and Transport assessment.
- 14.9.2 The assessment compares the traffic flows for the 2036 Future Baseline with those for the 2036 Future Baseline with the Proposed Development.

General approach

- 14.9.3 The guidance that is followed when assessing the potential significance of road traffic effects is summarised in GEART¹³, which states the following.
- "At an early stage, it is useful to identify particular groups or locations which may be sensitive to changes in traffic conditions." (Paragraph 2.5).
- "The detailed assessment of impacts is...likely to concentrate on the period during which the absolute level of an impact is at its peak, as well as the hour at which the greatest level of change is likely to occur."* (Paragraph 3.10).
- 14.9.4 To assess the impact, the percentage increase in traffic will be determined by comparing the Proposed Development traffic flows with the baseline traffic flows on the highway links identified in **Table 14.3**.

²⁰Department of Transport (2020). *Traffic Signs Manual* (online). Available at: <https://www.gov.uk/government/publications/traffic-signs-manual> (Accessed September 2021).

- 14.9.5 GEART¹³ provides two rules that are used to establish whether an environmental assessment of traffic effects should be carried out on receptors:
- **Rule 1:** Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
 - **Rule 2:** Include sensitive areas where traffic flows are predicted to increase by 10% or more.
- 14.9.6 It should be noted that, according to GEART¹³, predicted traffic flow increases below 10% are generally not considered to be significant as daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flows below this level are, therefore, assumed not to result in significant environmental effects and have therefore will not be assessed further.

Environmental effects assessed

- 14.9.7 Our approach uses the thresholds and guidance set out in GEART¹³ and considers the following environmental effects.

Severance

- 14.9.8 There are no predictive formulae which give simple relationships between traffic factors and levels of severance. GEART¹³ states that changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance. In general, marginal (slight) changes in traffic flow are, by themselves, unlikely to create or remove severance.

Driver delay

- 14.9.9 GEART¹³ states that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. The capacity of a road or a particular junction can be determined by establishing the ratio of flow to capacity (RFC).

Pedestrian delay

- 14.9.10 Given the range of local factors and conditions which can influence pedestrian delay, GEART¹³ does not recommend that thresholds be used as a means to establish the significance of pedestrian delay but recommend that reasoned judgements be made instead.

Pedestrian amenity

- 14.9.11 GEART¹³ notes that changes in pedestrian amenity may be considered significant where the traffic flow is halved or doubled, with the former leading to a positive effect and the latter a negative effect.

Fear and intimidation

- 14.9.12 There are no commonly agreed thresholds by which to determine the significance of fear and intimidation. GEART¹³ notes that special consideration should be given to areas where there are likely to be particular problems, such as high-speed sections of road, locations of turning points and accesses. Consideration should also be given to areas frequented by school children, the elderly and other vulnerable groups.

Accidents and safety

- 14.9.13 This is informed by a review of existing collision patterns and trends based upon the existing PIA records (see **Section 14.5**) and the forecast increase in traffic.

Receptor Sensitivity

14.9.14 As set out in GEART¹³, the impact of traffic is dependent upon a wide range of factors which include the volume of traffic, traffic speeds and operational characteristics and traffic composition (such percentage of HGVs). The perception of changes in traffic varies according to factors such as:

- existing traffic levels;
- the location of traffic movements;
- the time of day;
- temporal and seasonal variation of traffic;
- design and layout of the road;
- land-use activities adjacent to the route; and
- ambient conditions of adjacent land-uses

14.9.15 Each highway link included in the assessment has been assigned a sensitivity in accordance with GEART¹³, based on the groups identified in Paragraph 14.7.9. The allocation also takes account of the proximity of sensitive receptors to the highway link and the highway environment. **Table 14.11** summarises the rationale used to determine the sensitivity against the corresponding receptors as part of the assessment. Professional judgement has also been used to determine the sensitivity of the receptor.

Table 14.12 Receptor sensitivity

Sensitivity	Description/Reason	Receptor
High	Highway links with a high sensitivity to changes in traffic flows include routes with sensitive receptors alongside them such as schools and colleges, and/or where there are land-uses which result in high volumes of pedestrian/cycle users and the road is narrow and/or footway provision is poor, existing traffic volumes are high for the type of road resulting in congestion and road safety issues.	Occupants of land-uses alongside the highway link and users of the highway link.
Medium	Highway links with a medium sensitivity to changes in traffic flows include routes with some sensitive receptors alongside them, and/or where there are land-uses which result in some pedestrian/cyclist users, road design and footway provision is adequate/appropriate, existing traffic volumes can be accommodated for the type of road but approaching capacity.	Occupants of land-uses alongside the highway link and users of the highway link.
Low	Highway links with low sensitivity to changes in traffic flows include routes with no sensitive receptors and some land uses alongside and no/very limited pedestrian/cyclist users, road design and footway provision is appropriate, existing traffic volumes can be accommodated for the type of road.	Occupants of land-uses alongside the highway link and users of the highway link.
Negligible	Highway links with negligible sensitivity to changes in traffic flows include routes with no sensitive receptors and very few land uses alongside them, which have no direct access and no/very limited pedestrian/cyclist users and existing traffic volumes can be accommodated for the type of road.	Users of the highway link.

14.9.16 Sensitivity judged as 'Low' or 'Negligible' results in Rule 1 being considered for that link where traffic flows are predicted to increase by more than 30% or where the number of HGVs is predicted to increase by more than 30%. Sensitivity judged as 'High' or 'Medium' results in Rule 2 (sensitive areas where traffic flows are predicted to increase by 10% or more) being considered for that link.

Magnitude of Change

14.9.17 **Table 14.13** sets out the magnitude of change criteria, based on GEART¹³ and engineering judgement, which have been used to undertake the assessment of traffic flows as a result of the Proposed Development on the transport environmental effects.

Table 14.13 Magnitude of Change

Transport effect	Magnitude of change			
	High	Medium	Low	Negligible
Severance	Change in total traffic or HGV flows over 91%.	Change in total traffic or HGV flow of 61-90%.	Change in total traffic or HGV flows of 31-60%.	Change in total traffic or HGV flows of less than 30%.
Driver delay	High increase in queuing at junctions and/or congestion on road links.	Medium increase in queuing at junctions and/or congestion on road links.	Low increase in queuing at junctions and/or congestion on road links.	Low or no increase in queuing at junctions and/or congestion on road links.
Pedestrian amenity and delay and fear and intimidation	Based on general level of pedestrian activity, visibility, and physical conditions such as traffic flow, traffic composition, crossing points and pavement width/separation from traffic.			
Accident and safety	Informed by a review of existing collision patterns and trends based upon the existing PIA records and the forecast increase in traffic.			

Significance criteria

14.9.18 The classification of a likely significant effect is derived by considering the sensitivity of the receptor (derived from **Table 14.12**) against the magnitude of change (derived from **Table 14.13**) as defined in **Table 14.14**. The shading indicates those significance ratings that are deemed to be 'significant' effects.

Table 14.14 Significance evaluation matrix

		Magnitude of change			
		High	Medium	Low	Negligible
Receptor sensitivity	High	Major (Significant)	Major (Significant)	Moderate (Significant)	Negligible (Not significant)
	Medium	Major (Significant)	Moderate (Significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Significant)	Minor (Not significant)	Minor (Not significant)	Negligible (Not significant)
	Negligible	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

14.9.19 Major and Moderate effects are considered to be significant in EIA terms, whilst Minor and Negligible effects are considered not significant.

14.10 Assessment of Traffic and Transport effects

Sensitivity of highway links

14.10.1 **Table 14.15** identifies the sensitivity of highway links based on the current baseline (see **Section 14.5**) and the GEART¹³ Rule that applies.

Table 14.15 Sensitivity of highway links (baseline situation)

Link No.	Highway link	Rationale	Receptor sensitivity	Assessment (Rule 1/2)	Changes with Proposed Development
1	A47 (Hinkley Road North) - North of junction with B582	60 mph with no land uses and footways.	Negligible	Rule 1	No change.
2	B582 Desford Lane - South of junction with A47	60 mph with no footways. Only couple of farm accesses.	Low	Rule 1	No change.
3	A47 (Hinkley Road South) - South of junction with B582	50 mph with footway on side of the road. Most of the sections have no land use along its length. Frontage of few properties and on-road cycle lane.	Low	Rule 1	No change.
4	B582 Leicester Lane - Northwest of junction with A47	40 mph with a short section of footways. Residential properties are well back from the road.	Low	Rule 1	No change.
5	Leicester Road - West of junction with A47	50 mph with no land uses along its length.	Negligible	Rule 1	No change.
6	A47 Clickers Way - North of junction with the proposed site access (north)	60 mph with no land uses along its length. A segregated shared cycle and pedestrian route along the western side of the road.	Low	Rule 1	New three-arm roundabout to serve the northern section of the Site. Proposed pedestrian and cycle facilities within the junction will be tied into the existing provision.
7	A47 Clickers Way - South of junction with the proposed site access (north)	60 mph with no land uses along its length. A segregated shared cycle and pedestrian route along the western side of the road.	Low	Rule 1	New four arm junction with A47/Breach Lane. Proposed pedestrian and cycle facilities within the junction will be tied into the existing provision.
8	A47 Clickers Way - Northeast of junction with Masefield Drive	40 mph with hedgerow segregating residential properties. A segregated shared cycle and pedestrian route along the northern side of the road.	Low	Rule 1	North section of this link will be one of the arms of the proposed southern access to the Site.
9	A47 Clickers Way - Southwest of junction with Masefield Drive	40 mph with hedgerow segregating residential properties. A segregated shared cycle and pedestrian route along the northern side of the road.	Low	Rule 1	No change.
10	A47 Clickers Way - West of junction with Wilkinson Lane	40 mph with hedgerow segregating residential	Low	Rule 1	No change.

Link No.	Highway link	Rationale	Receptor sensitivity	Assessment (Rule 1/2)	Changes with Proposed Development
		properties. A segregated shared cycle and pedestrian route along the northern side of the road.			
11	Wilkinson Lane - North of junction with A47	30 mph with narrow footways and property frontage. It runs through a residential area.	Medium	Rule 2	No change.
12	Station Road (B581) - South of junction with A47	40 mph with footway along one side of the road. Properties are well back from the carriageway.	Low	Rule 1	No change.
13	A47 - Southwest of junction with Station Road	40 mph with hedgerow segregating residential properties. A segregated shared cycle and pedestrian route along one side of the carriageway.	Low	Rule 1	No change.
14	A47 - Southwest of junction with Leicester Road	70 mph short section of dual carriageway.	Negligible	Rule 1	No change.
15	Leicester Road (Carr Hill) - North of junction with A47	40 mph with footway on side of the carriageway. Rural setting without property frontage.	Low	Rule 1	No change.
16	B4668 Leicester Road - South of junction with A47	50 mph with segregated footways and shared cycle and pedestrian route. Properties are well back from the carriageway.	Low	Rule 1	No change.
17	A47 Normandy Road - West of junction with B4668 and The Common	60 mph with segregated footways and shared cycle and pedestrian route.	Low	Rule 1	No change.
18	The Common - North of junction with A47	40 mph/30 mph with segregated footways and property frontage.	Medium	Rule 2	No change.
19	B4667 Ashby Road - South of junction with A47	30 mph with segregated footways and shared cycle and pedestrian route. Properties are well back from the carriageway.	Low	Rule 1	No change.
20	A47 Normandy Road - West of junction with Ashby Road	40 mph with segregated footways. No property frontage.	Low	Rule 1	No change.
21	A447 Ashby Road - North of junction with A47	30 mph with segregated and non-segregated footways. Properties are well back from the carriageway.	Low	Rule 1	No change.
22	Mill Lane near Site Access	30 mph with footways and property frontage. Part of the carriageway is narrow. Western end has primary school access.	Medium	Rule 2	Road widening, new footway and 20 mph speed limit near Site access within public highway land.
23	Alexander Avenue - South of Mill Lane	30 mph with property frontage and narrow footways. Route to primary school access at western end.	Medium	Rule 2	Traffic calming measure at Alexander Avenue/Astley Road junction.

Link No.	Highway link	Rationale	Receptor sensitivity	Assessment (Rule 1/2)	Changes with Proposed Development
24	Alexander Avenue - West of junction with Astley Road	30 mph with property frontage and narrow footways. Primary school access.	Medium	Rule 2	Traffic calming measure at Alexander Avenue/Astley Road junction.
25	Astley Road - North of the proposed site access	30 mph with property frontage and adequate footways. Primary school access at northern end.	Medium	Rule 2	Traffic calming measures.
26	Astley Road - South of the proposed site access	30 mph with property frontage and adequate footways. Route to primary school access at northern end.	Medium	Rule 2	Traffic calming measures.
27	High Street - North of junction with Alexander Avenue	30 mph with property frontage and narrow footways.	Medium	Rule 2	No change.
28	High Street - South of junction with Alexander Avenue	30 mph with property frontage and narrow footways.	Medium	Rule 2	No change.
29	Wood Street - West of junction with Station Road	20 mph with shop and residential property frontage and adequate footways.	Medium	Rule 2	No change.

Changes in traffic flows

14.10.2 **Table 14.16** shows the percentage change in traffic flows in 2036, with the Proposed Development traffic on the LRN during the AM peak hours.

Table 14.16 Change in traffic flows: 2036 AM peak hour

Link No.	Link Name	GEART ¹³ Rule Screening	2036 Base (PCU)	2036 Base + Development (PCU)	% Change in total traffic	Assessment (Rule 1/2)
1	A47 (Hinkley Road North) - North of junction with B582	Rule 1	1716	1769	3.1%	Below 30% - no assessment required
2	B582 Desford Lane - South of junction with A47	Rule 1	1895	1901	0.3%	Below 30% - no assessment required
3	A47 (Hinkley Road South) - South of junction with B582	Rule 1	1923	2000	4.0%	Below 30% - no assessment required
4	B582 Leicester Lane - Northwest of junction with A47	Rule 1	1268	1292	1.9%	Below 30% - no assessment required
5	Leicester Road - West of junction with A47	Rule 1	544	568	4.4%	Below 30% - no assessment required

Link No.	Link Name	GEART ¹³ Rule Screening	2036 Base (PCU)	2036 Base + Development (PCU)	% Change in total traffic	Assessment (Rule 1/2)
6	A47 Clickers Way - North of junction with the proposed site access (north)	Rule 1	1258	1095	-13.0%	Below 30% - no assessment required
7	A47 Clickers Way – South of junction with the proposed site access (north)	Rule 1	1258	882	-29.9%	Below 30% - no assessment required
8	A47 Clickers Way - Northeast of junction with Masefield Drive	Rule 1	1258	1488	18.3%	Below 30% - no assessment required
9	A47 Clickers Way - Southwest of junction with Masefield Drive	Rule 1	1303	1533	17.7%	Below 30% - no assessment required
10	A47 Clickers Way - West of junction with Wilkinson Lane	Rule 1	1520	1745	14.8%	Below 30% - no assessment required
11	Wilkinson Lane - North of junction with A47	Rule 2	395	349	-11.6%	Below 10% - no assessment required
12	Station Road (B581) - South of junction with A47	Rule 1	1054	1042	-1.1%	Below 30% - no assessment required
13	A47 - Southwest of junction with Station Road	Rule 1	1960	2099	7.1%	Below 30% - no assessment required
14	A47 - Southwest of junction with Leicester Road	Rule 1	2876	2998	4.2%	Below 30% - no assessment required
15	Leicester Road (Carrs Hill) - North of junction with A47	Rule 1	1086	1057	-2.7%	Below 30% - no assessment required
16	B4668 Leicester Road - South of junction with A47	Rule 1	1660	1721	3.7%	Below 30% - no assessment required
17	A47 Normandy Road - West of junction with B4668 and The Common	Rule 1	1496	1554	3.9%	Below 30% - no assessment required
18	The Common - North of junction with A47	Rule 2	709	668	-5.8%	Below 10% - no assessment required
19	B4667 Ashby Road - South of junction with A47	Rule 1	1247	1261	1.1%	Below 30% - no assessment required
20	A47 Normandy Road - West of junction with Ashby Road	Rule 1	1838	1871	1.8%	Below 30% - no assessment required

Link No.	Link Name	GEART ¹³ Rule Screening	2036 Base (PCU)	2036 Base + Development (PCU)	% Change in total traffic	Assessment (Rule 1/2)
21	A447 Ashby Road - North of junction with A47	Rule 1	1361	1373	0.9%	Below 30% - no assessment required
22	Mill Lane near Site Access	Rule 2	3	138	4046.4%	Exceeds 10% - assessment required
23	Alexander Avenue - South of Mill Lane	Rule 2	63	95	50.5%	Exceeds 10% - assessment required
24	Alexander Avenue - West of junction with Astley Road	Rule 2	59	149	151.2%	Exceeds 10% - assessment required
25	Astley Road - North of the proposed site access	Rule 2	143	360	151.7%	Exceeds 10% - assessment required
26	Astley Road - South of the proposed site access	Rule 2	143	164	14.7%	Exceeds 10% - assessment required
27	High Street - North of junction with Alexander Avenue	Rule 2	479	527	9.9%	Below 10% - no assessment required
28	High Street - South of junction with Alexander Avenue	Rule 2	530	664	25.4%	Exceeds 10% - assessment required
29	Wood Street - West of junction with Station Road	Rule 2	577	693	20.2%	Exceeds 10% - assessment required

14.10.3 **Table 14.17** shows the percentage change in traffic flows in 2036, with the Proposed Development traffic on the LRN during the PM peak hours.

Table 14.17 Change in traffic flows: 2036 PM peak hour

Link No.	Link Name	GEART ¹³ Rule Screening	2036 Base (PCU)	2036 Base + Development (PCU)	% Change in total traffic	Assessment (Rule 1/2)
1	A47 (Hinkley Road North) - North of junction with B582	Rule 1	1784	1799	0.8%	Below 30% - no assessment required
2	B582 Desford Lane - South of junction with A47	Rule 1	1789	1805	0.9%	Below 30% - no assessment required
3	A47 (Hinkley Road South) - South of junction with B582	Rule 1	1965	1993	1.4%	Below 30% - no assessment required

Link No.	Link Name	GEART ¹³ Rule Screening	2036 Base (PCU)	2036 Base + Development (PCU)	% Change in total traffic	Assessment (Rule 1/2)
4	B582 Leicester Lane - Northwest of junction with A47	Rule 1	1332	1329	-0.2%	Below 30% - no assessment required
5	Leicester Road - West of junction with A47	Rule 1	566	554	-2.1%	Below 30% - no assessment required
6	A47 Clickers Way - North of junction with the proposed site access (north)	Rule 1	1116	1030	-7.7%	Below 30% - no assessment required
7	A47 Clickers Way - South of junction with the proposed site access (north)	Rule 1	1116	909	-18.5%	Below 30% - no assessment required
8	A47 Clickers Way - Northeast of junction with Masefield Drive	Rule 1	1116	1525	36.6%	Exceeds 30% - assessment required
9	A47 Clickers Way - Southwest of junction with Masefield Drive	Rule 1	1153	1562	35.5%	Exceeds 30% - assessment required
10	A47 Clickers Way - West of junction with Wilkinson Lane	Rule 1	1483	1801	21.4%	Below 30% - no assessment required
11	Wilkinson Lane - North of junction with A47	Rule 2	522	415	-20.5%	Below 10% - no assessment required
12	Station Road (B581) - South of junction with A47	Rule 1	1153	1170	1.5%	Below 30% - no assessment required
13	A47 - Southwest of junction with Station Road	Rule 1	2105	2400	14.0%	Below 30% - no assessment required
14	A47 - Southwest of junction with Leicester Road	Rule 1	2976	3155	6.0%	Below 30% - no assessment required
15	Leicester Road (Carrs Hill) - North of junction with A47	Rule 1	1226	1161	-5.3%	Below 30% - no assessment required
16	B4668 Leicester Road - South of junction with A47	Rule 1	1727	1796	4.0%	Below 30% - no assessment required
17	A47 Normandy Road - West of junction with B4668 and The Common	Rule 1	1559	1611	3.3%	Below 30% - no assessment required
18	The Common - North of junction with A47	Rule 2	883	815	-7.7%	Below 10% - no assessment required

Link No.	Link Name	GEART ¹³ Rule Screening	2036 Base (PCU)	2036 Base + Development (PCU)	% Change in total traffic	Assessment (Rule 1/2)
19	B4667 Ashby Road - South of junction with A47	Rule 1	1429	1427	-0.1%	Below 30% - no assessment required
20	A47 Normandy Road - West of junction with Ashby Road	Rule 1	1740	1786	2.6%	Below 30% - no assessment required
21	A447 Ashby Road - North of junction with A47	Rule 1	1330	1349	1.4%	Below 30% - no assessment required
22	Mill Lane near Site Access	Rule 2	5	159	3433.3%	Exceeds 10% - assessment required
23	Alexander Avenue - South of Mill Lane	Rule 2	79	122	54.2%	Exceeds 10% - assessment required
24	Alexander Avenue - West of junction with Astley Road	Rule 2	61	133	118.7%	Exceeds 10% - assessment required
25	Astley Road - North of the proposed site access	Rule 2	112	317	183.0%	Exceeds 10% - assessment required
26	Astley Road - South of the proposed site access	Rule 2	112	125	11.6%	Exceeds 10% - assessment required
27	High Street - North of junction with Alexander Avenue	Rule 2	548	573	4.5%	Below 10% - no assessment required
28	High Street - South of junction with Alexander Avenue	Rule 2	606	700	15.5%	Exceeds 10% - assessment required
29	Wood Street - West of junction with Station Road	Rule 2	687	710	3.3%	Below 10% - no assessment required

14.10.4

An assessment on the following links has been undertaken based on the percentage impact results detailed in **Table 14.16** and **Table 14.17**:

- Link 8: A47 Clickers Way - Northeast of junction with Masfield Drive (PM peak only);
- Link 9: A47 Clickers Way – Southwest of junction with Masfield Drive (PM peak only);
- Link 22: Mill Lane near site access (AM and PM peaks);
- Link 23: Alexander Avenue – South of Mill Lane (AM and PM peaks);
- Link 24: Alexander Avenue – West of junction with Astley Road (AM and PM peaks);
- Link 25: Astley Road - North of the proposed site access (AM and PM peaks);

- Link 26: Astley Road - South of the proposed site access (AM and PM peaks);
- Link 28: High Street – South of junction with Alexander Avenue (AM and PM peaks); and
- Link 29: Wood Street - West of junction with Station Road (AM peak only).

A47 Clickers Way (links 8 and 9)

- 14.10.5 With traffic flow increases on link 8 and 9 of 36.6% and 35.5% respectively, the GEART¹³ threshold (Rule 1, 30%) is exceeded during the PM peak hour.

Severance

- 14.10.6 The A47 is part of the primary network and there are no communities on the eastern side of the road nor any major pedestrian desire lines across the A47.
- 14.10.7 Given that the predicted percentage increase in the traffic is between 31% and 60%, the magnitude of change is classified as low.

Driver delay

- 14.10.8 A slight driver delay at this section of the A47 can be expected as a result of the Proposed Development due to the introduction of the roundabouts. However, based on the results of the capacity assessment of the proposed junction, the junctions will operate efficiently, thereby minimising delay (as shown in the TA, specifically Section 6.6). Therefore, the magnitude of change is considered to be low.

Pedestrian delay and amenity

- 14.10.9 The road has a shared use pedestrian/cycleway on the western side which is of adequate design to cater for pedestrian and cycle usage. The increase in traffic as a result of the Proposed Development is unlikely to affect the amenity of users of the route and the magnitude of change is therefore considered to be negligible.

Fear and intimidation

- 14.10.10 The assessment of pedestrian amenity is also applicable here. The magnitude of change is to be considered negligible.

Accident and safety

- 14.10.11 The Study Area does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The access junction is designed to DMRB standards¹⁵. The magnitude of change is therefore considered to be negligible.

Mill Lane (link 22)

- 14.10.12 With traffic flow increases of 4046.4% and 3433.3% in AM and PM peak respectively, the GEART¹³ threshold (Rule 2, 10%) is exceeded. The percentage increase in traffic should be treated with caution given the low volume of baseline traffic (without development) as this method of comparison gives results in a disproportionate impact. **Table 14.16** and **Table 14.17** show negligible traffic flows of 3 and 5 vehicles in the 2036 Future Baseline during AM and PM peak respectively.

Severance

- 14.10.13 The increase in traffic flows is 135 vehicles in the AM peak and 154 vehicles in the PM peak hour, which equates to an average of less than three vehicles per minute which will not impact on severance. The magnitude of change is considered to be low.
- 14.10.14 One of the major contributors to the increase in flows at this section of Mill Lane is the reassignment of background traffic to/from the A47 by routeing through the Proposed Development to the northern access roundabout. In order to minimise this movement and the magnitude of change, traffic management measures in the form of pinchpoints will be implemented on Mill Lane within the Site.

Driver delay

- 14.10.15 Mill Lane is currently not a through route and its use is for access to properties fronting it, the primary school and roads off it. It is the intention to create driver delay at its eastern end, within the Site, by means of a traffic management features and a road design to deter through traffic from elsewhere in Earl Shilton. With the implementation of these measures, the magnitude of change is considered to be low.

Pedestrian delay and amenity

- 14.10.16 The additional traffic (equating to less than three vehicles per minute) will not impact on pedestrian delay and amenity. Traffic management and pedestrian footway connectivity will provide a benefit to the pedestrian environment. The magnitude of change is considered to be negligible.

Fear and intimidation

- 14.10.17 The assessment of the pedestrian amenity environmental effect above is also applicable here. The magnitude of change is to be considered negligible.

Accident and safety

- 14.10.18 The Study Area does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The magnitude of change is therefore considered to be low.

Alexander Avenue (link 23 and 24)

- 14.10.19 With traffic flow increases of 50.5% and 54.2% on link 23 in the AM and PM peak respectively, and 151.2% and 118.7% on the link 24 in AM and PM peak respectively the GEART¹³ threshold (Rule 2, 10%) is exceeded. For the purpose of the assessment, the links have been combined as one as they are the same in character and the scale of impact is similar. The percentage increase in traffic should be treated with caution given the low volume of existing baseline traffic (without development) as this method of comparison gives results in a disproportionate impact.

Severance

- 14.10.20 The increase in traffic flows is up to 43 vehicles in the AM peak and 90 vehicles in the PM peak hour which equates to an average of less than one or two vehicles per minute respectively which will not impact on severance. The magnitude of change is therefore considered to be low.

Driver delay

- 14.10.21 Negligible increases in queuing or congestion on this highway link is anticipated as the link assessment in the TA (Section 6.5) demonstrates that this road has sufficient capacity to accommodate the future base and development traffic.
- 14.10.22 The magnitude of change is therefore considered to be low.

Pedestrian delay and amenity

- 14.10.23 There is currently good pedestrian provision along Alexander Road and increases in traffic of one vehicle every 83 seconds in the AM peak and every 40 seconds in the PM peak will not affect pedestrian delay and amenity. The magnitude of change is therefore considered to be negligible.

Fear and intimidation

- 14.10.24 The assessment of the pedestrian amenity environmental effect above is also applicable here. The magnitude of change is considered to be negligible.

Accident and safety

- 14.10.25 The Study Area does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The magnitude of change is considered to be negligible.

Astley Road (link 25 and 26)

- 14.10.26 With traffic flow increases of 151.7% and 183.0% on link 25 in the AM and PM peak respectively, and 14.7% and 11.6% on link 26 in AM and PM peak respectively the GEART¹³ threshold (Rule 2, 10%) is exceeded. For the purpose of the assessment, the links have been combined as one as the road characteristics are the same.
- 14.10.27 The percentage increase in traffic should be treated with caution given the low volume of existing baseline traffic (without development) as this method of comparison gives results in a disproportionate impact.

Severance

- 14.10.28 The increase in traffic flows is highest on the northern section, with up to 217 vehicles in the AM peak and 205 vehicles in the PM peak hour. This equates to an increase of less than four vehicles per minute or one vehicle every 17 seconds in the AM peak and every 18 seconds in the PM peak. The magnitude of change is therefore considered to be low.
- 14.10.29 One of the major contributors to the increase in flows on Astley Road is the reassignment of background traffic to/from the A47 by routeing through the Proposed Development to the southern access roundabout. In order to minimise this movement and the magnitude of change, traffic management measures in the form of pinchpoints will be implemented within the Site near to the Astley Road junction. In addition, it is proposed that the junction will have a speed table to keep speeds low and provide a safer environment for all users.

Driver delay

- 14.10.30 An assessment has been undertaken of the capacity of the link based on national guidance which is reported in Section 6.5 of the TA. This found that there is capacity both on the road and at the access junction, with the addition of the development traffic. Therefore the magnitude of change is considered to be low.

Pedestrian delay and amenity

- 14.10.31 Pedestrian amenity can be affected by increases in traffic and higher traffic speeds. The access proposal includes a speed table to help reduce traffic speeds. The modelling indicates high increases to flows on the northern section of Astley Road, however, the assessment of road capacity as reported in the TA found that the addition of the development traffic can be accommodated. There is good existing pedestrian provision along Astley Road and therefore the magnitude of change is considered to be low.

Fear and intimidation

- 14.10.32 The assessment of the pedestrian amenity environmental effect above is also applicable here. The magnitude of change is considered to be low.

Accident and safety

- 14.10.33 The Study Area does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The magnitude of change is considered to be negligible.

High Street Wood Street (link 28 and link 29)

- 14.10.34 With traffic flow increases of 25.4% and 15.5% on link 28 in the AM and PM peak respectively, and 20.2% on the link 29 in AM peak, the GEART¹³ threshold (Rule 2, 10%) is exceeded. For the purpose of the assessment, the links have been combined as one as they have similar characteristics. The percentage increase in traffic should be treated with caution given the low volume of existing baseline traffic (without development) as this method of comparison gives results in a disproportionate change.

Severance

- 14.10.35 The increase in traffic flows is up to 134 vehicles in the AM peak and 94 vehicles in the PM peak hour (both on link 28) which equates to an average of just over two per minute in the AM (or one every 27 seconds) and less than two vehicles per minute in the PM peak hour (or one every 38 seconds) which will not impact on severance. The magnitude of change is therefore considered to be low.

Driver delay

- 14.10.36 An assessment has been undertaken of the capacity of the link based on national guidance which is reported in Section 6.5 of the TA. This found that there is capacity on the road with the addition of the development traffic. The magnitude of change is therefore considered to be low.

Pedestrian delay and amenity

- 14.10.37 Link 28 and Link 29 have ample footways, guardrails, pedestrian crossing facilities and cycle markings. There are several traffic calming measures present such as build-outs, raised tables and 20 mph speed limit on Wood Street. All these factors provide a benefit to the pedestrian environment.
- 14.10.38 The increase in traffic as a result of the Proposed Development is unlikely to affect amenity of users of the route. The magnitude of change is therefore considered to be low.

Fear and intimidation

- 14.10.39 The assessment of the pedestrian amenity mentioned is also applicable here. The magnitude of change is considered to be low.

Accident and safety

- 14.10.40 The Study Area does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The level of effect is considered..

Summary of assessment of Traffic and Transport effects

- 14.10.41 A summary of the assessment is presented in **Table 14.18**.

Table 14.18 Summary of significance of adverse effects

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
A47 Clickers Way (link 8 and link 9)				
Severance: The separation of people from places and other people.	Low	Low	Not Significant	Severance will not occur, as the sensitivity of the receptor and the magnitude of change both are low.
Driver delay: Traffic delays as a result of development traffic.	Low	Low	Not Significant	A slight driver delay can be expected on the A47 as a result of the proposed access points to the Site, however assessment of the capacity of the proposed junction and traffic flows indicate that there will be no queuing or capacity issues.
Pedestrian delay and amenity: The ability to people to cross roads and the effect on the relative pleasantness of a pedestrian journey.	Low	Negligible	Not Significant	The road has a shared use pedestrian/cycleway on the western side which is of adequate design to cater for pedestrian and cycle usage. The increase in traffic as a result of the Proposed Development is unlikely to affect amenity of users of the route. The magnitude of change and sensitivity of receptor is considered to be negligible.
Fear and intimidation: The levels experienced by pedestrians and cyclists, its proximity to people or the lack of protection caused by such factors as narrow pavement widths.	Low	Negligible	Not Significant	The assessment of the pedestrian amenity environmental effect mentioned above is also applicable here.
Accident and safety: The risk of accidents occurring where development is expected to produce a change in the character of traffic.	Low	Negligible	Not Significant	No accident hot spot identified on this link. There is nothing related to the Proposed Development which will cause a safety issue.
Mill Lane (link 22)				
Severance: The separation of people from places and other people.	Medium	Low	Not Significant	Due to the low background traffic percentage increase is very high and it is disproportionate. The proposed improvement schemes will provide a safer highways environment for all users. The level of effects is considered negligible overall and not significant.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Driver delay: Traffic delays as a result of development traffic.	Medium	Low	Not Significant	The proposed improvement schemes will provide better traffic route and traffic calming measures will reduce through background traffic. Overall, it will improve the journey time for local traffic. The level of effects is considered negligible overall and not significant.
Pedestrian delay and amenity: The ability to people to cross roads and the effect on the relative pleasantness of a pedestrian journey.	Medium	Negligible	Not Significant	A package of traffic calming measures and footway is proposed to both reduce vehicular speeds and improve the walking and cycling connectivity/environment which will provide a benefit to the pedestrian environment. The level of effects is considered negligible overall and not significant.
Fear and intimidation: The levels experienced by pedestrians and cyclists, its proximity to people or the lack of protection caused by such factors as narrow pavement widths.	Medium	Negligible	Not Significant	The assessment of the pedestrian amenity environmental effect mentioned above is also applicable here.
Accident and safety: The risk of accidents occurring where development is expected to produce a change in the character of traffic.	Medium	Low	Not Significant	This link does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The magnitude of change is considered to be low and therefore not significant.
Alexander Avenue (link 23 and link 24)				
Severance: The separation of people from places and other people.	Medium	Low	Not Significant	Due to the low background traffic, percentage increase is very high and it is disproportionate. The level of effects is considered negligible overall and therefore not significant.
Driver delay: Traffic delays as a result of development traffic.	Medium	Low	Not Significant	Negligible increases in queuing or congestion on this highway link is anticipated as the link assessment demonstrates that this road has sufficient capacity to accommodate the future base and development traffic. The magnitude of change is considered low overall and not significant.
Pedestrian delay and amenity: The ability to people to cross roads and the	Medium	Negligible	Not Significant	The traffic calming measures at Alexander Avenue/Astley Road junction is proposed to both reduce vehicular speeds and improve

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
effect on the relative pleasantness of a pedestrian journey.				the walking and cycling connectivity/environment which will provide a benefit to the pedestrian environment. The level of effect is considered negligible and not significant.
Fear and intimidation: The levels experienced by pedestrians and cyclists, its proximity to people or the lack of protection caused by such factors as narrow pavement widths.	Medium	Negligible	Not Significant	The assessment of the pedestrian amenity environmental effect mentioned above is also applicable here.
Accident and safety: The risk of accidents occurring where development is expected to produce a change in the character of traffic.	Medium	Negligible	Not Significant	This link does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The level of effect is considered negligible and not significant.
Astley Road (link 25 and link 26)				
Severance: The separation of people from places and other people.	Medium	Low	Not Significant	The increase in traffic flows on the northern section equates less than four vehicles per minute or one vehicle every 17 seconds in the AM peak and every 18 seconds in the PM peak. The level of effect is minor and insignificant.
Driver delay: Traffic delays as a result of development traffic.	Medium	Low	Not Significant	Low increases in queuing or congestion on this highway link is anticipated based on the capacity assessment of the proposed access and link assessments. The level of effects is considered minor overall and not significant.
Pedestrian delay and amenity: The ability to people to cross roads and the effect on the relative pleasantness of a pedestrian journey.	Medium	Low	Not Significant	The access proposal includes a speed table to help reduce traffic speeds and there is good existing pedestrian provision along Astley Road. The level of effect is considered minor and not significant.
Fear and intimidation: The levels experienced by pedestrians and cyclists, its proximity to people or the lack of protection caused by such factors as narrow pavement widths.	Medium	Low	Not Significant	The assessment of the pedestrian amenity environmental effect mentioned above is also applicable here.

Receptor and summary of predicted effects	Sensitivity of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Accident and safety: The risk of accidents occurring where development is expected to produce a change in the character of traffic.	Medium	Negligible	Not Significant	This link does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The level of effect is considered negligible and not significant.
High Street/Wood Street (link 28 and link 29)				
Severance: The separation of people from places and other people .	Medium	Low	Not Significant	Due to the low background traffic, percentage traffic increase is very high and it's disproportionate. However, the increase in traffic is minor. The level of effects is considered minor overall and not significant.
Driver delay: Traffic delays as a result of development traffic	Medium	Low	Not Significant	An assessment found that there is capacity on the road with the addition of the development traffic. The level of effects is considered minor overall and therefore not significant.
Pedestrian delay and amenity: The ability to people to cross roads and the effect on the relative pleasantness of a pedestrian journey.	Medium	Low	Not Significant	These links have ample footways, guardrails, pedestrian crossing facilities and cycle markings. There are several traffic calming measures too such as build-outs, raised tables and 20 mph speed limit on Wood Street. All these factors provide a benefit to the pedestrian environment. The level of effects is considered minor overall and not significant.
Fear and intimidation: The levels experienced by pedestrians and cyclists, its proximity to people or the lack of protection caused by such factors as narrow pavement widths.	Medium	Low	Not Significant	The assessment of the pedestrian amenity environmental effect mentioned above is also applicable here.
Accident and safety: The risk of accidents occurring where development is expected to produce a change in the character of traffic.	Medium	Negligible	Not Significant	This link does not exhibit severe accident hot spots which need to be targeted with specific casualty reduction measures. The level of effect is considered negligible and not significant.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 14.9** and is defined as negligible, low, medium, and high
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 14.9** and is defined as negligible, low, medium, high.

3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 14.9**.

14.11 Assessment of cumulative effects

- 14.11.1 Common residential receptors are shared with **Chapter 11: Noise and Vibration** and **Chapter 6: Air Quality**. As detailed in this chapter, Traffic and Transport effects as a result of the Proposed Development are predicted to be not significant. Therefore, potential in-combination effects on the same receptors are considered to be not significant.

14.12 Consideration of optional additional mitigation or compensation

- 14.12.1 No additional mitigation measures are proposed to further reduce the Traffic and Transport effects that are identified in this chapter. This is because all relevant and implementable measures have been embedded into the development proposals and are assessed above. These measures are considered to be likely to be effective and deliverable and address the likely significant effects.

14.13 Conclusions of significance evaluation

- 14.13.1 As summarised in **Table 14.18**, it is assessed that operational traffic associated with the Proposed Development would result in no significant effects in terms of severance, driver delay, pedestrian delay and amenity, fear and intimidation, and accidents and safety.

14.14 Implementation of environmental measures

- 14.14.1 **Table 14.19** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented, i.e. they will have been secured through the planning conditions or Section 106/Section 278 agreements.

Table 14.19 Summary of environmental measures to be implemented – relating to Traffic and Transport

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Astley Road improvements	LCC or developer	S278 agreement	Section 14.10
Mill Lane improvements	LCC or developer	S278 agreement	Section 14.10
Travel Plan	Developer	S106 Agreement	Section 14.8
Pedestrian connectivity within the Proposed Development and external to the Site	Developer	Planning conditions, S278 and Reserved Matters	Section 14.8
Bus service provision	Developer	S106 Agreement	Section 14.8

15. Water Environment (surface water, groundwater and flood risk)

15.1 Introduction

- 15.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to the Water Environment (surface water, groundwater and flood risk). The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development** and with respect to relevant parts of other chapters including **Chapter 7: Biodiversity**, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects.

15.2 Limitations of this assessment

- 15.2.1 There are no limitations relating to the Water Environment chapter that affect the robustness of the assessment of the likely significant effects of the Proposed Development.

15.3 Relevant legislation, planning policy, technical guidance

Legislative context

- 15.3.1 The following legislation is relevant to the assessment of the effects on water receptors:
- *The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017 Statutory Instrument (SI) 2017 No. 407)*¹: focuses on delivering an integrated approach to the protection and sustainable use of the water environment on a river basin scale.
 - *Environmental Permitting (England and Wales) Regulations 2016 (Statutory Instrument (SI) 2016 No. 1154)*, as amended²: of relevance to surface water and drainage design due to any possible infiltration to ground. The regulations include requirements for the prevention of hazardous substances entering groundwater and the control of non-hazardous pollutants to avoid pollution of groundwater.
 - *The Water Resources Act 1991*³: states that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters. The Act was revised by *the Water Act 2003*⁴, which sets out regulatory controls for water abstraction, discharge to water bodies, water impoundment and protection of water resources.

¹ UK Government (2017) Water Resources, England and Wales, The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (2017), (online). Available at: https://www.legislation.gov.uk/ukxi/2017/407/pdfs/ukxi_20170407_en.pdf (Accessed 14 September 2021).

² UK Government (2016) The Environmental Permitting (England and Wales) Regulations 2016 together with subsequent amendments, (online). Available at: https://www.legislation.gov.uk/ukxi/2016/1154/pdfs/ukxi_20161154_en.pdf (Accessed 14 September 2021).

³ UK Government (1991) Water Resources Act 1991, (online). Available at: <https://www.legislation.gov.uk/ukpga/1991/57/contents> (Accessed 04 March 2021).

⁴ UK Government (2003) Water Act 2003, (online). Available at: <https://www.legislation.gov.uk/ukpga/2003/37/contents> (Accessed 14 September 2021).

- *The Land Drainage Act 1991 (as amended)*⁵: places responsibility for maintaining flows in watercourses on landowners and gives Local Authorities powers to serve a notice on landowners to ensure works are carried out to maintain flow of watercourses.
- In December 2009, *the Flood Risk Regulations* were published, which transpose the EU Floods Directive into UK law.
- *The Flood Risk Regulations 2009*⁶: transposes the EU Floods Directive into UK law.
- *The Flood and Water Management Act 2010*⁷: sets out the Government's proposals to improve flood risk management (building on the 2009 regulations), and also covers approaches to water quality and to ensure water supplies are more secure. The act also provided for the formation of Lead Local Flood Authorities (LLFAs) and aims to create a simpler and more effective means of managing the risk of flood and coastal erosion.
- *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)*⁸: outlines the Environmental Impact Assessment (EIA) process (hereafter referred to as the "EIA Regulations").

Planning policy context

15.3.2 A summary of the relevant planning policies is given in **Table 15.1**.

Table 15.1 Planning policy issues relevant to the Water Environment

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) ⁹	Paragraphs 159-169 provide guidance on the requirements for assessing flood risk from all sources, and for the siting of development to avoid flood risk. Companion technical guidance on design to ensure the development is safe from flooding and the management of surface water from a new development ensures that flood risk is not increased to people elsewhere.	Appendix 15A
Development plan policies		
Earl Shilton and Barwell Area Action Plan (2014) ¹⁰	The document covers the requirements for bringing forward a planning application for a Sustainable Urban Extension (SUE) to the east of Earl Shilton. It notes that a Flood Risk Assessment will be required, and that flood risk associated with the small watercourse on Site	Appendix 15A

⁵ UK Government (1994) Land Drainage Act 1994, (online). Available at: <https://www.legislation.gov.uk/ukpga/1994/25/contents> (Accessed 14 September 2021).

⁶ UK Government (2009) The Flood Risk Regulations (2009), (online). Available at: <http://www.legislation.gov.uk/uksi/2009/3042/contents/made> (Accessed 14 September 2021).

⁷ UK Government (2010) The Flood and Water Management Act 2010, (online). Available at: <https://www.legislation.gov.uk/ukpga/2010/29/contents> (Accessed 14 September 2021).

⁸ UK Government (2017) The Town and Country Planning (Environment Impact Assessment) Regulations 2017, (online). Available at: http://www.legislation.gov.uk/uksi/2017/571/pdfs/uksi_20170571_en.pdf (Accessed 14 September 2021)

⁹ Ministry of Housing, Communities and Local Government (2021). National Planning Policy Framework, (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf (Accessed 14 September 2021).

¹⁰ Hinckley and Bosworth Borough Council (2014). Earl Shilton and Barwell Area Action plan. (online). Available at: <https://www.hinckley-bosworth.gov.uk/downloads/file/4332/earl-shilton-and-barwell-area-action-plan-adopted> (Accessed 14 September 2021).

Policy reference	Policy issue	Considered in Section
	(The Earl Shilton Brook) and surface water flood risk will need to be appraised. Requirements for Sustainable Drainage Systems (SuDS) and ensuring flood risk downstream is not increased by runoff from the development is also noted.	
Hinckley and Bosworth Borough Council (HBBC) Local Plan 2006-2026 Site Allocations and Development Management Policies DPD (2016)¹¹	Policy DM7 covers the contamination of water through ensuring that schemes conform to and seek to contribute to the objectives of the Water Framework Directive (WFD). It also states that development must not create or exacerbate flooding by locating it in areas of flood risk unless the risk is adequately mitigated in line with national policy. Policy DM10 states that all development requires a sustainable drainage scheme which should incorporate wildlife areas, ponds, swales and permeable paving where appropriate.	Section 15.8 and Appendix 15A

Technical guidance

15.3.3 A summary of technical guidance relevant to the Water Environment (surface water, groundwater and flood risk) assessment is given in **Table 15.2**.

Table 15.2 Technical guidance relevant to surface water, groundwater and flood risk

Technical guidance	Relevance to this assessment
CIRIA (2001) C532: Control of water pollution from construction sites¹²	The guidance provides practical help for consultants and contractors on how to plan and manage construction projects to control water pollution.
CIRIA (2004) C624: Development and flood risk - guidance for the construction industry¹³	The document provides guidance on good practice in the assessment and management of flood risk as part of the development process.
CIRIA (2006) C635: Designing for exceedance in urban drainage - good practice¹⁴	The guidance provides good practice advice to drainage engineers, regulators, planners and the construction industry on the design and management of urban sewerage and drainage systems to reduce the impacts from drainage exceedance.

¹¹ Hinckley and Bosworth Borough Council (2016). Local Plan 2006-2026, Site Allocations and Development Management Policies DPD. (online). Available at: https://www.hinckley-bosworth.gov.uk/info/856/local_development_framework/426/site_allocations_and_generic_development_control_policies-development_plan_document (Accessed 14 September 2021).

¹² CIRIA (2001). C532: Control of water pollution from construction sites, (online). Available at: <http://www.ciria.org/ProductExcerpts/C532.aspx> (Accessed 14 September 2021).

¹³ CIRIA (2004). C624: Development and flood risk – guidance for the construction industry, (online). Available at: <https://www.ciria.org/ItemDetail?iProductCode=C624> (Accessed 14 September 2021).

¹⁴ CIRIA (2006). C635: Designing for exceedance in urban drainage - good practice, (online). Available at: https://www.ciria.org/Resources/Free_publications/Designing_exceedance_drainage.aspx (Accessed 04/03/21).

Technical guidance	Relevance to this assessment
CIRIA (2015a) C741: Environmental good practice on site¹⁵	The guide is intended to be a reference and training aid which provides practical advice about managing construction on site to minimise environmental impacts.
CIRIA (2015b) C753: The SuDS Manual¹⁶	The manual covers the planning, design, construction and maintenance of SuDS to assist with their effective implementation within both new and existing developments. Guidance is given on how to maximise amenity and biodiversity benefits while delivering the key objectives of managing flood risk and water quality.
Defra (2015) Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems¹⁷	The document sets out non-statutory technical standards for sustainable drainage systems. It is intended to be used in conjunction with the NPPF and NPPG.
(Ofwat, 2020) Ofwat's Code for Adoption Agreements - for water and sewerage companies operating wholly or mainly in England¹⁸	This guidance supersedes 'Sewers for Adoption' and is intended for use by developers when planning, designing and constructing conventional foul and surface water gravity sewers and lateral drains for developments. This code details the agreement process and standards for the drainage assets that developers may wish to be adopted by the appointed water or sewerage company once constructed.

15.4 Data gathering methodology

Study area

- 15.4.1 The Study Area used to scope the assessment in relation to potential effects on the water environment (surface water, groundwater and flood risk) has been based on the hydrological catchment on the Site. The assessment follows a source-pathway-receptor approach and therefore the Study Area includes the relevant water environment sources, pathways and receptors. The Study Area is shown on **Figure 15.1** and has been based on the catchment of the watercourse which flows through the Site – the Earl Shilton Brook – and is defined by the catchment's topographic boundary (watershed) which defines the entire upslope area draining onto the Site. As this chapter is assessing the effects both to the Site and to other off-site receptors, the Study Area extends beyond the Site downstream of the A47.

Desk study

- 15.4.2 A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 15.3**.

¹⁵ CIRIA (2015a). C741: Environmental good practice on site, (online). Available at: <https://www.ciria.org/ItemDetail?iProductCode=C741D> (Accessed 14 September 2021).

¹⁶ CIRIA (2015b). C753: The SuDS Manual, (online). Available at: https://www.ciria.org/Resources/Free_publications/SuDS_manual_C753.aspx (Accessed 14 September 2021).

¹⁷ Defra (2015). Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems, (online). Available at: <https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards> (Accessed 14 September 2021).

¹⁸ Ofwat, 2020. Code for adoption agreements for water and sewerage companies operating wholly or mainly in England. Ofwat, March 2020. Available online at: <https://www.ofwat.gov.uk/wp-content/uploads/2018/08/March-2020-Code-for-adoption-agreements-for-water-and-sewerage-companies-operating-wholly-or-mainly-in-England.pdf> (Accessed 17 September 2021)

Table 15.3 Requested data

Organisation	Data requested	Date received
Environment Agency (EA)	Surface water quality monitoring data within 1.5 kilometre (km) of the Site.	Received 10 September 2020.
EA	Details of all licensed surface water and groundwater abstractions for within 1.5 km of the Site.	Received 10 September 2020.
Leicestershire County Council	Records of 'local' sources of flooding affecting land, property and infrastructure around the Site, and SuDS requirements.	Received 4 September 2020.
HBBC	Records of all private water supplies within 1.5km of the Site.	Received 28 August 2020.
Blaby District Council	Records of all private water supplies within 1.5km of the Site	Received 19 August 2020.

15.4.3 Data has also been obtained from the following online sources:

- Bing Maps¹⁹;
- British Geological Survey (BGS) Geology of Britain Viewer²⁰;
- Cranfield University, Soilsclapes map²¹;
- EA River Basin Management Plan (2016 cycle 2). EA Catchment Data Explorer²²;
- EA. Flood map for planning²³;
- EA. Long term flood risk assessment for locations in England²⁴ ;
- EA Spatial Data Catalogue²⁵.

15.4.4 A site walkover was undertaken by a Wood hydrologist on 10 March 2012 to gather a conceptual understanding of the Site hydrology. Photographs from the site walkover can be found in the Flood Risk Assessment (FRA) (see **Appendix 15A**). From discussions with the project team and from the findings of the Historic Environment site visit in March 2021 (discussion, and review of photography, Site photographs included in **Appendix 9B**), it is understood that little change has

¹⁹ Bing Maps (2021) (online). Available at: <https://www.bing.com/maps> (Accessed 14 September 2021);

²⁰ British Geological Survey (no date) Geology of Britain Viewer, (online). Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> (Accessed 14 September 2021);

²¹ Cranfield University (2021), Soilsclapes map (online). Available at: <http://www.landis.org.uk/soilsclapes/> (Accessed 14 September 2021)

²² Environment Agency (2021a) River Basin Management Plan (2016 cycle 2). Environment Agency Catchment Data Explorer, (online). Available at <http://environment.data.gov.uk/catchment-planning/> (Accessed 14 September 2021);

²³ Environment Agency(2021b). Flood map for planning (online). Available at: <https://flood-map-for-planning.service.gov.uk/> (Accessed 14 September 2021);

²⁴ Environment Agency (2021c). Long term flood risk assessment for locations in England, (online). Available at: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/> (Accessed 14 September 2021);

²⁵ Environment Agency (2021d). Spatial Data Catalogue (online). Available at: <http://environment.data.gov.uk/ds/catalogue/#/catalogue> (Accessed 14 September 2021)

occurred at the Site with respect to the water environment since the original hydrology walkover in 2012, and the walkover findings are considered suitable to inform the assessment.

15.5 Overall baseline

Current baseline

- 15.5.1 An outline description of the land uses currently at the Proposed Development Site is provided in **Chapter 3: Description of the Proposed Development**. Existing hydrological features are shown on **Figure 15.1** comprising: the Earl Shilton Brook and downstream Thurlaston Brook, Waste Water Treatment Works (WwTW) effluent/CSO discharge point, and the existing raised deck bridge across the Earl Shilton Brook watercourse and a farm access track.

Topography

- 15.5.2 Broadly the Site consists of more elevated areas to the north, west and south (ground elevation of approximately 105 meters (m) Above Ordnance Datum (AOD)), with a central valley sloping towards the Earl Shilton Brook situated at around 95mAOD. This valley slopes eastwards under the A47 bypass which borders the Site to the south and east. The existing developed areas of Earl Shilton are situated to the west and north of the Site at ground elevations between 105mAOD and 110mAOD. The north-eastern area of the Site, between Mill Lane and Thurlaston Lane, generally slopes northwards towards the Thurlaston Brook.

Hydrology

- 15.5.3 The majority of the Site drains to the Earl Shilton Brook, which is a tributary of the Thurlaston Brook, while the remaining area north of Mill Lane drains to the upper Thurlaston Brook (see **Figure 15.1**). The Earl Shilton Brook starts as water issuing from a pipe in the centre of the Site and runs from west to east, conveying a combination of piped spring water and surface water drainage from Earl Shilton. The point of issue is situated at a ground level of 93mAOD. Several other surface water drains discharge into the headwaters of the watercourse. Adjacent to the WwTW, two adjacent outlet pipes discharge treated effluent and (untreated) storm overflow from the treatment works. On the day of the site visit (10 March 2012) the treated effluent discharge appeared to be contributing around 75% of the total flow in the stream. Land levels adjacent to the watercourse drop to approximately 86mAOD at the A47 on the Site's eastern boundary. The watercourse then passes through a rectangular concrete channel set in a wide, tall underpass (which also provides for a farm access track) to pass beneath the raised A47 road. At the A47 flow was approximately 0.25m³/s on the day of the site visit. To the point where the watercourse passes under the A47, the Earl Shilton Brook has a topographic catchment of 1.68km². Beyond the Site, the Brook flows for approximately 1.3km through open farmland, dropping to around 77mAOD before being culverted again beneath the M69.
- 15.5.4 There are very few ditches along field boundaries/in hedgerows within the Site, although a small number of short sections of ditch are present in the south of the Site conveying flows to the Earl Shilton Brook. In addition, two small ponds are located within the Site, one of which has in the past supported Great Crested Newts, although these were absent in the most recent survey (see Chapter 7: Biodiversity).

Flood Risk

- 15.5.1 The Environment Agency's flood maps indicate that entire Site is located within Flood Zone 1 - i.e. less than a 0.1% risk of flooding from fluvial sources in a given year (see **Figure 15.2**). However, the

absence of a flood outline for the Earl Shilton Brook on the EA Flood Map does not necessarily indicate an absence of flood risk, as the minimum catchment size for which flood outlines are shown is 3 km². An FRA has been carried out for the Proposed Development (see **Appendix 15A**).

- 15.5.2 The EA's online flood map shows no higher risk flood zones along the Earl Shilton Brook, as the catchment is too small to have been included in the national scale modelling. Wood has undertaken hydraulic modelling of the Earl Shilton Brook in order to provide an accurate assessment for the flood risk to the Site. Full details are provided within **Appendix 15A** and the modelled flood extents can be seen in **Figure 15.3**. This modelling shows that in reality, a narrow corridor of Flood Zone 3 and 2 extends along the Earl Shilton Brook.
- 15.5.3 EA surface water flood risk mapping (see **Figure 15.4**) shows that the majority of the Site is at 'Very Low' risk (less than 0.1% Annual Exceedance Probability (AEP)) of surface water flooding. However, there is a notable surface water flowpath which flows across the centre of the Site from west to east, along the corridor of the Earl Shilton Brook. This flowpath originates in Earl Shilton to the west and is shown to affect a number of existing off-site properties before flowing onto the Site from Meadow Court Road. It is predominantly 'Medium' risk (1% to 3.3% AEP) with patches of 'High' risk (greater than 3.3% AEP) in the west, becoming predominantly 'High' risk in the east of the Site adjacent to the WwTW. The flowpath continues off-site along the path of the Earl Shilton Brook. In addition, there is a small 'High' risk surface water flowpath which flows onto the Site from the north and flows southwards towards the Earl Shilton Brook. Parallel to this but originating within the Site is a 'Medium' risk flowpath.
- 15.5.4 In terms of flood risk from other sources - i.e. groundwater, surface water run-off, surface water run-on, and risks from artificial sources - the FRA (see **Appendix 15A**) has identified no significant issues. There are no artificial structures near the Site that could cause flooding of the Site (i.e. embankment water bodies, flood defences etc.). Groundwater flood risk is not considered an issue in the area.
- 15.5.5 Table 5.1 in the Hinckley and Bosworth Strategic Flood Risk Assessment (SFRA),²⁶ details HBBC's assessment of flood risk at the Site (termed "Area 6"). The SFRA identifies low risks from fluvial, groundwater and surface water flooding at the Site. The key issue identified is the need to provide sufficient drainage to support any development, and to ensure run-off from any development is attenuated to prevent increasing downstream flood risk. The table notes that infiltration methods are unlikely to be viable due to the impermeable mudstone geology.

Hydromorphology (relevant to Aquatic Environment receptor type)

- 15.5.6 A Site walkover was undertaken to inform the FRA and this chapter. Appendix D of the FRA (**Appendix 15A**) contains various images taken on Site and along the length of the Earl Shilton Brook. On Site, the Earl Shilton Brook is an artificially straightened re-sectioned ditch with limited natural hydromorphological features. Farmland extends right up to the watercourse banks, and a notable amount of sewer 'rag' material was present in the channel where various surface water drains discharge to the watercourse – all of which are located above the WwTW treated effluent discharge point.

²⁶ Hinckley and Bosworth Borough Council (2019). Strategic Flood Risk Assessment (online). Available at: https://www.hinckley-bosworth.gov.uk/downloads/download/1641/strategic_flood_risk_assessment_sfra_2019 (Accessed 14 September 2021).

Water Framework Directive

- 15.5.7 The Site is entirely located within the WFD waterbody - Thurlaston Brook Catchment (Tributary of Soar) ID GB104028046940. A summary of the WFD status is provided in **Table 15.4**, with the data provided by the EA's Catchment Data Explorer website²⁷.

Table 15.4 Summary of WFD water body and associated status definitions (EA (Cycle 2), 2019)

WFD water body	Thurlaston Brook Catchment (Tributary of Soar)
Water Body Identifier	GB104028046940
Hydromorphological designation	Not designated artificial or heavily modified
Overall current (2019 Cycle 2) status	Poor
Objectives	Good by 2027

- 15.5.8 The current Poor status of the waterbody relates to ecological quality elements, with Macrophytes and Phytobenthos Combined and Phosphate being classed as Poor. Invertebrates however are classed as Moderate and Fish are classed as High. Physico-chemical supporting elements is classed as Moderate, with dissolved oxygen being Moderate and Phosphate being Poor. In 2019 (the latest year for which data has been published) the catchment was rated as Moderate for physico-chemical quality elements, primarily due to Poor phosphate concentrations, High for pH, but it was rated as Fail for chemical elements overall. This was due to a Failure of polybrominated diphenyl ethers (PBDE) and Perfluorooctane sulfonate (PFOS) concentrations and Mercury and its compounds. For all other factors, the scores are classed as Good, High or Supports Good. The waterbody has an objective of achieving overall Good status by 2027. The reasons for not achieving Good status for this WFD unit²⁸ are provided in **Table 15.5**.

Table 15.5 Reasons for not achieving good status for Thurlaston Brook Catchment (Tributary of Soar)

SWMI (Significant Water Management Issue)	Activity	Category	Classification element
Diffuse source	Poor Livestock Management	Agriculture and rural land management	Macrophytes and Phytobenthos Combined
Point source	Sewage discharge (continuous)	Water Industry	Macrophytes and Phytobenthos Combined
Diffuse source	Poor Livestock Management	Agriculture and rural land management	Invertebrates
Point source	Sewage discharge (continuous)	Water Industry	Invertebrates
Point source	Sewage discharge (intermittent)	Water Industry	Invertebrates
Point source	Sewage discharge (continuous)	Water Industry	Phosphate

²⁷ Environment Agency (2021a) River Basin Management Plan (2016 cycle 2). Environment Agency Catchment Data Explorer, (online). Available at <https://environment.data.gov.uk/catchment-planning/WaterBody/GB104028046940> (Accessed 14 September 2021).

²⁸ See table of RNAG on the WFD water body status reporting page: Environment Agency (2021). Thurlaston Brook Catchment (trib of Soar) Water Body. (Online) Available at: <https://environment.data.gov.uk/catchment-planning/WaterBody/GB104028046940> (Accessed 13 December 2021)

SWMI (Significant Water Management Issue)	Activity	Category	Classification element
Diffuse source	Poor Livestock Management	Agriculture and rural land management	Phosphate

- 15.5.9 As noted in **Table 15.5**, the reasons for not achieving Good status are due to sewage discharges or poor livestock management. At the point where the watercourse issues on Site, sewer rag debris and a grey tinge/smell to the water was present on the day of the site visit (10 March 2012), suggesting that there were sewer misconnections draining to the surface water drainage network. This would have a further impact on the water quality of the watercourse.
- 15.5.10 The Proposed Development has minimal influence on the Poor conditions associated with livestock management (and may slightly reduce this effect by removing cattle grazing land from the catchment). Issues associated with sewer discharges are typically dealt with via the relevant water company investment program, with the EA and OfWat facilitating the continued investment in improving discharge to the water environment in a targeted fashion. The recent (2019 completion) investment²⁹ in the adjacent WwTW by Severn Trent Water Limited being an example of this. Improvements have been delivered to significantly improve treatment processes to significantly reduce the residual concentrations of phosphorous and ammonia in the final effluent discharged to the on-site watercourse. These improvements are required by the *WFD* and the *Fisheries Directive* respectively, the upgrade also allows for a 15% increase in the domestic population within the settlement of Earl Shilton, which forms the main contributing area to the WwTW that is expected to occur as Earl Shilton expands in the future.

Pollution Incidents (relevant to Aquatic Environment receptor type)

- 15.5.11 The EA website details no pollution recorded events on the Thurlaston Brook near the Site³⁰. No data is held for the Earl Shilton Brook.

Geology, Soils and Hydrogeology

- 15.5.12 BGS³¹ mapping shows the bedrock at the Site to be Edwalton Mudstone, made up of interbedded Mudstone, Siltstone and Sandstone. The superficial geology is made up of Diamicton (glacial tills) in the more elevated parts of the Site in the north and south, whilst the central lowest lying areas of the Site are not covered by superficial deposits, with the exception of the Earl Shilton Brook valley bottom. Alluvial clays, silts, sands and gravels are present in a narrow corridor along the Earl Shilton Brook. In the very southern parts of the Site, quaternary sands and gravels of the Wigston Member are present. A small area in the far north of the Site also has no superficial deposits.
- 15.5.13 The Soils³² database indicates that the soils present on the more elevated parts of the Site to the north and south are "*Freely draining slightly acid loamy soils*", whilst in the central lower lying areas, the soils are "*Slightly acid loamy and clayey soils with impeded drainage*".

²⁹ See: Water Projects (2019). Earl Shilton STW. (online) Available at: https://waterprojectsonline.com/custom_case_study/earl-shilton-stw/ (Accessed 14 September 2021)

³⁰ Environment Agency (2020) Environmental Pollution Incidents (Category 1 and 2) (online). Available at <https://data.gov.uk/dataset/c8625e18-c329-4032-b4c7-444b33af6780/environmental-pollution-incidents-category-1-and-2> (Accessed 14 September 2021)

³¹ British Geological Survey (2021). Geology of Britain Viewer, (online). Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> (Accessed 14 September 2021).

³² Cranfield University (2021), Soils³² map, (online). Available at: <http://www.landis.org.uk/soils/soils/> (Accessed 14 September 2021)

- 15.5.14 Defra MAGIC mapping³³ website indicates that the Site does not overlie and is not adjacent to a Groundwater Source Protection Zone (SPZ)³⁴. The bedrock beneath the Site is classified as a 'Secondary B' aquifer, the EA defines this as:

"predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers."

- 15.5.15 Small areas of the superficial deposits across the Site are classified as 'Secondary A' aquifer where alluvium is present, and in the very southern section of the Site where the Wigston Member is present. Secondary A aquifers are defined as:

"permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers."

- 15.5.16 In terms of groundwater vulnerability, areas in the far north and far south of the Site are classified by the Environment Agency as "Minor aquifer high"; based on the superficial geology description, these appear to be associated with the small areas of glacial sands/gravels present on the more elevated areas.

Climate

- 15.5.17 Mean rainfall for the region is typically around 620 millimetres (mm) (CEH, 2020)³⁵ with this rainfall being relatively evenly distributed throughout the year. Between autumn and spring, rainfall tends to derive from Atlantic depressions, with more marked contributions from convective rainfall occurring in summer. Mean temperatures are around 8 to 10°C with mean summer maximum temperatures of 22°C, and mean winter lows of around 0°C. Typically the Soil Moisture Deficit peaks in late summer/early autumn, due to levels of evapotranspiration exceeding rainfall. The National River Flow Archive³⁶ records indicate that, for the River Soar at Littlethorpe (to which the Site drains), mean river flows are highest during the wetter late autumn/winter/spring months of the year, with the lowest flows occurring in August/September. However, flood events may occur at any time of the year.

Abstractions and Discharges (relevant to Water Resources receptor type)

- 15.5.18 The EA has confirmed that there are no abstraction licences for potable water within a 1km radius of the Site. HBBC and Blaby district Council additionally confirmed that there are no unlicensed abstractions (private water supplies) within a 1.5km radius of the Site.
- 15.5.19 There is one discharge permit within the Study Area which is related to the Earl Shilton WwTW. The WwTWs is permitted to discharge into the Earl Shilton Brook within the Site boundary at grid reference SP 447607 297354.

Land Use and Existing Impermeable Areas

- 15.5.20 A large proportion of the Site is currently agricultural fields used for arable crops, with some areas occupied by grassland. There are areas used for recreation (grass football pitches and playground)

³³ Defra (2021). Multi-Agency Geographic Information for the Countryside mapping, (online). Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed 14 September 2021).

³⁴ Areas designated by the Environment Agency in order to protect aquifers important for public water supply

³⁵ Centre for Ecology and Hydrology (2020), Flood Estimation Handbook Web Service. Available at: <https://fehweb.ceh.ac.uk/> (Accessed 14 September 2021)

³⁶ National River Flow Archive (2021), 28082 – Soar at Littlethorpe (online). Available at: <https://nrfa.ceh.ac.uk/data/station/info/28082> (Accessed 14 September 2021)

in the north-west of the Site. Hedgerows separate the majority of fields. There are no notable existing impermeable areas on the Site.

Nature Conservation Designations

- 15.5.21 There are no statutory designated nature conservation sites (i.e. Special Area of Conservation, Site of Special Scientific Interest (SSSI) or Ramsar) within or immediately adjacent to the Site or within the Study Area. However, **Chapter 7: Biodiversity** identifies the Narborough Bog SSSI as being in hydrological connection with the Site. In relation to the water environment, the Bog is located 6.8km east of the Site and thus is outside of the Study Area of this Chapter. Notwithstanding this, the design of a suitable SuDS scheme to protect surface water quantity and quality and ensuring that all foul water from the Proposed Development will be discharged into foul sewers for treatment by Severn Trent Water Limited, and discharge in compliance with their WwTWs consents will avoid significant effects. The potential for a significant effect is further reduced since the Earl Shilton Brook at the Site has a catchment area of less than 2km², compared to the River Soar's 180km² catchment downstream at Narborough Bogs. Therefore, the Proposed Development will comply with the requirements stated by Natural England within **Chapter 7: Biodiversity** to ensure that there is no significant effect on the Narborough Bog SSSI and it is therefore not considered further within this assessment. There are no sites designated for geological/geomorphological reasons on or adjacent to the Site.

Future baseline

- 15.5.22 The future baseline could potentially change due to additional development in the vicinity of Earl Shilton. This could lead to increased demand for water supplies, increased treated effluent flows from Earl Shilton WwTW into the Earl Shilton Brook, and potentially larger amounts of run-off from impermeable developed areas into watercourses, thereby exacerbating flood risk. Climate change is also expected to result in more intense rainfall events, with more frequent and severe flooding. However, the Site is situated near the head of the catchment, with upslope areas within Earl Shilton already developed, so is not expected to see significant changes to stream flows associated with additional development located upslope. Additionally, changes to river flows downstream from the Site as a result of additional development would be expected to be managed by the implementation of SuDS, as required by the LLFA.
- 15.5.23 The quality of the WFD waterbodies would be expected to improve further towards Good status, as elevated levels of phosphate are reduced as Severn Trent Water Limited invest in improving their WwTWs (one of the causes identified), and improvements occur to farming practices (both livestock and arable).
- 15.5.24 However, the implication of these factors on the water environment is limited. Water supply and the discharge of treated effluent will have to comply with existing environmental legislation aimed at ensuring abstractions for water supply/discharge of treated effluent do not adversely affect the water environment. These issues are managed strategically by the relevant water company through future planning and development as set out in their Strategic Business Plan. Severn Trent Water Limited completed improvements to the WwTW to reduce phosphate levels in the final treated effluent discharged into the Earl Shilton Brook in 2019. It is expected that they will continue to invest in improvements to their WwTWs in order to fit with future demand.
- 15.5.25 Current planning guidance (NPPF⁹, specifically paragraphs 167c and 169) on flood risk advises that all new developments must manage their surface water run-off so as not to increase downstream flood risk.

- 15.5.26 Sustainability measures³⁷ also mean that new developments are designed to be more water-efficient than older developments.
- 15.5.27 With regards to the water supply and the treatment of sewage from the Proposed Development, Severn Trent Water Limited incorporates proposed growth into its 25 year water resources management plan. As the development in the surrounding area forms part of a planned area of growth at Earl Shilton, the potential population growth and associated impacts on water supply and sewage treatment capacity have been considered and addressed by Severn Trent Water Limited in their 25-year plan. The upgrade works completed to the adjacent WwTW³⁸ account for the planned 15% increase in population of Earl Shilton. A program of phased connection to the Severn Trent Water Limited's foul network, and the WwTW via new sewers would be agreed as part of detailed design stage for the Proposed Development.
- 15.5.28 The latest guidance on climate change allowances to be applied in England was last updated in July 2021³⁹ and provides guidance on the potential enhanced rainfall intensity and seasonality with wetter winters and drier summers. The current climate change allowance factors will be included in the design of the Proposed Development's SuDS, (designing for a 40% increase in rainfall intensity) and by ensuring that the development areas are above future flood levels (including for a 50% increase in discharge⁴⁰) and the measures to ensure climate change resilience of the Proposed Development are reported in the FRA and its accompanying Outline Drainage Strategy (see **Appendix 15A**).

15.6 Consultation

- 15.6.1 **Table 15.6** provides a summary of the issues relating to the Proposed Development that have been raised by consultees, and the responses given.

³⁷ Building Regulations set out the mandatory 125 litres/day per person maximum water use standard, with the option of local planning authorities specifying a 100 litres/day per person requirement where there is a local need. See: Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2015). Housing: optional technical standards. (Online) Available at: <https://www.gov.uk/guidance/housing-optional-technical-standards#water-efficiency-standards> (Accessed 02 December 2021)

³⁸ See: Water Projects (2019). Earl Shilton STW. (online) Available at: https://waterprojectsonline.com/custom_case_study/earl-shilton-stw/ (Accessed 02 December 2021)

³⁹ Ministry of Housing, Communities and Local Government (2021). National Planning Practice Guidance, Flood risk assessments: climate change allowances (online). Available at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> (Accessed 24 September 2021)

⁴⁰ The hydraulic modelling undertaken as part of the FRA was completed undertaken using NPPF 2019 climate change uplifts. Since the modelling was completed, the NPPF 2021 climate change uplifts have come into force. For a 'highly vulnerable' development, NPPF now states that the central allowance should be used, which is 28% for this location. As such the models have not been re-run with the updated climate change allowances as the current modelling represents a conservative approach. However, as the development could be considered to be a significant urban extension, the upper end allowance for peak river flow is recommended to be assessed as part of assessing credible maximum scenarios. In this instance the 60% climate change uplift would need to be applied. However, as the 0.1% river flows are greater than the 1% plus 60% climate change flows, and the masterplan and subsequent floodplain compensation have been based on ensuring no development within the 0.1% extent it can be seen that a flood event above the credible maximum has been assessed.

Table 15.6 Summary of issues raised during consultation regarding the Water Environment (surface water, groundwater and flood risk)

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
SuDS will need to be included in the development, as per best practice given by the CIRIA C753 The SuDS Manual.	Leicestershire County Council (as LLFA) and the EA	The Outline Drainage Strategy included within Appendix 15A has utilised SuDS in accordance with CIRIA C753.	Appendix 15A
All discharge from the site should be at no greater than the QBar greenfield value, with attenuation up to the peak return period plus a 40% allowance for climate change.	Leicestershire County Council (as LLFA)	The Outline Drainage Strategy has been prepared on the basis of attenuation to the QBar greenfield rate with a climate change uplift of 40% applied.	Appendix 15A
Over the lifetime of the development, it is possible that the overall impermeable area contributing to surface water runoff within the site could increase (known as 'urban creep'). Sensitivity testing of an increase in impermeable area should therefore be included in the surface water drainage design.	Leicestershire County Council (LLFA)	The Outline Drainage Strategy has been prepared with the inclusion of 10% urban creep, in addition to the impermeable area.	Appendix 15A
In line with the Water Framework Directive, there should be no deterioration in the ecological status and as such water quality should be used as an indicator of the sustainability of the proposals.	EA	Surface water quality is considered as one of the potential receptors.	Section 15.7
There should be no increase in flood risk to third parties as a result of the scheme and impacts on watercourses should be avoided or minimised wherever possible.	EA	The FRA (see Appendix 15A) demonstrates that flood risk will not increase, and the flood risk to offsite developments is considered as one of the potential receptors.	Appendix 15A and Section 15.7

15.7 Scope of the assessment

Spatial scope

- 15.7.1 The spatial scope of the assessment of effects on the Water Environment (surface water, groundwater and flood risk) covers the area of the Proposed Development, together with the Study Area described in **Section 15.4** and illustrated on **Figure 15.1**.

Temporal scope

- 15.7.2 The temporal scope of the assessment of the Water Environment (surface water, groundwater and flood risk) is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction and operational phases (see **Chapter 3: Description of the Proposed Development**).

Potential receptors

- 15.7.3 New development (i.e. construction works, buildings, access roads and supporting infrastructure) has the potential to affect the Water environment. Potentially both water quality and quantity in adjacent water bodies could be affected by construction and operation activities. Based on the baseline assessment of the existing Site, the potential receptors detailed in **Table 15.7** and paragraph 15.7.4 have been identified.
- 15.7.4 The receptors that will potentially be affected by the Proposed Development comprise:
- Surface water quality and Hydromorphology receptors:
 - ▶ the on-site Earl Shilton Brook and downstream Thurlaston Brook; and
 - ▶ WFD waterbody Thurlaston Brook Catchment (tributary of Soar), ID GB104028046940.
 - Flood risk receptors:
 - ▶ existing development downstream and adjacent to the Site.
 - Water Resources:
 - ▶ water supply (public and private), and sewerage services provided by Severn Trent Water Limited.

Likely significant effects

- 15.7.5 The Water Environment receptors that have been taken forward for assessment are summarised in **Table 15.7**.

Table 15.7 Water Environment receptors scoped in for further assessment

Receptor	Relevant assessment criteria	Likely significant effects
The Earl Shilton Brook and the Thurlaston Brook	WFD status	<u>Construction phase:</u> Potential effects on water quality: During the construction phase the Proposed Development has the potential to affect surface water quality through the spillage or release of chemicals such as fuels or oils or through the release of sediment entrained run-off into the local surface water network.

Receptor	Relevant assessment criteria	Likely significant effects
		<u>Operational phase:</u> Surface water quality could be reduced due to the contamination of surface water runoff with debris and pollutants from new urban development. <u>Cumulative effects of construction and operation:</u> Inappropriate development could limit access for watercourse maintenance and prevent biodiversity/amenity uses. Potential cumulative effects on surface water quality associated with the combined effect of the Proposed Development in tandem with other nearby developments.
Existing development downstream of the Site	NPPF	<u>Construction phase:</u> Potential effects on flood risk: Run-off rates could be temporarily increased, increasing flood risk to existing development downstream of the Site. <u>Operational phase:</u> Flood risk could increase due to the increase in impermeable area associated with the development of greenfield land at the Site. This could increase overland flow during storm events and result in flooding of receptors. <u>Cumulative effects of construction and operation:</u> Potential cumulative effects on flood risk associated with the combined effect of the Proposed Development in tandem with other nearby developments.
The Proposed Development	NPPF	<u>Construction phase:</u> Flood risk could increase due to the increase in impermeable area associated with the development of greenfield land at the Site. This could increase overland flow during storm events and result in flooding of receptors. <u>Operational phase:</u> The increase in impermeable surfaces on the Site will be increased which could increase surface run off during storm events which could affect the Proposed Development without suitable management. Without suitable attention to potential flooding associated with the Earl Shilton Brook, new development could be at risk of flooding. <u>Cumulative effects of construction and operation:</u> Potential cumulative effects on flood risk associated with the combined effect of the Proposed Development in tandem with other nearby developments.
Water Resources	WFD	<u>Operational phase:</u> Increased treated effluent discharges from the WwTW and increased mains water supply demand from the new development. <u>Cumulative effects of construction and operation:</u> The likely effects will primarily be associated with the operational phase, where there may be cumulative effects with the increased water demand and increased effluent discharges due to nearby developments.

Receptor	Relevant assessment criteria	Likely significant effects
Hydromorphology	WFD	<u>Construction Phase:</u> Construction near and above the Earl Shilton Brook has the potential to affect flow and sediment load if suitable mitigation measures are not put in place. <u>Operational phase:</u> The rate of discharge from the Proposed Development's SuDS and the potential impact of new watercourse crossings have the potential to affect the hydromorphology of the Earl Shilton Brook. <u>Cumulative effects of construction and operation:</u> Potential for development to damage physical quality of the local watercourses, with impacts on habitats and on aesthetic appearance of watercourses.

15.7.6 The following receptors have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant:

- Effects on groundwater:** The effects on groundwater were scoped out as part of the Scoping Report. Given the nature of the Proposed Development and the nature of the groundwater resource at the Site, the bedrock geology is mudstone and is unlikely to yield a significant quantity of groundwater. Potential yield/resource significance from the gravel superficial strata in the north and south of the Site is also limited, especially as this strata is clay rich (nearest BGS borehole log SP49NE69 in the same strata⁴¹). Since no piling and no excavations greater than 5 m deep are expected to form part of the Proposed Development, and any groundwater encountered is expected to be perched and of limited scale, only limited localised dewatering is expected in the worst case. Therefore, the potential effects on groundwater has been scoped out from further consideration.
- Effects on surface water or potable water abstractions:** Consultation with the EA, HBBC and Blaby District Council determined that there are no surface water or potable water abstractions within a 1.5 km radius of the Site boundary. Therefore, the potential effects on surface water or potable water abstractions has been scoped out from further consideration.

15.8 Environmental measures embedded into the development proposals

15.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 4.8**. Opportunities for embedded mitigation have been identified throughout the evolution of the design so as to support the demonstration of no significant effect within the EIA process. This process has ensured that potentially significant adverse environmental effects have been fed back into the design process to verify whether they can be avoided or otherwise mitigated in accordance with the hierarchy. Alongside this, best practice measures have been identified with reference to legislative requirements and measures of standard practice to manage commonly occurring effects. **Table 15.8** outlines how these embedded measures will influence the Water Environment assessment.

⁴¹ British Geological Survey (undated). BGS ID: 334128 : BGS Reference: SP49NE69 (Online) Available at: http://scans.bgs.ac.uk/sobi_scans/boreholes/334128/images/14820735.html (Accessed 17 September 2021)

Table 15.8 Summary of the embedded environmental measures and how these influence the Water Environment assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Earl Shilton Brook and Thurlaston Brook	Water Quantity: Run-off from the Site during construction and during operation.	<u>Construction:</u> Site run-off will be managed through the Site's SuDS system, which will be constructed at the earliest feasible stage of the Proposed Development. This will be designed to maintain flow pathways and not affect water quantity. As the SuDS will attenuate flows to the greenfield discharge rate, the rate and volume of run-off entering the Earl Shilton and Thurlaston Brooks from the Site will not increase. <u>Operation:</u> The Proposed Development design includes SuDS which will attenuate flows before discharge into the receiving watercourses. <u>Both Construction and Operation:</u> Discharge consents will be obtained for the discharge of water to the proposed receiving watercourses (i.e. the Earl Shilton Brook).
Earl Shilton Brook and Thurlaston Brook	Water Quality: Pollution effects as a result of accidental spillage and polluted run-off from construction activities. Pollution effects from polluted run-off from the development once constructed and fully occupied.	<u>Construction:</u> Construction work will follow best practice in CIRIA C532¹² and C741¹⁵. In addition, the contractor will be required to implement a Construction Environment Management Plan (CEMP) which will include measures such as: • bunding of chemical and fuel stores to 110% of capacity; • pollution incidence response plan to deal with any accidental spillages or leaks; • maintenance and re-fuelling of vehicles and equipment on hardstanding; and • Site run-off, which may contain silt, will be directed to settlement lagoon(s). <u>Operation:</u> For the residential areas of the Proposed Development, the routing of run-off through SuDS features such as attenuation basins will provide sufficient water

Receptor	Changes and effects	Embedded measures and influence on assessment
		quality treatment to ensure downstream water quality is not impaired by the Proposed Development. The guidance provided in CIRIA C697 will be followed to ensure the appropriate levels of treatment are provided. For the areas of commercial and industrial development where geocellular SuDS are proposed, sufficient treatment will be provided through following CIRIA C741¹⁵, 753¹⁶ best practice with a SuDS treatment train. Conveyance swales between the geocellular SuDS and the discharge location will provide additional stages of water quality treatment to provide a full SuDS management train. The commercial and industrial areas will require a greater degree of treatment than the residential areas due to the higher risk of pollution incidents occurring. However, through the application of a sufficient treatment train, this risk will be managed. <u>Both Construction and Operation:</u> Through designing a SuDS system following best practice and the application of a CEMP, water quality will not be significantly affected during construction and operation.
The Proposed Development and downstream developments	Flood risk: Increased risk of flooding as the Site is developed.	<u>Construction:</u> All construction will occur within areas least at risk of flooding. The Site's SuDS will be constructed early on in the construction phase to ensure that the downstream flood risk is not increased as a result of construction. <u>Operation:</u> The use of level-for level floodplain compensation⁴² along the Earl Shilton Brook Corridor will ensure that a suitable platform for development is provided within Flood Zone 1, and that no floodplain storage is lost, so that downstream flood risk is not increased. <u>Both Construction and Operation:</u>

⁴² Level-for-level floodplain compensation refers to raising some part of land out of the floodplain and lowering the equivalent volume of land in a nearby, hydraulically connected location while ensuring that the lowered land provides the same or greater volume at all levels, thereby ensuring that flood events of all magnitudes are suitably compensated for. This ensures that there will be no increase in flood risk to off-site receptors as a result of raising land out of the floodplain. Section 5.1 of the FRA in **Appendix 15A** covers the level-for-level floodplain compensation calculations.

Receptor	Changes and effects	Embedded measures and influence on assessment
		In addition to the proposed SuDS to attenuate Site run-off to natural greenfield levels, several measures have been identified in the FRA (Appendix 15A) which have been incorporated into the scheme design. These include: • locating all development within areas least at risk of flooding and using areas of the Site adjacent to watercourses as amenity areas such as public open space and landscaping; • using the areas of the Site adjacent to watercourses (and in Flood Zone 3 and 2) as amenity areas such as public open space and landscaping; • raising floor levels to 0.15m or more above local ground levels to minimise the risk of fluvial, surface water and groundwater flooding to properties within the Site; • inclusion of control measures which will mimic natural drainage, allow some infiltration and restrict run-off from the Site. Such measures would include filter strips, plus storage within the drainage system and would also include attenuation basins; and • The Earl Shilton Brook crossing would be designed to be clear span, so as not to impact on up or downstream flood risk, and also have the road level raised above the modelled 0.1% AEP flood level so that it is sufficiently elevated above predicted flood risk.
Regional Water Resources	Water Resources: Increased mains water demand and increased foul flows to Earl Shilton WwTW.	<u>Construction:</u> No likely significant effects. <u>Operation:</u> In order to minimise water use, the Proposed Development will be designed to comply with current water efficiency measures. The developer will work with the local water supply/sewerage undertaker to detail the expected timeframe over which the Proposed Development will be completed. This will enable the appropriate infrastructure to be put in place, with the appropriate environmental measures and licences. Where required, contributions made by the Applicant would contribute towards the cost of parts of this infrastructure provision. <u>Both Construction and Operation:</u>

Receptor	Changes and effects	Embedded measures and influence on assessment
		On a broader scale, Severn Trent Water Limited are aware of the population growth trajectories of the settlements within their region and plan for this accordingly in their strategic plans. Severn Trent Water Limited have invested in improvements to address elevated levels of phosphate in their WwTWs, It is expected that further investment for future improvements will be undertaken to fit with ongoing requirements.
Earl Shilton Brook	Hydromorphology: Deterioration of the hydromorphology of the Earl Shilton Brook. Potential replacement of large lengths of watercourse bed/banks with hard engineering structures.	<u>Construction:</u> Development will be set back from the watercourse to minimise impacts. There will need to be a minimum clear width of 3m provided from the top of each bank of the Earl Shilton brook (see Appendix 15A). Outfall structures (from the Site's SuDS attenuation basins) will be small low-key structures. The SuDS will attenuate surface runoff and discharge at the greenfield rate; this slow release would dissipate energy and reduce the erosion risk. The proposed watercourse crossings of the Earl Shilton Brook will be constructed according to current EA guidance; they would be open span and retain a natural bed which would enable fish, mammal and sediment passage. Ordinary Watercourse Land Drainage Consents (OWLDCs⁴³) will be obtained where required. <u>Operation:</u> The existing watercourse will be left within a green corridor. Watercourse crossings would be constructed sympathetically and according to current EA guidance. These crossings will carry an internal access road across the Earl Shilton Brook, an Ordinary Watercourse. This means that works will be undertaken in line with the guidance for works in watercourses (see EA PPG6⁴⁴), and consent for the crossing will be required from the LLFA (Policy 1 of the LFRMS⁴⁵). <u>Both Construction and Operation:</u>

⁴³ See: Leicestershire County Council (2021). Regulation of activities on watercourses. (online). Available at: <https://www.leicestershire.gov.uk/environment-and-planning/flooding-and-drainage/regulation-of-activities-on-watercourses> (Accessed 13 December 2021)

⁴⁴ Environment Agency (2014). PPG6 Construction and demolition site: prevent pollution. (online). Available at: <https://www.gov.uk/government/publications/construction-and-demolition-sites-ppg6-prevent-pollution> (Accessed 17 September 2021)

⁴⁵ Leicestershire County Council (2014). Appendix 3: Leicestershire LFRMS Policies. (online). Available at: https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2016/9/19/FLOOD_STRATEGY_PLAN_APPENDIX.pdf (Accessed 17 September 2021)

Receptor	Changes and effects	Embedded measures and influence on assessment
		The only other structures that will be constructed within the watercourse corridor will be the headwalls/pipe outfalls for the surface water management system. These will be relatively small, discrete structures. If possible, these will be constructed out of sympathetic materials rather than shuttered concrete. Protective measures such as silt fencing and sand bagging/overpumping will also be incorporated during watercourse crossing construction to prevent silt-laden runoff entering the watercourses. As a result of these measures, there will be no impact on the catchment's WFD status.

15.9 Assessment methodology

- 15.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this assessment.
- 15.9.2 The methodology outlined in this section has been developed for previous EIAs of a similar nature and has been followed when completing the impact assessment presented in this ES.

Determination of significance

- 15.9.3 The significance of an effect resulting from a development (during construction or operation) will be assessed with reference to the sensitivity (or value) of a given water receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the Proposed Development. The residual effects of the Proposed Development will be evaluated assuming that identified mitigation measures are fully implemented.
- 15.9.4 The assessment has been largely based on professional judgement, based on experience and the use of best practice guidance, such as that published by the EA, CIRIA and Defra. The key determinands of sensitivity and magnitude will relate to the Aquatic Environment (used here to refer to surface water quality/quantity and hydromorphology aspects), Water Resources and Flood Risk. **Table 15.9** details the basis for assessing receptor sensitivity.

Table 15.9 Establishing the sensitivity of receptors

Sensitivity	Criteria	Receptor type	Examples
Very High	Feature with a high quality and rarity at an international scale, with little potential for substitution	Aquatic environment	Conditions supporting sites with international conservation designations (SACs, SPAs, Ramsar sites), where the designation is based specifically on aquatic features.
		Water resources	Regionally important public water supplies.
		Flood risk	Land use types defined as 'Essential Infrastructure' (i.e. critical national infrastructure) in the NPPF ⁹ flood risk vulnerability classification.
High	Feature with a high yield and/or quality and rarity at a national scale, with a limited potential for substitution	Aquatic environment	Conditions supporting sites with national conservation designations (i.e. SSSIs, National Nature Reserves (NNRs)) where the designation is based specifically on aquatic features.
			Receptor water body: all relevant WFD supporting elements* at least good status/potential.
		Water resources	Local public water supplies.
Medium	Feature with a medium yield and/or quality at a regional scale or good quality at a local scale,	Flood risk	Land use types defined as 'Highly Vulnerable' in the NPPF ⁹ flood risk vulnerability classification.
		Aquatic environment	Sites with local conservation designations where the designation is based specifically on aquatic features.

Sensitivity	Criteria	Receptor type	Examples
	with some potential for substitution	Water resources	Receptor water body: all relevant WFD elements* at least moderate status/potential. Un-licensed potable water abstractions, e.g. private domestic water supplies.
		Flood risk	Land use types defined as 'More Vulnerable' in the NPPF ⁹ flood risk vulnerability classification.
Low	Feature with a low yield and/or quality at a local scale, with some potential for substitution	Aquatic environment	Receptor water body: relevant WFD elements* at less than moderate status/potential. Small watercourses not classified as a WFD river water body.
		Water resources	Licensed abstractions which are not public water supply, e.g. industrial process water, spray irrigation.
		Flood risk	Land use types defined as 'Less Vulnerable' in the NPPF ⁹ flood risk vulnerability classification.
Very Low	Feature with minimal yield and/or very low quality at a local scale, with a high potential for substitution	Aquatic environment	Receptor water body: relevant WFD elements* at poor status/potential. Minor water features such as ditches, not classified as a WFD river water body.
		Water resources	Un-licensed non-potable abstractions, e.g. livestock supplies.
		Flood risk	Land use types defined as 'Water-compatible development' in the NPPF ⁹ flood risk vulnerability classification and undeveloped land.
*For the purposes of this assessment, 'relevant WFD elements' are taken to mean: • all biological quality elements e.g. fish, invertebrates etc.; • all physico-chemical quality elements e.g. dissolved oxygen, phosphate etc.; and • hydromorphological supporting elements. The definition of 'relevant WFD elements' (given the lack of potential for the Proposed Development to influence these substances) excludes: • Priority Hazardous Substances; • Priority Substances; and • Specific Pollutants.			

15.9.5 **Table 15.10** details the basis for assessing magnitude of change.

Table 15.10 Establishing the magnitude of change

Magnitude	Criteria	Receptor type	Examples of negative change
Very High	Results in major change to feature, of sufficient magnitude to affect its use/integrity	Aquatic environment	Deterioration in river flow regime, morphology or water quality, leading to sustained, permanent or long-term breach of relevant Conservation Objectives (COs) or downgrading of WFD status (including downgrading of individual WFD supporting elements).
		Water resources	Complete loss of resource or severely reduced resource availability and/or quality, permanently compromising the ability of water users to exercise licensed rights.
		Flood risk	Change in flood risk resulting in potential loss of life or major damage to property and infrastructure.
High	Results in noticeable change to feature, of sufficient magnitude to affect its use/integrity in some circumstances	Aquatic environment	Deterioration in river flow regime, morphology or water quality, leading to periodic, short-term and reversible breaches of relevant COs, or downgrading of WFD status (including downgrading of individual WFD supporting elements or ability to achieve future WFD objectives).
		Water resources	Moderate reduction in resource availability and/or quality, which may compromise the ability of water users to exercise licensed rights on a temporary basis or for limited periods.
		Flood risk	Change in flood risk resulting in potential for moderate damage to property and infrastructure.
Medium	Results in minor change to feature, with insufficient magnitude to affect its use/integrity in most circumstances	Aquatic environment	Measurable deterioration in river flow regime, morphology or water quality, but remaining generally within COs, and with no change to WFD status (of overall status or supporting element status).
		Water resources	Minor reduction in resource availability and/or quality, but unlikely to affect the ability of water users to exercise licensed rights.
		Flood risk	Change in flood risk resulting in potential for minor damage to property and infrastructure.
Low	Results in little change to feature, with insufficient magnitude to affect its use/integrity	Aquatic environment	Limited measurable deterioration in river flow regime, morphology or water quality and limited probability of consequences in terms of COs or WFD designations.
		Water resources	Limited measurable change in resource availability or quality and limited probability of changes to the ability of water users to exercise licensed rights.
		Flood risk	Increased frequency of flood flows, but which does not pose an increased risk to people, property and infrastructure.
Very Low	Results in no change to feature, with insufficient magnitude to affect its use/integrity	Aquatic environment	No measurable deterioration in river flow regime, morphology or water quality and no consequences in terms of COs or WFD designations.
		Water resources	No measurable change in resource availability or quality and no change in ability of water users to exercise licensed rights.
		Flood risk	No increase in frequency of flood flows, and no increase in risk to people, property and infrastructure.

15.9.6 **Table 15.11** provides an indication of how the level of effect will be categorised from the interaction of a receptor's sensitivity to change and the magnitude of change. A level of effect of Moderate or greater is generally of most importance to the decision-maker, and so these effects are considered 'significant'. The significance of effects identified as being 'potentially significant' will be confirmed via professional judgement. Where a level of effect is Minor or below, these are generally considered to be 'not significant'.

15.9.7 Reference is made to:

- **Major effects**, which will always be determined as being significant in EIA terms. These are highlighted in purple in **Table 15.11**;
- **Moderate effects** can be significant, or not significant, based on specific scenarios and professional judgement; and
- **Minor or negligible effects**, which will always be deemed as not significant.

15.9.8 Effects can either be positive or negative.

Table 15.11 Significance evaluation matrix

		Magnitude of change				
		Very high	High	Medium	Low	Very low
Sensitivity/importance/value	Very high	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Potentially significant)
	High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Note: Significant effects are those identified as 'Major'. 'Moderate' effects may be deemed to be significant depending on the environmental topic and the application of professional judgment.

15.10 Assessment of Water Environment effects

Predicted effects and their significance

Surface Water Quantity

15.10.1 The measures detailed in **Section 15.8** are considered to fully mitigate against any potentially significant effects. No residual effects are predicted with these measures in place. A suitable surface

water management strategy has been prepared to demonstrate that during construction and operation there will be no significant impacts on surface water quantity.

Surface Water Quality

- 15.10.2 The measures detailed in **Section 15.8** are considered to fully mitigate against any potentially significant effects. No residual effects are predicted with these measures in place. Potentially significant effects on water quality during construction will be mitigated through the use of the CEMP and during operation through the use of SuDS.

Flood Risk

- 15.10.3 The measures detailed in **Section 15.8** are considered to fully mitigate against any potentially significant effects. No residual effects are predicted with these measures in place. The use of floodplain compensation and setting back of all development outside of the modelled flood zones will mitigate the flood risk during construction and operation and the surface water management strategy will ensure that there is no significant change in flood risk to offsite receptors.

Water Resources

- 15.10.4 The measures detailed in **Section 15.8** are considered to fully mitigate against any potentially significant effects. No residual effects are predicted with these measures in place. During construction and operation there will be no significant impact on existing abstractions and Severn Trent Water Limited have planned for increases in regional water demand via their strategic Water Resource Management Planning (WRMP) process.

Hydromorphology

- 15.10.5 The measures detailed in **Section 15.8** are considered to fully mitigate against any potentially significant effects. No residual effects are predicted with these measures in place. During construction and operation there will be no significant changes in water quantity through the construction of the surface water management strategy, and during operation the watercourse crossings will be clear-span to ensure that channel morphology (bed and adjacent banktops) is not affected.
- 15.10.6 A summary of the results of the assessment of effects on the Water Environment is provided in **Table 15.12**.

Table 15.12 Summary of significance of adverse effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
The Earl Shilton Brook and the Thurlaston Brook - Impact on surface water quality - Impact on surface water quantity	Low	Low	Minor/negligible (Not significant)	Receptor of low sensitivity and subject to a low magnitude of change. Identified environmental measures would prevent significant effects.
Existing development downstream of the SiteChange in Flood Risk	Low	Low	Minor/negligible (Not significant)	Receptor of low sensitivity and subject to a low magnitude of change. Identified environmental measures would prevent significant effects.
The Proposed Development Change in Flood Risk	Low	Low	Minor/negligible (Not significant)	Receptor of low sensitivity and subject to a low magnitude of change. Identified environmental measures would prevent significant effects.
Water Resources	Low	Low	Minor/negligible (Not significant)	Receptor of low sensitivity and subject to a low magnitude of change. Identified environmental measures would prevent significant effects.
Hydromorphology	Low	Low	Minor/negligible (Not significant)	Receptor of low sensitivity and subject to a low magnitude of change. Identified environmental measures would prevent significant effects.

- The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 15.9** and is defined as very low, low, medium, high and very high.
- The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 15.9** and is defined as very low, low, medium, high and very high.
- The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 15.9**.

15.11 Cumulative effects

- 15.11.1 **Chapter 7: Biodiversity** identifies the Earl Shilton Brook as a receptor due to the presence of water voles. The new watercourse crossings will not be pipe culverts and instead use clear span techniques (i.e. arch culvert, or concrete deck) with mammal ledges which will ensure that the effect on water vole habitat is minimised. In addition, the proposed SuDS will ensure that the water levels within the Earl Shilton Brook are not significantly affected as a result of increased runoff during operation. This will also minimise the effect on water voles. The potential effects on water quality of the Earl Shilton Brook during constitution and operation have been covered during this chapter with suitable measures taken to mitigate the effect.
- 15.11.2 **Chapter 16: Land Quality**, identifies controlled waters (alluvium and mudstone Secondary A Aquifers) as being potential receptors that could be affected by the construction of the Proposed Development through fuel spillages and contamination. If the contamination reached the groundwater, it would likely subsequently enter into the Earl Shilton Brook and negatively affect water quality therein. However, as identified within **Chapter 16: Land Quality**, through the use of best practice techniques to prevent contamination that will be enforced through embedded measures including a suitable CEMP, the risk of potential contamination on the water environment can be mitigated.
- 15.11.3 Cumulative effects with regards to potential inter-related effects from other topics on the same receptors are therefore considered to be negligible.

15.12 Consideration of optional additional mitigation or compensation

- 15.12.1 No additional mitigation is proposed to further reduce the Water Environment effects that are identified. This is because all relevant and implementable measures have been embedded into the development proposals and are considered to be deliverable and address the likely significant effects of the Proposed Development.

15.13 Conclusions of significance evaluation

- 15.13.1 The Proposed Development in combination with the identified mitigation measures is not predicted to result in any significant effects on the Water Environment. The Proposed Development therefore complies with the aims of the legislation detailed in **Table 15.1** as well as the NPPF⁹, and in particular HBBC Local Plan policies DM7 and DM10¹¹.

15.14 Implementation of environmental measures

- 15.14.1 **Table 15.13** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented, i.e. they will have been secured through the outline planning application and reserved matters.

Table 15.13 Summary of environmental measures to be implemented relating to the Water Environment

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Site SuDS To prevent an increase in Site run-off, and an increase in downstream flood risk Initially agreed at the planning application stage – overall scheme parameters (attenuation rate, storage required types of features).	LLFA, EA, Applicant and the SuDS Approving Body (SAB)	To achieve planning permission this will need to be signed off by the LPA following consultation with the EA and SAB. If the proposed SuDS are considered unacceptable, the application will not be approved. A planning condition will specify the details to be implemented during development. The developer will be responsible for constructing the SuDS to the final agreed design, in consultation with the SAB. The SAB, as the final adopting body will need to be satisfied with the construction and implementation standard of the SuDS before signing them off. The SAB will then be responsible for regular maintenance of the SuDS.	Section 15.8
Construction of perimeter soil mounds Potential pollution of ground and surface water during construction works.	LPA, Applicant	A CEMP will be produced detailing the measures to be taken during construction to minimise the risk of pollution incidents. The requirement for a CEMP can be enabled via a planning condition.	Section 15.8
Construction Earthworks Potential pollution of ground and surface water during development's lifetime.	SAB	The Proposed Development's SuDS will provide a means of capturing and treating a large proportion of potential contaminants contained in run-off from the Site. Debris/solid particles will settle out within the attenuation basins, and some bio-treatment of organic compounds will naturally occur within the attenuation basins. The SAB will be responsible for regular maintenance of the SuDS.	Section 15.8
Measures to prevent an increase in flood risk	LLFA, EA and Applicant	The planning application will only be approved if the LPA is satisfied (following consultation with the EA) with the flood risk mitigation measures included in the proposal. A planning condition can be included to specify the measures detailed in the FRA are included in the development. The developer will then construct the development as per the agreed designs.	Section 15.8
Measures to prevent impacts on hydromorphology	LPA, EA and Applicant	Ordinary Watercourse Land Drainage Consents (OWLDCs) will be required from LCC for watercourse crossings and the outfall structures draining the SuDS basins into local watercourses, and for the proposed bridge across the onsite watercourse. Only OWLDCs for necessary and appropriately designed structures will be approved.	Section 15.8
Measures to minimise water use	Applicant	Planning Condition. To minimise water use, the development will be designed to comply with current water efficiency measures. The applicants will work with the local water supply/sewerage undertaker (Severn Trent Water Limited) to detail the expected timeframe over which the development will be completed. This will enable the appropriate infrastructure to be put in place, with the appropriate licences. Where required, applicant contributions will contribute towards the cost of parts of this infrastructure provision.	Section 15.8

16. Land Quality

16.1 Introduction

- 16.1.1 This chapter presents desk study information on the Proposed Development with respect to land quality (specifically land contamination) and summarises the rationale for the conclusion presented in the Scoping Report that there is limited scope for significant land quality effects as a result of the Proposed Development. The chapter should be read in conjunction with the development description provided in **Chapter 3: Description of the Proposed Development**.

16.2 Limitations of this assessment

- 16.2.1 The information presented in this chapter uses environmental desk study reports obtained in 2012 and 2014 alongside freely available desk study information accessed online in September 2021. No new baseline data has been purchased as part of this assessment.

16.3 Relevant legislation, planning policy and technical guidance

Legislation

- 16.3.1 The key national legislation relevant to land quality is:
- The *Environmental Protection Act 1990: Part 2*¹ of the Act makes provision for the improved control of pollution arising from certain industrial and other processes. Part 2A of the Act provides the regulatory basis for the identification, designation, and remediation of contaminated land.

Planning policy

- 16.3.2 A summary of the relevant planning policies is given in **Table 16.1**.

Table 16.1 Planning policy issues relevant to land quality

Policy reference	Policy issue	Considered in Section
National planning policies		
National Planning Policy Framework (NPPF) ²	The NPPF sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. In summary, this requires (at paragraphs 120(d), 174(f) 183 and 184) that: • Planning decisions give weight to the use of suitable brownfield land and support opportunities to remediate degraded or contaminated land, where appropriate;	Section 16.5, 16.6 and 16.8

¹ Environmental Protection Act 1990. (online) Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> (Accessed September 2021)

² Ministry of Housing, Communities and Local Government. (2021). National Planning Policy Framework (NPPF). Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (Accessed September 2021)

Policy reference	Policy issue	Considered in Section
	- Land is suitable for the proposed use taking account ground conditions arising from contamination; and - If remediation is required, then, as a minimum, after remediation, the land should not be capable of being determined as contaminated land under Part 2A of the <i>Environmental Protection Act 1990</i>.	
Development plan policies		
Hinckley and Bosworth Borough Council (HBBC) Site Allocations and Development Management Policies adopted 2016	Policy DM7, Preventing Pollution and Flooding details that adverse impacts from pollution and flooding will be prevented. Policy requires that appropriate remediation of contaminated land in line with minimum national standards is undertaken.	Section 16.5, 16.6 and 16.8

Technical guidance

16.3.3 The national policy guidance of relevance to the assessment includes:

- The *Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance*³ sets out how local authorities should implement the Part 2A regime, including how they should go about deciding whether land is contaminated land in the legal sense of the term. It also elaborates on the remediation provisions of Part 2A, such as the goals of remediation, and how regulators should ensure that remediation requirements are reasonable; and
- The Environment Agency guidance document *Land Contamination Risk Management (LCRM)*⁴ dated October 2020 provides the technical framework for applying a risk management process when dealing with land affected by contamination.

16.4 Data gathering methodology

Study area

16.4.1 The study area comprises a Zone of Influence (Zoi) 500 m around the Site boundary for the Proposed Development. The rationale for this Zoi is informed by considering:

- The spatial extent (considering contaminant degradation, dilution and dispersion in the environment) at which significant land quality effects have the potential to be realised through potentially active contaminant linkages; and
- The spatial extent from which off-site sources of contamination have the potential to lead to significant effects on receptors within the Proposed Development.

³ Defra (2012) *Environmental Protection Act 1990 Part 2A – Contaminated Land Statutory Guidance* (online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/223705/pb13735cont-land-guidance.pdf (Accessed October 2021).

⁴ Environment Agency, (2020). *Land contamination risk management (LCRM)*. (online) Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm> (Accessed September 2021).

Desk study

16.4.2 Baseline land quality information has been obtained from desk studies using the following sources of information.

- Defra, Magic Map⁵;
- Geology of England and Wales Sheet 155: (Coalville, Solid and Drift Edition) 1:50k geological mapping. British Geological Survey (BGS), 1982;
- BGS 'Geology of Britain Viewer'⁶;
- BGS borehole logs, refs. SP49 NE23 (Coventry Leicester Motorway Stage 11 Borehole 271) and SP49 NE69 (Huit Farm, Earl Shilton dated December 1949);
- Google maps imagery⁷; and
- Landmark Envirocheck Reports dated 2012 and 2014.

16.5 Overall baseline

Current baseline

- 16.5.1 Most of the Site comprises arable fields and semi-improved grassland separated by hedgerows and trees. Historical mapping provided within the 2012 and 2014 Landmark Envirocheck reports indicates that the Site has predominantly been used for agricultural purposes with the addition of sports fields and a public park to the north-eastern extent of the Site.
- 16.5.2 Superficial deposits are present beneath the northern and southern portions of the Site comprising diamicton (described by the BGS as red or brown to grey clay and silty clay with rock fragments of mudstone and flint). Alluvium (consisting of clay, silt, sand and gravel) is also present in a narrow band running east to west across the centre of the Site associated with the location of the Earl Shilton Brook.
- 16.5.3 The solid geology across the whole of the Site comprises mudstone and the mudstone outcrops directly beneath the central parts of the Site where the superficial deposits are not indicated to be present.
- 16.5.4 The diamicton, alluvium and mudstone deposits beneath the Site are classified by the Environment Agency as a Secondary A and B Aquifers respectively. The Site is not located in a groundwater Source Protection Zone (SPZ).
- 16.5.5 According to the 2012 and 2014 *Landmark Envirocheck* reports, the Site does not comprise 'Contaminated Land' under Part 2A of the *Environmental Protection Act 1990*¹ and no Part 2A sites were located within 500 m of the Site boundary.
- 16.5.6 Several potentially contaminative land uses were identified from the 2012 and 2014 Landmark Envirocheck report within 500 meters (m) of the Site boundary including a Wastewater Treatment Works (WwTW), a cemetery and two Environment Agency and Local Planning Authority listed historical landfill sites known as Weavers Close and Breach Farm. The locations of these potentially

⁵ Defra (2018) Magic Map (online) Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed September 2021)

⁶ British Geological Survey (BGS) (2021) Geology of Britain Viewer (online) Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> (accessed September 2021)

⁷ Google maps imagery (no date) (online) Available at: <https://www.google.co.uk/maps> (Accessed September 2021)

contaminative land uses are shown on **Figure 16.1**. No new potentially contaminative land uses have been identified from aerial imagery of the Site taken in 2021⁷.

- 16.5.7 According to Public Health England's Radon mapping⁸, the Site is in a low probability radon area, where less than 1% of homes are above the action level. No radon protective measures are, therefore, necessary in the construction of new dwellings or extensions.

Future baseline

- 16.5.8 It is considered unlikely that the baseline conditions associated with land quality would change in the absence of the Proposed Development. This is because the geology and ground conditions are unlikely to be altered over time without a significant change of land use.

16.6 Consultation

- 16.6.1 The formal Scoping Opinion from 2012 included comments from the HBBC Environmental Health (Pollution) Officer (EHO) indicating that an assessment should be made of the potential for contamination from the Site's past agricultural use along with an assessment of the potential for landfill gas generation from Weavers Close historic landfill, which was stated to have included inert, commercial, and household waste.
- 16.6.2 Formal discussions were subsequently held with the EHO to discuss the potential for the historical use of the Site and the potentially contaminative land uses in the vicinity of the Site to present a risk to the Proposed Development. During these discussions, the following points were noted:
- The existing cemetery and WwTW may have resulted in local contamination of soil and/or groundwater, however, both are outside the area of Proposed Development, and any contamination is unlikely to have migrated onto the Site; and
 - No dates are provided to indicate the cessation of landfilling at the Weavers Close site and historical mapping does not clearly identify the presence of ground workings consistent with the Weavers Close site as landfill. A small area of ground workings at Breach Farm is shown to lie beneath the footprint of the (in 2012) newly constructed A47, with a new housing development situated to the north. It is, therefore, unlikely that any unsuitable fill materials are present in this location and it is, therefore, unlikely to pose a risk of hazardous ground gas generation.
- 16.6.3 The EHO subsequently agreed that potential significant effects arising from the historical use of the Site and the nearby Weavers Close historic landfill were unlikely and there was, therefore, no requirement to take this forward for further assessment in the Environmental Impact Assessment (EIA). No other comments on the Land Quality scoping chapter were received at that time.
- 16.6.4 This information was also presented as part of the Scoping Report submitted in 2014. There were no comments on the Land Quality scoping chapter in the Scoping Opinion from 2014.
- 16.6.5 It was, therefore, proposed that the topic land quality be scoped out from further consideration in this EIA. However, in its 2020 Scoping Opinion, HBBC requested that land quality be included in the Environmental Statement (ES), and that potential impacts from potentially contaminative past uses of the Site be considered. This land quality chapter has, therefore, been included to address this request.

⁸ Public Health England (no date) UK Maps of Radon (online) Available at: <https://www.ukradon.org/information/ukmaps> (Accessed September 2021)

16.7 Scope of the assessment

Spatial scope

- 16.7.1 As detailed in **Section 16.4**, the spatial scope of the assessment comprises a Zol 500 m around all the land required for the Proposed Development.

Temporal scope

- 16.7.2 As detailed in **Chapter 3: Description of the Proposed Development**, the Proposed Development is likely to be built in phases over a period of ten years with construction starting in 2026 and first occupation expected from 2026.
- 16.7.3 The temporal scope of the assessment, therefore, considers the period over which the Proposed Development would be constructed and the potential risks to future users of the Proposed Development.

Potential receptors

- 16.7.4 The receptors that could potentially be affected by the Proposed Development comprise:
- future on-site residents and commercial workforces;
 - construction workers for the Proposed Development; and
 - controlled waters (alluvium and mudstone Secondary A and B Aquifers respectively beneath the Site).

16.8 Environmental measures embedded into the development proposals

- 16.8.1 A range of environmental measures have been embedded into the development proposals as outlined in **Section 3.3. Table 16.2** outlines how these embedded measures will influence the land quality assessment. It is anticipated that all the embedded measures will be secured through a Construction Environmental Management Plan (CEMP).

Table 16.2 Summary of the embedded environmental measures and how these influence the land quality assessment

Receptor(s)	Embedded measures	Influence on assessment
Controlled waters	Adoption of best practice construction techniques to prevent ground contamination (for example the use of bunded fuel tanks, refuelling of plant and equipment on hardstanding)	Prevents ground contamination arising from construction activities
Future on-site residents and commercial workforces	Development of an unexpected contamination protocol	Ensures unexpected contamination will be dealt with in line with UK guidance to prevent unacceptable risks to people or the environment associated with the future development.
Controlled waters		

16.9 Assessment of land quality effects

- 16.9.1 In considering the potential effects from land contamination on the identified receptors the following points are noted:
- The Site history comprises solely agricultural land use, from which there would not be expected to be contaminative sources that could present a significant risk to the identified receptors and require remediation to be undertaken;
 - The EHO agreed in 2012 that there were unlikely to be significant effects arising from the historical use of the Site and the nearby historical landfills, cemetery and WwTW. No other, or new, potentially contaminative land uses have been identified in the vicinity of the Site since these discussions were held with the EHO which would alter this conclusion;
 - Potential contamination effects on the water environment (i.e. the aquifers beneath the Site which are controlled waters receptors) during the construction of the Proposed Development can be mitigated through the adoption of best practice construction techniques to prevent ground contamination (for example through the use of bunded fuel tanks, refuelling of plant and equipment on hardstanding) and the development of an unexpected contamination protocol by a suitably qualified and experienced environmental professional in line with the UK guidance LCRM⁴. These measures have been embedded into the development proposals and would form part of a CEMP; and
 - Construction work for the Proposed Development must comply with the law. Construction workers will, therefore, be subject to The *Construction Design and Management (CDM) Regulations 2015*⁹ and safe working practices as part of normal construction health and safety management under the *Health and Safety at Work Act (1974)*¹⁰ and regulations made under the Act. These legal obligations include the requirement for risk assessments and method statements for all construction related activities and the use of appropriate working methods, training, and Personal Protective Equipment (PPE). As such the risks to construction workers is considered to be low.
- 16.9.2 Based on the above, it is considered that significant land quality effects as a result of the Proposed Development are unlikely.

16.10 Assessment of cumulative effects

- 16.10.1 A common receptor (controlled waters) is shared with **Chapter 15: Water**. As detailed in this chapter, significant land quality effects as a result of the Proposed Development are unlikely and the Water Environment assessment has not identified any significant effects on controlled waters as a result of the Proposed Development. Therefore, potential in-combination effects with other topics on the same receptors are also considered to be unlikely.
- 16.10.2 A cumulative assessment has also been considered for the effects of the Proposed Development in conjunction with other developments. The cumulative assessment is presented in **Chapter 18: Cumulative Effects Assessment**.

⁹ UK Government (2015). The Construction (Design and Management) Regulations 2015 (online) Available at: [The Construction \(Design and Management\) Regulations 2015 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/2015/618/contents/make)

¹⁰ UK Government (1974). Health and Safety at Work Act 1974 (online) Available at: [Health and Safety at Work etc. Act 1974 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/1974/37/contents/make)

16.11 Conclusions of significance evaluation

- 16.11.1 This chapter summarises the findings of the assessment of potential effects for land quality, specifically in relation to land contamination. The assessment considers the most recent scoping responses received in November 2020 alongside the Scoping Opinion responses originally received in 2012 and 2014.
- 16.11.2 The baseline land quality conditions have been established from environmental information reports and desk study data which identified that the site history comprises solely agricultural land use, from which there would not be expected to be contaminative sources which could present a significant risk to the identified receptors.
- 16.11.3 Offsite potentially contaminative land uses were identified in the form of historical landfills, a cemetery and WwTW. However, following discussion with the EHO in 2012, it was agreed that there are unlikely to be significant effects arising from the historical use of the Site and these offsite land uses. No other, or new, potentially contaminative land uses have been identified in the vicinity of the Site since these discussions were held with the EHO.
- 16.11.4 Construction work for the Proposed Development must comply with the law under which risks to construction workers from land contamination will be considered and managed by appropriate working methods, training and PPE. Best practice construction techniques to prevent ground contamination and development of an unexpected contamination protocol in line with UK guidance would mitigate potential effects on the water environment during construction.
- 16.11.5 Accordingly, there is limited scope for significant land quality effects as a result of the Proposed Development.

16.12 Implementation of environmental measures

- 16.12.1 **Table 16.3** describes the environmental measures noted in this chapter which will form part of the Proposed Development and how those measures will be secured.

Table 16.3 Summary of environmental measures to be implemented relating to land quality

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Adoption of best practice construction techniques to prevent ground contamination (for example the use of bunded fuel tanks, refuelling of plant and equipment on hardstanding)	Contractor	Embedded in CEMP	Section 16.8
Development of an unexpected contamination protocol by a suitably qualified and experienced environmental professional	Contractor	Embedded in CEMP	Section 16.8

17. Cumulative Effects Assessment

17.1 Introduction

- 17.1.1 This chapter presents an assessment of cumulative effects that may arise with respect to interactions between the Proposed Development and other development projects. This assessment should be read with reference to **Chapter 3: Description of the Proposed Development** and the relevant environmental topic chapters (**Chapters 6 to 16**).
- 17.1.2 The requirement for Cumulative Effects Assessment (CEA) is set out in Article 4(3) and Article 5(1) of the *European Commission (EC) Directive 2014/52/EU*¹ (the 'EIA Directive') and implemented into UK law through the *Town and Country Planning (Environmental Impact Assessment) Regulations 2017*² (the 'EIA Regulations'). A range of public sector and industry-led guidance is available on CEA but at present there is no single, agreed industry standard method. Consequently, the approach to CEA varies between applications.
- 17.1.3 The approach that has been taken in this Environmental Statement (ES) is to distinguish between intra-cumulative effects, and inter-cumulative effects (see **Information Box 1**).

Information Box 1

Cumulative effects can be categorised by two different types of relationships:

- **Intra-cumulative effects** – combined effect of technical aspects of the development application being considered on one particular receptor (i.e. noise and dust on local residents); and
- **Inter-cumulative effects** – several developments with insignificant impacts individually but which together represent a significant cumulative effect (i.e. other developments in addition to the development application being considered).

- 17.1.4 This approach is consistent with the advice contained within the Planning Inspectorate (PINS) *Advice Note Seventeen*³ and is in accordance with the EIA Regulations. This chapter therefore considers cumulative effects that may arise as a result of the Proposed Development in combination with other developments (inter-cumulative effects). The potential combined effects of individual environmental topic effects (intra-cumulative effects) are considered within the individual environmental topic chapters (**Chapters 6 - 16**).

17.2 Assessment methodology

- 17.2.1 The approach to the assessment of inter-cumulative effects that may arise as a result of the Proposed Development in combination with other developments is outlined in **Section 4.9 of Chapter 4: Approach to Preparing the Environmental Statement**.

¹ The European Commission (2014). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 (online). Available at: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32014L0052> (Accessed 22 October 2021).

² UK Government (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (online). Available at: <http://www.legislation.gov.uk/uksi/2017/571/contents/made> (Accessed 22 October 2021).

- 17.2.2 In conjunction with the above, although specifically intended for Nationally Significant Infrastructure Projects (NSIPs), *PINS Advice Note Seventeen*³ was also deemed as an appropriate basis to further identify the other developments that should be considered in this inter-CEA. Specifically, **Table 17.1** which shows the hierarchy of other developments was utilised. This acknowledges that the availability of information necessary to conduct a CEA will partly depend on the prevailing status of the relevant other developments. It develops this concept further by grouping the other developments into tiers, which reflect the likely degree of certainty attached to each development, with Tier 1 being the most certain and Tier 2 the least certain.

Table 17.1 Other developments to be considered in the CEA

Hierarchy of other developments	Certainty of other developments	
Tier 1	Under construction*.	 Decreasing level of detail likely to be available
	Permitted application(s), whether under the <i>Planning Act 2008</i> or other regimes, but not yet implemented.	
	Submitted application(s), whether under the <i>Planning Act 2008</i> or other regimes, but not yet determined.	
Tier 2	Projects for which a Scoping Report have been submitted	
	Identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.	
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.	

* Where other projects are expected to be completed before construction of the Proposed Development, and the effects of those projects are fully determined, effects arising from such projects are considered as part of the baseline and therefore as part of the assessment of both the construction and operational phases. This ES will therefore clearly distinguish between projects forming part of the baseline and those in the CEA.

- 17.2.3 For each environmental topic considered in this ES, an assessment has been undertaken of how the environmental effects resulting from the Proposed Development could combine with similar topic-related effects generated by other developments that affect a common receptor or receptors. This includes approved developments (i.e. developments which have been approved between August 2019 – August 2021 that may or may not be under construction) and developments for which an application has been made (this includes developments which have progressed further than the scoping stage for an EIA development, or have an application submitted for a non-EIA development between August 2019 – August 2021), as well as local authority allocations for development specified in the Hinckley and Bosworth Borough Council (HBBC) Local Development Framework Core Strategy⁴. Existing completed developments are not considered within the CEA as they are considered within the environmental topic assessment baselines.
- 17.2.4 The starting point for this inter-cumulative assessment is to determine the Zone of Influence (Zoi) from the Proposed Development where the presence of other developments could result in

³ The Planning Inspectorate, (2015 and updated in August 2019). Advice note seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects. Available at <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf> (accessed November 2021).

⁴ Hinckley and Bosworth Borough Council (2009). Hinckley and Bosworth Borough Council Local Development Framework Core Strategy (online) available at: https://www.hinckley-bosworth.gov.uk/downloads/file/487/core_strategy_adopted_document (accessed November 2021).

potentially significant inter-cumulative effects in combination with the Proposed Development on a given receptor or receptors. Taking into consideration the spatial extent of potential effects of the Proposed Development for each environmental topic, a maximum Zol was defined to encompass all environmental topic Zols in order to identify relevant other developments. This maximum Zol is a 2 km buffer from the Site boundary for major developments⁵, and a 5 km buffer for other major urban expansion projects and NSIPs.

- 17.2.5 The potential for inter-cumulative effects has been assessed for the construction and operational phases of the Proposed Development (see **Chapter 3: Description of the Proposed Development**). It is assumed that the Proposed development will have a ten-year build out, with the construction phase extending between 2026 - 2036. As the construction of the Proposed Development will be phased over a ten-year period, first residential occupation of the areas of the Site is expected one year after construction work begins in 2026.
- 17.2.6 For the purpose of undertaking the CEA with respect to the Proposed Development, there is only sufficient information via publicly available sources for Tier 1 developments and therefore, such developments, where they are located within the Zol, have been the subject of this inter-cumulative effect assessment. Typically, there would not be sufficient information available for Tier 2 developments, however the relevant parts of the Earl Shilton Sustainable Urban Extension (SUE) and Barwell SUE have been considered within the assessment of cumulative effects. These other developments have been considered for the CEA where relevant details are available.

17.3 Pre-application consultation

Scoping

- 17.3.1 A Scoping Report was submitted to HBBC on 09 October 2020 which included the proposed CEA methodology and a list of developments for inclusion in the inter-project effects assessment (see Table 4.2 of the Scoping Report). HBBC subsequently provided a Scoping Opinion on 12 November 2020, which included comments on the CEA from Natural England and Blaby District Council.
- 17.3.2 **Natural England** commented (see page 6 of the Scoping Opinion) as follows:
- "Cumulative and in-combination effects*
- A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.*
- The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. The following types of projects should be included in such an assessment, (subject to available information):*
- existing completed projects;*
 - approved but uncompleted projects;*
 - ongoing activities;*
 - plans or projects for which an application has been made and which are under consideration by the consenting authorities; and*

⁵ Hinckley and Bosworth Borough Council defines major development as: more than 10 dwellings, a proposed floor area of more than 1,000 m² or a site area of larger than 1 ha.

- e. *plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects."*

- 17.3.3 This ES has considered the implications of the Proposed Development and the CEA has considered effects that are likely to result from interactions between the Proposed Development and other approved developments (which may or may not be under construction) and developments for which an application has been made, as well as any local authority allocations for development. Existing completed developments have not been considered within the CEA as they have been considered within the environmental topic assessment baselines (as described in **Section 4.9 of Chapter 4: Approach to Preparing the Environmental Statement**).
- 17.3.4 Natural England requested inclusion of projects in the CEA where applications are not yet submitted. Such developments have not been considered within the CEA as they are too immature in the planning process for the required detail to be considered and also they fall outside the criteria and general best practice for CEA as specified in PINS *Advice Note Seventeen*³. For this CEA, the remaining parts of the Earl Shilton SUE and Barwell SUE have been considered within the assessment of cumulative effects.
- 17.3.5 **Blaby District Council** commented (see page 16 of the Scoping Opinion):
- "Blaby District Council has recently received Screening Opinions for the following major developments, which would be within the Zone of Influence of the Earl Shilton SUE, which the applicant may also wish to consider when determining any significant cumulative effects. However, neither of these proposals have yet progressed to planning application stage:*
- 20/01/EIASCR – Land at Hill Farm, Earl Shilton Road, Thurlaston - Environmental Impact Assessment Screening Opinion relating to proposed 50 ha solar farm.*
- 20/03/EIASCR – Land at Hill Farm, Earl Shilton Road, Thurlaston - Environmental Impact Assessment Screening Opinion relating to proposed 52 ha solar farm."*
- Blaby District Council is also currently considering applications for residential development to the north of Hinckley Road in Kirby Muxloe (applications 19/0789/OUT and 19/1610/OUT) which form the site allocation for a minimum of 750 dwellings as set out in Policy SA1 of the Blaby District Local Plan (Delivery) Development Plan Document (2019). Whilst being in excess of 5 km from the proposed Earl Shilton SUE and therefore outside of the ZOI, additional traffic from the SUE heading towards Leicester along the A47 could have an impact on these developments and in particular the proposed accesses."*
- 17.3.6 The solar farm developments (20/01/EIASCR and 20/03/EIASCR) have not been included in the CEA. Application 20/01/EIASCR is too immature within the planning process for inclusion within this CEA. No further documentation is available other than a screening report. The decision notice associated with application 20/03/EIASR concluded that the development did not constitute EIA development and hence its inclusion in this CEA would not follow the guidance specified in PINS *Advice Note Seventeen*³. Additionally, the residential developments (19/0789/OUT and 19/1610/OUT) proposed for inclusion by Blaby District Council, have not be included in the CEA as there are no potential inter-cumulative environmental effects other than traffic related effects. The assessment of traffic and transport effects presented in **Chapter 14: Traffic and Transport** provides a cumulative assessment since it incorporates modelled traffic data growth for future traffic flows originating both from the Proposed Development and other developments, including committed development. Therefore, no additional cumulative assessment is required above and beyond that contained within the chapter.

CEA scope agreement

- 17.3.7 A Technical Note was produced for the purpose of agreeing the scope of the CEA with HBBC for the ES for the Proposed Development. This note provided a response to the Scoping Opinion comments on the CEA (see Section 3 of the Scoping Opinion) and included a revised list of developments for inclusion in the inter-cumulative effect assessment (see Section 4 of the Scoping Opinion).
- 17.3.8 HBBC did not provide further comment on the projects to be included within the CEA assessment. **Appendix 4A** provides the list of other developments that have been considered in the CEA for the Proposed Development (see **Figure 17.1**). Where they are located within the ZOI for a given environmental topic, the developments have been screened and taken forward for assessment where appropriate.

17.4 Limitations of this assessment

- 17.4.1 No limitations to this CEA have been identified, though the following assumptions have been made:
- other proposed or committed developments with overlapping construction programmes will implement mitigation measures during construction (such as through a Construction Environmental Management Plan (CEMP)) to minimise adverse effects, hence reducing the likelihood of significant cumulative effects. This also applies to mitigation measures during operation where relevant; and
 - the assessment has been completed based on information relating to other proposed and committed developments which is available in the public domain as of August 2021 (see **Section 17.2**).

17.5 Assessment of cumulative effects

- 17.5.1 The applications for the projects listed in **Appendix 4A** have been reviewed and the construction phase for these projects have been detailed in **Table 17..** Assumptions have been made based on professional experience where specifics relating to construction phases have not been provided in the planning application documents for these other projects.

Table 17.2 Review of cumulative project list applications

Project ID	Decision issued	Was an EIA required? (List of assessments provided in application)	Construction Phase	Project carried forward into next stage of assessment?
Project 1	Jan 2020	No (n/a)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2020 - 2026, as a worst-case scenario.	Yes

Project ID	Decision issued	Was an EIA required? (List of assessments provided in application)	Construction Phase	Project carried forward into next stage of assessment?
Project 2	Aug 2018	No (n/a)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2018 - 2024, as a worst-case scenario.	No This project will be constructed prior to the commencement of the construction phase of the Proposed Development, therefore this application has been included where details are relevant in the baseline for the technical assessments (see Chapters 6 - 16).
Project 3	Jun 2021	No (n/a)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2021 - 2027, as a worst-case scenario.	Yes
Project 4	Jul 2020	No. (environmental topic reports included: noise, ground, arboricultural, transport, heritage, ecology)	No construction dates have been provided for this application. As this is for a medium sized residential development (100 – 1,000 dwellings) it is estimated that construction should take between three - seven years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2020 - 2030, as a worst-case scenario.	Yes
Project 5	Nov 2017	No. (environmental topic reports included: ecology, heritage, arboricultural, ground, noise)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2017 - 2023, as a worse-case scenario.	No This project will be constructed prior to the commencement of the construction phase of the Proposed Development, therefore this application has been included where details are relevant in the baseline for the technical assessments (see Chapters 6 - 16).
Project 6	Decision pending	Yes (ES topics included: socio-economics, landscape and visual, ecology, heritage, water, transport, air quality & noise, utilities, cumulative effects)	This application has been pending a decision since 2010. The application indicates a construction phase lasting 12 years, with development being phased during this period. Having construction phases for both the Proposed Development and Project 6 taking place over the same temporal period represents the worst-case scenario in terms of cumulative effects. This CEA assumes Project 6 to have a construction phase extending between 2026 and 2038.	Yes.

Project ID	Decision issued	Was an EIA required? (List of assessments provided in application)	Construction Phase	Project carried forward into next stage of assessment?
Project 7	Scoping Opinion published Dec 2020	Yes. (The scoping Opinion has requested the ES include topics: land-use and socio-economics, transport, air quality, noise, landscape and visual, ecology, heritage, water, hydrogeology, ground, materials and waste, energy and climate, cumulative effects)	This project is in the early stages of the planning application process with the scoping opinion issued in 2020. The scoping report provided an indicative programme for the application with consultation on the Preliminary Environmental Impact Report (PEIR) is Q1/Q2 2021 and submission of the Development Consent Order application in Q3 2021. Currently consultation on the PEIR has not taken place, and so this indicative programme has been delayed. Due to the time required for PEIR consultation, application preparation and submission, and application determination, the earliest feasible decision on this application is considered to be Q4 2022/Q1 2023. This CEA has assumed a decision date of January 2023 to represent a worst-case scenario in terms of potential cumulative effects. The scoping report states an indicative construction phase lasting between five - ten years. As the Applicant is legally required to begin construction within three years of the application decision date, this assessment assumes this application to have a construction phase extending between 2023 and 2036.	Yes
Project 8	Decision pending	No. (environmental topic reports included: arboricultural, ecology, water, transport, landscape and visual, ground, air quality)	No construction dates have been provided for this application. As this is for a medium sized residential development (100 – 1,000 dwellings) it is estimated that construction should take between three - seven years. The Applicant is legally required to begin construction within three years of the application decision date. Having the construction phases of this application and the Proposed Development taking place over the same temporal period represents the worst-case scenario in terms of potential cumulative effects. This CEA therefore assumes this application to have a construction phase extending between 2022 and 2032.	Yes
Project 9	Decision pending	No. (Environmental topic reports included: socio-economics, air quality, water, arboricultural, ecology, noise, heritage, transport, utilities, landscape and visual)	No construction dates have been provided for this application. As this is for a medium sized residential development (100 – 1,000 dwellings) it is estimated that construction should take between three - seven years. The Applicant is legally required to begin construction within three years of the application decision date. Having the construction phases of this application and the Proposed Development taking place over the same temporal period represents the worst-case scenario in terms of potential cumulative effects. This CEA therefore assumes this	Yes

Project ID	Decision issued	Was an EIA required? (List of assessments provided in application)	Construction Phase	Project carried forward into next stage of assessment?
			application to have a construction phase extending between 2022 and 2032.	
Project 10	Decision pending	No. (Environmental topic reports included: transport, arboricultural, heritage, ecology, ground, water, landscape and visual)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. Having the construction phases of this application and the Proposed Development taking place over the same temporal period represents the worst-case scenario in terms of cumulative effects. This CEA therefore assumes this application to have a construction phase extending between 2022 and 2028.	Yes
Project 11	Mar 2018	No. (Environmental topic reports included: transport, water)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2018 - 2024, as a worst-case scenario.	No This project will be constructed prior to the commencement of the construction phase of the Proposed Development, therefore this application has been included where details are relevant in the baseline for the technical assessments (see Chapters 6 - 16).
Project 12	Nov 2016	No. (Environmental topic reports included: ground, water)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2016 - 2022, as a worst-case scenario.	No This project will be constructed prior to the commencement of the construction phase of the Proposed Development, therefore this application has been included where details are relevant in the baseline for the technical assessments (see Chapters 6 - 16).
Project 13	Jan 2018	No (n/a)	No construction dates have been provided for this application. As this is for a small sized residential development (under 100 dwellings) it is estimated that construction should take no more than three years. The Applicant is legally required to begin construction within three years of the application decision date. The overall construction phase is estimated to take place between 2018 - 2024, as a worst-case scenario.	No This project will be constructed prior to the commencement of the construction phase of the Proposed Development, therefore this application has been included where details are relevant in the baseline for the technical assessments (see Chapters 6 - 16).

17.5.2

Following this review of the project applications, Projects 1, 3, 4, 6, 7, 8, 9, and 10 have been taken forward to the next stage of the CEA.

Air Quality

Construction

- 17.5.3 Construction dust has been assessed up to 500 m from the Site, as per IAQM guidance (see **Chapter 6: Air Quality**). The developments within 1 km (i.e. the maximum distance between two developments each with a 500 m buffer) of the Proposed Development which may have a cumulative effect with respect to construction dust are Projects 1, 4, 8, 9, and 10.
- 17.5.4 Should this be the case, there is the potential for residential properties in Earl Shilton to be impacted by dust soiling, however, as mitigation measures will be utilised during the construction works by the Proposed Development and it is assumed that the other developments will also apply similar mitigation measures, the cumulative effect related to construction dust is likely to be **not significant**.

Operation

- 17.5.5 Committed development schemes within the study area that could have a cumulative effect during operation have been assessed through the approach adopted for the air quality assessment. **Chapter 6: Air Quality** identified potential sensitive receptors as residential properties, and Burbage Common and Woods Local Nature Reserve (LNR) that could be impacted by additional road traffic. As concentrations of NO₂, PM₁₀, PM_{2.5}, and nitrogen associated with road traffic emissions remain negligible, **no significant** adverse effects were identified.

Biodiversity

- 17.5.6 Consideration has been given as to whether any of the biodiversity receptors that have been taken forward for assessment in **Chapter 7: Biodiversity** are likely to be subject to cumulative effects because of biodiversity effects generated by other developments.
- 17.5.7 **No significant cumulative effects** are expected as a result of interactions between the Proposed Development and the other developments identified in **Table 17.2**. The embedded measures for the Proposed Development have been designed to offset any perceived impacts such that there are no adverse residual effects during the construction phase and operational phases and thus negating the potential for any accumulation of significant adverse effects.

Climate

- 17.5.8 The climate change assessment considered the global climate as the only receptor and was carried out on Green House Gas (GHG) emissions for the Proposed Development (see **Chapter 8: Climate**). The assessment considered the Proposed Development's contribution to the national climate targets.
- 17.5.9 The effects of all GHG emissions are essentially cumulative. The excess of emissions from human activities contributes to the overall effect on climate in the UK, not only to local emissions. For this reason, the impact of the Proposed Development has been considered in the context of overall GHG emissions from the UK, rather than in combination with other local developments, by comparing the estimated Proposed Development's GHG emissions with UK carbon budgets.
- 17.5.10 The Proposed Development is assessed as having a low (adverse) magnitude and a minor effect. It is therefore assessed as **not significant**, as stated in the conclusion of **Chapter 8: Climate**.

Historic Environment

- 17.5.11 Cumulative historic environment effects can occur during construction where areas of archaeology or contiguous or contemporaneous archaeology assets are affected by more than one development footprint. For such effects to occur development footprints need to overlap or be adjacent and where this is not the case the distance of separation is such that the inter-project development proposal can be scoped out of any cumulative assessment for this aspect of the historic environment topic. Therefore, only Project 8 has the potential for cumulative effects on cultural heritage, as Projects 1, 3, 4, 6, 7, 9, and 10 are separated from the Proposed Development by existing built development and/or a considerable distance.
- 17.5.12 Intrusive groundwork associated with the construction of the Proposed Development may remove sub-surface archaeology within areas of intrusive groundworks in the Site. Following the implementation of mitigation identified in the Written Scheme of Investigation following consultation with the archaeologist for Leicestershire County Council (LCC) secured through a planning condition, no significant effects to archaeological remains would be anticipated. It is predicted that Project 8 will have a similar potential impact on buried archaeology, and it assumed that comparable mitigation measures to those for Proposed Development would be implemented. Therefore, the predicted cumulative effect from both developments is considered to be **not significant**.
- 17.5.13 Different development projects in combination can also have a cumulative effect on the settings of a heritage assets, or shared setting of an associated group of assets, when it is affected by more than one development during the construction and operational phases of those developments; and where the part of the settings that are affected by both proposals makes a positive contribution to the heritage significance of the asset. Effects can be scoped out where there are no heritage asset effects common to the Proposed Development and the project being assessed for cumulative effects, and/or the effects are individually and in combination not of sufficient scope to affect underlying historic landscape character or the contribution made by setting to significance.
- 17.5.14 Initial desk-based assessment and a site visit has determined that there are unlikely to be any anticipated indirect effects to the setting of scoped in heritage assets during the construction phase, with the exception of the Church of St Simon and St Jude (Grade II* Building, NHLE: 1074259).
- 17.5.15 The Church of St Simon and St Jude lies within the historic core of Earl Shilton and is located 530 m north of the Site. Surrounded by the later development of the town, there would be no visibility between the main body of the church or its churchyard and the Site. The Site would be visible from the church spire, at a distance and across the existing residential buildings that separate the Site and the church. Despite this, there will be no actual viewpoint from the spire that can see the Site and therefore nobody will be able to perceive the change to setting.
- 17.5.16 The Proposed Development will be seen in the foreground of existing residential buildings with the spire at a distance in the background. Mitigation has been designed into the Proposed Development, in the form of additional tree and shrub planting along the southern boundary, which will soften the appearance of the built form. The proposed buildings will fit into the residential character that is already established in the views on the approach along Thurlaston Lane. In addition, the introduction of buildings into this approach will not block views towards the church, and the prominence of the spire visible above the houses will be retained.
- 17.5.17 The design of the Proposed Development will give consideration to maintaining views of the spire of St Simon and St Jude Church along proposed retained and enhanced green corridors. In addition, the rising topography to the south of the Site will also help to maintain these views of the spire from within the Site. As a result, a visual relationship between the residents of the Proposed Development and the parish church will be maintained.

- 17.5.18 The presence of the Proposed Development during the operation phase will result in, at most, a negligible magnitude of change to the historic interest of the church by changing the view on the initial approach to the town but by not significantly impacting on the significance of the church, due to the existing modern residential development that separates the Site from the church. The architectural and archaeological interests of the church, which are confined to the immediate environs surrounding the church will be unaffected.
- 17.5.19 Only application Project 8 has the potential to result in cumulative effects on the significance of the Church of St Simon and St Jude given the proximity and scale of this project and the Proposed Development during their construction and operational phases.
- 17.5.20 The predicted effect of the current Proposed Development on the significance of the Church of St Simon and St Jude is negligible, or neutral following mitigation. It is predicted that Project 8 would potentially have a similar effect on the Church of St Simon and St Jude, as mitigation measures are assumed to be comparable to those for the Proposed Development. Therefore, the predicted cumulative effect from both developments is considered to be **not significant**.

Landscape and Visual

Landscape

- 17.5.21 The Landscape and Visual Impact Assessment (LVIA) has assessed the effects during the construction and operational phases of the Proposed Development on three groups of landscape elements within the Site and on the character of the host Urban Character Area (UCA) (UCA 10: Earl Shilton) and on the neighbouring Landscape Character Assessment (LCA) (LCA F: Burbage Common Rolling Farmland).
- 17.5.22 No potential cumulative landscape effects are anticipated as a result of Projects 1 and 3 in combination with the Proposed Development as Projects 1 and 3 are proposed on existing developed land within the settlement of Earl Shilton. Intervening existing built development to the west of the Proposed Development would prevent inter-visibility with the Projects 4, 6, 9, and 10. Project 10 is over 1 km to the south of the Proposed Development at the closest point. Intervening mature vegetation together with intervening built development and arable land would prevent inter-visibility and there would be no cumulative landscape effects.
- 17.5.23 One significant potential cumulative effect on the landscape is anticipated as a result of Project 8 in combination with the Proposed Development during construction and operation. These developments in combination, could have a direct landscape effect on UCA 10 and on LCA F, identified as part of the landscape baseline for the Proposed Development.
- 17.5.24 Due to the larger development size, the greatest cumulative significance of effect on landscape character is anticipated within the construction phase for the Proposed Development, when there would be increased human activity when clearance and earthworks operations and construction works are underway.
- 17.5.25 In general, the greater source of effect on landscape character within UCA 10 and LCA F, during construction and operation, would be the Proposed Development. The predicted landscape effects of the Proposed Development cumulatively with Project 8 would not give rise to a greater significance of adverse effect on UCA 10 and LCA F than that caused by the Proposed Development alone. It is anticipated that the cumulative significance of effect on UCA 10 and LCA F would slightly improve in the long-term as mitigation planting associated with Project 8 and Proposed Development matures.

- 17.5.26 The cumulative significance of effect on this local landscape character area during construction and operation (at Years 1 and 15) would be similar to the Proposed Development in isolation (slight adverse to neutral).
- 17.5.27 The completed built developments, set within a framework of retained hedgerows and trees, would reflect development which is already present within the UCA in terms of density, scale, height, and land use. Whilst the character within the development sites would alter, this would not be uncharacteristic of the UCA and when considering UCA 10 as a whole, the magnitude of change would be Low. Long-term landscape effects would therefore be Negligible beneficial and **not significant**.
- 17.5.28 Perceptual effects associated with construction activities for both developments would be incremental to the audible role that traffic on the A47 already has and the resultant lower levels of tranquillity already established across the northern part of LCA F. The operational development would introduce built development closer to LCA F with a corresponding slight intensification in urbanising influence, representing an incremental effect to a baseline key characteristic as opposed to a new or uncharacteristic effect. The small, partial change to the landscape character, primarily affecting a localised geographical extent along the northern fringes would be Minor adverse, and **not significant**.
- 17.5.29 With reference to paragraph 7.28 of the Guidelines for Landscape and Visual Impact Assessment 3rd Edition, the Proposed Development would not comprise a '*tipping point*' which would give rise to a greater significance of adverse effects on the local landscape cumulatively with Project 8.

Visual

- 17.5.30 Visual changes associated with the construction phase are driven principally by the loss of vegetation, land cover and a change to the composition of views as a consequence of plant and materials (notably soils) that would be operating and stored on the Site. Existing views may potentially be foreshortened through the introduction of new elements; opened up through the removal of vegetation or altered upon by the introduction of new activities and elements. Due to the localised nature of views and the extent of the Site, only certain phases of construction would be experienced by visual receptors.
- 17.5.31 Visual changes associated with the operation of the Site would result from permanent changes in land-use and the introduction of new built form and its operation. Similar to the construction period, no visual receptors would have a complete view of the entire Proposed Development.
- 17.5.32 The Proposed Development layout has accommodated existing Public Right of Way (PRoW) with only slight diversions where necessary to accommodate components of the Proposed Development (e.g. the Primary School). Generally, existing PRoW are set within green corridors where existing planting would be retained where possible and supplemented with new planting. In addition, appropriate privacy distances and orientation between existing residential properties and the proposed residential units has been carefully considered. Notwithstanding the mitigation proposals, it is accepted that some existing views across the Site, predominantly rural in character would be replaced by views that would be more suburban in character. Consequently, the type of change is typically assessed as adverse, noting that the magnitude of change relative to the baseline view may reduce as a result of the growth of mitigation planting.
- 17.5.33 All of the significant visual effects would occur for receptors which reside in private properties adjacent to the Site boundary or are using PRoWs adjacent to or within the Site itself. For these receptors, their proximity to the Site means that a moderate to large proportion of their views would be altered by the Proposed Development during both its construction and subsequent operation/occupation phase.

- 17.5.34 Due to the location of the receptors, only Project 8 could cause potential cumulative effects as the remaining other developments are separated from the receptors by existing built environment that restricts potential visual impact.
- 17.5.35 It is predicted that Project 8 will have a similar potential impact on visual receptors adjacent to the project development footprint. The visual receptors include residential receptors along Thurlaston Lane, King Richard's Hill, and Mill Lane. However, it is considered that the potential cumulative impact on these residential receptors is negligible as the development of Project 8 will restrict potential cumulative adverse views from Thurlaston Lane and King Richard's Hill to the Proposed Development, and the Proposed Development will restrict the potential cumulative adverse views from Mill Lane. Project 8 will have comparable mitigation measures to the Proposed Development. Therefore, the cumulative visual effect from both developments will be **not significant**.

Noise and Vibration

- 17.5.36 Consideration has been given as to whether any of the noise and vibration receptors that have been taken forward in **Chapter 11: Noise and Vibration** are likely to be subject to cumulative noise and vibration effects because of noise and vibration effects generated by other developments.
- 17.5.37 The traffic flows for all the scenarios are based on LCC's Pan Regional Transport Model (PRTM) which is a SATURN (Simulation and Assignment of Traffic to Urban Road Network) model covering the County and the wider Midlands area. PRTM is an extension of the Leicester and Leicestershire Integrated Transport Model (LLITM). LCC controls the use of PRTM and only LCC approved transport consultants are allowed access and to undertake model testing. The Applicants appointed WSP through LCC to undertake the modelling of the traffic generation from the Earl Shilton SUE proposal using PRTM (see **Chapter 14: Traffic and Transport**).
- 17.5.38 The traffic data output from PRTM shows a reduction in traffic flows on some of the road links in the future baseline traffic in the 'with development' (do something) scenarios as background traffic is redistributed on the road network based on elasticity of demand; changes to traffic flow conditions on the road network will result in the use of alternative routes. For example, increases in traffic flow on a road link/junction which causes queuing/longer journey times will result in some traffic being reassigned onto different routes which have less congestion/shorter journey times. The traffic data from PRTM reflects the changes on the whole network due to the traffic generated from proposed and committed developments. Therefore, not every road link within the assessment area demonstrates an increase in the traffic flows due to the Proposed Development, as some baseline traffic will be reassigned due to changes in the traffic conditions.
- 17.5.39 As the traffic modelling considers traffic generated from proposed and committed developments and road traffic noise is the dominant source of noise in the area, cumulative effects are embedded into the noise and vibration assessment, as presented in **Chapter 11: Noise and Vibration**.
- 17.5.40 A number of the other developments are located within 1 km of the Proposed Development, these are all primarily residential in nature. Due to the proximity of the applications, construction noise of these developments could be considered to lead to a cumulative effect. It is unlikely that anything other than piling works would be audible at the Noise Sensitive Receptors (NSRs) considered in the noise assessment (see **Chapter 11: Noise and Vibration**), and construction works for the Proposed Development would be the dominant noise source at the NSRs. It is considered unlikely that the construction of other development would lead to an increase in noise levels at the NSRs considered in this assessment. Therefore, the Proposed Development is **unlikely to result in significant cumulative effects**.

Socio-economics and Health

- 17.5.41 Consideration has been given as to whether any of the socio-economics and health receptors that have been taken forward for assessment in **Chapter 12: Socio-economics and Health** are likely to be subject to cumulative socio-economics and health effects because of socio-economics and health effects generated by other developments.
- 17.5.42 All of the other developments could have moderate (potentially significant) **beneficial cumulative effects** in relation to employment in the construction sector, depending on the timing of development.
- 17.5.43 There could be moderate (potentially significant) **beneficial cumulative effects** associated with expenditure locally associated with residential developments that could benefit local businesses, including those in Earl Shilton town centre. The majority of the residential developments highlighted in **Table 17.** could contribute to such effects. Residents of the proposed SUE at Barwell (Project 6) would likely use Barwell district centre to access local services and for convenience shopping, whereas other developments at Earl Shilton would be more likely to gravitate to its town centre.
- 17.5.44 There are anticipated to be moderate (potentially significant) **beneficial cumulative effects** associated with local community receptors (residents and visitors) using the open space. This includes the open space provision that will meet the needs of existing and future residents of Earl Shilton and financial contribution towards the improvements to the Weavers Springs Playing Fields, and the creation/upgrades to the footpaths, cycleways, bridleways, and establishment of a new bus route will make the local community better connected. The majority of the residential developments highlighted in **Table 17.** could contribute to such effects. Residents of the proposed SUE at Barwell (Project 6) would likely use the open space provided by the Barwell SUE, whereas usage of facilities at other developments at Earl Shilton would be likely to vary use between the two SUEs.
- 17.5.45 Given the requirement to meet future housing needs, including affordable housing provision, and that the Proposed Development is a key element of the adopted Development Plan there could be **significant beneficial cumulative effects** associated with local housing provision associated with the availability of up to 1,500 homes which would be provided by the Proposed Development. The residential developments highlighted in **Table 17.** would further contribute to such beneficial effects. The delivery of the proposed SUE at Barwell (Project 6) could also result in further significant beneficial effects with respect to the provision of homes in the area.
- 17.5.46 The capacity of education in the town will be increased through the provision of land and capital funding for a new primary school and further financial contributions will be made to the capacity of education provision for the up to 18 years old age group. There could be moderate (potentially significant) **beneficial cumulative effects** associated with local community receptors using the educational facilities in the town. Further benefits could be realised through the creation of employment opportunities within the educational facilities effected by the Proposed Development during the operational phase. The residential developments highlighted in **Table 17.** would further contribute to such beneficial effects. Residents of the proposed SUE at Barwell (Project 6) could also cause further significant beneficial effects for the provision of homes in the area. Residents of the proposed SUE at Barwell (Project 6) would likely use the educational facilities provided by the Barwell SUE, whereas other developments at Earl Shilton would be likely to vary use between the two SUEs.
- 17.5.47 The capacity of primary healthcare in the town will be increased through the provision of a financial contribution to enhance capacity of the Heath Lane Surgery. There could be moderate (potentially significant) **beneficial cumulative effects** associated with local community receptors using the healthcare facilities in the town. The residential developments highlighted in **Table 17.** would

further contribute to such beneficial effects. Residents of the proposed SUE at Barwell (Project 6) could also cause further significant beneficial effects for the provision of healthcare facilities in the area.

Soils

- 17.5.48 Consideration has been given as to whether any of the receptors that have been taken forward for assessment in **Chapter 13: Soils** are likely to be subject to cumulative effects because of effects generated by the list of other developments identified for assessment.
- 17.5.49 In order to ensure that only developments of a scale and nature that could result in likely significant cumulative effects are considered, an additional screening criterion has been applied to the other developments listed in **Table 17.**, namely, to only include developments on agricultural land and with a redline (planning application) boundary area greater than 20 hectares (ha).
- 17.5.50 This additional screening criterion has been selected based on the scale of developments that could result in a significant cumulative loss of Best and Most Versatile (BMV) land noting that this value is used in the Natural England (2018) guidance⁶ as a threshold for 'smaller losses', and only above which more detailed advice is required if the development is not already in an approved local or neighbourhood plan.
- 17.5.51 Based on the list of developments outlined in **Table 17.** and the additional agricultural land quality screening criterion, the Hinckley National Rail Freight Interchange (Project 7) is the only development which has been taken forward for further consideration.
- 17.5.52 None of the other developments have been identified as having the potential to have a significant cumulative effect as they are either:
- not on agricultural land;
 - on agricultural land but are smaller than 20 ha in size;
 - on agricultural land and greater than 20 ha in size but already allocated in an approved local plan; or
 - are already in construction and, therefore, are not used or available for agriculture (as the loss of any agricultural land or soils has already occurred).
- 17.5.53 Assuming the Hinckley National Rail Freight Interchange (Project 7) was to proceed alongside the Proposed Development, there would be a total additional loss of up to approximately 377 ha of agricultural land. Information presented in the Hinckley National Rail Freight Interchange Soils and Agricultural Land Quality Topic Paper issued for informal consultation in 2019⁷ indicates that the agricultural land was surveyed in February 2018 and found to comprise predominantly Grade 3b agricultural land with only a small area (approximately 3 ha) of Grade 3a BMV agricultural land.
- 17.5.54 On this basis, the total cumulative loss of BMV agricultural land from the Hinckley National Rail Freight Interchange alongside the Proposed Development would be approximately 44 ha which remains a major and, therefore, significant effect.
- 17.5.55 The Hinckley National Rail Freight Interchange is noted to be a Nationally Significant Infrastructure Project and the informal consultation materials indicate that the development would seek to protect soil resources through good practice measures for stripping and handling of soils like those

⁶ Natural England (2018). Guide to assessing development proposals on agricultural land (online). Available at: <https://www.gov.uk/government/publications/agricultural-land-assess-proposals-for-development/guide-to-assessing-development-proposals-on-agricultural-land> (Accessed 22 April 2021).

⁷ Hinckley National Rail Freight Interchange (2019). Soils and Agricultural Land Quality Topic Paper (online). Available at: <https://www.hinckleynrfi.co.uk/db-informal-consultation/> (Accessed 31 March 2021).

embedded as part of the Proposed Development. On this basis, the cumulative effects on soil resources and soil structure would remain as **significant**.

Traffic

- 17.5.56 Traffic modelling has been undertaken to inform the Transport Assessment (see **Chapter 14: Traffic and Transport**) and has considered all of the cumulative schemes identified in **Appendix 4A** in its assessment of future traffic generation rates. Therefore, cumulative effects have already been assessed in the chapter and have not been considered within this CEA.

Water Environment

- 17.5.57 Consideration has been given as to whether any of the water environment receptors that have been taken forward for assessment in **Chapter 15: Water Environment** are likely to be subject to cumulative water environment effects because of water environment effects generated by other developments.
- 17.5.58 Potential cumulative effects (with respect to water environment receptors) could occur as a result of the Proposed Development occurring alongside other developments within the same spatial area noted in **Table 17..** However, it is understood that no other major developments are currently proposed in the area around the Site that could impact on the water environment. As the Site is in the upper catchment of the Earl Shilton Brook, the only area higher up the catchment is the already developed area of east Earl Shilton. Furthermore, the Site would provide the majority of the planned housing provision for Earl Shilton, and as such no developments with a similar degree of potential impact on the water environment are expected. The other developments considered are primarily residential and mainly consist of brownfield redevelopments, with some other areas of greenfield development in the surrounding areas of the Earl Shilton SUE. The Barwell SUE (Project 6) is located 3.1 km to the west of the Site within a different surface water catchment, limiting the potential for cumulative effects. The other notable development is the Hinckley National Rail Freight Interchange (Project 7) 1.1 km to the south of the Site.
- 17.5.59 All new developments will be required by the National Planning Policy Framework (NPPF)⁸ to utilise Sustainable Urban Drainage Systems (SuDS). Through the application of SuDS it should be ensured that downslope and downstream flood risk will not increase due to the developments, even though greenfield developments would result in an increase in impermeable surfaces. In addition, SuDS would ensure water quality is not negatively impacted through the use of sufficient treatment stages. Where brownfield sites are being redeveloped, the use of SuDS at the brownfield sites which previously did not previously have SuDS for attenuation and water quality management would actually result in a small decrease in flood risk to off-site receptors and associated improved water quality. Where infiltration currently occurs on greenfield land, then infiltration-based SuDS will be required by the Lead Local Flood Authorities (LLFA) and the quantity of water infiltrating to ground would not be significantly affected.
- 17.5.60 Whilst infrastructure such as the Hinckley National Rail Freight Interchange (Project 7) could result in more substantial changes to runoff rates or the potential for pollution impacts on water quality, as a new development being brought forward under the current planning and SuDS requirements, the SuDS and drainage systems incorporated will need to be fully commensurate with the level of pollution risk. This will avoid there being any significant off-site impacts.

⁸ Ministry of Housing, Communities and Local Government (2019). National Planning Policy Framework (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/733637/National_Planning_Policy_Framework_web_accessible_version.pdf (Accessed 4 March 2021).

- 17.5.61 With regards to surface and groundwater quantity and quality, flood risk and hydromorphology, the mitigations undertaken will ensure that all of the potential effects are prevented on site. As a result of these measures, there will be no significant off-site effects. Therefore, no significant cumulative effects of the Proposed Development with any other developments are anticipated.
- 17.5.62 It has been assessed that the identified potential effects on the water environment receptors are **unlikely to give rise to significant effects** with the proposed environmental measures in place.

Land Quality

- 17.5.63 Consideration has been given as to whether any of the land quality receptors that have been taken forward for assessment in **Chapter 16: Land Quality** are likely to be subject to cumulative effects because of effects generated by other developments.
- 17.5.64 For land quality, UK legislation and planning policy requires all developments to be suitable for their proposed use. Specifically, this requires risks to human health and controlled waters from land contamination to have been appropriately managed.
- 17.5.65 It is, therefore, reasonable to assume that prior to commencement of construction activities for other developments, planning conditions on those development would require submission of detailed land contamination remediation plans, if potential land contamination risks are identified, and adoption of best practice construction mitigation to prevent pollution.
- 17.5.66 On this basis, there are not considered to be any impacts from the Proposed Development that have the potential to act cumulatively with similar impacts from other developments. Therefore, cumulative land quality effects are considered to be **not significant**.

17.6 Conclusion

- 17.6.1 **Table 17.2** provides a summary of the likely significant cumulative effects that may arise as a result of the Proposed Development in combination with other developments.

Table 17.2 Summary of the likely significant cumulative effects

Environmental aspect	Potential cumulative impacts	
	Construction phase	Operation phase
Air quality	Providing mitigation is place no significant adverse cumulative impacts are anticipated.	Not significant.
Biodiversity	Not significant.	Not significant.
Climate	Not significant.	Not significant.
Historic	Not significant.	Not significant.
Landscape	Providing mitigation is place no significant adverse cumulative effects are anticipated.	Providing mitigation is place no significant adverse cumulative effects are anticipated.
Noise	Providing mitigation is place no significant adverse cumulative effects are	Providing mitigation is place no

Environmental aspect	Potential cumulative impacts	
	Construction phase	Operation phase
	anticipated.	significant adverse cumulative effects are anticipated.
Socio-economics and health	Potentially significant beneficial effects.	Potentially significant beneficial effects.
Soils	Significant effect due to cumulative loss of Grade 3a or above BMV agricultural land from the Hinckley National Rail Freight Interchange and the Proposed Development of approximately 44ha.	Significant effect due to cumulative loss of Grade 3a or above BMV agricultural land from the Hinckley National Rail Freight Interchange and the Proposed Development of approximately 44ha.
Water	Providing mitigation is place no significant adverse cumulative effects are anticipated.	Providing mitigation is place no significant adverse cumulative effects are anticipated.
Land quality	Providing mitigation is place no significant adverse cumulative effects are anticipated.	Not significant.